



Draft Environmental Assessment

Long-Term Sustainability for Provo's Water Supply

EMD-2021-BR-063-0001

Provo City, Utah County, Utah

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FEMA

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Acronyms and Abbreviations

AADT	annual daily traffic
APE	Area of Potential Effect
AF	Acre-feet
ASR	aquifer storage recovery
BMPs	Best Management Practices
BRIC	Building Resilient Infrastructure and Communities
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
CUWCD	Central Utah Water Conservancy District
CWA	Clean Water Act
DAHP	Department of Archaeology and Historic Preservation
dBA	A-weighted decibels
DBH	diameter at breast height
EA	environmental assessment
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FIRM	flood insurance rate map
FONSI	finding of no significant impact
HDPE	high-density polyethylene
JSRIP	June Sucker Recovery Implementation Program

MBTA	Migratory Bird Treaty Act
MGD	million gallons per day
msl	mean sea level
NAAQS	National Ambient Air Quality Standards
NATA	National Scale Air Toxics Assessment
NEPA	National Environmental Policy Act
PM _{2.5}	fine particulate matter less than 2.5 micrometers in diameter
PM ₁₀	particulate matter that is less than 10 micrometers in diameter
TMDLs	Total Maximum Daily Loads
USACE	United States Army Corps of Engineers
U.S.C.	United States Code
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UST	Underground Storage Tank
Utah DEQ	Utah Department of Environmental Quality
WTP	water treatment plant
YBCU	yellow-billed cuckoo

SECTION 1. Introduction

Provo City proposes to construct an aquifer storage recovery (ASR) system in Provo City, Utah County, Utah (**Figure 1-1**). Provo applied to the Federal Emergency Management Agency (FEMA) through the Utah Division of Emergency Management for a grant under FEMA’s Building Resilient Infrastructure and Communities (BRIC) grant program. Utah Division of Emergency Management is the direct applicant for the grant, and Provo City is the Subapplicant. The BRIC grant program is authorized under Section 203 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 United States Code (U.S.C.) 5133, as amended by the Disaster Recovery Reform Act of 2018.

The proposed project is to construct an ASR system, which would include construction of a new water treatment plant (WTP) and approximately 9,000 feet of new piping infrastructure, along with a new booster pump station (**Figure 1-2**). The water would be diverted from the Provo River, treated to drinking water standards, and piped to Rock Canyon Creek using a combination of new and existing municipal infrastructure. The water would be discharged as surface water into an existing natural stream channel to replenish the aquifer. Water diverted from the Provo River and treated at the WTP may also be used directly in the City’s municipal water system instead of using groundwater supplies, thus keeping groundwater in the aquifer and increasing community resilience against future drought.

FEMA prepared this environmental assessment (EA) in accordance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) regulations to implement NEPA (40 Code of Federal Regulations [CFR] Parts 1500–1508), and FEMA guidance for implementing NEPA (U.S. Department of Homeland Security Instruction 023-01-001 and FEMA Instruction 108-01-1). FEMA is required to consider potential environmental impacts before funding or approving actions and projects. The purpose of this EA is to analyze the potential environmental consequences of the proposed project and alternatives, including a no action alternative. FEMA used the findings in this EA to determine whether to prepare an environmental impact statement or to issue a finding of no significant impact (FONSI).

In accordance with CEQ regulations implementing NEPA (40 CFR Part 1501.8), FEMA sent formal requests to multiple federal agencies to become cooperating agencies for the planning and development of the EA on January 11, 2023. All of the agencies were identified as having special expertise or jurisdiction by law related to the project. The following agencies accepted FEMA’s invitation to act as a cooperating agency:

- U.S. Bureau of Reclamation, Provo Area Office
- Central Utah Project Completion Act Office
- Utah Reclamation Mitigation and Conservation Commission
- Central Utah Water Conservancy District (CUWCD)
- U.S. Environmental Protection Agency (EPA) Region 8
- U.S. Fish and Wildlife Service (USFWS), Utah Ecological Services Field Office

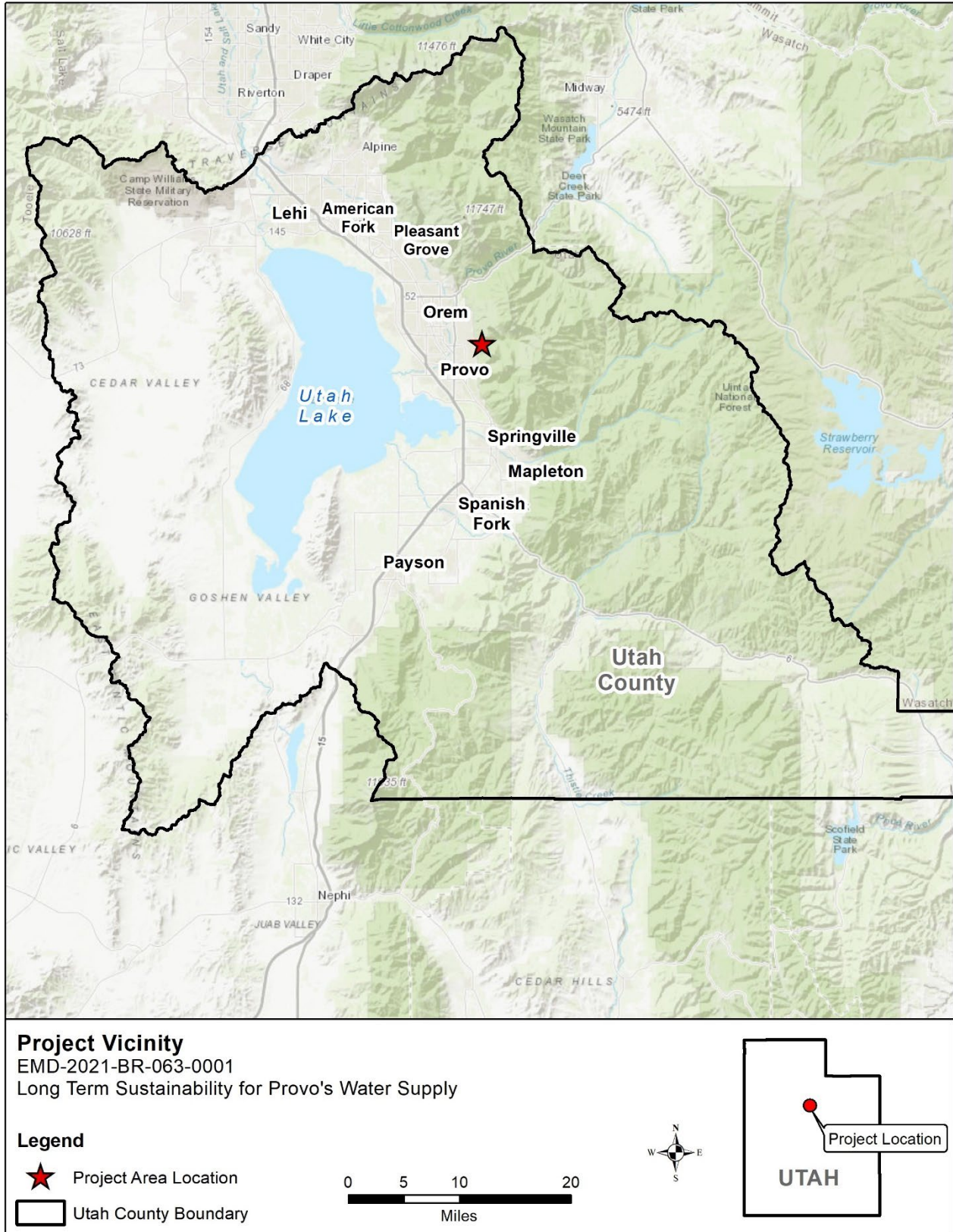


Figure 1-1. Project Vicinity

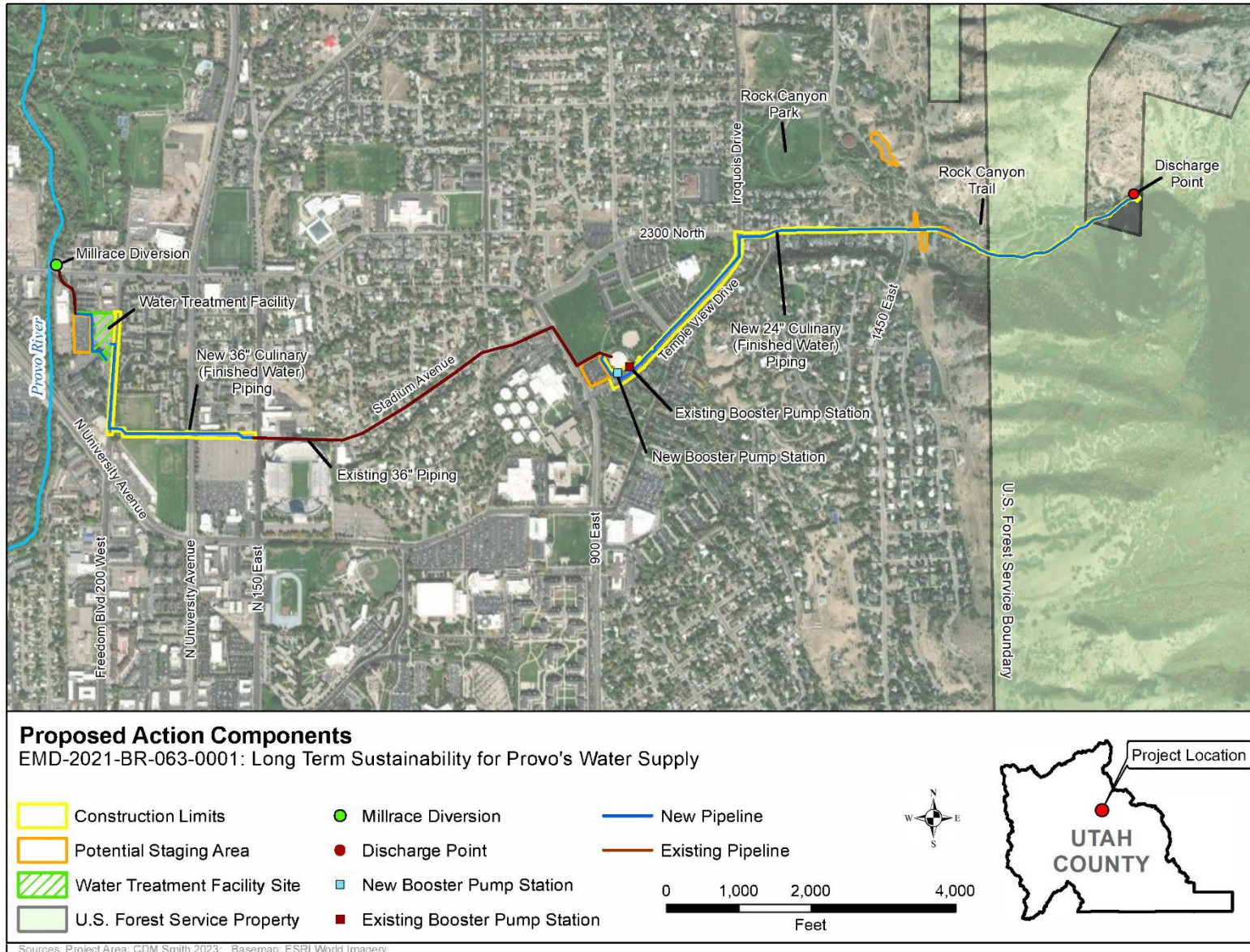


Figure 1-2. Proposed Action Components

SECTION 2. Purpose and Need

FEMA's BRIC Program provides funds to eligible state and local governments and federally recognized tribes to implement natural hazard mitigation projects that are cost-effective and designed to reduce injuries, loss of life, and damage and destruction of property. The objective of the BRIC program is to shift the federal focus away from reactive disaster spending and toward research-supported proactive investment in community resilience to reduce overall risk to the population and structures from future hazard events. Specifically, the purpose of the proposed BRIC project is to create a sustainable water supply for Provo to mitigate the effects of long-term drought and build resilience by increasing the City's reliable water supply year-round, including during times of drought.

The proposed project is needed to provide long-term sustainability of Provo's water supply and mitigate the impacts from drought currently affecting all Provo residents and surrounding communities who share the aquifer.

2.1. Background

Utah is the second driest state in the country, with annual precipitation averaging 13 inches. The National Drought Mitigation Center identifies areas in drought and labels them according to intensity—normal conditions, abnormally dry (D0), moderate (D1), severe (D2), extreme (D3), and exceptional (D4). Several inputs are used to classify drought intensity, including precipitation, streamflow, reservoir levels, temperature and evaporative demand, soil moisture, and vegetation health. According to the National Drought Mitigation Center (2023), Utah County has experienced several extreme droughts (drought intensity category D3) and, in 2021, an exceptional drought (drought intensity category D4). **Figure 2-1** shows historical drought conditions in Utah.

Based on a drought analysis prepared by Provo using the Standard Precipitation Index and Palmer Drought Severity Index, the occurrence of moderate, severe, and extreme drought in Provo has increased in the past 10 years compared to the 72-year period of record. The drought analysis also considered the potential impact of climate change on Provo's water supply using EPA's national stormwater calculator tool. Climate change is a change in the state of the climate that can be identified by changes in the mean and/or variability of its properties and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings such as modulations of the solar cycles, volcanic eruptions, and persistent human-driven changes in the composition of the atmosphere or in land use (U.S. Global Change Research Program 2022). The results showed that under the hot/dry climate change scenario, there is a significant increase in the estimated drought return periods when compared to historical conditions without climate change considerations. It is expected that, as a result of climate change, drought will occur more frequently (approximately 1.5 to 2 times more likely) and be more severe than it has in the past (Provo City 2021).

During droughts there is a risk of shortages of water in reservoirs, streams, and groundwater wells, which subsequently lead to water emergencies. Governor Spencer J. Cox issued an Executive Order

(EO) on March 17, 2021, declaring a state of emergency due to drought, and a second EO on May 3, 2021, requiring water conservation at state facilities. Many communities in Utah County rely on surface water reservoirs, such as Deer Creek Reservoir and Jordanelle Reservoir, as well as Utah Lake. This surface water is subject to evaporation and, according to a 2022 study, long-term average lake evaporation has increased from 1985 to 2018, mostly due to an increasing evaporation rate from increased average temperatures, decreasing lake ice coverage, and increasing lake surface area. The study also found that while reservoirs account for only 5 percent of the global lake storage capacity, they contribute 16 percent to the evaporation volume (Zhao et al. 2022).

Provo's drinking water comes predominantly from springs and groundwater wells with a small supply from CUWCD. Prolonged drought conditions have impacted the groundwater levels in the aquifer used by Provo, thus requiring increased pumping and stresses on the aquifer supply. Provo's water well levels have dropped as much as 60 feet over the past 40 years. Large amounts of groundwater withdrawal can lead to land subsidence, which is a gradual settling or sudden sinking of the land-surface elevation due to the loss of water pressure in the supporting aquifer. This can result in a permanent reduction in the total storage capacity of the aquifer system as the soil and rocks within the aquifer settle and compact (United States Geological Survey [USGS] 2018a).

In addition to drought, according to the USGS National Seismic Hazard Map, the project is within an area designated as severe/violent for groundshaking (Utah Geologic Survey 2020). Currently, a single concrete pipeline conveys the water from the springs in Provo Canyon to the City's distribution system. The pipeline supplies approximately 50 to 60 percent of the City's water supply. If the pipeline were to be damaged during a seismic event, the City would be cut off from this water supply.

Historical Drought Conditions in Utah

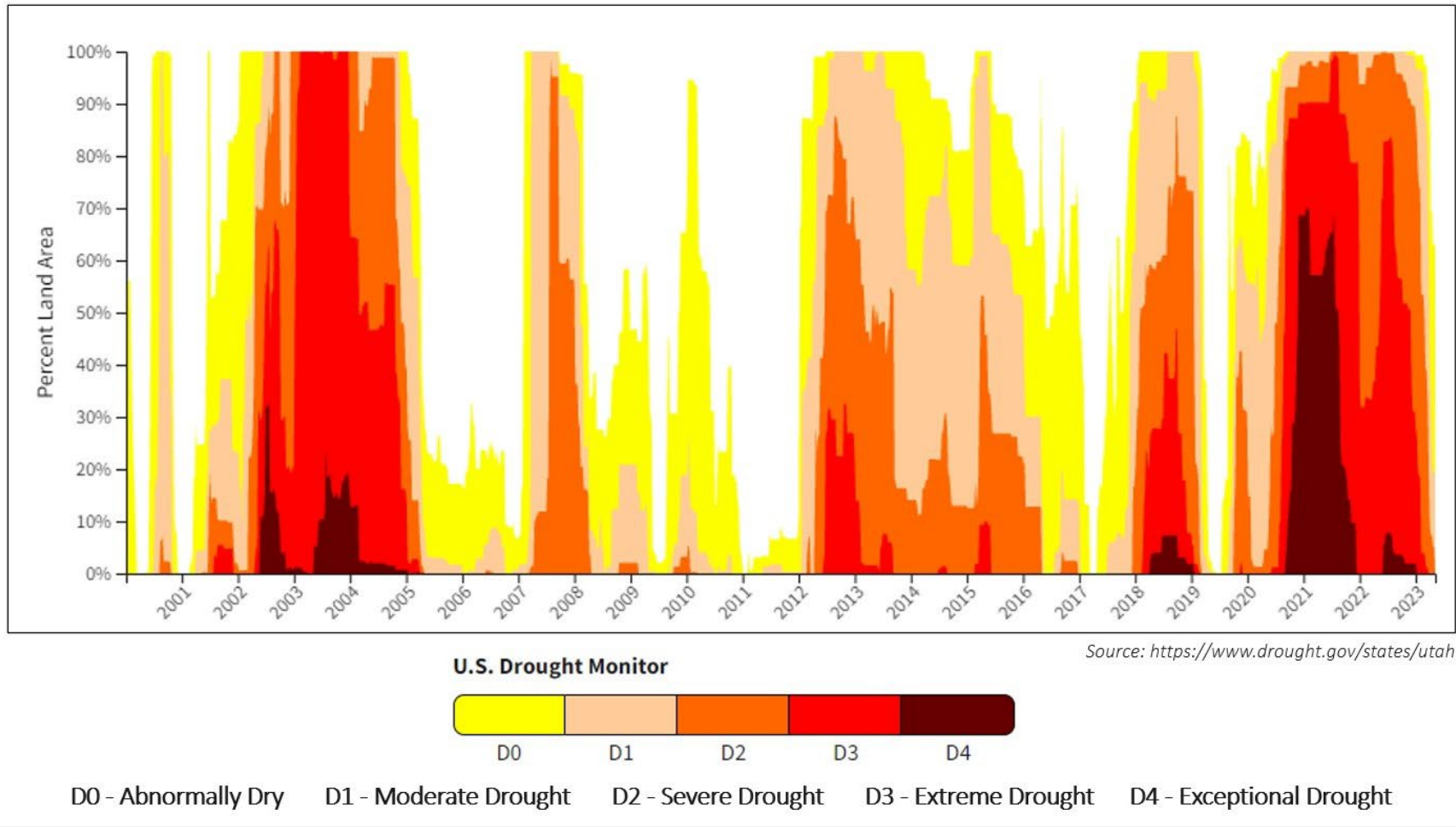


Figure 2-1. Historical Drought Conditions in Utah

SECTION 3. Alternatives

This section describes the no action alternative, the proposed action, and alternatives that were considered but dismissed.

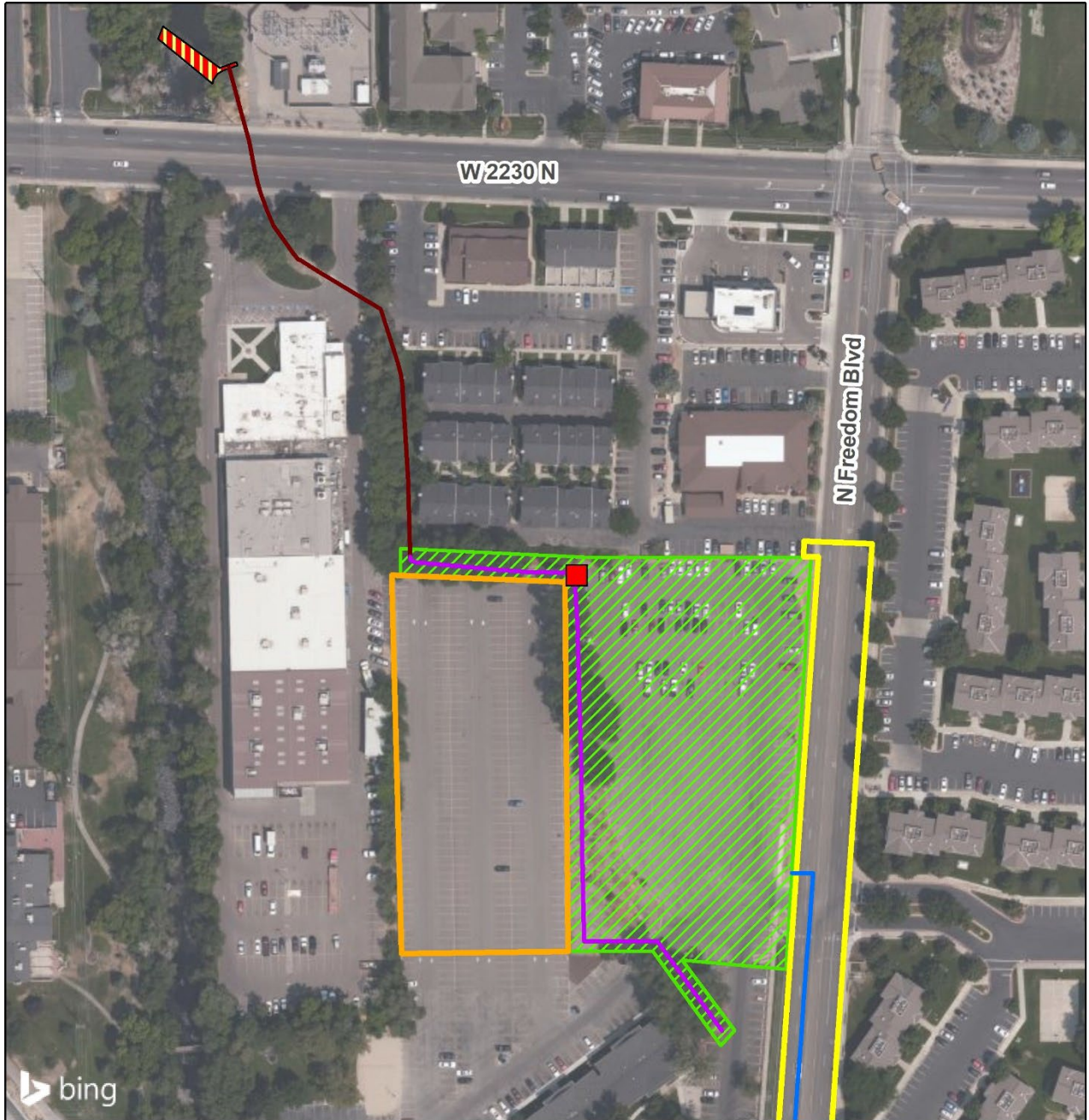
3.1. No Action Alternative

Under this alternative, the ASR system and WTP would not be constructed to reduce the impacts of drought. Provo would continue efforts to mitigate the effects of drought, including continuing its comprehensive water conservation program, landscape conservation programs and incentives, reclaimed water use, and use of advanced irrigation technology. However, these efforts have largely been implemented to their maximum potential and have a limited ability to continue to improve drought resiliency and water supply reliability. Because current drought hazards in the project area may not be substantially reduced under the no action alternative, the probability of reduced water supply reliability in the event of a drought would continue to be high and the community would continue to be vulnerable. Under the no action alternative, the project area would continue to rely on surface reservoirs and overused regional aquifers, while not proactively managing the groundwater system.

3.2. Proposed Action

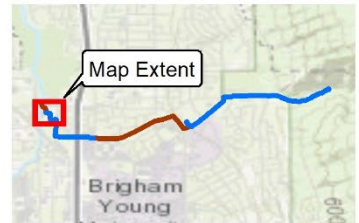
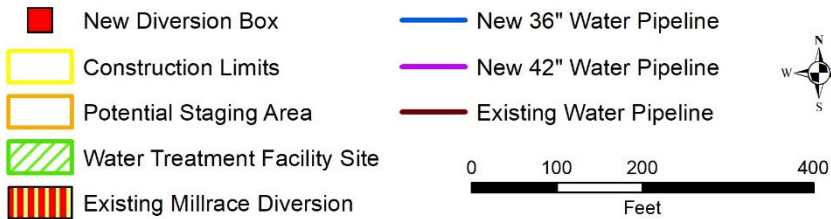
Provo City proposes to construct an ASR system in northeastern Utah County. The ASR system would use an existing diversion structure—known as the Mill Race Diversion—to divert water from the Provo River (**Figure 3-1**). Raw water would be conveyed to a new WTP via existing pipes, treated to drinking water standards, and pumped through a combination of new and existing pipes in the City’s water distribution system to be discharged into Rock Canyon Creek, an ephemeral stream that is well connected to the local aquifer system. Once discharged, water would infiltrate into the ground and recharge the aquifer.

The new WTP would be located near the intersection of Freedom Boulevard and West 2230 North and would be sized to treat 30 million gallons per day (MGD) (equivalent to approximately 46 cubic feet per second [cfs]). Approximately 2,850 feet of new 36-inch-diameter pipe would be installed from the proposed WTP, traversing south along Freedom Boulevard, and then traversing east across the Brigham Young University Stadium parking lot to the intersection of North 150 East and Stadium Avenue. The new pipe would connect to an existing 36-inch-diameter pipe that runs from North 150 East to an existing water tank and booster pump station on Temple View Drive (**Figure 3-2**). The existing booster station would remain in service while a new expanded booster pump station would be built approximately 100 feet southwest of the existing booster station. The existing booster station is necessary for redundancy and would remain operational for the foreseeable future. From the new booster pump station, approximately 6,400 feet of new 24-inch-diameter pipe would be installed northeast along Temple View Drive, east along East 2300 North Street, and traverse into Rock Canyon to a discharge point in Rock Canyon Creek (**Figure 3-3**).



Point of Diversion

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Sources: Project Area: CDM Smith 2023; Basemap: Bing Aerial Imagery from Microsoft

Figure 3-1. Mill Race Diversion and Water Treatment Plant Site



Figure 3-2. Proposed Booster Pump Station

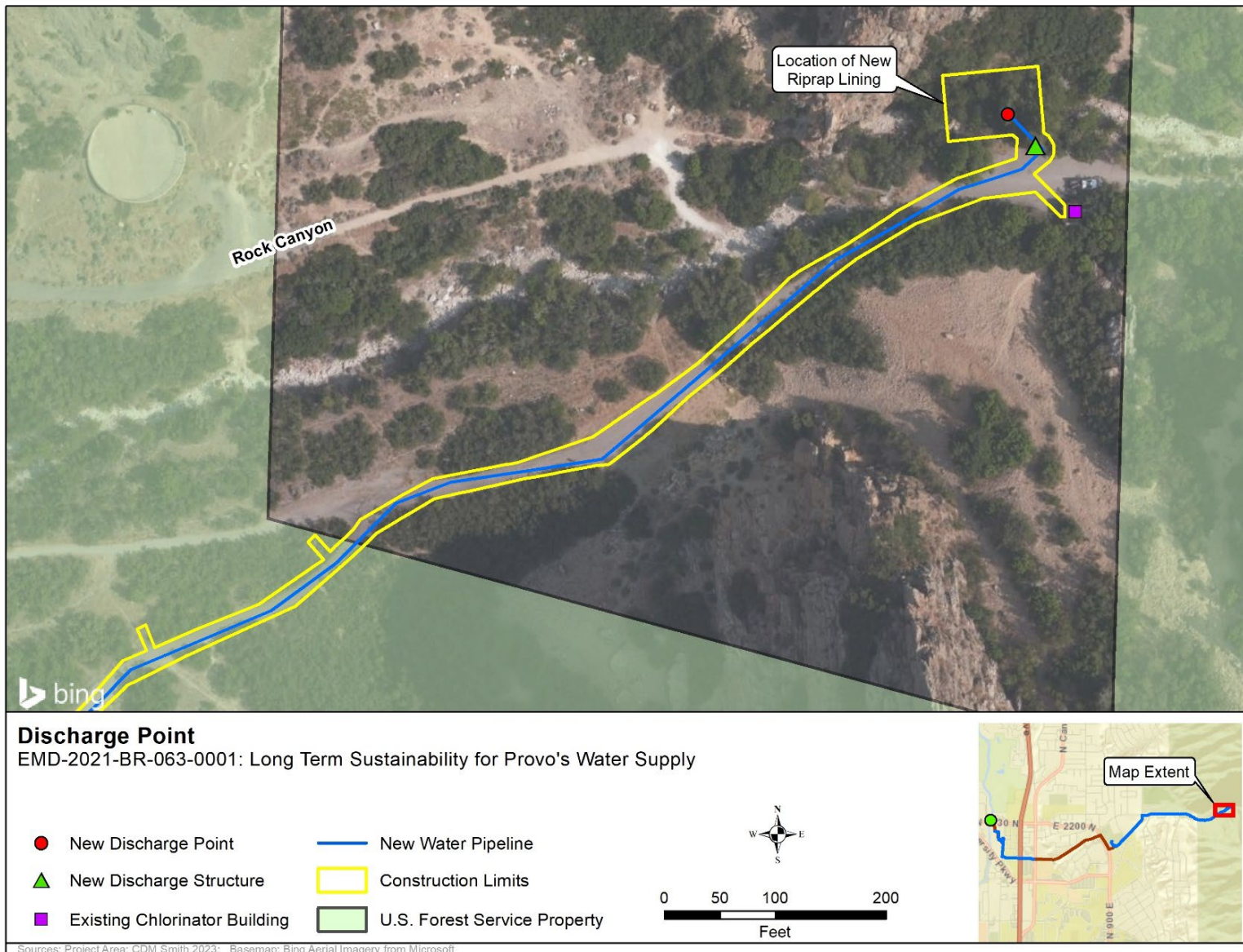


Figure 3-3. Rock Canyon Discharge Point

3.2.1. PROJECT ELEMENTS

Mill Race Diversion and New Distribution Line Installation

Raw water for the WTP would be diverted from the Provo River at the existing Mill Race Diversion. This diversion would not require any modification prior to its use under the proposed action. From the diversion, an existing 42-inch-diameter high-density polyethylene (HDPE) pipe would be used to convey water to the northwest corner of the Raintree Commons Apartments' parking lot. Approximately 180 feet of new 42-inch-diameter HDPE pipe would be constructed from the end of the existing pipeline to a new diversion box in the northwest corner of the WTP site. A section of the existing Mill Race pipeline would be replaced with approximately 500 feet of new 42-inch-diameter reinforced concrete pipe would continue south from the diversion box for stormwater management and would reconnect to the existing Mill Race pipeline and stormwater system (**Figure 3-1**). Once at the WTP, the raw water would be treated to drinking water standards. From the WTP site, approximately 2,850 feet of new 36-inch-diameter ductile iron pipe, with two small sections of 36-inch diameter welded steel pipe, would be installed traversing south along Freedom Boulevard and east across the Brigham Young University Stadium parking lot to connect to the existing pipeline at the intersection of North 150 East and Stadium Avenue. The existing pipeline connects to the Main Tank Reservoir near 900 East and Temple View Drive. Approximately 300 feet of new pipeline would be constructed from the existing pipeline near the tank—southeast to the new booster pump station (**Figure 3-2**). From the new booster pump station, approximately 6,400 feet of new 24-inch-diameter pipe would be installed northeast along Temple View Drive, east along East 2300 North, and into Rock Canyon.

All roads, except for University Avenue, would be temporarily closed and traffic control measures would be put in place during construction of the new distribution lines. Installation across University Avenue would be done in two segments, by shifting all traffic to one side, keeping two lanes open in both directions, while the pipe is installed through the other side of the street. The asphalt roadways would be demolished and excavated to allow for the pipe placement. The pipe would be placed around existing utilities, none of which would need to be relocated. The new lines would be installed at depths required to avoid existing utilities as well as frost protection, up to 15 feet below grade. Following installation, trenches would be backfilled and compacted, and pavement would be replaced or restored to existing conditions upon project completion. Excavation would be limited to existing asphalt roadways. Distribution line installation would be in public rights-of-way and on Provo City property, except for approximately 1,200 feet of pipeline in Rock Canyon, which would cross property owned by the U.S. Forest Service, and approximately 1,410 feet of pipeline that would cross two parking lots on Brigham Young University property. Work within the canyon would adhere to government agency permits and requirements while on federal lands and a special use permit has been obtained by Provo for this segment. Provo has obtained easements for work on Brigham Young University property.

Water Treatment Plant

The WTP would be constructed on a City-owned vacant parcel currently used as a parking lot. Preliminary sitework would include pavement removal, clearing and grubbing, and removal of trees. Construction of the WTP would require excavation to a depth of approximately 15 to 20 feet below existing grade. Excavation would be done using standard track-mounted excavators and wheeled dump trucks. Deep foundations may also be required below the WTP, consisting of soil mix columns or compacted aggregate columns. The WTP would include a two-level process area and have a capacity of 30 MGD. The process area would consist of inline coagulation, low service pumps, strainers, pressurized ultrafiltration membranes and cleaning system, advanced oxidation, chlorine disinfection, clearwell storage in a partially belowground tank, high-service pump station, and a compressed air system. Development of the new facilities would also require utility installation, including electrical, natural gas, plumbing, heating, ventilation, air-conditioning, fire protection, and a control system.

Booster Pump Station Upgrade

An existing booster pump station—which houses three intermediate systems' pumps and three Rock Canyon pumps—is currently located on the south side of the Main Tank Reservoir. Under the proposed action, a new booster pump station would be constructed approximately 100 feet west of the existing booster station on Provo City property (**Figure 3-2**). The existing booster pump station would remain operational throughout construction of the new booster station. An in-line booster style pump station would be constructed, replacing the existing pump station, with all pumps placed in a line in a large diameter suction header pipe located within a single trench to minimize the footprint of the building. The new expanded booster pump station would accommodate additional pumps to convey water up to the Rock Canyon discharge point. The new booster station would also include an upgraded electrical system. After completion of the new booster pump station, the existing booster station would remain in place for the foreseeable future.

Rock Canyon Discharge Point

The proposed action would include one discharge point in Rock Canyon near the existing chlorinator building and would discharge water into the ephemeral Rock Canyon creek bed (**Figure 3-3**). The surficial geology within the ephemeral creek bed is predominantly boulders, cobbles, and large rocks. The pipeline would be constructed to discharge into the ephemeral creek among the rocks and boulders in such a way as to prevent any scouring of erosive materials from occurring. Restoration in the ephemeral creek bed and the area around the pipe at the discharge point would utilize the existing boulders, cobbles, and large rocks salvaged during construction as riprap to prevent erosion. There would be a protected diversion control valve near the point of discharge to regulate flows that would be powered from the nearby chlorinator building. Construction of the new discharge point would be done during the late summer or fall when there is usually no flow in the creek. The proposed 24-inch-diameter distribution pipelines connecting to Rock Canyon would support the delivery and discharge of as much as 13 MGD (20 cfs) of water supplied by the WTP for ASR in Rock Canyon. Water would flow west toward Rock Canyon Park, and it would infiltrate into the groundwater aquifer as it travels along the creek bed.

3.2.2. EQUIPMENT AND STAGING

Table 3.1 shows the anticipated vehicles and equipment that would be required to implement the proposed action. Six existing paved parking areas throughout the project area would be used for staging (**Figure 1-2**). For the WTP and booster station, two parking lots (one directly west of the WTP site and one directly west of the booster station site) would be used for staging. Staging in Rock Canyon would occur at three parking areas near the Rock Canyon Trailhead. A parking area east of Rock Canyon Park (off of Foothill Drive) would also be used for staging.

Table 3.1. Construction Equipment List

Equipment Description	Quantity
Articulated boom lift	1
Asphalt paver	1
Automatic scaffolding system (continuous lift)	1
Concrete boom pump truck	2
Concrete stinger vibrator	4
Crawler crane	1
Electric scissor lift	2
Extended reach forklift	2
Forklift	1
Grader	2
Jumping jack compactor	2
Pickup trucks	8
Ready-mix concrete mixer truck	4
Remote controlled trench roller	1
Ride-on roller compactor	1
Skid steer loader (bobcat)	1
Standard track-mounted excavator	4
Truck-mounted crane	1
Water truck	2
Wheeled dump trucks	4
Wheeled front-end loader	3

3.2.3. PROJECT DURATION

Construction of the WTP and ASR system, including preliminary sitework and final testing, would take approximately 3 years. Road closures and installation of distribution lines near and through the Brigham Young University parking lots and intramural fields would be limited to the spring and summertime offseason to avoid impacting the athletic events taking place at the university.

3.2.4. PROPOSED OPERATION

Provo River System

The Provo River originates in the Uinta Mountains and flows west into the Jordanelle Reservoir. From Jordanelle, the river flows south into Deer Creek Reservoir and through Provo Canyon. The Provo River is widely used as a source of water for irrigation, hydropower, and domestic water, with the earliest water diversion dating back to the 1800s. Historical points of diversion along the Lower Provo River, from the mouth of Provo Canyon downstream to Utah Lake, include Timpanogos, Provo Bench, Upper East Union, Upper West Union, Lake Bottom, Upper City, Lower City, Mill Race (Factory Race), City Race, Tanner Race, and Fort Field (Utah Reclamation Mitigation and Conservation Commission 2001). Newer diversions along the Lower Provo River, such as Olmsted Diversion and Murdock Diversion, are also part of the Provo River distribution system. June and July are typically the months when the greatest amount of water is diverted, with diversions usually occurring from April through October (Utah Reclamation Mitigation and Conservation Commission 2001). The river flows through Provo and into Utah Lake. Utah Lake empties into the Jordan River, which flows north into the Great Salt Lake.

Water Rights in Provo for Proposed Project

The Utah Division of Water Rights is an agency of the Utah State Government within the Department of Natural Resources that administers the appropriation and distribution of the state's water resources, including Provo River diversions. Because of Provo City's historical use of the Provo River, the City's rights are among the most senior on the river. The rights that the City would use for the WTP and ASR system include Class A rights from the 1921 Morse Decree.

Provo proposes to use Water Right No. 55-11001, aka the "4(a) water right," Water Right No. 55-11002, aka the "4(b) water right", Water Right No. 55-11003, aka the "4(c) water right" under approved Recharge Permit RC019, and Water Right No. 55-11005, aka the "4(e) water right" year-round under approved Recharge Permit RC024 for the proposed project. Each water right has an associated period of time when the water can be diverted from the source, a quantity of water that can be diverted, and acceptable water uses.

Provo currently diverts water from the Provo River during the irrigation season using Water Right Numbers 55-11001, 55-11002, and 55-11003. The quantity of water that may be diverted under these rights varies by the period of use, as shown in **Table 3.2.** and **Figure 3-4.** Operation of the proposed project with water from these water rights would be limited to between April 1 through

October 31, as approved under Recharge Permit RC019, even though the 1921 Morse Decree gives Provo the right to divert water from the Provo River at additional times of the year.

Table 3.2. Water Rights on the Provo River for Proposed Project

Water Right Number	Water Use	Source	Period of Use	Quantity of Use (cfs)
55-11001	Municipal	Provo River	April 1 to May 10	29.41
			May 10 to June 20	36.12
			June 20 to July 20	32.68
			July 20 to October 31	29.41
55-11002	Municipal	Provo River	April 1 to May 10	7.14
			May 10 to September 1	10.00
			September 1 to October 31	7.14
55-11003	Municipal	Provo River	April 1 to October 31	16.50

Key: cfs = cubic feet per second

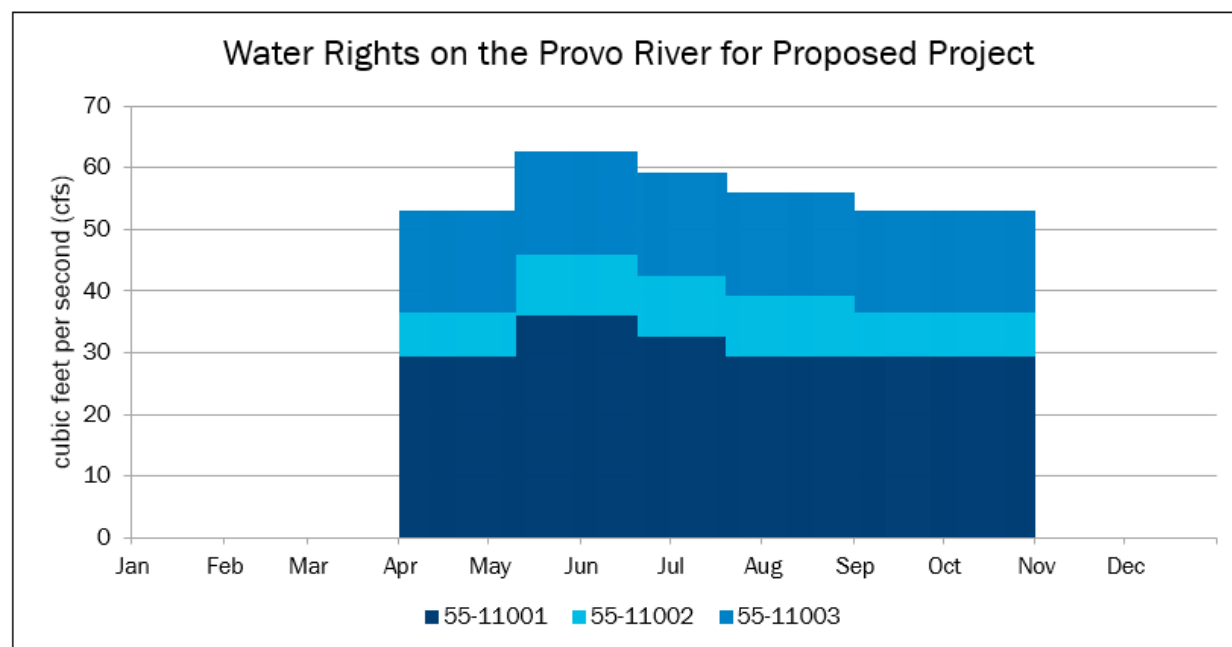


Figure 3-4. Provo’s Water Rights on the Provo River for Proposed Project

Water associated with Water Right Number 55-11005 is diverted year-round from multiple springs in the canyon north of Provo for municipal use. The quantity of water in the springs available for diversion varies based on hydrologic and seasonal conditions. Larger quantities are diverted in the

summer during wet years, sometimes as much as 13 cfs, and smaller quantities are diverted in the winter during dry years, as little as 1 cfs. This water would be used to supplement the ASR system.

Rock Canyon Operation

Recharge Permit Application RC019, filed by Provo on October 9, 2020, was approved to support the recharge of the valley fill aquifer underlying the Provo area of the Utah Valley in the amount of 7,250 acre-feet (AF) of water annually. Recharge Permit RC019 is supported by Water Right Numbers 55-11001, 55-11002, and 55-11003 (Provo River), and is limited by the diversion, use, and period of use allowed under the supporting water rights.

The proposed 24-inch distribution pipelines connecting to Rock Canyon would support the delivery and discharge of up to 13 MGD (20 cfs) of water supplied by the treatment plant for ASR in Rock Canyon. Provo has agreed it would use Water Right Numbers 55-11001, 55-11002, and 55-11003 for the diversion of water from the Provo River for the ASR system only during April 1 through October 31. The ASR system would deliver approximately 13 MGD or a constant rate of approximately 20 cfs and, if operated at a constant rate throughout a 7-month period as permitted under existing water rights (April 1 through October 31), would generate the 7,250 AF of capacity available for recharge. Diversion for aquifer recharge at Rock Canyon would occur during the winter months using Water Right No. 55-11005 and Recharge Permit RC024 (Table 3.3).

Table 3.3. Project Water Supply Time Constraints

	Time Constraints	Water Quantity (Daily)	Permitted Water Quantity (Annual)
Operational Capacity for ASR	Year-round – 12 months	13 MGD / 20 cfs	15,661 AF per year
	Summer – 7 months	13 MGD / 20 cfs	7,250 AF per year
Water Rights 55-11001, 55-11002, and 55-11003	Winter – 5 months	0 MGD / 0 cfs	
Water Right 55-11005	Year-round – 12 months	varies based on conditions	varies based on conditions up to 8,411 AF

Key: ASR = aquifer storage recovery; MGD = million gallons per day; cfs = cubic feet per second; AF = acre-feet

Surface Water Use In Place of Groundwater Use

In addition to the 13 MGD aquifer recharge through infiltration, Provo would also be able to treat Provo River water to drinking water standards for immediate use instead of using groundwater for municipal needs. Provo would use Water Right Numbers 55-11001, 55-11002, and 55-11003 to divert water from the Provo River to be treated at the proposed WTP. Provo anticipates treating 30 MGD, limited to April 1 through October 31, which would allow 17 MGD of groundwater to stay in the aquifer. Provo would also use spring water sources under Water Right Number 55-11005 to offset the use of groundwater. This approach would reduce groundwater pumping and would

effectively recharge the aquifer by allowing groundwater to remain within the aquifer without being lost to evaporation. Groundwater that is not pumped would be available to support the community during a drought emergency when Provo River water may not be available or could be used by other users.

Total Aquifer Recharge

Under the proposed project, Provo would be able to recharge as much as 13 MGD in Rock Canyon through infiltration. In addition, Provo would conserve as much as 17 MGD in groundwater wells by treating 17 MGD of Provo River water for immediate use. The recharge of 13 MGD through infiltration combined with the maintenance of 17 MGD of groundwater through surface water offset would fully use the proposed 30 MGD (46 cfs) capacity of the WTP. Overall, the ASR system would store as much as 30 MGD in the aquifer during April 1 through October 31 and at least 13 MGD in the aquifer during the non-irrigation season.

3.2.5. MAINTENANCE ACTIVITIES

The Provo Public Works Division of Water Resources would perform long-term maintenance of the WTP and ASR on an annual basis. Existing staff would be maintained and one to two new employees would be needed to operate the WTP. Maintenance would include annual water quality sampling and field support.

3.3. Additional Action Alternatives Considered and Dismissed

Several alternatives to the proposed action were considered to mitigate risks associated with drought and water shortages in Provo. These alternatives were dismissed from further consideration.

3.3.1. DEMAND MANAGEMENT

Water demand management strategies, policies to control or influence the use of water, were considered to reduce the impacts of drought. Provo currently has designated a Water Conservation Coordinator who is responsible for the City's public education program, attending the annual Utah Growing Water Smart workshop, and distributing water conservation information at City events. Other current management efforts include a seasonal rate structure with an increased peak season overage rate, leak detection, advanced metering infrastructure, and landscape and advanced irrigation technology programs and incentives. Current efforts have primarily focused on education and pricing to motivate customers to voluntarily reduce demand, which have been effective. However, a significantly more aggressive demand management effort beyond education and voluntary conservation would be needed to meet future water demands during periods of drought.

According to the Provo 40-Year Water Supply Plan, existing City supplies are currently inadequate to meet projected demands. Historically, deficiencies have been eliminated through demand reduction by residents and by pumping wells above the estimated sustainable yield of the aquifer. While using extra groundwater has allowed the City to avoid any water shortfalls in the past, this is not a sustainable long-term solution to this deficiency. As of 2019, the deficit was approximately 9,900 AF

of water per year, yet to meet future demands an estimated 17,400 AF of water per year is needed (Provo City 2019). To achieve this volume through demand reduction, consumption would need to be reduced by approximately 130 gallons per day per capita, which is considered to be infeasible. Under this alternative, Provo would also continue to depend on the single pipeline delivering water from the springs in Provo Canyon. Therefore, this alternative was dismissed from further consideration.

3.3.2. USE OF TREATED WASTEWATER EFFLUENT

Potable Reuse

Future use of the Water Advanced Treatment and Resource Recovery Center (Wastewater Treatment Plant) effluent for indirect potable reuse or direct potable reuse was considered to reduce the impacts of drought. Indirect potable reuse is the intentional reuse of treated wastewater effluent for potable water supply that involves storing treated effluent in an environmental buffer (typically a surface waterbody or an aquifer). ASR using treated effluent as a water source is considered indirect potable reuse. Direct potable reuse is the intentional reuse of treated wastewater effluent for potable water supply that does not involve storing treated effluent in an environmental buffer. Both reuse methods would require additional treatment of the effluent using carbon-based advanced treatment in an advanced treatment facility, as well as semi-permeable membrane treatment. Due to the high cost associated with disposal of brine created during the treatment process, this alternative was determined to not be cost effective. This alternative was also dismissed from further consideration because of pending development of regulations associated with carbon-based advanced treatment in Utah. The 2023 House Bill 349, Water Reuse Projects Amendments, restricts wastewater reuse. Provo plans to investigate this alternative further in the future as more carbon-based pilot projects and full-scale operations throughout the country are developed that meet regulatory requirements. In addition, a portion of Provo's treated wastewater effluent is needed to meet its return flow requirements related to its water rights. This alternative was determined to not be technically feasible for ASR.

Non-Potable Reuse

Use of treated wastewater effluent for non-potable reuse (reuse for irrigation) was also considered to reduce the impacts of drought. Effluent treated with an ultrafiltration process would only require the addition of chlorine to be delivered for non-potable reuse, which could be used for the planned and ongoing west side development in Provo. However, new non-potable irrigation distribution lines and pumping stations would need to be installed because the non-potable water cannot be distributed in the same lines that carry potable water. Conveyance and pumping costs also would be high because of the distance between the source and the end use. In addition, there would be limited demand because water for irrigation is only needed from early spring to late fall. This alternative was determined to not be cost-effective.

3.3.3. NEW SURFACE WATER RESERVOIR

Construction of a new surface water reservoir was considered in regard to reducing the impacts of drought. However, surface water supplies are especially susceptible during times of drought, as they are not protected from evaporation and water quality degradation. In addition, a new surface water reservoir would require a large land area and have a high cost to construct and maintain. Overall, construction of a new surface water reservoir would be less effective at meeting the purpose and need at a greater cost. Therefore, this alternative was dismissed from further consideration.

3.3.4. USE EXISTING CENTRAL UTAH CONSERVANCY WATER DISTRICT WATER TREATMENT PLANT

Provo considered using existing capacity available at the CUWCD's Don A. Christiansen Regional WTP to treat their water and then use existing infrastructure to transmit and deliver the treated water to ASR discharge locations. However, based on a preliminary analysis of CUWCD costs completed by Provo, it is estimated that the fee to use CUWCD's WTP would be 150 percent to 300 percent of the cost for Provo to construct their own WTP and treat water over the life cycle of the WTP (Provo City 2020). Provo would also continue to depend on the single pipeline delivering water from the springs in Provo Canyon. Due to the high cost, this alternative was eliminated from further consideration.

3.3.5. NO WATER TREATMENT PLANT WITH WATER PIPED DIRECTLY TO ROCK CANYON

Delivering untreated water from the Provo River directly to Rock Canyon for infiltration would require construction of two new pump stations, a storage regulating basin, and new dedicated transmission lines. Construction of the new lines would cause additional disruption of traffic and destruction of roadways. While river water could be used for infiltration, with some treatment such as the settling of suspended solids, there is still the chance that some contaminant in the river water could be discharged undetected. In addition, the raw river water has a higher sediment load than treated water. Even with some settling, there would still be the potential for fine particles to accumulate in the infiltration zone and eventually prevent water from infiltrating into the aquifer. Construction of the pump stations, regulating basin, and transmission line would have a high cost and water quality would be lower in comparison to water treated at the WTP. In addition, this alternative would not provide an opportunity to offset groundwater use with surface water use. Therefore, this alternative was dismissed from further consideration.

3.3.6. SMALLER CAPACITY WATER TREATMENT PLANT

Provo considered multiple WTP capacities, including a 13 MGD capacity WTP to only supply the ASR in Rock Canyon and a reduced 20 MGD capacity WTP. However, a larger capacity WTP was found to be cost-effective and Provo has existing summer water rights that exceed the proposed 30 MGD capacity of the WTP. Therefore, while considering the opportunity to maximize drought resiliency and the greater water management options available with a larger capacity WTP, a smaller capacity WTP was determined to not meet the project purpose as effectively and was dismissed from further consideration.

SECTION 4. Affected Environment, Potential Impacts, and Mitigation

This section describes the environment potentially affected by the alternatives, evaluates potential environmental impacts, and recommends measures to avoid or reduce those impacts. When possible, quantitative information is provided to establish potential impacts; the significance of potential impacts is based on the criteria listed in **Table 4.1**. The study area generally includes the project area and access and staging areas needed for the alternatives. If the study area for a particular resource category is different from the project area, the differences will be described in the appropriate subsection.

Table 4.1. Evaluation Criteria for Potential Impacts

Impact Scale	Criteria
None/Negligible	The resource area would not be affected, or changes or benefits would be either nondetectable or, if detected, would have effects that would be slight and local. Impacts would be well below regulatory standards, as applicable.
Minor	Changes to the resource would be measurable, although the changes would be small and localized. Impacts or benefits would be within or below regulatory standards, as applicable. Mitigation measures would reduce any potential adverse effects.
Moderate	Changes to the resource would be measurable and have either localized or regional-scale impacts/benefits. Impacts would be within or below regulatory standards, but historical conditions would be altered on a short-term basis. Mitigation measures would be necessary to reduce any potential adverse effects.
Major	Changes would be readily measurable and would have substantial consequences on a local or regional level. Impacts would exceed regulatory standards. Mitigation measures to offset the adverse effects would be required to reduce impacts, though long-term changes to the resource would be expected.

4.1. Resources Not Affected and Not Considered Further

The following resources (**Table 4.2**) would not be affected by either the no action alternative or the proposed action because they do not exist within the project area or the alternatives would have no effect on the resource. These resources have been removed from further consideration in this EA.

Affected Environment, Potential Impacts, and Mitigation

Table 4.2. Resources Eliminated from Further Consideration

Resource Topic	Reason for Elimination
Farmland Protection Policy Act	The project area is within Provo municipal boundaries, which is designated by the U.S. Census Bureau (2010) as an urban area. Therefore, the Farmland Protection Policy Act is not applicable to the no action alternative or the proposed action and no further compliance work is necessary (7 CFR 658.2[a]).
Wild and Scenic Rivers Act	According to the National Wild and Scenic River System website (National Wild and Scenic Rivers System 2023), the closest National Wild and Scenic River, the Green River, is approximately 110 miles southeast of the proposed project area. Thus, the alternatives would have no effect on wild and scenic rivers.
Sole Source Aquifers	According to the EPA's sole source aquifer map (EPA 2023a), there are no sole source aquifers designated in Utah County; therefore, the alternatives would have no effect on sole source aquifers.
Land Use and Zoning	This proposed action would not change existing land uses and is consistent with the current zoning. The alternatives would have no effect on land use and zoning.
Essential Fish Habitat (Magnuson-Stevens Fishery Conservation and Management Act)	The project area is not within or near designated Essential Fish Habitat (National Oceanic and Atmospheric Administration 2023).

4.2. Geology, Topography, and Soils

The project area is within both Utah Valley (on the eastern bank of Utah Lake on the Wasatch Front) and Rock Canyon (a feature of the Wasatch Mountains). Most of the project area lies at an elevation between 4,600 feet and 4,700 feet above sea level, with the elevation at the proposed Rock Canyon Creek discharge point approximately 5,200 feet above sea level.

The Wasatch Fault Zone, consisting of a network of Quaternary faults, lies on the west side of the Wasatch Mountains, with the Provo segment posing significant seismic hazards. According to the USGS National Seismic Hazard Map, the project is within an area designated as severe/violent for groundshaking (Utah Geologic Survey 2020).

Utah Valley consists of unconsolidated sediments from the surrounding mountain blocks, deposited by colluvial, alluvial, fluvial, and lacustrine processes. The transgressions and regressions of Lake Bonneville resulted in alternating sequences of coarser and finer grained sediments. The soil types found within the project area are listed in **Table 4.3**. The overall project area is relatively level with a gentle slope up towards the escarpment at the base of the Wasatch Mountains to the Rock Canyon Trailhead. The project area follows Rock Canyon Trail into Rock Canyon, a narrow canyon with steep sides of rocky cliffs, and continues along the relatively flatter canyon bottom from the Rock Canyon Trailhead to the discharge point.

Table 4.3. Project Area Soil Types

Soil Type	Acres in Project Area	Percentage of Project Area
Cobbly alluvial land	2.0	11.7%
Hillfield-Sterling complex, 20- to 35-percent slopes	0.3	1.8%
Keigley silty clay loam, 1- to 3-percent slopes	1.9	11.0%
Pits and dumps	0.7	4.0%
Pleasant Grove gravelly loam, 3- to 6-percent slopes	2.9	17.1%
Pleasant Grove gravelly loam, 6- to 10-percent slopes	4.1	24.1%
Pleasant Grove-Terrace escarpments complex, 30- to 60-percent slopes, eroded	0.1	0.4%
Provo-Sunset complex	0.9	5.1%
Sunset loam	3.9	23.2%

Source: U.S. Department of Agriculture 2023.

When groundwater levels decrease within aquifers, the pore spaces in the soils collapse and the ground subsides. Groundwater levels within the aquifer near the mouth of Provo Canyon (approximately 3.5 miles from the project area) have decreased as much as 70 to 100 feet in the past 40 years, according to monitoring data from Provo’s 5600 North Well. Surface subsidence can result in fissures that damage infrastructure and allow for the introduction of contaminants to the groundwater.

4.2.1. NO ACTION ALTERNATIVE

Under the no action alternative, there would be no construction-related short-term impact on topography, geology, or soils in the project area.

In the long term, Provo would continue efforts to mitigate the effects of drought. However, the probability of reduced water supply reliability during drought events would continue to be high, requiring increased groundwater pumping to meet water supply demands. Climate change is also expected to increase the frequency and intensity of drought. Without the project, the groundwater aquifer could continue to decline with use, potentially resulting in subsidence. Roads, bridges, utilities, and buildings in northern Provo City and Orem City could be severely damaged over time. Water supply infrastructure that could be damaged by subsidence includes the Provo River Aqueduct, Provo Bench, Timpanogos, East and West Union Canals, and the Spanish Fork-Provo Reservoir branch of the Utah Lake Drainage Basin Water Delivery System Pipeline. Therefore, this alternative could result in moderate to major long-term adverse impacts on geology and topography due to subsidence, depending on the intensity and duration of future drought events.

4.2.2. PROPOSED ACTION

Under the proposed action, excavation and soil disturbance would be required to build the WTP and new pump station and install the new pipeline. The WTP, clearwell, and pump station would require excavation to a depth of 15 to 20 feet below the existing grade. The pipelines would require trenching to depths of 10 to 15 feet below the existing grade. Soil exposed during construction and soil stockpiles would be subject to erosion during storm events and high winds. However, best management practices (BMPs) to control erosion and sediment runoff would be implemented during construction. Areas temporarily disturbed during construction would be stabilized, primarily by replacing existing pavement, once construction is completed, thereby preventing erosion. The proposed action would result in a minor short-term adverse impact on soils due to erosion with implementation of BMPs to control erosion and sediment.

Construction of the WTP would require grading and fill and would have a minor impact on the overall topography at the site. The installation of salvaged rock and boulders at the discharge point would result in a slight alteration of the topography in Rock Canyon Creek, resulting in a negligible adverse impact on topography. The riprap placed within the channel would aid in preventing erosion in the long term by dissipating the energy of the discharged water.

Operation of the proposed action would recharge the groundwater aquifer, increasing groundwater levels and helping avoid future subsidence. This would have a moderate long-term benefit on the geology and topography in the region.

4.3. Visual Quality and Aesthetics

Because the proposed construction activities include the removal of vegetation and installation of infrastructure, the proposed project has the potential to affect visual quality. Visual quality is a qualitative analysis that considers the visual context of the project area, the potential for changes in character and contrast, an assessment of whether the project areas include any places or features designated for protection, the number of people who can view the site and their activities, and the extent to which those activities are related to the aesthetic qualities of the area.

The viewshed within the western portion of the project area (west of 1450 East) is typical of residential, commercial, and industrial areas; dominant visual features include houses, apartment complexes, buildings, roadways, street trees and recreational landscaped fields, and other associated infrastructure. Typical viewers of this portion of the project area include students and visitors to the Brigham Young University Campus, residents of the area, or people traveling through the region via the roadways. The eastern portion of the project area (east of 1450 East) is within Rock Canyon, where the viewshed is dominated by steep, rocky slopes vegetated by conifer trees and shrubs. The roadway in this portion of the project area is narrow and partially paved. People typically visit this portion of the project area to engage in recreational activities, such as hiking and birdwatching, or other activities related to the aesthetic quality of the area.

4.3.1. NO ACTION ALTERNATIVE

No construction would occur under the no action alternative; therefore, there would be no short-term impacts on visual resources within the project area.

In the long term, Provo would continue efforts to mitigate the effects of drought. However, the probability of reduced water supply reliability during drought events would continue to be high and climate change is also expected to increase the frequency and intensity of drought. Under this alternative, urban landscaping and vegetation throughout Provo may dry out and/or die if not properly irrigated for long periods of time. Larger amounts of dry and dead vegetation could impact the quality of the viewshed along roadways and at residences, businesses, and parks in Provo. Therefore, this alternative could have minor to moderate long-term adverse impacts on the visual quality within Provo, depending on the intensity and duration of future drought events.

4.3.2. PROPOSED ACTION

Under the proposed action, a new WTP would be constructed at the western end of the project area, new pipes would be installed throughout the entire project area, a new booster pump station would be constructed at the intersection of Temple View Drive and 900 East, and a new discharge point structure would be constructed in Rock Canyon. The construction of the project components would require heavy equipment, described in **Table 3.1**, to be staged and operated within the project area, subjecting viewers to visual elements that would temporarily disrupt the existing visual character of the project area and surrounding views. This visual disruption would be more apparent in the Rock Canyon portion of the project area, as construction equipment and activities are more incongruent with the surrounding viewshed in Rock Canyon than in the developed urban portions of the project area. However, these visual disruptions would be temporary, and the most dramatic visual disruptions in Rock Canyon would likely be observed by a relatively small number of people. Therefore, construction of the proposed action would have minor short-term adverse impacts on visual resources within the project area.

As described previously, two new structures and a piped outlet would be constructed as part of the proposed action. The WTP and the booster pump station would be constructed in locations where similar infrastructure either already exists or where the introduction of the new structure would be congruent with the existing viewshed of the area. Both the WTP and booster pump station would be fully enclosed buildings and, following construction, native trees and bushes would be planted in front of the WTP along Freedom Boulevard and a few native trees and shrubs would be planted around the booster station. Preliminary WTP design and renderings were on display for public viewing in August 2022. Updated design plans and renderings are available for public review upon request. The new piped outlet would be installed off the main roadway in Rock Canyon, mostly hidden from viewers' sight. Therefore, the construction of the new structures and piped outlet would not introduce visual elements incongruent with the surrounding viewsheds and the proposed action would have negligible long-term adverse impacts on visual resources within the project area.

Implementation of the proposed action would increase water supply reliability in Provo. This would help maintain the water supply for the irrigation of urban vegetation, reduce the risk of vegetation drying out

or dying that could disrupt visual quality. In addition, water discharged into Rock Canyon Creek would maintain green vegetation along the stream. Therefore, implementation of the proposed action could improve visual quality throughout Provo and result in minor, long-term visual benefits.

4.4. Air Quality and Climate

The Clean Air Act, as amended, requires EPA to establish National Ambient Air Quality Standards (NAAQS) for six pollutants harmful to human and environmental health, including ozone, nitrogen dioxide, carbon monoxide, sulfur dioxide, lead, and particulate matter (including particulate matter that is less than 10 micrometers in diameter [PM₁₀] and fine particulate matter less than 2.5 micrometers in diameter [PM_{2.5}]). Fugitive dust, which is considered a component of particulate matter, can also affect air quality. Fugitive dust is released into the air by wind or human activities, such as construction, and can have human and environmental health impacts. Federally funded actions in nonattainment and maintenance areas for these pollutants are subject to conformity regulations (40 CFR Parts 51 and 93) to ensure that emissions of air pollutants from planned federally funded activities would not cause any violations of the NAAQS, increase the frequency or severity of NAAQS violations, or delay timely attainment of the NAAQS or any interim milestone. According to the EPA Green Book (2023), Utah County is currently in attainment status for nitrogen dioxide, sulfur dioxide, and lead (EPA 2023b). The Southern Wasatch Front portion of Utah County, which includes Provo, is classified as a marginal nonattainment area for 8-hour ozone under the 2015 rule. The Provo area is also classified as a serious nonattainment area for PM_{2.5} under the 2006 rule (EPA 2023b).

Climate change refers to a change in the state of the climate that can be identified by changes in the mean and/or variability of its properties and that persists for an extended period, typically decades or longer (U.S. Global Change Research Program 2022). Its primary cause is emissions of greenhouse gases, including carbon dioxide and methane. Climate change is capable of affecting species distribution, temperature fluctuations, and weather patterns. The CEQ's *National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change* (2023) recommends that agencies quantify projected direct and indirect greenhouse gas (GHG) emissions of a proposed agency action, taking into account suitable available data and GHG quantification tools. Agencies use projected GHG emissions (including, where applicable, carbon sequestration implications associated with the proposed agency action) as a proxy for assessing potential climate change effects when preparing a NEPA analysis for a proposed agency action. When agencies do not quantify a proposed agency action's projected GHG emissions—because tools, methodologies, or data inputs are not reasonably available to support calculations for a quantitative analysis—agencies include a qualitative analysis in the NEPA document and explain the basis for determining that the quantification is not reasonably available (CEQ 2023). Previous CEQ guidance suggested quantitative analysis should be done if an action would release more than 25,000 metric tons of GHG per year (CEQ 2010).

The temperature in Provo ranges from an average low of 22 degrees Fahrenheit in January to an average high of 94 degrees Fahrenheit in July (U.S. Climate Data 2023). Provo receives an average of approximately 19.75 inches of precipitation annually, which falls throughout the year, with the

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highest precipitation levels occurring in the late spring and late fall (April, May, and October) and the lowest precipitation levels occurring in summer (June through September) (U.S. Climate Data 2023). In 2011–2020 global surface temperature increased 1.96 degrees Fahrenheit from the 1850–1900 period, with larger increases over land (Intergovernmental Panel on Climate Change 2023). Temperatures in Utah have increased more than 2.5 degrees Fahrenheit since the beginning of the 20th century. Climate models are not consistent in their projections of precipitation for Utah; but, generally, droughts, a natural part of Utah’s climate, are expected to become more intense (Frankson et al. 2022).

4.4.1. NO ACTION ALTERNATIVE

No construction would occur under the no action alternative; therefore, there would be no emissions and no short-term impacts on air quality or climate change.

In the long term, Provo would continue efforts to mitigate the effects of drought. However, the probability of reduced water supply reliability during drought events would continue to be high and climate change is also expected to increase the frequency and intensity of drought. A lack of water to irrigate landscaping within Provo could lead to dry soil and vegetation, which can impact air quality and increase the number of particulates that are suspended in the air, such as dust (Centers for Disease Control and Prevention 2020). In the future, the no action alternative would have an increased long-term negligible adverse impact on air quality.

4.4.2. PROPOSED ACTION

Under the proposed action, the use of construction equipment and vehicles would result in the short-term release of air pollutant emissions. Construction of the proposed action would require the use of the equipment listed in **Table 3.1**. Emissions from off-road construction equipment, on-road construction-related vehicles, and dust-generating construction activities have the potential to affect short-term air quality. Heavy equipment and earth moving machinery could temporarily increase the levels of some pollutants, including carbon monoxide, volatile organic compounds, nitrogen dioxide, ozone, and particulate matter. The proposed action would take approximately 3 years to construct, with the WTP and the booster station having the longest construction duration of the proposed project activities. Construction of the WTP and booster station would be below "de minimis" thresholds for the General Conformity Rule, and air emissions would not increase to the extent that a general conformity analysis would be required for the proposed action. The pipeline would be installed in segments and work at any one location along the pipeline route would typically be less than one month. Thus, vehicle and equipment use in the project area would be temporary and localized. Temporary impacts on air quality would be reduced through the implementation of BMPs. Vehicles and equipment running times would be kept as short as possible and areas of exposed soil would be covered or wetted to reduce fugitive dust. All construction equipment would be required to meet current EPA emissions standards. Therefore, construction of the proposed action would have minor short-term adverse impacts on air quality within the project area.

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Operation of the new WTP and ASR system would require one to two new employees and one truck trip per week for deliveries and waste disposal. The additional trips by the employees and weekly truck trip to and from the WTP would not substantially increase traffic or alter traffic patterns in a way that would impact air quality. Operation of the electric pumps at the new WTP and booster station would not result in long-term emissions. Construction of the new facilities would be completed to current building codes and standards; as such, the pumps would likely be more energy efficient than pumps at other similar older facilities. In addition, power would be provided to the new WTP and booster station by Provo Power, whose overall resource mix consists of 48-percent green energy with a goal to be 60-percent green by 2030 (Provo Power 2015). The use of surface water in place of groundwater under the proposed action would also reduce emissions associated with the use of groundwater pumps. Therefore, the proposed action would have negligible long-term effects on air quality, because although it would be a new source of power demand, the project is unlikely to result in a measurable change in the load requirements for Provo Power.

Operation of the ASR system under the proposed action would increase the reliability of Provo's water supply in the long term. With an improved future water supply, urban irrigation could be maintained and an increase in soil moisture could reduce the number of particulates that are suspended in the air. Therefore, the proposed action would have a minor, long-term, beneficial effect on air quality.

4.5. Water Quality and Quantity

The Clean Water Act (CWA) of 1977, as amended, regulates the discharge of pollutants into water, with sections falling under the jurisdiction of the U.S. Army Corps of Engineers (USACE) and EPA. Section 404 of the CWA establishes the USACE permit authority to regulate the discharge of dredged or fill materials into waters of the United States. Under the National Pollutant Discharge Elimination System, EPA and the Utah Department of Environmental Quality (DEQ) regulate both point and nonpoint pollutant sources, including stormwater and stormwater runoff, via a permitting system. Activities that disturb one or more acres of ground are required to apply for a Utah Pollutant Discharge Elimination System Stormwater permit through the Utah DEQ.

CWA Section 303(d) requires states to identify waters that do not or are not expected to meet applicable water quality standards with current pollution control technologies alone. Under Section 303(d), states must develop Total Maximum Daily Loads (TMDLs) for impaired water bodies. A TMDL establishes the maximum amount of a pollutant or contaminant allowed in a water body and serves as a planning tool for restoring water quality. Utah DEQ is responsible for compliance with Section 303(d) of the CWA.

Relevant state regulations include Standards of Quality for Waters of the State (Utah Administrative Code R317-2), Groundwater Quality Protection (Utah Administrative Code R317-6), and Utah Water Quality Act (Title 19 Environmental Quality Code, Chapter 5 Water Quality Act).

The project area is in the Utah Lake watershed, hydrologic unit code 16020201, and the Provo River watersheds, hydrologic unit code 16020203. The project area includes the Provo River and Rock

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Canyon Creek. The Provo River originates in the Uinta Mountains and flows west into the Jordanelle Reservoir. From Jordanelle, the river flows south into Deer Creek Reservoir and through Provo Canyon. The river flows through Provo and into Utah Lake. Utah Lake empties into the Jordan River, which flows north into the Great Salt Lake.

To comply with CWA Section 303(d), Utah DEQ maintains a database of waters requiring a TMDL, also known as the 303(d) list or Category 5 waters. Provo River has TMDLs in place for dissolved oxygen and benthic macroinvertebrates bioassessments and Utah Lake has TMDLs in place for eutrophication, polychlorinated biphenyls, E. coli, algal blooms, phosphorus, and total dissolved solids (Utah DEQ 2023).

Water quality data from the groundwater monitoring wells near the Rock Canyon discharge area indicate that groundwater has an average total dissolved solids content of 340 milligrams per liter. Utah groundwater quality standards (Utah Administrative Code R317-6-3.2) classifies the groundwater as Class IA, pristine groundwater. The monitoring wells also indicate that concentrations of other constituents in the groundwater do not violate Utah groundwater quality standards.

4.5.1. NO ACTION ALTERNATIVE

Because the no action alternative would not require construction, it would have no short-term impacts on water resources and quality. Under the no action alternative, Provo would continue efforts to mitigate the effects of drought. However, the probability of reduced water supply reliability during drought events would continue to be high, requiring increased groundwater pumping to meet water supply demands. Climate change is also expected to increase the frequency and intensity of drought.

Groundwater quality generally degrades with increasing depth within an aquifer; thus, groundwater depletion can lead to a deterioration of groundwater quality (USGS 2018b). Therefore, the continued groundwater pumping during future droughts may negatively impact groundwater quality. As discussed in Section 4.2, as groundwater is withdrawn from the aquifer, the subsurface soils may collapse and compact leading to reduced aquifer capacity. Even if drought conditions ease, the capacity of the aquifer may be permanently compromised. The no action alternative would have minor to moderate adverse impacts on groundwater water quality and quantity, depending on the intensity and duration of future drought events.

4.5.2. PROPOSED ACTION

Under the proposed action, instream impacts would be limited to the small area where the ASR pipeline would be placed within Rock Canyon Creek at the discharge point. Existing boulders, large rocks, and cobbles would be salvaged during construction and placed back around the discharge point as riprap to prevent erosion. Construction of the new discharge point would be done during the late summer or fall when there is usually no flow in the creek. On May 3, 2023, the Utah Division of Water Rights approved a Stream Alteration Permit (Number 23-55-OSSA) for work within Rock Canyon Creek under Section 404 of the CWA, consistent with the Programmatic General Permit 10

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issued to the State of Utah by USACE on February 22, 2021. Provo would comply with the conditions outlined in the approved authorization, as well as the Programmatic General Permit 10 conditions, including the implementation of BMPs and the minimization of impacts. In addition, Provo would implement a Stormwater Pollution Prevention Plan in compliance with the general stormwater permit for construction activities that would cover all project activities. Therefore, there would only be a short-term minor adverse impact on water quality from construction-related activities as long as all required BMPs are used.

In January 2023, the Utah Division of Water Quality issued Groundwater Discharge Permit Number UGW490010 allowing Provo to discharge water into Rock Canyon Creek for groundwater infiltration and recharge. Water would be treated to drinking water standards prior to being discharged and would not impair groundwater quality. In the long term, the proposed action would recharge the aquifer with high-quality treated surface water. In addition, the construction of the WTP would allow Provo to reduce its reliance on groundwater, reserving groundwater in the aquifer for more severe droughts. The proposed action would result in a long-term, minor to moderate beneficial impact on groundwater quantity without compromising quality.

Implementation of the proposed action would increase water supply reliability in Provo. Provo currently diverts water from the Provo River and springs and would continue to do so after the completion of the proposed project, consistent with the existing approved permits. Under the proposed action there would be no change to the existing approved permits for water diversions during the irrigation season relative to existing conditions. Therefore, operation of the proposed action would not impact existing Provo River water supplies for other customers. The proposed action would result in a long-term, moderate beneficial impact on water supply for Provo and would have no impact on other Provo River water users.

4.6. Wetlands

EO 11990, Protection of Wetlands, requires federal agencies to consider alternatives to work in wetlands and limits potential impacts on wetlands if there are no practicable alternatives. FEMA regulation 44 CFR Part 9, Floodplain Management and Protection of Wetlands, sets forth the policy, procedures, and responsibilities to implement and enforce EO 11990 and prohibits FEMA from funding activities in wetlands unless no practicable alternatives are available. Activities that disturb wetlands may also require a permit from USACE under Section 404 of the CWA.

A review of the USFWS National Wetlands Inventory mapper indicates that no wetlands are present in or directly adjacent to the project area (USFWS 2023a).

4.6.1. NO ACTION ALTERNATIVE

Because there are no existing wetlands within or adjacent to the project area, implementation of the no action alternative would have no short- or long-term impact on wetlands.

4.6.2. PROPOSED ACTION

Because there are no existing wetlands within or adjacent to the project area, implementation of the proposed action would have no short- or long-term impact on wetlands.

4.7. Floodplains

EO 11988, Floodplain Management, requires federal agencies to avoid, to the extent possible, short- and long-term, adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. FEMA regulations (44 CFR Part 9.7) use the 1-percent-annual-chance flood as the minimal area for floodplain impact evaluation. FEMA follows an eight-step decision-making process to ensure compliance with EO 11988, which requires the evaluation of alternatives to the use of a floodplain prior to funding the action.

The project area spans three FEMA flood insurance rate map (FIRM) panels: 49049C0343F (dated June 19, 2020), 49049C0344F (dated June 19, 2020), and 49049C0375F (dated June 19, 2020). According to these FIRMs, the project area is entirely within FEMA Flood Zone X, an area of minimal flood hazard (FEMA 2023). The new discharge point in Rock Canyon Creek would use an existing channel that eventually flows down through Rock Canyon Park, which is within Flood Zone AH, an area with a 1-percent annual chance of shallow (1 to 3 feet deep) flooding/ponding. The mapped floodplain is approximately 0.5 mile from the proposed discharge point in Rock Canyon Creek.

4.7.1. NO ACTION ALTERNATIVE

Because the project area is not located within floodplains, implementation of the no action alternative would have no short- or long-term impacts on floodplains.

4.7.2. PROPOSED ACTION

No construction would occur within floodplains; therefore, the proposed action would have no short-term impact on floodplains.

The proposed new discharge point in Rock Canyon Creek would be approximately 0.5-mile upstream of Rock Canyon Park, which has a 1-percent annual chance of shallow flooding. Water discharged into the existing channel in Rock Canyon Creek would infiltrate into the ground along the creek bed before reaching the park and would not contribute to flooding at the park. In addition, the ASR system would not be operated during times when the ephemeral stream is running or when there is a potential for flooding to occur. Therefore, the proposed action would have no long-term adverse impacts on floodplains.

4.8. Vegetation

The project area largely consists of urbanized areas within Provo that have been highly developed for human uses. Vegetation in these developed areas is generally restricted to flower beds, maintained patches of turfgrass, and linear landscaped features along roadways that support ornamental trees,

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shrubs, and patches of weedy herbaceous species. According to site assessments conducted in 2022, tree species occurring within the developed portions of the project footprint include: Siberian elm (*Ulmus pumila*), honey locust (*Gleditsia triacanthos*), littleleaf linden (*Tilia cordata*), Callery pear (*Pyrus calleryana*), Japanese zelkova (*Zelkova serrata*), blue spruce (*Picea pungens*), box elder (*Acer negundo*), red maple (*Acer rubrum*), Siberian crabapple (*Malus baccata*), ponderosa pine (*Pinus ponderosa*), Engelmann spruce (*Picea engelmannii*), Norway maple (*Acer platanoides*), bur oak (*Quercus macrocarpa*), and Gambel oak (*Quercus gambelii*) (BIO-WEST, Inc. 2022). Additional woody species present within developed portions of the project area include Oregon grape (*Berberis aquifolium*), wintercreeper euonymus (*Euonymus fortunei*), and oakleaf hydrangea (*Hydrangea quercifolia*) (BIO-WEST, Inc. 2022). Prevalent herbaceous species within the developed portions of the project area include Kentucky blue grass (*Poa pratensis*), meadow fescue (*Schedonorus pratensis*), white clover (*Trifolium repens*), and common dandelion (*Taraxacum officinale*) (BIO-WEST, Inc. 2022).

The portion of the project area within Rock Canyon is comparatively undisturbed and largely consists of areas vegetated with a mix of naturally growing trees, woody shrubs, and naturalized nonnative grasses. The tree stratum is generally dominated by Gambel oak. Other trees occurring throughout the canyon include velvet ash (*Fraxinus velutina*) and bigtooth maple (*Acer grandidentatum*). Commonly occurring shrub species include Oregon grape, big sagebrush (*Artemisia tridentata*), white sagebrush (*Artemisia ludoviciana*), and rubber rabbitbrush (*Ericameria nauseosa*). Prevalent herbaceous species include cheatgrass (*Bromus tectorum*), meadow fescue, and foxtail barley (*Hordeum jubatum*).

Federally listed plant species that may occur in the vicinity of the proposed project areas are discussed in Section 4.10.

Invasive Species

EO 13112 requires federal agencies to prevent the introduction of invasive species and provide for their control to minimize the economic, ecological, and human health impacts that invasive species cause. Invasive species, such as cheatgrass, prefer disturbed habitats and generally possess high-dispersal abilities, enabling them to out-compete native species.

4.8.1. NO ACTION ALTERNATIVE

Under the no action alternative, no vegetation removal related to construction would occur. The spatial extent and composition of existing vegetation, including the proportion of invasive species, would be largely maintained. Therefore, the no action alternative would have no short-term impacts on vegetation within the project area.

In the long term, Provo would continue efforts to mitigate the effects of drought. However, the probability of reduced water supply reliability during drought events would continue to be high, and climate change is also expected to increase the frequency and intensity of drought. Under this alternative, urban landscaping and vegetation within Provo may dry out and/or die if not properly irrigated for long periods of time. Therefore, this alternative could have minor to moderate long-term

adverse impacts on the vegetation within Provo, depending on the intensity and duration of future drought events.

4.8.2. PROPOSED ACTION

Under the proposed action, impacts on vegetation would include the removal of existing trees, shrubs, forbs, and grasses within the project footprint. This would include the removal of trees where the WTP would be constructed and ten trees where the booster station would be constructed. Temporarily disturbed unpaved portions of the project area (e.g., staging areas and access routes) would likely naturally revegetate through the establishment of plants growing from the existing soil seed bank or seeds from nearby plants. Following construction of the project, the area around the WTP and booster station would be landscaped with a variety of native trees and shrubs. In addition, other temporarily disturbed areas are expected to naturally revegetate in approximately 1 to 2 years following project completion. Therefore, the temporary removal of vegetation during construction activities would have a negligible adverse short-term impact on vegetation.

Existing vegetation within the footprints of the new WTP, booster station, and piped discharge outlet into Rock Canyon Creek would be permanently removed. However, the majority of vegetation that would be permanently removed consists of ornamental species and weedy grasses and forbs. Additionally, the extent of vegetation loss resulting from the proposed action would be minimal relative to the amount of similarly vegetated areas that would remain within and near the project area upon project completion. Following construction, several native trees and bushes would be planted in front of the WTP along Freedom Boulevard and a few native trees and shrubs would be planted around the booster station. Provo would be required to use seed mix free of invasive species for the revegetation of the project area. To the greatest extent possible, native seed mix and native plant species would be planted. Therefore, permanent vegetation removal within the footprints of the new WTP, booster station, and piped discharge into Rock Canyon Creek would have a minor adverse impact on vegetation by incrementally reducing the amount of vegetation within the project area, including existing invasive species.

Implementation of the proposed action would increase water supply reliability in Provo. This would help maintain the water supply for the irrigation of urban vegetation and reduce the risk of vegetation drying out or dying. In addition, water discharged into Rock Canyon Creek would maintain green vegetation along the stream. Therefore, implementation of the proposed action could improve the health of vegetation throughout Provo and result in minor long-term benefits.

4.9. Fish and Wildlife

Fish and wildlife include the species that occupy, breed, forage, rear, rest, hibernate, or migrate throughout the project area. Regulations relevant to fish and wildlife include the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act. Threatened and endangered fish and wildlife species are evaluated separately in Section 4.10.

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The MBTA of 1918, as amended (16 U.S.C. 703–711), provides protection for migratory birds and their nests, eggs, and body parts from harm, sale, or other injurious actions except under the terms of a valid permit issued pursuant to federal regulations. The U.S. Fish and Wildlife Service (USFWS) is the lead federal agency for implementing the MBTA. All native birds are protected by the MBTA.

The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c), enacted in 1940, provides for the protection of bald and golden eagles by prohibiting the take, possession, sale, purchase, barter, transport, export, or import of any bald or golden eagle, alive or dead, including any part, nest, or egg, unless allowed by permit. This act requires consultation with USFWS to ensure proposed federal actions do not adversely affect bald or golden eagles.

The following paragraphs describe the existing terrestrial and aquatic habitats within the project area and the wildlife and fish species that may occupy those habitats.

Terrestrial Fauna

Other than the portion within Rock Canyon, the project area is composed of urbanized areas that are expected to have minimal value to wildlife and likely only function as marginal foraging or dispersal habitat, except for urban-adapted species. Hence, wildlife with the potential to occur across the majority of the project area would include regionally common species that are adapted to living in and near developed areas with frequent human disturbance. Such species include the mule deer (*Odocoileus hemionus*), raccoon (*Procyon lotor*), and garter snakes (*Thamnophis* spp.) (iNaturalist 2023). The portion of the project area within Rock Canyon provides higher quality wildlife habitat relative to the remainder of the project area (owing to lower levels of human disturbance and a greater range of less altered natural habitats). Consequently, this portion of the project area has the potential to support a slightly more diverse assemblage of wildlife, including species such as the rock squirrel (*Otospermophilus variegatus*), bobcat (*Lynx rufus*), common sagebrush lizard (*Sceloporus graciosus*), western rattlesnake (*Crotalus oreganus*), canyon tree frog (*Hyla arenicolor*), and western toad (*Bufo boreas*) (iNaturalist 2023).

Additionally, existing habitats throughout the project area have the potential to support a variety of native bird species protected under the MBTA, including the American robin (*Turdus migratorius*), House finch (*Haemorhous mexicanus*), Mourning dove (*Zenaida macroura*), and Western kingbird (*Tyrannus verticalis*). The nesting season for these species is generally March through September (eBird 2023a; iNaturalist 2023).

Both bald and golden eagles have potential to occur transiently in the project area. Bald eagles are most likely to occur in association with large surface water bodies such as Utah Lake, outside the project area, and may forage in the Provo River near the project area. In addition, bald eagles are known to nest along the shores of Utah Lake (eBird 2023b). Golden eagles are regularly observed flying over the portion of the project area near Rock Canyon (eBird 2023b), and Rock Canyon provides suitable foraging habitat for golden eagles. While there are no known golden eagle nests in the vicinity of the project area, suitable nesting habitat for golden eagles may be present on high elevation rocky cliffs in areas of Rock Canyon away from frequent disturbance.

Aquatic Fauna

Although the project area does not contain aquatic resources, project activities would occur in close proximity to the lower Provo River and Rock Canyon Creek, and operations associated with the proposed action may influence both watercourses. The lower Provo River has been extensively modified by human activities and flows in the lower Provo River are greatly influenced by a complicated network of dams and water diversions. Flow regimes for the lower Provo River are intensely managed with consideration for maintaining favorable conditions for aquatic species, especially the federally threatened June sucker (*Chasmistes liorus*). The June sucker and all other federally listed species with the potential to be impacted by the action alternatives are discussed in Section 4.10. In addition to the June sucker, fish species known to occur in the lower Provo River include the native mottled sculpin (*Cottus bairdii*), speckled dace (*Rhinichthys osculus*), Utah sucker (*Catostomus ardens*), mountain sucker (*Catostomus platyrhynchus*), Bonneville cutthroat trout (*Oncorhynchus clarkii utah*), and mountain whitefish (*Prosopium williamsoni*), as well as numerous introduced species such as the common carp (*Cyprinus carpio*), white bass (*Morone chrysops*), green sunfish (*Lepomis cyanellus*), and largemouth bass (*Micropterus salmoides*) (Utah Reclamation Mitigation and Conservation Commission et al. 2015). Rock Canyon Creek is an intermittent stream that typically only flows during snowmelt runoff in the late spring and early summer. Therefore, Rock Canyon Creek lacks a sufficient hydroperiod to support fish or other fully aquatic species.

4.9.1. NO ACTION ALTERNATIVE

Under the no action alternative, there would be no construction-related impacts on terrestrial or aquatic fauna within or near the project area, including migratory birds. Therefore, the no action alternative would have no short-term impacts on fish and wildlife with the potential to occur within or near the project area.

In the long term, Provo would continue efforts to mitigate the effects of drought. However, the probability of reduced water supply reliability during drought events would continue to be high, and climate change is also expected to increase the frequency and intensity of drought. Under this alternative, a lack of water to irrigate landscaping within Provo could lead to dry soil and vegetation, including vegetation in parks and green space throughout Provo that support a variety of birds and urban-adapted wildlife species. Larger amounts of dry and dead vegetation could impact the quality of the habitat in the parks and green space within Provo. Therefore, this alternative could have minor to moderate long-term adverse impacts on wildlife within Provo, depending on the intensity and duration of future drought events.

4.9.2. PROPOSED ACTION

Under the proposed action, there is the potential for direct harm to terrestrial fauna to result from the use of heavy equipment during construction. Localized vegetation removal and disturbance associated with construction work would cause some extant urban-adapted wildlife to leave the limited amount of low-quality habitat within the project area in search of refuge, which could make them vulnerable to injury, predation, loss of food resources, and subject to increased competition for remaining resources. However, the number of individuals that would be displaced because of

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project-related disturbance is expected to be relatively small owing to the limited extent and low quality of existing wildlife habitat. Further, displaced individuals would be able to relocate to habitats of comparable quality in the vicinity and would be able to return to temporarily disturbed portions of the project area once construction is complete. The proposed action would result in an incremental reduction of marginal terrestrial wildlife habitat where the new WTP, booster station, and piped outlet into Rock Canyon Creek are constructed. However, the footprints of the new WTP and booster station are highly developed and the footprint of the piped outlet into Rock Canyon Creek is subject to regular ongoing human disturbance from recreational use of the adjacent hiking trail. Therefore, the proposed action would not result in the loss of any unique or high-quality habitats for terrestrial wildlife. Additionally, construction activities under the proposed action would not involve work in or directly adjacent to waters with the potential to support fish or other fully aquatic species, and operational activities under the proposed action would not have an appreciable impact on existing flow conditions in the lower Provo River. For these reasons, construction activities conducted under the proposed action would have minor short- and long-term adverse impacts on terrestrial fauna and negligible short- and long-term adverse impacts on aquatic fauna.

Birds are mobile and can readily fly away from construction noise and disturbance. However, if construction occurs during the general bird breeding season (i.e., March through September), related activities could have moderate short-term adverse impacts on species protected by the MBTA because vegetation removal could result in nest destruction and the loss of eggs and/or young. In addition, tree removal associated with construction of the WTP would have a minor long-term adverse impact on migratory birds by incrementally decreasing nesting habitat availability within the project area. Given the potential for take of migratory birds to occur, the proposed action would be subject to the prohibitions of the MBTA and Provo would be responsible for complying with federal and state laws for the protection of birds before initiating work. To the extent feasible, activities involving the removal of vegetation would occur outside of the general bird nesting season for migratory birds, which is April 1 through August 31 for songbirds and January 15 through August 31 for raptors. If vegetation removal must occur during the general bird nesting season for migratory birds and raptors, Provo shall retain a qualified biologist to perform a pre-construction survey of potential nesting habitat to confirm the absence of active nests belonging to migratory birds and raptors afforded protection under the MBTA. The pre-construction survey shall be performed no more than seven days prior to the commencement of vegetation removal activities. The results of the pre-construction survey shall be documented by the qualified biologist and submitted to Provo. If the qualified biologist determines that no active migratory bird or raptor nests are present, the activities shall be allowed to proceed without any further requirements. If the qualified biologist determines that an active migratory bird or raptor nest is present, no construction activity within 300 feet (500 feet for raptors) of the active nest shall occur until the young have fledged the nest and the nest is confirmed to no longer be active, or as determined by the qualified biologist. The biological monitor may modify the buffer or propose other recommendations in order to minimize disturbance to nesting birds. With compliance with the MBTA, the proposed action would have a negligible short-term adverse impact and a negligible long-term adverse impact on bird species protected under the MBTA.

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There are no known bald or golden eagle nests in the project area. The nearest bald eagle nesting habitat is over three miles west of the project area along Utah Lake. Therefore, there would be no short-term adverse impacts on nesting bald eagles during construction of the proposed action. Golden eagles may nest on rocky cliffs above the project area in Rock Canyon. However, golden eagles would select nest sites away from areas with frequent human presence and activity such as that associated with recreational use of the Rock Canyon portion of the project area. Golden eagles that may forage within Rock Canyon would likely avoid the canyon bottom during construction due to the activity along the road. However, the canyon represents a small portion of an eagle's foraging range and is an area that typically has a relatively high level of human activity; therefore, there would only be a negligible effect on golden eagles during construction. The proposed action would have no long-term adverse impacts on bald or golden eagles.

Implementation of the proposed action would increase water supply reliability in Provo. This would help maintain the water supply for the irrigation of urban vegetation and reduce the risk of vegetation drying out or dying. Therefore, implementation of the proposed action could improve the quality of the habitat in the parks and green space within Provo. This would have a minor long-term benefit on the wildlife in the City.

4.10. Threatened and Endangered Species and Critical Habitat

The Endangered Species Act (ESA) of 1973 gives USFWS and the National Marine Fisheries Service authority for the protection of threatened and endangered species. This protection includes a prohibition on direct take (e.g., killing, harassing) and indirect take (e.g., destruction of habitat).

The ESA defines the action area as “all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action” (50 CFR 402.02). Therefore, the action area where effects on listed species must be evaluated may be larger than the project area where project activities would occur. With respect to the terrestrial component of the action area, noise from heavy equipment used during construction is expected to be the farthest-reaching effect of the proposed action and thus an appropriate determinant of the action area's extent on land. Hence, the terrestrial component of the action area is defined to extend to the point where noise is expected to attenuate to background levels. This is conservatively estimated to be approximately 300 feet from the construction limits, based on an analysis of expected noise levels generated by the types of equipment that would be used (Federal Highway Administration 2017) and estimated ambient noise levels within the action area (USFWS 2006). The aquatic component of the action area includes all sections of the Provo River main stem that may experience hydraulic and hydrologic changes due to the proposed action. Hence, the aquatic portion of the action area includes the Provo River main stem from the Jordanelle Dam to the Provo River's confluence with Utah Lake.

The USFWS Information for Planning and Consultation and the National Marine Fisheries Service Protected Resource Application were used to identify proposed, threatened, and endangered species with the potential to occur within the action area (USFWS 2023b, National Marine Fisheries Service 2023). Based on information obtained from these resources, four federally listed species

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have the potential to occur within the action area, all of which are under the jurisdiction of USFWS (Table 4.4). The likelihood of these species to occur within the action area is briefly discussed below.

Table 4.4. Federally Listed Species with the Potential to Occur Within or Near the Project Area

Common Name	Scientific Name	Status
Mammals		
Canada lynx	<i>Lynx canadensis</i>	Threatened
Birds		
Yellow-billed cuckoo, western distinct population segment	<i>Coccyzus americanus</i>	Threatened
Fish		
June sucker	<i>Chasmistes liorus</i>	Threatened
Plants		
Ute ladies'-tresses	<i>Spiranthes diluvialis</i>	Threatened

Sources: USFWS 2023b

Canada Lynx: The Canada lynx inhabits large tracts of boreal forest that support sufficient abundance of its primary prey, snowshoe hares (*Lepus americanus*). No suitable habitat for this species is present within the action area. Additionally, according to the species status assessment conducted by USFWS in 2017, Utah does not support any resident lynx populations (USFWS 2017). Therefore, the Canada lynx is not expected to occur within or near the action area and is not discussed further in this EA.

Yellow-billed cuckoo (YBCU), western distinct population segment: The YBCU is a migratory bird species that travels from its wintering grounds in Central and South America to its breeding grounds in North America where it remains for the duration of the breeding season (i.e., May through September). The YBCU typically breeds in large blocks of riparian habitat and generally prefers riparian woodlands with cottonwoods (*Populus* spp.) and (*Salix* spp.) willows. The YBCU generally occurs along perennial rivers and streams, which provide sufficient moisture to support the dense riparian plant communities required by the species for nesting, shelter, cover, and food resources. According to the Utah Natural Heritage Program database, the YBCU was detected in 2005 within approximately 2 miles of the project area (as cited in BIO-WEST, Inc. 2022). Additionally, the action area overlaps an approximately 0.1-mile-long section of the riparian corridor along the eastern bank of the Provo River, near the site of the proposed WTP, that could provide marginal YBCU breeding habitat. Therefore, the YBCU is considered to have some, albeit extremely low, potential to occur within the action area.

June sucker: The June sucker is endemic to Utah Lake and its tributaries, which serve as the primary spawning habitat for the species. The majority of June sucker spawning occurs in the Provo River

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because the river's flow conditions best support the habitat types preferred by the June sucker for spawning (i.e., moderately deep runs and riffles in slow to moderate current with a substrate composed of coarse gravel or small cobble that is free of silt and algae). The June sucker was listed as endangered in 1986 (USFWS 2021). Since 1994, efforts have been made to manage flows in the lower Provo River for the benefit of the June sucker and the species was subsequently downlisted to threatened in 2021 (USFWS 2021) because of substantial improvements in the species' overall status.

Since its establishment in 2002, the multi-agency June Sucker Recovery Implementation Program (JSRIP) has provided annual recommendations for river flows to water-managing entities to support June suckers in the Provo River based on the known biology of the species and historical flow levels (USFWS 2021). The flow scenarios recommended by the JSRIP generally attempt to mimic the natural lower Provo River spring hydrograph with which the June sucker has evolved and adapted. As such, hydrographs recommended by the JSRIP include consideration for early season attractant flows needed to cue spawning adults, sustained base flows in spawning areas to maintain optimal conditions for egg incubation, and flows needed by larval June suckers to move into downstream rearing habitats (USFWS 2021). The upstream limit of June sucker migration and spawning in the Provo River corresponds to the Tanner Race Diversion Dam, which is approximately 4.9 miles upstream of the Provo River's confluence with Utah Lake and approximately 1 mile downstream of the Mill Race Diversion. The Tanner Race Diversion Dam is a total barrier to June sucker movement under all flow conditions. Hence, within the action area, June sucker are restricted to the lowermost 4.9 miles of the Provo River.

The action area includes an approximately 4.9-mile stretch of the lower Provo River, starting approximately 1 mile downstream of the project area to Utah Lake, that has been designated as critical habitat for the June sucker.

Ute ladies'-tresses: Ute ladies'-tresses are known primarily from moist meadows and wetland habitats associated with perennial stream terraces, floodplains, and oxbows at elevations between 4,300 and 6,850 feet above mean sea level. Historically, Ute ladies'-tresses have been detected in riparian and wetland habitats along the Provo River (Walter et al. 2005). Additionally, marginally suitable habitat for the species occurs along the section of the Provo River included within the action area. Therefore, this species has low potential to occur within the action area.

4.10.1. NO ACTION ALTERNATIVE

Under the no action alternative, no construction-related disturbance or operational changes to the existing diversion of water in the lower Provo River would occur. Therefore, the no action alternative would have no short- or long-term impacts on federally listed species with the potential to occur within the action area.

4.10.2. PROPOSED ACTION

Yellow-billed cuckoo: As discussed above, the YBCU is highly unlikely to occur within the action area. However, if individuals were to occur within the action area during project implementation, they

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could be subject to construction-related noise disturbance that may disrupt their normal nesting and/or foraging behavior. However, the nearest potentially suitable YBCU habitat is approximately 300 feet away from the anticipated limits of construction. At this distance, it is expected that construction related noise would reduce to levels within the range of existing noise sources. Therefore, construction related noise is not expected to alter the normal behavior of any YBCUs that may occur within the action area during project implementation. Further, it is expected that operational impacts of the proposed action would not have an appreciable effect on existing riparian vegetation that may constitute suitable YBCU habitat along the Provo River because existing hydrology would be maintained. Therefore, the proposed action would have no short- and long-term impacts on the YBCU.

June sucker: As discussed above, the June sucker is known to occur within the action area in the lowermost 4.9 miles of Provo River. This stretch of the lower Provo provides essential habitat for June sucker spawning, hatching, larval transport, rearing, and recruitment; hence, this stretch has been designated as a critical habitat for the species. The proposed action would not involve work in aquatic habitats occupied by the June sucker; therefore, the proposed action would not directly impact the species. However, the proposed action could indirectly impact the June sucker and its critical habitat if water diverted from the Provo River for the operation of the WTP and ASR system were to decrease water availability such that flow deliveries to the Provo River recommended by the JSRIP could not be fully implemented. Of particular concern would be any resulting flow reductions during the spawning season when specific flow conditions are required to facilitate successful spawning and larval transport to Utah Lake. Additionally, any reduction in summer base flows due to operation of the proposed action could decrease the quality and quantity of rearing habitat at the interface of the Provo River and Utah Lake, thereby posing a threat to the successful recruitment of young June sucker to the adult life stage and potentially impairing recovery of the species. However, under the proposed action there would be no change to the existing approved permits for water diversions during the irrigation season relative to existing conditions. In addition, the JSRIP would continue to manage flows for the benefit of the species. Therefore, the proposed action would not impact existing water supplies for June sucker flows, and thus would have a negligible adverse long-term impact on the species and its critical habitat.

Ute ladies'-tresses: As discussed above, Ute ladies'-tresses have low potential to occur within the action area. Although no suitable habitat is present within the project footprint, suitable habitat does occur along the section of the lower Provo River included in the action area. The proposed action could impact Ute ladies'-tresses if water diverted for operation of the proposed action were to decrease flows in the Provo River to the extent that the hydrology of adjacent wetlands would be altered. However, operation of the proposed action would not impact existing Provo River flow conditions. In addition, the JSRIP would remain in effect and continue to manage flows for the benefit of the June sucker. Therefore, the proposed action would not impact the existing hydrology of streamside habitats along the lower Provo River that may support the species. Hence, the proposed action would have no short-term and long-term- adverse impacts on the species.

Effects Determination Summary: FEMA determined that the proposed action may affect, but is not likely to adversely affect, listed species (**Table 4.5**). Coordination with USFWS has been ongoing

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throughout project development. The Section 7 ESA consultation was submitted to USFWS for review and concurrence on August 17, 2023. Any project conditions provided by USFWS will be made a condition of the FEMA grant.

Table 4.5. Effect Determination Summary for Federally Listed Species

Federally Listed Species	Effect Determination
Canada lynx	No Effect
Yellow-billed cuckoo	No Effect
June sucker	May Affect, but is Not Likely to Adversely Affect
Ute ladies'-tresses	No Effect

4.11. Cultural Resources

This section provides an overview of potential environmental effects on cultural resources, including historic properties. Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470f), requires that activities using federal funds undergo a review process to consider potential effects on historic properties that are listed in or may be eligible for listing in the National Register of Historic Places. Cultural resources include prehistoric or historic archeology; historic standing structures; historic districts; objects; artifacts; cultural properties of historic or traditional significance, referred to as Traditional Cultural Properties, which may have religious or cultural significance to federally recognized Indian tribes; or other physical evidence of human activity considered to be important to culture, subculture, or community for scientific, traditional, religious, or other reasons.

Pursuant to 36 CFR 800.4(a)(1), FEMA has defined an Area of Potential Effects (APE) that includes all areas within which the undertakings may directly affect cultural resources. The APE encompasses 16.97 acres of land within public rights-of-way and on City property, except for approximately 1,200 feet of pipeline in Rock Canyon, which would cross property owned by the U.S. Forest Service, and approximately 1,410 feet of pipeline that would cross two parking lots on Brigham Young University property. The U.S. Forest Service did their own evaluation of cultural resources under Section 106. The two parking lots on Brigham Young University property were included in the APE. The vertical depth of the APE includes the deepest extent of project-related ground-disturbing activity anticipated, not to exceed 20 feet below existing grade.

The proposed clearwell at the western end of the APE in the proposed new WTP would be the area with the deepest potential effects. The western portion of the project pipeline (approximately 75 percent) would be constructed within existing curb-and-gutter paved roadway in Provo City. The easternmost portion of pipeline would be constructed within an existing roughly paved road (no curb and gutter). Nearly the entire APE has been previously subjected to ground disturbance and substantial portions are covered with pavement.

There is some, albeit fairly small, potential for buried prehistoric and historic archaeological resources to be present within the APE. However, no known subsurface archaeological resources have been identified within the APE to date. Such resources may include, but are not limited to, sites associated with Native American occupation and use of the area (e.g., camps or habitation locales) or historic settlement and development of the area (e.g., historic pipelines, building foundations, trash deposits, outhouses). Between the developed nature of nearly all of the APE and the limited potential for buried archaeological deposits beneath the ground surface or existing roads in the APE, no subsurface archaeological testing was conducted.

Identification efforts included a records search combined with an intensive pedestrian inventory of 8.34 acres that identified three cultural resources, all of which are historic properties (Johnson 2023). These three historic properties are part of the historic Mill Race Canal, and two public water system buildings. The remnant Mill Race Canal segments were deemed not eligible for inclusion in the National Register. The two public water system buildings were deemed eligible for the National Register under Criterion C (design/construction).

4.11.1. NO ACTION ALTERNATIVE

Under the no action alternative, there would be no construction-related impacts on historic properties in the APE or the surrounding area.

In the long term, Provo would continue efforts to mitigate the effects of drought. However, the probability of reduced water supply reliability during drought events would continue to be high and climate change is also expected to increase the frequency and intensity of drought. Without the project, the groundwater aquifer could continue to decline with use, potentially resulting in subsidence. Roads, bridges, utilities, and buildings in northern Provo City and Orem could be severely damaged over time. Water supply infrastructure that could be damaged by subsidence includes the Provo River Aqueduct, Provo Bench, Timpanogos, East and West Union Canals, and the Spanish Fork-Provo Reservoir branch of the Utah Lake Drainage Basin Water Delivery System Pipeline. Although not evaluated for eligibility, some of these resources may be eligible now or in the future. Therefore, this alternative could result in long-term minor negative impacts on historic properties depending on the intensity and duration of future drought events.

4.11.2. PROPOSED ACTION

The proposed action would result in a No Adverse Effect determination for the two National Register eligible historic properties known to exist within the APE because the project would not alter the characteristics of those historic properties that qualify them for the National Register. Under the proposed action excavation and soil disturbance would be required to build the WTP and new pump station and install the new pipeline. The WTP, clearwell, and pump station would require excavation to a depth of 15 to 20 feet below the existing grade. The pipelines would require trenching to depths of 10 to 15 feet below the existing grade. FEMA consulted with the Utah State Historic Preservation Office (SHPO) on June 29, 2023; on July 17, 2023, the SHPO concurred with FEMA's determinations

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of eligibility for the identified historic properties and the finding of No Adverse Effect for the Undertaking.

FEMA consulted with the seven Native American Tribes claiming cultural affinity to the APE in July and early August 2023. These tribes are the Confederated Tribes of Goshute, the Paiute Indian Tribe of Utah, the Northwestern Band of Shoshone Nation, the Skull Valley Band of Goshute, the Ute Indian Tribe of the Uintah and Ouray Reservation, the Ute Mountain Ute Tribe, and the Navajo Nation. No responses from the tribes were received.

As yet unidentified cultural resources (in the form of buried archaeological deposits) could be exposed and impacted during construction. However, the potential for encountering significant cultural resources within project area during the proposed action is very limited. Furthermore, BMPs for identifying archaeological materials would be implemented during construction. Construction workers would be trained to recognize historic and prehistoric artifacts and features. If unanticipated cultural resources are discovered during construction, protocols for timely notification to Provo City, SHPO, and FEMA, and professional resource documentation, evaluation, and (if necessary) treatment would be fulfilled. Therefore, implementation of the proposed action would result in mitigation of possible adverse effects to any newly discovered historic properties or other cultural resources.

4.12. Environmental Justice

Environmental justice is defined by EO 12898 (59 Federal Register 7629) and CEQ guidance (1997). Under EO 12898, demographic information is used to determine whether minority populations or low-income populations are present within the areas potentially affected by the range of project alternatives. If so, a determination must be made whether implementation of the project alternatives may cause disproportionately high and adverse human health or environmental impacts on those populations.

The study area for construction of the proposed project includes the project area and access and staging areas, and the Provo municipal utility district. Thus, the study area for the environmental justice analysis includes Provo City. The study area represents the area where project-related impacts would occur, potentially causing disproportionately high and adverse effects on neighboring minority and low-income populations. For the purposes of this analysis, environmental justice populations are identified using demographic indicators and Environmental Justice Indexes.

In accordance with the FEMA EO 12898 Environmental Justice: Interim Guidance for FEMA EHP Reviewers, environmental justice populations are defined as meeting either or both of the following criteria:

- The populations within the project benefit area contains a minority or low-income population that is equal to or exceeds the 50th percentile compared to the average of the state where the affected environment is located.

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- One or more Environmental Justice Index (e.g., air quality pollutants, traffic proximity and volume, proximity to hazardous waste sites) equals or exceeds the 80th percentile compared to the average of the state.

EPA defines minority populations (people of color) as individuals who list their racial status as a race other than white alone and/or list their ethnicity as Hispanic or Latino (i.e., all people other than non-Hispanic white-alone individuals) (EPA 2023c). Low-income populations are measured as households with an income that is less than or equal to twice the federal poverty level. The EJ Indices combine environmental indicators with socioeconomic indicators to identify areas where there may be a disproportionate exposure to environmental pollution.

Table 4.6 and **Table 4.7** depict the demographic indicators and Environmental Justice Indexes for the study area and the state and identify if environmental justice populations are present based on the criteria described above.

Table 4.6. Environmental Justice Population Demographic Indicators – Provo City

Demographic Indicator	Provo City Average Percentage	Utah Average Percentage	Percentile in State	Environmental Justice Population Present in the Study Area?
People of Color	28%	22%	72	Yes
Low-Income	46%	26%	86	Yes

Source: EPA 2023d

Table 4.7. Environmental Justice Indexes – Provo City

EJ Index	Percentile in State	Environmental Justice Population Present in the Study Area? ¹
Particulate Matter	29	No
Ozone	30	No
NATA Diesel Particulate Matter	71	No
NATA Air Toxics Cancer Risk	1	No
NATA Respiratory Hazard Index	16	No
Toxic Releases to Air	48	No
Traffic Proximity and Volume	85	Yes
Lead Paint Indicator	68	No
Proximity to National Priorities List Sites	25	No

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EJ Index	Percentile in State	Environmental Justice Population Present in the Study Area? ¹
Proximity to Risk Management Plan Sites	49	No
Proximity to Treatment Storage and Disposal Facilities	73	No
Underground Storage Tanks	72	No
Wastewater Discharge Indicator	85	Yes

Source: EPA 2023d

Notes: ¹ Index equals or exceeds the 80th percentile compared to the average of Utah; therefore, an environmental justice population is present.

As shown in **Table 4.6** and **Table 4.7**, the study area meets the criteria for containing environmental justice populations based on thresholds for minority populations, low-income populations, traffic proximity and volume, and the wastewater discharge indicator. Traffic proximity and volume is based on the count of vehicles per day (average annual daily traffic) at major roads within 500 meters of environmental justice populations, divided by distance in meters. The wastewater discharge indicator is based on EPA's modeled toxic concentrations at stream segments within 500 meters, divided by distance in kilometers. The high percentage of low-income households is related to the study area having a high concentration of college students, due to its proximity to Brigham Young University.

4.12.1. NO ACTION ALTERNATIVE

Under the no action alternative, no construction of the ASR system would occur; thus, no construction-related impacts, such as increased noise or temporary reductions in air quality, would occur. Therefore, the no action alternative would have no short-term impacts on environmental justice populations.

In the long term, implementation of the no action alternative would not reduce the impacts of drought within the project area, and environmental justice populations within Provo would continue to be vulnerable. Drought could result in the increased cost of utilities and water shortages, both of which would place a disproportionate burden on environmental justice populations that are unlikely to have the same financial capacity to pay for increased water costs, as compared to other populations. Therefore, the no action alternative could have a disproportionately high and adverse effect on environmental justice populations over the long term, depending on the intensity and duration of future drought events.

4.12.2. PROPOSED ACTION

Under the proposed action, construction activities would result in short-term adverse effects, including noise and reduced air quality, which would impact those proximate to work areas. Low-income populations in Provo are evenly distributed around Brigham Young University campus to the north, where the project construction would occur, as well as to the south and west. As previously

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mentioned, this corresponds with the high student population living near the campus. Construction and installation of distribution lines near and through the Brigham Young University would be limited to the spring and summertime when there is a lower student population present, which would reduce potential impacts. In addition, these effects would not disproportionately impact environmental justice populations, as these short-term effects would impact all residents near the project areas equally. Therefore, construction of the proposed action would have minor short-term adverse effects on environmental justice populations as well as the entire community, but there would be no disproportionately high and adverse impacts on these populations.

Implementation of the proposed action would not result in any residential or business displacements. However, under the proposed action, operation of the WTP could result in adverse impacts related to noise, which would impact those near the new WTP. The main source of noise from operation of the WTP would be from the pump station, located on the east side of the WTP site along Freedom Boulevard, and would include the operation of five water pumps. However, all the WTP components, including the pump station, would be fully enclosed within the WTP facility. Construction of the WTP facility would include the installation of acoustical sound absorption panels on the walls and ceiling to attenuate noise levels to be below Provo City's permitted continuous and intermittent noise limits, outlined in Chapter 9.06 of the Provo Municipal Code. Operation of the expanded booster station could also result in long-term adverse impacts related to noise, impacting those near the booster station. However, the booster station would replace an existing booster station in the same location. The booster station would also be built with updated equipment operating at a lower noise volume and the building would be constructed with improved noise attenuation construction methods. As previously mentioned, low-income populations in Provo are evenly distributed around Brigham Young University campus, where operation of the WTP and booster station would occur. Therefore, the proposed action would have minor long-term adverse effects on environmental justice populations, but there would be no disproportionately high and adverse impacts on these populations.

Implementation of the proposed action would reduce the impacts of drought, which would benefit the entire surrounding community, including environmental justice populations. In addition, the proposed action would provide reliable water over the long term at a lower cost than if Provo purchased water through CUWCD. Therefore, the proposed action would have a minor long-term benefit on environmental justice populations.

4.13. Hazardous Materials

Hazardous materials are those substances defined by the Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the Superfund Amendments and Reauthorization Act, and the Toxic Substances Control Act. The Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, which was further amended by the Hazardous and Solid Waste amendments, defines hazardous wastes. In general, both hazardous materials and waste include substances that, because of their quantity, concentration, physical, chemical, or infectious characteristics, may present substantial danger to public health or the environment when released or otherwise improperly managed.

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Hazardous materials may be encountered in the course of a project, or they may be generated by the project activities. To determine whether any hazardous waste facilities exist in the vicinity or upgradient of the proposed project area, or whether there is a known and documented environmental issue or concern that could affect the proposed project area, a search for Superfund sites, toxic release inventory sites, industrial water dischargers, hazardous facilities or sites, and multiactivity sites was conducted using EPA's NEPA Assist website (EPA 2023e) and EPA's Underground Storage Tank (UST) Finder (EPA 2023f). According to the NEPA Assist database, there are 36 permitted wastewater dischargers and 13 hazardous waste generators within an approximate 0.5 mile of the project area. Hazardous waste generators near the project area include a Chevron station, a Jiffy Lube, a Chevrolet dealership and service center, and ignitable waste from the *Daily Herald*. There is one open UST within 0.5 mile of the project area, at Stadium Chevron 0.2 mile south of the project area (EPA 2023f). However, it is not expected that contaminated soils or hazardous materials exist within the project footprint where ground disturbance or excavation would occur as there are no hazardous facilities or open USTs listed within the limits of the project area. No Superfund sites are located within a mile of the project area (USEPA 2023e).

4.13.1. NO ACTION ALTERNATIVE

No construction would occur under the no action alternative; therefore, no short-term impacts related to hazardous materials would occur as a result of construction equipment use or the exposure of contaminated materials through ground-disturbing activities. Under this alternative there would be no potential for long-term production or exposure of hazardous wastes or materials. Therefore, this alternative would have no short- or long-term impacts related to hazardous materials.

4.13.2. PROPOSED ACTION

Under the proposed action, construction would occur and the use of mechanical equipment and vehicles would introduce a risk of leaks and spills of hazardous fuels, oils, and lubricants. However, all equipment used would be in good condition and project activities would adhere to local and state regulations to reduce the risk of hazardous leaks and spills. Any spills during construction would be immediately contained and cleaned. Although no known subsurface hazardous materials are present within the project area, excavation activities could expose or otherwise affect previously undetected subsurface hazardous wastes or materials. Any hazardous materials discovered, generated, or used during implementation of the proposed action would be disposed of and handled in accordance with applicable local, state, and federal regulations. Any hazardous material unexpectedly encountered during construction would be reported to the Utah DEQ. Therefore, there would be a negligible short-term adverse impact from the use of vehicles and equipment or from the potential for inadvertent exposure of previously unknown hazardous materials.

In the long term, operation of the water treatment plant would involve the storage and use of hazardous material, including chlorine gas. Provo would develop an emergency response protocol that would be updated annually. The gas storage room would be properly labelled with hazard signs, sealed from the remainder of the building, and equipped with remote control and an emergency shut off switch. Rubber gloves, protective clothing, gas masks, and a bottle of ammonia hydroxide

solution, used for leak detection, would be stored nearby. All chemical storage and handling would comply with local, state, and federal regulations. Therefore, there would be a minor long-term adverse impact from the transport, storage, and use of hazardous material during operation of the WTP.

4.14. Noise

Sounds that disrupt normal activities or otherwise diminish the quality of the environment are considered noise. Noise events that occur during the night (10 p.m. to 7 a.m.) are more annoying than those that occur during normal waking hours (7 a.m. to 10 p.m.). Noise is regulated at the federal level by the Noise Control Act of 1972 (42 U.S.C. §§ 4901, et seq). At the local level, noise is regulated in the Provo City Code. Section 9.06.030 of the City Code, *Noise Limits*, provides the maximum lawful noise limits during the day and night for different kinds of noise (intermittent, continuous, and impulse noise) in different districts (residential/agricultural, commercial, and industrial) (Provo City 2023a). Section 9.06.040 of the City Code, *Exemptions*, exempts sounds created by construction from the regulations laid out in Section 9.06.030 provided a permit is obtained from the mayor (Provo City 2023a).

Assessment of noise impacts includes the proximity of the proposed action to sensitive receptors, which are defined as an area of frequent human use that would benefit from a lowered noise level. Typical sensitive receptors include residences, schools, churches, hospitals, nursing homes, and libraries. Ambient noise levels vary throughout the project area; the western segment of the project area has the highest ambient noise level, as it is surrounded by some industrial, commercial, and educational land uses. Typical noises in this region are generated by traffic, recreational activities, and intermittent fanfare during large athletic events at the Brigham Young University stadium. The middle segment of the project area (Temple View Drive to 1450 East) is surrounded by residential land uses and has a lower ambient noise level than the western portion of the project area, with most noise being generated from traffic and recreational activities. The eastern portion of the project area within Rock Canyon has the lowest ambient noise level, with most noise being generated from wildlife, wind, and low levels of traffic. Many sensitive receptors occur in or directly adjacent to the project area, including multiple residences (especially along Stadium Avenue, Temple View Drive, and 2300 North), three churches within 0.25 mile of the project area (the closest of which is directly adjacent to Stadium Avenue), and the Brigham Young University campus, through which the project area passes.

4.14.1. NO ACTION ALTERNATIVE

No construction would occur under the no action alternative and implementation of the no action alternative would not introduce a new permanent noise source. Therefore, this alternative would have no short- or long-term noise impacts.

4.14.2. PROPOSED ACTION

Construction activities, including demolition, excavation, and construction of the new WTP and other structures, would cause temporary increases in noise levels. Residences, churches, and the university would likely experience a temporary increase in daytime noise levels. Temporary increases in noise levels owing to construction activities would be minimized through compliance with the local noise ordinance and adherence to any conditions described in issued permits. Additionally, all construction equipment would be well maintained, have sound-control devices no less effective than those provided on the original equipment, and have muffled exhaust. With the implementation of these BMPs and compliance with all applicable noise regulations, implementation of the proposed action would have minor short-term adverse noise impacts.

In the long term, as discussed in Section 4.12.2, operation of the WTP could result in adverse impacts related to noise. The main source of noise from operation of the WTP would be from the pump station, located on the east side of the WTP site along Freedom Boulevard, and would include the operation of five water pumps. However, all the WTP components, including the pump station, would be fully enclosed within the WTP facility. Construction of the WTP facility would include the installation of acoustical sound absorption panels on the walls and ceiling to attenuate noise levels to be below Provo City's permitted continuous and intermittent noise limits, outlined in Chapter 9.06 of the Provo Municipal Code. Operation of the expanded booster station could also result in long-term adverse impacts related to noise. However, the booster station would replace an existing booster station in the same location. The booster station would also be built with updated equipment operating at a lower noise volume, would be fully enclosed and constructed with improved noise attenuation construction methods. Therefore, the proposed action would have a negligible long-term adverse noise impact.

4.15. Transportation

Provo City can be accessed regionally via US Route 89 (State Street), US Route 189 (North University Avenue), and State Route 265 (North University Parkway). Freedom Boulevard 200 West, North University Avenue, North 150 East, 900 East, and some smaller roadways provide local access to the project area. Arterial and collector roadways within the project area include Freedom Boulevard 200 West, Stadium Avenue, 900 East, Temple View Drive, and 2300 North. **Table 4.8** presents the most updated (2020) approximate average annual daily traffic (AADT) counts along the roadways within the project area for which data are available (Utah Department of Transportation 2021).

Table 4.8. Average Annual Daily Traffic within the Project Area

Street	2020 AADT (number of vehicles)
Freedom Boulevard 200 West	5,400
900 East	24,000
Temple View Drive	4,800
2300 North	990

Source: Utah Department of Transportation 2021

Key: AADT = average annual daily traffic

Note: AADT numbers represent traffic in both directions

The Utah Transit Authority operates several bus lines on roadways adjacent to the project area, including along the portions of Freedom Boulevard and 900 East south of the project area, the portion of 2230 North west of the project area, and along University Parkway (Utah Transit Authority 2023).

4.15.1. NO ACTION ALTERNATIVE

Under the no action alternative, no construction would occur along the roadways within the project area. Thus, there would be no short-term potential for traffic in the area to increase because no equipment or personnel would be transported to the project area, and no road closures or other traffic detours would occur. The no action alternative would not alter long-term road use. Therefore, the no action alternative would have no short- or long-term impacts on transportation.

4.15.2. PROPOSED ACTION

Under the proposed action, roadways in the project area would be temporarily closed and traffic control measures would be put in place during construction of all new distribution lines. The asphalt roadways presented in **Table 4.8** would be closed during demolition and trench excavation to allow for the new pipes to be placed, and travelers would be directed to use alternative routes. Only a short segment of a roadway would be closed at any one time (e.g., one to two blocks at a time). Following pipe installation, the trenches would be backfilled, compacted, and repaved or restored to pre-construction conditions. Installation across University Avenue would be done in two segments, by shifting all traffic to one side, keeping two lanes open in both directions, while the pipe is installed through the other side of the street. Although the road closures would not directly impact bus routes, increased traffic due to construction equipment and personnel access and traffic detours caused by the road closures may increase traffic along the nearby roadways that support bus routes. However, construction activities and road closures would be temporary, and Provo would develop a traffic control plan and would adhere to any conditions laid out in all necessary permits obtained. Additionally, road closures related to the installation of distribution lines near and through the Brigham Young University parking lots and intermural fields would be limited to the spring and summertime to avoid impacting athletic events that take place at the university. Therefore,

implementation of the proposed action would have moderate, short-term adverse impacts on transportation in and around the project area.

Implementation of the proposed action is not expected to measurably increase the number of travelers to the project area. The WTP would only require one to two new workers who would commute to the plant and one truck trip per week for deliveries and waste disposal. Therefore, the proposed action would have no long-term adverse impact on transportation in or around the project area.

4.16. Public Services and Utilities

The Provo Public Works Department provides water and sewer services, trash collection, and stormwater management services to the project area (Provo City n.d.-a). Provo Power provides electricity to the project area, and Dominion Energy provides natural gas (Provo Power 2015).

The project area includes the Rock Canyon Trailhead and a portion of the Rock Canyon Trail, which provides the public with recreational opportunities such as hiking, rock climbing, and mountain biking. The Rock Canyon Trailhead also includes a picnic pavilion and open-air amphitheater (Provo City n.d.-b).

4.16.1. NO ACTION ALTERNATIVE

No construction activities would occur under the no action alternative; therefore, this alternative would not disrupt or increase demand on public services or utilities in the project area in the short term.

In the long term, the probability of reduced water supply reliability during drought events would continue to be high and climate change is also expected to increase the frequency and intensity of drought. Drought could result in water shortages and service interruptions. Therefore, this alternative could have minor to moderate long-term adverse impacts on utilities within Provo depending on the intensity and duration of future drought events.

4.16.2. PROPOSED ACTION

During construction of the proposed action, installation of the new pipeline would mostly be placed around existing utilities, with some smaller utility lines relocated under the new pipeline. Construction of the proposed action would include the temporary closure of the Rock Canyon Trailhead and a portion of the Rock Canyon Trail during installation of the new pipeline within Rock Canyon. Therefore, the proposed action would have minor short-term adverse impacts on recreation within the project area. Following construction, the trail would be restored to pre-project conditions with an improved natural surface and both the Rock Canyon Trailhead and the Rock Canyon Trail would reopen to the public. There would be no long-term adverse impacts on recreation under the proposed project.

Operation of the proposed action would improve water supply reliability during drought events and would reduce the risk of water shortages and service interruptions. Therefore, this alternative would have minor to moderate long-term beneficial impacts on utilities within Provo.

4.17. Public Health and Safety

Police services in the area are provided by the Provo Police Department located at 445 West Center Street, approximately 2.3 miles away from the WTP site and 4 miles from the Rock Canyon Trailhead (Provo City 2023b). Fire and Emergency Medical Services are provided by the Provo Fire Department, with Station Numbers 22 and 23 being the closest in proximity to the project area. Station 22 is located at 2737 North Canyon Road, approximately 0.8 mile from the WTP site and 2 miles from the Rock Canyon Trailhead. Station 23 is located at 601 Columbia Lane, approximately 1.2 miles from the WTP site and 3 miles from the Rock Canyon Trailhead (Provo City 2023c). Additional emergency services in the area are provided by Gold Cross Ambulance Service, located at 925 North 500 West, approximately 1.3 miles from the WTP site and 3.2 miles from the Rock Canyon Trailhead. Utah Valley Hospital is located at 1034 North 500 West, approximately 1.4 miles from the WTP site and 3.3 miles from the Rock Canyon Trailhead.

Provo is vulnerable to several natural hazards including wildfires, droughts, floods, landslides, avalanches, and earthquakes, which pose public health and safety concerns. The mayor is responsible for planning and responding to disasters and has appointed three committees with operational and planning responsibilities: the Emergency Management Executive Committee, the Hazards Subcommittee, and the Resources Committee. The City uses the Emergency Alert Notification System in conjunction with radio stations, sirens and speakers, local tv channels, and the Provo City website to alert the public during emergencies (Provo City 2023d).

4.17.1. NO ACTION ALTERNATIVE

Under the no action alternative, there would be no short-term construction-related impacts on the health and safety of those in and near the project area.

In the long term, the ASR system would not be constructed and the probability of reduced water supply reliability in the event of a drought would continue to be high and the community would continue to be vulnerable. Climate change is also expected to increase the frequency and intensity of drought. Future drought conditions in Provo could lead to long-term public health problems, including shortages of drinking water, as well as impacts on air quality. Dry soil and vegetation increase the number of particulates that are suspended in the air, such as dust and smoke (Centers for Disease Control and Prevention 2020). These substances can irritate the bronchial passages and lungs, making chronic respiratory illnesses like asthma worse. Under the no action alternative, there could be minor to major adverse impacts on public health and safety depending on the scale and intensity of a drought.

4.17.2. PROPOSED ACTION

Under the proposed action, construction of the WTP, booster pump station, pipelines, and piped outlet would occur. As discussed in Section 4.15, construction would result in road closures, traffic, and detours that could impact emergency providers' response times. However, Provo would ensure emergency access through the work zones and work zones would be relatively short segments of the alignment at a time. Thus, there would be a negligible adverse impact on public health and safety in the short term.

Operation of the ASR system under the proposed action would increase the reliability of Provo's water supply in the long term. With an improved future water supply, the risk of public health problems related to drought, including shortages of drinking water and air quality impacts, would be reduced. Therefore, the proposed action would have a moderate, long-term, beneficial effect on public health and safety.

4.18. Summary of Effects and Mitigation

Table 4.9 provides a summary of the potential environmental effects from implementing the proposed action, any required agency coordination efforts or permits, and any applicable proposed mitigation or BMPs.

Table 4.9. Summary of Impacts and Mitigation

Resource	Potential Impacts	Agency Coordination or Permits	Mitigation/BMPs
Geology, Topography, and Soils	<p>Geology – no short-term impact; moderate long-term benefit.</p> <p>Topography – negligible short-term adverse impacts; moderate long-term benefit.</p> <p>Soil - negligible short-term adverse impacts; no long-term adverse impact.</p>	N/A	<ul style="list-style-type: none"> ▪ BMPs to control erosion and sediment runoff
Visual Quality and Aesthetics	<p>Minor short-term adverse impact on visual quality and aesthetics; negligible long-term adverse impact and minor long-term benefit.</p>	N/A	N/A

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Resource	Potential Impacts	Agency Coordination or Permits	Mitigation/BMPs
Air Quality	<p>Construction would have minor short-term adverse impacts on air quality and climate.</p> <p>In the long term, operation would have negligible adverse impacts and minor beneficial impacts on air quality and climate.</p>	N/A	<ul style="list-style-type: none"> ▪ All construction equipment would be required to meet current EPA emissions standards. ▪ Areas of exposed soil would be covered or wetted to reduce fugitive dust. ▪ Vehicle and equipment runtimes would be kept to a minimum.
Water Quality and Quantity	<p>Water Quality - Minor short-term adverse impacts; minor beneficial long-term impacts</p> <p>Water Quantity - No short-term impacts; moderate beneficial long-term impacts (Provo); no adverse long-term impacts (other Provo River water users)</p>	<p>Stream Alteration Application Number 23-55-05SA - USACE; Utah Pollutant Discharge Elimination System Stormwater permit - Utah DEQ; Groundwater Discharge Permit Number UGW490010 - Utah Division of Water Quality</p>	<ul style="list-style-type: none"> ▪ Erosion control BMPs ▪ Project-specific Stormwater Pollution Prevention Plan would be prepared
Wetlands	No short- or long-term adverse impacts on wetlands.	N/A	N/A
Floodplains	No short- or long-term adverse impacts on floodplains.	N/A	N/A

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Resource	Potential Impacts	Agency Coordination or Permits	Mitigation/BMPs
Vegetation	Construction would have short-term adverse impacts from removing vegetation and invasive species. Operation would have a minor beneficial long-term impact.	N/A	<ul style="list-style-type: none"> ▪ Use weed-free seed. Verify seed mix to ensure it does not contain invasive plants. ▪ Restore project area with native trees and vegetation.
Fish and Wildlife	Minor short- and long-term adverse impacts on wildlife and migratory birds from vegetation removal; negligible short- and long-term adverse impacts on aquatic fauna. No short- or long-term adverse impacts on bald or golden eagles. Operation would have a minor beneficial long-term impact.	N/A	<ul style="list-style-type: none"> ▪ To the extent feasible, activities involving the removal of vegetation would occur outside of the general bird nesting season for migratory birds. ▪ If vegetation removal must occur during the nesting season, a qualified biologist must perform a pre-construction survey of potential nesting habitat prior to the start of vegetation removal activities.
Threatened and Endangered Species	Construction would have no short-term impacts. Operation would have no to negligible long-term adverse impacts from project operation. The proposed action may affect, but would not likely adversely affect June sucker.	USFWS Informal Consultation	<ul style="list-style-type: none"> ▪ Any project conditions provided by USFWS will be made a condition of the FEMA grant.

Affected Environment, Potential Impacts, and Mitigation

Resource	Potential Impacts	Agency Coordination or Permits	Mitigation/BMPs
Cultural Resources	No adverse effect to historic properties.	Utah SHPO	<ul style="list-style-type: none"> ▪ Construction workers will be trained to identify historic and prehistoric artifacts and features. ▪ Should resources be discovered during the project, a report will be made immediately to Provo City, the Utah Division of Emergency Management, the FEMA Environmental and Historic Preservation Regional Officer, and the Utah SHPO.
Environmental Justice	The proposed action would have no short-term disproportionately high and adverse impact on environmental justice populations. Long-term minor beneficial effects would occur.	N/A	N/A
Hazardous Materials	The proposed action would have a negligible short-term adverse impacts and minor long-term adverse impacts.	N/A	<ul style="list-style-type: none"> ▪ Equipment would be kept in good condition. ▪ Any spills or leaks from equipment would be contained and cleaned up right away. ▪ All equipment and project activities would adhere to local regulations to reduce the risk of hazardous leaks and spills. ▪ Any hazardous material unexpectedly encountered during construction would be reported to the Utah DEQ.

Affected Environment, Potential Impacts, and Mitigation

Resource	Potential Impacts	Agency Coordination or Permits	Mitigation/BMPs
Noise	Construction would have minor adverse impacts from increased noise within the project area and the immediate vicinity of the work. Operation would have negligible adverse impacts from increased noise associated with the operation of the WTP.	Provo will obtain a noise exemption permit from the Mayor if construction noise may exceed the limits described in Section 9.06.030 of the City Code	<ul style="list-style-type: none"> ▪ All construction equipment would be well maintained, have sound-control devices no less effective than those provided on the original equipment, and have muffled exhaust. ▪ Vehicle and equipment runtimes would be kept to a minimum.
Transportation	Construction would have moderate short-term adverse impacts. No long-term adverse impacts.	Coordinate with Utah DOT and Provo City to obtain necessary permits for road closures.	N/A
Public Services and Utilities	The proposed action would have a negligible short-term adverse impact on recreation and no short-term impact on utilities. No long-term impact on recreation. The proposed action would have a long-term beneficial effect on utilities.	N/A	N/A
Public Health and Safety	Negligible short-term adverse impacts from construction. Operation would have moderate long-term benefits.	N/A	N/A

SECTION 5. Cumulative Effects

This section addresses the potential cumulative effects associated with the implementation of the proposed action. Cumulative effects are effects on the environment that result from the incremental effects of a proposed action when added to the effects of other reasonably foreseeable actions. This EA reviews the potential for other local construction projects to create cumulative effects in and near the project area. Other statutes require federal agencies to consider cumulative effects. These include the CWA Section 404(b)(1) guidelines, the regulations implementing the conformity provisions of the Clean Air Act, the regulations implementing Section 106 of the NHPA, and the regulations implementing Section 7 of the ESA. Other past, present, and reasonably foreseeable future projects both close to the project area and within the area affected by operation of the proposed action are considered for cumulative effects.

Provo Utah Temple Rebuild – The Provo Utah Temple on Temple View Drive, northeast of the Main Tank Reservoir and proposed booster station, will be undergoing a major reconstruction starting in February 2024 (Church of Jesus Christ of Latter-Day Saints 2023). Provo City would coordinate with the Church of Jesus Christ of Latter-Day Saints to coordinate the construction of both projects at the same time to minimize the duration of impacts due to construction. Provo City would complete the construction along Temple View Drive around the same time as the rebuilding of the Provo Utah Temple in February 2024.

Rock Canyon Park Trailhead Improvements – Provo City Parks Department will be improving the Rock Canyon Park Trailhead in Fall 2023, reconstructing the access road, adding additional parking stalls, and installing other facility upgrades. Construction of these improvements is expected to be completed prior to the start of the construction of the proposed project.

Provo Wastewater Treatment Plant – Due to the aging infrastructure at the existing wastewater treatment plant, Provo City is currently constructing a new wastewater treatment plant in the same area as the existing plant, at 1685 South East Bay Boulevard. Construction of the new wastewater treatment plant began in 2020 with Phase 1 of construction expected to be complete in 2024 (Provo City 2022). The wastewater treatment plant is located approximately 3.5 miles south of the proposed project area and discharges into the Mill Race, which empties into Utah Lake.

Provo River Delta Restoration Project – The Utah Reclamation Mitigation and Conservation Commission, CUWCD, the Central Utah Project Completion Act Office of the U.S. Department of the Interior, and the JSRIP implemented the Provo River Delta Restoration Project to restore June sucker habitat in the Provo River Delta. The restoration project involves constructing a new system of braided channels and wetlands and connecting the area to the lower Provo River and Utah Lake. Construction of the project is expected to be fully complete in 2024 (Provo River Delta 2023). The proposed action would not involve work in the Provo River Delta or the Provo River; therefore, the proposed action would not have any direct cumulative impacts. Provo City and CUWCD have been working together to ensure that operation of the proposed action does not affect summer base

flows. Therefore, there would be no decrease in the quality and quantity of the restored rearing habitat in the Provo River Delta.

Direct Injection – Two methods, surface spreading and direct injection, are typically used for ASR. While the proposed action would include surface spreading, Provo also intends to use the direct injection method as a separate project, which involves using an existing or dedicated groundwater well to inject water directly into the aquifer for storage. Provo obtained permits to use two wells for this purpose and plans to permit additional wells in the future for operational flexibility of the ASR system.

There are currently no additional construction projects planned near the project area.

The proposed action would result in short-term negligible to minor adverse impacts on topography and soils, water quality, transportation, public services and utilities, and public health and safety and would also result in both short- and long-term negligible to minor adverse impacts on visual resources, air quality, terrestrial and aquatic environments, migratory birds, threatened and endangered species, hazardous materials, and noise. The proposed action would result in negligible to moderate long-term benefits on topography and soils, visual resources, water quality, vegetation, environmental justice, public services and utilities, and public health and safety.

Construction of the Provo Utah Temple rebuild would occur during the same time as the proposed action, which would result in minor short-term adverse cumulative impacts associated with construction of both projects. Thus, the construction of the Provo Temple rebuild, when combined with the proposed action, would result in minor short-term cumulative adverse impacts on visual resources, air quality, topography and soils, water quality, vegetation, terrestrial and aquatic environments, transportation, hazardous materials, noise, public services and utilities, and public health and safety when combined with the proposed action. Both projects would implement BMPs and mitigation measures to reduce impacts to the maximum extent practicable. In addition, construction of both projects at the same time would reduce the duration of these impacts within the area.

The Rock Canyon Park Trailhead Improvements, when combined with the proposed action, would not have cumulative impacts because of the different timing of construction between the two projects. The Provo River Delta Restoration Project, when combined with the proposed action, would not have cumulative impacts as the proposed action would not have an appreciable impact on existing flow conditions in the Provo River. Construction and operation of the new Provo Wastewater Treatment Plant, when combined with the proposed action, would not have any short- or long-term cumulative impacts as the wastewater treatment plant has no direct impact on flows in the Provo River. The direct injection, when combined with the proposed action, would not have short-term cumulative impacts because it would provide drought mitigation and aquifer recharge using existing infrastructure. Thus, the direct injection would result in minor long-term cumulative benefits on topography and soils, visual resources, water quality, vegetation, environmental justice, public services and utilities, and public health and safety when combined with the proposed action.

SECTION 6. Agency Coordination, Public Involvement, and Permits

This section provides a summary of the agency coordination efforts and public involvement process for the proposed Long-Term Sustainability for Provo's Water Supply project. In addition, an overview of the permits that would be required under the proposed action is included in Section 6.3.

6.1. Agency Coordination

FEMA consulted with the seven Native American Tribes claiming cultural affinity to the APE in July and early August 2023. These tribes are the Confederated Tribes of Goshute, the Paiute Indian Tribe of Utah, the Northwestern Band of Shoshone Nation, the Skull Valley Band of Goshute, the Ute Indian Tribe of the Uintah and Ouray Reservation, the Ute Mountain Ute Tribe, and the Navajo Nation. No responses from the tribes were received. FEMA consulted with the Utah SHPO on June 29, 2023, and on July 17, 2023, the SHPO concurred with FEMA's determinations of eligibility for the identified historic properties and the finding of No Adverse Effect for the Undertaking.

FEMA initiated informal consultation with USFWS on August 17, 2023. FEMA determined that the proposed action may affect, but is not likely to adversely affect, listed species. Consultation is on-going.

6.2. Public Participation

A public scoping notice about the proposed project was published at https://www.fema.gov/sites/default/files/documents/fema_ut-provo-asr-public-notice_03132023.pdf and in the *Daily Herald* newspaper on March 15, 2023, to notify and provide the public with an opportunity to comment on the proposed action, potential alternatives, and preliminary identification of environmental issues. The scoping notice was sent to the following federal agencies for comment:

- U.S. Bureau of Reclamation, Provo Area Office
- Central Utah Project Completion Act Office
- Utah Reclamation Mitigation and Conservation Commission
- CUWCD
- EPA Region 8
- USFWS, Utah Ecological Services Field Office

The public comment period on the public notice closed on April 14, 2023.

Agency Coordination, Public Involvement, and Permits

Comments were received from CUWCD, Department of the Interior Central Utah Project Completion Act Office, Jordan Valley Water Conservancy District, June Sucker Recovery Implementation Program, Salt Lake City Department of Public Utilities, Metropolitan Water District of Salt Lake & Sandy, Utah Lake Distributing Company, Provo River Water Users Association, EPA, USFWS, Utah Reclamation Mitigation and Conservation Commission, and Department of the Interior Bureau of Reclamation. The key areas of concern raised in the comment letters in response to the scoping notice included:

- The potential use of additional water rights.
- Impacts on June sucker habitat and implementation of the Provo River Delta Restoration Project.
- Potential reduction of instream flows in Provo River that would reduce water availability for the June sucker and impact the recovery of the species.
- Impairment of other water right holders' operations and water deliveries.

In accordance with FEMA's NEPA procedures, FEMA is releasing this draft EA to the public and resource agencies for a 30-day public review and comment period. Comments on this draft EA will be incorporated into the final EA, as appropriate. This draft EA reflects the evaluation and assessment of the federal government, the decision-maker for the federal action; however, FEMA will take into consideration any substantive comments received during the public review period to inform the final decision regarding grant approval and project implementation. If no substantive comments are received from the public and/or agency reviewers, this draft EA will be assumed to be final and a FONSI will be issued by FEMA.

Provo will make the draft EA available on its website at <https://www.provo.org/departments/public-works/water-resources> and <https://www.provo.org/about-us/public-notice>. The draft EA also will be available on FEMA's website at <https://www.fema.gov/emergency-managers/practitioners/environmental-historic/nepa-repository>. Hard copies of the draft EA will be made available at Provo Public Works, 1377 S 350 E Provo, UT 84606. The comment period for the draft EA will start when the public notice of EA availability is published and will extend for 30 days. Comments on the draft EA may be submitted to the FEMA email at fema-r8ehp@fema.dhs.gov; please include 'Provo ASR' in the subject line. Comments also may be submitted via mail to: Denver Federal Center, Building 710, Box 25267, Denver, Colorado 80225-0267 Attn: Richard Myers.

6.3. Permits

Provo will be responsible for obtaining or maintaining any necessary local, state, or federal permits needed to conduct the proposed work. The following permits would be required for the proposed action and all work authorized under these permits must be performed in compliance with the conditions of the permits.

Agency Coordination, Public Involvement, and Permits

- Obtain a Utah Pollutant Discharge Elimination System Storm Water General Permit for Construction Activities from the Utah Division of Water Quality.
- Coordinate with Utah DOT and Provo City to obtain necessary permits for road closures.
- Obtain a noise exemption permit from the Mayor if construction noise may exceed the limits described in Section 9.06.030 of the City Code.
- Obtain Utah Division of Drinking Water Operating Permit following WTP construction.
- Maintain Stream Alteration Permit (Number 23-55-OSSA).
- Maintain Ground Water Discharge Permit (Number UGW490010).
- Maintain Recharge Permit RC019 and Recharge Permit RC024.
- Maintain the special use permit and obtain all required government agency permits for pipeline segment work on federal lands.

SECTION 7. List of Preparers

The following is a list of preparers who contributed to the development of the Long-Term Sustainability for Provo's Water Supply Draft EA for FEMA. The individuals listed below had principal roles in the preparation of this document. Many others contributed, including senior managers, administrative support personnel, and technical staff, and their efforts in developing this EA are appreciated.

CDM Smith

Preparers	Experience and Expertise	Role in Preparation
Bankston, Sam	Biologist	NEPA Documentation
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This document was prepared by CDM Smith under Contract No.: 70FA6020D00000002, Task Order: 70FA6021F00000053.

SECTION 8. References

- BIO-WEST, Inc. 2022. *Federally Listed Threatened and Endangered Species, State Listed Sensitive Species, and Migratory Bird Assessment at the Provo Drinking Water Treatment Plant Project, Provo*. Logan, Utah: BIO-WEST, Inc.
- Centers for Disease Control and Prevention. 2020. Health Implications of Drought. Accessed July 10, 2023. Available at: <https://www.cdc.gov/nceh/drought/implications.htm>
- Church of Jesus Christ of Latter-Day Saints. 2023. Provo Utah Temple Latest News. Accessed August 4, 2023. Available at: <https://churchofjesuschristtemples.org/provo-utah-temple/news/>
- Council on Environmental Quality (CEQ). 2023. National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change. Federal Register 88 Federal Register (FR) 1196. Accessed July 10, 2023. Available at: <https://www.federalregister.gov/documents/2021/02/19/2021-03355/national-environmental-policy-act-guidance-on-consideration-of-greenhouse-gas-emissions>.
- _____. 2010. Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions. Accessed August 23, 2023, <https://ceq.doe.gov/docs/ceq-regulations-and-guidance/20100218-nepa-consideration-effects-ghg-draft-guidance.pdf>.
- eBird. 2023a. "Birding Hotspots near Provo, Utah." Accessed July 24, 2023. Available at: <https://ebird.org/hotspots>.
- eBird. 2023b. Bald Eagle and Golden Eagle Occurrences near Provo, Utah. Accessed August 23, 2023. Available at <http://www.ebird.org>.
- Federal Emergency Management Agency (FEMA). 2023. FEMA's National Flood Hazard Layer Viewer. Accessed July 6, 2023. Available at: <https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd>.
- Federal Highway Administration. 2017. Construction Noise Handbook, Chapter 9.0 Construction Equipment Noise Levels and Ranges. Accessed September 6, 2023. Available at: https://www.fhwa.dot.gov/ENVIRonment/noise/construction_noise/handbook/handbook09.cfm.
- Frankson, R., K.E. Kunkel, L.E. Stevens, and D.R. Easterling. 2022. Utah State Climate Summary 2022. NOAA Technical Report NESDIS 150-UT. NOAA/NESDIS, Silver Spring, MD, 5 pp. Accessed July 10, 2023. Available at: <https://statesummaries.ncics.org/downloads/Utah-StateClimateSummary2022.pdf>.

- iNaturalist. 2023. "Animal Observations in the General Project Area." Accessed July 24, 2023.
Available at:
https://www.inaturalist.org/observations?nelat=40.27444092716443&nelng=-111.58373979463697&place_id=any&subview=map&swlat=40.25643012526574&swlng=-111.66540769472242&taxon_id=1.
- Intergovernmental Panel on Climate Change. 2023. Summary for Policymakers. p 4. In: Climate Change 2023: Synthesis Report. A Report of the Intergovernmental Panel on Climate Change. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, 36 pages. (in press). Accessed July 10, 2023, Available at: https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_SPM.pdf.
- Johnson, Wendy Simmons. 2023. A Cultural Resources Inventory of the Provo Water Treatment Plant and Waterline in Utah County, Utah. Utah Project No. U22HP0186. Commonwealth Report No. U-0732. Commonwealth Heritage Group, Inc., Ogden, Utah.
- National Marine Fisheries Service. 2023. "Protected Resources App." Accessed July 21, 2023.
Available at:
<https://www.webapps.nwfsc.noaa.gov/portal/apps/webappviewer/index.html?id=7514c715b8594944a6e468dd25aaacc9>.
- National Drought Mitigation Center. 2023. Drought Monitor Data Tables, Utah County. Accessed on: May 12, 2023. Available at:
<https://droughtmonitor.unl.edu/DmData/DataTables.aspx?county,49049>
- National Wild and Scenic Rivers System. 2023. Official Website. Accessed July 13, 2023. Available at: <https://www.rivers.gov/>.
- National Oceanic and Atmospheric Administration. 2023. "Essential Fish Habitat Mapper." Accessed July 20, 2023. Available at: <https://www.habitat.noaa.gov/apps/efhmapper/>
- Provo City. 2023a. Chapter 9.06, Provo City Code, Public Disturbances. Accessed July 3, 2023.
Available at: <https://provo.municipal.codes/Code/9.06>.
- . 2023b. Provo Police- Police Services. Accessed July 25, 2023. Available at:
<https://www.provo.org/city-services/provo-police/police-services>.
- . 2023c. Provo Fire & Rescue- Apparatus & Equipment. Accessed July 25, 2023. Available at:
<https://www.provo.org/city-services/fire-rescue/apparatus-equipment>.
- . 2023d. Provo Fire & Rescue- Emergency Management. City Planning and Response. Accessed July 26, 2023. Available at: <https://www.provo.org/city-services/fire-rescue/emergency-management/city-planning-and-response>.

- . 2022. Wastewater Treatment Plant Project Overview. Accessed September 8, 2023. Available at: <https://pwmaps.provo.org/pwportal/apps/storymaps/stories/1739dd0eadf34c158874e6835e840ece>
- . 2021. Drought Analysis Memo, July 2021, Prepared by Hansen, Allen & Luce, Inc.
- . 2020. Feasibility Study: Alternatives for Water Use, Reuse, and Advanced Treatment Facilities, Prepared by AECOM and Hansen, Allen & Luce, Inc.
- . 2019. 40 Year Water Supply Plan, June 2019, Prepared by Bowen Collins Associates.
- . n.d.-a. City Utilities. Accessed July 26, 2023. Available at: <https://www.provo.org/city-services/city-utilities>.
- . n.d.-b. Rock Canyon Trailhead. Accessed July 26, 2023. Available at: <https://www.provo.org/Home/Components/FacilityDirectory/FacilityDirectory/52/200>.
- Provo Power. 2015. About Us. Accessed July 26, 2023. Available at: <https://provopower.org/about-provo-power/>
- Provo River Delta. 2023. The Provo River Delta Restoration Project. Accessed on August 4, 2023. Available at: <https://www.provoriverdelta.us/about-the-project>
- United States Census Bureau. 2010. “Urban and Rural Classification and Urban Area Criteria.” Accessed July 10, 2023. Available at: <https://www.census.gov/programs-surveys/geography/guidance/geo-areas/urban-rural/2010-urban-rural.html>
- United States Climate Data. 2023. Climate Provo – Utah. Accessed July 10, 2023. Available at: <https://www.usclimatedata.com/climate/provo/utah/united-states/usut0208>.
- United States Department of Agriculture. 2023. Web Soil Survey. Accessed July 27, 2023. Available at: <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>.
- United States Environmental Protection Agency (EPA). 2023a. Map of Sole Source Aquifer Locations. Accessed July 10, 2023. Available at: <https://www.epa.gov/dwssa/map-sole-source-aquifer-locations>.
- . 2023b. Green Book. Utah Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants. Updated June 30, 2023. Accessed July 10, 2023. Available at: https://www3.epa.gov/airquality/greenbook/anayo_ut.html.
- . 2023c. Overview of Socioeconomic Indicators in EJScreen. Accessed July 10, 2023. Available at: <https://www.epa.gov/ejscreen/overview-socioeconomic-indicators-ejscreen>.

- . 2023d. EJScreen Community Report. Accessed July 10, 2023. Available at: <https://ejscreen.epa.gov/mapper/>.
- . 2023e. NEPAAssist Mapping Tool. Version 2023.04.001. Accessed July 18, 2023. Available at: <https://nepassisttool.epa.gov/nepassist/nepamap.aspx>.
- . 2023f. Underground Storage Tank (UST) Finder. Accessed September 9, 2023. Available at: <https://www.epa.gov/land-research/underground-storage-tank-ust-finder>.
- United States Fish and Wildlife Service (USFWS). 2023a. National Wetlands Inventory Mapper. Accessed July 5, 2023. Available at: <https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/>.
- . 2023b. “Information for Planning and Consultation (IPaC) search of the project vicinity.” Accessed July 21, 2023. Available at: <https://ipac.ecosphere.fws.gov/>
- . 2021. “Endangered and Threatened Wildlife and Plants; Reclassification of the Endangered June Sucker to Threatened With a Section 4(d) Rule.” FR 86(1):192–212.
- . 2019. Coastal Barrier Resources Mapper. Accessed July 21, 2023. Available at: <https://fwsprimary.wim.usgs.gov/CBRSMapper-v2/>.
- . 2017. *Species Status Assessment for the Canada lynx (Lynx canadensis) Contiguous United States Distinct Population Segment*. Lakewood, Colorado: USFWS.
- . 2006. *Transmittal of Guidance: Estimating the Effects of Auditory and Visual Disturbance of Northern Spotted Owls and Marbled Murrelets in Northwestern California*. Arcata, California: USFWS.
- United States Geological Survey (USGS). 2018a. Land Subsidence. Accessed on July 7, 2023. Available at: <https://www.usgs.gov/special-topics/water-science-school/science/land-subsidence>
- . 2018b. Groundwater Decline and Depletion. Accessed on July 7, 2023. Available at: <https://www.usgs.gov/special-topics/water-science-school/science/groundwater-decline-and-depletion>
- United States Global Change Research Program. 2022. The U.S. Global Change Research Program 2022–2031 Strategic Plan. U.S. Global Change Research Program, Washington, DC, USA. <https://www.doi.org/10.7930/usgcrp-20222031-strategic-plan>
- Utah Department of Environmental Quality (DEQ). 2023. 2022 Integrated Report. Accessed July 3, 2023. Available at: <https://deq.utah.gov/water-quality/most-recent-approved-integrated-report>

- Utah Department of Transportation. 2021. Open Data Portal – AADT Rounded Map Viewer. Updated October 27, 2021. Accessed July 3, 2023. Available at: <https://data-uplan.opendata.arcgis.com/datasets/uplan::aadt-rounded/about>.
- Utah Geological Survey. 2020. Utah Geologic Hazard Portal. Hazardous (Quaternary age) Faults and Earthquake Ground Shaking map layers. Database updated May 2020. Accessed July 11, 2023. Available at: <https://geology.utah.gov/apps/hazards/#>.
- Utah Reclamation Mitigation and Conservation Commission. 2001. Diversion Dam Modifications. Accessed on: May 12, 2023. Available at: https://www.mitigationcommission.gov/watershed/provoriver/provoriver_diversions.htm
- Utah Reclamation Mitigation and Conservation Commission, U.S. Department of the Interior — Central Utah Project Completion Act Office, and Central Utah Water Conservancy District. 2015. *Provo River Delta Restoration Project Final Environmental Impact Statement Volume I: Chapters 1–5*. Accessed July 24, 2023, <https://www.doi.gov/sites/doi.gov/files/provorivdelta-finaleis-vol-i.pdf>
- Utah Transit Agency. 2023. Utah County System Map. Accessed July 3, 2023. Available at: <https://www.rideuta.com/-/media/Files/Rider-Tools/System-Maps/UtahCountySystemMapApr2023.ashx>.
- Walter F., R. Black, and P. Wolken. 2005. *Rangewide Status Review of Ute Ladies'-Tresses (*Spiranthes diluvialis*)*. Accessed July 24, 2023. Available at: <https://efotg.sc.egov.usda.gov/references/public/WY/UtesRangewideStatusReview2005byFertig.pdf>
- Zhao, G., Y. Li, L. Zhou, and H. Gao. 2022. Evaporative water loss of 1.42 million global lakes. *Nature Communications*, 13(1), 3686. Accessed August 8, 2023. Available at: <https://www.nature.com/articles/s41467-022-31125-6>