ENVIRONMENTAL ASSESSMENT

Resilient St. Vrain, Channel Improvement Project, Longmont, Colorado

May 2016

U.S. Department of Homeland Security
FEMA Region VIII
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FEMA

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Cover Sheet

Final Environmental Assessment

Resilient St. Vrain Project

Longmont, Colorado

Responsible Agency: The Federal Emergency Management Agency (FEMA) and the City of Longmont

Proposed Action: Implementation of improvement projects along St. Vrain Creek

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Report Designation: Final Environmental Assessment

Abstract: FEMA has produced a Final Environmental Assessment (FEA) for the Resilient St. Vrain Project. The FEA analyzes the potential environmental impacts associated with implementing a series of improvement projects along St. Vrain Creek in response to the 2013 floods through Longmont, Colorado. Environmental resources and concerns considered in the FEA include socioeconomics, land use and community cohesion, health and safety, traffic and transportation, noise, hazardous materials and solid waste, utilities, cultural resources, water resources, biological resources, geological resources, air quality and climate change and environmental justice.

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Acronyms and Abbreviations

°F	degrees Fahrenheit
ACAM	Air Conformity Applicability Model
APCD	Air Pollution Control Division
APE	area of potential effects
APP	Avian Protection Plan
ARPA	Archaeological Resources Protection Act
ASTM	ASTM International
BCC	Birds of Conservation Concern
BE	Biological Evaluation
BGEPA	Bald and Golden Eagle Protection Act
bgs	below ground surface
BMP	best management practice
CAA	Clean Air Act
Caltrans	California Department of Transportation
CCR	Code of Colorado Regulation
CDBG	Community Development Block Grant
CDPHE	Colorado Department of Public Health and Environment
CDWR	Colorado Division of Water Resources
CEQ	President's Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	*Code of Federal Regulations*
CGS	Colorado Geological Survey
CH2M	CH2M HILL
City	City of Longmont
CLOMR	Conditional Letter of Map Revision
CNHP	Colorado Natural Heritage Program
CO	carbon monoxide
CO_{2e}	carbon dioxide equivalent
CPW	Colorado Parks and Wildlife
Creek	St. Vrain Creek
CRS	Cultural Resource Survey
CSU	Colorado State University
CWCB	Colorado Water Conservation Board
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibel

DHSEM	Division of Homeland Security and Emergency Management
EA	Environmental Assessment
EDR	Environmental Data Resources, Inc.
EIS	Environmental Impact Statement
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ERO	Resources Corporation
ESA	Endangered Species Act
ESG	Environmental Statistics Group
FACWet	Functional Assessment of Colorado Wetlands
FCI	Functional Capacity Index
FEA	Final Environmental Assessment
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
GHG	greenhouse gas
GOCO	Great Outdoors Colorado
HGM	hydrogeomorphic
HMMF	Hazardous Materials Management Facility
HUD	U.S. Department of Housing and Urban Development
IP	Individual Permit
LBP	lead-based paint
Longmont	City of Longmont
LPC	Longmont Power & Communications
LEM	Lacustrine Emergent
MBTA	Migratory Bird Treaty Act
MOA	memorandum of agreement
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NOI	Notice of Intent
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
O_3	ozone
OSHA	Occupational Safety and Health Administration
PEM	Palustrine Emergent
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter

PM_{10}	particulate matter less than 10 microns in diameter
ppb	parts per billion
PPE	personal protective equipment
ppm	parts per million
Preble's	Preble's meadow jumping mouse
Project	Resilient St. Vrain Project
PSS	Palustrine Scrub-Shrub
RCRA	Resource Conservation and Recovery Act
RICD	Recreational In-Channel Diversion
ROW	right-of-way
RTD	Regional Transportation District
Sandstone Reach	Sandstone Ranch Reach
SB40	Senate Bill 40
SH	State Highway
SHPO	State Historic Preservation Office or Officer
SIP	State Implementation Plan
SO_2	sulfur dioxide
SRIA	Sandy Recovery Improvement Act
SWMP	Stormwater Management Plan
$\mu g/m^3$	micrograms per cubic meter
UFR	Unified Federal Review
ULTO	Ute ladies'-tresses orchid
URA	Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970
US 287	U.S. Highway 287
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	volatile organic compound
WQCD	Water Quality Control Division
WTP	water treatment plant
WWTP	wastewater treatment plant

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SECTION 1

Introduction

The City of Longmont, Colorado (Longmont or the City), has applied to the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) for funding to implement a series of improvement projects along St. Vrain Creek (Creek). Longmont is intending to use FEMA grant funds along with other federal and non-federal funding to design and construct improvements to the Creek. The improvement would occur in three reaches: the City Reach between Airport Road and the confluence with Left Hand Creek; the Sandstone Ranch Reach (Sandstone Reach) between County Line Road and the confluence with Boulder Creek; and the Middle Reach between the City Reach and Sandstone Reach (**Figure 1-1**). These proposed measures would be implemented to reduce flood hazards, repair flood damage, restore habitat, and improve resiliency for the City and nearby communities. These measures are collectively referred to as the Proposed Action or the Resilient St. Vrain Project (the Project). The Project has been divided into three phases. Final engineering and design of several portions of the Project are pending identification of potential funding sources. All three reaches are included in this Environmental Assessment (EA) to ensure a holistic approach to the identification of potential impacts to the human and natural environment. All phases of the Project have independent utility and will function as designed pending implementation of the other phases.

Federal and non-federal government sources that may provide funding for the Resilient St. Vrain Project are listed below. In addition to these sources, it is possible that other federal or non-federal sources may be identified or available in the future.

Federal Government Funding Sources:

- FEMA Hazard Mitigation Assistance Programs
- FEMA Public Assistance grants
- U.S. Fish and Wildlife Service (USFWS) – Fish Passage Development
- U.S. Army Corps of Engineers (USACE)
- U.S. Department of Housing and Urban Development (HUD)

Non-Federal Funding Sources:

- City of Longmont
- State of Colorado
- Trout Unlimited
- Colorado Department of Public Health and Environment (CDPHE)
- Aggregate Industries
- Great Outdoors Colorado (GOCO)
- Colorado Water Conservation Board (CWCB)

Pursuant to requirements of the National Environmental Policy Act of 1969 (NEPA) and the President's Council on Environmental Quality (CEQ) regulations for implementing NEPA (Title 40 of the Code of Federal Regulations [CFR] Parts 1500-1508 [40 CFR 1500-1508]), federal agencies are required to consider the potential environmental impacts before funding or approving an action. The purpose of this EA is to evaluate the potential environmental impacts of the Proposed Action and its alternatives, and to make this information available to the public as part of the federal decision-making process. If the impacts are found to be less than significant, FEMA, as the lead federal agency, would issue a Finding of No Significant Impact (FONSI) in accordance with 44 CFR 10. If the impacts are found to be significant based on criteria established in 40 CFR 1508.27, a Notice of Intent (NOI) and Environmental Impact Statement (EIS) would be prepared and published prior to implementation of the Proposed Action.

1.1 Background

Longmont is located in Boulder County approximately 30 miles north of Denver. St. Vrain Creek is the primary stream in the region and a major drainage within the South Platte River Basin. It originates at the continental divide, collects drainage water from Boulder County, and conveys flows to the South Platte River at their confluence approximately 20 miles northeast of Longmont. Left Hand Creek and Boulder Creek flow into St. Vrain Creek within the City and Sandstone Reaches, respectively (see **Figure 1-1**).

The alignment of St. Vrain Creek was drastically altered throughout Longmont during the 100- to 500-year flood event that occurred in September 2013. Catastrophic flooding caused extensive damage in the Longmont area, damaging both public infrastructure and private property. Damage to public infrastructure included roads and bridges, water and sewer utilities, parks and trails, and public buildings. Flows passed through both commercial and residential neighborhoods, damaging homes and businesses. Likewise, the flood resulted in environmental damage to the Creek, its banks, and surrounding riparian corridor. In various locations, the Creek migrated laterally; experienced significant in-stream and off-channel erosion and deposition of materials such as rocks, cobble, sand, trees, and trash; cut new overbank channels; lost a significant amount of its riparian ecological function; and migrated or scoured to the point of destroying numerous utilities, roads, embankments, bridges, etc.

1.2 Purpose and Need

1.2.1 Purpose

The purpose of the Proposed Action is to repair flood damage, protect infrastructure, improved property and public health and safety in Longmont and surrounding communities during significant flood events, and to preserve, restore, create, and enhance the natural and beneficial functions, values, and characteristics in the St. Vrain Creek corridor.

1.2.2 Need

St. Vrain Creek was severely degraded during flood events in 2013. Using federal, state, and local funding, Longmont would restore and improve the condition of St. Vrain Creek from approximately Airport Road to the confluence with Boulder Creek in Weld County. Channel and floodplain improvements contemplated under the Proposed Action are needed to achieve the following:

- Repair damage to the greenway trail to restore recreational opportunities, and restore and enhance the natural values of the existing greenway.
- Stabilize and repair the Creek channel to restore and ultimately increase its flood conveyance capacity.
- Promote resiliency by reducing the economic and physical effects of flooding on the community.
- Promote the environment by using natural restoration techniques to maintain and improve fish passage and habitat, wildlife habitat, the natural riparian setting, and the greenway corridor.
- Maintain or improve existing natural habitat conditions and, where possible, provide conditions that allow natural restoration of the Creek and its riparian habitat.
- Minimize land use changes and preserve the value of existing parks, trails, and open space land uses.

1.3 Applicable Regulatory Requirements and Required Coordination

This EA has been prepared in accordance with CEQ (40 CFR 1500-1508) and FEMA (44 CFR 10) regulations as they implement the requirements of NEPA (42 United States Code [U.S.C.] 4321 et seq.), and in keeping with the Unified Federal Review (UFR) process as described in Section 6 of The Sandy Recovery Improvement Act (SRIA). The UFR process mandates the establishment of an expedited and unified interagency review process to ensure compliance with environmental and historic requirements under federal law relating to disaster recovery projects in order to expedite the recovery process, consistent with applicable law. Other federal agencies may choose to adopt FEMA's NEPA analysis in accordance with their own implementing regulations. The following is a list of regulatory requirements that were also considered during the EA process.

1.3.1 Regulatory Requirements

Environmental regulatory requirements established under the following statutes, among others, were considered in developing this EA:

- Clean Air Act of 1970
- Clean Water Act of 1972
- National Historic Preservation Act of 1966
- Archaeological Resources Protection Act of 1979
- Endangered Species Act of 1973
- Migratory Bird Treaty Act of 1918
- Noise Control Act of 1972
- Resource Conservation and Recovery Act of 1976
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980
- Toxic Substances Control Act of 1970
- Energy Policy Act of 2005
- Energy Independence and Security Act of 2007
- Uniform Relocation Assistance and Real Property Acquisition Act of 1970
- Occupational Safety and Health Act of 1970

Requirements also include compliance with the following Executive Orders (EOs):

- EO 11988, Floodplain Management
- EO 11593, Protection and Enhancement of the Cultural Environment
- EO 11990, Protection of Wetlands
- EO 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations
- EO 12088, Federal Compliance with Pollution Control Standards
- EO 13045, Protection of Children from Environmental Health Risks and Safety Risks
- EO 13423, Strengthening Federal Environment, Energy and Transportation Management
- EO 13514, Federal Leadership in Environmental Energy and Economic Performance
- EO 13112, Invasive Species

1.3.2 Required Coordination

FEMA and the City have coordinated with the following agencies regarding the Proposed Action:

- USFWS
- U.S. Environmental Protection Agency (EPA)
- Colorado State Historic Preservation Office (SHPO)
- USACE
- CWCB
- Colorado Parks and Wildlife (CPW)
- Weld County, Colorado
- Boulder County, Colorado

1.4 Decision to be Made

Based on the analysis in this EA, FEMA will make one of three decisions regarding the Proposed Action:

1. Select the No Action Alternative, where the Proposed Action would not be funded;
2. Prepare a FONSI and move forward with the Project funding; or
3. Initiate preparation of an EIS.

1.5 Public Outreach and Involvement

A public NOI to prepare an EA for the proposed Project was published in the *Longmont Times-Call* and posted on the Longmont website on March 30, 2016. A series of public outreach meetings have been held regarding the Proposed Action to keep community members and stakeholders involved throughout the NEPA process. The first meeting was held in Longmont, Colorado, on March 24, 2015, to announce the purpose and need of the Project and provide a Project overview. The City held a second meeting on August 25, 2015, to provide information regarding the Project alternatives. Comments supported the use of bioengineering and other naturalistic restoration techniques to maintain and improve fish passage and habitat, wildlife habitat, the natural riparian setting, and the greenway corridor. A summary of comments received during the scoping meetings can be found in **Appendix A**. A listing of other public information efforts and input related to the Project can also be found in **Appendix A**.

A public Notice of Availability of the Draft EA (DEA) was published in the *Longmont Times-Call* on March 30, 2016, and posted on the Longmont website in English and Spanish. Public notices announcing the availability of the DEA were also sent out to all property owners, media outlets, project e-mail distribution list, and residents of the St. Vrain Mobile Home Park. Substantive comments are addressed in this FEA in **Appendix K**.

As plans become more refined for each of the areas, the opportunity for public review and comment will be provided in keeping with the City's standard procedures for public participation.

SECTION 2

Description of Proposed Action and Alternatives

The City is proposing to use FEMA grant funding as well as other federal and non-federal funding to reduce flooding hazards in the vicinity of the City. The following is an explanation of the alternatives eliminated from further study, the Proposed Action, and the No Action Alternative.

2.1 Alternatives Considered but Eliminated

The following alternatives were considered during alternatives development but eliminated from detailed analysis in this EA.

2.1.1 Detention Pond

A detention pond would be constructed as a dam on the main stem of the Creek. Constructing a detention pond would require a large dam and pose adverse environmental effects on the existing stream system, fish passage, and wildlife habitat. A detention pond would need to be constructed on existing open space lands owned by Boulder County, which would negatively impact the existing value and use of the open space. This alternative does not meet the purpose and need of the Project because it would alter existing designated open space land use and have substantial adverse effects on existing habitats and natural resources.

2.1.2 Improved Channel—Concrete Trapezoid Channel

Concrete trapezoidal channels can be an effective and maintainable means of transporting flood flows. However, this alternative would cause substantial adverse impacts to fish passage and habitat, wildlife habitat, the natural riparian setting, and the greenway corridor. Additionally, this alternative would not provide water quality treatment for stormwater discharges. This alternative does not meet the purpose and need of the Project because it does not allow for natural channel design and has substantial adverse effects on existing natural resources.

2.2 Proposed Action

The Proposed Action consists of three major reaches of the Creek (**Figure 2-1**). The City Reach is the section from approximately Airport Road on the west end to roughly the confluence with Left Hand Creek on the east end. The Sandstone Reach is the section from County Line Road on the west end to approximately Boulder Creek on the east end. The Middle Reach is the section between the City and Sandstone Reaches. The Proposed Action involves the design, construction, and maintenance of improvements along each of these reaches to be implemented in three major Project phases. The goals of the Proposed Action are presented in **Table 2-1** and the components of the Proposed Action are presented in **Table 2-2**.

To accommodate these improvements, additional rights-of-way (ROWs) would need to be acquired in the Project Area. Locations for placement of fill material generated during construction are currently being identified in coordination with property owners; current location options include various parcels of undeveloped land and gravel ponds within and in the vicinity of the Project Area. The removal and placement or disposal of the fill material generated by the portion of the project funded by FEMA funds will be tracked during Project construction according to FEMA guidelines.

The Proposed Action improvements have been divided into three phases. These phases represent the most likely chronology of improvements; however, it is possible that some phases may occur concurrently or out of order, dependent on the funding that is received.

TABLE 2-1
Goals of the Proposed Action
Resilient St. Vrain Project EA

Project Phases		Goals
Phase 1	City Reach	• Protect vulnerable populations • Restore the St. Vrain Greenway • Increase public safety and protect the community – increase flood conveyance capacity • Maintain or improve the natural habitat (i.e., utilizing natural channel design, planting diverse native vegetation) • Use an environmentally sensitive and innovative approach
	Sandstone Reach	• Stabilize the Creek channel • Restore the St. Vrain Greenway • Help nature reestablish vegetation and habitat
Phase 2 City Reach		• Protect vulnerable populations • Restore the St. Vrain Greenway • Increase public safety and protect the community – increase flood conveyance capacity • Maintain or improve the natural habitat (i.e., utilizing natural channel design, planting diverse native vegetation) • Use an environmentally sensitive and innovative approach
Phase 3 Middle Reach		• Protect vulnerable populations • Restore the St. Vrain Greenway • Increase public safety and protect the community – increase flood conveyance capacity • Maintain or improve the natural habitat (i.e., utilizing natural channel design, planting diverse native vegetation) • Use an environmentally sensitive and innovative approach

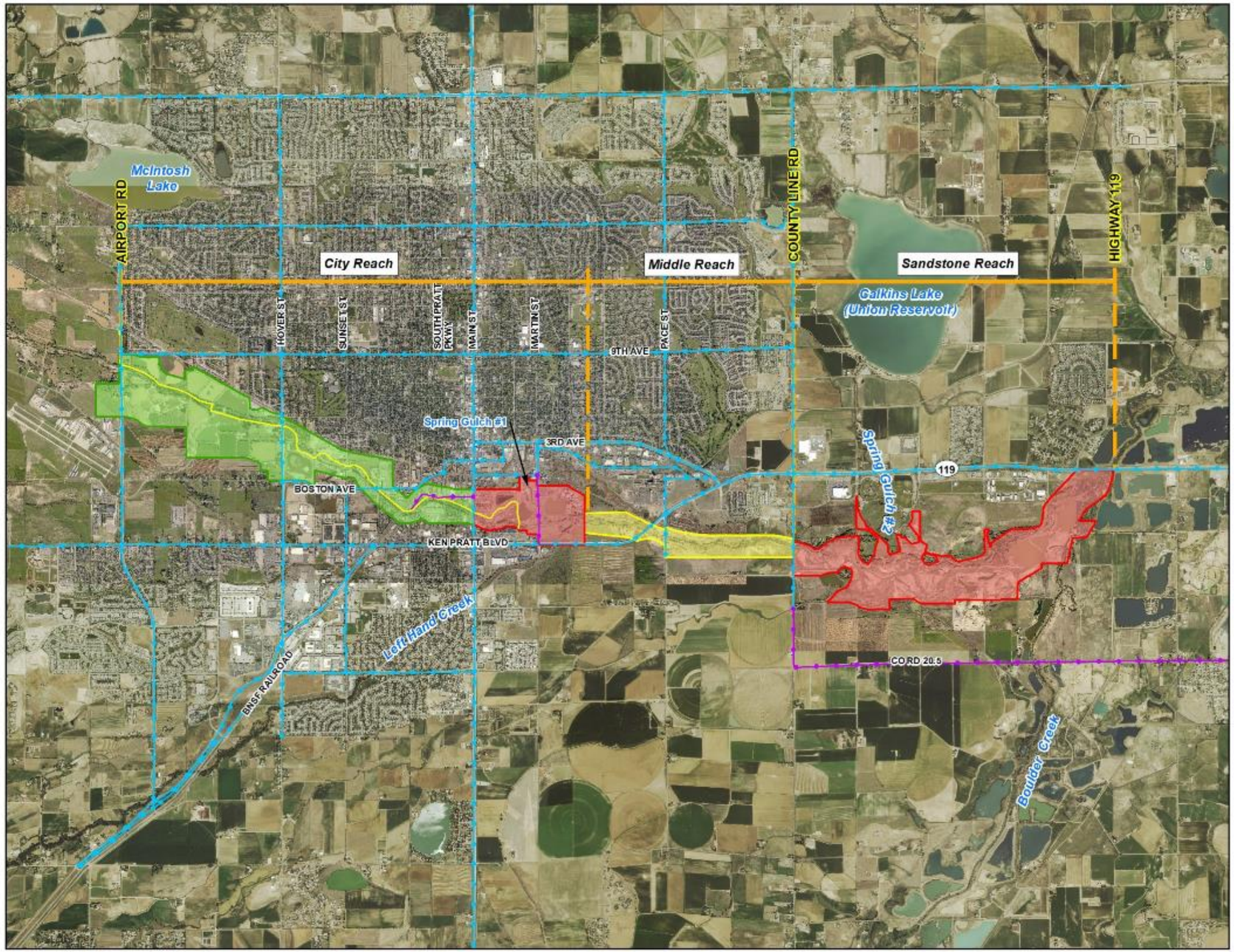
2.2.1 Phase 1

Improvements that would be constructed during Phase 1 are located in City Reach–Main Street (U.S. Highway 287 [US 287]) to the confluence with Left Hand Creek and the entire Sandstone Reach. FEMA funding will be used to fund Phase 1 (see Section 1, *Introduction*) and, hence, the discontinuous geographical boundaries.

City Reach–Main Street to Confluence with Left Hand Creek. The Proposed Action in this reach would widen the channel downstream of Main Street and maintain and stabilize the Creek at its post-flood alignment through Dickens Farm Park (City of Longmont, 2015a). Project improvements include reestablishing three diversion structures (D-Barn, St. Vrain Pump Station #1, and Bonus Ditch), channel stabilization with fish passage components, bank stabilization, a water quality wetland for Spring Gulch #1 flows, revegetation of the area, and construction and/or restoration of park amenities. The pre-flood St. Vrain Creek channel south of the current channel is used for additional conveyance capacity during high flow events and is being modified to provide an enhanced backwater area for habitat. Bank protection and stabilization adjacent to the City's wastewater treatment plant (WWTP) would be included to protect this vital component of the City's infrastructure from future flood damage.

Main Street Bridge is currently being reconstructed under a separate permitting process and is not included as part of the Proposed Action. However, the design of the bridge reconstruction was coordinated with the Phase 1 design and does not preclude implementation of the Proposed Action. The Boston Avenue extension is under design, along with ROW acquisition along Main Street. This effort is not part of the Proposed Action.

Sandstone Reach. The Proposed Action in the Sandstone Reach would maintain and stabilize the Creek along its post-flood alignment from County Line Road to State Highway (SH) 119. Improvements would include vegetation and habitat improvements to aid natural restoration of the area; bank stabilization of the new Creek alignment at critical locations; facilitating conveyance of Spring Gulch #2 in both the former Creek channel and the current post-flood channel to maintain vegetation and comply with water rights; and construction of a pedestrian bridge and trails to restore greenway trail connectivity, which were lost in the 2013 flood.



Legend

- Phase 1 - Sandstone and Main to Left Hand
- Phase 2 - The Rest of City Reach
- Phase 3 - Middle Reach
- Future Trail

Construction Haul Routes

- Additional Haul Routes
- City Approved Truck Haul Route

* Not Shown: City code allows construction traffic on streets that provide the shortest distance between the City-Approved Truck Haul Routes and the construction site.

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Figure 2-1
Resilient St. Vrain Project
NEPA Overview

CH2MHILL

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TABLE 2-2
Components of the Proposed Action
Resilient St. Vrain Project EA

Project Component	Phase 1		Phase 2 City Reach	Phase 3 Middle Reach
	City Reach	Sandstone Reach		
Channel reconstruction, including streambed elevation changes, channel widening, and channel realignment	X	X	X	X
Channel armoring and bank protection using various types of bioengineered bank stabilization methods, including soil riprap, root wads, native vegetation, and other bioengineering techniques	X	X	X	X
Earthwork and grading, including installation of berms and embankments	X	X	X	X
Low flow channel and terraced banks for higher flows	X		X	X
Alterations and replacement of diversion structures with fish passage, safe boat passage, pumping and piping, and/or sediment control features	X		X	
In-stream rock, boulder, and grouted boulder structures to support channel grade control, diversion structures, fish passage, boat passage, sediment transport, and habitat improvements	X	X	X	X
In-stream rock and boulder deflector structures to offset channel flows for the purpose of aquatic habitat and recreation (eddies and low-velocity waters)	X	X	X	X
Modification, repair, and replacement of utilities, including sanitary sewer lines, water lines, storm sewers, and dry utilities	X	X	X	X
Construction, repair, and restoration of park and recreational amenities, such as parking areas, hard-surfaced trails, soft-surfaced trails, pedestrian bridges, signage, irrigation, benches, picnic tables, shelter, bike skills area, sand play area, pond improvements, viewing areas, and restroom facilities	X	X	X	
Creek access and interaction areas	X		X	X
Installation of cutoff walls to prevent stream degradation and protect other infrastructure	X	X	X	X
Riffle drop structures with fish passage		X	X	X
Removal of earthen material and sediment to aid in flow conveyance	X	X	X	X
Repair and restoration of greenway trails, including trails and bridges	X	X	X	X
Repair and restoration of maintenance roads	X	X	X	X
Vegetation, irrigation, and habitat restoration and improvements	X	X	X	X
Installation of a water quality wetland along Spring Gulch #1A check structure and pipe to divert water from Spring Gulch into the wetland that will then flow back into Spring Gulch	X			
Installation of stepped channel walls in narrow and confined areas			X	
Diversion structure at the confluence of Spring Gulch #2 to provide the ability to divert water into the pre-flood St. Vrain Creek channel		X		
Enhancement of a backwater area for habitat and high-flow capacity	X			

2.2.2 Phase 2

Improvements that would be conducted in the Project's second phase comprise the remaining sections of the City Reach, as described below. Phase 2 may be divided into multiple phases.

City Reach–Airport Road to Lykins Gulch. Within this reach, flood flows in the Creek upstream of Airport Road are split between the main channel and overbank areas during major storm events to the south. The Proposed Action includes construction of a bridge or box culvert on Airport Road to pass the

southerly flows without overtopping Airport Road in a 100-year flood event, and modifications to the existing ponds downstream of Airport Road to allow flood flows to pass through and re-enter the Creek. The main Creek channel would be widened downstream to accommodate the 100-year flood flows. The widening would occur onto the City-owned property north of the Creek, but would not encroach into Golden Ponds. Damage caused to the Golden Ponds spillway during the flood would be repaired; however, the pond embankments would not be relocated for flood capacity. The pedestrian bridge connecting Golden Ponds and the St. Vrain and Lykins Gulch Greenways would be replaced with a longer structure to accommodate the widened channel.

Improvements being constructed for the Heron Lake Flood Channel upstream of Airport Road that redirect the Creek split flows from the north back to the main channel have been approved under a separate permitting process and are not included as part of the Project. Those improvements, however, would not preclude implementation of the Proposed Action.

City Reach – Lykins Gulch to Roger's Grove. Within this reach, the Proposed Action currently includes two different design options that would meet the Project's purpose and need. Each design option is evaluated in this EA as part of the Proposed Action and is described below.

Design Option 1: Single-Thread Channel Option. The single-thread channel design option would replace the existing Hover Street Bridge with a new structure that would pass the 100-year storm flows, and the channel upstream and downstream of the bridge would be widened to carry 100-year storm flows. The channel widening upstream of Hover Street would require tree removal. To avoid removal of large areas of existing trees and vegetation in the Roger's Grove Park area, the channel overbanks would be lowered and widened, and pockets of strategically maintained high-value trees would be preserved. The existing damaged pedestrian bridge would be replaced with a new longer-span pedestrian bridge.

If the Hover Street Bridge cannot be raised due to roadway constraints, the channel improvements upstream of Hover Street would need to extend to the south, potentially encroaching into private property and requiring easement acquisition.

Design Option 2: Split-Flow Channel Option. This design option would allow for a high-flow split-flow channel south of the main St. Vrain Creek channel, allowing high flows to be conveyed in both the main channel and the split-flow channel during a 100-year flood event. The flows that remain in the main channel would be able to pass through the existing Hover Street Bridge with no overtopping; therefore, no channel improvements would be needed upstream of Hover Street or downstream through Roger's Grove. Some vegetation removal would be required at the split-flow location and at the confluence of the split flow with the St. Vrain Creek main channel.

A new weir would be constructed near the confluence with Lykins Gulch to divert the high-flow split flows to the south split-flow channel. Those flows would then be conveyed through the ponds west of Hover Street through the development of the split-flow conveyance channel. The ponds are privately owned, and property acquisition would likely be required for implementation of this design option. A new bridge or box culvert structure would be constructed through Hover Street to connect the south split-flow channel to the Fairgrounds Pond east of Hover Street. The split-flow conveyance channel would be constructed through Fairgrounds Pond to convey the split flows back to the St. Vrain Creek main channel.

City Reach – Roger's Grove to Boston Avenue. The Proposed Action would accommodate the 100-year flow through channel widening and replacement of Boston Avenue Bridge. The embankment between the St. Vrain Creek channel and Izaak Walton Pond that was breached during the 2013 flood would be relocated and reconstructed further north within the pond to allow increased channel capacity to contain 100-year storm flows. Fish-passable drop structures would also be constructed to increase channel capacity, stabilize the Creek bottom, and allow for the movement of native fish. Acquisition of additional ROW adjacent to the improvements in this reach would be required.

The Sunset Street Bridge is currently being reconstructed; it is not part of this Project but would not preclude implementation of the Proposed Action.

City Reach – Boston Avenue to Main Street. Within this reach, the Creek is constrained by existing businesses and residences that make natural channel improvements challenging. A walled section of the channel between Boston Avenue and South Pratt Parkway would be constructed to convey the 100-year flood flow. Despite being walled, the design cross-section would result in opportunities to enhance the environmental aspects of this channel section to meet the Project's purpose and need. Within this reach, acquisition of additional ROW adjacent to the improvements would be required. As noted previously, reconstruction of Main Street Bridge is not included as part of the Project but would not preclude implementation of the Proposed Action.

2.2.3 Phase 3

Middle Reach. Improvements that would be conducted during the Project's third phase consist of the Middle Reach, or the area between the City and Sandstone Reaches. Within this reach, the Proposed Action would include capacity improvements to accommodate the 100-year storm flows and stabilize the Creek. Components required in the Middle Reach would be similar to those described for the City and Sandstone Reaches. Specific components within this reach could potentially include stabilizing the area around the 119th Street and County Line Road Bridges and replacing the 119th Street Bridge to convey the 100-year storm flows. All greenway trail repairs and associated bank stabilization and revegetation have been completed in this area as part of a separate project. Improvements in this area would reduce the floodplain through the corridor, thereby increasing channel stability, protecting public and private property, and improving consistency of the greenway.

Improvements to the Middle Reach remain unfunded at this time. General design elements have been considered, but detailed engineering and design are pending identification of funding sources. The Middle Reach is included in this EA to ensure a holistic approach to the identification of potential impacts to the human and natural environment. If, as plans become more refined, the impacts from the design elements are found to be substantively greater or affect resources differently than disclosed in this EA, a supplemental EA for this reach may be completed. The updated design plans will be evaluated, regulatory agencies will be notified, and consultations and project conditions will be updated as appropriate.

2.3 No Action Alternative

The No Action Alternative is defined as not performing the Proposed Action, and provides a benchmark against which the Proposed Action can be evaluated.

The No Action Alternative assumes that the City would be unable to implement the Proposed Action for lack of federal assistance. While it is possible that some funding mechanisms might still be available, those sources would not allow mitigation of existing flood hazards and repair of existing damages to be completed as a comprehensive project. The No Action Alternative does not meet the purpose and need, and would not promote the City's mission to reduce overall risk to people and structures while reducing reliance on federal funding if a disaster were to occur.

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SECTION 3

Affected Environment

This section presents specific information about the environment that could be adversely affected as a result of implementing the Proposed Action. Potential impacts resulting from the Proposed Action are detailed in Section 4, *Environmental Consequences*.

3.1 Water Resources

This section describes the existing water resources in the Project Area, including wetlands, surface water, floodplains, and groundwater. These resources are highly integrated and have many important functions in the natural and human environments. Protection of water resources is critical to the ecosystem and our way of life, and is required and administered by various federal and state regulatory programs.

3.1.1 Wetlands

EPA and USACE jointly define wetlands as areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Section 404 of the Clean Water Act (CWA) regulates the discharge of dredged or fill material into waters of the United States, including wetlands. The Section 404 program is jointly administered by the EPA and USACE, with USACE being responsible for Section 404 permit decisions. EO 11990 (Protection of Wetlands), as implemented in 44 CFR 9, requires federal agencies to minimize the destruction, loss, or degradation of wetlands; preserve and enhance the natural and beneficial values of wetlands; consider alternatives to wetland sites; and limit potential damage if an activity affecting a wetland cannot be avoided. This analysis is accomplished through the 8-step decision-making process as described in 44 CFR 9 for projects that have the potential for impacts to or within a wetland (see Appendix L). The State of Colorado does not have a state wetland regulatory program; however, CDPHE is responsible for issuing the state's Section 401 Water Quality Certification during the federal Section 404 permitting process. The Section 401 Water Quality Certification confirms that a proposed Project would meet the state's surface water quality standards.

Wetlands and surface water bodies in the Project Area were delineated and characterized by ERO Resources Corporation (ERO) on behalf of the City between April and October 2015 in support of the overall Project. Concurrent with meeting the Project's NEPA requirements through preparation of this EA, the City is pursuing a CWA Section 404 Individual Permit (IP) from USACE for the Phase 1 components of the Proposed Action to be implemented in the City and Sandstone Reaches.

Wetland delineations were conducted in accordance with the routine methodology described in the *Corps of Engineers Wetlands Delineation Manual* (USACE, 1987). The jurisdictional boundaries of wetlands were based on the dominance of hydrophytic vegetation, presence of hydric soils, and evidence of hydrology. Wetlands in the Project Area were classified in accordance with the USFWS National Wetlands Inventory (NWI) classification system as described in *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979). The hydrogeomorphic (HGM) wetland classification system developed by Brinson (1993) was also used to classify wetlands in the Project Area.

Based on the wetland delineations conducted for the Project, approximately 102.8 acres of wetlands are present in the Project Area. Wetlands in the Project Area fall into one of the following three NWI classifications: Palustrine Emergent (PEM), Palustrine Scrub-Shrub (PSS), or Lacustrine Emergent (LEM). PEM wetlands are the most abundant type of wetland in the Project Area (90.3 acres). PEM wetlands are characterized by rooted herbaceous and grass-like plants that stand erect above the water or ground surface (excluding mosses or lichens). PSS wetlands are the second most abundant type of wetland in the Project Area (8.9 acres). PSS wetlands are dominated by woody vegetation less than

20 feet tall. LEM wetlands are the least abundant type of wetland in the Project Area (3.6 acres). LEM wetlands are associated with lakes, ponds, or other similar surface water bodies. The acreage of wetlands in each reach of the Project Area is presented in **Table 3-1**. Wetlands and surface waters in the Project Area are shown on **Figure 3-1**. Information on the wetland types that occur in the City and Sandstone Reaches, including their hydrology and plant species composition, can be found in the City's Section 404 IP application for Phase 1 of the Project (City of Longmont, 2015b).

TABLE 3-1
Acreage of Wetlands in the Project Area
Resilient St. Vrain Project EA

Reach	Wetland Type			Total Wetlands (acres)
	Palustrine Emergent (acres)	Palustrine Scrub-Shrub (acres)	Lacustrine Emergent (acres)	
City Reach	16.3	1.2	3.5	21.0
Middle Reach	1.5	0	0	1.5
Sandstone Reach	72.5	7.7	0.1	80.3
Total (Project Area)	90.3	8.9	3.6	102.8

Source: Compiled using data provided by ERO.

The City's Section 404 IP application for Phase 1 of the Project includes a functional assessment conducted for the wetlands in the City and Sandstone Reaches (City of Longmont, 2015b). The functional assessment of these wetlands was conducted using the Functional Assessment of Colorado Wetlands (FACWet) – Version 3.0 Method (Johnson et al., 2013). Assessing the existing functionality of wetlands helps in the overall analysis and determination of appropriate mitigation for proposed wetland impacts. Based on FACWet, the wetlands in the City Reach received a composite Functional Capacity Index (FCI) score of 0.68, which is defined as being "Functioning Impaired." Wetlands in the Sandstone Reach received a composite FCI score of 0.80, which is defined as being "Highly Functioning." These results indicate that wetlands in the City Reach have lower overall functionality than those in the Sandstone Reach due primarily to the greater extent of development that has occurred in the City Reach.

3.1.2 Surface Water

Surface water is water on the surface of the earth; it is differentiated from groundwater. Surface water includes natural water bodies, constructed water bodies, and unconfined stormwater on the land surface. A watershed or drainage basin is a defined area of land where surface water from rain or melting snow or ice converges to a single point at a lower elevation, usually the exit of the basin, where the waters join another water body.

The Project Area is located in the St. Vrain Creek Watershed, which drains 993.4 square miles within the larger South Platte River Basin (Environmental Statistics Group [ESG], 2003). The St. Vrain Creek Watershed is considered one of the most important natural features in the Colorado Front Range due to its richness of natural and cultural resources, and the recreational and economic opportunities it provides. Water quality in the St. Vrain Creek Watershed is influenced naturally by elevation, geology, soils, climate, vegetative cover, and stream channel characteristics, as well as by anthropogenic factors such as urban and agricultural runoff, and various types of point source discharges (Wright Water Engineers, 2015). Water quality in the watershed is good overall; however, based on limited monitoring data compiled in a Watershed Plan (draft submitted to the CDPHE Water Quality Control Division [WQCD] for review and approval) prepared by Wright Water Engineers, elevated levels of *Escherichia coli* (*E. coli*; fecal indicator bacteria), nutrients, and metals exist in certain locations (Wright Water Engineers, 2015). In September 2013, the St. Vrain Creek Watershed experienced a catastrophic flooding event. Floodwaters breeched stream banks and impacted large amounts of infrastructure and riparian communities throughout the watershed.

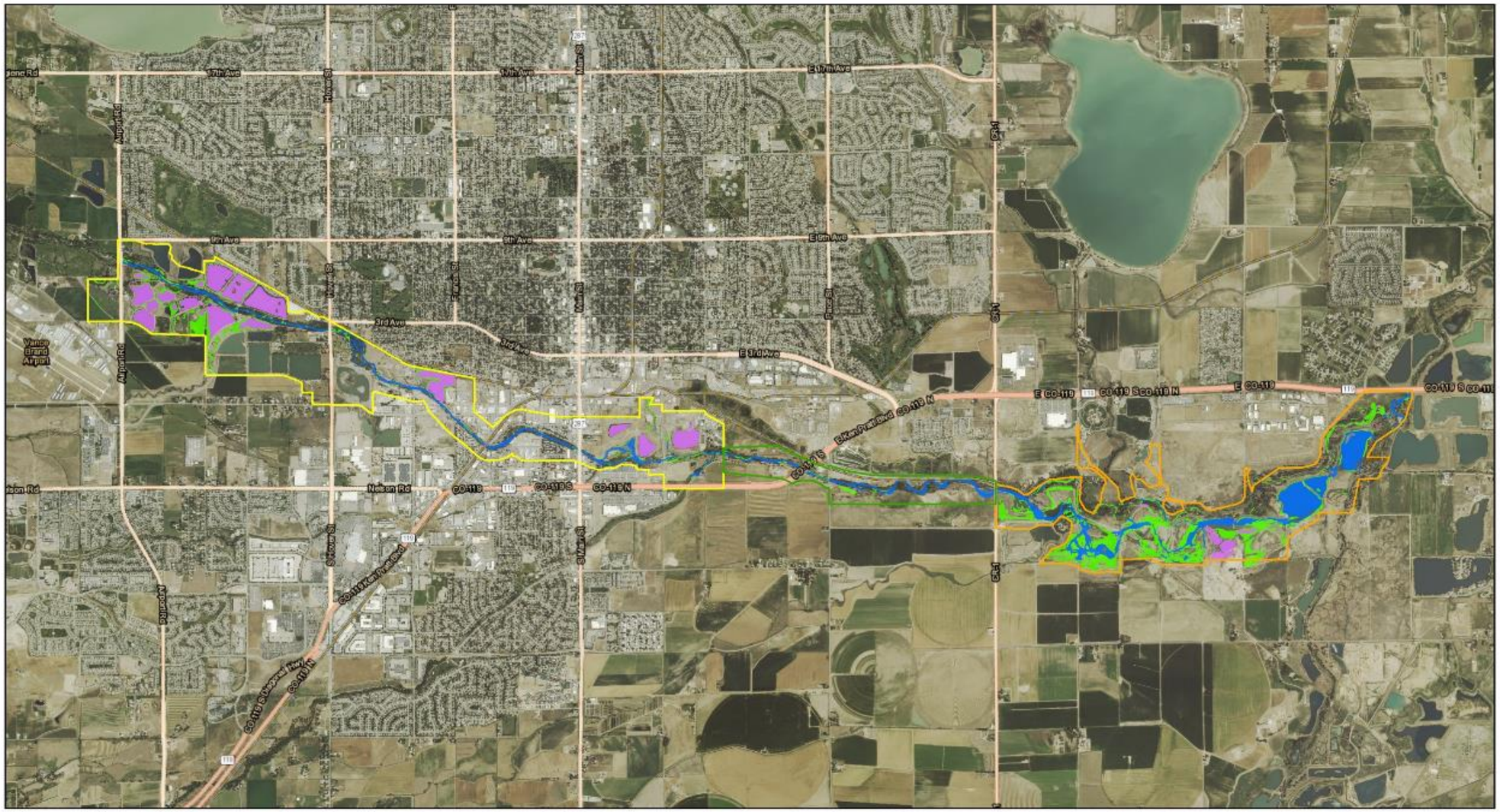

Figure 3-1
Wetlands and Waters
Resilient St. Vrain Project EA

Image Source: National Agriculture Imagery Program (NAIP) 2013
Wetlands and Waters Source: ERO, 2015

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There are three primary types of surface water bodies in the Project Area: natural streams, irrigation ditches, and constructed ponds. The largest stream in the Project Area is St. Vrain Creek, which flows eastward and ultimately drains into the South Platte River. In parts of the Project Area, the Creek has been modified or otherwise affected by residential, commercial, agricultural, and/or industrial development, including sand and gravel mining operations. The 2013 flood altered the natural course of the Creek in the Sandstone Reach, where the Creek has realigned itself south of its pre-flood channel.

Several natural streams and irrigation ditches drain into the Creek in the Project Area. Left Hand Creek, Dry Creek, and Boulder Creek are perennial streams that flow into the Creek from the south. Spring Gulch #1 and Spring Gulch #2 (also known as the Union Reservoir Ditch) flow into the Creek from the north.

The Project Area supports a number of freshwater ponds, most of which have been created by sand and gravel mining operations. Former gravel ponds are present throughout the Project Area. Active gravel ponds exist on the Aggregate Industries mine located in the southeastern part of the Sandstone Reach. During the 2013 flood, the Creek breached into the gravel ponds in the Sandstone Reach and currently continues to flow through the ponds. The City has determined that allowing the main flows of the Creek to continue through the ponds would have ecological benefits by letting wetland vegetation to establish and improving water quality in the Creek.

Dredging and filling in waters of the United States are regulated under Section 404 of the CWA. Surface water bodies that qualify as waters of the United States can include natural as well as certain constructed water bodies, depending on their size and hydrological connections to other surface waters. In addition to the Section 401 Water Quality Certification, the State of Colorado regulates pollution in stormwater runoff discharged from certain construction sites. In Colorado, a general permit for stormwater discharges associated with construction activities (Stormwater Construction Permit) is required from CDPHE for any proposed project that would disturb 1 acre or more of land. As part of this permit, the proponent of the Project is required to prepare and implement a Stormwater Management Plan (SWMP), which outlines the best management practices (BMPs) and engineering controls to be used to prevent and minimize erosion, sedimentation, and pollution during the Project.

Surface water bodies in the Project Area were delineated and characterized by ERO on behalf of the City between April and October 2015 in support of the overall Project (see Section 3.1.1). Based on the delineations conducted for the Project, approximately 148 acres of waters of the United States and 127.6 acres of non-jurisdictional “open waters” are present in the Project Area. Waters of the United States in the Project Area consist primarily of St. Vrain Creek, tributaries to St. Vrain Creek, and gravel ponds hydrologically connected to St. Vrain Creek or its tributaries. Open waters in the Project Area consist primarily of gravel ponds that are not hydrologically connected to waters of the United States; these water bodies are not federally jurisdictional per Section 404 of the CWA. The acreage of surface water bodies in each reach of the Project Area is presented in **Table 3-2**. Surface waters in the Project Area are shown on **Figure 3-1**.

TABLE 3-2
Acreage of Surface Water Bodies in the Project Area
Resilient St. Vrain Project EA

	Surface Water Body Type	
Reach	**Waters of the United States (acres)**	**Open Water[a] (acres)**
City Reach	28.81	114.65
Middle Reach	13.96	0
Sandstone Reach	105.25	13.01
Total (Project Area)	148.02	127.65

[a] Surface water bodies that are not federally jurisdictional per Section 404 of the CWA.

Source: Compiled using data provided by ERO.

3.1.3 Floodplains

A floodplain is an area of land that is prone to flooding. Floodplains are typically the lowland and relatively flat areas adjoining inland and coastal waters. The 100-year floodplain is the area covered by water in the event of a 100-year flood, which is a flood that has a 1 percent chance of being equaled or exceeded in magnitude in any given year. The 500-year floodplain is the area covered by water in the event of a 500-year flood, which is a flood that has a 0.2 percent chance of being equaled or exceeded in magnitude in any given year. The 100- and 500-year floodplains are mapped on FEMA Flood Insurance Rate Maps (FIRMs).

EO 11988 (Floodplain Management) as amended January 29, 2015, and as implemented in 44 CFR 9, requires federal agencies 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 or indirect support of floodplain development wherever there is a practicable alternative." This analysis is accomplished through the 8-step decision-making process as described in 44 CFR 9 for projects that have the potential for impacts to or within a floodplain (see Appendix K). It is anticipated that this Project will decrease flooding risk in support of the goals of EO 11988. Freeboard and resiliency are being incorporated to the extent practicable.

Based on the current regulatory FEMA FIRMs that cover the Project Area, approximately 77 percent of the Project Area is located in the floodplain (**Figure 3-2**). A total of 1,350.6 acres of floodplain are present in the Project Area, 1,230.4 acres of which are 100-year floodplain and 120.2 acres are 500-year floodplain (**Table 3-3**). The acreage of floodplains in each reach of the Project Area is presented in **Table 3-3**.

TABLE 3-3
Acreage of Floodplain in the Project Area
Resilient St. Vrain Project EA

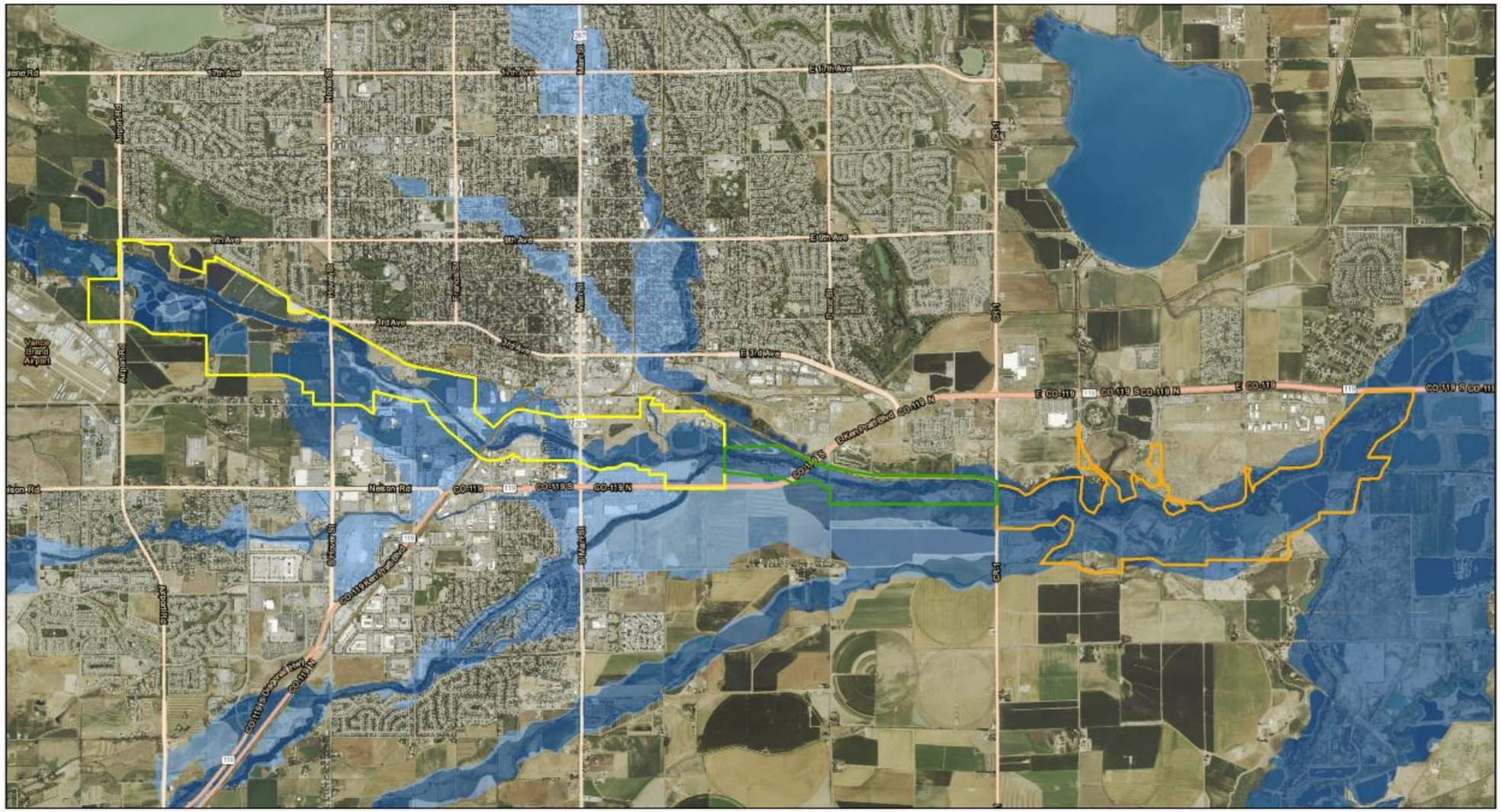
Reach	100-Year Floodplain (acres)	500-Year Floodplain (acres)	Total Floodplain (acres)
City Reach	488.5	111.6	600.1
Middle Reach	161.5	8.6	170.1
Sandstone Reach	580.4	0	580.4
Total (Project Area)	1,230.4	120.2	1,350.6

Source: FEMA, 2015.

3.1.4 Groundwater

Groundwater is water that occupies the pore spaces in subsurface rocks and sediments; it is differentiated from surface water. An aquifer is an underground layer of water-bearing rock or unconsolidated materials (e.g., gravel, sand, or silt) from which groundwater can be extracted.

The Project Area overlies the westernmost part of the South Platte River Aquifer, which spans more than 3,000 square miles. This aquifer is alluvial and integrally connected to the South Platte River and its tributaries, which include the Creek. The degree of interaction between surface water and groundwater in this aquifer is influenced by several factors, including local hydraulic conditions and lithology (U.S. Geological Survey [USGS], 2015). The South Platte River Aquifer is composed primarily of unconsolidated deposits consisting of sand, gravel, silt, and clay from the South Plate River and its tributaries. The thickness of the aquifer varies from less than 20 feet to approximately 200 feet. Based on maps prepared by the Colorado Geological Survey (CGS), the thickness of the aquifer is less than 20 feet throughout most of the Project Area (CGS, 2015). Water withdrawn from the South Platte River Aquifer is used mostly for irrigation and, to a lesser extent, domestic water supply. The aquifer is recharged primarily by precipitation and irrigation return flows. Due to the integral connection between St. Vrain Creek and the underlying aquifer, groundwater in the Project Area is expected to flow predominantly eastward.



Legend
- City Reach
- Middle Reach
- Sandstone Reach
- 100-Year (1%-annual-chance) Floodplain
- 500-Year (0.2%-annual-chance) Floodplain

N

0 1,500 3,000
Feet

Image Source: National Agriculture Imagery Program (NAIP) 2013
Floodplain Source: Federal Emergency Management Agency (FEMA)

Figure 3-2
Floodplains
Resilient St. Vrain Project EA

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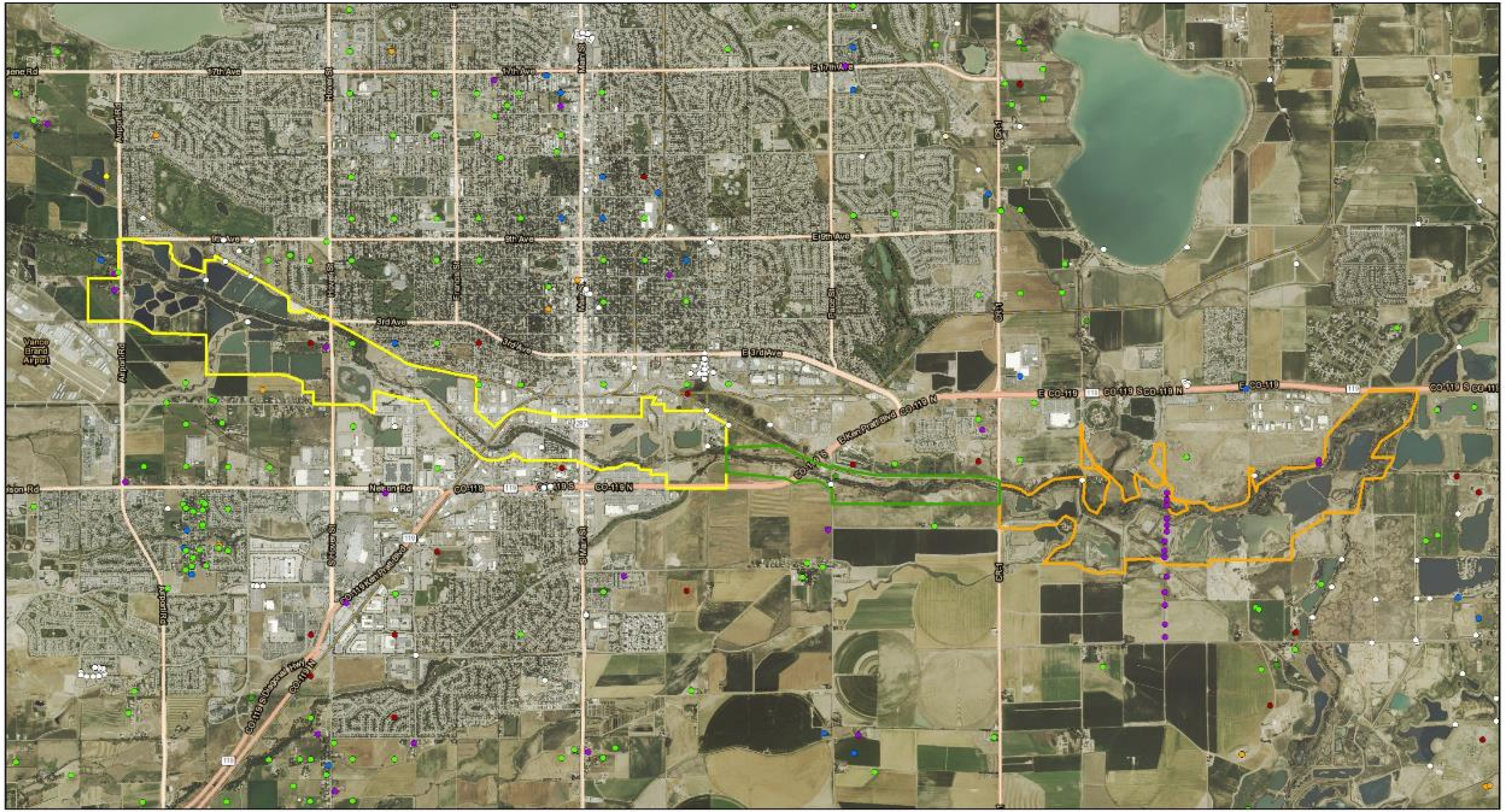

Legend

City Reach	**Well Use**	● HOUSEHOLD USE ONLY ● USGS
Middle Reach	○ OTHER	● INDUSTRIAL
Sandstone Reach	● COMMERCIAL	● IRRIGATION
	● DOMESTIC	○ MUNICIPAL
	● FISHERY	● RECREATION
	● GEOTHERMAL	● STOCK

N

0 1,500 3,000
Feet

Image Source: National Agriculture Imagery Program (NAIP) 2013
Groundwater Well Source: Colorado Dept. of Water Resources (CDWR) 2015

Figure 3-3
Groundwater Wells
Resilient St. Vrain Project EA

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Based on data from the Colorado Division of Water Resources (CDWR) (CDWR, 2015), a number of groundwater wells are present in the Project Area (**Figure 3-3**). The number and types of groundwater wells in each reach of the Project Area are presented in **Table 3-4**.

TABLE 3-4
Groundwater Wells in the Project Area
Resilient St. Vrain Project EA

Reach	USGS Wells	Domestic Wells	Commercial Wells	Household Use-Only Wells	Other Wells	Total Wells
City Reach	2	2	**1**	**0**	**7**	**12**
Middle Reach	0	0	**0**	**1**	**1**	**2**
Sandstone Reach	10	0	**0**	**0**	**1**	**11**
Total (Project Area)	12	2	**1**	**1**	**9**	**25**

Source: CDWR, 2015.

3.2 Biological Resources

Existing biological resources in the Project Area are discussed in this section under the following five categories: ecological setting, vegetation, fish and wildlife, threatened and endangered species, and migratory birds.

3.2.1 Ecological Setting

The western part of the Project Area is located in the High Plains ecoregion (Level III) and the Front Range Fans ecoregion (Level IV); the eastern part of the Project Area is located in the Flat to Rolling Plains ecoregion (Level IV). Elevations in the Project Area range from approximately 4,860 to 5,040 feet above mean sea level.

The entire Project Area has been affected by human activities and settlement, including residential and commercial development, agriculture, mining activities, and water diversions. The City Reach has been impacted by these activities to a greater extent than the Sandstone and Middle Reaches.

3.2.2 Vegetation

Natural vegetative communities in the High Plains ecoregion represent transitional high- and lower-elevation species. The majority of the area consists of grasslands, shrub lands, riparian areas, and wetlands. Common grassland plants include warm-season short- and mid-grasses, such as blue grama (*Bouteloua gracilis*), buffalograss (*Bouteloua dactyloides*), and little bluestem (*Schizachyrium scoparium*); and cool season species such as sand dropseed (*Sporobolus cryptandrus*), Indian ricegrass (*Achnatherum hymenoides*), western wheatgrass (*Pascopyrum smithii*), and junegrass (*Koeleria cristata*). Common upland shrubs and forbs include Gambel oak (*Quercus gambelii*), fringed sagebrush (*Artemisia frigida*), mountain mahogany (*Cercocarpus* sp.), rubber rabbitbrush (*Ericameria nauseosa*), Great Plains yucca (*Yucca glauca*), Indian paintbrush (*Castilleja* sp.), and prickly pear (*Opuntia* sp.). Riparian and wetland areas often contain a variety of herbaceous, shrub, and tree species including inland saltgrass (*Distichlis spicata*), prairie cordgrass (*Spartina pectinata*), switchgrass (*Panicum virgatum*), sedges (*Carex* sp.), rushes (*Juncus* spp.), chokecherry (*Prunus virginiana*), American plum (*Prunus americana*), three-leaf sumac (R*hus trilobata*), sandbar willow (*Salix exigua*), peachleaf willow (*Salix amygdaloides*), and plains cottonwood (*Populus deltoides*) (ERO, 2015).

The Project Area consists of two general habitat types: the more developed areas of the City Reach, and the more natural areas of the Middle and Sandstone Reaches. The City Reach consists of an urban area surrounded by commercial and residential development. A recreational trail parallels St. Vrain Creek in this reach. Common plant species in the City Reach include plains cottonwood, crack willow (*Salix fragilis***)**, sandbar willow (*Salix interior*), reed canarygrass (*Phalaris arundinacea*), smooth brome (*Bromus inermis*), western wheatgrass, Canada thistle (*Cirsium arvense*), Emory's sedge (*Carex emoryi*) and broad leaf cattail (*Typha latifolia*). The Middle and Sandstone Reaches are east of the urban portion of Longmont and

surrounded primarily by agricultural and range lands, and gravel mining operations. Dominant vegetation in these areas includes sapling crack willow, sandbar willow, and peachleaf willow, plains cottonwood saplings, common sunflower (*Helianthus annuus*), Canada thistle, smooth brome, alkali sacaton (*Sporobolus aroides*), western wheatgrass, inland saltgrass, broadleaf cattail, soft-stem bulrush (*Schoenoplectus tabernaemontani*), and threesquare bulrush (*Schoenoplectus pungens*). Along the pre-flood channel in the Sandstone Reach, herbaceous vegetation is beginning to transition from riparian to upland species (ERO, 2015). Wetlands are located along the stream corridor throughout the Project Area (wetlands are further discussed in Section 3.1.1).

3.2.3 Fish and Wildlife

The Creek corridor combined with other water features (e.g., ponds, reservoirs, and streams), parks, open space, and natural areas, provides a variety of habitats and resources for wildlife. The City's *Wildlife Management Plan* (2005) lists more than 300 species that are known to occur or are likely to occur in the area. Common animals in the area include raptors, waterfowl, songbirds, bats, fish, reptiles, amphibians, deer, and small mammals, such as bobcats, rabbits, raccoons, mice, prairie dogs, and squirrels. Big-game animals known to occur in the area include mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), and black bear (*Ursus americanus*). Small-game animals include various species of mammals, birds, reptiles, and furbearers (City of Longmont, 2005).

The Creek is a transitional stream that flows from the mountains to the plains. Headwater streams from the mountains in northeastern Colorado converge near the town of Lyons to form the Creek, which then flows to the east through primarily agricultural land to the City, and continues approximately 15 miles eastward through agricultural land to its confluence with the South Platte River near Platteville, Colorado (USGS, 2007). Following intense urban development in the region, the Creek has maintained higher species diversity than similar streams in the region. Within Longmont, the Creek has 21 species of fish, 14 of which are native. Small-bodied native fish known to occur in the Creek include the common shiner (*Luxilus cornutus*), stonecat (*Noturus flavus*), Iowa darter (*Etheostoma exile*), and northern redbelly dace (*Phoxinus eos*) (City of Longmont, 2005). A number of the native fish species which occur in the Creek are considered sensitive species by the State of Colorado and various environmental non-government organizations. Multiple species of native and non-native game fish also occur in the Creek.

CPW and its partners routinely monitor fish populations in the Creek, and post-flood monitoring was conducted to further assess the populations. CPW works closely with cities and counties adjacent to the Creek to help manage aquatic species and fish populations. Fish sampling conducted at 10 sites in the Creek in 2015 reported the presence of 14 native fish species and 13 introduced fish species.

3.2.4 Threatened and Endangered Species

Threatened and endangered species are federally protected plants and animals that are in danger of becoming extinct within the foreseeable future throughout all or a significant portion of the species' range. The federal Endangered Species Act (ESA) requires federal agencies to avoid any actions that might jeopardize the existence of threatened or endangered species, or destroy or adversely impact critical habitat of such species. Section 7 of the ESA requires federal agencies to consult with USFWS if a proposed action has the potential to impact a federally listed threatened or endangered species. This process is commonly referred to as ESA Section 7 consultation.

Three federally listed endangered species and eight federally listed threatened species have been documented to occur in Boulder and Weld counties (USFWS, 2015) (**Table 3-5**). The potential occurrence of the federally listed species in the Project Area, presented in **Table 3-5**, has been analyzed in a Biological Evaluation (BE) document prepared as part of ESA Section 7 consultation with USFWS on the Proposed Action (**Appendix C**). Based on the findings of the BE, two federally listed species have the potential to occur in the Project Area: Preble's meadow jumping mouse (Preble's) (*Zapus hudsonius preblei*) and Ute ladies'-tresses orchid (ULTO) (*Spiranthes diluvialis*). The BE concluded that due to a lack of suitable habitat, none of

the other federally listed species presented in **Table 3-5** has the potential to occur in the Project Area. There is no designated critical habitat for any federally listed species in the Project Area.

Preble's has never been captured during past surveys in the Project Area; however, suitable Preble's habitat exists in portions of the Project Area. As part of the BE, potential Preble's habitat was mapped in the Project Area by ERO. ERO identified approximately 4 acres of high-quality habitat, 313 acres of moderate-quality habitat, and 272 acres of low-quality habitat for Preble's in the Project Area (see BE in **Appendix C**). The City and Middle Reaches of the Project Area lack suitable habitat for the ULTO; however, suitable ULTO habitat has started to develop in the Sandstone Reach since the 2013 flood. The ULTO was not observed during surveys conducted by ERO for this species in the Sandstone Reach as part of the BE.

CPW maintains a list of state threatened and endangered animal species. Colorado has no state-level recognition or protection for plant species. **Table 3-6** provides information on the state threatened and endangered species that have been documented to occur in Boulder and Weld counties, including the potential of the species to occur in the Project Area. Two state-listed fish species, the common shiner (*Luxilus cornutus*) and brassy minnow (*Hybognathus hankinsoni*), have the potential to occur in the Project Area. Neither of these species was captured during fish sampling conducted at 10 sites in the Creek in 2015.

3.2.5 Migratory Birds

3.2.5.1 Regulations Protecting Bird Species

The Migratory Bird Treaty Act (MBTA) and EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, require federal agencies to support migratory bird conservation. Additionally, the Bald and Golden Eagle Protection Act (BGEPA) affords added protections for eagles.

The MBTA (16 U.S.C. 703–712) is the primary legislation protecting native birds in the United States. The MBTA protects migratory birds and prohibits the taking of migratory birds, their eggs, parts, and nests, except when authorized by USFWS. Under the MBTA, "take" is defined as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture or collect." The act also protects native resident species that are not considered migratory, but does not protect introduced bird species. The MBTA essentially includes all species except for introduced upland gamebirds, domestic pigeons, European starlings, and house sparrows. The destruction of most unoccupied bird nests (containing no birds or eggs) is permissible under the MBTA, but unoccupied nests of federally threatened or endangered bird species cannot be disturbed or destroyed.

The BGEPA (16 U.S.C. 668-668c) is the primary law protecting eagles in the United States. The BGEPA prohibits "take" of individual eagles and their parts, nests, or eggs without a permit. The BGEPA defines "take" to include "pursue, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." "Disturb" is further defined as: "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

3.2.5.2 Birds Occurring in the Project Area

The Project Area, including both natural and developed areas, provides habitat for numerous bird species. The Creek and the surrounding ponds provide habitat for resident and migratory birds. The Middle and Sandstone Reaches, in particular, provide open, natural areas that support many species. Birds known to nest in those areas include hawks, owls, osprey, bald eagles, herons, egrets, geese, ducks, and various songbirds. Seasonal restrictions and nest buffers limit activity in the area during nesting season for raptors and eagles (CPW, 2008).

Several species on the USFWS list of Birds of Conservation Concern (BCC) may occur in the Project Area. The objective of the BCC program is to accurately identify the migratory and non-migratory bird species (beyond those already designated as federally threatened or endangered) that represent the highest conservation priorities (USFWS, 2012). A list of BCC birds that may occur in the Project Area is presented in **Table 3-7**.

TABLE 3-5

Federally Threatened and Endangered Species Documented to Occur in Boulder and Weld Counties, Colorado

Resilient St. Vrain Project EA

Species	Federal Status	Critical Habitat in Project Area	Potential to Occur in the Project Area	Preferred Habitat
BIRDS				
Interior Least Tern *Sterna antillarum athalassos*	Endangered	No	None – Species occurs in the South Platte River Basin in Nebraska, outside of the Project Area. Species could be affected by water depletions within the watershed.	Preferred nesting habitat is on sandy or pebbly beaches, well above the water line, around lakes and reservoirs or on sandy soil sandbars in river channels.
Mexican Spotted Owl *Strix occidentalis lucida*	Threatened	No	None – Project Area lacks suitable habitat.	Forested mountains and canyons. In Colorado, most nests are in caves or on cliff ledges in rocky canyons.
Piping Plover *Charadrius melodus*	Threatened	No	None – Species occurs in the South Platte River Basin in Nebraska, outside of the Project Area. Species could be affected by water depletions within the watershed.	Nesting habitat in Colorado is on sandy lakeshore beaches, sandbars within riverbeds, or even sandy wetland pastures with sparse vegetation.
Whooping Crane *Grus americana*	Endangered	No	None – Species occurs in the South Platte River Basin in Nebraska, outside of the Project Area. Species could be affected by water depletions within the watershed.	Roosts in wide river channels, wetlands, reservoirs, mud flats, and farm ponds. Feeds in nearby grassland and cropland.
FISHES				
Greenback Cutthroat Trout *Oncorhynchus clarki stomias*	Threatened	No	None – Only known population is located outside of the Project Area (Bear Creek near Colorado Springs, Colorado).	Prefers cold, clear, gravely headwater streams and mountain lakes, which provide an abundant food supply of insects.
Pallid Sturgeon *Scaphirhynchus albus*	Endangered	No	None – Species occurs in the South Platte River Basin in Nebraska, outside of the Project Area. Species could be affected by water depletions within the watershed.	Large, turbid, free-flowing riverine habitat. The species occurs in strong current over firm gravel or sandy substrate.
MAMMALS				
Canada Lynx *Lynx canadensis*	Threatened	No	None – Project Area lacks suitable habitat and is below the preferred elevation for the species.	Found in dense subalpine forest and willow-choked corridors along mountain streams and avalanche chutes, the home of its favored prey species, the snowshoe hare.
Preble's Meadow Jumping Mouse *Zapus hudsonius preblei*	Threatened	No	Possible – Marginal suitable habitat exists in parts of Project Area, primarily in the Middle and Sandstone Reaches. Species has never been captured in the Project Area during past surveys.	Occurs along the Front Range of northern Colorado and along permanent or intermittent streams in areas of good herbaceous cover and adequate cover of shrubs and trees.

Species	Federal Status	Critical Habitat in Project Area	Potential to Occur in the Project Area	Preferred Habitat
PLANTS				
Colorado Butterfly Plant *Gaura neomexicana var. coloradensis*	Threatened	No	None – Project Area lacks suitable habitat and a known seed source, and is below the preferred elevation for the species.	Colonies are often found in low depressions or along bends in wide, active, meandering stream channels a short distance upslope of the actual channel. The plant requires early- to mid-succession riparian habitat and is typically found at elevations of 5,000 to 6,400 feet (USFWS, 2010; USFWS, 2011).
Ute Ladies'-Tresses Orchid *Spiranthes diluvialis*	Threatened	No	Possible – City and Middle Reaches lack suitable habitat. Suitable habitat has started to develop in the Sandstone Reach post 2013 flood.	Known primarily from moist meadows associated with perennial stream terraces, floodplains, and oxbows at elevations of 4,300 to 6,850 feet. Most sites were reported from openings where vegetation cover was not overly dense or heavily grazed, although at least one Colorado population was known from Narrowleaf cottonwood-River birch-Boxelder riparian woodlands with a grassy understory (Fertig et al., 2005)
Western Prairie Fringed Orchid *Platanthera praeclara*	Threatened	No	None – Species occurs in the South Platte River Basin in Nebraska, outside of the Project Area.	Occurs most often in mesic to wet unplowed tallgrass prairies and meadows in Nebraska but has been found in old fields and roadside ditches.

Sources: CPW, 2015; USFWS, 2015; CPW and Colorado State University [CSU], 2014.

TABLE 3-6

State Threatened and Endangered Species Documented to Occur in Boulder and Weld Counties, Colorado

Resilient St. Vrain Project EA

Species	State Status	County	Potential to Occur in the Project Area	Preferred Habitat
AMPHIBIANS				
Boreal Toad *Bufo boreas*	Endangered	Boulder	None – Project Area is below the elevation of known habitat.	Vicinity of mountain lakes, ponds, meadows, and wetlands in subalpine forest at elevations between 7,500 and 12,000 feet.
BIRDS				
Burrowing Owl *Athene cunicularia*	Threatened	Not listed in Colorado Natural Heritage Program (CNHP) 2014 records but known to occur in Boulder and Weld counties.	Possible – Prairie dog colonies and agricultural fields in the Project Area may provide suitable habitat.	Primarily found in grasslands and mountain parks, usually in or near prairie dog towns. They will also use steppes, deserts, prairies, and agricultural lands. Open landscapes, short vegetation, and burrow availability are essential.

Species	State Status	County	Potential to Occur in the Project Area	Preferred Habitat
FISHES				
Brassy Minnow *Hybognathus hankinsoni*	Threatened	Not listed in CNHP 2014 records but may occur in Boulder and Weld counties.	Possible – Species is known to occur in St. Vrain Creek in the Project Area.	Areas of cool, clear water with abundant aquatic vegetation, a gravel substrate, and flooded backwaters and slow-moving pools.
Common Shiner *Luxilus cornutus*	Threatened	Not listed in CNHP 2014 records but known to occur in Boulder County.	Possible – Species is known to occur in St. Vrain Creek in the Project Area.	Requires streams of moderate gradient with cool, clear water, gravel bottoms, and shaded by brush or trees.
Lake Chub *Couesius plumbeus*	Endangered	Boulder	None – Project Area is outside the known range of the species.	Currently, this species appears to be limited to upper-elevation lakes and reservoirs with rocky shorelines. Most recent records are from lake habitats with rocky shorelines, whereas historical records are primarily from transition zone stream habitats (USGS, 2007).
Northern Redbelly Dace *Phoxinus eos*	Endangered	Boulder, Weld	None – Although historically known in St. Vrain Creek, the only known populations currently exist in tributaries of Plum Creek.	Relatively intact perennial streams with diverse habitat and good water quality. Requires vegetation and slow-flowing streams.
Southern Redbelly Dace *Phoxinus erythrogaster*	Endangered	Boulder	None – The only known populations of the species are located in the Arkansas River Basin.	Small, slow-flowing, clear waters with abundant algal growths covering a stream substrate of deep silt deposits, with riparian vegetation providing shade.
MAMMALS				
Black-footed Ferret *Mustela nigripes*	Endangered	Weld	None – No known populations in or near the Project Area.	Habitat in Colorado includes the eastern plains, mountain parks, western valleys, grasslands, and shrubland.
Preble's Meadow Jumping Mouse *Zapus hudsonius preblei*	Threatened	Boulder, Weld	Unlikely – Project Area is outside of known area of occurrence post-2013 floods, but it is known to occur upstream along St. Vrain Creek.	Occurs along the Front Range of northern Colorado and along permanent or intermittent streams in areas of good herbaceous cover and adequate cover of shrubs and trees.

Sources: City of Longmont, 2005; CNHP, 2014; USGS, 2007.

TABLE 3-7
Birds of Conservation Concern that May Occur in the Project Area
Resilient St. Vrain Project EA

Common Name	Scientific Name	Season of Concern
American Bittern	*Botaurus lentiginosus*	Breeding
Bald Eagle	*Haliaeetus leucocephalus*	Year-round
Brewer's Sparrow	*Spizella breweri*	Breeding
Burrowing Owl	*Athene cunicularia*	Breeding
Dickcissel	*Spiza americana*	Breeding
Ferruginous Hawk	*Buteo regalis*	Year-round
Golden Eagle	*Aquila chrysaetos*	Year-round
Lark Bunting	*Calamospiza melanocorys*	Breeding
Loggerhead Shrike	*Lanius ludovicianus*	Breeding
Mountain Plover	*Charadrius montanus*	Breeding
Peregrine Falcon	*Falco peregrinus*	Breeding
Pinyon Jay	*Gymnorhinus cyanocephalus*	Year-round
Prairie Falcon	*Falco mexicanus*	Year-round
Red-headed Woodpecker	*Melanerpes erythrocephalus*	Breeding
Sage Thrasher	*Oreoscoptes montanus*	Breeding
Short-eared Owl	*Asio flammeus*	Wintering
Swainson's Hawk	*Buteo swainsoni*	Breeding
Williamson's Sapsucker	*Sphyrapicus thyroideus*	Breeding

Source: USFWS, 2015.

3.3 Land Use and Community Cohesion

3.3.1 Land Use

Land use planning refers to the planned development of property to ensure compatibility among adjacent uses. Land use classifications guide the type and extent of allowable land use in an effort to control and limit growth, maintain and improve amenities, promote a stable economy, preserve agricultural lands, maintain scenic area, supply adequate housing, and protect environmental sensitive areas. Land use classifications for the areas within the Project boundaries were obtained from the City of Longmont, Weld County, and Boulder County.

Phase 1 consists of the City Reach (Main Street to the confluence of Left Hand Creek) and the Sandstone Reach. Much of the Sandstone Reach area is in unincorporated Weld County (incorporated City land) and does not have a designated Land Use Classification (Weld County, 2015). The Phase 1 City Reach contains the following percentages for each major land use classification (City of Longmont, 2015c) (**Figure 3-4**):

- 18% Agricultural
- 6% Industrial/Commercial
- 7% Public
- 69% Parks, Greenways, and Open Space

Phase 2, consisting of City Reaches 2-4, includes the following percentages for each major land use classification (City of Longmont, 2015c) (see **Figure 3-4**):

- 0% Agricultural
- 10% Residential

- 26% Industrial/Commercial
- 1% Public
- 63% Parks, Greenways, and Open Space

Phase 3, consisting of the Middle Reach, contains the following percentages for each major land use classification (Boulder County, 2015) (see **Figure 3-4**):

- 40% Agricultural
- 3% Residential
- 9% Industrial/Commercial
- 0% Public
- 48% Parks, Greenways, and Open Space

3.3.2 Community Cohesion

Community cohesion involves factors that contribute to the sense of community within an area and includes access and linkages to areas that provide opportunities for residents to gather and interact. There are no regulations that define or guide changes to community cohesion. Nonetheless, alterations to access and linkages, and the displacement of individuals, businesses, and community resources can adversely affect daily activities and how individuals interact.

Phase 1, consisting of the City Reach (Main Street to the confluence of Left Hand Creek) and the Sandstone Reach, had the following 24 community resources within 0.5 mile of the Project Area (**Figure 3-5**):

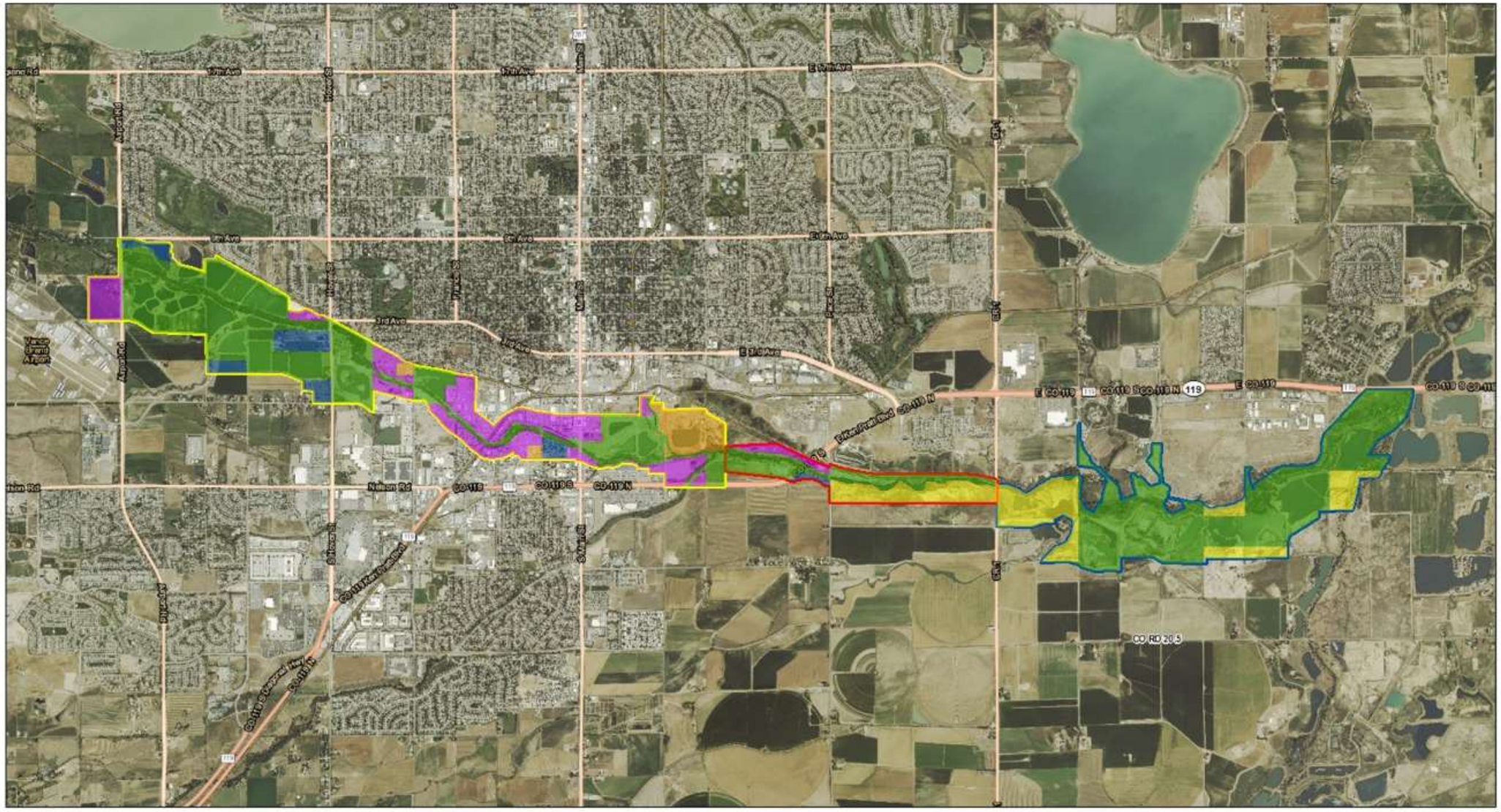
- Schools/Daycares – 6
- Churches – 5
- Parks – 1
- Medical – 9
- Emergency Services – 3

Phase 2, consisting of the remaining City Reaches, has the following 62 community resources within 0.5 mile of the Project Area (see **Figure 3-5**):

- Airport – 1
- Schools/Daycares – 26
- Churches – 7
- Parks – 8
- Medical – 20

Phase 3, consisting of the Middle Reach, has the following three community resources within 0.5 mile of the Project Area (see **Figure 3-5**):

- Schools/Daycares – 1
- Medical – 2



Legend

- City Reach
- Middle Reach
- Sandstone Reach

N

0 1,500 3,000
Feet

Image Source: National Agriculture Imagery Program (NAIP) 2013
Land Use Source: City of Longmont, Boulder and Weld Counties, CO

Figure 3-4
Land Use
Resilient St. Vrain Project EA

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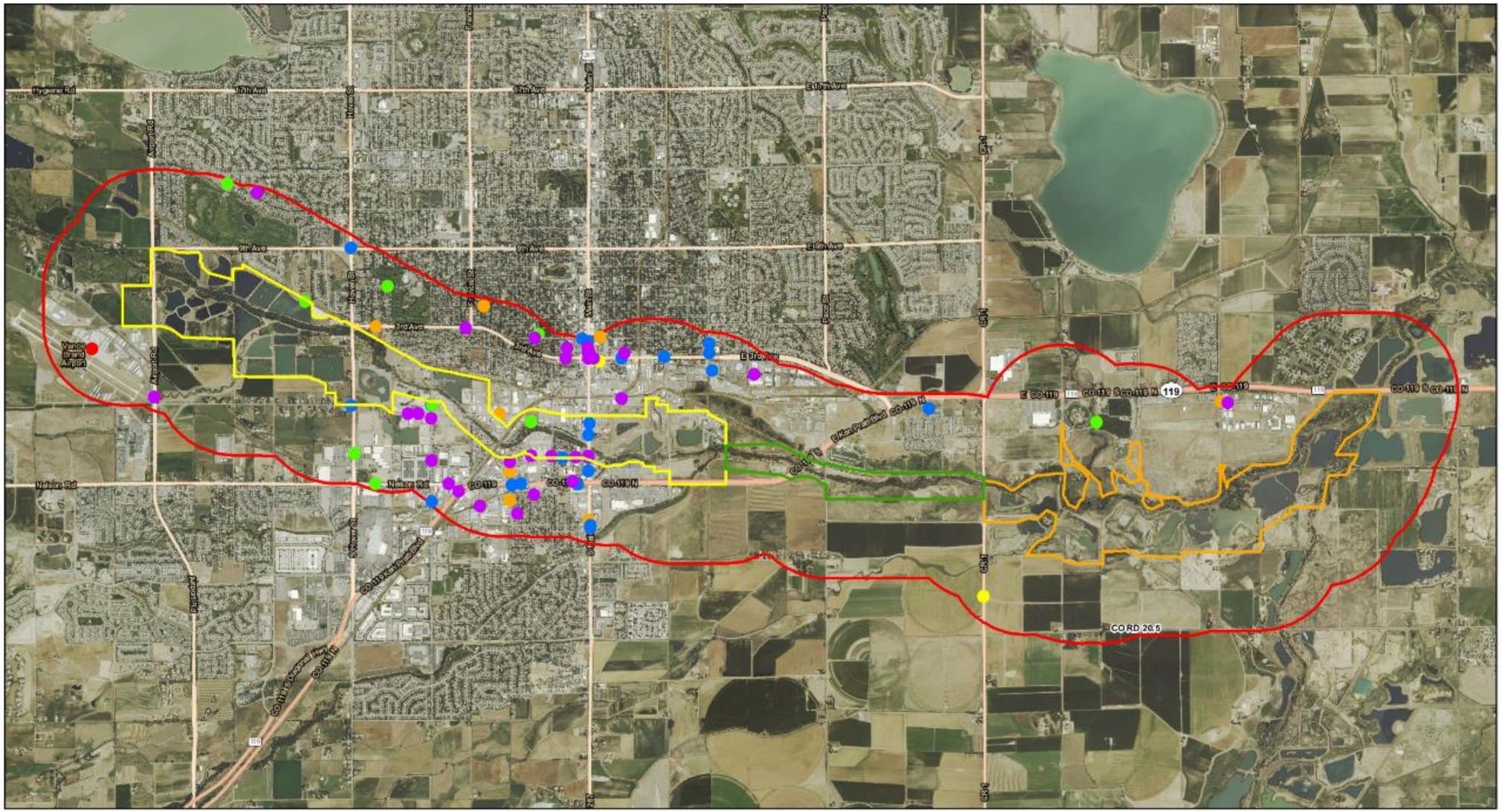

Legend

- City Reach
- Middle Reach
- Sandstone Reach
- Half Mile Buffer
- Airport
- Church
- Emergency
- Medical
- Park
- School/Daycare
- Additional Haul Routes
- City Approved Truck Haul Route

N

0 1,500 3,000
Feet

Image Source: National Agriculture Imagery Program (NAIP) 2013
Community Source: ESRI, 2015

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Figure 3-5
Community Resources
Resilient St. Vrain Project EA

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3.4 Health and Safety

Health and safety has been broken into three categories for this analysis: public safety, occupational health, and the protection of children.

3.4.1 Public Safety

The Project site is within the floodplain of the Creek, which in 2013 experienced a catastrophic flood event, resulting in a federally declared disaster. During the 2013 flood, residential properties, such as a trailer park and multi-family housing on the south side of the Creek and industrial properties on the north side of the Creek, experienced up to 5 feet of water flows. City infrastructure, such as street crossings and greenway trails, also suffered significant damage.

Flooding in an urban environment such as Longmont can lead to numerous health and safety risks; in fact, flooding is the leading cause of weather-related deaths in the United States (Flood Safety, 2015). Risks associated with flooding include exposure to contaminated water, vehicle hazards (such as water on roads and debris), and fast-moving water, which increases the risks for falls, serious injuries, and drowning. Floods may also damage or otherwise close off access routes to hospitals and other emergency resources, causing a major public safety issue as experienced during the 2013 flood in Longmont.

3.4.2 Occupational Health

Occupational health risks are defined as risks arising from physical, chemical, and other workplace hazards that interfere with establishing and maintaining a safe and healthy working environment. Hazards could include chemical agents, physical agents, such as loud noise or vibration, physical hazards, such as slip, trip, and fall hazards, electricity, or dangerous machinery, and natural hazards, such as flooding, botanical hazards (poison ivy and thorned plants), or wildlife hazards (stinging insects, poisonous spiders, venomous snakes, and ticks and tickborne pathogens).

Safety and occupational health issues include exposure to natural hazards, one-time and long-term exposure to asbestos, lead, radiation, chemicals, and other hazardous materials, and injuries or deaths resulting from a one-time accident. Safety and occupational health concerns could affect personnel working on the Project and in the surrounding area, as well as individuals near the Project site.

3.4.3 Protection of Children

EO 13045, Protection of Children from Environmental Health Risks and Safety Risks*,* requires federal agencies to identify and assess environmental health and safety risks that may disproportionately affect children. There are 89 community resources within 0.5 mile of the Project Area that may attract children. These resources include schools/daycare centers, churches, and parks (see **Figure 3-5** in Section 3.3, *Land Use and Community Cohesion*). Children are also likely to be present in the residential areas that surround much of the Project Area.

3.5 Socioeconomics

Prior to the flood event in September 2013, the Creek was widely considered one of the most important natural features in area, and of particular value to the City. The Longmont community enjoyed the Creek corridor for its natural beauty, wildlife habitat, and neighboring parks and trails lining the Creek. Residents and business owners neighboring the Creek's riparian corridor within the City Reach enjoyed the natural aesthetics of the Creek as part of the landscape that identifies the City. Similarly, within the more eastern and less-developed Sandstone Reach, the Creek attracted community members to its lengthy trails that allowed for abundant recreational activities.

While projects were underway prior to the 2013 flood to evaluate the Creek's channel for risks and plan mitigation measures, the Creek was not able to carry the 100-year and greater flood flows that occurred during the 2013 flood event. As a result, the floodwaters rushed through the Creek bed with significant

erosive energy, and much of the flow spilled out beyond the Creek channel into the City. This event dramatically changed the Creek, and with it, the infrastructure and livelihoods of local residents.

The intensity and extent of the flood resulted in widespread damages to private residences, businesses, infrastructure, and wildlife habitat resulting in significant socioeconomic setbacks and losses for the City and its community. After the floodwaters receded and an inventory of damage could be taken, the following losses and impacts were recorded:

- More than 2,000 homes were inundated and/or destroyed.
- Hundreds of businesses suffered damage and loss.
- The City's transportation links were destroyed, including the loss or need for dramatic repairs to multiple bridges and arterial roadways.
- Significant road closures were necessary, resulting in re-routing traffic using complicated detours.
- Utility lines were damaged, resulting in prolonged electrical service outages and some water service disruptions.
- Flood flows extended to and damaged the City's WWTP, also causing contamination risks.
- Sanitary sewer trunk lines were compromised, requiring re-routing of sewage flows for treatment.
- Approximately 9 miles of the City's greenway and trail system were destroyed.
- Wildlife habitat in the riparian corridor was destroyed and dramatically reshaped with debris and sediment (City of Longmont, 2013).

The damages from the flood equated to considerable financial hardships for Longmont and the surrounding communities. Residents lost their homes and business owners suffered damage, inventory losses, and loss of customer traffic. A majority of the homes lost due to the flood were in low-income areas of the City. The Royal Mobile Home Park was destroyed and required relocation of residents, and the St. Vrain Mobile Home Park experienced extensive damage. Relocation and interim housing needs resulted in increased pressure on rental properties throughout the City. Impacts to minority and low-income populations are discussed further is Section 4.13, Environmental Justice.

Numerous businesses near the Creek in the City were inundated by floodwaters, causing damage not only to their structures, but also to their inventory and operational equipment. Many of these businesses were located on main thoroughfares for vehicle and pedestrian traffic, and, as such, their recovery has been hampered by the prolonged repairs of roads, bridges, pedestrian sidewalks, and the Creek's greenway corridor. These businesses have been particularly susceptible to economic loss during the recovery period, which, in turn, has reduced earned revenue and slowed job recovery and growth in the area.

3.6 Transportation

This section describes the existing transportation network adjacent to and through the Project Area, including roadways, rail lines, non-motorized transportation facilities, and transit routes.

3.6.1 Roadway Facilities

The Project Area follows the Creek through urban and suburban portions of the City into more rural land uses outside of the City. The Project Area, shown on **Figure 2-1**, crosses Airport Road, Hover Street, Sunset Street, Boston Avenue, Pratt Parkway, US 287/Main Street, Martin Street, SH 119, 119th Street, and County Line Road. Airport Road, Hover Street, and US 287/Main Street are four-lane arterial roadways with City-approved truck haul routes. US 287/Main Street serves as a primary entrance to the City. Sunset Street and Boston Avenue are two-lane neighborhood collectors that are also City-approved truck haul routes through all or a portion of the Project Area. The Sunset Street Bridge across the Creek was destroyed in the 2013 flood and access across the Creek has not yet been restored at this location. Pratt Parkway, a four-lane

primary collector, and Martin Street, a two-lane arterial, are not City-approved truck haul routes; however, they have been designated as additional haul routes for this Project. SH 119, a primary entrance to the City, is a four-lane divided expressway and a designated truck haul route. Both 119th Street and County Line Road are two-lane arterials and City-approved truck haul routes. Neighborhoods adjacent to the Project Area are served by local roads that do not cross the Project Area and are not City-approved truck haul routes. However, City code allows for construction and heavy truck traffic on local streets that provide the shortest distance between the City-approved truck haul routes and the construction site.

3.6.2 Transit and Rail Facilities

Regional and local bus service is provided within the City. Within the Project Area, bus service operates along Pratt Parkway and US 287/Main Street, with selected routes operating on Hover Street. There are no Regional Transportation District (RTD) Park-n-Ride facilities within the Project Area. In addition to bus transit, the BNSF Railway line, an active freight rail line, crosses St. Vrain Creek via a bridge near Price Road. Another rail line runs along the north side of the Creek to Lyons.

3.6.3 Non-Motorized Facilities

Non-motorized transportation facilities in the Project Area include off-street trails and bikeways, on-street bikeways, and on-street sidewalks. Off-street trails and bikeways are shown on **Figure 2-1**. The St. Vrain Greenway includes an off-street trail and bikeway system that runs along the Creek and connects the Golden Ponds trailhead to the Sandstone Reach trailhead 8 miles to the east. Much of the existing greenway trail is located within the Project Area. The greenway trail was extensively damaged in the 2013 flood and some segments have yet to reopen. The greenway trail provides a connection to other regional trails, on-street bikeways, and sidewalks. The trail has grade-separated crossings of the Creek and adjacent roadways, although some of these features were damaged in the 2013 flood and still have not been repaired. Sidewalks for non-motorized users within the Project Area are provided on Airport Road, Hover Street, Boston Avenue, Pratt Parkway, US 287/Main Street, Martin Street, and SH 119.

3.7 Cultural Resources

FEMA is required under federal law to ensure that cultural resources are considered in all of its undertakings and that significant resources are protected to the extent possible. The most relevant federal laws pertaining to cultural resources for the Proposed Action are the National Historic Preservation Act (NHPA) of 1966, and the Archaeological Resources Protection Act (ARPA) of 1979.

The implementing regulation for the NHPA is the Protection of Historic Properties (36 CFR 800). Historic properties are defined in 36 CFR 800.16 as any prehistoric or historic district, site, building, structure, or object included in or eligible for the National Register of Historic Places (NRHP). The NRHP is a federally maintained list of historic properties significant in American history, prehistory, architecture, archeology, engineering, or culture. To be eligible for inclusion in the NRHP, a property must meet the requirements of at least one of the four primary NRHP criteria listed in 36 CFR 60.4. These criteria include the following:

- Criterion A: Association with events that have made a significant contribution to the broad patterns of our history;
- Criterion B: Association with the lives of persons significant in our past;
- Criterion C: Embodiment of the distinctive characteristics of a type, period, or method of construction or representative of the work of a master or possessing high artistic value, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- Criterion D: Yielding, or likely to yield, information important in prehistory or history.

In addition, properties must retain enough integrity to demonstrate their significance under the criteria. The NRHP recognizes seven aspects of integrity: setting, feeling, association, location, materials, design, and workmanship. Even if a property meets the criteria, it must retain sufficient integrity to convey that

significance in order to be eligible for listing in the NRHP. Generally, properties must be a least 50 years of age to be eligible for the NRHP, unless they are proven to have exceptional importance.

Section 106 of the NHPA requires that any federal or federally assisted project and any project requiring federal licensing or permitting must take into account the effects of their undertakings on historic properties. In order to satisfy the Section 106 process, federal agencies must take the following steps: initiate consultation with regulatory agencies and identify concerned Native American tribes and other interested parties; identify (inventory) and evaluate historic properties; identify project effects; and consult with affected parties to resolve adverse effects to historic properties. Properties are evaluated in consultation with the relevant State Historic Preservation Officer (SHPO).

As part of this consultation, FEMA has identified the area of potential effects (APE), which represents, in accordance with 36 CFR 800.16(D), the area within which the Proposed Action may "directly or indirectly cause alterations in the character or use of historic properties if such properties exist." The APE corresponds with the direct impact area shown in **Figure 2-1**. A Cultural Resource Survey (CRS) report was prepared to identify potential historic resources **(Appendix H)**. FEMA determined and SHPO concurred on February 23, 2016, that the 10 resources shown in **Table 3-8** are listed or eligible for listing in the NHRP.

Cultural resources have been separated into two categories for this analysis: archaeological resources (prehistoric and historic) and historic architectural resources. The following sections describe the NRHP-listed and -eligible sites found within the APE.

3.7.1 Archaeological Resources

Prehistoric and historic archaeological resources are items or sites resulting from human activities that predate and postdate written records, respectively. Archaeological resources may include structural ruins or deposits of prehistoric occupation debris, such as artifacts and food remains (seed, shells, and bones). Archaeological resources, if eligible for listing in the NRHP, typically are eligible under Criterion D (research potential), but other eligibility criteria may also apply.

The area within the APE is heavily impacted and experienced extensive disturbance during the 2013 floods, which would have an effect on the quality of archaeological resources in the area. In fact, a limited number of prehistoric resources were identified during cultural surveys (ERO, 2015) and none of these was deemed eligible for the NRHP.

3.7.2 Historic Architectural Resources

Historic architectural resources are defined as physical properties, structures, and buildings resulting from human activities that occurred after European settlement. There were a number of historic-era architectural resources identified within the APE. These resources are associated with the early settlement era (circa 1860-1900), commercial growth era (circa 1900-1929), and the retrenchment and modernization era (circa 1929-1960). A detailed list of the NRHP-eligible and -listed sites and local landmarks is provided in Table 3-8.

TABLE 3-8

NHRP-Eligible and -Listed Historic Architectural Resources within the APE

Resilient St. Vrain Project EA

Site Number	Resource Name/Type	Description	NRHP Eligibility
		City Reach	
5BL374.18	BNSF Railway (segment)	Actively used segment of the BNSF line that extends in a generally northwest-to-southeast direction between 9th Avenue and South Grant Street. The full extent of the BNSF (5BL374) line was determined eligible for listing in the NRHP in 1990.	Supports eligibility of overall linear resource

Site Number	Resource Name/Type	Description	NRHP Eligibility
5BL400.36	Colorado and Southern/BNSF Railway Bridge	The railroad bridge crosses St. Vrain Creek on the south side of the City. The steel deck girder bridge spans 90 feet across the Creek and consists of concrete abutments supported by three concrete piers. The bridge was constructed in 1908; the wooden trestle was added in 1935 and the steel beams were added in 1955.	Supports eligibility of overall linear resource
5BL400.50	Colorado and Southern/BNSF Railway (segment)	Actively used railroad segment is 0.35 mile in length and defined by the extent of the APE. The segment is approximately 30 feet wide and consists of one set of standard gauge tracks on cobble ballast. A bridge (5BL400.36) is located in the center of the segment.	Supports eligibility of overall linear resource
5BL5499	Dickens (Knake) Property	This farm property is located north of St. Vrain Creek on the west side of Main Street in downtown Longmont. Various structures and buildings are present onsite. Constructed in 1872, the house is presently used as a residence and bed and breakfast.	Determined not eligible, City of Longmont Landmark (2004)
5BL7882.1	Hoyt-to-Terry Street transmission line (segment)	This segment of the Hoyt-to-Terry Street transmission line is located along the Fordham-to-Terry Street transmission line (5BL7885.2) within the urban setting of Longmont. The segment trends in a north-south alignment that passes over St. Vrain Creek. State and federal government agencies collaborated in 1951 to construct the Hoyt-to-Terry Street transmission line as an element of the Colorado–Big Thompson Project.	Supports eligibility of overall linear resource
5BL7885.2	Fordham-to-Terry Street transmission line (segment)	This segment of the Fordham-to-Terry Street transmission line extends in a generally northwest-southeast direction across the entire western half of Longmont. The segment parallels the north side of the BNSF line (5BL374) and both resources roughly parallel St. Vrain Creek. The Fordham-to-Terry Street transmission line is part of the larger Flatiron-Leyner-Brighton line, an element of the Colorado–Big Thompson Project constructed in 1950.	Supports eligibility of overall linear resource
5BL13296.1	South Flat Ditch (segment)	The ditch segment trends in a generally northwest-to-southeast direction and is defined by the extent of the APE to the north and south. The ditch extends for 0.24 mile through agricultural fields and averages 6 to 8 feet in width. The ditch was appropriated in 1863 but was not adjudicated until 1882.	Supports eligibility of overall linear resource
5BL13297.1	Unnamed spreader ditch (segment)	The ditch segment represents the western extent of an unnamed system; the segment is defined by the APE to the west and its terminus into Mason Meadows Ditch (5BL7601.1) to the east. The segment conveys water east beside buildings on a historical farm (5BL13298). This earthen ditch is an average of 2 feet wide and 1 foot deep.	Supports eligibility of overall linear resource
		Sandstone Reach	
5WL712	Sandstone Ranch, Morse H. Coffin Ranch, Sandstone Farmstead	The Sandstone Ranch is situated along St. Vrain Creek. The historic buildings and open space on the north side of the Creek are preserved in a public open space under the ownership and maintenance of the City. Morse H. Coffin began to develop the Sandstone Ranch during the early 1870s and continued to construct buildings that contributed to the eligibility of the site until 1920. The ranch complex includes irrigation features and historic graffiti dating from 1871, buildings constructed between 1880 and 1920, a sandstone quarry with historic graffiti, a scatter of historic artifacts, and modern buildings the City uses to store vehicles.	NRHP Listed (1984), City of Longmont Landmark
5WL2876.1	Bonus Lateral Ditch (segment)	Segment 5WL2876.1 of the Bonus Lateral Ditch is located within the Sandstone Ranch (5WL712) on the southeast side of Longmont in Weld County. The ditch is “V”-shaped, of earthen construction, and ranges from 2 to 3 feet wide by about 1 foot deep. A portion of the segment is piped underground and is controlled by metal headgates. The Bonus Lateral Ditch was constructed in 1870 and is directly associated with agricultural activities of Sandstone Ranch.	NRHP Eligible

Site Number	Resource Name/Type	Description	NRHP Eligibility
5WL2877.1	Union Reservoir Ditch (segment)	Segment 5WL2877.1 of the Union Reservoir Ditch borders the west side of the Sandstone Ranch (5WL712) and extends into the ranch near its intersection with St. Vrain Creek. Most of the segment is located inside a heavily incised natural stream channel that varies from 6 to 30 feet in width and approximately 6 to 20 feet in depth. In 1875, the Coffin family channelized Coffin Spring Gulch, a natural drainage, and renamed it Union Reservoir Ditch. Today, the ditch retains its earthen construction and the same alignment as the gulch.	NRHP Eligible

3.8 Geology

This section describes the existing geology in the Project Area, including soils. Geology is the science that pertains to the earth's physical structure, substance, and history. Soil consists of varying amounts of mineral particles and organic matter. It serves as a medium for plant growth and water storage, and as habitat for certain types of organisms.

The western half of the Project Area is located in the Front Range Fans ecoregion, while the eastern half is located in the Flat to Rolling Plains ecoregion (Chapman et al., 2006). The geology of the Front Range Fans ecoregion is generally characterized as Quaternary gravel and sandy alluvium, eolian sand deposits underlain by sandstone, claystone, and shale of the Cretaceous Laramie and Fox Hills formations, and sandstone, mudstone, claystone, and conglomerate of the Tertiary Denver and Arapahoe formations towards the southern part of the ecoregion (Chapman et al., 2006). The geology of the Flat to Rolling Plains ecoregion is generally characterized as Quaternary loess, alluvial deposits, and some thin residuum. Tertiary gravel, claystone, sandstone, and sand deposits, including the Ogallala Formation, exist in the eastern part of the ecoregion, and Cretaceous shales, sandstones, claystones, and coal beds exist in the western part of the ecoregion (Chapman et al., 2006).

The Front Range Fans ecoregion contains soils that are weathered from arkosic sedimentary rock, gravelly alluvium, and redbed shales and sandstone and the Flat to Rolling Plains ecoregion contains soils that are generally silty with a veneer of loess (Chapman et al., 2006). Soil types in the Project Area have been identified by the Natural Resources Conservation Service (NRCS) Soil Surveys for Boulder and Weld counties, Colorado (NRCS, 2015). Based on the NRCS soil survey data, 21 soil types occur in the Project Area. The dominant soil types by spatial coverage in the Project Area are presented in **Table 3-9**.

TABLE 3-9
Dominant Soil Types in the Project Area
Resilient St. Vrain Project EA

Soil Type	Acres in Project Area	Percent of Project Area
Niwot soils	441.0	25.0
Aquolls and Aquents, gravelly substratum	234.5	13.3
Loveland soils	168.9	9.6
Bankard sandy loam, 0 to 3 percent slopes, frequently flooded	145.9	8.3
Aquolls and Aquepts, flooded	122.2	6.9
Manter sandy loam, 1 to 3 percent slopes	97.3	5.5

Source: NRCS, 2015.

As indicated in **Table 3-9**, Niwot soils are the most abundant soil type in the Project Area. Niwot soils occur primarily in floodplains and typically consist of loam from 0 to 14 inches below ground surface (bgs) and

gravelly sand from 14 to 60 inches bgs. This soil type is poorly drained and typically has a water table between 18 to 36 inches bgs (NRCS, 2015).

Niwot soils are not classified as prime farmland by NRCS. Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is available for these uses. The other soil types presented in **Table 3-9** are considered by NRCS to qualify as prime farmland if irrigated, drained, or under other specific conditions, depending on the soil type (NRCS, 2015).

3.9 Hazardous Materials and Waste

According to the Resource Conservation and Recovery Act of 1976 (RCRA), a solid waste is "any discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities." A hazardous waste is "a waste which because of its quantity, concentration, or physical, chemical, or infectious characteristics may pose a substantial hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed."

Hazardous materials and wastes are regulated in Colorado by a combination of federal and state laws. Federal regulations governing the assessment and disposal of hazardous wastes include RCRA; the RCRA Hazardous and Solid Waste Amendments; the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA); the Solid Waste Act; and the Toxic Substances Control Act.

To determine whether any facilities in the vicinity or upgradient of the Project Area have known and documented environmental issues or concerns, an Environmental Data Resources, Inc. (EDR) database report was obtained. The EDR report includes environmental database records for the proposed Project Area, immediately adjacent properties, and the standard EDR search radius. The search radius is specific to each database, and ASTM International (ASTM) standards were used. These international standards are important because they provide a consistency with technical criteria.

The sites found within the Project Area are summarized as follows:

- The results of the federal record search for the Project Area are presented in Table 1 of **Appendix D**. This search included 54 databases. Although the total number of sites identified in the federal record search is 136, some sites may be listed in more than one database.
- The results of the state and local record search for the Project Area are presented in Table 2 of **Appendix D**. This search included 23 databases. Although the total number of sites identified in the state and local record search is 172, some sites may be listed in more than one database.
- The results of the EDR Proprietary record search for the Project Area are presented in Table 3 of **Appendix D**. This search included five databases. Although the total number of sites identified in the EDR proprietary record search is 74, some sites may be listed in more than one database.
- The results of the EDR tribal records search for the Project Area are presented in Table 4 of **Appendix D**. This search included five databases in which no sites were found.

3.10 Air Quality and Climate Change

This section discusses air quality, greenhouse gases (GHGs), and climate change. Air quality and GHGs are discussed in this EA on a regional level, not just within boundaries of the Project Area.

3.10.1 Criteria Pollutants

Federal air quality policies are regulated through the Clean Air Act (CAA). Pursuant to the CAA, EPA has established National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. NAAQS have been established for the following air pollutants, which are called

criteria pollutants: carbon monoxide (CO), ozone, nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable particulate matter defined as particulate matter less than 10 microns in aerodynamic diameter (PM_{10}), fine particulate matter defined as particulate matter less than 2.5 microns in aerodynamic diameter ($PM_{2.5}$), and lead. **Table 3-10** summarizes the NAAQS for these criteria pollutants. The CAA requires each state to maintain a State Implementation Plan (SIP) for achieving compliance with the NAAQS. It also requires EPA to designate areas (counties or air basins) as being in attainment or nonattainment with respect to each criteria pollutant, depending on whether the area meets the NAAQS. An area designated as being in nonattainment does not meet one or more NAAQS, and is subject to planning requirements to attain the standard. Conformity of a proposed action to the required planning documents or SIP is defined under the CAA as conformity with the plan's purpose in eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of these standards. Areas that currently meet the air quality standard but previously were classified as nonattainment are "in maintenance" for that standard. Maintenance areas also are subject to the General Conformity Rule.

TABLE 3-10
National Ambient Air Quality Standards
Resilient St. Vrain Project EA

Pollutant	Primary/Secondary	Averaging Time	Level	Form
Carbon Monoxide	Primary	8-hour	9 ppm	Not to be exceeded more than once per year
		1-hour	35 ppm	
Lead	Primary and Secondary	Rolling 3 month average	0.15 µg/m^3	Not to be exceeded
Nitrogen Dioxide	Primary	1-hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Primary and Secondary	Annual	53 ppb	Annual mean
Ozone	Primary and Secondary	8-hour	0.075 ppm	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution $PM_{2.5}$	Primary	Annual	12 µg/m^3	Annual mean, averaged over 3 years
	Secondary	Annual	15 µg/m^3	Annual mean, averaged over 3 years
	Primary and Secondary	24-hour	35 µg/m^3	98th percentile, averaged over 3 years
Particle Pollution PM_{10}	Primary and Secondary	24-hour	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide	Primary	1-hour	75 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

Notes:
$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter
PM_{10} = particulate matter less than 10 microns in diameter
ppb = parts per billion
ppm = parts per million
µg/m^3 = micrograms per cubic meter
Data Source: EPA, 2015a.

Table E-1 in **Appendix E** provides a summary of the ambient criteria pollutant concentrations at air quality monitoring stations near the Project Area. As indicated in **Table E-1**, the last 3 years of available data indicate that background O_3 concentrations exceeded the NAAQS in 2012 and 2013 at the Eldora Ski Area and South Foothills Parkway monitoring stations. Ambient monitoring results for O_3 varied from 0.075 to 0.094 parts per million (ppm) at these stations compared to the 8-hour NAAQS threshold of 0.075 ppm. These monitored background concentrations reflect current air quality conditions in the vicinity of the Project Area.

The regional emission inventories maintained by EPA summarize the types and quantities of air quality pollutants released within monitored regions during each year. The most recent published air emissions inventory data for Boulder County are summarized in **Table E-2** in **Appendix E**. Area sources account for approximately 32 percent of the county's PM_{10} emissions; stationary sources account for approximately 94 percent of the county's SO_2 emissions; and mobile sources account for approximately 78 percent of the county's CO emissions.

EPA has issued regulations addressing the applicability and procedures for ensuring that federal activities comply with the CAA. The EPA Final Conformity Rule requires federal agencies to ensure that federal actions resulting in nonattainment or maintenance criteria pollutant emissions conform to an approved or promulgated SIP or federal implementation plan. This ensures that a federal action would not result in any of the following:

- Cause a new violation of the NAAQS;
- Contribute to any increase in the frequency or severity of violations of existing NAAQS; and
- Delay the timely attainment of any NAAQS interim or other attainment milestones.

If a project would result in a total net increase in direct and indirect emissions of nonattainment or maintenance pollutants that are less than the applicable *de minimis* (i.e., negligible) thresholds established in 40 CFR 93.153(b), detailed conformity analyses are not required pursuant to 40 CFR 93.153(c). The net emissions increase includes evaluating stationary sources, area sources, and mobile sources that result from the federal action and are not covered by another permitting program.

3.10.2 Greenhouse Gas Emissions

GHGs are gases that trap heat in the Earth's atmosphere. They are emitted by both natural processes and human activities, and their accumulation in the atmosphere regulates temperature. On October 30, 2009, EPA published a Final Rule that requires mandatory reporting of GHG emissions from facilities that have major stationary sources generating 25,000 metric tons or more of carbon dioxide equivalent (CO_{2e}) emissions annually. The GHGs covered by the Final Rule are carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and other fluorinated gases, including nitrogen trifluoride and hydrofluorinated ethers.

On December 18, 2014, CEQ released revised draft guidance regarding the methods by which federal agencies can improve their consideration of the effects of GHG emissions and climate change in their evaluations of proposed actions (CEQ, 2014). This guidance established 25,000 metric tons of CO_{2e} per year as a reference point for when a quantitative analysis and disclosure of GHG emissions should occur.

3.10.3 Climate Change

Climate change is a global phenomenon with regional implications. The City has and will continue to experience impacts associated with climate change. Numerous comprehensive studies have been performed to determine the effects of climate change within the region, including the City. The following is a brief summary of the various study findings.

Colorado's annual average temperatures have increased by 2 degrees Fahrenheit (°F) over the past 30 years. Under a mid-range emissions scenario in the global climate model, temperatures will continue to increase between 2.5 and 5.5°F. Typical summer temperatures in 2050 are projected to be warmer than all but the

very hottest summers in the observed record (University of Colorado and Colorado State University, 2015). Future droughts are projected to be substantially hotter and more frequent, intense, and of a longer duration than those recorded historically (Garfin, et.al, 2014).

Projections of precipitation changes are less certain than those for temperature. Climate projections do not agree on whether average annual precipitation will increase or decrease within the region, though winter precipitation is likely to increase by 2050 (University of Colorado and Colorado State University, 2015). Most projections of future hydrology show decreases in annual streamflow by 2050 for Colorado's major rivers. In some projections, however, the projected increase in precipitation is large enough to overcome the effect of warming and, therefore, those projections show increased streamflow (University of Colorado and Colorado State University, 2015).

3.11 Noise

This section describes the existing noise conditions at and around the proposed Project Area. The area of influence for noise includes local access routes to the Project Area, as well as within the Project Area boundaries.

Acoustics is the study of sound, and noise is defined as unwanted sound. Sound levels are measured on a logarithmic scale in decibels (dB). The most common metric for noise is the overall A-weighted sound level measurement, which has been adopted by regulatory bodies worldwide. The A-weighting network measures sound as it is heard by humans, thereby providing a measure for evaluating acceptable and unacceptable sound levels. A-weighted measurements are expressed in terms of A-weighted decibels (dBA).

The following are the general categories of the effects of noise on people:

- Subjective effects of annoyance, nuisance, and dissatisfaction;
- Interference with activities, such as speech, sleep, and learning; and
- Physiological effects, such as startling and hearing loss.

Table 3-11 explains how noise levels in dBA are perceived by individuals.

TABLE 3-11
Typical Sound Levels Measured in the Environment and Industry
Resilient St. Vrain Project EA

Noise Source at a Given Distance	A-Weighted Sound Level in Decibels (dBA)	Subjective Impression
Loud rock music	110	
Jet flyover at 1,000 feet	100	Very Loud
Gas lawnmower at 3 feet	90	
Garbage disposal at 3 feet	80	
Vacuum cleaner at 10 feet	70	Moderately loud
Heavy traffic at 300 feet	60	
Dishwasher in next room	50	
Quiet urban nighttime	40	Quiet
Library	30-20	
Recording studio	20	Threshold of hearing

Source: Technical Noise Supplement (California Department of Transportation [Caltrans], 2009).

3.11.1 Existing Conditions

Noise-sensitive land uses generally are defined as locations where people reside or where the presence of unwanted sound adversely could affect the designated use of the land. Typically, noise-sensitive land uses

include residential areas, hospitals, places of worship, libraries, and schools, as well as nature and wildlife preserves and parks. Noise-sensitive locations in and near the Project Area include the residential areas along the haul routes and within hearing distance of the Project Area. The existing noise environment primarily consists of occasional aircraft overflights and traffic noise on the local roadways, including a mix of automobiles and medium and heavy trucks.

3.12 Utilities and Infrastructure

The following sections summarize the known utility infrastructure within the currently identified limits of the Proposed Action (Phases 1 to 3). Utility infrastructure includes services such as water supply, sanitary sewer and stormwater drainage, electric power supply, natural gas, and cable and telecommunications.

3.12.1 Water Supply

The City of Longmont Department of Public Works and Natural Resources provides water service within the existing city limits. The City operates two conventional filtration surface water treatment plants (WTPs): Nelson-Flanders and Wade Gaddis (City of Longmont, 2015d).

There are two additional water supply service providers in the Longmont municipal service area: Left Hand Water District provides water service to areas southwest, south, and southeast of the city limits of Longmont; and Longs Peak Water District provides water service to areas northwest, north, and northeast of the city limits (City of Longmont, 2015d).

The water supply infrastructure within the City Reach includes two water main lines and a series of water lines that cross the Creek (CH2M HILL [CH2M], 2015a).

3.12.2 Sanitary Sewer and Stormwater Drainage

The City of Longmont Department of Public Works and Natural Resources provides sanitary sewer and stormwater drainage services within the Project Area. The City also operates an activated sludge WWTP within the Project Area. In addition to the City sanitary sewer and stormwater drainage system services, the St. Vrain Sanitation District provides sanitary sewer service to areas east of the City's service area (City of Longmont, 2015d).

Sanitary sewer infrastructure within the City Reach includes sewer lines, inverted siphons, and aerial crossings. There is also a sanitary sewer main located on the north side of the Creek, west of South Pratt Parkway. The City has a 15-inch-diameter sanitary sewer line in the City Reach that previously crossed the Creek at the Main Street Bridge; however, that line was damaged in the 2013 flood.

Stormwater drainage infrastructure within the City Reach includes stormwater pipes, box culverts, pond outfalls, and storm drains.

3.12.3 Electric Power Supply

Longmont Power & Communications (LPC) supplies electric power to the Project Area (City of Longmont, 2015e). Wind and hydroelectric renewable sources account for approximately 23 percent of the electric power supply available to LPC electric customers (City of Longmont, 2015f). The Platte River Power Authority, a not-for-profit wholesale electricity generation and transmission provider, delivers the City the remaining electric power supply needed for its customers (City of Longmont, 2015g). No nuclear power plants are present in the Project Area or in the Project vicinity.

Overhead and underground electrical lines are located throughout the Project Area (CH2M, 2015a). LPC has an overhead line crossing the Creek approximately 150 feet east of Main Street and an underground three-phase primary electric line that crosses the Creek approximately 150 feet downstream of the Martin Street Bridge in the Phase 1 portion of the City Reach. The existing electrical power supply lines in the Phase 2 portion of the City Reach also include overhead and underground electrical lines.

3.12.4 Natural Gas

Xcel provides natural gas service to residential and business customers within the Project Area, and is in the process of installing a new natural gas main along Airport Road (CH2M, 2015a). Anadarko Petroleum, Top Operating Company, and Noble Gas have natural gas utility lines within the Project Area, and all three companies have gas lines that cross the Creek in the Sandstone Reach portion of Phase 1.

3.12.5 Cable and Telecommunications

CenturyLink and Comcast provide telecommunication services within the Project Area (CH2M, 2015a), and both have overhead and underground cable conduits crossing the Creek at various locations (CH2M, 2015b; 2015c).

Within the City Reach, LPC has an underground fiber optic communications line downstream of Airport Road Bridge, as well as an overhead fiber optic line that crosses the Creek.

SECTION 4

Environmental Consequences

This EA analyzes the potential environmental impacts of the Proposed Action and alternatives. As defined by CEQ at 40 CFR 1508.27, a determination of significance requires consideration of context, intensity, and duration. Impacts described in this chapter are evaluated in terms of type (beneficial or negative), context (setting or location), intensity (none, negligible, minor, moderate, or significant), and duration (short term/ temporary or long term/permanent). The type, context, and intensity of an impact on a resource are explained under each resource area. Unless otherwise noted, short-term impacts are those that would result from activities associated with a project's construction/demolition phase, plus the time required for mitigations to establish. Long-term impacts are generally those resulting from operation of the proposed facility or activity and would remain post-mitigation. Impact intensities are defined as follows:

- A **negligible** impact is defined as an environmental effect that is so small it would be difficult to observe and is trivial enough to be disregarded.
- A **minor** impact is defined as an environmental effect that is observable, yet is unlikely to noticeably affect human health and welfare, cultural resources, or the environment.
- A **moderate** impact is an environmental effect that is observable and may affect human health and welfare, cultural resources, or the environment.
- A **significant** impact is observable and could cause a major impact to human health and welfare, cultural resources, or the environment.

4.1 Water Resources

This section analyzes the potential impacts on water resources, including wetlands, surface water, floodplains, and groundwater in the Project Area under each phase of the Proposed Action and under the No Action Alternative.

4.1.1 Phase 1

4.1.1.1 Wetlands

During Phase 1 of the Proposed Action, certain wetlands in the City and Sandstone Reaches would be impacted by channel widening and realignment, bank stabilization, installation of in-stream boulder and riffle drop structures, or repair/replacement of damaged infrastructure. Although existing wetlands would be impacted, the proposed activities under Phase 1 have been designed to have an overall positive effect on wetlands, including restoration and enhancement of wetland vegetation, improvements in wetland hydrology and water quality, and reduction of erosion and sedimentation in wetlands. The acreage of permanent wetland impacts proposed in the Phase 1 City and Sandstone Reaches are presented in **Table 4-1**.

TABLE 4-1
Permanent Impacts to Wetlands under Phase 1
Resilient St. Vrain Project EA

Reach	Permanent Wetland Impacts (acres)				Total Permanent Impacts (acres)
	Grading and Soil Fill	In-Stream Boulder and Riffle Drop Structures	Soil Riprap	Trail Repair	
City Reach (Main Street to the Confluence of Left Hand Creek)	0.764	0.052	0.012	0.004	0.832
Sandstone Reach	3.118	0.093	2.030	0.227	5.468
Total (Phase 1 Project Area)	3.882	0.145	2.042	0.231	6.300

Source: City of Longmont, 2015b.

As indicated in **Table 4-1**, approximately 6.3 acres of wetlands would be permanently impacted under Phase 1 of the Proposed Action. Most of the wetland impacts would occur in the Sandstone Reach from grading and soil fill (3.12 acres) and installation of soil riprap for bank stabilization (2.03 acres). PEM wetlands would be impacted more than any other wetland type in both reaches (City of Longmont, 2015b). Appropriate BMPs (e.g., silt fencing) would be implemented during construction to avoid and minimize potential indirect impacts (erosion, sedimentation, and pollution) to wetlands.

Impacts to federally jurisdictional wetlands under Phase 1 of the Proposed Action would require a CWA Section 404 IP from USACE and a CWA Section 401 Water Quality Certification from CDPHE. The City is pursuing the IP and associated Water Quality Certification for Phase 1 concurrently with the NEPA process for the Proposed Action. As part of the CWA Section 404 permitting process for Phase 1, the City is required to show that it has, to the extent practicable, taken steps to avoid impacts to wetlands/waters, minimized potential impacts to wetlands/waters once they have avoided impacts, and then provide compensatory mitigation for any remaining unavoidable impacts. The impact avoidance and minimization measures and compensatory mitigation proposed for Phase 1 are included in the City's IP application, which is provided in **Appendix B.**

The City's proposed compensatory mitigation plan for the 6.3 acres of permanent wetland impacts that would be incurred under Phase 1 would involve enhancing a backwater stream channel, widening the riparian corridor, and planting native wetland vegetation in the mitigation areas (City of Longmont, 2015b). The mitigation would be provided in-kind (wetland types mitigated are the same as those impacted) and onsite at a 1:1 impact/mitigation ratio (each acre of wetland impact requires replacement of 1 acre of wetland).

Based on the overall beneficial nature of the proposed activities, the extent of wetland impacts that would be incurred, compensatory mitigation that would be provided to offset unavoidable wetland impacts, and the measures that would be implemented to prevent indirect impacts to wetlands, Phase 1 of the Proposed Action would have a minor, short-term impact on wetlands.

4.1.1.2 Surface Water

During Phase 1 of the Proposed Action, certain surface water bodies in the City and Sandstone Reaches would be impacted by channel widening and realignment, bank stabilization, installation of in-stream boulder and riffle drop structures, or repair/replacement of damaged infrastructure. Although existing surface water bodies would be impacted, the proposed activities under Phase 1 have been designed to have an overall positive effect on surface waters, including improvements in stream hydrology, morphology, and water quality, and reduction of erosion, sedimentation, and flooding potential.

Only impacts to waters of the United States are analyzed in this EA because impacts to surface waters that are not federally jurisdictional are not regulated under Section 404 of the CWA. The acreage of temporary and permanent impacts to waters of the United States proposed in the Phase 1 City and the Sandstone Reaches is presented in **Table 4-2**.

TABLE 4-2
Impacts to Waters of the United States under Phase 1
Resilient St. Vrain Project EA

Waters of the United States	Temporary Impacts to Waters of the United States (acres)	Permanent Impacts to Waters of the United States (acres)				Total Permanent Impacts (acres)
		Grading	In-Stream Boulder Structures	Soil Riprap	Bridge Abutments and Diversions	
St. Vrain Creek in City Reach (Main Street to confluence of Left Hand Creek)	0.04	6.36	0.39	0.55	0.07	7.37
Left Hand Creek	0.02	0.19	0	0	0	0.19
St. Vrain Creek in Sandstone Reach	21.50	4.83	0.37	2.15	0.41	7.76
St. Vrain Creek Pre-Flood Channel	0.13	0.73	0.05	0.18	0	0.96
Spring Gulch #1	0.05	0	0	0	<0.01	<0.01
Total (Phase 1 Project Area)	21.74	12.11	0.81	2.88	0.48	16.28

Source: City of Longmont, 2015b.

As indicated in **Table 4-2**, approximately 16.3 acres of jurisdictional surface waters would be permanently impacted under Phase 1 of the Proposed Action. Most of the permanent impacts would result from grading in the Creek in both reaches. In addition, approximately 21.7 acres of jurisdictional surface waters would be temporarily impacted during Project activities, primarily from temporary access roads, staging areas, cofferdams, and diversions (City of Longmont, 2015b).

Impacts to waters of the United States under Phase 1 of the Proposed Action would require a CWA Section 404 IP from USACE and a CWA Section 401 Water Quality Certification from CDPHE. The City is pursuing the IP and associated Water Quality Certification for Phase 1 concurrently with the NEPA process for the Proposed Action. As part of the CWA Section 404 permitting process for Phase 1, the City is required to show that it has, to the extent practicable, taken steps to avoid impacts to wetlands/waters, minimized potential impacts to wetlands/waters once they have avoided impacts, and then provide compensatory mitigation for any remaining unavoidable impacts. The impact avoidance and minimization measures and compensatory mitigation proposed for Phase 1 are included in the City's IP application.

The City's proposed compensatory mitigation plan for the 16.3 acres of jurisdictional surface waters that would be permanently impacted under Phase 1 would involve enhancing a backwater stream channel, widening of the riparian corridor, and planting of native wetland vegetation in the mitigation areas (City of Longmont, 2015b). The mitigation would be provided onsite on a 1:1 impact/mitigation ratio, and in-kind (surface water types mitigated are the same as those impacted).

In addition to the CWA Section 404 IP, implementation of Phase 1 of the Proposed Action would require a Stormwater Construction Permit from CDPHE, which is required for any proposed project that would disturb 1 acre or more of land in Colorado. As part of this permit, the City would be required to prepare and implement a SWMP that would outline the BMPs and engineering controls to be used to prevent and minimize erosion, sedimentation, and pollution during the Project.

The proposed activities under Phase 1 would be in compliance with and not conflict with the Recreational In-Channel Diversion (RICD) water right of the City or any other water rights held on the Creek. Under Phase 1 of the Proposed Action, repair of multiple damaged diversion structures in the Creek would restore

the functionality of the diversion structures for irrigation and, therefore, would restore the water rights of individuals whose lands the diversion structures help irrigate.

Based on the overall beneficial nature of the proposed activities, the extent of surface water impacts that would be incurred, compensatory mitigation that would be provided to offset unavoidable surface water impacts, and the measures that would be implemented to prevent indirect impacts to surface waters, Phase 1 of the Proposed Action would have a minor, short-term impact on surface water.

4.1.1.3 Floodplains

Most of the Project activities under Phase 1 of the Proposed Action would occur either within the channel of the Creek or in areas immediately adjacent to the channel that are within either the 100-year floodplain or the 500-year floodplain. The primary activities under Phase 1, which would involve channel widening and realignment, bank stabilization, installation of in-stream boulder and riffle drop structures, and repair/ replacement of damaged infrastructure, would have a negligible impact on floodplains. Although land disturbance would occur within the floodplain under Phase 1, little impervious area is expected to be created that would displace floodplain area or impact floodplain functions. The Project activities under Phase 1 would have an overall beneficial impact on floodplains because they are designed to reduce flooding extents and improve impacted floodplain functions in the Project Area. The Proposed Action would result in a change in the 100-year floodplain limits and thus result in a modification to the existing regulatory floodplain; consequently, the City is in the process of requesting a FEMA Conditional Letter of Map Revision (CLOMR) for areas where floodplain changes would occur.

The 100-year design flow rates for Phase 1 have been developed using the updated State of Colorado flow rates that have been established based on a recently completed hydrology study of the Creek. In compliance with EO 11988, Floodplain Management, the City would avoid and minimize floodplain impacts during Phase 1 to the extent practicable. Any infrastructure located within the floodplain would be designed and constructed in compliance with all applicable floodplain regulatory requirements.

Based on the analysis conducted, Phase 1 the Proposed Action would have a moderate, long-term beneficial impact on floodplains.

4.1.1.4 Groundwater

Groundwater that exists just below the land surface may be encountered during excavation, grading, and other land-disturbing activities under Phase 1 of the Proposed Action. Any dewatering necessary during such activities would be conducted using standard methods and would have no effect on groundwater quality or flow. If contaminated groundwater is encountered during dewatering, it would be managed in accordance with all applicable laws and regulations. Based on data from CDWR, a number of groundwater wells are present in the Phase 1 portion of the Project Area (see Section 3.1.4 and **Figure 3-3**). The City would avoid and minimize impacts to groundwater wells under Phase 1 of the Proposed Action to the extent practicable.

Based on the analysis conducted, Phase 1 of the Proposed Action would have a negligible impact on groundwater.

4.1.2 Phase 2

4.1.2.1 Wetlands

The Project components under Phase 2 would primarily include channel widening, modifications to connecting ponds, installation of in-stream boulder and riffle drop structures, and replacement of damaged bridges in the remaining sections of the City Reach. These Project activities would have similar types of impacts and benefits on wetlands as their counterparts under Phase 1. Based on the scope of activities proposed and the amount of wetlands that exist in each reach (see Section 3.1.1), the overall extent of wetland impacts under Phase 2 is expected to be less than under Phase 1.

As under Phase 1, impacts to federally jurisdictional wetlands under Phase 2 would require a CWA Section 404 IP from USACE and a CWA Section 401 Water Quality Certification from CDPHE. As part of the CWA Section 404 permitting process, the City would be required to show that it has, to the extent practicable, taken steps to avoid impacts to wetlands/waters, minimized potential impacts to wetlands/waters once they have avoided impacts, and then provide compensatory mitigation for any remaining unavoidable impacts. As under Phase 1, appropriate BMPs (e.g., silt fencing) would be required to be implemented during construction under Phase 2 to avoid and minimize potential indirect impacts (erosion, sedimentation, and pollution) to wetlands.

Based on the analysis conducted, Phase 2 of the Proposed Action would have a minor, short-term impact on wetlands.

4.1.2.2 Surface Water

The Project components under Phase 2 would primarily include channel widening, modifications to connecting ponds, installation of in-stream boulder and riffle drop structures, and replacement of damaged bridges in the remaining sections of the City Reach. These Project activities would have similar types of impacts and benefits on jurisdictional waters as their counterparts under Phase 1. Based on the scope of activities proposed and the amount of jurisdictional waters that exist in each reach (see Section 3.1.2), the overall extent of impacts on waters of the United States under Phase 2 is expected to be less than under Phase 1.

As under Phase 1, impacts to waters of the United States under Phase 2 would require a CWA Section 404 IP from USACE and a CWA Section 401 Water Quality Certification from CDPHE. As part of the CWA Section 404 permitting process, the City would be required to show that it has, to the extent practicable, taken steps to avoid impacts to wetlands/waters, minimized potential impacts to wetlands/waters once they have avoided impacts, and then provide compensatory mitigation for any remaining unavoidable impacts. As under Phase 1, implementation of Phase 2 would require a Stormwater Construction Permit from CDPHE and an associated SWMP that would outline the BMPs and engineering controls to be used to prevent and minimize erosion, sedimentation, and pollution during the Project. Phase 2 would not conflict with any water rights held on the Creek.

Based on the analysis conducted, Phase 2 of the Proposed Action would have a minor, short-term impact on surface water.

4.1.2.3 Floodplains

As under Phase 1, most of the Project activities under Phase 2 would occur either within the channel of the Creek or in areas immediately adjacent to the channel that are within either the 100- or 500-year floodplain. The primary activities under Phase 2 would involve channel widening, modifications to connecting ponds, installation of in-stream boulder and riffle drop structures, and replacement of damaged bridges in the remaining sections of the City Reach, and would have a negligible impact on floodplains. Although land disturbance would occur within the floodplain under Phase 2, little impervious area is expected to be created that would displace floodplain area or impact floodplain functions. The Project activities under Phase 2 would have an overall beneficial impact on floodplains because they are designed to reduce flooding extents and improve impacted floodplain functions in the Project Area. In compliance with EO 11988, Floodplain Management, the City would avoid and minimize floodplain impacts during Phase 2 to the extent practicable. Any infrastructure located within the floodplain would be designed and constructed in compliance with all applicable regulatory requirements pertaining to floodplains. A CLOMR will also be obtained for Phase 2, if applicable.

Based on the analysis conducted, Phase 2 the Proposed Action would have a moderate, long-term beneficial impact on floodplains.

4.1.2.4 Groundwater

Groundwater that exists just below the land surface may be encountered during excavation, grading, and other land-disturbing activities under Phase 2 of the Proposed Action. Any dewatering necessary during such activities would be conducted using standard methods and would have no effect on groundwater quality or flow. If contaminated groundwater is encountered during dewatering, it would be managed in accordance with all applicable laws and regulations. Based on data from CDWR, a number of groundwater wells are present in the Phase 2 portion of the Project Area (see Section 3.1.4 and **Figure 3-3**). The City would avoid and minimize impacts to groundwater wells under Phase 2 of the Proposed Action to the extent practicable.

Based on the analysis conducted, Phase 2 the Proposed Action would have a negligible impact on groundwater.

4.1.3 Phase 3

4.1.3.1 Wetlands

The Project components under Phase 3 would primarily include improvements to channel capacity and to the greenway in the Middle Reach. These Project activities would have similar types of impacts and benefits on wetlands as their counterparts under Phases 1 and 2. Based on the scope of activities proposed and the amount of wetlands that exist in the Middle Reach (see Section 3.1.1), the overall extent of wetland impacts under Phase 3 is expected to be less than under Phase 1 or Phase 2.

As under Phases 1 and 2, impacts to federally jurisdictional wetlands under Phase 3 would require a CWA Section 404 IP from USACE and a CWA Section 401 Water Quality Certification from CDPHE. As part of the CWA Section 404 permitting process, the City would be required to show that it has, to the extent practicable, taken steps to avoid impacts to wetlands/waters, minimized potential impacts to wetlands/ waters once they have avoided impacts, and then provide compensatory mitigation for any remaining unavoidable impacts. As under Phases 1 and 2, appropriate BMPs (e.g., silt fencing) would be required to be implemented during construction under Phase 3 to avoid and minimize potential indirect impacts (erosion, sedimentation, and pollution) to wetlands.

Based on the analysis conducted, Phase 3 of the Proposed Action would have a minor, short-term impact on wetlands.

4.1.3.2 Surface Water

The Project components under Phase 3 would primarily include improvements to channel capacity and to the greenway in the Middle Reach. These Project activities would have similar types of impacts and benefits on jurisdictional waters as their counterparts under Phases 1 and 2. Based on the scope of activities proposed and the amount of jurisdictional waters that exist in each reach (see Section 3.1.2), the overall extent of impacts on waters of the United States under Phase 3 is expected to be less than under Phase 1 or Phase 2.

As under Phases 1 and 2, impacts to waters of the United States under Phase 3 would require a CWA Section 404 IP from USACE and a CWA Section 401 Water Quality Certification from CDPHE. As part of the CWA Section 404 permitting process, the City would be required to show that it has, to the extent practicable, taken steps to avoid impacts to wetlands/waters, minimized potential impacts to wetlands/waters once they have avoided impacts, and then provide compensatory mitigation for any remaining unavoidable impacts. As under Phases 1 and 2, implementation of Phase 3 would require a Stormwater Construction Permit from CDPHE and an associated SWMP that would outline the BMPs and engineering controls to be used to prevent and minimize erosion, sedimentation, and pollution during the Project. Phase 3 would not conflict with any water rights held on the Creek.

Based on the analysis conducted, Phase 3 of the Proposed Action would have a minor, short-term impact on surface water.

4.1.3.3 Floodplains

As under Phases 1 and 2, most of the Project activities under Phase 3 would occur either within the channel of the Creek or in areas immediately adjacent to the channel that are either within the 100-year floodplain or the 500-year floodplain. The primary activities under Phase 3, which would involve improvements to channel capacity and to the greenway in the Middle Reach would have a negligible impact on floodplains. Although land disturbance would occur within the floodplain under Phase 3, little impervious area is expected to be created that would displace floodplain area or impact floodplain functions. The Project activities under Phase 3 would have an overall beneficial impact on floodplains because they are designed to reduce flooding extents and improve impacted floodplain functions in the Project Area. In compliance with EO 11988, Floodplain Management, the City would avoid and minimize floodplain impacts during Phase 3 to the extent practicable. Any infrastructure located within the floodplain would be designed and constructed in compliance with all applicable regulatory requirements pertaining to floodplains. A CLOMR will also be obtained for Phase 3, if applicable.

Based on the analysis conducted, Phase 3 the Proposed Action would have a moderate, long-term beneficial impact on floodplains.

4.1.3.4 Groundwater

Groundwater that exists just below the land surface may be encountered during excavation, grading, and other land-disturbing activities under Phase 3 of the Proposed Action. Any dewatering necessary during such activities would be conducted using standard methods and would have no effect on groundwater quality or flow. If contaminated groundwater is encountered during dewatering, it would be managed in accordance with all applicable laws and regulations. Based on data from CDWR, only two groundwater wells are present in the Middle Reach (see Section 3.1.4 and **Figure 3-3**). The City would avoid and minimize impacts to these wells under Phase 3 of the Proposed Action to the extent practicable.

Based on the analysis conducted, Phase 3 the Proposed Action would have a negligible impact on groundwater.

4.1.4 No Action Alternative

Under the No Action Alternative, no improvements to the Creek would be conducted; therefore, there would be no dredge and fill impacts to jurisdictional wetlands and waters. However, there would also be no associated benefits to wetlands, surface water, and floodplains through the proposed restoration and enhancement of wetland vegetation, improvements in wetland/stream hydrology and water quality, and reduction of erosion, sedimentation, and flooding potential in the Project Area. For these reasons, the No Action Alternative would have a moderate, long-term impact on water resources.

4.2 Biological Resources

The Proposed Action has the potential to impact biological resources during channel widening and realignment, bank stabilization, installation of in-stream boulder and riffle drop structures, and repair/ replacement of damaged infrastructure.

4.2.1 Phase 1

4.2.1.1 Vegetation

The majority of impacts to vegetation and habitat would be temporary, and post-construction revegetation efforts would restore impacted areas. Various native plants and seed mixes would be used throughout the Project Area based on hydrology, water regime, elevation, and microhabitat considerations for specific areas. A Noxious Weed Monitoring and Management Plan would be implemented to prevent the growth of invasive weeds and allow native and beneficial plant species to establish. Management of noxious weeds in the Project Area would also comply with the Colorado Noxious Weed Act (Title 35, Article 5.5) and EO 13112, *Invasive Species*.

Some trees and shrubs would be removed for access and construction, and to eliminate flow restrictions to minimize future flood conditions. The City of Longmont municipal code (Section 15.05.030.O) contains tree preservation requirements for removal and replanting trees that must be removed during construction projects. These regulations would be incorporated into revegetation plans for the Project Area. As appropriate for different areas along the Creek, landscape plans would also incorporate design elements for urban parks, public use, native areas, and wildlife habitat. Information on the various methods proposed to restore and enhance riparian and wetland vegetation in areas targeted for improvement, and the planting of native wetland vegetation in mitigation areas in the City and Sandstone Reaches, can be found in the City's Section 404 IP application for Phase 1 of the Project (City of Longmont, 2015b) (**Appendix B**).

Based on the analysis conducted, Phase 1 of the Proposed Action would have a minor, short-term impact on vegetation.

4.2.1.2 Fish and Wildlife

During Phase 1 of the Proposed Action, certain terrestrial and aquatic habitats in the City and Sandstone Reaches would be impacted by channel widening and realignment, bank stabilization, installation of in-stream boulder and riffle drop structures, or repair/replacement of damaged infrastructure. Although existing habitats would be impacted, the proposed activities under Phase 1 have been designed to have an overall positive effect on habitats and the fish and wildlife the habitats support. Little to no existing habitat would be permanently displaced under the Proposed Action. Noise generated during construction activities may temporarily disturb wildlife; however, any disturbance experienced by wildlife would be limited to the construction period and is expected to be negligible. Construction contractors will be required to adhere to the stipulations in the City's Wildlife Management Plan, to include requirements minimizing disturbance to prairie dog colonies.

Channel improvements, including channel reshaping and bank stabilization, would decrease erosion and sedimentation, ultimately improving water quality and habitat for aquatic species in the Project Area. A large diversion and drop structure which served as an impediment to fish passage was severely damaged during the 2013 flood. This structure will be replaced with a series of smaller drop structures which would allow for a stable channel invert and more natural fish passage through the channel, per requirements by Colorado Parks and Wildlife (CPW). Diverse habitats would also be incorporated into the design, including backwater areas, eddies, and high- and low-velocity flow areas. Construction within the Creek channel may temporarily disturb fish and other aquatic species. However, the City of Longmont will obtain Senate Bill 40 (SB40) approval from CPW. SB40 requires review by CPW to ensure minimal impacts from construction activities in streams or its banks or tributaries. SB40 emphasizes the protection of fishing waters, but also acknowledges the need to protect and preserve all fish and wildlife resources associated with streams in Colorado. Impacts to aquatic species during construction would also be minimized through the implementation of a SWMP that would outline the BMPs and engineering controls to be used to prevent and minimize erosion, sedimentation, and pollution during the Project.

The City would implement protective measures in coordination with the USFWS, CPW, and Boulder County to minimize impacts during construction to bird species protected under the MBTA. Specifically, an Avian Protection Plan (APP) will be developed for the project. The APP will outline protection measures for avian species including hawks, eagles, songbirds, and other migratory birds. The APP will provide avoidance and mitigation measures including the following:

- Vegetation and nest removal activities will occur outside the nesting season to the extent practicable.
- Preconstruction clearance surveys will be conducted during the nesting season by a qualified biologist to identify active nests.
- Avoidance measures will be implemented for nests observed within and immediately adjacent to the active project area.
- For hawk and eagle nests within the project area, seasonal restrictions will be coordinated with CPW.

Impacts to bald eagles would be avoided by implementing the *National Bald Eagle Management Guidelines* (USFWS, 2007) and through coordination with USFWS and CPW.

Based on the analysis conducted, Phase 1 of the Proposed Action would have a minor, short-term impact on fish and wildlife.

4.2.1.3 Threatened and Endangered Species

The potential impacts of the Proposed Action on federally listed species have been analyzed in a BE prepared as part of ESA Section 7 consultation with USFWS on the Proposed Action (see **Appendix C**). Based on the findings of the BE, Preble's and ULTO are the only federally listed species that have the potential to occur in the Project Area (see Section 3.2, *Biological Resources*). These species have not been documented to occur in the Project Area; however, suitable Preble's habitat exists in portions of the Project Area and suitable ULTO habitat has started to develop in the Sandstone Reach since the 2013 flood.

Based on the findings of the BE, Phase 1 of the Proposed Action would permanently impact approximately 0.24 acre of Preble's habitat and temporarily impact approximately 98.7 acres of Preble's habitat. No high-quality Preble's habitat would be permanently impacted and only 0.49 acre of high-quality Preble's habitat would be temporarily impacted. Impacts to Preble's habitat impacts would be avoided and minimized to the extent practicable, and habitat improvements under the Proposed Action are expected to have an overall long-term, beneficial impact on Preble's habitat.

Based on ongoing ESA Section 7 consultation and the BE, FEMA has determined that the Proposed Action "may affect, but is not likely to adversely affect" Preble's and ULTO, and would have "no effect" on the other federally listed species documented to occur in Boulder and Weld counties. USFWS concurred with FEMA's determination on May 3, 2016.

The City has previously consulted with USFWS under Section 7 of the ESA for water withdrawals from Button Rock Reservoir. The City has committed to using water only from Button Rock Reservoir for dust control and other construction needs of the Proposed Action. Therefore, the Proposed Action is not expected to result in downstream water depletions that could adversely affect federally listed species in the Platte River system.

Two state-listed fish species—the common shiner and brassy minnow—have the potential to occur in the Project Area. Although these species, if present in the Creek, may be disturbed during construction activities, any disturbance is expected to be negligible to species stability and the species are expected to benefit from the proposed improvements to the Creek system.

Based on the analysis conducted, Phase 1 of the Proposed Action would have a negligible impact on threatened or endangered species.

4.2.2 Phase 2

The Project components under Phase 2 would primarily include channel widening, modifications to connecting ponds, installation of in-stream boulder and riffle drop structures, and replacement of damaged bridges in the remaining sections of the City Reach. These Project activities would have similar types of impacts and benefits on biological resources as their counterparts under Phase 1. All structures would be designed in compliance with SB 40 and allow for fish passage.

Based on the scope of activities proposed and the amount of natural habitat that exists in each reach, the overall extent of impacts under Phase 2 on vegetation, habitat, and wildlife is expected to be less than under Phase 1. As under Phase 1, the proposed activities under Phase 2 are expected to have a negligible impact on threatened or endangered species. The various measures to avoid and minimize impacts to biological resources under Phase 1 would also be implemented under Phase 2, including measures to protect migratory birds and implementation of BMPs to minimize erosion, sedimentation, and pollution during construction.

Based on the analysis conducted, and because no federally listed species have the potential to occur in the Project Area, Phase 2 of the Proposed Action would have a minor, short-term impact on biological resources.

4.2.3 Phase 3

The Project components under Phase 3 would primarily include improvements to channel capacity and to the greenway in the Middle Reach. These Project activities would have similar types of impacts and benefits on biological resources as their counterparts under Phases 1 and 2. Based on the scope of activities proposed and the amount of natural habitat that exists in each reach, the overall extent of impacts under Phase 3 on vegetation, habitat, and wildlife is expected to be less than under Phase 1 or Phase 2. As under Phases 1 and 2, the proposed activities under Phase 3 are expected to have a negligible impact on threatened or endangered species. The various measures to avoid and minimize impacts to biological resources under Phases 1 and 2 would also be implemented under Phase 3, including measures to protect migratory birds and implementation of BMPs to minimize erosion, sedimentation, and pollution during construction.

Based on the analysis conducted, and because no federally listed species have the potential to occur in the Project Area, Phase 3 of the Proposed Action would have a minor, short-term impact on biological resources.

4.2.4 No Action Alternative

Under the No Action Alternative, no improvements to the Creek would be conducted; therefore, there would be no impacts to biological resources during construction activities. However, there would also be no associated benefits to biological resources through the proposed restoration and enhancement of wetland and riparian vegetation, improvements in the water quality of aquatic habitats, and reduction of erosion, sedimentation, and flooding potential that would benefit aquatic biota in the Project Area. For these reasons, the No Action Alternative would have a moderate, long-term impact on biological resources.

4.3 Land Use and Community Cohesion

Impacts to land use were evaluated by considering the consistency of the Proposed Action with land use plans, zoning, and known future development plans, and whether prime, unique, or otherwise important farmland would be converted to non-agricultural uses. Community cohesion impacts were based on effects to community resources and gathering places, and the ability to access these resources.

4.3.1 Phase 1

4.3.1.1 Current Land Use

The Sandstone Reach is located in Weld County and consists of “Agriculture” and “Parks, Greenways, and Open Space” land uses The areas classified as “Agriculture” are not currently being used as farms and do not qualify as prime farmland.

The Phase 1 City Reach is located in Boulder County and consists primarily of “Parks, Greenways, and Open Space” and “Public” land uses, and includes some areas classified as “Industrial/Commercial.” The areas classified as “Public” contain the City of Longmont WWTP ponds.

Changes in land use classifications would not be required under the Proposed Action; therefore, there would be no effect on current land use.

4.3.1.2 Future Land Use

The Proposed Action was evaluated against the Longmont Area Comprehensive Plan (adopted by the City Council on August 26, 2003, including amendments through May 21, 2013) (City of Longmont, 2013). It was determined the Proposed Action would complement the following goals identified in the plan:

- GOAL LUD-5: Develop a mix of interdependent, compatible, and mutually supportive land uses to support multiple means of transportation.
- GOAL LUD-6: Integrate land use and transportation so that activity can be easily incorporated into people's daily lives.
- GOAL LUD-9: Promote an attractive appearance and quality urban design in Longmont.
- GOAL T-2: Provide an adequate, safe, and efficient multi-modal transportation system that is compatible with the natural, community, and economic environment, and supports community health.
- GOAL HS-1: Support and enhance a wide range of social, cultural, informational, and educational resources so that all Longmont residents have an equal opportunity to maximize their potential and enhance their quality of life.
- GOAL E-1: Maintain and improve Longmont's environmental quality.
- GOAL E-2: Preserve environmental resources and unique natural areas.
- GOAL P-1: Provide adequate parks to serve the recreational needs of Longmont residents and visitors.
- GOAL P-2: Develop a greenway system of linear public open space that encompasses utility corridors, rivers, lakes, and ditches and creeks used for stormwater drainage; provides for the multiple uses of storm drainage corridors; assists in their efficient maintenance; accommodates trail-oriented recreation; and connects residential areas to the bikeway network and with community activity areas.
- GOAL P-3: Preserve the natural and cultural resources of the Longmont area to help maintain the City's separate identity; provide connections to useable open space areas; provide low-impact, passive recreation; and enhance scenic space areas and scenic entryway corridors to the City.

Phase 1 of the Proposed Action would result in a moderate, long-term beneficial impact on future land use because it would complement future land use plans and the above-mentioned goals for the City.

4.3.1.3 Community Cohesion

The Proposed Action would complement the goals related to community cohesion identified in the Longmont Area Comprehensive Plan. None of the community resources identified in Section 3.3.2 would be directly impacted by construction within Phase 1. However, nearby residences and community resources could be affected by increased noise levels, reduced air quality, and increased traffic during construction. Please see Section 4.6, *Transportation*, Section 4.10, *Air Quality*, and Section 4.11, *Noise*, for a detailed explanation of these impacts. Construction-related noise and air quality impacts would be unlikely to impact use of community resources or reduce the quality of outdoor gatherings, such as picnics, festivals, or sporting events. Construction will occur primarily on weekdays during normal working hours, which would reduce the potential for impacts to outdoor activities at nearby community resources. Construction-related traffic should not interfere with access to community resources. For these reasons, there would be minor short-term impacts to community cohesion during construction.

During operation of the Proposed Action, there will be an increase in recreational trails and open space available to the community, thereby resulting in a moderate, long-term beneficial impact on community cohesion.

4.3.1.4 Displacement/Relocation

Phase 1 of the Proposed Action would not result in the displacement or relocation of any residences or businesses in the Phase 1 Reach.

4.3.2 Phase 2

The Phase 2 area is located in the City and consists primarily of "Parks, Greenways, and Open Space" land use, and includes some areas classified as "Residential," "Industrial/Commercial," and "Public." Impacts and

benefits to current land use, future land use, and community cohesion in the Phase 2 area would be similar to the impacts and benefits associated with Phase 1 of the Proposed Action.

4.3.2.1 Displacement/Relocation

Based on the current level of design, Phase 2 of the Proposed Action could result in the relocation of an estimated 10 mobile home residences and a few businesses located adjacent to the Creek. These residences and businesses would need to be relocated to allow for the proper realignment and widening of the Creek to reduce the existing floodplain extents. While the relocation would directly impact those working and residing in the displaced homes and businesses, the Proposed Action would result in an overall benefit because these approximately 130 mobile home residences and businesses would be removed from a high-risk flood zone and many other residences and businesses near the Creek would no longer be within the limits of the 100-year floodplain. Further, all relocations will be handled in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (URA), which entitles those relocated to appropriate compensation and assistance. For these reasons, displacement and relocation would result in a moderate, short-term impact to the individuals and businesses relocated, but an overall long-term benefit because these individuals would be relocated away from the floodplain. Relocation impacts borne by minority and low-income populations are analyzed further in Section 4.13 *Environmental Justice.*

4.3.3 Phase 3

The Middle Reach is located within unincorporated Boulder County and consists primarily of “Parks, Greenways, and Open Space” and “Agriculture” land uses. It also includes some areas classified as “Residential” and “Industrial/Commercial.” Impacts and benefits to current and future land use, community cohesion, and displacement/relocation in the Phase 3 area would be similar to the impacts and benefits associated with Phase 1 of the Proposed Action.

4.3.4 No Action Alternative

The No Action Alternative would result in no new impacts to current and future land use or displacement/ relocation. However, under the No Action Alternative, damaged infrastructure, parks, trails, and publicly used natural areas would not be repaired/replaced. Therefore, the No Action Alternative would have a moderate, long-term impact on land use and community cohesion.

4.4 Health and Safety

This section describes the potential impacts to health and safety as a result of implementing the Proposed Action or the No Action Alternative.

4.4.1 Phase 1

4.4.1.1 Public Safety

Phase 1 of the Proposed Action would have a significant, long-term beneficial impact on public health and safety because the current 100-year floodplain for the Creek would be greatly reduced in size, decreasing the potential impact of future floods on the community of Longmont and surrounding areas. The current 100-year floodplain covers much of the urban Longmont area, as demonstrated by the 2013 floods. The Proposed Action would decrease the extents of the floodplain so that the 100-year flows are contained in the channel, greatly reducing the potential impact to life and property.

4.4.1.2 Occupational Health

Construction activities can be inherently dangerous. Construction workers and equipment operators would be required to wear appropriate personal protective equipment (PPE) and be properly trained for the work being performed. All solid or hazardous wastes that might be generated during construction would be

removed and disposed of at a permitted facility or designated collection point. Standard construction traffic control measures would be used to protect workers, residents, and the travelling public.

The construction contractor would be required to develop and implement a Health and Safety Plan to ensure worker safety during construction activities. The contractor would also be required to schedule construction during reasonable weather to avoid risk of flooding. All construction areas would be clearly marked with appropriate signage. Construction workers would be required to comply with applicable Occupational Safety and Health Administration (OSHA) regulations, as well as other applicable regulations. For these reasons, Phase 1 of the Proposed Action would have a minor, short-term impact on occupational health.

4.4.1.3 Protection of Children

Children could be present near the Project Area due to the close proximity of residential neighborhoods and community resources where children may congregate. The features associated with the Proposed Action would be designed with child safety in mind. For instance, steep slopes would be avoided to the extent possible. Children may also be susceptible to increased impacts from health-related resources (air quality, water quality, hazardous materials, and noise). An analysis of these resources is provided in the corresponding resource sections in this EA. Although children may be present in the area, all of the health-related impacts are non-significant and below regulatory thresholds. Finally, children may be attracted to construction sites; however, construction areas would be well-marked and fencing, signage, or barriers would be utilized to the extent possible to prevent unauthorized access.

The Proposed Action would not result in health and safety risks that would disproportionately affect children and no impacts are expected to children.

4.4.2 Phase 2

The impacts to public safety, occupational health, and protection of children described for Phase 1 would also apply to Phase 2.

4.4.3 Phase 3

The impacts to public safety, occupational health, and protection of children described for Phase 1 would also apply to Phase 3.

4.4.4 No Action Alternative

Under the No Action Alternative, residents, communities, and property would be left susceptible to significant future damages from flood events. Therefore, the No Action Alternative would have a significant, long-term impact on public health and safety.

4.5 Socioeconomics

4.5.1 Phase 1

Improvements to the Creek and related infrastructure under Phase 1 of the Proposed Action would have a significant, long-term beneficial impact on socioeconomics due to the integral link between Longmont and the Creek.

Socioeconomic conditions would improve through the expansion of the trail system and recreation corridor, which draws individuals to the Longmont area. These connectivity benefits encourage residents to experience the community, socialize, and form lasting ties (Walker, 2004).

Proximity to parks and the Creek also affects property and resident values. A direct correlation can be made between residential property value and linear proximity to a park (McConnell et al., 2005). There is a heightened desirability for residential properties neighboring open spaces such as parks and greenways, and

a correlation of increased home value with closer proximity to natural spaces including rivers. Therefore, it is highly probable that restoring the Creek would have a positive impact on local housing and property values.

Restoration efforts to both vehicle and pedestrian infrastructure around the Creek are expected to improve commercial traffic and emergency services in the area. The Proposed Action would restore trail ways (St. Vrain Greenway trail) in the immediate area of the Creek.

Construction spending would also increase the number of jobs available in the City. The Proposed Action would use local materials such as boulders, vegetation, concrete, etc., and draw from local tradesmen and construction companies to complete the Project to the extent possible. The exact numbers for job creation and local economic impacts are still being determined

Restoring the Creek and surrounding infrastructure damaged by the 2013 flood would likely improve the lives of Longmont residents by furthering the recovery and growth of local businesses, improving available recreational activities, and increasing property values. Thus, the City would recognize significant socioeconomic benefits from the restoration of the Creek and protect these benefits by preparing for resiliency from disasters that may occur in the future.

4.5.2 Phase 2

Socioeconomics are analyzed on a regional rather than a site-specific level. Therefore, the analysis of socioeconomic impacts under Phase 1 would apply to Phase 2.

4.5.3 Phase 3

Socioeconomics are analyzed on a regional rather than a site-specific level. Therefore, the analysis of socioeconomic impacts under Phase 1 would apply to Phase 3.

4.5.4 No Action Alternative

Under the No Action Alternative, the socioeconomic benefits described above would not occur, and the City would remain at risk for similar economic impacts as those associated with the 2013 flood. Therefore, the No Action Alternative would have a significant, long-term impact on socioeconomics.

4.6 Transportation

This section describes the potential impacts to the transportation infrastructure, including roadways, transit and rail facilities, and non-motorized facilities under each phase of the Proposed Action and under the No Action Alternative.

4.6.1 Phase 1

As part of Phase 1, trails and pedestrian bridges in the Phase 1 City and Sandstone Reaches would be constructed to restore connectivity for non-motorized users along the St. Vrain Greenway, resulting in a long-term benefit to the trails. There would be no long-term impacts to transit and rail facilities or roadway facilities as part of the Proposed Action. The Main Street Bridge is under reconstruction as a separate action unrelated to this Project, and would not be precluded by the Proposed Action. In addition, the Boston Avenue extension is planned for construction as a separate action unrelated to this Project.

During construction, roadways adjacent to the Project would be used for construction traffic, including trucks that are used to import and export materials, which would temporarily increase traffic surrounding the Project site. On average, it is expected that approximately 30 to 60 haul vehicles would be added to local roadways each day. Haul vehicles and heavy trucks would use City-approved truck haul routes and additional haul routes where necessary as shown on **Figure 2-1**. Road closures and detours are not expected in Phase 1 because there are no new or reconstructed bridges planned in this area. Temporary trail construction detours or closures would be signed and information would be made available on the City's website on multiple webpages, including a page specifically for the Project.

4.6.2 Phase 2

Within Phase 2, the Proposed Action would construct new and replace existing bridge structures to accommodate 100-year channel flows on the Creek. A new bridge or box culvert would be constructed on Airport Road south of the Creek to accommodate southerly flows for the split-channel design, and the Boston Avenue Bridge and BNSF Railway Bridge would also be replaced. The Sunset Street Bridge, which was damaged in the 2013 flood and has not yet reopened, is planned for reconstruction as a separate action, unrelated to and not precluded by the Proposed Action.

The trails that parallel the Creek would be repaired and reconnected to restore connectivity for non-motorized users. A longer pedestrian bridge to accommodate a wider channel design would be constructed to connect Golden Ponds and the St. Vrain and Lykins Gulch Greenways.

In the Lykins Gulch-to-Roger's Grove Reach, there are two design options that would impact roadway and trail facilities differently. Design Option 1 would replace the existing Hover Street Bridge with one that can pass 100-year flows. A pedestrian bridge in this reach would also be replaced by one with a longer span to accommodate flood flows. Design Option 2 would construct a new bridge on Hover Street to accommodate a split-stream flow. There would be no change to the existing Hover Street Bridge over the Creek. In Option 2, a pedestrian bridge in this reach would also be replaced by one with a longer span to accommodate flood flows.

Implementation of the Proposed Action would result in a long-term benefit to roadway and non-motorized facilities.

Implementation of Phase 2 would result in moderate, short-term construction impacts from new bridge construction and replacement that could require temporary roadway closures and detours. Temporary detours and closures would be signed and information would be made available to the public on the City's road closure map/"Cone Zone" webpage, and webpage dedicated to this Project. Other short-term construction impacts in Phase 2 are similar to those described in Phase 1.

4.6.3 Phase 3

Implementation of Phase 3 would have construction-related impacts similar to those under Phases 1 and 2. Long-term impacts to roadways, transit and rail facilities, and non-motorized facilities are not expected. For these reasons, Phase 3 of the Proposed Action would have a minor, short-term impact on transportation.

4.6.4 No Action Alternative

The 2013 flood caused extensive damage to the roadway infrastructure that crosses the Creek as well as the trail facilities that parallel it. Under the No Action Alternative, the trail along the St. Vrain Greenway would not be rebuilt and large sections would remain closed to the public. Without the proposed channel improvements, roadway and railroad infrastructure would not be improved to accommodate 100-year flows and would remain at risk during future flood events. For these reasons, the No Action Alternative would have a moderate, long-term impact on transportation.

4.7 Cultural Resources

This section describes the potential effects to cultural resources within the APE under each phase of the Proposed Action and under the No Action Alternative. After historic properties were identified within the APE, the Project was analyzed to determine whether it would have an effect (direct or indirect), either permanently or during construction, on those properties. Under Section 106 of the NHPA, effects to historic properties are defined in one of the following ways:

- No Historic Properties Affected: Historic properties are either not present or not affected by the action.
- No Adverse Effect: A historic property is affected but the characteristics that qualify the property for inclusion in the NRHP are not appreciably altered.

- Adverse Effect: An action directly or indirectly alters the characteristics of a property that qualify it for inclusion in the NRHP.

The lead federal agency makes the determination of effect for each architectural property or archaeological site. Based on these determinations, an overall finding of effect for the undertaking is reached in consultation with the SHPO and other consulting parties. The federal agency then requests concurrence from the SHPO on the finding of effect.

The goal of Section 106 consultation is to identify historic properties potentially affected by the undertaking, assess effects to them, and seek ways to avoid, minimize, or mitigate any adverse effects on historic properties. When an undertaking is found to have an adverse effect, Section 106 requires notification to the ACHP and consultation with SHPO and other interested parties regarding appropriate avoidance or mitigation measures. Generally speaking, mitigation measures might include redesigning aspects of a project, and documenting buildings and/or structures. For a finding of adverse effect, the product of consultation is usually a memorandum of agreement (MOA) per 36 CFR 800.6(c) or a Programmatic Agreement per 36 CFR 800.14(b) between the SHPO, the federal agency, ACHP if they choose to participate, and other consulting parties. This agreement contains stipulations specifying measures to be implemented that would avoid, minimize, or mitigate the adverse effects.

This section and **Table 4-3** summarize the effects from implementation of the Proposed Action as determined by FEMA and concurred upon by SHPO on April 19, 2016.

TABLE 4-3

Effects to NRHP-Eligible and NRHP-Listed Historic Architectural Resources within the APE

Resilient St. Vrain Project EA

Site Number	Resource Name/Type	NRHP Eligibility	Effects Determination
	City Reach		
5BL374.18	BNSF Railway (segment)	Supports eligibility of overall linear resource	No adverse effect
5BL400.36	Colorado and Southern/BNSF Railway Bridge	Supports eligibility of overall linear resource	Adverse effect
5BL400.50	Colorado and Southern/BNSF Railway (segment)	Supports eligibility of overall linear resource	Adverse effect
5BL7882.1	Hoyt-to-Terry Street Transmission Line (segment)	Supports eligibility of overall linear resource	No adverse effect
5BL7885.2	Fordham-to-Terry Street Transmission Line (segment)	Supports eligibility of overall linear resource	No adverse effect
5BL13296.1	South Flat Ditch (segment)	Supports eligibility of overall linear resource	Pending final project design
5BL13297.1	Unnamed Spreader Ditch (segment)	Supports eligibility of overall linear resource	Pending final project design
	Sandstone Reach		
5WL712	Sandstone Ranch, Morse H. Coffin Ranch, Sandstone Farmstead	NRHP Listed (1984), City of Longmont Landmark	No adverse effect
5WL2876.1	Bonus Lateral Ditch (segment)	NRHP Eligible	No adverse effect
5WL2877.1	Union Reservoir Ditch (segment)	NRHP Eligible	No adverse effect

4.7.1 Phase 1

4.7.1.1 Historic Architectural Resources

There are three historic architectural properties within Phase 1 of the Proposed Action: 5WL712, 5WL2876.1, and 5WL2877.1. Effects to each historic architectural property resulting from implementation of the Project are summarized below.

- Sandstone Ranch, Morse H. Coffin Ranch, Sandstone Farmstead (5WL712): The Proposed Action includes improvements within the property legal boundaries; however, it would avoid impacts to structures at this site, and improvements would not diminish any of the characteristics that qualify the property for listing in the NRHP.
- Bonus Lateral Ditch segment (5WL2876.1): The Proposed Action would avoid impacts to the ditch segment and improvements within this phase would not diminish the qualities that qualify this property as eligible for listing in the NRHP.
- Union Reservoir Ditch segment (5WL2877.1): The Proposed Action would avoid impacts to the ditch segment and improvements within this phase would not diminish the qualities that qualify this property as eligible for listing in the NRHP.

FEMA determined there would be no adverse effect to any eligible resources in Phase 1 as a result of the Project, provided avoidance measures described in the Technical Effects Memorandum (**Appendix H**) are implemented. SHPO concurred on April 19, 2016.

For these reasons, there would be no impact to cultural resources in Phase 1.

4.7.1.2 Archeological Resources

FEMA determined and SHPO concurred on February 23, 2016, that no archaeological resources within the APE are listed or eligible for listing in the NRHP. Therefore, there will be no historic properties affected by the undertaking.

Consultation was initiated March 28, 2016, with area Native American Tribes, in compliance with NHPA Section 106 requirements. FEMA requested identification of Tribal interests in the Project Area during consultation. Responses were received by the Cheyenne and Arapaho Tribes and the Comanche Nation. None of the Tribes identified historic properties. However, if at any time during the project inadvertent discoveries are made that reflect evidence of human remains, ceremonial or cultural objects, historical sites such as stone rings, burial mounds, village or battlefield artifacts, work will be discontinued and the Tribal Historic Preservation Officer will be notified immediately. A list of parties consulted and response letters are provided in **Appendix H.**

4.7.2 Phase 2

4.7.2.1 Historic Architectural Resources

There are seven historic properties within Phase 2 of the Proposed Action: 5BL374.18, 5BL400.36, 5BL400.50, 5BL7882.1, 5BL7885.2, 5BL13296.1, and 5BL13297.1. Effects to each historic property resulting from implementation of the Project are summarized below.

- BNSF Railroad segment (5BL374.18): The Proposed Action would avoid impacts to the rail segment. Improvements within this phase would not result in adverse effects that would diminish the qualities that qualify this property as a contributing element to the overall linear resource, which is eligible for listing on the NRHP. FEMA provided a determination of No Adverse Effect and requested concurrence from SHPO per Section 106 of the NHPA. SHPO concurred with FEMAs determination on April 19, 2016.
- Colorado and Southern/BNSF Railroad Bridge (5BL400.36): The Proposed Action includes demolition and reconstruction of a bridge that contributes to the overall NRHP-eligible linear resource in order to facilitate conveyance of flood flows in the St. Vrain Creek. FEMA determined this action would result in

an adverse effect to this segment of the resource. FEMA is currently in consultation with SHPO and the consulting parties to mitigation for this property per Section 106 of the NHPA.

- Colorado and Southern/BNSF Railroad segment (5BL400.50): The Proposed Action would avoid impacts to the rail segment; however, improvements to the adjacent bridge (5BL400.36) would adversely affect the characteristics that qualify this property as a contributing element to the overall linear resource, which is eligible for listing on the NRHP. FEMA determined this action would result in an adverse effect to this segment of the listed resource. FEMA is currently in consultation with SHPO and the consulting parties to determine mitigation for this property per Section 106 of the NHPA.
- Hoyt-to-Terry transmission line segment (5BL7882.1): The Proposed Action includes Project improvements that would be completed underneath this segment of the transmission line, which contributes to the overall NRHP-eligible linear resource. There would be no physical impact or alterations to the line, resulting in a determination of No Adverse Effect by FEMA. SHPO concurred with FEMA's determination on April 19, 2016.
- Fordham-to-Terry transmission line segment (5BL7885.2): The Proposed Action avoids impacts to the transmission line and improvements within this phase would not adversely affect the qualities that qualify this segment as a contributing element to the overall linear resource, which is eligible for listing on the NRHP. FEMA provided a determination of No Adverse Effect and requested concurrence from SHPO per Section 106 of the NHPA. SHPO concurred with FEMA's determination on April 19, 2016.
- South Flat Ditch segment (5BL13296.1): The Proposed Action may make modifications inside this segment of the ditch, which contributes to the overall NRHP-eligible linear resource. These alterations could affect the historic integrity of the ditch segment. However, because Project plans in this area are not yet well defined, specific impacts cannot be determined at this time. When design plans are finalized and if the ditch is impacted, FEMA will re-open consultation on this urban irrigation ditch.
- Unnamed Spreader Ditch segment (5BL13297.1): The Proposed Action may make modifications inside this segment of the ditch, which contributes to the overall NRHP-eligible linear resource. These alterations could affect the historic integrity of the ditch segment. However, because Project plans in this area are not yet well defined, specific impacts cannot be determined at this time. When design plans are finalized and if the ditch is impacted, FEMA will re-open consultation on this urban irrigation ditch.

Because there would be an adverse effect to one or more historic properties in Phase 2, impacts to historic properties would be long-term and moderate. FEMA, in consultation with SHPO, the City, the Colorado Division of Homeland Security and Emergency Management (DHSEM), and the Colorado Southern/BNSF Railway, has begun development of a Memorandum of Agreement (MOA) in accordance with 36 CFR 800.6 to address unavoidable adverse impacts to the Colorado Southern/BNSF Railway bridge and the adjacent linear segment of track. Discussion has centered on Level II documentation and installation of onsite educational signage as being appropriate measures to treat adverse effects on the historic properties. No construction will occur in the vicinity of NRHP eligible sites until the MOA is signed by consulting parties and accepted by the Advisory Council on Historic Places.

4.7.2.2 Archeological Resources

The impacts to archeological resources described for Phase 1 would also apply to Phase 2.

4.7.3 Phase 3

4.7.3.1 Historic Architectural Resources

There were no historic properties identified within this phase; therefore, FEMA has determined there would be No Historic Properties Affected resulting from implementation of Phase 3 of the Proposed Action. SHPO concurred with FEMAs determination on April 19, 2016.

4.7.3.2 Archeological Resources

The impacts to archeological resources described for Phase 1 would also apply to Phase 3.

4.7.4 No Action Alternative

The No Action Alternative would not directly impact historic properties within the APE. However, without flood mitigation, such as the projects included in the Proposed Action, historic properties would remain in the floodplain and at risk of sustaining damage or destruction in future flooding events. The No Action Alternative would result in a moderate long term impact to cultural resources.

4.8 Geology

This section analyzes the potential impacts on geology, including soils, in the Project Area under each phase of the Proposed Action and under the No Action Alternative.

4.8.1 Phase I

4.8.1.1 Geology

Most of the Project components under Phase 1 of the Proposed Action would include excavation, grading, and other land-disturbing activities that would involve contact with subsurface materials. The depth of these activities and the subsurface materials that would be encountered would depend on the type of construction activity. Subsurface construction activities would be conducted using standard and approved methods; these activities would have a negligible impact on subsurface geological materials within the construction footprint and no effect on geological materials outside the construction footprint. The Project activities are expected to have no impact on geological materials considered unique or currently economically important in the area, and no active gravel mining operations would be affected.

Based on the analysis conducted, Phase 1 of the Proposed Action would have a negligible impact on geology.

4.8.1.2 Soils

Under the Proposed Action, soils and sediments would be disturbed during channel widening and realignment, bank stabilization, installation of in-stream boulder and riffle drop structures, and repair/ replacement of damaged infrastructure. Disturbance to soils and sediments would be temporary and involve relatively minor applications of pavement/concrete, primarily for repair/replacement of damaged infrastructure. Soils throughout much of the Project Area have been disturbed by the 2013 flood. Although some soil types in the Project Area qualify as prime farmland if irrigated, drained, or under other specific conditions, the Proposed Action would have no effect on prime farmland based on the type of activities proposed, which are aimed at restoring and enhancing natural habitats in the Project Area. A number of the proposed Project components have been designed to directly and indirectly prevent and minimize soil erosion, and restore areas that have been impacted by erosion and sedimentation. Various temporary BMPs and engineering controls will also be implemented during construction to prevent and minimize erosion and sedimentation. These measures will be included in the construction plans and outlined in the SWMP to be implemented as part of the Project's Stormwater Construction Permit to be obtained from CDPHE.

Based on the analysis conducted, Phase 1 of the Proposed Action would have a minor, short-term impact on soils.

4.8.2 Phase 2

4.8.2.1 Geology

The Project components under Phase 2 would primarily include channel widening, modifications to connecting ponds, installation of in-stream boulder and riffle drop structures, and replacement of damaged bridges in the remaining sections of the City Reach. These Project activities would have a negligible impact on subsurface geological materials and no effect on geological materials outside the construction footprint.

The Project activities are expected to have no impact on geological materials considered unique or currently economically important in the area.

4.8.2.2 Soils

Based on the scope of activities proposed and the size of the Project Area, the overall extent of soil disturbance under Phase 2 is expected to be comparable to Phase 1. As under Phase 1, soil disturbance under Phase 2 would largely be temporary and beneficial because the impacts would be confined to the construction period and aimed at restoring natural habitats in the Project Area. BMPs and engineering controls would be implemented during construction to prevent and minimize soil erosion and sedimentation. These measures would be included in the Phase 2 construction plans and SWMP.

Based on the analysis conducted, Phase 2 of the Proposed Action would have a minor, short-term impact on soils.

4.8.3 Phase 3

4.8.3.1 Geology

The Project components under Phase 3 would primarily include improvements to channel capacity and to the greenway in the Middle Reach. These Project activities would have a negligible impact on subsurface geological materials and no effect on geological materials outside the construction footprint. The Project activities are expected to have no impact on geological materials considered unique or currently economically important in the area.

Based on the analysis conducted, Phase 3 of the Proposed Action would have a negligible impact on geology.

4.8.3.2 Soils

Based on the scope of activities proposed and the size of the Project Area, the overall extent of soil disturbance under Phase 3 is expected to be less than under Phase 1. As under Phase 1, soil disturbance under Phase 3 would largely be temporary and beneficial because the impacts would be confined to the construction period and aimed at restoring natural habitats in the Project Area. BMPs and engineering controls would be implemented during construction to prevent and minimize soil erosion and sedimentation. These measures would be included in the Phase 3 construction plans and SWMP.

Based on the analysis conducted, Phase 3 of the Proposed Action would have a minor, short-term impact on soils.

4.8.4 No Action Alternative

The potential for soil erosion and sedimentation from future flood events would remain high under the No Action Alternative. Therefore, the No Action Alternative would have a moderate, long-term impact on soils; there would be no effect on geology.

4.9 Hazardous Materials and Waste

The presence of a hazardous substance/waste within, in the vicinity of, and/or upgradient of a project area is important in determining development constraints and the viability of an action. For a flood control/flood mitigation-type project such as the Proposed Action, items of concern would include the following:

- Presence of hazardous substance/waste within buildings to be demolished;
- Use of hazardous substances, such as diesel fuel, during construction;
- Presence of a hazardous substance/waste within or in the immediate vicinity of the Project Area; and
- Presence of an upgradient hazardous substance/waste.

4.9.1 Phase 1

Construction activities typically require the use of hazardous materials, including, fuel, aerosols, batteries, and solvents. Construction activities would result in the consumptive use of most hazardous materials;

however, an aboveground storage tank would likely be used during Phase 1 construction to store diesel fuel for construction equipment. Any unused or stored hazardous materials would be handled in accordance with federal, state, and local laws and regulations. Hazardous wastes, if generated, would be disposed of at the Hazardous Materials Management Facility (HMMF) located at 1901C 63rd Street in Boulder. Impacts associated with hazardous materials used during construction would be minor and short term.

EDR identified 44 sites within the Phase 1 portion of the search radius. These sites are presented in Table 5 of **Appendix D**. The Project Area will be further sampled for the presence of hazardous materials prior to construction, and a treatment plan will be created and implemented if hazardous sites are identified. If a previously unidentified hazardous waste site was located, construction would cease and CDPHE would be notified. Impacts associated with existing hazardous waste sites are expected to be negligible and short term.

During construction, contractors would follow a Solid Waste Management Plan. Solid waste would be disposed of at the Front Range Landfill located at 1830 County Road 5, Erie, Colorado, which has the capacity to handle the solid waste associated with the Proposed Action (Front Range Landfill, 2010). Impacts from solid waste would be negligible and short term.

CDPHE regulates construction dewatering activities through a variety of construction and remediation dewatering permits. Many areas of construction have potential groundwater contamination from upgradient sources. Prior to discharge, these areas of potential contamination would be evaluated per the CDPHE regulations and permits, and would be sampled as appropriate to meet the requirements. Complying with the CDPHE permits would ensure that groundwater contamination will not be transferred to the Creek and impacts would be negligible and short term.

Based on the analysis conducted, Phase 1 of the Proposed Action would have negligible impact on hazardous materials and waste.

4.9.2 Phase 2

Impacts associated with the use of hazardous materials during construction, solid waste, and dewatering would be similar to those under Phase 1.

Construction proposed in Phase 2 would require the demolition of buildings. CDPHE provides guidance for the management and disposal of demolished structures. Appropriate testing would be completed prior to demolition of buildings to determine if lead-based paint (LBP) or asbestos are present in the structure. If LBP or asbestos are determined to be present in the building, removal and disposal of these hazardous materials would be completed in accordance with all federal, state, and local regulations. Small appliance refrigerant recovery is also regulated by CDPHE through its Air Pollution Control Division (APCD) and the Indoor Environment Program. Hazardous material impacts associated with the demolition of structures would be moderate and short term.

EDR identified 223 sites within in the Phase 2 portion of the search radius. These sites are presented in Table 6 of **Appendix D**. Construction activities would not be conducted within or in the immediate vicinities of these sites. If a previously unidentified hazardous waste site was located, construction would cease and CDPHE would be notified. Impacts associated with existing hazardous waste sites are expected to be negligible and short term.

Based on the analysis conducted, Phase 2 of the Proposed Action would have negligible impact on hazardous materials and waste.

4.9.3 Phase 3

Impacts associated with the use of hazardous materials during construction, solid waste and dewatering would be similar to those under Phase 1.

Construction proposed in Phase 3 would not involve demolishing structures; therefore, there would be no associated impacts from asbestos or LBP during demolition.

EDR identified eight sites within the Phase 3 portion of the search radius. These sites are presented in Table 7 of **Appendix D**. Construction activities would not be conducted within or in the immediate vicinities of these sites. If a previously unidentified hazardous waste site was located, construction would cease and CDPHE would be notified. Impacts associated with existing hazardous waste sites are expected to be negligible and short term.

Based on the analysis conducted, Phase 3 of the Proposed Action would have negligible impact on hazardous materials and waste.

4.9.4 No Action Alternative

There are no expected impacts associated with hazardous materials or solid waste under the No Action Alternative.

4.10 Air Quality and Climate Change

This section analyzes the potential impacts on air quality and GHGs and the effects of climate change under each phase of the Proposed Action and under the No Action Alternative. Impacts on air quality and GHGs are discussed in this EA on a regional level, not just within boundaries of the Project Area.

4.10.1 Phase 1

4.10.1.1 NAAQS Emissions

Construction activities under Phase 1 of the Proposed Action would result in short-term emissions of criteria pollutants and volatile organic compounds (VOCs). Air emissions would result from the exhausts of construction vehicles and equipment, and from fugitive dust. Fugitive dust would be generated primarily by construction vehicle and equipment operation on dirt surfaces and by wind action on stockpiled materials. Generated fugitive dust would consist primarily of non-toxic particulate matter, and would be controlled by measures prescribed in Title 5 of the Code of Colorado Regulations (CCR) 1001-3 and a Dust Control Plan that would be implemented for the Proposed Action. Measures that would be implemented to control fugitive dust under the Proposed Action include application of water and post-construction planting and maintenance of vegetative ground cover.

Boulder County is in nonattainment for O_3 and PM_{10}, and designated as a maintenance area for CO. Therefore, the Proposed Action is subject to review under the General Conformity Rule for these pollutants. Detailed emission calculations for the Proposed Action were performed using the U.S. Air Force Air Conformity Applicability Model (ACAM), Version 5.0.2. The ACAM results are provided as **Appendix F** and the assumptions used in the ACAM analysis are provided as **Appendix G**. The ACAM analysis was conducted for all three phases of the Proposed Action, with the assumption that construction-related emissions under Phase 1, Phase 2, and Phase 3 would begin in 2017, 2021, and 2024, respectively. As indicated in **Appendix F**, construction-related air emissions are predicted to peak in 2018. **Table 4-4** compares the predicted peak annual construction emissions to the federal *de minimis* thresholds.

TABLE 4-4
Comparison of Predicted Peak Annual Construction Emissions and Federal Thresholds
Resilient St. Vrain Project EA

Emissions	Peak Emissions under the Proposed Action (2018) (ton/year)						
	VOCs	**CO**	**NO_x**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**Lead**
Federal *De Minimis* Thresholds	100	100	100	--	100	--	--
Construction under the Proposed Action	2.16	9.49	16.6	0.027	68.4	0.210	0.000

Emissions	Peak Emissions under the Proposed Action (2018) (ton/year)						
	VOCs	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	Lead
Thresholds Exceeded?	No	No	No	NA	No	NA	NA

Notes:

$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter

PM_{10} = particulate matter less than 10 microns in diameter

CO = carbon monoxide

NOx = nitrogen oxides

SO2 = sulfur dioxide

VOCs = volatile organic compounds

NA = Not applicable

As indicated in **Table 4-4**, predicted peak annual construction emissions under the Proposed Action would be less than the federal *de minimis* thresholds.

Based on the analysis conducted, Phase 1 of the Proposed Action would have a minor, short-term impact on air quality.

4.10.1.2 Greenhouse Gases

Construction under Phase 1 of the Proposed Action is estimated to generate well below 25,000 metric tons of CO_{2e}, the suggested reference point per revised draft CEQ guidance for quantitative analysis and disclosure of GHG emissions (CEQ, 2014). Therefore, Phase 1 of the Proposed Action would have a negligible impact on GHGs.

4.10.1.3 Climate Change

While regional temperatures are expected to rise, climate projections indicate precipitation rates could actually increase for the region, including Longmont (University of Colorado and Colorado State University, 2015). The Proposed Action, however, would improve the City's response to flooding events and would ultimately result in a long-term benefit in the City's response to climate change.

4.10.2 Phase 2

4.10.2.1 NAAQS Emissions

Construction activities under Phase 2 of the Proposed Action would result in short-term emissions of criteria pollutants, VOCs, and fugitive dust (non-toxic particulate matter). Generated fugitive dust would be controlled as described for Phase 1. Based on the ACAM analysis conducted for the Proposed Action, which assumes that construction under Phase 2 would begin in 2021, predicted annual construction emissions under Phase 2 would be less than the federal *de minimis* thresholds (see **Appendices F and G**). Average annual construction emissions under Phase 2 would be comparable to those under Phase 1. Phase 2 would have a shorter construction period than Phase 1; therefore, overall construction emissions under Phase 2 would be less than under Phase 1.

Based on the analysis conducted, Phase 2 of the Proposed Action would have a minor, short-term impact on air quality.

4.10.2.2 Greenhouse Gases

Construction under Phase 2 of the Proposed Action is estimated to generate well below 25,000 metric tons of CO_{2e}, the suggested reference point per revised draft CEQ guidance for quantitative analysis and disclosure of GHG emissions (CEQ, 2014). Therefore, Phase 2 of the Proposed Action would have a negligible impact on GHGs.

4.10.2.3 Climate Change

Climate change is analyzed on a regional rather than a site-specific level. Therefore, the analysis of climate change effects under Phase 1 would apply to Phase 2.

4.10.3 Phase 3

4.10.3.1 Construction Emissions

Construction activities under Phase 3 of the Proposed Action would result in short-term emissions of criteria pollutants, VOCs, GHGs, and fugitive dust (non-toxic particulate matter). Generated fugitive dust would be controlled as described for Phase 1. Based on the ACAM analysis conducted for the Proposed Action, which assumes that construction under Phase 3 would begin in 2024, predicted annual construction emissions under Phase 3 would be less than the federal *de minimis* thresholds (see **Appendices F and G**). Average annual and overall construction emissions under Phase 3 would be less than those under Phases 1 or 2.

Based on the analysis conducted, Phase 3 of the Proposed Action would have a minor, short-term impact on air quality.

4.10.3.2 Greenhouse Gases

Construction under Phase 3 of the Proposed Action is estimated to generate well below 25,000 metric tons of CO_{2e}, the suggested reference point per revised draft CEQ guidance for quantitative analysis and disclosure of GHG emissions (CEQ, 2014). Therefore, Phase 3 of the Proposed Action would have a negligible impact on GHGs.

4.10.3.3 Climate Change

Climate change is analyzed on a regional rather than a site-specific level. Therefore, the analysis of climate change effects under Phase 1 would apply to Phase 3.

4.10.4 No Action Alternative

Under the No Action Alternative, no improvements to St. Vrain Creek would be performed. Therefore, the No Action Alternative would have no impact on air quality or GHG emissions. However, the City would be more susceptible to increased flooding associated with climate change.

4.11 Noise

Noise from construction activities would add to the noise environment within or near the Project Area. Construction activities would be temporary and are expected to occur during normal working hours, although some construction work may take place outside normal hours, when required. Construction is usually carried out in reasonably discrete steps, each with its own mix of equipment and noise characteristics. Construction under the Proposed Action would be conducted using standard construction equipment and methods.

Based on data presented in *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances* (EPA, 1971), the primary phases of outdoor construction typically generate noise levels that range from 78 to 89 dBA approximately 50 feet from a construction site (**Table 4-5**).

TABLE 4-5
Typical Noise Levels Associated with Main Phases of Outdoor Construction
Resilient St. Vrain Project EA

Construction Phase	Noise Level at 50 feet (dBA)
Ground Clearing	84
Excavation, Grading	89
Foundations	78
Structural	85
Finishing	89

Data Source: EPA, 1971.

4.11.1 Phase 1

The nearest noise-sensitive land uses to the Phase 1 portion of the Project Area are residential areas that border the site. Based on typical construction noise levels, construction activity that occurs near the outer perimeter of the Project site could generate noise levels within the general range of 78 to 89 dBA. Construction contractors will comply with the City's noise ordinance (City of Longmont, 2015h), which requires no construction activity between 7 p.m. and 7 a.m. Monday through Saturday, or before 9 a.m. on Sundays, within a residential area or within 500 feet of a school, except for temporary conditions approved by the Economic Development Director.

Phase 1 of the Proposed Action would have a moderate, short-term noise impact because construction activities would be perceptible by nearby receptors, but would be mitigated in accordance with the Longmont noise ordinances.

No noise impacts are associated with the post-construction phase of the Proposed Action.

4.11.2 Phase 2

The Phase 2 portion of the Project Area is located primarily within the City; therefore, noise-sensitive populations, such as residences, churches, and businesses, would be located adjacent and within close vicinity of the Project Area. The noise impacts described for Phase 1 construction and operation noise would also apply to Phase 2.

4.11.3 Phase 3

The Phase 3 portion of the Project Area is in the vicinity of some residents and other sensitive noise receptors. The noise impacts described for Phase 1 construction and operation noise would also apply to Phase 3.

4.11.4 No Action Alternative

Under the No Action Alternative, no improvements to the Creek would be performed; therefore, there would be no noise impacts.

4.12 Utilities

This section describes the potential impacts to the utility infrastructure under the No Action Alternative or as a result of implementing the Proposed Action. The analysis of impacts on utilities was based on the utility's existing infrastructure. The infrastructure information was obtained through individual utility providers webpage information, utility provided maps, technical reports, and email exchanges.

Each utility crossing the Creek or running parallel to the Creek within the planned limits of grading may require relocation to accommodate the Proposed Action. Impacts related to Project construction could include scheduled utility service interruptions, accidental interruptions of utility service, environmental impacts from digging and trenching, and potential ROW acquisition. Planned outages would be avoided to the extent possible. If planned outages are necessary, utility customers would be given advanced notice. To avoid accidental outages, public utilities within the Project Area would be located prior to construction, and the City would coordinate with utility companies. For these reasons, each phase of the Proposed Action would have a moderate, short-term impact on utilities.

The following sections summarize the requirements for relocation of each known utility within the Project Area. This information is organized by design phase and reach.

4.12.1 Phase 1

4.12.1.1 Water Supply

The City's water main line would be relocated to accommodate improvements to Main Street Bridge.

4.12.1.2 Sanitary Sewer and Stormwater Drainage

The sanitary sewer line located west of Martin Street would need to be replaced. The sanitary sewer line that previously crossed the Creek at the Main Street Bridge was damaged in the 2013 flood. It was removed and the crossing was re-routed south of the Creek to connect to an existing sewer line as part of another project.

The pond outfall located west of Main Street would be reconfigured to accommodate Creek improvements. The pipe that connected the diversion structure to the Dickens Farm Park west pond would be relocated along with the Dickens Farm Park improvements (City of Longmont, 2015a). The City's pond outfall east of Martin Street on the south side of the Creek would be relocated to accommodate the Creek improvements.

4.12.1.3 Electric Power Supply

Electric poles may need to be relocated for the LPC overhead line path crossing the Creek east of Main Street and the overhead three-phase primary electric line crossing the Creek downstream of the Martin Street Bridge.

LPC would determine the extent of relocation required based on the design of bridge and Creek improvements, and would relocate electric lines as required. The extent of pole relocations would be based on required improvements to the Creek and on ongoing bridge design efforts.

4.12.1.4 Natural Gas Supply

No natural gas lines should be affected by the Proposed Action.

4.12.1.5 Cable and Telecommunications

Comcast, CenturyLink, and LPC fiber optic cable, conduits, and telecommunication lines may require relocation to accommodate improvements to the Creek and bridges.

LPC's underground fiber optic communications line would likely need to be relocated to accommodate the bridge and Creek improvements. LPC would determine the extent of relocation required based on the preliminary design of bridge and Creek improvements, and the line would be relocated as required.

There would likely be building disconnects and relocation of Comcast and CenturyLink cables and conduits at the various bridge and other Creek crossings.

4.12.2 Phase 2

4.12.2.1 Water Supply

The City has a series of water lines located at various locations within the City Reach that would require relocation or rerouting to accommodate bridge and Creek improvements.

The elevation of the underground water main located downstream of the Airport Road Bridge is unknown but it would likely require relocation to accommodate the bridge and Creek improvements. The water main located downstream of the Hover Street Bridge would also need to be relocated to accommodate improvements to the bridge and the Creek.

4.12.2.2 Sanitary Sewer and Stormwater Drainage

Three sanitary lines in the City Reach would be relocated to accommodate bridge and Creek improvements, and to protect the lines from future flood and scour events. Demolition and disposal of the sewer line would be performed per CDPHE requirements.

The sanitary sewer inverted siphon located north of Boston Avenue would be relocated to accommodate Creek improvements. The sanitary sewer aerial crossing located south of Boston Avenue would be rerouted to the north side of Boston Avenue and connected to the existing sanitary sewer crossing.

There is an extensive stormwater drainage system in the City Reach portion of the Proposed Action that includes culverts, outfalls, pipes, ponds, and spillways. The storm drain box culverts, outfalls, and spillway would require reconfiguration to accommodate bridge improvements or improvements to the Creek. The pond outfall located north of Boston Avenue, connecting Izaak Walton Pond to the Creek, would also need to be reconfigured to accommodate Creek improvements.

4.12.2.3 Electric Power Supply

LPC has a series of underground electric lines that cross the Creek within the Phase 2 Project Area. The elevations of these lines are presently unknown but it is anticipated that underground electric lines would require relocation to accommodate bridge and Creek improvements.

Pole relocation would likely be required for overhead lines crossing the Creek near the east end of Golden Ponds; the overhead three-phase primary electric line that crosses the Creek just downstream of the Sunset Street Bridge; the overhead line that runs parallel to the Creek on the south side between Boston Avenue and the BNSF Railway; and the overhead three-phase primary electric line that crosses the Creek just upstream of the BNSF Railway Bridge.

LPC would determine the extent of relocation required based on the design of bridge and Creek improvements and would relocate electric lines as required. The extent of pole relocations would be based on required improvements to the Creek and on ongoing bridge design efforts.

4.12.2.4 Natural Gas Supply

Xcel Energy plans to install a 16-inch-diameter gas main along Airport Road; this line is in preliminary design by Xcel, and the final location is to be determined. Coordination would be required with Xcel as the Creek design progresses so that the gas line is located appropriately for future bridge improvements.

4.12.2.5 Cable and Telecommunications

LPC has an existing underground fiber optic communications line downstream of Airport Road Bridge as well as an overhead fiber optic line that crosses the Creek upstream of the Sunset Street Bridge.

The elevation of LPC's underground fiber optic communications line downstream of Airport Road Bridge is presently unknown but would likely require relocation to accommodate the bridge and Creek improvements. LPC would determine the extent of relocation required based on the design of bridge and Creek improvements, and the line would be relocated as required.

There would likely be building disconnects and relocation of Comcast and CenturyLink cables and conduits at the various bridge crossings of the Creek. For CenturyLink specifically, an overhead line crossing the Creek at the Sunset Street Bridge would be dismantled and a fiber optic conduit would be temporarily supported and reattached to the new South Pratt Parkway Bridge crossing.

Pole relocation for overhead telecommunication line paths may be required based on grading limits of the Creek improvements. The extent of pole relocation would be based on required improvements to the Creek and on preliminary or ongoing bridge design efforts.

4.12.3 Phase 3

4.12.3.1 Water Supply

There is no water supply infrastructure within Middle Reach that would be impacted by the Proposed Action.

4.12.3.2 Sanitary Sewer and Stormwater Drainage

Sanitary sewer and stormwater drainage infrastructure within the Middle Reach would be improved as needed during Phase 3 of the Proposed Action.

4.12.3.3 Electric Power Supply

There is an overhead power line within the Middle Reach that would be impacted by the Proposed Action. LPC overhead lines crossing the Creek may require relocation of poles. LPC would determine the extent of pole relocations based on required improvements to the Creek.

4.12.3.4 Natural Gas Supply

There is no natural gas supply infrastructure within the Middle Reach that would be impacted by the Proposed Action.

4.12.3.5 Cable and Telecommunications

There is no primary cable or telecommunications infrastructure within the Middle Reach that would be impacted by the Proposed Action.

4.12.4 No Action Alternative

The No Action Alternative would not impact the utilities near the Project sites or electrical loads on the nearby utilities because no change in the existing conditions would occur. However, utility infrastructure will remain vulnerable during future flood events.

4.13 Environmental Justice

The key legislation and policy directives behind environmental justice assessment requirements are Title VI of the Civil Rights Act of 1964 and EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. Title VI of the Civil Rights Act[1] prohibits intentional discrimination as well as disparate impact discrimination. EO 12898 mandates that agencies evaluate whether a Proposed Action would result in any disproportionately high and adverse effects on minority or low-income populations. EO 12898 directs federal agencies to take appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority populations and/or low-income populations to the greatest extent practicable by law.

4.13.1 Environmental Justice Analysis

This section presents the demographic analysis used to determine minority and low-income populations. The demographic information in this section is based on EPA's environmental justice screening and mapping tool, EJSCREEN. EPA's EJSCREEN tool assesses environmental justice populations relative to the region's populations.

[1] Title VI states that "no person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance."

EJSCREEN results showed 27 percent minority populations for the Proposed Action area (Phases 1 to 3). This minority percentage is lower than the state (30 percent) and the nation (36 percent). In addition, EJSCREEN results showed 41 percent low-income populations for the Proposed Action area (Phases 1 to 3), which is higher than the state (30 percent) and the nation (34 percent). **Appendix J** provides the full EJSCREEN report. Based on the EJSCREEN tool, there are low-income populations surrounding the Project Area that could have potential environmental justice considerations. These considerations are addressed in the following sections.

4.13.2 Identification of Disproportionately High and Adverse Effects on Minority and Low-Income Populations

The following indicators were used to determine the effect of the Proposed Action on minority and low-income populations:

- Environmental conditions, such as quality of air, water, and other environmental media, as well as loss of open space;
- Human health, such as exposure to pathogens and nuisance concerns (noise and dust);
- Public welfare, such as exposure to safety risks and access to amenities; and
- Economic conditions, such as changes in employment, income, and the cost of housing.

Earlier resource sections of the EA, as appropriate, are referenced to determine whether a potential environmental justice consideration exists for this site.

Table 4-6 presents a summary of the potential impacts and environmental protection measures for the resources that could affect minority and low income populations. This table shows whether an impact may be caused by the Proposed Action, not whether low-income or minority populations are affected. The far right column of each table contains information on the potential for high and adverse impacts, and if there is such an impact, whether further site-specific review is necessary to determine whether the Project may result in disproportionately high and adverse impact on minority and low-income populations. See the preceding resources sections or a detailed analysis of all resource impacts.

TABLE 4-6
Summary of Potential Environmental Justice Impacts and Mitigations for the Proposed Action
Resilient St. Vrain Project EA

Element of Analysis	Impacts (Adverse and Beneficial)	Relevant Environmental Protection Measures[a]	Adverse Effects to be Reviewed Further
Socioeconomics	Beneficial impacts associated with improvement of Creek corridor.	--	No high adverse effect. Therefore, no further review is necessary.
Land Use and Community Cohesion	Complementary to future land use plans for the region.	--	No high adverse effect. Therefore, no further review is necessary.
	Beneficial impacts associated with improvement to trails and greenways.	--	No high adverse effect. Therefore, no further review is necessary.
	Beneficial impacts associated with floodplain reduction.		No high adverse effect. Therefore, no further review is necessary
	Direct impacts to residences and businesses needing to be relocated.	Relocations will be handled in accordance with the URA, to the extent the URA is applicable.	Potential adverse effect. Reviewed further below.
Health and Safety	Safety improvements related to the reduction of the floodplain.	--	No high adverse effect. Therefore, no further review is necessary.

Element of Analysis	Impacts (Adverse and Beneficial)	Relevant Environmental Protection Measures[a]	Adverse Effects to be Reviewed Further
Traffic and Transportation	Increased construction traffic.	A Construction Management Plan will be created and implemented.	No high adverse effect. Therefore, no further review is necessary.
Noise	Increased noise from construction.	Construction noise would be compliant with Longmont noise ordinances.	No high adverse effect. Therefore, no further review is necessary.
Hazardous Materials	Use of hazardous materials during construction.	Hazardous materials and wastes will be used, stored, disposed of, and transported during construction in compliance with all applicable laws and regulations.	No high adverse effect. Therefore, no further review is necessary.
Water Resources	Stormwater runoff during construction.	Implement erosion control BMPs during construction.	No high adverse effect. Therefore, no further review is necessary.
Air Quality and Climate Change	Short-term construction emissions of criteria pollutants, VOCs, GHGs, and fugitive dust. Emissions would be less than the federal *de minimis* thresholds.	Air quality BMPs will be implemented during construction.	No high adverse effect. Therefore, no further review is necessary.
	Potential benefits associated with reduced exposure to flooding.	--	No high adverse effect. Therefore, no further review is necessary.

[a] The environmental protection measures shown in this table represent the measures required to protect residents and individuals in and around the Project Area. Additional environmental protection measures are discussed in the preceding resource discussions.

4.13.3 Relocation/Displacement

Potential direct impacts from the Proposed Action include property acquisition and relocation of approximately 10 residences of St. Vrain Mobile Home Park. However, these relocations would mean removing 130 mobile home residences from high-risk flood areas and would result in a benefit to human health and public welfare to a predominantly low-income population. The Proposed Action would also protect more than 27,535 residents who currently live within the St. Vrain Creek floodplain.

The City will attempt to voluntarily relocate business owners and tenants consistent with requirements of the URA, as applicable. The potential relocations represent a potential adverse impact in a predominantly low-income neighborhood. However, these relocations would occur in an area that is currently at high risk during floods.

In the short term, residents would experience disruption of their normal routines and duress from changing residences. The City, to the extent required by the URA, would mitigate the potential disruption and duress by assuming reasonable costs of the relocation efforts. While the potential effects would be borne by a low-income population, the short-term relocation impacts are not considered high and adverse because the City's relocation process would substantially facilitate moving by compensating moving-related expenses, identifying relocation options, and tailoring essential services to individual needs.

4.13.4 Compliance with EO 12898

This environmental justice analysis and screening present anticipated impacts to minority and low-income populations to FEMA, the agency decision maker for the Project, with the purpose of informing its policy judgment and ultimate determination on whether a potential disproportionate impact exists that merits additional action (EPA, 2015b). This analysis finds that if the Proposed Action were implemented, the short-term impacts of relocation of residents and business would be borne by predominantly low-income populations. However, this impact is not high or adverse after considering several other factors, including the potential financial and other assistance under the URA, and the removal of the relocated homes from a

high flood hazard area. Additionally, the Proposed Action furthers the EO 12898 goal of reducing environmental health and safety risks to minority and low-income populations by constricting the floodplain through Longmont, and reducing flood hazards to mobile and low-income homes. Therefore, the Proposed Action does not result in high and adverse effects to minority and low-income populations.

4.14 Cumulative

Cumulative impacts are defined in the CEQ regulations implementing provisions of NEPA (CEQ 1508.7) 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."

The City has experienced steady population and economic growth over the last few decades. Past and ongoing major actions in the area were/are primarily associated with residential and commercial development and, development of supporting infrastructure such as roadways and utility systems, and response to the 2013 flood. Current and foreseeable future development projects within and in the vicinity of the Project Area are identified in various documents, including the Longmont Area Comprehensive Plan, Longmont Multimodal Transportation Plan, Longmont Roadway Plan, and the Longmont Parks, Recreation, and Trails Master Plan. The St. Vrain Blueprint was referenced in a number of comments during the DEA public comment period. The St. Vrain Blueprint was not considered as a cumulative activity because the Blueprint would serve as a planning document and aide in the response to future requests for development. The Blueprint itself would not result in activities which would affect the environment.

The primary current and foreseeable future projects identified in these documents involve various transportation system improvement projects (roads and railways), commercial development projects to enhance quality of life and stimulate economic development, residential/housing development projects, utility improvement projects, and recreational projects (parks, greenways, and open space). Foreseeable future projects associated with planned improvements to St. Vrain Creek to address damages incurred to habitats and infrastructure and increase community resiliency to flooding in the Project Area from the 2013 flood are identified in the St. Vrain Creek Watershed Master Plan (http://www.bouldercounty.org/flood/creek restoration/pages/stvraincreekmasterplan.aspx), this EA, and the City's Section 404 IP application for Phase 1 of the Project. These planned projects would primarily involve repair and restoration of infrastructure (roads, bridges, utility systems, trail and park features, and water flow structures), and surface water, wetland, and riparian habitats.

Due to the increased population growth, maintaining a stable supply of water has been of increased concern along Colorado's Front Range. The Windy Gap Firming project proposes the construction of a reservoir to store water for delivery via the Colorado-Big Thompson East Slope distribution system to multiple users, including the City of Longmont. An Environmental Impact Statement (EIS) was completed and Record of Decision issued by the Bureau of Reclamation on December 19, 2012. According to the EIS streamflow increases resulting from the proposed Windy Gap project into St. Vrain Creek are limited to occasional overflow and maintenance activities, and are unlikely to substantially alter stream morphology or the rate of sediment transport. The increased flows would be small compared to the typical spring and early summer flows and would be well within the capacity of the stream channel. It would be difficult to measurably differentiate changes to stream morphology and sedimentation from the many other ongoing actions influencing streamflow conditions in St. Vrain Creek. For these reasons the Windy Gap Firming project was not included as a cumulative activity in this analysis.

4.14.1 Water Resources

The Proposed Action would have dredge and fill impacts on jurisdictional wetlands and surface waters, negligible impacts on groundwater, and beneficial impacts on the floodplain. The proposed activities have been designed to have overall beneficial impacts on water resources through restoration and enhancement

of wetland vegetation, improvements in wetland/stream hydrology and water quality, and reduction of erosion, sedimentation, and flooding extents. The majority of other foreseeable future development projects within and in the vicinity of the Project Area not associated with the 2013 flood would occur within or adjacent to developed areas and; therefore, they are expected to have negligible/minor impacts or no effect on water resources. All unavoidable impacts to jurisdictional wetlands/waters under the Proposed Action and those incurred by other projects within and in the vicinity of the Project Area would be offset by compensatory mitigation per CWA regulations, resulting in no net loss of these resources.

The Proposed Action and all other proposed projects would also implement BMPs and engineering controls to prevent and minimize indirect impacts on water resources. For these reasons, the Proposed Action is not expected to have significantly adverse cumulative impacts on water resources.

4.14.2 Biological Resources

The Proposed Action would temporarily disturb vegetation, fish, and wildlife, and would have negligible impacts on the habitats of threatened and endangered species that potentially occur in the Project Area. However, the proposed activities have been designed to have overall beneficial impacts on biological resources, including potentially occurring threatened or endangered species through restoration of wetland and riparian vegetation, installation of fish passages, improvements in water quality, and reduction of erosion, sedimentation, and flooding extents. The majority of other foreseeable future development projects within and in the vicinity of the Project Area not associated with the 2013 flood would occur within or adjacent to developed areas and, therefore, are expected to have negligible/minor impacts or no effect on biological resources. All natural habitats disturbed under the Proposed Action and by other projects within and in the vicinity of the Project Area would be restored per city, state, and federal regulations. The Proposed Action and all other proposed projects would also implement BMPs to prevent and minimize indirect impacts on biological resources. For these reasons, the Proposed Action is not expected to have significantly adverse cumulative impacts on biological resources.

4.14.3 Land Use and Community Cohesion

The Proposed Action would have no effect on current land use designations within or in the vicinity of the Project Area. Many of the components of the Proposed Action would complement the future land use goals identified in the Longmont Area Comprehensive Plan. Construction activities under the Proposed Action would have minor, short-term impacts on community cohesion. When coupled with potential concurrent construction from other projects, construction under the Proposed Action is not expected to result in major disruptions to public use of community resources. The Proposed Action would increase the amount of recreational trails, parks, and natural areas available to the community and, therefore, would have a long-term, beneficial impact on community cohesion. Positive cumulative impacts on community cohesion would result when the Proposed Action is combined with recreational improvements of other projects. A number of residents of the St. Vrain Mobile Home Park and a few businesses would be relocated during Phase 2 of the Proposed Action. There were also voluntary relocations of residents of the Royal Mobile Home Park as a direct response to the 2013 flood and associated damage to those homes. However, there would be no cumulative impacts from these activities as the relocations involve separate communities. For these reasons, the Proposed Action is not expected to have significantly adverse cumulative impacts on land use or community cohesion.

4.14.4 Health and Safety

Construction activities under the Proposed Action and other projects in the Project Area would have inherent occupational health and safety hazards that would be mitigated through standard worker protection measures. The Proposed Action would not result in health and safety risks that would disproportionately affect children. The Proposed Action would decrease the potential impact of future floods on the City and surrounding areas and, therefore, would have long-term beneficial impacts on public health and safety. Other projects within and in the vicinity of the Project Area not associated with the 2013 flood are

expected to have either no effect or beneficial impacts on future flooding in the area. For these reasons, the Proposed Action is not expected to have significantly adverse cumulative impacts on health and safety.

4.14.5 Socioeconomics

The Proposed Action would have long-term beneficial impacts on socioeconomics within and in the vicinity of the Project Area through increases in property values, improvements in the transportation system and emergency services, increases in employment and economic growth, expansion of recreational opportunities, and improvements in the quality of life of residents in the area. Many other planned projects within and near the Project Area not associated with the 2013 flood would also have similar positive impacts on these socioeconomic factors. For these reasons, the Proposed Action is not expected to have significantly adverse cumulative impacts on socioeconomics.

4.14.6 Transportation

The Proposed Action would have short-term, temporary impacts on traffic during the construction period. Any cumulative impacts on traffic levels in and around the Project Area that may result from other construction activity that occurs concurrently with construction under the Proposed Action would be temporary and not expected to be significantly adverse. The Proposed Action would involve repair/restoration of trails and bridges in the Project Area. The Proposed Action would also decrease roadway flooding during storm events, which would have a positive impact on transportation functions during storm conditions. When coupled with ongoing and planned transportation improvement projects identified in the Longmont Multimodal Transportation Plan and Longmont Roadway Plan, the Proposed Action would have positive cumulative impacts on the transportation system within and in the vicinity of the Project Area. For these reasons, the Proposed Action is not expected to have significantly adverse cumulative impacts on transportation.

4.14.7 Cultural Resources

The Proposed Action would have moderate long-term impacts to cultural resources. However, each of these resources is considered discrete, and it is unexpected that other ongoing and foreseeable future development projects would also effect the resources impacted by the Proposed Action. For these reasons, the Proposed Action is not expected to have significantly adverse cumulative impacts on cultural resources.

4.14.8 Geology

The Proposed Action would have a negligible impact on geology and minor, short-term impacts on soils in the Project Area during the construction period. Potential impacts on soils from ongoing and foreseeable future development projects in the Project Area would be comparable, and no adverse cumulative impacts to soils are expected to result from the combination of these projects and the Proposed Action. A number of the proposed Project components have been designed to directly and indirectly prevent and minimize soil erosion, and restore areas that have been impacted by erosion and sedimentation. Various temporary BMPs and engineering controls would be implemented during the Proposed Action and other planned projects in the area to prevent and minimize erosion and sedimentation. For these reasons, the Proposed Action is not expected to have significantly adverse cumulative impacts on geology or soils.

4.14.9 Hazardous Materials and Waste

Use of hazardous materials, generation of hazardous and solid waste, and dewatering during construction under the Proposed Action and during other planned construction projects in the Project Area would be conducted in accordance with all applicable regulations and, therefore, are not expected to result in associated adverse cumulative impacts. The Proposed Action and other foreseeable future projects would not be conducted within or in the immediate vicinity of known hazardous waste sites. If any previously unidentified hazardous waste site is encountered during any of the projects, construction would cease and CDPHE would be notified. For these reasons, the Proposed Action is not expected to have significantly adverse cumulative impacts on hazardous materials and waste.

4.14.10 Air Quality

The Proposed Action would result in short-term construction emissions of criteria pollutants, VOCs, GHGs, and fugitive dust (non-toxic particulate matter). Predicted annual construction emissions would be less than the federal *de minimis* thresholds for criterial pollutants and VOCs, and well below the reference point for quantitative analysis and disclosure of GHGs. Air emissions from other foreseeable future development projects within and in the vicinity of the Project Area are expected to be temporary, intermittent, and minor; therefore, significantly adverse cumulative impacts are not expected from potential concurrent emissions from the Proposed Action and other planned projects. Fugitive dust would be required to be controlled via state regulations during the Proposed Action and other planned projects. For these reasons, the Proposed Action is not expected to have significantly adverse cumulative impacts on air quality or GHGs.

4.14.11 Noise

The Proposed Action would generate construction noise that would be perceptible by receptors near the construction sites. Construction noise would be temporary and intermittent, and would be in compliance with the City's noise ordinance. Construction noise from other foreseeable future development projects within and in the vicinity of the Project Area would also be required to comply with the City's noise ordinance; therefore, significantly adverse cumulative impacts are not expected from potential concurrent construction noise from the Proposed Action and other planned projects. For these reasons, the Proposed Action is not expected to have significantly adverse cumulative noise impacts.

4.14.12 Utilities

The Proposed Action would have moderate, short-term impacts on utilities during the construction period primarily via utility relocations and potential utility service interruptions. Planned outages would be avoided to the extent possible; however, if outages are necessary, advanced notice would be provided to all utility customers. Public utilities would be located prior to or during construction and the City would coordinate construction activities with utility companies. Potential impacts on utilities from other foreseeable future development projects in the Project Area not associated with the 2013 flood would be comparable and mitigated in a similar manner. A number of these projects specifically involve utility improvements and, therefore, would have an overall positive impact on utilities in the area. For these reasons, the Proposed Action is not expected to have significantly adverse cumulative impacts on utilities.

Based on the analysis conducted, when added to past, present, and reasonably foreseeable actions, the Proposed Action is not expected to have significantly adverse cumulative impacts on any resource.

4.14.13 Environmental Justice

The Proposed Action would not result in a disproportionately high and adverse effect on minority or low-income populations and complies with EO 12898. Cumulative resource impacts that would affect minority and low-income populations are discussed in the preceding sections and none would result in a significantly adverse cumulative impact. Therefore, no cumulative impacts are expected to result in a significantly adverse effect on minority or low-income populations.

SECTION 5

Summary

Table 5-1 compares the impacts to environmental resources analyzed in this EA for the No Action Alternative and the Proposed Action.

TABLE 5-1
Comparison of Environmental Impacts and Environmental Protection Measures
Resilient St. Vrain Project EA

No Action Alternative	Proposed Action	Environmental Protection Measures
Water Resources		
– No benefits to water resources via restoration and enhancement of wetland vegetation. – No benefits to water resources via improvements in wetland/ stream hydrology and water quality. – No benefits to water resources via reduction of erosion, sedimentation, and flooding extents.	– Dredge and fill impacts to jurisdictional wetlands and waters. – Beneficial impact on wetlands, including restoration and enhancement of wetland vegetation, improvements in wetland hydrology and water quality, and reduction of erosion and sedimentation in wetlands. – Beneficial impact on surface waters, including improvements in stream hydrology, morphology, and water quality, and reduction of erosion, sedimentation, and flooding potential. – Beneficial impact on floodplains via reduction of flooding extents and improvement of impacted floodplain functions.	– A CWA Section 404 IP will be obtained from USACE. – Compensatory mitigation will be provided for unavoidable impacts to jurisdictional wetlands and waters. – A Stormwater Construction Permit will be obtained from CDPHE. – A SWMP will be developed and implemented. – BMPs and engineering controls will be implemented during construction to avoid and minimize erosion, sedimentation, and pollution impacts on water resources. – Impact to groundwater wells will be avoided and minimized to the extent practicable. – A CLOMR will be obtained from FEMA for potential changes to the FIRM
Biological Resources		
– No benefits to biological resources via restoration and enhancement of wetland and riparian vegetation. – No benefits to biological resources via improvements in the water quality of aquatic habitats. – No benefits to biological resources via reduction of erosion, sedimentation, and flooding potential that would benefit aquatic biota.	– Benefits to habitat and fish and wildlife via restoration of wetland and riparian vegetation, installation of fish passages, improvements in water quality, and reduction of erosion, sedimentation, and flooding extents. – Temporary impacts to vegetation from construction. – Removal of some trees within the Project Area. – Temporary disturbance to fish and wildlife during construction. – Negligible impact to threatened or endangered species that potentially occur in the Project Area.	– Areas disturbed by construction will be revegetated. – A Noxious Weed Management Plan will be implemented. – A SWMP will be created and implemented. – City requirements for tree preservation will be followed. – Consultation with USFWS under Section 7 of the ESA. – Obtain SB40 certification from CPW. – An APP will be developed and implemented – Vegetation removal will occur outside the nesting season, preconstruction surveys will be conducted during nesting, and seasonal restrictions around hawk and eagle nests will be implemented. – Construction contractors will adhere to the requirements in the City's Wildlife Management Plan

No Action Alternative	Proposed Action	Environmental Protection Measures
Land Use and Community Cohesion		
– No change to current conditions. – Continued community exposure to high-risk flood events.	– Benefits due to furthering of the Longmont Area Comprehensive Plan goals. – Benefits to community cohesion from increased green space and reduced exposure to flooding. – Disturbance to communities during construction. – Impacts associated with relocation of homes and businesses.	– Construction will occur primarily during weekdays and normal working hours. – All relocations will be handled in accordance with the URA.
Health and Safety		
– Continued community exposure to high-risk flood events.	– Benefits due to decreased flood risk. – Occupational health hazards associated with construction activities.	– Use of PPE by construction workers. – A Project-specific health and safety plan will be created and implemented. – All construction areas will be clearly marked.
Socioeconomics		
– Continued community exposure to socioeconomic impacts associated with flood events.	– Benefits due to improved economic conditions.	– N/A
Transportation		
– Continued degradation of trails and roadways.	– Impacts due to increased construction traffic. – Temporary impacts to traffic during bridge reconstruction. – Increased transportation system reliability and safety during a future flood.	– Detour information will be available on Longmont's "Cone Zone" and Resilient St. Vrain websites.
Cultural Resources		
– Risk to historic resources from future flooding events.	– Direct impacts to historic resources eligible for listing on the NRHP.	– No construction activities will occur in the vicinity of NRHP eligible or listed sites until the MOA is signed by consulting parities and the ACHP. – Stop work in the vicinity of any inadvertent discoveries and contact Tribal Historic Preservation Officer
Geology		
– High potential for soil erosion and sedimentation during future floods.	– Soil disturbance during construction activities.	– Implementation of BMPs to control erosion and sedimentation during construction. – Creation and implementation of a SWMP.
Hazardous Materials and Waste		

No Action Alternative	Proposed Action	Environmental Protection Measures
– No change to current conditions.	– Use of hazardous materials during construction. – Potential impacts to existing hazardous waste sites. – Generation of solid waste during construction. – Exposure to groundwater contamination during dewatering.	– Any unused or stored hazardous material will be handled in accordance with federal, state, and local laws and regulations. – Hazardous wastes if encountered will be disposed of at the HMMF. – Construction sites will be sampled for the presence of hazardous materials. If identified, a treatment plan will be created and implemented. – If previously unidentified hazardous waste sites are found, CDPHE will be notified. – A SWMP will be created and implemented. – All solid wastes will be disposed of appropriately at the local landfill. – CDPHE permits regarding dewatering will be obtained and followed.
Air Quality and Climate Change		
– No change to current air quality conditions or GHG emissions. – Increased susceptibility to increased flooding associated with climate change.	– Improved resiliency toward potential flooding associated with climate change – Short-term construction emissions of criteria pollutants, VOCs, GHGs, and fugitive dust (non-toxic particulate matter). – Predicted annual construction emissions would be less than the federal *de minimis* thresholds for criteria pollutants and VOCs. – Construction is estimated to generate well below 25,000 metric tons of CO_{2e}, the suggested reference point per revised draft CEQ guidance for quantitative analysis and disclosure of GHG emissions.	– Fugitive dust will be controlled by measures prescribed in 5 CCR 1001-3 and implementation of a Dust Control Plan.
Noise		
– No change to current conditions.	– Increased noise during construction.	– All construction activities will comply with the City of Longmont Noise Ordinance (City of Longmont, 2015h).
Utilities		
– Potential impacts during future flood events.	– Relocation of existing utility infrastructure. – Potential disruptions to utility service during construction.	– Planned outages will be avoided to the extent possible. – If planned outages are necessary, utility customers will be given advanced notice. – To avoid accidental outages, utilities within the Project Area will be located prior to construction. – The City will coordinate construction activities with utility companies.

No Action Alternative	Proposed Action	Environmental Protection Measures
Environmental Justice		
– Continued exposure by minority and low-income populations to health and safety risks associated with flood events.	– Disturbance to communities due to relocation. – Benefits due to reduced flood risks.	– Relocations will be handled in accordance with the URA.

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SECTION 6

Consultation and Coordination

6.1 Distribution List

FEMA
EPA
USFWS
Colorado SHPO
CPW
City of Longmont
USACE

6.2 Individuals Consulted

Richard Myers	FEMA
Portia Ross	FEMA
Kim Shugar	City of Longmont
Nick Wolfrum	City of Longmont
Brad Schol	City of Longmont

6.3 Agencies Consulted

USFWS
Colorado SHPO
USACE
CPW

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SECTION 7

List of Preparers

The following individuals contributed to the preparation of this EA.

TABLE 7-1
List of Preparers
Resilient St. Vrain Project EA

Name	Role	Education	Years of Experience
Kyle Hamilton	Project Manager	M.S. Civil Engineering B.S. Civil Engineering	20
Michelle Rau	NEPA Task Manager/Lead Author	M.B.A. B.S. Ecology and Evolutionary Biology	18
Harold Copeland	Lead Technical Review	M.S. Zoology-Aquatic Ecology B.S. Fishery Biology	26
Paul Thies	Senior Technical Review	Ph.D. Civil and Environmental Engineering M.S. Water Resources B.S. Forestry	36
Tunch Orsoy	Senior NEPA Support Water Resources Lead	M.S. Marine Science B.S. Zoology	26
Sara Orton	Cultural Resource Senior Review Qualified Architectural Historian	M.S. Preservation Studies B.A. Political Science	28
Richard Zeroka	Senior NEPA Support	M.A. Energy and Environmental Studies B.A. Ecology B.A. Physical Geography	24
Becky Moores	Biology Lead	B.S. Biology	10
Laura Dreher	Transportation Lead	B.S. Civil Engineering	14
Ronald Vaughn	Air Quality Lead	M.S. Environmental Engineering B.S. Chemical Engineering	25
Christina McDonough	Land Use and Hazardous Materials Lead	M.E. Environmental Engineering B.S. Civil Engineering	20
Tom Cheney	Lead Technical Editor	B.A. English Literature	39

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SECTION 8

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Appendix A
Scoping Comments Matrix and Public Outreach

Please See Attached DVD

Appendix B
Clean Water Act 404 Application

Please See Attached DVD

Appendix C
Endangered Species Act Section 7 Consultation

Please See Attached DVD

Appendix D
EDR Reports

Please See Attached DVD

Appendix E
Ambient Criteria Pollutant Concentrations

Please See Attached DVD

Appendix F
ACAM Report

Please See Attached DVD

Appendix G
ACAM Assumptions

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Appendix H
NHPA Section 106 Consultation Documents

Please See Attached DVD

Appendix I
Senate Bill 40 Statute

Please See Attached DVD

Appendix J
EJSCREEN Report

Please See Attached DVD

Appendix K
Response to Public on the DEA

Please See Attached DVD

Appendix L
EO 11988 and EO 11990 8-Step Decision-making Process

Please See Attached DVD