



— BUREAU OF —  
RECLAMATION

Final

# **Environmental Assessment**

## **Eastside Reuse System, Washington County, Utah**

Provo Area Office – Upper Colorado Basin Region

## **Mission Statements**

The U.S. Department of the Interior protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its trust responsibilities or special commitments to American Indians, Alaska Natives, Native Hawaiians, and affiliated Island Communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Final

# **Environmental Assessment**

## **Eastside Reuse System, Washington County, Utah**

Provo Area Office – Upper Colorado Basin Region

*prepared by:*

**United States Department of the Interior  
Bureau of Reclamation  
Provo Area Office**

February 2026



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## Abbreviations and Acronyms

AADT	average annual daily traffic
APE	area of potential effect
BGEPA	Bald and Golden Eagle Protection Act
BLM	U.S. Department of the Interior, Bureau of Land Management
CFR	Code of Federal Regulations
CPWRF	Confluence Park Water Reclamation Facility
dBa	A-weighted decibel
District	Washington County Water Conservancy District
EA	Environmental Assessment
EPA	U.S. Environmental Protection Agency
EPM	environmental protection measure
ERC	Equivalent Residential Connection
ESA	Endangered Species Act
FHWA	Federal Highway Administration
FR	Federal Register
HCP	Habitat Conservation Plan
IPaC	USFWS Information for Planning and Consultation
ITA	Indian Trust Asset
MBTA	Migratory Bird Treaty Act
MGD	million gallons per day
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
OHWM	ordinary high water mark
P.L.	Public Law
Proposed Action	Eastside Reuse System
Reclamation	U.S. Department of the Interior, Bureau of Reclamation
ROW	right-of-way
SHPO	State Historic Preservation Office
SWReGAP	Southwest Regional Gap Analysis Project
TSWS	Toquerville Secondary Water System
UCA	Utah Code Annotated
UDOT	Utah Department of Transportation
UDWR	Utah Division of Wildlife Resources
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WOTUS	Waters of the United States

# Chapter 1 Introduction

The U.S. Department of the Interior, Bureau of Reclamation (Reclamation) was founded in 1902 under the Reclamation Act (Public Law [P.L.] 57-161) to manage, develop, and protect water and related resources in the Western United States. Reclamation is the nation's largest wholesale water supplier and the second largest producer of hydropower. One of Reclamation's priorities is to work in partnership with states, Tribes, water and power customers, and others to seek creative and collaborative solutions to Western water issues.

The Washington County Water Conservancy District (District or the "Project Proponent") is a not-for-profit public agency, organized by the Fifth Judicial District Court in St. George on November 28, 1962, under the Utah Water Conservancy District Act (Utah Code Annotated [UCA] § 17B-2a-1001 et seq.). The District is charged under state law with conserving, developing, managing, and stabilizing water supplies for the citizens of Washington County. The District plans to meet the future water needs in Washington County through a multi-faceted "One Water" approach that includes conservation, reuse, groundwater optimization, agriculture conversion, and water development. One Water Washington County will help prepare, plan, and secure the county's water future (District 2025a).

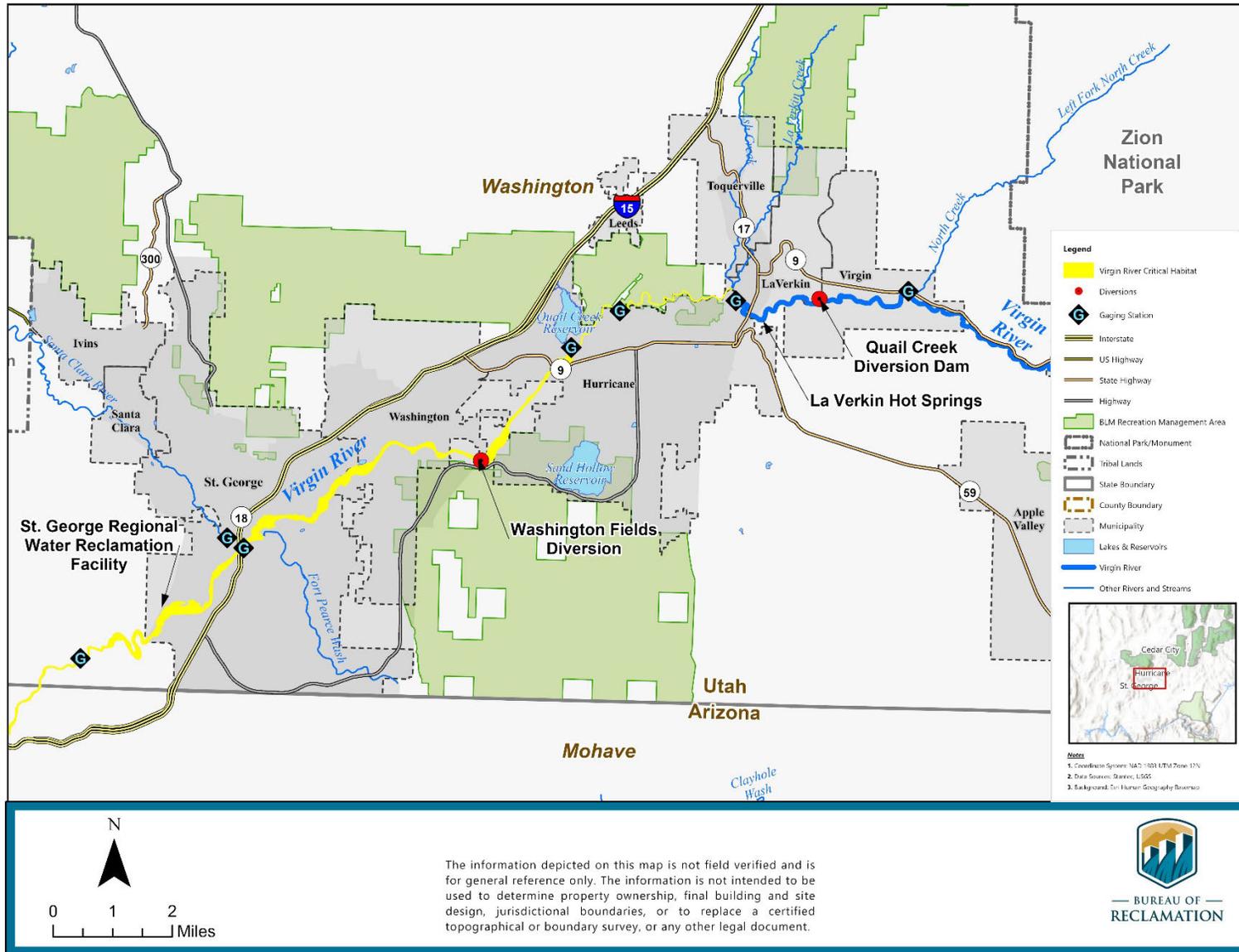
A major component of the District's plan to meet future water demand is contingent on reusing the water used inside homes and businesses for both potable (drinking water) and non-potable (outdoor irrigation) purposes. Currently about 40% of Washington County's annual water supplies are used indoors based on winter metering data and metering of homes with secondary irrigation supply, and about 90% of that water is collected and returned to water reclamation facilities. The District, in partnership with the Ash Creek Special Service District, proposes to construct and operate facilities to deliver reuse water for multiple uses in the communities of La Verkin and Toquerville, Utah.

Congress directed Reclamation to promote development of water reuse projects under the Infrastructure Investment and Jobs Act, P.L. 117-58, signed November 15, 2021. Pursuant to this authority, Reclamation awarded the District funds through its Large-Scale Water Recycling Projects Competitive Grant Program for the Eastside Reuse System (Proposed Action). This Environmental Assessment (EA) has been prepared to disclose and analyze the environmental consequences of the Proposed Action.

## 1.1 Background

Washington County is one of the fastest growing metro areas in the United States (U.S. Census Bureau 2022) and is in Utah's hottest, driest region. Water supplies in Washington County are limited to the Virgin River drainage basin (Figure 1-1), which is reaching its full developmental capacity. As the county faces unprecedented land development and increases in tourism, water demand is quickly approaching the reliable yield of existing local supplies (District 2023).

# Introduction



**Figure 1-1. Virgin River Basin Features in Washington County**

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### 1.1.1 Water Supplies

Municipal and industrial water include supplies owned by the District and municipalities (Table 1-1). The primary District diversion on the Virgin River is at the Quail Creek Diversion Dam, which sends water via a pipeline to the Sand Hollow and Quail Creek off-stream drinking water reservoirs (Figure 1-1). Multiple municipal groundwater projects exist in the basin, but most groundwater sources are closed to further appropriations by the Utah State Engineer due to relatively shallow basin-fill Navajo Sandstone and Kayenta Formation aquifers (District 2022).

**Table 1-1. Municipal and Industrial Water Supplies in 2075**

Year	La Verkin and Toquerville Existing and Planned Supply <sup>1,2</sup>		Washington County Water Conservancy District Existing and Planned Supply <sup>1,2,3</sup>	
	Potable Supply (acre-feet/year)	Secondary Supply <sup>4</sup> (acre-feet/year)	Potable Supply (acre-feet/year)	Secondary Supply <sup>4</sup> (acre-feet/year)
2025	1,200	1,558	781	253
2030	1,200	1,558	1,204	305
2035	1,200	1,558	1,422	354
2040	1,200	1,558	1,619	388
2045	1,200	1,558	1,878	375
2050	1,200	1,558	2,084	445
2055	1,200	1,558	2,298	510
2060	1,200	1,558	2,485	565
2065	1,200	1,558	2,703	615
2070	1,200	1,558	2,999	661
2075	1,200	1,558	3,371	720

Notes:

<sup>1</sup> Planned supplies are local projects that are under construction, permitted, or otherwise anticipated to be implemented.

<sup>2</sup> The Planning Scenario reflects effects of recent drought periods and projected hydrologic variability on water supply reliable yields.

<sup>3</sup> The District is a regional water wholesaler. District supplies available to communities are proportional to municipal demands.

<sup>4</sup> Secondary supply is secondary irrigation supply and is used for non-potable applications (e.g., cemeteries, parks, golf courses, and commercial and residential landscaping).

Existing and future potable diversions from the Virgin River are constrained by the following:

- The Virgin River is a flashy desert stream and high flow events during the spring runoff and summer thunderstorms can fill the stream channel with sediment and debris. Under these conditions, the District often shuts down diversions to protect infrastructure (USFWS 2020a).
- The naturally occurring La Verkin Hot Springs (Figure 1-1) discharge 10-12 cubic feet per second of water with approximately 10,000 milligrams per liter concentration of salt into the Virgin River (Reclamation 1981, USGS 2018), thus rendering downstream water unsuitable for potable and many non-potable uses.
- Agricultural water supply at the Washington Fields Diversion may not be exchanged or diverted at the Quail Creek Diversion Dam for potable use (thereby avoiding the hot springs contamination) because of designated critical habitat for listed fish species between the Quail Creek Diversion Dam and the Washington Fields Diversion (Figure 1-1) (USFWS 2020a).

**Introduction**

**1.1.2 Water Demands**

Per the District's 2024 Consumptive Use Report, Washington County's 2024 per capita consumptive water use was 148 gallons per day. Water use varies significantly from year to year in desert communities like Washington County, driven primarily by variations in climate conditions, outdoor irrigation, and economic activity. The Utah Division of Drinking Water requires public water systems to establish a source sizing standard that defines the amount of water supply and infrastructure that must be available to reliably serve the system's users (UCA Section 19-4-114). This source sizing standard is a planning and design requirement; however, it is not a measure of actual per-capita water use. The standard is expressed in terms of an Equivalent Residential Connection (ERC), which represents the system capacity necessary to serve a typical single-family residential connection under peak operating conditions.

Required system capacity includes sufficient water supply, treatment, storage, and distribution infrastructure to meet average use, peak daily and hourly demands, fire flow, and routine operational requirements. To ensure that all types of development are consistently incorporated into system planning, non-residential and higher-density land uses (including multi-family, commercial, institutional, and industrial development) are converted into an equivalent number of ERCs. This approach provides a uniform method for estimating total system capacity needs regardless of development type (District 2025b).

Projections of future water demand incorporate the documented effects of the District's ongoing water conservation programs (District 2023, 2025a, 2025b, 2025c). Washington County has implemented extensive conservation measures, including lawn replacement incentives, excess water use surcharges, and conservation ordinances for new development. As a result of these efforts, countywide per-capita water use has declined by more than 50 percent since 2000. The District's planning objective is to achieve an additional 18 percent reduction in use by 2042 (District 2025c).

Although per-capita water use has declined substantially, total system capacity requirements continue to be governed by population growth, peak demand conditions, and required reliability standards. Future demand projections therefore reflect both anticipated growth and the expected benefits of continued conservation. Table 1-2 presents the projected number of ERCs and associated total water demands for La Verkin and Toquerville, accounting for planned conservation achievements.

**Table 1-2. Projected Water Demands for La Verkin and Toquerville, Utah**

Year	Equivalent Residential Connections Served by District <sup>1</sup>	Potable Water Demand (acre-foot/year) <sup>2</sup>	Secondary Irrigation Water Demand (acre-foot/year) <sup>2</sup>	Total Water Demand (acre-foot/year) <sup>2</sup>
2025	3,044	1,435	971	2,406
2030	4,420	2,055	1,172	3,227
2035	5,761	2,655	1,368	4,023
2040	7,182	3,296	1,581	4,876
2045	8,750	4,005	1,814	5,819
2050	10,697	4,915	2,073	6,988
2055	12,976	6,013	2,336	8,349

Year	Equivalent Residential Connections Served by District <sup>1</sup>	Potable Water Demand (acre-feet/year) <sup>2</sup>	Secondary Irrigation Water Demand (acre-feet/year) <sup>2</sup>	Total Water Demand (acre-feet/year) <sup>2</sup>
2060	15,374	7,206	2,553	9,759
2065	17,873	8,498	2,705	11,203
2070	20,907	10,105	2,847	12,952
2075	24,682	12,150	2,991	15,141

Notes:

<sup>1</sup> Equivalent residential connections calculated using adjusted 2022 vintage population projections (Gardner Institute 2022).

<sup>2</sup> Project demands incorporate future conservation measures and goals (District 2023, 2025a, 2025b, 2025c). The reductions in demand due to conservation measures are primarily associated with outdoor potable and secondary demands. Potable demands per equivalent residential connections remain relatively static due to new builds that have little outdoor demand and the shifting of some existing outdoor potable demand to secondary irrigation supply sources as that supply becomes available.

### 1.1.3 Supply Deficits

The projected water supply deficits for La Verkin and Toquerville are in Figure 1-2. Deficits in total water supply would begin between 2035 and 2040 under the population and supply projections, but could begin earlier if drought conditions persist or worsen in the region. Potable supply deficits are projected to begin earlier between 2030 and 2035 (Table 1-1 and Table 1-2). Deficits in secondary supply would occur a few years after deficits in potable supply begin.

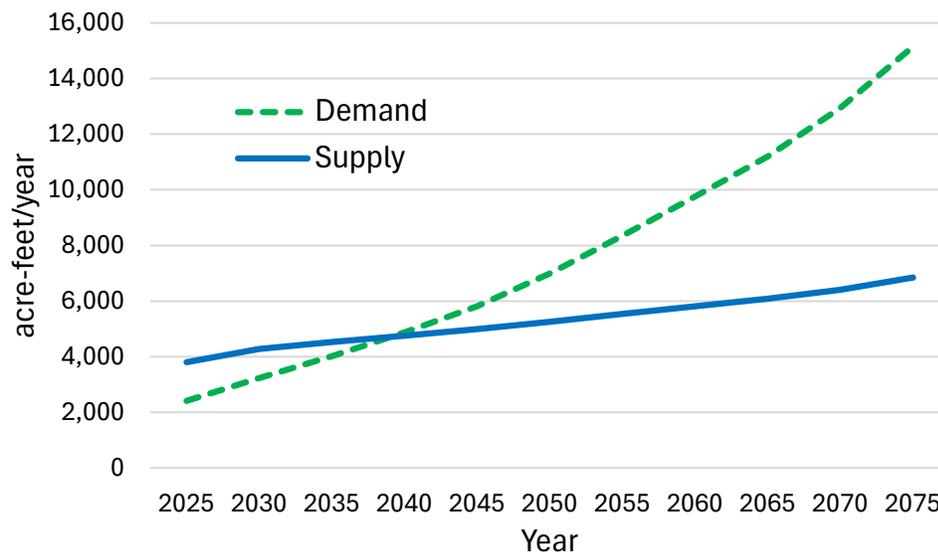


Figure 1-2. Projected Total Supply Deficit in La Verkin and Toquerville, Utah

## 1.2 Statement of Purpose and Need

### 1.2.1 Purpose

Under the Large-Scale Water Recycling Projects Competitive Grant Program, all projects being considered for award funding require compliance with the National Environmental Policy Act

## **Introduction**

(NEPA) before any ground-disturbing activity may begin. Reclamation's purpose of this action is to comply with its obligation under this and other laws.

### **1.2.2 Need**

Reclamation's need for federal action arises from its responsibility under the Infrastructure Investment and Jobs Act and other legislation which constitute a major federal action by virtue of the federal funding and involvement of federal agencies authorizing substantial federal control and responsibility over the outcome of the project (42 U.S. Code § 4336e(10)). Reclamation is required under the Infrastructure Investment and Jobs Act and other legislation to consider and respond to the applicant's request for federal funding.

### **1.2.3 Project Proponent's Objectives**

The District proposes building the Proposed Action and implementing additional conservation to meet future water needs. The Proposed Action, additional conservation, and other District plans which are not part of the Proposed Action (District 2023) will achieve prudent planning objectives consistent with the District's mission. These include:

1. Secure long-term water resource reliability considering climate variability;
2. Diversify the region's water sources and delivery systems;
3. Fulfill District contractual obligations to provide water supplies to its municipal partners;
4. Promote, facilitate, and monitor water conservation;
5. Improve operational dependability and flexibility; and
6. Provide drought resiliency.

## **1.3 Decision to be Made**

Reclamation is the lead federal agency for NEPA compliance and will supervise preparation of the EA to ensure that environmental concerns and effects are adequately considered based on reliable data. As the lead agency, Reclamation is responsible for ensuring that findings under NEPA, and consultations, as appropriate, will support Reclamation's decision on whether to fund the project.

## **1.4 Relationship to Statutes, Regulations, and Authorizations**

Implementation of the Proposed Action may require a number of authorizations or permits from state and federal agencies. This EA is prepared in compliance with all applicable federal statutes, regulations, and Executive Orders, which are described in Appendix A.

# Chapter 2 Alternatives Development and Screening

## 2.1 Description of Alternatives

### 2.1.1 No Action Alternative

The No Action Alternative serves as the baseline to which action alternatives are compared to determine potential effects. The No Action Alternative may differ from existing conditions if there are actions that could occur in the future that (1) currently do not exist and (2) do not rely on approval or implementation of the Proposed Action. Under the No Action Alternative, the Proposed Action would not be built. Reclamation would not provide grant funding for the Proposed Action. The District would continue current operations and conservation programs and may implement future planned projects.

### 2.1.2 Proposed Action

The Proposed Action would augment potable water supplies by conveying non-potable reuse water to irrigation users in exchange for current irrigation sources to be used as potable supply. In simple terms, current water users in La Verkin and Toquerville are using clean river water for irrigation. Under the Proposed Action, they would receive non-potable reuse water instead. The clean river water they were using would then go towards drinking water, thereby extending the county's limited supply. The Proposed Action would also directly supplement secondary irrigation deliveries with non-potable reuse water.

Under the Proposed Action, the District would construct the following facilities:

- Confluence Park Water Reclamation Facility (CPWRF) to La Verkin Pond Pipeline
- La Verkin Pond
- La Verkin Pond to Toquerville Secondary Water System (TSWS) Pipeline and Pump Station
- TSWS Pond to Chief Toquer Reservoir Pump Station
- Advanced Water Purification Demonstration Facility

The proposed La Verkin Pond would provide a centralized location to facilitate exchanges with non-potable reuse water and supplement the La Verkin secondary irrigation system. The proposed pipeline from CPWRF (currently under construction) would convey non-potable reuse water to the La Verkin Pond in exchange for Virgin River water, the current irrigation source, to be used as potable supply. The La Verkin Pond would also serve as a settling pond to limit the sediment that

## Alternatives Development and Screening

builds up in the existing La Verkin secondary irrigation system. The La Verkin secondary irrigation system is supplied with Virgin River water from the District’s Quail Creek Pipeline. This pipeline carries heavy sediment loads during certain times of the year, and this sediment causes operational issues in the system.

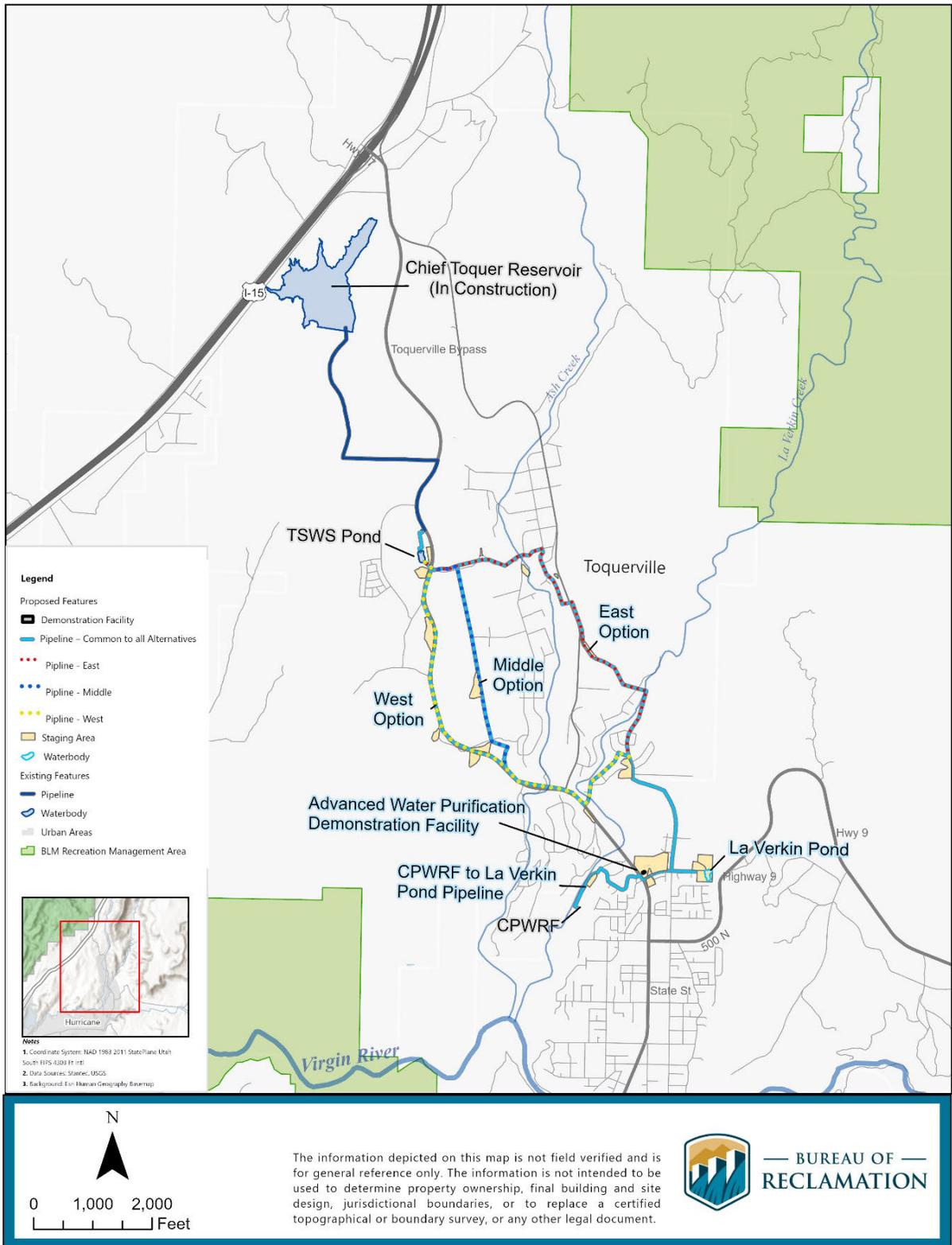
A second proposed pipeline would convey non-potable reuse water from the La Verkin Pond to the existing TSWS Pond to supplement secondary irrigation deliveries in Toquerville and storage of non-potable reuse water in Chief Toquer Reservoir (previously received approval via a Finding of No Significant Impact in June 2021 [BLM 2021]; currently under construction). Conveying non-potable reuse water to the TSWS would allow water from Toquerville Springs, the current irrigation source, to be used as potable supply. These proposed pipelines and pond facilities would be constructed and operated by the District.

An Advanced Water Purification Demonstration Facility would be constructed on one of the proposed pipelines to facilitate state regulatory approval; confirm design parameters and treatment performance; train operators in the operations, maintenance, and monitoring of the advanced purification processes; and for public education, engagement, and building community support for potable reuse.

The following sections describe the components, environmental protection measures (EPMs), and operations and maintenance of the Proposed Action. The schedule to construct the Proposed Action is provided as Figure 2-1. A map of the Proposed Action is provided in Figure 2-2. All proposed facilities would be located on private land; the District would coordinate final design and construction activities with landowners and the municipalities. The proposed pipeline to the TSWS Pond is evaluated in this EA, but would be constructed at a later phase than other Proposed Action facilities.

Year	2026				2027				2028				2029				2030				2031				2032				
	Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
CPWRF to La Verkin Pond Pipeline																													
La Verkin Pond																													
La Verkin Pond to TSWS Pipeline and Pump Station																													
TSWS Pond to Chief Toquer Reservoir Pump Station																													
Potable Reuse Demonstration Facility																													

**Figure 2-1. Eastside Reuse System Construction Schedule**



**Figure 2-2. Eastside Reuse System**

## Alternatives Development and Screening

### 2.1.2.1 **CPWRF to La Verkin Pond Pipeline**

Approximately 6,700 feet of buried, 18-inch ductile iron pipe would be constructed through mostly developed areas in northern La Verkin from the existing CPWRF to the proposed La Verkin Pond. Air/vacuum valves would be installed at regular intervals and at critical high points along the length of the pipeline. Construction would occur in 2026-2027 and would disturb up to 50 feet on either side of the pipe centerline (less in more constrained areas such as transportation rights-of-way [ROW]). Four temporary construction staging areas (6.3 acres total) would be located along the pipeline alignment. Access during construction would be along existing paved and dirt roads. Approximately 4,800 square yards of asphalt would be replaced in road areas disturbed during construction. Trenchless methods such as jack and bore would be used for the pipeline crossing at Main Street (State Highway 11).

### 2.1.2.2 **La Verkin Pond**

The La Verkin Pond would be designed to contain approximately 7.5 million gallons in volume and located on the northern edge of La Verkin just to the west of State Highway 9 (Figure 2-3). The pond would be approximately 1.25 miles east of La Verkin Creek. The pond would be approximately 1.8 acres in area and the maximum water level elevation would be 3,320 feet above sea level. Earthen embankments would impound the water and would be constructed using 28,000 cubic yards of on-site earthwork and 4,250 cubic yards of imported material. The pond would include a polyethylene liner and a small concrete settling basin. The liner would include a protective cover, including use of reinforced concrete on the pond floor. All pond features and operations would comply with Utah Division of Water Resources Dam Safety Section requirements. Aeration equipment would operate in the pond. The La Verkin Pond would be serviced by a 12-foot gravel road with fencing around the facility.

### 2.1.2.3 **La Verkin Pond to TSWS Pipeline and Pump Station**

The La Verkin Pond to TSWS Pipeline and Pump Station would consist of an 18-inch ductile iron pipe constructed through developed and developing areas in Toquerville (Figure 2-2). Three pipeline alignment options are being considered in this EA; the East Option is the preferred alignment.

- **East Option (Preferred):** This option would be 19,270 feet in length and would follow Grand Canyon Parkway, then cut over to State Highway 17 via Hunter Lane, and then cut over to the TSWS Pond at Berry Lane. This option would have seven temporary construction staging areas for a total of 10 acres.
- **Middle Option:** This option would be 20,040 feet in length and would follow South Zion Parkway to the Toquerville Parkway. Prior to the South Westfield Road intersection, the alignment would cut north along an existing electrical transmission line and then cut over to the TSWS Pond. This option would have five temporary construction staging areas for a total of 15 acres.
- **West Option:** This option would be 20,020 feet in length and would follow South Zion Parkway to the Toquerville Parkway and then would follow the Toquerville Parkway to the TSWS Pond. This option would have eight temporary construction staging areas for a total of 24 acres.

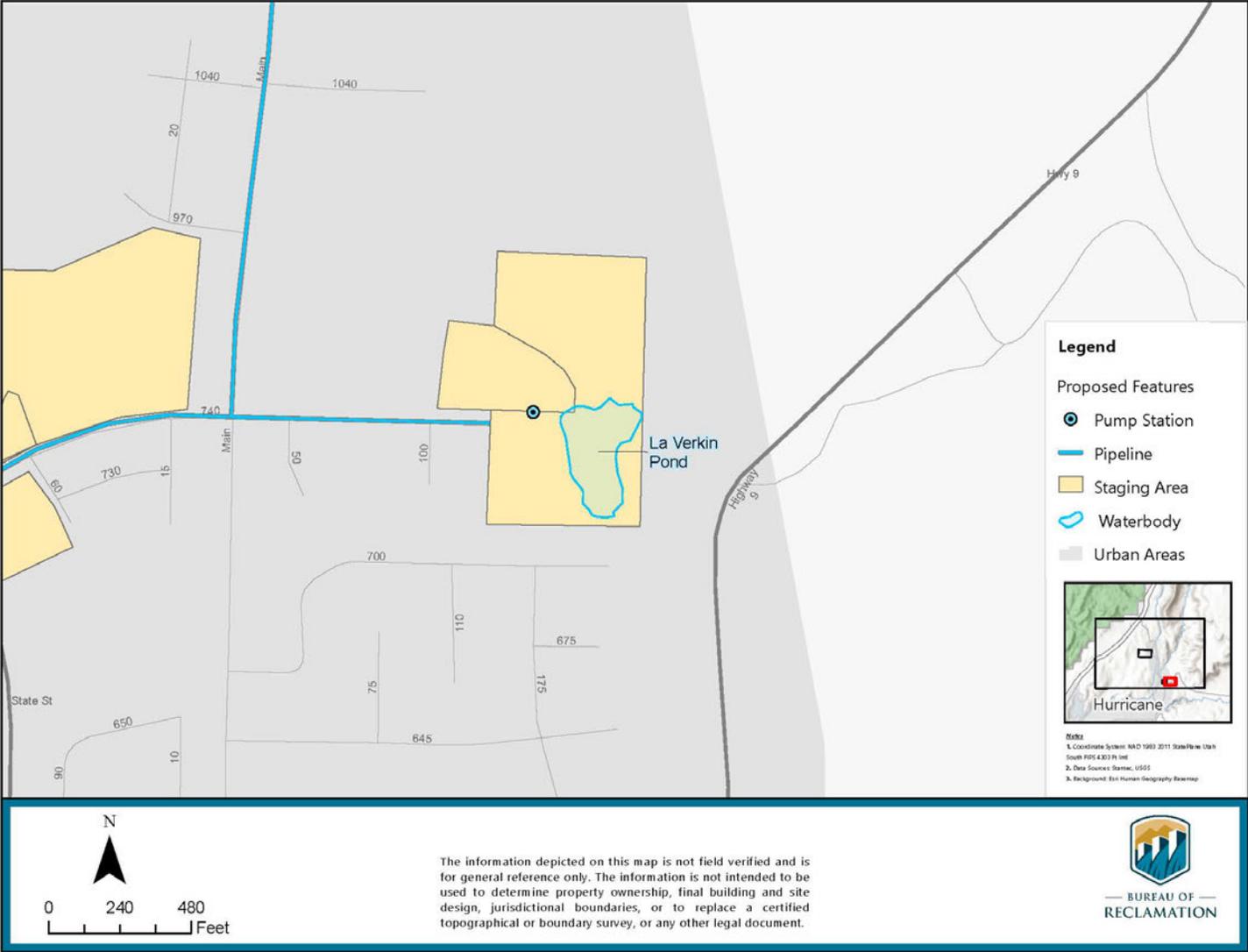


Figure 2-3. La Verkin Pond

## **Alternatives Development and Screening**

Air/vacuum valves would be installed at regular intervals and at critical high points along the length of the pipeline. Construction would occur from end of 2030 to beginning of 2032 and would disturb up to 50 feet on either side of the pipe centerline (less in more constrained areas such as transportation ROWs). Access during construction would be along existing paved and dirt roads. Approximately 3,500 square yards of asphalt would be replaced in road areas disturbed during construction, primarily in the segment leaving the La Verkin Pond, which is common to all options. All three alignment options would cross State Highway 17, La Verkin Creek, and Ash Creek, although in different locations. Trenchless methods such as jack and bore would be used for highway crossings and cut/fill methods would be used for creek crossing during the periods of the year when these creeks are dry. Creek crossings would be at existing infrastructure crossings, such as roadways or flow control structures.

A pump station would be constructed at the La Verkin Pond site to pump water to TSWS. The pump station would include three vertical turbine pumps (up to 3.5 million gallons per day [MGD] total), which would be housed in a 665-square foot concrete building. Backup electrical power would not be included in this pump station.

### **2.1.2.4 TSWS Pond to Chief Toquer Reservoir Pump Station**

A pump station would be constructed at the existing TSWS Pond site to pump water into Chief Toquer Reservoir through the existing TSWS Pond to Chief Toquer Reservoir Pipeline (Figure 2-4). The pump station would include three vertical turbine pumps (up to 3.5 MGD total), which would be housed in a 665-square foot concrete building. The pump station would be connected to the existing pipeline with 625 feet of 20 to 24-inch ductile iron pipe. The pump station yard would be fenced and would be accessed by extending the existing TSWS Pond dirt access road. Backup electrical power would not be included in this pump station.

### **2.1.2.5 Advanced Water Purification Demonstration Facility**

The Advanced Water Purification Demonstration Facility would be located just north of 740 North in La Verkin between SH17 and North Main Street (see Figure 2-5). The facility would be adjacent to a new road planned by the landowner/developer (the new road is not part of the Proposed Action). The facility would include a 2,600-square foot building that would house offices, public education space, and water treatment skids with up to 30 gallons per minute capacity for public education and on-site irrigation uses. Any remaining purified water would be placed into the CPWRF to La Verkin Pond Pipeline or returned to the CPWRF. The facility grounds would include approximately 0.3 acres of paved access and parking and would include approximately 1 acre of demonstration gardens.

The proposed process for the Advanced Water Purification Demonstration Facility is a reverse osmosis based advanced treatment process. This process includes membrane ultrafiltration, granulated activated carbon, reverse osmosis, ultraviolet advanced oxidation, chlorine disinfection, and remineralization. This demonstration process would produce a minute amount of concentrated brine stream and would be disposed of by returning to the CPWRF.

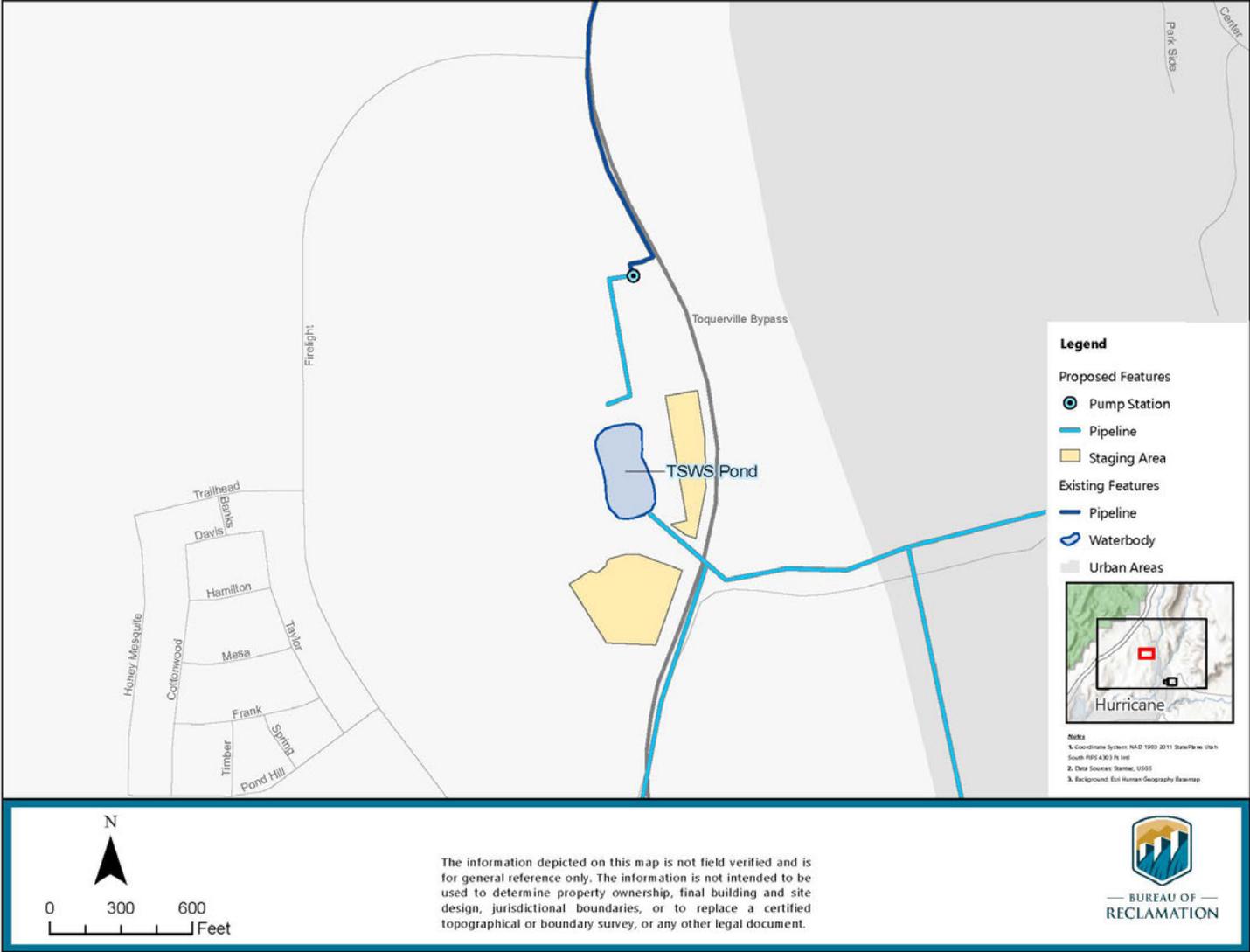
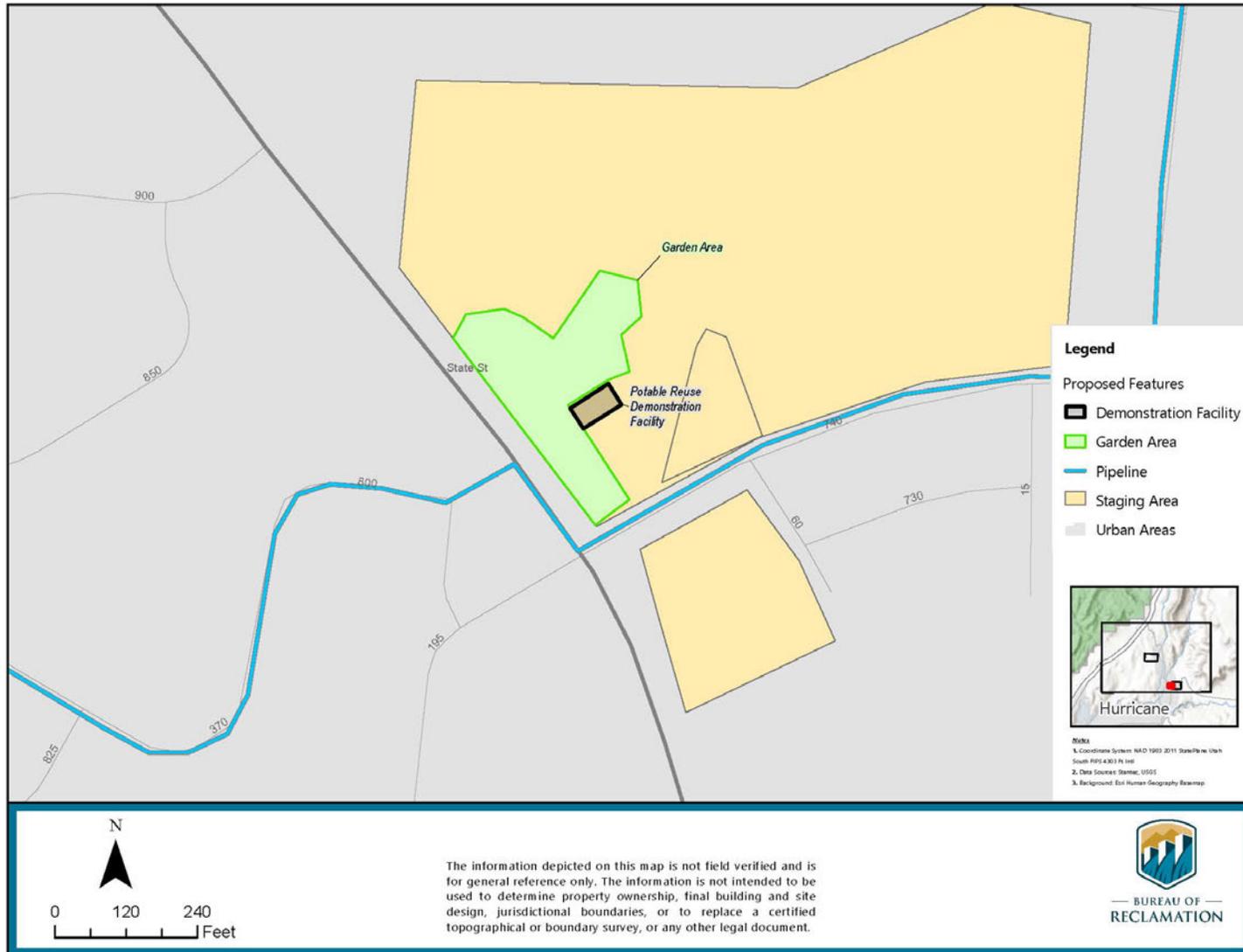


Figure 2-4. TSWs Pond to Chief Toquer Reservoir Pump Station

# Alternatives Development and Screening



**Figure 2-5. Advanced Water Purification Demonstration Facility**

### **2.1.2.6 Environmental Protection Measures**

EPMs would be used to avoid or minimize environmental effects during construction and operation. Disturbed lands associated with the pipeline would be stabilized and restored to a condition equal to or better than the pre-existing condition after construction activities, in coordination with private and municipal landowners (state or federal lands would not be affected). Multiple other measures would be used to protect the public, wildlife, and other resources. See Appendix B for a complete list of proposed EPMs.

### **2.1.2.7 Operations and Maintenance**

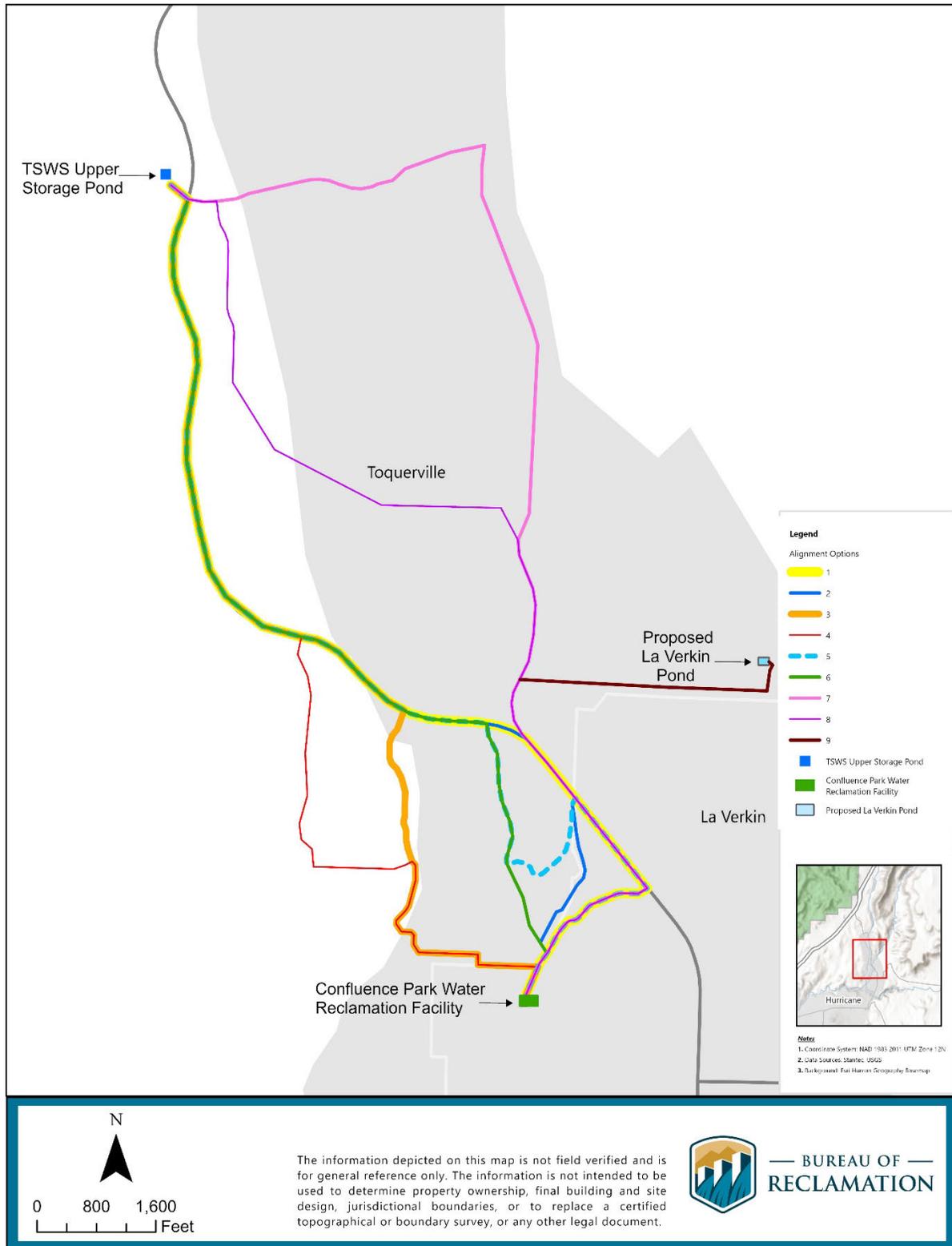
Routine operation and maintenance activities would include remote and on-site monitoring of system functions, inspection of the pipelines and facilities, regular maintenance of equipment, repairs conducted as needed, and responses to emergency conditions should they occur. All operation and maintenance activities would be confined to the easement or other ROW areas. If additional ROW area is required for unforeseen circumstances, the District would request it from the applicable landowners and conduct applicable environmental review. Facilities would periodically be visually inspected to maintain proper functioning, with emphasis on main facilities and mechanical and electrical equipment. On-site personnel and remote monitoring and control systems would track and manage facility functions. Local municipalities would be notified if extraordinary maintenance or repair efforts are necessary and the District would conduct applicable environmental review.

## **2.2 Alternatives Considered but Eliminated**

In addition to the Proposed Action, several pipeline alignments and an alternate La Verkin Pond location were considered during preliminary routing analyses (Figure 2-6). The alignments and pond location were evaluated based on the following criteria: utility conflicts, presence of groundwater, land acquisition requirements, excessive hard surface (concrete or asphalt) restoration, river crossing conditions, geology (e.g., hard rock blasting needs), and construction schedule/costs. Some segments of Alignments 5 through 8 had significant flaws under one or more criteria and were eliminated from further consideration. A cost factor analysis was completed for Alignments 1 through 4 and several segments were eliminated due to excessive land acquisition or construction costs. A few pipeline segments from all eight alignments did not have substantial flaws and were retained in the Proposed Action alignment. The alternate La Verkin Pond location was eliminated from further consideration as it would have a longer associated pipeline (i.e., greater costs) and greater environmental effects.

Potable reuse and other reuse strategies (e.g., direct injection to groundwater aquifers) to use non-potable reuse water from CPWRF were eliminated from further consideration due to the availability and proximity of exchange opportunities and secondary demands in the La Verkin/Toquerville area.

## Alternatives Development and Screening



Note: Some segments of alignments eliminated from consideration are incorporated into the Proposed Action

**Figure 2-6. Alternative Pipeline Alignments and Pond Location Eliminated from Consideration**

# Chapter 3 Affected Environment and Environmental Consequences

This chapter presents an assessment of the effects of the Proposed Action on the human and natural environment. The affected environment and environmental consequences are described for each resource.

## 3.1 Resources

To comply with NEPA, Reclamation is required to address specific elements of the environment that are subject to requirements specified in statutes, regulations, or by Executive Order. Table 3-1 lists the resources considered in this EA, and either the corresponding section of the EA where each resource is discussed or a rationale as to why it was excluded from analysis. The analysis for each resource analyzed in the EA is detailed in resource-specific sections of Chapter 3.

**Table 3-1. Resources Considered for Inclusion in Environmental Assessment**

Resource	Not Present	Present but Effects would be Negligible	Present and Potentially Affected	Assessed in this EA	Rationale for Analysis Section
Air Quality		X		No	Effects would be negligible due to EPMs such as dust control and operating permits that require operating procedures for particulate matter and emissions management.
Cultural			X	Yes	Refer to Section 3.4
General Fish and Wildlife		X		Yes	Refer to Section 3.5
General Vegetation			X	Yes	Refer to Section 3.6
Geology and Soils		X		No	Resources present in or adjacent to the Study Area, such as biocrusts, faults, or other important geological features, would not be affected.
Hazardous Materials		X		No	Effects will be negligible due to EPMs such as controlling hazardous materials on construction sites to prevent accidental spills. Toxic and hazardous materials will be stored in accordance with the project's Spill Prevention, Control, and Countermeasures plan.

**Affected Environment and Environmental Consequences**

<b>Resource</b>	<b>Not Present</b>	<b>Present but Effects would be Negligible</b>	<b>Present and Potentially Affected</b>	<b>Assessed in this EA</b>	<b>Rationale for Analysis Section</b>
Hydrology		X		No	Effects would be negligible as the Proposed Action would not reduce streamflows. No new diversions would be made on streams. Existing water rights on the river would not be affected.
Indian Trust Assets	X			Yes	Refer to Section 3.7
Land Use		X		No	Resources present in or adjacent to the Study Area, such as land or resource management plans, would not be affected. The Proposed Action would be entirely within private land or local ROW.
Noise and Vibration			X	Yes	Refer to Section 3.8
Paleontological Resources		X		No	Most of the Study Area has a low potential for fossils (Potential Fossil Yield Classification 1 and 2). A small portion of the alignment near the Toquerville Parkway has a high potential classification. No localities have been recorded in these or other nearby outcrops, and there are no paleo localities recorded from any geologic units in or near the Study Area. Resource effects would be negligible due to EPMs such as monitoring during construction in areas with high potential to yield previously unknown fossil sites/specimens.
Public Services and Utilities		X		No	Effects would be negligible as utilities/services would be avoided or temporarily maintained during construction.
Recreation			X	Yes	Refer to Section 3.9
Riparian/Wetland Resources			X	Yes	Refer to Section 3.10
Socioeconomics		X		No	Resources present in or adjacent to the Study Area would not be adversely affected.
Special Status Species			X	Yes	Refer to Section 3.11

**Affected Environment and Environmental Consequences**

<b>Resource</b>	<b>Not Present</b>	<b>Present but Effects would be Negligible</b>	<b>Present and Potentially Affected</b>	<b>Assessed in this EA</b>	<b>Rationale for Analysis Section</b>
Threatened, Endangered, and Migratory Birds			X	Yes	Refer to Section 3.12
Transportation			X	Yes	Refer to Section 3.13
Water Quality		X		No	<p>Effects during construction would be negligible due to EPMS such as permits for stormwater discharge, a prepared Stormwater Pollution Prevention Plan, erosion and sediment BMPs, and restoration of drainage functions.</p> <p>Operations of the Proposed Action, including exchanges, would not affect stream water quality. The District currently diverts La Verkin irrigation supply at the Quail Creek Diversion and delivers it to La Verkin users. The Proposed Action would deliver non-potable reuse to these same users in exchange for their Quail Creek Diversion water, which the District would keep in its pipeline to its existing drinking water treatment plant. The Virgin River streamflow and water quality would not be affected.</p> <p>The La Verkin Pond, which is not adjacent to a stream, would be lined with a geomembrane and protective cover to eliminate seepage. Pond embankments would meet dam safety requirements for design, construction, and maintenance/inspection. Stream water quality in the area would not be affected.</p>

### 3.2 Consultation, Coordination, and Public Involvement

Reclamation coordinated with the U.S. Fish and Wildlife Service (USFWS) on technical assistance for the Eastside Reuse System throughout 2025 via email and virtual or in-person meetings as part of Virgin River Program coordination activities. USFWS reviewed and approved the Biological and Aquatic Resources Survey Plan (District 2025d). Reclamation requested informal consultation pursuant to Section 7(a)(2) of the Endangered Species Act (ESA) and met with USFWS on November 20, 2025, November 24, 2025, and January 7, 2026. On January 23, 2026, USFWS issued its concurrence on discountable effects to Southwestern willow flycatcher and Western yellow-billed cuckoo.

The USFWS, in consultation with Reclamation, has evaluated the Eastside Reuse System's eligibility to tier to the Washington County Habitat Conservation Plan (HCP) (Consultation FWS/R6/FF06E23000/2026-0032636). USFWS has found the project to fall within the HCP area, its actions are consistent with Covered Activities in the HCP, and the effects to desert tortoise were analyzed in the Service's intra-Service BO (Consultation FF06E2300/2024-0035575). USFWS issued a letter on January 9, 2026, approving the effects from the Proposed Action on Mojave desert tortoise to tier to the Washington County Habitat Conservation Plan and be covered under the valid Incidental Take Permit (ES036719-V2).

Reclamation is engaging with the Paiute Indian Tribe of Utah (PITU) and has worked to address Tribal comments received during development of this EA. This includes acknowledgment of the importance of Chief Toquer, a leader of a Paiute band in southwestern Utah, who was recognized for his friendly and diplomatic leadership when members of the Southern Utah Indian Mission first visited him in 1854. His welcoming approach facilitated the settlement of the Toquerville area by Mormon pioneers between 1857 and 1858 (City of Toquerville History). Reclamation acknowledges the significance of Chief Toquer's leadership and legacy in the historical development of the area and recognizes the broader spiritual importance of the Virgin River corridor to the Paiute Indian Tribe of Utah.

Reclamation has determined, in consultation with the Utah State Historic Preservation Office (SHPO), that construction of the CPWRF to La Verkin Pond Pipeline, La Verkin Pond, and the Advanced Water Purification Demonstration Facility components of the Eastside Reuse System during the first phase of construction would not affect historic properties. SHPO concurred with cultural resource findings (see Section 3.4) for the latter phase of construction in a letter dated December 31, 2025 (Case No. 25-2479).

The District has notified and coordinated with owners of property within or near the planned ROW as part of its right-of-entry activities for data gathering and other studies. Reclamation provided a 15-day comment period for the public and government agencies to review and comment on the Draft EA. Public comments and Reclamation's responses are in Appendix C.

### 3.3 General Methodology

The general Study Area would be the area disturbed during construction, as described in Chapter 2 and illustrated on Figure 2-2, and encompasses the linear components and a 50-foot ROW on either side of the centerline of the alignments. In addition, it includes disturbance areas for above-ground facilities and for temporary and permanent access and temporary storage and staging areas. The effects of the Proposed Action are described as temporary (during construction and restoration) and permanent (remaining after construction and restoration, typically associated with permanent aboveground facilities). The temporary and permanent disturbance areas associated with each component of the Proposed Action are listed in Table 3-2.

**Table 3-2. Temporary and Permanent Effects of the Proposed Action**

<b>Proposed Action Component</b>	<b>Temporary Disturbance (acres)</b>	<b>Permanent Disturbance (acres)</b>
CPWRF to La Verkin Pond Pipeline	12.34	0
La Verkin Pond	0	8.65
La Verkin Pond to TSWS Pipeline and Pump Station – <i>East Option</i>	40.38	0
La Verkin Pond to TSWS Pipeline and Pump Station – <i>Middle Option</i>	42.27	0
La Verkin Pond to TSWS Pipeline and Pump Station – <i>West Option</i>	42.31	0
TSWS Pond to Chief Toquer Reservoir Pump Station	0.02	0
Advanced Water Purification Demonstration Facility (building and gardens)	0	1.51
Staging Area – <i>East Option</i>	44.79	0
Staging Area – <i>Middle Option</i>	49.65	0
Staging Area – <i>West Option</i>	55.19	0

For some resources described in this chapter, the Study Area encompasses a larger extent, such as a survey buffer from pipeline centerline or an additional buffer beyond the disturbance area. These buffer areas capture effects, such as noise, to potential resources that may extend beyond immediate construction, transportation, and staging areas disturbance areas. These extended Study Areas vary by resource and are described below in each respective resource section and summarized in Table 3-3.

## Affected Environment and Environmental Consequences

**Table 3-3. Specific Resource Study Areas**

Resource	Study Areas <sup>1</sup>
Cultural	APE (150-foot survey buffer) and 0.5-mile buffer of the APE
General Fish and Wildlife	Disturbance area plus approximately 0.25-mile to 2-mile survey buffer depending on species (as determined by federally-listed species survey areas)
General Vegetation	Disturbance area plus a 325-foot survey buffer
Indian Trust Assets	N/A
Noise and Vibration	N/A
Recreation	Disturbance area
Riparian and Wetland	Disturbance area plus a 150-foot survey buffer
Special Status Species	Disturbance area plus approximately 0.5-mile to 2-mile
Threatened and Endangered Species and Migratory Birds <sup>2</sup>	Disturbance area plus approximately 0.25-mile to 2-mile survey buffer depending on species
Transportation	Disturbance area

Key

APE = area of potential effect

N/A = not applicable

Note:

<sup>1</sup> Survey buffers were applied to pipeline centerlines and boundaries of above ground features.

<sup>2</sup> See Section 3.12 Threatened and Endangered Species, and Migratory Birds, and Appendix D for details on survey buffers.

## 3.4 Cultural

This section describes the regulatory framework, affected environment, and potential environmental effects on cultural resources resulting from the Proposed Action.

### 3.4.1 Regulatory Framework and Methodology

Section 106 of the National Historic Preservation Act (NHPA) (Title 54 of the U.S.C., hereafter simply referred to as “Section 106”) sets forth federal policy and procedures for identifying and evaluating historic properties—defined as any district, site, building, structure, or object listed in or eligible for listing in the National Register of Historic Places (NRHP).

The entire Proposed Action would be located on private land. However, because the Proposed Action would be federally funded, the Proposed Action constitutes a federal undertaking pursuant to Section 106 of the NHPA and its implementing regulations, as amended (36 Code of Federal Regulations [CFR] 800). Pursuant to NEPA and Section 106 compliance, as the lead agency for the project, Reclamation is required to consider effects on historic properties from the undertaking. Substitution under 36 CFR 800.8(c) permits agencies to use the NEPA review to comply with Section 106 as an alternative to the processes set out in 36 CFR 800.3-800.6. Identification efforts will follow the SHPO Documentation Guidelines and Standards for Contractors, 2024, or as updated, pursuant to 36 CFR 800.14, Subpart C prior to implementation of the Proposed Action; the agency and consulting parties will review plans and known cultural resources.

Pursuant to Section 106, federal agencies must consider whether any historic property (i.e., NRHP-eligible cultural resource) within a project’s area of potential effect (APE) could be affected by the

Proposed Action. The SHPO manages the database of archaeological sites, historic buildings, and other historic properties within the state of Utah.

The APE is defined as a 150-foot corridor centered on the proposed pipeline, including the footprints of all associated facilities and a buffer area, totaling approximately 48.58 acres of privately owned land. Approximately 18.14 acres were not surveyed due to lack of landowner access. These areas remain unsurveyed and will require additional cultural resource identification efforts prior to any ground-disturbing activities. Reclamation and the Proponent will ensure that appropriate surveys are completed in these areas, and that any identified cultural resources are evaluated in consultation with the Utah SHPO and affiliated tribes before construction proceeds (see Appendix E for SHPO communications to date).

To understand broader cultural resources context within the affected environment, a records search of the Utah SHPO database and the Historic Utah Buildings (HUB) database was conducted to identify all previous archaeological and architectural inventory and recorded cultural resources within 0.5-miles of the APE. U.S. Geological Survey (USGS) topographic maps, General Land Office survey plats, and a sample of aerial imagery were reviewed for potential historic-period cultural resources within the APE. In addition, a pedestrian cultural resource inventory of the APE, where private landowner permission was granted, was conducted in accordance with the SHPO guidelines for Class III intensive inventories.

### **3.4.2 Affected Environment**

Eighteen cultural resources were identified within the APE and 0.5-mile buffer as a result of the records search. Of these, six are prehistoric, ten are historical, and two are multicomponent sites. General types of prehistoric cultural resources identified within the vicinity of the APE include one rock art site, four task-specific sites, and one temporary camp. Previously recorded historic-period sites include one settlement, two temporary historic sites, six transportation sites, and one water storage and conveyance site. The multicomponent sites include a prehistoric rock art/historic rock wall and a prehistoric temporary camp/ethnohistoric temporary camp site.

Only three of the eighteen previously recorded cultural resources were identified within the APE (42WS4138, 42WS4142, 42WS6525).

42WS4138 was recorded in 2001 as a historic-period rock wall with an associated prehistoric rock art panel and was determined eligible for listing in the National Register of Historic Places under Criterion C. Since that time, changes in site conditions, including erosion and subsequent construction activities, have altered the site's physical context. The boulder on which the rock art panel was documented is no longer present within the recorded site area, and the site no longer retains sufficient integrity of materials, workmanship, and setting to convey the characteristics that supported its original eligibility. Based on current conditions, the site is recommended not eligible for listing to the NRHP.

42WS4142 was recorded in 2001 as a historic-period rectangular rock feature with an associated historic trash scatter and was determined eligible for listing in the National Register of Historic Places. Since that time, site conditions have been substantially altered by modern construction

## **Affected Environment and Environmental Consequences**

activities unrelated to the current project. These changes have resulted in a loss of integrity across all seven aspects defined by the National Register (location, design, setting, materials, workmanship, feeling, and association). As a result, the site no longer retains the characteristics necessary to convey its significance and is recommended not eligible for listing to the NRHP.

42WS6525 was recorded in 2021 as a prehistoric rock art site with curvilinear panels and an associated historic rock wall and was recommended eligible for listing in the National Register of Historic Places under Criterion D. Mitigation measures completed in 2022 included LiDAR scanning and photogrammetric documentation of the rock art panels, followed by removal of the boulders from the impact area. Subsequent ground disturbance and heavy equipment activity have further altered site conditions, including impacts to the historic rock wall. As a result, the site no longer retains integrity of location, design, setting, materials, workmanship, feeling, or association, and no longer retains the characteristics necessary to convey its significance. Based on current conditions, the site is recommended not eligible for listing to the NRHP.

SHPO concurred with these findings in a letter dated December 31, 2025 (Case No. 25-2479). Therefore, there are no historic properties within the APE.

### **3.4.3 Environmental Consequences**

Under the No Action Alternative, the Proposed Action would not be implemented, and no adverse effects to cultural resources would occur.

Under the Proposed Action, no effects on historic properties would occur, as no historic properties are present within the APE. Effects on other cultural resources could include damage, loss, or disturbance; however, cultural resources that are not eligible for the NRHP do not require additional management under the NHPA.

Reclamation acknowledges the Tribe's concerns submitted during the public comment period for the Draft EA, noting that the identified locations possess important spiritual values. The Tribe requested that a tribal monitor be present during construction activities to provide oversight during ground-disturbing work. Reclamation and the District are amenable to this request.

Additional cultural resource survey will be conducted prior to construction after final design is complete. Based on information obtained through the records search, Reclamation anticipates that the previously unsurveyed portions of the APE, which are primarily located in areas of prior disturbance, would likely exhibit site densities and eligibility determinations comparable to those identified within previously surveyed portions of the APE.

Cultural monitors will be present during construction and restoration activities. In the event that cultural resources, including human remains, are inadvertently discovered during construction or operation, all work will cease within a 100-foot radius of the discovery, and the find will be immediately reported to Reclamation's Provo Area Office archaeologist by telephone, followed by written notification to the responsible Federal agency official. The Utah SHPO and the Chairwoman of the Paiute Indian Tribe of Utah, or the Chairwoman's formally designated representative, will also be notified and consultation will be initiated in accordance with applicable laws and regulations. No

work will resume in the discovery area until the resource has been evaluated, and Reclamation has issued a notice to proceed. Contractors will be briefed on these protocols prior to ground-disturbing activities and will be required to comply with all avoidance, monitoring, and mitigation measures.

### 3.5 General Fish and Wildlife

This section describes the regulatory framework, affected environment, and potential environmental consequences on general fish and wildlife resulting from the Proposed Action. Fish and wildlife species protected or managed under other programs or regulatory agencies are described in Section 3.11 and Section 3.12.

#### 3.5.1 Regulatory Framework and Methodology

The Utah Division of Wildlife Resources (UDWR) has management authority over more than 940 species of wildlife, including mammals, birds, amphibians, reptiles, fish, mollusks, and crustaceans (UCA (23A-1-101(65))). This includes management and protection responsibilities for various big and small game species and non-game species. General wildlife observations were documented within the Study Area during surveys conducted for federally-listed threatened and endangered species (see Section 3.12 and Appendix D).

#### 3.5.2 Affected Environment

A variety of general fish and wildlife have the potential to inhabit the Study Area throughout all or a portion of the year. Vegetation and seasonal water sources provide breeding, foraging, cover, and movement corridors for an array of wildlife. Several species of fish and wildlife (e.g., mule deer) are considered culturally significant and ecologically sensitive by area Tribe members. Sections in the Study Area that overlap Ash Creek and La Verkin Creek provide small parcels of riparian habitat within an overall area dominated by arid to semi-arid landscapes, developed space, and agriculture. However, human development and scouring events have degraded vegetation diversity and understory previously associated with riparian areas. Remaining undeveloped, upland habitats are characterized by rocky hillsides, desert scrub, and sandy flats, all of which have potential to provide additional breeding, foraging, and cover for wildlife within the Study Area.

General mammal observations documented during species-specific field surveys included mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), rock squirrel (*Otospermophilus variegatus*), and white-tailed antelope squirrel (*Ammospermophilus leucurus*). Reptile observations included Great Basin collared lizard (*Crotaphytus bicinctores*), long-nosed leopard lizard (*Gambelia wislizenii*), desert horned lizard (*Phrynosoma platyrhinos*), desert spiny lizard (*Sceloporus magister*), and common side-blotched lizard (*Uta stansburiana*). See the Baseline Wildlife Survey Report in Appendix D for additional details on incidental observations.

The Study Area supports mule deer year-round and overlaps with “year-long substantial habitat” for the species as designated by UDWR. However, the Study Area is outside of designated crucial seasonal ranges and migration corridors mapped to the north and east along the Hurricane Cliffs (UDWR 2025a). Existing agricultural fields in and near the Study Area offer foraging opportunities

## Affected Environment and Environmental Consequences

for wildlife, including mule deer, but provide minimal cover or vegetative diversity. Existing fences and development create barriers to dispersal and habitat use, including ungulate migration.

Speckled dace (*Rhinichthys osculus*) and desert sucker (*Pantosteus clarkii*) are native fish species in the Virgin River Basin that have the potential to occur in or near the Study Area (UDWR 2024). These species may be found in lower Ash Creek near its confluence with the Virgin River, but only during periods of high seasonal precipitation as lower Ash Creek is intermittent to ephemeral (i.e., characterized as dry for most of the year) below Ash Creek Reservoir (District 2016). Species may also be found in La Verkin Creek which is typically considered perennial but can go dry under drought and low flow conditions as a result of heavy water diversion practices (District 2006).

### 3.5.3 Environmental Consequences

Under the No Action Alternative, there would be no effects on general fish and wildlife within the Study Area and therefore no adverse effects are anticipated.

Small and large mammals, reptiles, and amphibians may be temporarily displaced by the Proposed Action via surface disturbance, noise, and increased human presence during construction and restoration activities. Movement corridors for these species would be temporarily affected during pipeline construction activities. These species would be expected to return to previously occupied areas after construction or restoration activities.

Construction activities could increase wildlife mortality due to vehicle collisions on new access roads or increased use of existing access roads. Injury or mortality could also occur within the area of ground disturbance, especially for smaller mammal, reptile, and amphibian species that seek shelter in underground burrows or dens. In addition, 10.15 acres of terrestrial habitat which includes blackbrush-Mormon tea shrubland, mixed salt desert scrub, shale badland, semi-desert shrub steppe, and developed open space would be permanently lost due to the construction of the La Verkin Pond and Advanced Water Purification Demonstration Facility.

For creek crossings, the District will coordinate with the Virgin River Program on construction methods and timing. The Virgin River Program is a cooperative partnership between local, state, federal, and private entities (USFWS, UDWR, and The Nature Conservancy are some of the participants). If water is absent at the time of construction, there would be no effects on fish and amphibian species. If water is present, the District would install a temporary earthen cofferdam or use trenchless technology under the creek at each crossing as described in the EPMs. Any work within the stream would occur outside of spawning/breeding season (April 1 – August 31) per Virgin River Program protocols. With the application of these measures, flow would be maintained in at least a portion of the creek at any given time to allow for continued fish passage. Upon construction completion, any disturbed channel morphology would be restored, and the water regime would return to normal conditions. All proposed Options for the siting of pipeline infrastructure from the La Verkin Pond to the existing TSWS Pond would include one crossing of Ash Creek and one crossing of La Verkin Creek. Therefore, effects on fish and amphibian species from all Options would be similar. The Proposed Action would not reduce streamflows.

Intermittent disturbance to general wildlife would occur post-construction from vehicle and human presence on access roads for operation and maintenance purposes. However, these effects would be infrequent, temporary, and would not be expected to cause detectable changes in populations or habitat.

With the implementation of EPMs, the temporary and permanent effects of the Proposed Action to general wildlife and fish would be negligible. Due to co-location with existing development (e.g., roads, powerline infrastructure) for the majority of the proposed pipeline installation routes outside of commercial and residential areas, construction of the East, Middle, and West Options are expected to have a similar level of effect on general wildlife species.

### 3.6 General Vegetation

This section describes the regulatory framework, affected environment, and potential environmental consequences on general vegetation resulting from the Proposed Action. Plant species protected or managed under other programs or regulatory agencies are described in Section 3.11 and Section 3.12.

#### 3.6.1 Regulatory Framework and Methodology

The Federal Noxious Weed Act of 1974 (P.L. 93-629) (7 U.S.C. 2801 et seq.) and the Utah Noxious Weed Act (Title 4, Chapter 17, Section 112) directs the management of undesirable plants on federal lands and lands under a state agency's control or jurisdiction, including highways, roadways, ROWs, and easements within the Study Area. Other federal and state regulations regarding general vegetation (e.g., plant collection) are not applicable to the Study Area.

For general vegetation resources, the Study Area is 325 feet off the 50-foot disturbance area, totaling 375-feet on either side of linear components. The Study Area includes above ground facilities, areas identified for temporary and permanent access, and temporary storage and staging areas. Noxious weed surveys were completed concurrently with surveys conducted for federally-listed threatened and endangered species (see Section 3.12). General vegetation community types were assessed using the Southwest Regional Gap Analysis Project (SWReGAP) land cover types which was a multi-institutional cooperative to map and assess biodiversity and landcover across a 5-state region (Arizona, Colorado, Nevada, New Mexico, and Utah) (SWReGAP 1999). Limited field verification of the SWReGAP data related to rare plant habitat was conducted.

#### 3.6.2 Affected Environment

##### 3.6.2.1 Noxious Weeds

Scotch thistle (*Onopordum acanthium*), a Class 3: Containment species, which is a widely spread noxious and invasive weed not native to the State of Utah (Utah Department of Agriculture 2022), was identified in one location of the Study Area on private land. Giant cane (*Arundo donax*) is another noxious weed that is known to occur in the Study Area.

## Affected Environment and Environmental Consequences

### 3.6.2.2 General Vegetation

Within the Study Area there are a variety of vegetation communities present (see Table 3-4). Desktop surveys and limited verification in the field (see Appendix D) did not identify any areas that would be deemed rare or sensitive.

**Table 3-4. Vegetation Communities Present in the Study Area**

SWReGAP Vegetation Community Type	West Option (acres)	Middle Option (acres)	East Option (acres)
Colorado Plateau Blackbrush-Mormon-tea Shrubland	113.86	165.02	136.46
Agriculture	52.2	9.36	70.41
Sonora-Mojave Creosotebush-White Bursage Desert Scrub	49.16	32.48	N/A
North American Warm Desert Riparian Woodland and Shrubland	31.53	31.53	43.95
Mojave Mid-Elevation Mixed Desert Scrub	29.24	10.13	N/A
Colorado Plateau Mixed Bedrock Canyon and Tableland	22.59	22.59	24.17
Inter-Mountain Basins Mixed Salt Desert Scrub	17.44	11.56	18.53
Inter-Mountain Basins Shale Badland	10.33	10.33	10.76
Developed, Open Space - Low Intensity	10.31	48.73	44.29
Inter-Mountain Basins Semi-Desert Shrub Steppe	9.85	6.01	5.12
Inter-Mountain Basins Greasewood Flat	2.09	1.78	1.78
Great Basin Pinyon-Juniper Woodland	1.48	0.81	0.81
Inter-Mountain Basins Semi-Desert Grassland	1.06	1.06	N/A
Colorado Plateau Pinyon-Juniper Shrubland	0.01	0.01	N/A
Invasive Southwest Riparian Woodland and Shrubland	67.43	67.43	43.93
Invasive Annual Grassland	7.19	5.56	9.79
Invasive Annual and Biennial Forbland	5.59	5.59	5.59
Developed, Medium - High Intensity	N/A	N/A	0.96
<b>Totals</b>	<b>431.36</b>	<b>429.98</b>	<b>416.55</b>

Source: SWReGAP 1999

### 3.6.3 Environmental Consequences

Under the No Action Alternative, there would be no effects on vegetation within the Study Area and therefore no adverse effects would occur.

#### 3.6.3.1 Noxious Weeds

The Proposed Action would minimize the spread of noxious weeds during construction and restoration/revegetation activities with the application of EPMS (see Appendix B) such as implementation of a noxious weed control plan.

#### 3.6.3.2 General Vegetation

The Proposed Action would temporarily affect 87.80 acres on the East Option alignment, 82.23 acres on the Middle Option alignment, and 75.46 acres on the West Option alignment (Table 3-5). Temporary disturbances would consist of pipeline construction and transport and staging areas for vehicles, equipment, materials, parking, and human foot traffic. Vegetation removal would be kept

## Affected Environment and Environmental Consequences

to what is necessary to install and maintain the project. EPMS would restore vegetation to a condition equal to or better than the pre-existing condition where temporary disturbances occurred. Where appropriate and in coordination with private and municipal landowners (state or federal lands would not be affected), the seed mixes will consist of native plants endemic to the region and vegetation community being restored.

The La Verkin Pond and Advanced Water Purification Demonstration Facility would result in a permanent loss of 10.15 acres. None of the vegetation communities permanently affected by the Proposed Action are considered rare or sensitive. Vegetation would not be affected during operations and maintenance of the Proposed Action. Temporary and permanent effects on general vegetation would be minor.

**Table 3-5. Effects on Vegetation Communities in the Disturbance Area**

<b>SWReGAP Vegetation Community Type</b>	<b>East Option Temporary Effects</b>	<b>East Option Permanent Effects</b>	<b>Middle Option Temporary Effects</b>	<b>Middle Option Permanent Effects</b>	<b>West Option Temporary Effects</b>	<b>West Option Permanent Effects</b>
Colorado Plateau Blackbrush- Mormon-tea Shrubland	24.49	7.32	30.59	7.32	25.76	7.32
Agriculture	12.18	0	0.07	0	7.6	0
Sonora-Mojave Creosotebush- White Bursage Desert Scrub	11.71	0	7.2	0	0	0
North American Warm Desert Riparian Woodland and Shrubland	4.16	0	4.16	0	8.14	0
Mojave Mid- Elevation Mixed Desert Scrub	5.32	0	2.42	0	0	0
Colorado Plateau Mixed Bedrock Canyon and Tableland	4.8	0	4.8	0	5.43	0
Inter-Mountain Basins Mixed Salt Desert Scrub	1.64	0.26	1.52	0.26	1.75	0.26
Inter-Mountain Basins Shale Badland	3.52	0.56	3.52	0.56	3.5	0.56
Developed, Open Space - Low Intensity	2.59	0.52	11.39	0.52	9.73	0.52

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SWReGAP Vegetation Community Type	East Option Temporary Effects	East Option Permanent Effects	Middle Option Temporary Effects	Middle Option Permanent Effects	West Option Temporary Effects	West Option Permanent Effects
Inter-Mountain Basins Semi-Desert Shrub Steppe	1.68	1.11	1.19	1.11	0.96	1.11
Inter-Mountain Basins Greasewood Flat	0.51	0	0.51	0	0.51	0
Great Basin Pinyon-Juniper Woodland	0	0	0	0	0	0
Inter-Mountain Basins Semi-Desert Grassland	0	0	0	0	0	0
Colorado Plateau Pinyon-Juniper Shrubland	0	0	0	0	0	0
Invasive Southwest Riparian Woodland and Shrubland	12.88	0.38	12.88	0.38	9.8	0.38
Invasive Annual Grassland	0.96	0	0.62	0	0.92	0
Invasive Annual and Biennial Forbland	1.36	0	1.36	0	1.36	0
Developed, Medium - High Intensity	0	0	0	0	0	0
<b>Totals</b>	<b>87.8</b>	<b>10.15</b>	<b>82.23</b>	<b>10.15</b>	<b>75.46</b>	<b>10.15</b>

Source: SWReGAP 1999

### 3.7 Indian Trust Assets and Tribal Issues

Indian Trust Assets (ITAs) are legal interests in property held in trust by the United States for Indian tribes or individuals. Trust assets may include lands, minerals, hunting and fishing rights, traditional gathering grounds, and water rights. The Department of the Interior's policy is to recognize and fulfill its legal obligations to identify, protect, and conserve the trust resources of federally recognized Indian tribes and tribal members, and to consult with tribes on a government-to-government basis, whenever plans or actions affect tribal trust resources, trust assets, or tribal safety (see Departmental manual, 512 DM 2).

Under this policy, as well as Reclamation's ITA policy, Reclamation is committed to carrying out its activities in a manner which avoids adverse effects on ITAs when possible, and to mitigate or

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compensate for such effects when it cannot. All effects on ITAs, even those considered nonsignificant, must be discussed in the trust analyses in NEPA documents and appropriate compensation or mitigation must be implemented. Effects on ITAs are evaluated by assessing how the action affects the use and quality of ITAs. Any action that adversely affects the use, value, quality, or enjoyment of an ITA is considered to have an adverse effect on the resources.

There are no known ITAs in the Study Area, but there are ITAs in nearby areas (see Appendix F showing the Proposed Action's distant proximity to ITAs in the regional area). The Shivwits Band of the Paiute Indian Tribe of Utah Water Rights Settlement Act (Public Law 106-263) makes available to the Tribe 4,000 acre-feet of water from the Santa Clara River and the existing St. George Reuse Facility, along with associated pipelines, pumping, and delivery facilities. Reclamation anticipates that the Proposed Action would have no foreseeable adverse effects on ITAs.

Although not designated as ITAs, the Paiute Indian Tribe of Utah considers other resources to be culturally significant, such as, but not limited to, the following:

- Virgin River, tributaries, and surrounding lands
- Wildlife and plant species
- Soils, habitats, and migration areas
- Historic properties that may be eligible or ineligible under the NRHP

### 3.8 Noise and Vibration

This section describes the regulatory framework, affected environment, and potential environmental consequences on noise and vibration resulting from the Proposed Action.

#### 3.8.1 Regulatory Framework and Methodology

The Proposed Action would be primarily located within designated utility corridors, along existing paved roadways, and on private land. Various rules, regulations, and local ordinances related to noise and vibration would apply to construction and operation, including noise exposure guidelines from the U.S. Environmental Protection Agency (EPA) and Occupational Safety and Health Administration. A 75-decibel (A-weighted decibel [dBA]) sound level is the threshold for significant noise effects on human receptors (for periods of up to 8 hours per day). Washington County has a nuisance ordinance that prohibits unnecessary, unusual, annoying, disturbing, or endangering noises; however, the County does not specify a specific decibel level.

The analysis of noise and vibration effects was completed in two steps. First by reviewing existing background noise data. Second, by using previous analyses, probable construction and peak operational noise levels and their spatial extent, completed by similar projects in the same vicinity as the Proposed Action. Temporary noise effects are those that occur within the duration of the construction period. Permanent effects are those that occur from ongoing operations of the

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Proposed Action. Effects from vibration are discussed qualitatively. Vibration from construction activities would be intermittent, temporary, and impulsive in nature.

### 3.8.2 Affected Environment

Noise levels in most environments normally range from 30 dB to 100 dB. Noise levels in a quiet natural area can be as low as 20 dBA (with no wind). The “A-weighted” noise scale, which weights the frequencies to which humans are sensitive, is used to describe noise in the human environment. Within Washington County and the surrounding areas, ambient sound levels in developed areas (background noises present) varied between less than 50 to 54 dBA to peak sound levels of 54 to 79 dBA (Reclamation 2020).

Vibration is a change in pressure that at certain levels may be perceived as a nuisance. Vibration can be felt outdoors, but the perceived intensity of vibration effects is much greater indoors due to the shaking of structures. Human response to vibration is difficult to quantify, and vibration can be perceived at levels that are below those required to produce any damage to structures.

Table 3-6 lists average and peak noise levels of example construction equipment typically used in similar projects. These noise levels were used as source data for determining average and maximum expected sound levels for the construction and operation of the Proposed Action.

**Table 3-6. Operational Noise Levels of Example Construction Equipment**

Equipment	Average (dBA) <sup>1</sup>	Peak (dBA) <sup>1</sup>
Pickup Truck	75	78
Dump Truck	76	90
Grader	75	94
Loader	79	94
Dozer	82	94
Excavator	81	93
Paver	77	89
Backhoe	76	85
Roller	80	92
Welder	74	87
Drill Rig (Auger)	84	85
Concrete Pump	81	93
Compactor	83	95
Crane	81	86
Blasting (above ground)	<94 (variable)	94 (variable)
Blasting (below ground)	<90 (variable)	<90 (variable)
Jackhammer	<89	89

Source: UBWR 2016

Key:

dBA = A-weighted decibel

Note:

<sup>1</sup> Average and peak noise values at the equipment source with no silencers.

**3.8.3 Environmental Consequences**

Under the No Action Alternative, the Proposed Action would not be built and there would be no changes to existing background sound levels in the affected environment.

Estimated peak noise levels by construction phase for similar projects is shown in Table 3-7. The peak hourly equivalent sound level would be 99 dBA for both the clearing, grading/earthwork phase and the cleaning, restoring, and site work at facility phase. This is a result of the number and size of equipment (i.e., noise level) that would be used in these phases.

**Table 3-7. Estimated Noise Levels by Construction Phase for Similar Projects**

Construction Phase	Average Noise (dBA) <sup>1</sup>	Peak Noise (dBA) <sup>1</sup>
Clearing, Grading / Earthwork	88	99
Pipeline Installation	85	92
Facility Construction (pump station, hydrostation, etc.)	86	94
Cleaning, Restoring, and Site Work at Facility	86	99

Source: UBWR 2016

Key:

dBA = A-weighted decibel

Note:

<sup>1</sup> Average and peak noise values at the equipment source with no silencers.

Since these operations would be noise point sources on land, noise levels would decay in approximate 6 dBA increments with each doubling of distance (FHWA 2011). Table 3-8 reports the noise level decay of the peak construction-phase noise levels at various distances from the point sources (UBWR 2016). Noise levels at their peak would meet the EPA recommended environmental noise threshold (75 dBA, 8-hour average) at a maximum of 800 feet from the source.

Blasting would be used in construction of the Middle Option of the La Verkin Pond to TSWS Pipeline and Pump Station (District 2025e). Blasting would create perceptible vibration and ground borne noise. Noise from blasting would be instantaneous, not continuous. Per the EPMs in Appendix B, blasting would be monitored if in the vicinity of occupied properties or sensitive wildlife or cultural sites. The Middle Option is in a remote area and has few occupied properties adjacent to the alignment.

Effects of noise and vibration would be minimized through implementation of EPMs and standard industry practices. All construction equipment would be equipped with manufacturer’s standard noise control devices. Construction would be temporary, would only occur during daytime hours, and vibration would be intermittent.

Permanent use of electrical and mechanical equipment at pump stations and pipelines would operate per manufacturers’ specifications and would follow occupational health and safety codes and regulations. Operating noise levels directly at the pump would be up to 85 dBA. The mechanical equipment within each facility would be housed in noise attenuating buildings. The EPMs (see Appendix B) include design measures for permanent facilities to operate at a maximum noise level

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of 60 dBA at the site boundary, 15 dBA below the EPA recommended environmental noise threshold.

Noise and vibration effects due to the Proposed Action would vary in space and time. Most effects would be minor, temporary, and project-specific, particularly during construction. Noise levels would return to prior existing conditions, except in the case of permanent infrastructure, which would be similar to ambient noises at facility boundaries, causing negligible effects.

**Table 3-8. Noise Decay (Peak Noise Levels) per Construction or Operations Type**

Distance from Point Source (feet)	Clearing and Grubbing/ Earthwork Noise (dBA) <sup>1,2</sup>	Pipeline and Transmission Line Installation Noise (dBA) <sup>1,2</sup>	Facility Construction Noise (dBA) <sup>1,2</sup>	Cleaning, Restoring, and Site Work at Facilities Noise (dBA) <sup>1,2</sup>
50	99	92	94	99
100	93	86	88	93
150	90	83	85	90
200	87	80	82	87
400	81	74	76	81
<b>800</b>	<b>75</b>	<b>68</b>	<b>70</b>	<b>75</b>
1,600	69	62	64	69
3,200	63	56	58	63
6,400	57	50	52	57

Source: UBWR 2016

Key:

dBA = A-weighted decibel

Note:

<sup>1</sup> Bolded meet EPA recommended environmental noise threshold (75 dBA, 8-hour average).

<sup>2</sup> Average and peak noise values at the equipment source with no silencers.

## 3.9 Recreation

This section describes the regulatory framework, affected environment, and potential environmental consequences on recreation resulting from the Proposed Action.

### 3.9.1 Regulatory Framework and Methodology

Construction and operational activities associated with the Proposed Action would occur on private lands. Recreation resources are subject to local ordinances and management. There is limited overlap between recreation areas, facilities, and recreation opportunities in the Study Area. Recreation resources were evaluated for the defined Study Area.

### 3.9.2 Affected Environment

The U.S. Department of the Interior, Bureau of Land Management (BLM) manages National Scenic and Historical Trails, recreation areas, and BLM-managed land which hosts numerous recreational activities. There are no BLM resources located within the Study Area (BLM 2024a, BLM 2024b,

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BLM 2025). Local off-road recreational trail segments, paved and unpaved, are found throughout the Study Area (UGRC 2024, Utah DNR 2020).

The UDWR manages hunting, fishing, and wildlife management areas within the state of Utah. There are no wildlife management areas within the Study Area. The UDWR’s Fish Utah Map notes zero fishing access spots within the Study Area (UDWR 2025b). Wilderness areas are wild, undeveloped, and federally protected areas where wildlife lives in their natural habitat and the natural ecosystem is protected and preserved (USFWS 2025a). There are no wilderness areas within the Study Area (UGRC 2025a). There are no all-terrain vehicle (ATV) day ride trails within the Study Area (Utah DNR 2020). A summary of inventoried recreational resources is in Table 3-9.

**Table 3-9. Summary of Recreational Resources and Effects on the Study Area**

<b>Recreational Activities in Southwest Utah</b>	<b>Within or Near Study Area?</b>	<b>East Option (Number/Extent)</b>	<b>Middle Option (Number/Extent)</b>	<b>West Option (Number/Extent)</b>
Paved Trails	Yes	1 / 0.4 miles	1 / 0.4 miles	1 / 0.4 miles
Dirt Trails	Yes	11 / 6.4 miles	17 / 3.7 miles	13 / 3.8 miles
ATV Day Rides	No	N/A	N/A	N/A
Utah State Parks	No	N/A	N/A	N/A
Utah Fishing Location	No	N/A	N/A	N/A
Wildlife Management Area	No	N/A	N/A	N/A
BLM National Scenic and Historical Trails	No	N/A	N/A	N/A
BLM Recreation Areas	No	N/A	N/A	N/A
BLM-Managed Land	No	N/A	N/A	N/A
Wilderness Areas	No	N/A	N/A	N/A

*Source: UGRC 2025a, UGRC 2024, Utah DNR 2020, UDWR 2025b, UDWR 2020, USFWS 2025a, BLM 2024a, BLM 2024b, BLM 2025*

Key

ATV = all-terrain vehicle

### 3.9.3 Environmental Consequences

Under the No Action Alternative, there would be no effects on recreation sites or recreational opportunities within the Study Area and therefore no adverse effects would occur.

The Proposed Action would affect local paved and dirt trails. The effects would be temporary during construction and access would be restored within one to two days after the crossing is complete. Affected trail infrastructure (e.g., pavement) would be restored after construction. One paved trail segment (0.4 miles) would be affected by the Proposed Action (Table 3-9). Between 11, 17, or 13 unpaved segments of trails (6.4, 3.7, or 3.8 miles) would be affected by the East Option, Middle Option, or West Option alignments, respectively.

The Proposed Action would only affect trails where they intersect within the Study Area, and thus other segments of trails would be available for use. ATV day ride trails would not be affected by the Proposed Action. The 10.15 acres of permanent disturbance associated with construction of the La

## Affected Environment and Environmental Consequences

Verkin Pond and Advanced Water Purification Demonstration Facility would not affect recreation resources. Operations and maintenance of the Proposed Action would not affect recreation resources. Under the Proposed Action, there would be negligible effects on recreational resources.

### 3.10 Riparian and Wetland Resources

This section describes the regulatory framework, affected environment, and potential environmental consequences on riparian and wetland resources resulting from the Proposed Action

#### 3.10.1 Regulatory Framework and Methodology

Wetlands are areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and in normal conditions do support, a prevalence of vegetation adapted for life in saturated soil conditions (USACE 1987; 33 C.F.R. § 328.3(c)(1) (2025)). Wetlands and riparian areas serve several important ecological functions, including but not limited to, water filtration, flood control, groundwater recharge, biodiversity, wildlife habitat, and climate regulation. Federal law regulates certain waters and wetlands. The rules which identify these waters have recently changed based on a Supreme Court decision. What follows summarizes the current regulatory status.

On August 29, 2023, the EPA and U.S Army Corps of Engineers (USACE) issued a final rule amending the “Revised Definition of the ‘Waters of the United States’” (WOTUS) rule that was first published in the Federal Register (FR) on January 18, 2023 (88 FR 3142). The final, amended rule, published in the FR on September 8, 2023 (88 FR 61964), conforms the definition of “waters of the United States” to the U.S. Supreme Court’s May 25, 2023, decision in the case of *Sackett v. U.S. Environmental Protection Agency* (“*Sackett?*”) (598 U.S. 651 (2023)). The *Sackett* decision removed the “significant nexus” test when identifying wetlands and other waters, as federally jurisdictional. The *Sackett* decision also resulted in the EPA and USACE revising the definition of the term “adjacent,” which is now defined as “having a continuous surface connection” (40 CFR 120.2(c)(2); 33 CFR 328.3(c)(2)). Under the current WOTUS rules, “waters of the United States” include (1) traditionally navigable waters, territorial seas, or interstate waters (“Jurisdictional Waters”); (2) impoundments of Jurisdictional Waters; (3) tributaries to Jurisdictional Waters or Jurisdictional Impoundments that are relatively permanent, standing, or continuously flowing bodies of water (“Jurisdictional Tributaries”); (4) wetlands that are adjacent to Jurisdictional Waters or are adjacent to Jurisdictional Impoundments or Jurisdictional Tributaries that are relatively permanent, standing, or continuously flowing (relatively permanent waters); and (5) intrastate lakes and ponds not included in the previous categories that are relatively permanent, standing, or continuously flowing bodies of water with a continuous surface connection to Jurisdictional Waters, Jurisdictional Impoundments, or Jurisdictional Tributaries (40 CFR 120.2(a); 33 CFR 328.3(a)).

Until the EPA and USACE undertake new WOTUS rulemaking, due to ongoing litigation affecting approximately half of the states (including Utah), the EPA and USACE are currently interpreting WOTUS consistent with the “pre-2015” regulatory regime and the *Sackett* ruling. Under the pre-2015 regulatory regime, consistent with *Sackett*, the agencies will not assert jurisdiction based on the “significant nexus” standard, will not assert jurisdiction over interstate wetlands solely because they

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are interstate, will interpret “adjacent” to mean “having a continuous surface connection,” and will limit the scope of the “other waters” provision to only relatively permanent lakes and ponds that do not meet one of the other jurisdictional categories, as explained in agency guidance (USACE and EPA March 12, 2025). Future rulemaking may also clarify when, if at all, ephemeral or intermittent streams are regulated as jurisdictional WOTUS. The terms “relatively permanent” and “continuous surface connection” currently remain undefined and heavily impact whether wetlands and tributaries are considered WOTUS.

The amount of potentially jurisdictional wetlands and other aquatic resources within and near the Study Area provides a baseline for understanding the scale of potential effects and the regulatory process under the Clean Water Act Section 404.

In addition to federal regulation of aquatic resources, the Utah Division of Water Rights manages the state’s Stream Alteration Permit program. That program requires that effects to natural streams be reviewed and permitted by the Utah Division of Water Rights. For the purposes of state permitting, a natural stream is “any waterway, along with its fluvial system, that receives sufficient water to sustain an ecosystem that distinguishes it from the surrounding upland environment.” Canals, ditches, or other constructed channels are not considered natural streams (Utah Division of Water Rights 2025).

Riparian areas associated with streams are often protected for their benefits to wildlife, plants, and society (in the form of flood control, etc.). Riparian areas are vegetated zones that form a transition between stream communities and upland areas. These areas typically exhibit vegetation and physical characteristics associated with permanent sources of surface or subsurface water. These areas may or may not meet all three USACE parameters for wetlands delineations (i.e., (1) wetlands hydrology; (2) a prevalence of wetlands or “hydrophytic” vegetation; and (3) saturated or hydric soils). Moreover, an individual aquatic resources system may contain jurisdictional and non-jurisdictional areas and still be considered riparian. In southern Utah, riparian areas are often characterized by a distinct zone of shrubs or trees such as willow (*Salix* spp.), cottonwood (*Populus* spp.), and non-native salt cedar (*Tamarix* spp.).

The aquatic resource assessment included evaluating a variety of existing data and information, including the following: a review of the USFWS National Wetlands Inventory database, the U.S. Geological Society National Hydrography Database Plus, aerial imagery, and topographical maps. Field-based delineation surveys were completed that included evaluation of vegetation, soils, and hydrology of wetlands, and the ordinary high water mark (OHWM), morphological characteristics, and vegetative communities at stream crossings.

The aquatic resource delineation surveys were completed following the USACE Wetland Delineation Manual (USACE 1987) and Arid West Regional Supplement (USACE 2008a). Stream delineations and flow determinations will be based on the following USACE regional guidance documents: A Field Guide to the Identification of the OHWM in the Arid West Region of the Western United States (USACE 2008b) and the Streamflow Duration Assessment Method for the Arid West of the United States (Mazor et al. 2023).

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To understand the riparian and wetland resources near and within the Proposed Action, the aquatic resources Study Area consists of the area within a 200-foot buffer from the preliminary proposed pipeline centerline and around the boundary of preliminary proposed infrastructure (e.g., ponds, temporary workspaces, pump stations, demonstration facility). Where private land access was not authorized for field survey, public data and aerial imagery was used to digitize the location and type of aquatic resources, if present. Appendix D presents more information on field surveys.

### 3.10.2 Affected Environment

Discussion on wetlands, streams, and riparian zones for the Proposed Action is derived primarily from aquatic resources delineation. Total acreage and linear feet of wetlands, streams, and riparian areas identified in the Study Area, including all pipeline alignment options, are provided in Table 3-10.

**Table 3-10 Riparian and Wetland Resources in the Study Area**

<b>Aquatic Resource Category</b>	<b>Number of Features</b>	<b>Acreage</b>	<b>Linear Feet</b>
Wetlands	0	0	Not Applicable
Stream Segments (Total)	7	1.45	5,811.23
<i>Perennial</i>	3	1.22	4,443.51
<i>Intermittent</i>	3	0.19	877.37
<i>Ephemeral</i>	1	0.04	490.35
Riparian Areas	7	17.30	Not Applicable
Open Waters	4	1.43	Not Applicable

#### 3.10.2.1 Wetlands

No wetlands meeting USACE criteria were identified within the Study Area. Notably, the riparian areas (accessible for field evaluation) did not meet USACE wetland status.

#### 3.10.2.2 Streams and Riparian Areas

Under current law, the perennial stream channels discussed below, and potentially the intermittent stream channels, are considered Relatively Permanent Waters, and are regulated under the Clean Water Act Section 404 as WOTUS. The aquatic resource Study Area includes seven stream segments<sup>1</sup> meeting the OHWM criteria. Of those, three perennial streams (all segments of La Verkin Creek), three intermittent streams (two segments of Ash Creek and one segment of an unnamed stream that flows into La Verkin Creek), and one unnamed ephemeral stream were mapped.

Seven riparian areas occur within the Study Area. These riparian areas were associated with La Verkin Creek (four areas), Ash Creek (two areas), and the unnamed intermittent stream that flows into La Verkin Creek (one area). Riparian areas associated with the Proposed Action's route have

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<sup>1</sup> For purposes of this analysis, the term "stream segment" means a portion of a defined stream channel located between road crossings. Multiple stream crossings (segments) occurring within the survey area at different locations may represent a single stream. Segments are reported to align this generally accepted permitting guidelines of single and complete crossings.

experienced common effects, including channelization and encroachment of residential and agricultural properties.

### **La Verkin Creek and Associated Riparian Areas**

La Verkin Creek is a tributary of the Virgin River that originates up gradient of Zion National Park. The stream exits the western park boundary and flows through BLM-managed lands and private lands near La Verkin before its confluence with the Virgin River. Wildfires and stream channelization have affected the stream and its riparian corridor (District 2006). Surface flow throughout most of the stream length is considered perennial.

Within the Study Area La Verkin Creek's riparian area is narrow and channelized. Encroachment of residential and rural properties restricts riparian vegetation, as do natural topographic changes.

### **Ash Creek and Associated Riparian Areas**

Ash Creek is a tributary of the Virgin River that extends along Interstate-15 from southern Iron County to the city of St. George (District 2016). Surface water flow within the upper part of Ash Creek is typically perennial; however, water seeps into fractures surrounding and within Ash Creek Reservoir reduces the surface water volume. Below Ash Creek Reservoir, Ash Creek is mostly ephemeral between southern Iron County and northern Washington County parallel to Interstate-15 and outside the Study Area. Two springs near Toquerville, Utah (Toquerville Springs and Ash Creek Spring), occurring upstream from the Study Area, contribute surface water that creates intermittent conditions within the Study Area.

Within the Study Area, Ash Creek's riparian area is narrow and closely bordered by residential and agricultural encroachment. Additionally, the intermittent nature of the stream does not support a wide band of riparian vegetation.

### **Unnamed Streams and Associated Riparian Areas**

One unnamed intermittent stream and associated riparian area occurs in the southeastern portion of the Study Area near the proposed Advanced Water Purification Demonstration Facility. This stream originates from a culvert on the edge of residential development and flows to La Verkin Creek. This small, treed area is dominated by salt cedar (*Tamarix* spp.)

One unnamed ephemeral stream occurs along the pipeline alignment. This ephemeral stream is not associated with a riparian area within the Study Area; however, riparian area conditions appear to present to the west near the unnamed stream's confluence with La Verkin Creek.

#### **3.10.2.3 Open Waters**

The Study Area overlaps four open water features (e.g., ponds, lakes, retention basins) meeting the USACE OHWM criteria. These include the TSWs pond, a pond used in the Interstate Rock – La Verkin Pit operations, and two stormwater/flood control basins near residential and commercial development.

### **3.10.3 Environmental Consequences**

Under the No Action Alternative, there would be no effects on stream and riparian resources within the Study Area and therefore no adverse effects would occur.

## Affected Environment and Environmental Consequences

Effects alter aquatic resources or alter environmental factors that are important to aquatic resources and the functioning condition of these areas. Effects on aquatic resources, including potentially jurisdictional waters, were determined using the data and methods described above. Table 3-11 lists affected stream and riparian areas of the Proposed Action. Effects on stream and riparian areas for the Proposed Action within the Study Area are considered temporary (up to five years after restoration), respectively, as all areas affected would be restored, and streamflow would be unaffected through usage of cofferdams or trenchless technology. Operations and maintenance of the Proposed Action would not affect riparian and wetland resources.

**Table 3-11 Effects on Riparian and Wetland Resources in the Study Area**

<b>Aquatic Resource Category</b>	<b>West Option (acres/feet)</b>	<b>Middle Option (acres/feet)</b>	<b>East Option (acres/feet)</b>
Wetlands ( <i>acres</i> )	0.00	0.00	0.00
Stream Total ( <i>feet</i> )	340.84	340.84	304.89
<i>Perennial</i>	<i>140.43</i>	<i>140.43</i>	<i>100.82</i>
<i>Intermittent</i>	<i>100.25</i>	<i>100.25</i>	<i>103.92</i>
<i>Ephemeral</i>	<i>100.15</i>	<i>100.15</i>	<i>100.15</i>
Riparian Areas ( <i>acres</i> )	1.71	1.71	0.69
Open Waters ( <i>acres</i> )	0.00	0.00	0.00

### **3.10.3.1 Wetlands**

No wetlands occur within the Proposed Action area. Therefore, no effects on wetlands would occur.

### **3.10.3.2 Streams and Riparian Areas**

#### **La Verkin Creek and Associated Riparian Areas**

All proposed Options for the siting of pipeline infrastructure from the La Verkin Pond to the existing TSWS Pond (East, Middle, and West) would include one crossing of La Verkin Creek. Flow in this section of La Verkin Creek is perennial except in extreme drought and overdraw years. Surface water is expected to be present during construction, and the Proposed Action would include installation of a temporary cofferdam to maintain streamflow within the system until pipeline infrastructure installation is complete and the stream morphology and vegetation restored to preconstruction conditions. The District would acquire federal and state permits required for stream crossings (e.g., applicable USACE permit).

Effects on La Verkin Creek would be temporary during construction with the stream crossing and function returned to preconstruction conditions immediately after installation of the pipeline. The Proposed Action would not affect the magnitude, duration, or frequency of flow events within La Verkin Creek during permanent operations. It would not affect water quality.

The Proposed Action pipeline routes cross La Verkin Creek's riparian corridor along residential neighborhoods. The riparian area is adjacent to rural properties and acts as a boundary between residential developments and the Hurricane Cliffs. The riparian areas around La Verkin Creek at the proposed crossings are narrow bands of cottonwood (*Populus* spp.) and willow (*Salix* spp.) trees, riparian shrubs, grasses, and forbs that have been further narrowed by residential encroachment.

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Construction may require vegetation removal. Vegetation would be expected to regrow or be restored within one to five years (see Appendix B for EPMs related to revegetation).

### **Ash Creek and Associated Riparian Areas**

All proposed Options for the siting of pipeline infrastructure from the La Verkin Pond to the existing TSWS Pond (East, Middle, and West) would include one crossing of Ash Creek. Although flow in this section of Ash Creek is intermittent, if water is present, the Proposed Action would include installation of a temporary cofferdam to maintain streamflow within the system until pipeline infrastructure installation is complete, and the stream morphology and vegetation restored to preconstruction conditions. The District would acquire federal and state permits required for stream crossings (e.g., applicable USACE permit).

Effects on Ash Creek would be temporary during construction with the stream crossing and function returned to preconstruction conditions immediately after installation of the pipeline. The Proposed Action would not affect the magnitude, duration, or frequency of flow events within Ash Creek during permanent operations. It would not affect water quality.

The Proposed Action pipeline routes cross Ash Creek's riparian corridor along locally significant roadways/bridges (Westfield Road and South Toquerville Boulevard). The riparian areas around Ash Creek at the proposed crossings are narrow bands of cottonwood (*Populus* spp.) trees, riparian shrubs, grasses, and forbs. Construction may require vegetation removal. Vegetation would be expected to regrow or be restored within one to five years (see Appendix B for EPMs related to revegetation).

### **Other Streams and Riparian Areas**

All proposed Options for the siting of pipeline infrastructure from the La Verkin Pond to the existing TSWS Pond (East, Middle, and West) would include one crossing of one ephemeral stream. Surface water is not expected to be present during construction; however, if surface water is present, the Proposed Action would include installation of a temporary cofferdam to maintain stream flow within the system until pipeline infrastructure installation is complete, or surface water was no longer present. The stream morphology and vegetation would be restored to preconstruction conditions. The District would acquire federal and state permits required for stream crossings (e.g., applicable USACE permit).

#### **3.10.3.3 Open Waters**

The Study Area overlaps the TSWS pond, a pond used by the Interstate Rock – La Verkin Pit, and two stormwater / flood control basins near residential and commercial development. None of the open water features would be crossed by the Proposed Action. The TSWS pond would be temporarily affected for the purposes of connecting the Proposed pipeline to the pond itself. This temporary effect is not expected to affect functionality of the pond for water retention or use.

The Proposed Action would result in the creation of the La Verkin Pond which would create 1.8 new acres of open water in the region. This permanent effect would be considered a positive effect as surface water retention and water regime management may have benefits to regional hydrology.

## Affected Environment and Environmental Consequences

### 3.11 Special Status Species

This section describes the regulatory framework, affected environment, and potential environmental consequences on special status species resulting from the Proposed Action. This section excludes species protected under the ESA and Migratory Bird Treaty Act (MBTA), which are described in Section 3.12.

#### 3.11.1 Regulatory Framework and Methodology

The BLM Special Status Species Management Policy Manual 6840 (BLM 2008) provides management direction and guidance for the conservation of special status species and their habitats on BLM-managed land. The Proposed Action would not affect BLM land and thus BLM special status species are not assessed in this EA.

UDWR oversees the development and implementation of the State Wildlife Action Plan (Utah Wildlife Action Plan Core Team 2025), which identifies Utah Species of Greatest Conservation Need and Utah Species of Greatest Information Needs (species with insufficient data regarding population). The goal of the State Wildlife Action Plan is “to manage native wildlife and plant species ... and their habitats sufficient to prevent the need for additional listings under the ESA.” This plan facilitates cooperation to achieve range-wide species conservation but is considered noncompulsory guidance by other state and federal agencies.

Several species of fish and wildlife are considered culturally significant and ecologically sensitive by area Tribe members.

Currently available data sources (UDWR 2025c) were used to evaluate effects on Utah Species of Greatest Conservation Need. Any observations of these species were documented within the Study Area during surveys conducted for federally-listed threatened and endangered species (see Appendix D). Several Utah Species of Greatest Conservation Need are also federally listed under the ESA. The effects on listed species are described in Section 3.12.

#### 3.11.2 Affected Environment

Kit fox was the only Utah Species of Greatest Conservation Need observed during species-specific surveys within the Study Area. Although not observed during field surveys, other species are known to occur in or near the Study Area (Table 3-12).

#### 3.11.3 Environmental Consequences

Under the No Action Alternative, there would be no effects on special status species within the Study Area and therefore no adverse effects would occur.

Wildlife that are Utah Species of Greatest Conservation Need may be temporarily displaced by the Proposed Action via surface disturbance, noise, and increased human presence during construction and restoration activities (wildlife that are also federally-listed are described in Section 3.12). Movement corridors for these species would be temporarily affected during pipeline construction activities. Per the EPMs in Appendix B, the District will work with the appropriate state agency to determine applicable avoidance and minimization measures or other conservation activities for these

species. These species would be expected to return to previously occupied areas after construction or restoration activities.

**Table 3-12. Utah Species of Greatest Conservation Need Not Also Managed Under Federal Laws with Documented Occurrence in the Study Area**

<b>Common Name<sup>1,2</sup></b>	<b>Scientific Name</b>	<b>State Wildlife Action Plan Status</b>
Arizona toad	<i>Anaxyrus microscaphus</i>	SGCN
flannelmouth sucker	<i>Catostomus latipinnis</i>	SGCN
Virgin spinedace	<i>Lepidomeda mollispinis</i>	SGCN
desert sucker	<i>Pantosteus clarkii</i>	SGCN
gila monster	<i>Heloderma suspectum</i>	SGCN
Smith’s black-headed snake	<i>Tantilla hobartsmithi</i>	SGIN
kit fox	<i>Vulpes macrotis</i>	SGCN
Townsend’s big-eared bat	<i>Corynorhinus townsendii</i>	SGCN
Western red bat	<i>Lasiurus blossevillii</i>	SGIN

Source: UDWR 2025c

Key:

SGCN = Species of Greatest Conservation Need

SGIN = Species of Greatest Information Need

Note:

<sup>1</sup> Occurrence data were not available on potential plant and insect species that are included in the pending 2025 Utah Wildlife Action Plan update.

<sup>2</sup> Utah Species of Greatest Conservation Need also managed under the Endangered Species Act or Migratory Bird Treaty Act are discussed in Section 3.12 of this report.

Construction activities could increase wildlife mortality due to vehicle collisions on new access roads or increased use of existing access roads. Injury or mortality could also occur within the area of ground disturbance, especially for smaller mammal, reptile, and amphibian species that seek shelter in underground burrows or dens. 10.15 acres of terrestrial habitat characterized by blackbrush-Mormon tea shrubland, mixed salt desert scrub, shale badland, semi-desert shrub steppe, and developed open space would be permanently lost due to the construction of the La Verkin Pond and Advanced Water Purification Demonstration Facility.

Temporary disturbances during pipeline construction would affect plants that are Utah Species of Greatest Conservation Need (plants that are also federally-listed are described in Section 3.12). Vegetation removal would be kept to what is necessary to install and maintain the project. EPMS would restore vegetation to a condition equal to or better than the pre-existing condition where temporary disturbances occurred. Where appropriate and in coordination with private and municipal landowners (state and federal lands would not be affected), the seed mixes will consist of native plants endemic to the region and vegetation community being restored.

For creek crossings, the District will coordinate with the Virgin River Program on construction methods and timing. The Virgin River Program is a cooperative partnership between local, state, federal, and private entities (USFWS, UDWR, and The Nature Conservancy are some of the participants). If water is absent at the time of construction, there would be no effects on fish and amphibian species. If water is present, the District would install a temporary earthen cofferdam or

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use trenchless technology under the creek at each crossing as described in the EPMs. Any work within the stream would occur outside of spawning/breeding season (April 1 – August 31) per Virgin River Program protocols. With the application of these measures, flow would be maintained in at least a portion of the creek at any given time to allow for continued fish passage. Upon construction completion, any disturbed channel morphology would be restored, and the water regime would return to normal conditions. All proposed Options for the siting of pipeline infrastructure from the La Verkin Pond to the existing TSWs Pond would include one crossing of Ash Creek and one crossing of La Verkin Creek. Effects on fish and amphibian species from all Options would be similar. The Proposed Action would not reduce streamflows.

Intermittent disturbance to special status species would occur post-construction from vehicle and human presence on access roads for operation and maintenance purposes. However, these effects would be infrequent, temporary, and would not be expected to cause detectable changes in populations or habitat.

The effects of the Proposed Action to Utah Species of Greatest Conservation Need would be minor. Due to co-location with existing development (e.g., roads, powerline infrastructure) for the majority of the proposed pipeline installation routes outside of commercial and residential areas, construction of the East, Middle, and West Options are expected to have a similar level of effect on these species.

### **3.12 Threatened and Endangered Species, and Migratory Birds**

This section describes the regulatory framework, affected environment, and potential environmental consequences on threatened, endangered, and other sensitive species resulting from the Proposed Action.

#### **3.12.1 Regulatory Framework and Methodology**

The ESA, as amended (16 U.S.C. 1531 et seq.), protects and recovers imperiled species and the ecosystems on which they depend. The ESA requires federal agencies, in consultation with the USFWS, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of species listed by the USFWS as threatened or endangered. The ESA also prohibits the take of any listed species unless otherwise authorized by the USFWS.

Migratory bird species, including eagles and other raptors, waterfowl, shorebirds, seabirds, wading birds, and songbirds are protected under the MBTA of 1918 and Executive Order 13186. The USFWS maintains a list of all species protected by the MBTA at 50 CFR Section 10.13. Under authority of the MBTA, it is unlawful to take, kill, or possess migratory birds, their parts, nests, or eggs, including the disturbance or destruction of a migratory bird nest that results in the loss of eggs or young. Executive Order 13186 was enacted, in part, to ensure that environmental analyses of federal actions evaluate the effects of actions and agency plans on migratory birds. The order also states that emphasis should be placed on species of concern, priority habitats, and key risk factors, and it prohibits the take of any migratory bird without authorization from the USFWS.

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In addition to MBTA protections, the bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*) are protected from a variety of harmful activities under the Bald and Golden Eagle Protection Act (BGEPA), which protects bald and golden eagles, their nests, young, eggs, and parts.

To evaluate the potential for USFWS-designated species and their habitats to be adversely affected by the Proposed Action, desktop and/or field survey information was collected within species-dependent survey corridors using species-specific survey protocols (District 2025d), as noted in the following sections.

### 3.12.2 Affected Environment

#### 3.12.2.1 ESA-Listed Species

The USFWS Information for Planning and Consultation (IPaC) review identified nine threatened, endangered, proposed, or candidate species for listing under the ESA with the potential to occur in the Study Area as shown in Table 3-13 (USFWS 2025b). The UDWR's Wildlife Habitat Assessment Tool was also consulted to determine which USFWS-designated species had documented occurrence within or near the Study Area (UDWR provides data up to 2 miles from project features, UDWR 2025a). No USFWS-designated plant species were identified in USFWS IPaC review, nor observed during field studies within the disturbance area. The presence or absence of critical habitat relative to disturbance areas and USFWS-designated species is also presented in Table 3-13, alongside a summary of habitat suitability and potential occurrence.

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**Table 3-13. USFWS-designated Species that May Occur in the Study Area and Critical Habitat Summary**

Species	Listing Designation	Potential to Disturb Critical Habitat <sup>1</sup>	Species Summary	Potential to Occur in the Study Area <sup>1</sup>
California condor ( <i>Gymnogyps californianus</i> )	Experimental / Non-essential Population	No	There are no documented occurrences of California condor breeding or nesting within the Study Area or a 1-mile buffer. This species forages long distances through a variety of habitats from canyons and cliff faces to open scrubland and grasslands. Individuals may fly over or forage in the Study Area; however, suitable habitat and species' occurrence is more abundant along the large cliff faces and mountains to the north, south, and east in association with the Virgin River and Zion National Park.	Yes
Mexican spotted owl ( <i>Strix occidentalis lucida</i> )	Threatened	No	Designated critical habitat occurs adjacent to the East Option of the Study Area. However, this area lacks suitable breeding habitat (mature forest, rocky-canyon, or cliffs) and there are no documented occurrences of Mexican spotted owl breeding or nesting within the Study Area or a 1-mile buffer. Potential habitat for foraging or stopover may include riparian habitat or canyons within the Study Area (USFWS 1995).	Yes

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<b>Species</b>	<b>Listing Designation</b>	<b>Potential to Disturb Critical Habitat<sup>1</sup></b>	<b>Species Summary</b>	<b>Potential to Occur in the Study Area<sup>1</sup></b>
Southwestern willow flycatcher ( <i>Empidonax traillii extimus</i> )	Endangered	No	<p>Designated critical habitat occurs along the Virgin River more than 6 miles from the Study Area. This species typically requires dense riparian habitat in a patch's interior or an aggregate of dense patches with interspersed openings, and dense vegetation within the first 3 to 4 meters above ground for nesting. Standing water or saturated soils are present near breeding sites (USFWS 2002).</p> <p>Potentially suitable habitat was identified along Ash Creek and La Verkin Creek within the Study Area and a 0.25-mile buffer. However, data from the field habitat assessment confirmed that the areas were unsuitable for nesting due to scouring flood events at sufficient frequency and magnitude to prevent the maturation and maintenance of suitable habitat. Habitat at the proposed Ash Creek crossing (Middle and West Option) lacked a dense understory and was highly altered (i.e., cleared) from human activities. The field assessment determined habitat associated with La Verkin Creek was unsuitable for nesting based on a lack of dense understory and overstory, a narrow habitat patch limited to less than 15 feet of the creek, frequency and magnitude of scouring events, and active human maintenance repressing vegetation.</p> <p>There were no documented occurrences of the species breeding or nesting within the Study Area as provided in UDWR data.</p>	Yes

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Species	Listing Designation	Potential to Disturb Critical Habitat <sup>1</sup>	Species Summary	Potential to Occur in the Study Area <sup>1</sup>
Western yellow-billed cuckoo ( <i>Coccyzus americanus occidentalis</i> )	Threatened	No	<p>Found in mixed native and non-native riparian woodlands. Patches vary in size and shape but must be greater than or equal to 12 acres and 100 meters wide in at least one location. Quality habitat is structurally diverse with a multi-layered overstory and dense understory.</p> <p>Potentially suitable habitat for yellow-billed cuckoo was identified along Ash Creek and La Verkin Creek within the Study Area and a 0.5-mile buffer; however, a field habitat assessment determined that riparian habitat lacked dense tracts of regenerating riparian vegetation with mature cottonwoods and willows, and habitat was commonly degraded from scouring events and human alteration. One patch of riparian habitat, located downstream of the crossing at Ash Creek, was dominated by native broadleaf species and contained a suitable patch size of large cottonwoods, willows, and ash surrounding open water features which has the potential to attract foraging yellow-billed cuckoos. However, the patch lacked an adequate combination of the primary constituent elements of canopy closure and understory for suitable nesting habitat.</p> <p>There were no recent observations of the species occurring or nesting within the Study Area or a 2-mile buffer per UDWR correspondence.</p>	Yes

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Species	Listing Designation	Potential to Disturb Critical Habitat <sup>1</sup>	Species Summary	Potential to Occur in the Study Area <sup>1</sup>
Mojave desert tortoise <i>(Gopherus agassizii)</i>	Threatened	No	<p>The nearest designated critical habitat is 1.3 miles southwest of the Study Area. This species is found in washes, canyons, sandy flats, and rocky foothills with suitable soils or recesses for burrows in southwestern Washington County.</p> <p>The Desert Tortoise Study Area consisted of a 756-foot (230-meter) buffer beyond the proposed 15-meter (50-foot) disturbance area on each side of the proposed pipeline routes (i.e., areas that could be either directly or indirectly affected based on the Proposed Action). Additional transects were walked in areas proposed for permanent disturbance. Approximately 1,273 acres were surveyed for tortoises and their habitat within the Study Area: 595.8 acres were determined to be medium quality habitat, and 677.1 acres were determined to be unsuitable habitat. An additional 106.8 acres could not be surveyed due to land access restrictions. Habitat for the species occurs along all proposed Options of the Study Area.</p> <p>No tortoise burrows or sign were identified within the Desert Tortoise Study Area, although occurrence records exist within 0.5 miles of the disturbance area.</p>	Yes
Virgin River chub <i>(Gila seminuda)</i>	Endangered	No	<p>Virgin River chub inhabit deep runs or pool habitats of slow to moderate velocities, with large boulders or cover such as root snags. The species is known to occur in the Virgin River segments downstream from the Study Area and in lower reaches of Ash Creek and La Verkin Creek (USFWS 2020a).</p>	Yes
woundfin <i>(Plagopterus argentissimus)</i>	Endangered	No	<p>Woundfin typically inhabit the main channel of swift, turbid, and warm waterways with a sandy substrate. The species is known to occur in the Virgin River segments downstream from the Study Area and in lower reaches of La Verkin Creek (USFWS 2020a).</p>	Yes

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Species	Listing Designation	Potential to Disturb Critical Habitat <sup>1</sup>	Species Summary	Potential to Occur in the Study Area <sup>1</sup>
monarch butterfly ( <i>Danaus plexippus</i> )	Proposed Threatened	No	<p>Proposed critical habitat focuses on overwintering habitat for the western migratory population in coastal California and is outside of the Study Area. Monarch butterflies are found throughout the U.S. and utilize a diversity of resources with nectar to feed on during the migration and breeding seasons but require milkweed (primarily <i>Asclepias</i> spp.) host plants for reproduction. Migratory monarch butterflies could utilize milkweed species found in southwestern Utah such as showy milkweed (<i>Asclepias speciosa</i>), narrowleaf milkweed (<i>Asclepias fascicularis</i>), and desert milkweed (<i>Asclepias erosa</i>), which may be found within the Study Area adjacent to both natural vegetative communities and highly disturbed roadsides or development.</p> <p>In the Study Area, monarchs are likely to be found where milkweed species are present. Individuals were documented within 0.5- and 2.0-mile buffers of the Study Area per UDWR occurrence data.</p>	Yes
Suckley's cuckoo bumble bee ( <i>Bombus suckleyi</i> )	Proposed Endangered	No	<p>There is currently no proposed critical habitat for Suckley's cuckoo bumble bee. The species is an obligate, social parasite of other bumble bees which requires presence of other suitable host colonies; host colonies are typically in underground, abandoned holes and can be found in a variety of habitats including grasslands, forests, urban areas, and agricultural fields. This species requires a diversity of native floral vegetation (both pollen and nectar-bearing). Suckley's cuckoo bumble bee may occur within the Study Area where (and if) pollen/nectar bearing plants and suitable host bumble bee colonies are present. However, species' numbers are continuing to decline, and observations have not occurred in the contiguous U.S. since 2016 (USFWS 2024a).</p>	Yes

Sources: USFWS 1995, USFWS 2002, USFWS 2020a, USFWS 2024a, UDWR 2025a, UDWR 2025d.

Note:

<sup>1</sup> Occurrence potential determined from USFWS Information for Planning and Consultation review. See Appendix D for more information about biological data.

**3.12.2.2 Migratory Birds**

The Proposed Action is located within the Pacific Flyway and migratory birds protected under the MBTA and BGEPA use the Upper Virgin watershed, including riparian habitat within the Study Area, for nesting and migratory habitat. The Proposed Action is also within or adjacent to desert scrub habitat which provides areas for breeding, nesting, and foraging to a wide variety of migratory birds protected under the MBTA. Eroded, rocky hillsides that could support foraging raptors are located within 1 mile of the Proposed Action; however, rock ledge outcropping and cliff habitat with the potential to support nesting raptors is absent.

Within Washington County, the nesting season can be divided into three major timeframes: (1) Early Nesting Season: January 1–March 31 (e.g., eagles, owls, falcons, and hawks); (2) Primary Nesting Season: April 1–July 15 (e.g., the majority of songbirds, flycatchers, cuckoos, raptors); and (3) Maximum Nesting Season: January 1–August 31 (e.g., eagles) (Romin and Muck 2002, USFWS 2020b).

Bald eagles may occur during the winter season, primarily in association with water features, and are not expected to nest within the vicinity. Golden eagles may occur in a variety of habitats year-round (USFWS 2025b). Preferred nesting habitat for golden eagles in Utah (i.e., rocky crevices and cliff faces) is absent within the Study Area and a 0.5-mile buffer (Romin and Muck 2002) but exists within 1 to 2 miles. Golden eagles may also utilize trees and powerline infrastructure for nesting on a rare basis; however, the availability of these substrates within the Study Area is associated with human development and unlikely to attract nesting eagles due to the presence of existing human activity and low tolerance to disturbance.

Although not comprehensive of all species with the potential to occur, the USFWS IPaC tool (USFWS 2025b) and data from UDWR identified the potential and/or known occurrence for 19 migratory bird species to occur within a 2-mile radius of the Study Area. These species are listed in Table 3-14 and are marked if they were observed during field surveys or if they are listed on the Birds of Conservation Concern list.

**Table 3-14. Migratory Bird Species that May Occur or are Known to Occur Within the Study Area**

Common Name	Scientific Name	Federal Law Protecting Species
Abert’s towhee*	<i>Melozone aberti</i>	MBTA
bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA / MBTA
band-tailed pigeon	<i>Patagioenas fasciata</i>	MBTA
black-chinned hummingbird*	<i>Archilochus alexandri</i>	MBTA
black-chinned sparrow*†	<i>Spizella atrogularis</i>	MBTA
broad-tailed hummingbird†	<i>Selasphorus platycercus</i>	MBTA
California gull†	<i>Larus californicus</i>	MBTA
Cassin’s finch†	<i>Haemorhous cassinii</i>	MBTA
evening grossbeak†	<i>Coccothraustes vespertinus</i>	MBTA
golden eagle	<i>Aquila chrysaetos</i>	BGEPA / MBTA

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Common Name	Scientific Name	Federal Law Protecting Species
greater roadrunner*	<i>Geococcyx californianus</i>	MBTA
lesser yellowlegs†	<i>Tringa flavipes</i>	MBTA
long-eared owl†	<i>Asio otus</i>	MBTA
mourning dove*	<i>Zenaida macroura</i>	MBTA
olive-sided flycatcher†	<i>Contopus cooperi</i>	MBTA
peregrine falcon	<i>Falco peregrinus</i>	MBTA
pinyon jay†	<i>Gymnorhinus cyanocephalus</i>	MBTA
red-tailed hawk*	<i>Buteo jamaicensis</i>	MBTA
Virginia's warbler†	<i>Leiothlypis virginiae</i>	MBTA

Sources: UDWR 2025a, USFWS 2025b, USFWS 2024b, 50 CFR 10.13.

Key:

\* = Observed during field surveys (2025)

† = Included in Birds of Conservation Concern list (2024)

BGEPA = Bald and Golden Eagle Protection Act

MBTA = Migratory Bird Treaty Act

### 3.12.3 Environmental Consequences

#### 3.12.3.1 USFWS Designated Species

Under the No Action Alternative, there would be no effects on threatened, endangered, or other sensitive species within the Study Area and therefore no adverse effects are anticipated.

#### California Condor

Construction-related effects on California condor would be temporary and would dissipate immediately following completion of the Proposed Action. There is some potential for condors to use the Study Area for foraging, and individuals could be drawn to a construction site if scavenging opportunities exist. Foraging individuals could encounter temporary disturbances associated with noise and construction personnel and equipment, or direct effects from vehicular collisions within construction areas. EPMS such as maintaining a clean worksite free of trash and debris and adhering to speed limits during the construction phase would reduce the potential for on-site garbage to attract condors to the work areas and reduce potential vehicular collisions that could produce roadkill which also attracts condors.

Potential effects on foraging California condors created by human presence and noise would be similar across all Options for the siting of pipeline infrastructure from the La Verkin Pond to the existing TSWP Pond (East, Middle, and West).

There would be no effect on nesting habitat because known nesting sites are located on NPS-managed lands and Vermillion Cliffs National Monument, which are well outside of the Study Area. There would be no effect on designated USFWS critical habitat for California condor because it does not occur within Washington County or the vicinity of the Proposed Action.

Intermittent disturbance to foraging condors would occur post-construction from vehicle and human presence on access roads for operation and maintenance purposes. However, these effects

would be infrequent, temporary, and would not be expected to cause detectable changes in populations or habitat.

Because the likelihood of foraging condors in the area during construction is low, and effects would be temporary and unlikely to result in injury or mortality, it is determined that the Proposed Action will have no effect on the California condor.

### **Mexican Spotted Owl**

Construction-related effects on Mexican spotted owl would be temporary and would dissipate immediately following completion of the Proposed Action. There is some potential for Mexican spotted owl to use the Study Area for foraging or as stopover habitat, primarily in association with Ash Creek and La Verkin Creek drainages. Foraging individuals could encounter temporary disturbances associated with noise and construction personnel and equipment.

Potential effects on foraging Mexican spotted owl from noise and human presence would be similar across all Options for the installation of pipeline infrastructure from the La Verkin Pond to the existing TSWS Pond (East, Middle, and West).

The northeastern extent of the Study Area (the proposed pipeline, East Option) runs parallel to, but does not overlap, the eastern edge of designated Mexican spotted owl critical habitat and Recovery Unit CP-11 for the species for approximately 2 miles (USFWS 2025c). The adjacent habitat at this location is not suitable nesting habitat and lacks the primary constituent elements of critical habitat such as canyon walls containing crevices, ledges, or caves; and a range of tree species, tree sizes, and associated shaded canopies (USFWS 1995).

Intermittent disturbance to foraging owls would occur post-construction from vehicle and human presence on access roads for operation and maintenance purposes. However, these effects would be infrequent, temporary, and would not be expected to cause detectable changes in populations or habitat.

Because the likelihood of foraging owls in the area during construction is low, and effects would be temporary and unlikely to result in injury or mortality, it is determined that the Proposed Action will have no effect on the Mexican spotted owl.

### **Southwestern Willow Flycatcher**

Transient Southwestern willow flycatchers could use patches of riparian vegetation in association with Ash Creek and La Verkin Creek as temporary foraging or stopover habitat within the Study Area during migration or travel to/from nesting or overwintering habitat outside of the Study Area. Any loss or alteration of riparian vegetation has the potential to affect flycatchers that could potentially migrate through the Study Area; however, these effects are expected to be negligible as the habitat within the Study Area is sparse and not expected to be occupied except potentially on a transient basis. Riparian areas temporarily disturbed during construction will be restored to a condition equal to or better than the pre-existing condition (refer to EPMs in Appendix B).

Effects on these transient individuals would include temporary displacement by the Proposed Action via noise and increased human presence during construction and restoration activities

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associated with pipeline installation. Individuals could return to these areas after construction or disturbance activities cease.

Habitat surveys confirmed that riparian habitat within the Study Area was unsuitable for nesting. Data on nest locations from the UDWR also confirmed that there were no identified nests within the Study Area from 2013 to 2024 (UDWR 2025d). EPMS related to avoiding construction activities, where appropriate, during nesting season would reduce potential effects (see Appendix B).

There would be no effect on designated USFWS critical habitat for Southwestern willow flycatcher from the Proposed Action. Potential effects on Southwestern willow flycatcher would be similar across all Options for the installation of pipeline infrastructure from the La Verkin Pond to the existing TSWWS Pond (East, Middle, and West) based on the proposed installation of pipeline at one creek crossing along each Option.

Intermittent disturbance to transient Southwestern willow flycatchers would occur post-construction from vehicle and human presence on access roads for operation and maintenance purposes. However, these effects would be infrequent, temporary, and would not be expected to cause detectable changes in populations or habitat.

Because these effects on Southwestern willow flycatcher moving through the Study Area are temporary and unlikely to result in injury or mortality, it is determined that the Proposed Action may affect, but is not likely to adversely affect, the Southwestern willow flycatcher. On January 23, 2026, USFWS issued its concurrence on this determination.

### **Western Yellow-billed Cuckoo**

Patches of riparian vegetation within the Study Area may be used as foraging or stopover habitat by transient yellow-billed cuckoos. Any change in riparian vegetation has the potential to affect cuckoos that may be present in the Study Area; however, these effects are expected to be negligible as the habitat within the Study Area is sparse and only expected to be occupied on a rare and transient basis, if at all. Riparian areas temporarily disturbed during construction will be restored to a condition equal to or better than the pre-existing condition (refer to EPMS in Appendix B).

Effects on these transient individuals would include temporary displacement by the Proposed Action via noise and increased human presence during construction, restoration, and maintenance activities. However, individuals could return to these areas after construction or disturbance activities cease.

Habitat surveys confirmed that riparian habitat within the Study Area was unsuitable for nesting. The UDWR have no recent records of yellow-billed cuckoo occurrences in the Study Area and surrounding area, with the most recent breeding record occurring more than 20 years ago near St. George, Utah (UDWR 2025d). EPMS related to avoiding construction activities, where appropriate, during nesting season would reduce potential effects (see Appendix B).

The Proposed Action does not occur within designated critical habitat for the Western yellow-billed cuckoo and does not occur near designated critical habitat. Therefore, there would be no effect on designated critical habitat for Western yellow-billed cuckoo from the Proposed Action. Potential

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effects on Western yellow-billed cuckoo are anticipated to be greater across the West and Middle Options based on proximity to the most suitable habitat, though effects would be minimal.

Intermittent disturbance to transient cuckoos would occur post-construction from vehicle and human presence on access roads for operation and maintenance purposes. However, these effects would be infrequent, temporary, and would not be expected to cause detectable changes in populations or habitat.

Foraging Western yellow-billed cuckoos have the potential to be temporarily affected by the human presence and noise associated with construction, restoration, and maintenance activities. Because these effects are temporary and unlikely to result in injury or mortality, it is determined that the Proposed Action may affect, but is not likely to adversely affect, the Western yellow-billed cuckoo. On January 23, 2026, USFWS issued its concurrence on this determination.

### **Mojave Desert Tortoise**

The desert tortoise Study Area is 1,379.1 acres: 595.8 acres of which were determined to be medium quality habitat, 677.1 acres of which were determined to be unsuitable habitat, and the remaining 106.8 acres of which could not be surveyed due to land access restrictions. Table 3-15 provides acres of disturbance by land jurisdiction and proposed pipeline option. Areas not able to be surveyed were considered potentially suitable and would be considered medium quality habitat during the implementation of EPMS as a precautionary measure for the species. Within the Study Area, there would be between 30.2 and 33.7 acres of temporary disturbance associated with the construction of the various pipeline routes and a 100-foot ROW, staging areas, and updates to the existing TSWS Pond within suitable or potentially suitable habitat. A total of 10.15 acres of permanent habitat removal (7.29 acres of medium quality habitat and 2.86 acres of unsuitable habitat) would be associated with construction of the La Verkin Pond and Advanced Water Purification Demonstration Facility regardless of the pipeline route option.

Proposed Action-related vegetation removal, excavation, and vehicle use have the potential to disturb or destroy desert tortoises and their burrows, if present during construction activities. Effects may also include the loss, fragmentation, and degradation of habitat; fatality as a result of crushing or burying; and entrapment.

Effects on desert tortoises and habitat would occur during construction activities and could result in fatalities of individual tortoises; however, implementation of EPMS would minimize this potential. Preconstruction surveys would be completed prior to construction and monitoring or fencing would be in place during construction, as applicable. Individuals working on the project would be required to take a worker education training class conducted by Washington County. Efforts to reduce the spread of noxious weeds and limit disturbance of desert tortoise habitat would be implemented. If found, all construction activities would halt until such time as the tortoise leaves the area or is moved from the site. Construction-related effects would be temporary and would dissipate immediately following completion of the Proposed Action. Revegetation would be completed per the EPMS in Appendix B and coordinated with private landowners per easement agreements, and would minimize effects of construction on habitat, although management of invasive species such as cheatgrass (*Bromus tectorum*) in restored suitable tortoise habitat may be needed.

**Affected Environment and Environmental Consequences**

**Table 3-15. Disturbance to Mojave Desert Tortoise Habitat Within the Study Area**

<b>Land Ownership</b>	<b>Medium Quality Habitat – Temporary Effects (acres)</b>	<b>Unsuitable Habitat – Temporary Effects (acres)</b>	<b>Potentially Suitable/No Access – Temporary Effects (acres)</b>	<b>Medium Quality Habitat – Permanent Effects (acres)</b>	<b>Unsuitable Habitat – Permanent Effects (acres)</b>
<b>East Option</b>					
Private	14.03	32.92	9.23	7.29	2.84
Municipally Owned	0.63	0.24	0	0	0
District	5.18	0.11	0	0	0
Road	0.04	10.62	0	0	0.03
No Parcel Data	0.65	0.75	1.05	0	0
<b>Total</b>	<b>20.53</b>	<b>44.64</b>	<b>10.28</b>	<b>7.29</b>	<b>2.87</b>
<b>Middle Option</b>					
Private	24.31	36.15	0	7.29	2.84
Municipally Owned	0.63	2.81	0	0	0
District	2.54	0.11	0	0	0
Road	1.77	11.03	0	0	0.03
No Parcel Data	0.98	1.88	0	0	0
<b>Total</b>	<b>30.23</b>	<b>51.98</b>	<b>0</b>	<b>7.29</b>	<b>2.87</b>
<b>West Option</b>					
Private	22.05	38.34	0	7.29	2.84
Municipally Owned	9.06	2.81	0	0	0
District	1.53	0.11	0	0	0
Road	0.04	10.99	0	0	0.03
No Parcel Data	0.99	1.88	0	0	0
<b>Total</b>	<b>33.67</b>	<b>54.13</b>	<b>0</b>	<b>7.29</b>	<b>2.87</b>

The pipeline routes are not expected to create barriers to tortoise movement. Operational effects would primarily be associated with vehicle use needed for maintenance activities and the potential for vehicles injuring or running over tortoises, although implementation of EPMs such as adhering to speed limits would reduce this potential. Critical habitat for the desert tortoise does not occur within the Project area. Additionally, the Proposed Action is located more than a mile from the designated critical habitat. As such, the Proposed Action will have no effect on Mojave desert tortoise critical habitat.

Due to the effects described in this section, the Proposed Action under all alignment options may affect and likely adversely affect the Mojave desert tortoise. USFWS issued a letter on January 9, 2026, approving the effects from the Proposed Action on Mojave desert tortoise to tier to the

## Affected Environment and Environmental Consequences

Washington County Habitat Conservation Plan and be covered under the valid Incidental Take Permit (ES036719-V2).

### **Virgin River Chub and Woundfin**

Virgin River chub and woundfin can be in Ash Creek and La Verkin Creek, but only during periods of streamflow (USFWS 2020a). Ash Creek is intermittent to ephemeral (i.e., characterized as dry for most of the year) below Ash Creek Reservoir (District 2016). Species may also be found in La Verkin Creek which is typically considered perennial but has gone dry in past under drought and low flow conditions as a result of heavy water diversion practices (District 2006).

For creek crossings, the District will coordinate with the Virgin River Program on construction methods and timing. The Virgin River Program is a cooperative partnership between local, state, federal, and private entities (USFWS, UDWR, and The Nature Conservancy are some of the participants). If water is absent at the time of construction, there would be no effects on fish. If water is present, the District would install a temporary earthen cofferdam or use trenchless technology under the creek at each crossing as described in the EPMs. Any work within the stream would occur outside of spawning/breeding season (April 1 – August 31) per Virgin River Program protocols. With the application of these measures, flow would be maintained in at least a portion of the creek at any given time to allow for continued fish passage. Upon construction completion, any disturbed channel morphology would be restored, and the water regime would return to normal conditions. All proposed Options for the siting of pipeline infrastructure from the La Verkin Pond to the existing TSWS Pond would include one crossing of Ash Creek and one crossing of La Verkin Creek. Effects on fish species from all Options would be similar.

The Proposed Action's operations and maintenance would not affect streamflow or water quality in these creeks and would not affect USFWS-designated critical habitat downstream in the Virgin River or alter biological productivity of the downstream river system. Because these displacement effects are temporary and unlikely to result in injury or mortality, it is determined that the Proposed Action will have no effect on the Virgin River chub and woundfin.

### **Monarch Butterfly**

Vegetation would be disturbed or removed during construction of the Proposed Action, which may include milkweed. There would be a range of 75.5 – 87.8 acres of temporary disturbance associated with construction, depending on alignment option. A total of 10.15 acres of permanent disturbance (vegetation removal) would be associated with construction of the La Verkin Pond and Advanced Water Purification Demonstration Facility. Areas of temporary disturbance would be reseeded where appropriate with a native species mix, including milkweeds, during restoration efforts per the EPMs, and have the potential to improve butterfly habitat.

Effects on mobile individuals that pass through or utilize the Study Area would include temporary displacement by the Proposed Action via noise and increased human presence during construction, restoration, and maintenance activities, if these activities take place during the migration or breeding seasons. However, butterflies would be expected to move to adjacent suitable habitat or return to previously occupied areas after disturbance activities cease. Additional EPMs, such as implementing

## **Affected Environment and Environmental Consequences**

speed limits on site, would contribute to the avoidance or minimization of effects including collision or mortality.

Intermittent disturbance to butterflies would occur post-construction from vehicle and human presence on access roads for operation and maintenance purposes. However, these effects would be infrequent, temporary, and would not be expected to cause detectable changes in populations or habitat.

There would be no effect on proposed USFWS-designated critical habitat for the monarch butterfly from the Proposed Action. Potential effects on suitable habitat would be similar across all Options for the siting of pipeline infrastructure from the La Verkin Pond to the existing TSWS Pond (East, Middle, and West). Because these habitat and displacement effects are temporary and unlikely to result in injury or mortality, it is determined that the Proposed Action will have no effect on the Monarch butterfly.

### **Suckley's Cuckoo Bumble Bee**

Effects on Suckley's cuckoo bumble bee could occur from the Proposed Action if nectarous and pollen-bearing plants and other bumble bee species are present within the Study Area. Vegetation would be disturbed or removed during construction of the Proposed Action, which may include nectarous and pollen-bearing plants. There would be a range of 75.5 – 87.8 acres of temporary disturbance associated with the construction, depending on alignment option. A total of 10.15 acres of permanent disturbance (vegetation removal) would be associated with construction of the La Verkin Pond and Advanced Water Purification Demonstration Facility. Areas of temporary disturbance would be reseeded where appropriate with a native species mix during restoration efforts per the EPMs and have the potential to improve bumble bee habitat.

Effects on mobile individuals that pass through or utilize the Study Area would include temporary displacement by the Proposed Action via noise and increased human presence during construction, restoration, and maintenance activities, if these activities take place during the active or breeding seasons. However, bumble bees would be expected to move to adjacent suitable habitat or return to previously occupied areas after disturbance activities cease. Direct effects to nests can result from crushing due to vehicles and equipment. Additional EPMs, such as implementing speed limits on site, would contribute to the avoidance or minimization of effects including collision or mortality.

Intermittent disturbance to bumble bees would occur post-construction from vehicle and human presence on access roads for operation and maintenance purposes. However, these effects would be infrequent, temporary, and would not be expected to cause detectable changes in populations or habitat.

Potential effects on suitable habitat would be similar across all Options for the siting of pipeline infrastructure from the La Verkin Pond to the existing TSWS Pond (East, Middle, and West). Because these habitat and displacement effects are temporary and unlikely to result in injury or mortality, it is determined that the Proposed Action will have no effect on the Suckley's cuckoo bumble bee.

### **3.12.3.2 Migratory Birds**

No active nests were observed during field surveys. However, migratory birds, including raptors, may be temporarily displaced from the Study Area via surface disturbance, noise, and increased human presence during construction or reclamation activities. EPMs would avoid or minimize effects on nesting birds and their young by conducting vegetation-clearing, grading, and drilling outside of migratory bird breeding and nesting seasons. Once vegetation has been cleared, the risk of effects on an active nest would be negligible and adjacent suitable habitat would be available for migratory birds. If the nesting seasons cannot be avoided, implementation of nest surveys prior to construction activities and the establishment of species-specific disturbance buffers around active nests would reduce effects. Other EPMs such as reseeded with native species would aid in the restoration of disturbed habitat after the completion of construction activities and contribute to future reoccupation.

Implementation of the Proposed Action would result in the permanent loss of 10.15 acres of potential foraging, nesting, and roosting habitat for migratory birds and raptors over the life of the Project. The construction of these sites would permanently displace local bird species to adjacent, suitable habitat. There is some potential for the La Verkin Pond to increase the availability of shallow water habitat for birds, including migratory shorebirds and other species that can utilize shallows for wading and foraging despite the presence of a fencing enclosure.

Intermittent disturbance to nesting birds would occur post-construction from vehicle and human presence on access roads for operation and maintenance purposes. However, these effects would be infrequent, temporary, and would not be expected to cause detectable changes in bird populations or habitat.

There would be a similar level of effect between all proposed Options for the siting of pipeline infrastructure from the La Verkin Pond to the existing TSWP Pond (East, Middle, and West). Overall, the Proposed Action's effects on migratory birds and eagles, with the implementation of EPMS, are indiscriminate and/or discountable and therefore unlikely to result in a significant adverse effect to any of the species' populations.

## **3.13 Transportation**

This section describes the regulatory framework, affected environment, and potential environmental consequences on traffic resulting from the Proposed Action. For the purpose of this analysis, transportation resources include roadways used by motorized vehicles (e.g., cars and trucks).

### **3.13.1 Regulatory Framework and Methodology**

State and local agencies administer and regulate roadways in the Study Area and are responsible for maintenance and future additions, traffic management, and issuance of permits; they also govern the use of ROWs and construction activities that parallel or cross existing roads.

## Affected Environment and Environmental Consequences

Potential effects on transportation resources due to the construction and operation of the Proposed Action would occur in areas where facilities, including pipelines, cross or would be located adjacent to existing transportation infrastructure. The evaluation of effects considers the following:

- Use of existing roadways and roadway ROW
- Number and locations of roadway crossings and those in which the pipeline would parallel existing roads
- Total mileage of disturbance through the construction and operation of access roads

To understand the transportation resources near and within the Proposed Action, the Study Area encompasses the linear components, including a 50-foot buffer on either side of the alignments. In addition, it includes areas for above ground facilities and areas identified for temporary and permanent access and temporary storage and staging areas.

### 3.13.2 Affected Environment

Roads within and near the Study Area are classified as either major state highways or local, neighborhood, or rural roads. State Route 9 and State Route 17 are in the southwest corner of the Study Area. All other roads are low-speed two-lane roads. Examples of local roads include 740 N and Zion’s Parkway.

There are five road segments within or near the Study Area that the Utah Department of Transportation (UDOT) annually monitors average annual daily traffic (AADT) (UDOT 2024). AADT for these road segments ranges from 6,500 to approximately 19,000 vehicles, shown in Table 3-16 (UDOT 2024). All other roads near the Study Area experience traffic typical of rural areas, with higher traffic associated with seasonal levels of tourism.

**Table 3-16. Major Roads Within or Near the Study Area**

UDOT Identifier	Local Name	AADT (2023)
Route: 0017PM, Milepost: 000.401 - 003.011	740 N via State St - Center Ave Toquerville	6,500
Route: 0017PM, Milepost: 000.000 - 000.401	SR 9 La Verkin via State St - 740 N	7,900
Route: 0009PM, Milepost: 011.384 - 012.464	300 South via State St - 500 N La Verkin	19,000
Route: 0009PM, Milepost: 012.464 - 012.648	SR 17 State St via 500 N - 100 E La Verkin	8,700
Route: 0009PM, Milepost: 012.648 - 018.590	100 East La Verkin - Mill St Virgin	7,200

Source: UDOT 2024

Key

AADT = average annual daily traffic; UDOT = Utah Department of Transportation

**3.13.3 Environmental Consequences**

Under the No Action Alternative, there would be no effects on traffic within the Study Area and therefore no adverse effects would occur.

The CPWRF to the La Verkin Pond Pipeline runs parallel to multiple local, neighborhood, rural roads, crosses Highway 17, and is identical for all three alternatives. All three alternatives turn north and parallel E 200 N for 0.9 miles before branching apart. The East Option pipeline heads north before running parallel with Highway 17 for 0.1 miles and follows neighborhood or rural roads for 0.8 miles towards the TSWS Pond. The Middle and West Options follow S. Zion Parkway for 0.4 miles before crossing Highway 17. The Middle and West Options follow the same alignment for 0.6 miles before splitting and do not parallel other roads. The number of crossings per road type are shown in Table 3-17. Prior to construction, permits and/or easements would be required from the respective agencies with jurisdiction over these highways and roads.

The Proposed Action would result in a small increase in vehicle use of highways and local roads during the timeframe construction would occur (see Figure 2-1). Effects from the Proposed Action would be minimized through EPMS such as the completion of a Construction Traffic Management plan. Each construction phase would affect some proportion of the highways and roads throughout the disturbance area. Conservatively, there would be an increase of 10-20 vehicles using one or more highways and local roads each day of construction as part of the Proposed Action; about a quarter of a percent overall increase in AADT throughout Study Area. This slight increase would have a negligible effect on traffic. Operations of the Proposed Action would result in a few additional passenger vehicles on local roads each day, which would be negligible.

**Table 3-17. Number and Type of Road Crossings Within Study Area**

Type of Road	East Option	Middle Option	West Option
Major State Highways, Unseparated	3	4	4
Other Local, Neighborhood, Rural Roads	43	39	36

*Source: UGRC 2025b*

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# **Appendix A – Statutes, Regulations, and Policy**

## **Eastside Reuse System, Washington County, Utah**

Provo Area Office – Upper Colorado Basin Region

February 2026

# Statutes, Regulations, and Policy

Implementation of the Proposed Action may require a number of authorizations or permits from federal and state agencies. This EA is prepared in compliance with all applicable statutes, regulations, and Executive Orders.

## Federal Statutes, Regulations, and Policy

### National Environmental Policy Act of 1969 as Amended (42 U.S.C. 4321 et seq.)

- Department of Interior NEPA-implementing regulations (43 CFR 46)

### Endangered Species Act of 1973, as Amended (16 U.S.C. 1531 et seq.) and related Statutes and Orders

- Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. 703-712)
- Fish and Wildlife Coordination Act of 1958, as amended (16 U.S.C. 661 et seq.)
- Secretarial Order 3206, American Indian Tribal Rights, Federal-Tribal Trust responsibilities, and the Endangered Species Act

### National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 et seq.) and related Statutes, Regulations and Orders

- American Indian Religious Freedom Act of 1978 (42 U.S.C. 1996)
- Archaeological Resources Protection Act of 1979 (16 U.S.C. 470)
- Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001 et seq.)
- Protection and Enhancement of the Cultural Environment (EO 11593)
- Indian Sacred Sites (EO 13007)
- Departmental Responsibilities for Indian Trust Resources (Departmental Manual 512 DM Chapter 2)

### Clean Water Act (CWA) of 1972, as Amended (33 U.S.C. 1251 et seq.) and related Orders

- Protection of Wetlands (EO 11990)

## **Other Applicable Statutes, Regulations and Orders**

- Clean Air Act of 1972, as amended (42 U.S.C. 7401 et seq.)
- Noise Control Act of 1972 (42 U.S.C. 4901 et seq.)
- Floodplain Management (EO 11988)
- Invasive Species (EO 13112)

## **State Regulations or Permits**

### **Utah Division of Water Quality**

- Utah Pollutant Discharge Elimination System General Construction (Stormwater) Permit
- Utah Pollutant Discharge Elimination System Construction Dewatering/Hydrostatic Testing Permit
- 401 Water Quality Certification (Clean Water Act Section 401)

### **Utah Division of Water Rights**

- Stream Alteration Permit (Clean Water Act Section 404)

### **Utah Division of Drinking Water**

- Special Permit for Potable Reuse Demonstration

### **Utah Division of Emergency Management**

- Floodplain Development Permit

### **Utah Department of Transportation**

- Utility License Agreement
- Conditional Access/Encroachment Permit



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# **Appendix B – Environmental Protection Measures**

## **Eastside Reuse System, Washington County, Utah**

Provo Area Office – Upper Colorado Basin Region

February 2026

# Environmental Protection Measures

The Washington County Water Conservancy District (District) environmental protection measures include design features, best management practices, monitoring, standard operating procedures, and other practices consistent with permits, agreements and applicable Federal, state, or local regulatory requirements:

## Air Quality

1. The District will comply with all requirements of applicable dust control permits. Fugitive dust will be monitored and mitigated using best management practices, such as water trucks or application of magnesium chloride on access roads.
2. Operating permits will be obtained as required from the local county and/or the state for stationary sources as necessary, such as aggregate rock handling equipment, rock crushers, conveyors, and screening equipment which may emit particulate matter. The District will comply with all requirements of the operating permits.
3. Operating permits will be obtained for combustion equipment such as stationary internal combustion engines (greater than 250 horsepower) used during construction or operation of the project. The Operating Permit will include operating requirements, reporting requirements and pollutant emission limits.

## Construction Methods/Safety

4. A worker education program will be developed by the District and used during construction and operation. It will be presented to personnel who will be on-site, including but not limited to contractors, contractor's employees, supervisors, inspectors, and subcontractors. A handout will be developed addressing environmental protection measures incorporated into the project and the responsibility of each worker in environmental protection.
5. Temporary construction fencing may be installed, as necessary, for management of wildlife resources and for public safety during both construction and restoration efforts.
6. To protect human safety during construction, temporary signs warning the public of the presence and danger of any open trenches in the area will be installed where paved roads, gravel roads or OHV trails occur near an open trench.
7. Construction contractors will provide site security personnel or fencing, as necessary, for equipment and materials, and limit access to construction sites to authorized personnel.
8. Construction areas will be kept free from any accumulation of construction waste, trash, and debris. Disposal or recycling of trash and debris will be off-site, at a State of Utah approved sanitary landfill or recycling site. Construction materials shall be stored in a gathered, piled, or other organized manner that will readily accommodate use and eventual removal and will not create fluid or additional waste problems. Hazardous and toxic materials will be controlled to prevent accidental

spills. Toxic and hazardous materials will be stored in accordance with the project's Spill Prevention, Control, and Countermeasures ("SPCC") plan. Vehicle and equipment refueling and hazardous materials storage will not be allowed within 100 feet of any wash, stream, or spring. Spill cleanup kits will be available on heavy equipment and maintained so that any spill of fuels, solvents, lubricants, or acids can be quickly cleaned up. Construction and maintenance personnel will be trained in the proper use of the spill kit materials and correct disposal procedures.

9. Sanitary waste will be contained within portable toilet facilities. Portable toilets will be obtained by construction contractors and sited in designated locations in the construction area. The toilets will be maintained and serviced as needed for the duration of construction and removed at the completion of construction. Facilities will be anchored to prevent blowing over in high winds.
10. For every active phase of construction, fire suppression equipment such as extinguishers and shovels will be available on-site during construction. Vehicles will not be parked in tall vegetation to prevent fires from exhaust contact. One member of a construction crew, in addition to other roles, will be responsible for fire watch and fire suppression. For welding crews, one team member will be responsible for fire watch, in addition to the individual designated for the construction site fire watch and fire suppression. When welding at field locations, all flammable materials (i.e., brush, litter) will be cleaned for a distance of 15 feet around the area.
11. Noxious weed control will be implemented to minimize the spread of noxious weeds during construction and restoration/revegetation activities. Best management practices could include targeted herbicide treatments, physical removal, and equipment cleaning/inspection.
12. Where any ROWs cross beneath existing power lines, warning signs will be installed with identified height restrictions during construction. A construction watchman may be designated as needed during construction activities beneath power lines, to ensure equipment keeps specified distances from the power line conductor cables.
13. Any blasting will be conducted and managed to avoid damage to nearby facilities, properties, or sensitive cultural sites. Blast noise monitoring will be conducted if blasting will be in the vicinity of occupied properties, wildlife areas, or sensitive public uses.
14. Use of firearms by contractor personnel for target practice will be prohibited from the construction site and access routes.
15. Contractor personnel will be prohibited from bringing unrestrained domestic dogs to the construction site.

## **Cultural Resources**

16. Cultural monitors will be present during construction and restoration activities. In the event that cultural resources, including human remains, are inadvertently discovered during construction or operation, all work will cease within a 100-foot radius of the discovery, and the find will be immediately reported to the U.S. Bureau of Reclamation's Provo Area Office archaeologist by telephone, followed by written notification to the responsible Federal agency official. No work will resume in the discovery area until the resource has been evaluated, and Reclamation has issued a notice to proceed.

17. In the event that cultural resources, including human remains, are inadvertently discovered during construction or operation, the Utah State Historic Preservation Office and the Cultural Resource Manager for the Paiute Indian Tribe of Utah will be notified, and consultation will be initiated in accordance with applicable laws and regulations. Contractors will be briefed on these protocols prior to ground-disturbing activities and will be required to comply with all avoidance, monitoring, and mitigation measures.

## **Hydrology**

18. If water is present at the time of construction of creek crossings, in coordination with the Virgin River Program, a temporary earthen cofferdam would be installed or trenchless technology used under the creek at each crossing. The cofferdams would maintain flow in at least a portion of the creek at any given time to allow for continued fish passage. Any work within the stream would occur outside of spawning/breeding season (April 1 – August 31) per Virgin River Program protocols. Trenchless technology would not disrupt flow in the creek.

## **Migratory Birds (including Raptors)**

19. As feasible and applicable, the District will conduct initial clearing outside of the migratory bird nesting season. Within Washington County, the nesting season can be divided into 3 major timeframes: (1) Early Nesting Season: January 1–March 31 (e.g., eagles, owls, falcons, and hawks); (2) Primary Nesting Season: April 1–July 15 (e.g., the majority of songbirds, flycatchers, cuckoos, raptors); and (3) Maximum Nesting Season: January 1–August 31 (e.g., eagles)
20. If initial ground clearing will occur during the critical nesting period, pre-construction surveys for nesting migratory birds will be conducted by a qualified biologist (no more than 10 days prior to construction). If an active nest is identified, a no-activity buffer (ranging from 100-feet to 1-mile, depending on species) will be established around the nest site by a qualified biologist. The no-activity buffer will remain in place until the young have fledged or the nest has been deemed inactive by a qualified biologist.
21. If trees located within the ROWs cannot be avoided and must be removed for construction, the trees will be removed outside of the nesting period for raptors or other migratory birds. If removal of a tree during the nesting period is required, the tree will first be surveyed by a qualified biologist to ascertain the presence of any nests. Should an active raptor or other migratory bird nest be present, the tree will not be removed until the birds have fledged.
22. Where appropriate, restrict permitted activities from May 1 through July 15 within 0.5 mile of raptor nest sites unless the nest site has been determined to be inactive for at least the previous 5 years. Construction could occur during restricted periods if sufficient monitoring of the nest is completed during the present active season and the nest is found to be unoccupied for that year by a qualified biologist.

## **Mojave Desert Tortoise**

23. The U.S. Fish and Wildlife, in consultation with the U.S. Bureau of Reclamation, has evaluated the Eastside Reuse System's eligibility to tier to the Washington County Habitat Conservation Plan (HCP) (Consultation FWS/R6/FF06E23000/2026-0032636). The U.S. Fish and Wildlife has found

the project to fall within the HCP area, its actions are consistent with Covered Activities in the HCP, and the effects to desert tortoise were analyzed in the Service's intra-Service BO (Consultation FF06E2300/2024-0035575). As such, effects from the project to desert tortoise may tier to the Washington County HCP and be covered under the valid Incidental Take Permit (ES036719-V2). The District will coordinate with the HCP Administrator on complying with the applicable HCP Development Protocols<sup>1</sup>.

## Noise

24. All construction equipment will be equipped with manufacturers' standard noise control devices (e.g., mufflers, acoustical lagging, and/or engine enclosures). All construction equipment will be inspected at periodic intervals to ensure proper maintenance and presence of noise control devices.
25. Pumping stations will be enclosed and utilize noise design features to lessen operational noise levels.
26. Equipment will be operated conservatively, which means the operator will not throttle the engine excessively and will keep engine speed as low as necessary to perform required tasks. In addition, the operator will not leave equipment running or idling needlessly. Equipment will be operated during daylight hours only, unless permission is granted to work during the night in coordination with applicable entities and residences.
27. Pump stations will be enclosed and will be designed with a maximum operational noise level of 60 dBA at the boundary of the facility.

## Operations

28. Facility inspection and maintenance will only use established access roads, and no off-road travel will be allowed.
29. Pipelines and related facilities will be equipped with pressure and flow sensors that will immediately indicate a major system failure or break. Valve placement and storage capacity are planned to allow isolation of pipeline segments to manage drainage volumes. Personnel will be promptly mobilized to evaluate and repair any failure.
30. Pipeline and related facilities repairs that may be needed will be accomplished within the ROWs, as appropriate, following all environmental requirements of this plan.

## Other Special Status Species

31. If federally listed species are documented within the ROW, the District will work with the appropriate federal agency to determine applicable avoidance and minimization measures or other conservation activities. Avoidance and minimization measures may include buffers around documented specimens or construction timing restrictions. Conservation measures may include relocation.
32. If Utah Species of Greatest Conservation Need are documented within the ROW, the District will work with the appropriate state agency to determine applicable avoidance and minimization

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<sup>1</sup> Habitat Conservation Plan for Washington County, Utah. Restated and Amended October 2020

measures or other conservation activities. Avoidance and minimization measures may include buffers around documented specimens or construction timing restrictions. Conservation measures may include relocation.

### **Paleontological Resources**

33. A paleontologist will monitor areas with high or very high potential to yield previously unknown significant fossil sites/specimens.

### **Recreation**

34. Temporarily affected existing trail infrastructure would be restored after construction is complete.

### **Restoration**

35. All available growth medium (topsoil and cleared vegetation) will be salvaged and marked with signage for redistribution during reclamation, where applicable. Growth medium will be windrowed along the edge of the ROWs or placed in stockpiles and temporarily stabilized (if stockpiled for more than 14 days) to reduce or eliminate erosion or dust.
36. Soils and cut/fill areas will be restored to blend into existing landforms, as appropriate. Pre-existing hydrological contours should be maintained so that the moisture regime of the area is not disrupted. Any aquatic connectivity should be maintained throughout construction or re-established upon project completion.
37. An appropriate seeding program (methods and sources to be developed during final design) will be applied after final grading, where applicable and in coordination with private landowners per easement agreements. Seeding will have the goal of restoring the vegetation to the condition equal to or better than the pre-existing condition. Where appropriate, the seed mixes will consist of native plants endemic to the region and habitat type being restored. Appropriate native seed mixes will be composed of species adapted to the arid climate to prevent the spread of non-native invasive species. Where appropriate, native milkweeds and nectarous/pollen-bearing plants will be included in the seeding program.
38. Monitoring will be conducted post-restoration in coordination with private landowners per easement agreements to ensure stabilization of the area and that vegetative growth is successfully established in order to maintain the ecological integrity of the restored habitat. Adaptive management in coordination with private landowners will be used to address any areas where restoration is unsuccessful.
39. Signs and/or physical blocking barriers indicating restoration activities are being conducted will be installed where needed to deter off-road vehicular damage to restored areas.

### **Stormwater and Erosion Control**

40. As required, a General Permit for Stormwater Discharges Associated with Construction Activity will be obtained from the State of Utah by the contractor prior to any surface disturbance that includes clearing, grading, excavation, and/or stockpiling. The District will ensure compliance.

41. A site-specific Stormwater Pollution Prevention Plan (SWPPP) will be prepared and implemented for each construction contract by the contractor. A copy of the SWPPP will be kept on site and updated as needed to manage pollutants or reflect changes in site conditions. The District will ensure compliance.
42. A SPCC Plan (40 CFR 112) will be prepared and submitted to applicable agencies by the contractor. The plan will describe measures that will be taken to properly store, handle, and prevent hazardous materials from being picked up in stormwater and transported offsite. It will also contain measures related to clean up procedures and time frames, notification procedures, and restoration efforts for the affected area. The District will ensure compliance.
43. Erosion and sediment control will be implemented using both non-structural and structural best management practices (BMPs), such as mulching, matting, wattles, silt fences, and tracking pads.
44. Where appropriate, vegetation within construction areas will be crushed instead of removed by blading, to minimize effects to soils.
45. Non-stormwater discharges, including discharges from pipeline and facility hydrostatic testing, will be directed into existing dry washes or other downstream project facilities as appropriate. Best management practices will be used to prevent bank instability and erosion, such as mulching, matting, wattles, silt fences, and berms. Water quality of the hydrostatic testing water will be tested prior to discharge in accordance with UDEQ requirements.
46. At the completion of construction, all non-natural berms, ditches, temporary erosion and sediment controls, bales, wattles, and other energy dissipating/filtering devices not required for protection of facilities will be removed, and drainage function restored. Soils used for erosion control structures and soils captured by those structures will be distributed across the ROWs prior to replacing the topsoil and reclamation.

### **Traffic/Roads**

47. A Construction Traffic Management Plan, if applicable, will be developed and coordinated with relevant state and local authorities prior to the start of construction for each major phase of the project.
48. While driving on paved roads or marked dirt roads, posted speed limits will be maintained by construction vehicles and personnel. While driving within the construction area, ROW, or on un-posted dirt roads, a maximum speed limit of 25 miles per hour (15 miles per hour within occupied desert tortoise habitat) will be required for construction vehicles and personnel.
49. Designated construction exit locations from the ROWs onto existing paved or improved roads will be identified. These exit locations will be stabilized to minimize sediment being tracked onto asphalt, concrete, or improved road surfaces and to limit other damage.
50. Cross-country vehicular travel by contractor personnel outside of the ROWs or identified access routes is prohibited.

51. Sediment transported onto a public paved road surface by construction equipment or other vehicles that will require removal by sweeping will be disposed of in an approved landfill. Road washing and/or street sweeping on public paved roads will be conducted, as needed.
52. During construction and maintenance, all unpaved access roads used by construction personnel, equipment, and materials deliveries will be maintained to meet local county standards, as applicable.

### **Visual Resources**

53. Pumping stations, permanent fencing, permanent access roads, culvert ends, markers and other project facilities will utilize architectural details and be painted or constructed according to local ordinances.
54. Lighting needed to conduct construction at night will be limited to the basic requirements for conducting the work. Lighting will be shielded and directed down towards the site and not into surrounding areas or onto roads.
55. Nighttime lighting during project operations at the pumping stations and other permanent facilities will either be manually controlled or programmed and used when occupied or when needed for safety and security.
56. Existing vegetation that screens pipeline alignments and other features from key viewing areas will be retained if it does not impede construction activities.



— BUREAU OF —  
RECLAMATION

Final Environmental Assessment

# **Appendix C – Public Comments and Reclamation Responses**

## **Eastside Reuse System, Washington County, Utah**

Provo Area Office – Upper Colorado Basin Region

February 2026



**Table 1. Public Comments on Draft Environmental Assessment for Eastside Reuse System**

Num-ber	Commentor(s)	Page (PDF)	Section	Resource	Comment	Response
1	Toquerville City	9 to 11	1.1.1 to 1.1.3	Purpose and Need	Toquerville City recognizes that water conservation alone will be insufficient to meet projected demands in our region. We support the Proposed Action as a critical component of the County’s water supply strategy and a necessary step toward ensuring reliable water for future growth.	Comment noted. No change was made to the EA.
2	Toquerville City	10	1.1.2	Purpose and Need	Table 1-2 projects the number of ERCs served by the District in this area. Based on current growth patterns and vested land use entitlements, the City anticipates that actual ERCs in Toquerville and surrounding areas will be realized more rapidly than projected. This accelerated growth could accelerate the water supply deficits described in Section 1.1.3.	The growth projections are based on the Kem C. Gardner Policy Institute population projections (2022) and recent municipality master plan studies. If growth occurs more rapidly than currently projected, the District would work with the municipalities on implementing other measures. No change was made to the EA.
3	Toquerville City	16	2.1.2.3	Description of Alternatives	The City supports any of the three proposed transmission line paths with the East Option as our preferred alignment due to geographic and future right of way anticipated that would impact both the West and the Middle Options.	Comment noted. The East Option is the preferred alignment for the Proposed Action. Section 2.1.2.3 (p. 2-4) was edited to note the preferred alignment.
4	Toquerville City	13 to 21	2.1.2	Description of Alternatives	The City requests that Washington County Water Conservancy District coordinate with Toquerville regarding construction staging areas, restoration, and final alignment in areas affecting City infrastructure.	A sentence was added in Section 2.1.2 (p. 2-2) stating that the District would coordinate final design and construction activities with landowners and municipalities.
5	Toquerville City	23 to 65	3	Affected Environment and Environmental Consequences	The City believes the Draft EA disclosed all environmental impacts and the scope of the analysis was sufficient. We believe direct impacts to the community have been addressed.	Comment noted. No change was made to the EA.
6	Conserve Southwest Utah	7	1	Purpose and Need	How was 40% inside water use determined? The water meters at many/most residences in the county meters measure both inside and outside water use combined.	Indoor use is estimated using winter metering data (when outdoor use is limited or curtailed) and using metered data from homes that use potable supply for indoor use and secondary irrigation supply for outdoor use. An explanation was added to the text in Section 1 (p. 1-1).

Num-ber	Commentor(s)	Page (PDF)	Section	Resource	Comment	Response
7	Conserve Southwest Utah	13 to 21	2.1.2	Description of Alternatives	There is no overall description of the project, including the full areas impacted, phases, or duration. How can we determine that impact to bird breeding seasons, for example, when we the project's duration, phases, or total timeline are not specified?	The Proposed Action is described in Section 2.1.2, including a description of the construction schedule in Figure 2-1. No change was made to the EA.
8	Conserve Southwest Utah	9	1.1.1	Background	Please add the reason(s) the State Engineer stopped further appropriations of groundwater supplies.	The State Engineer's policy for Area 81 states that groundwater is fully appropriated. The State Engineer set this policy based on review of the relatively shallow basin-fill, Navajo Sandstone, and Kayenta Formation aquifers (i.e., the aquifers in which water rights have been appropriated). A reference to the State Engineers policy for Area 81 was added to the text in Section 1.1.1 (p. 1-3).

Num-ber	Commentor(s)	Page (PDF)	Section	Resource	Comment	Response
9	Conserve Southwest Utah	10	1.1.2	Background	<p>What are the current gallons per capita day (GPCD) and target GPCD for potable water usage? How do these numbers compare to other southwest urban areas? What calculation method for GPCD was used in this EA since Utah changed its GPCD calculation method in 2024?</p>	<p>Per the District's 2024 Consumptive Use Report, Washington County's 2024 per capita consumptive water use was 148 gallons per day. This figure represents the total water consumed divided by the total population divided by 365 days, as set forth in Utah State Statute (Utah Code § 73-5-8.5). Vast differences in how water use and population are defined drastically alter GPCD calculations across the southwest. As a result, federal agencies and other water providers (see below) consistently discourage the use of GPCD to determine and compare a community's water efficiency. No change was made to the EA.</p> <p>U.S. Environmental Protection Agency, Best Practices to Consider When Evaluating Water Conservation and Efficiency as an Alternative for Water Supply Expansion (December 2016) at p. 46. GPCD is not "appropriate for comparing utilities to each other because of the variations in customer make-up."</p> <p>Southern Nevada Water Authority, Joint Water Conservation Plan (2019) at p. 3. "GPCD varies across communities due to several factors, including differences in climate, demographics, water-use accounting practices and economic conditions. As such, it is difficult to compare GPCD rates for different communities for the purpose of evaluating efficiency."</p> <p>New Mexico Office of the State Engineer Gallons Per Capita Per Day Calculator, Instruction Module (March 2009) at p. 26. "Each drinking water supplier represents large differences in population, customer water uses, and economic conditions. This GPCD should not be used to compare drinking water suppliers."</p> <p>Texas Water Development Board, Special Report, Water Conservation Implementation Task Force, Report to the 79th Legislature (November 2004) at p. 4, "[A] simple comparison of per-capita use among Texas municipal water providers that may have significant differences in climate, geography and source water characteristics, as well as their service and population profiles may, without additional data and analysis, lead to inaccurate conclusions about comparative water use efficiencies among those providers."</p>

Num-ber	Commentor(s)	Page (PDF)	Section	Resource	Comment	Response
10	Conserve Southwest Utah	10	Table 1-2	Background	CSU cannot reconcile these statements with the data provided in Table 1-2. Our calculations indicate a 43% increase in demand by 2030, and another 29% increase by 2035 while population (measured by ERC) grows by 45% and 30% respectively.	The values in Table 1-2 include the District's conservation saving projections. A footnote was added to Table 1-2 (Section 1.1.2, p. 1-4) to clarify.
11	Conserve Southwest Utah	10	Table 1-2	Background	For the 15% reduction in water use goal by 2035, does that apply to La Verkin and Toquerville only, or is that a county-wide goal? Relatedly, is that an absolute reduction in water usage or just relative to the projected usage given the growth in ERCs?	The text in Section 1.1.2 (p. 1-4) was updated to be consistent with the District's recently published 2025 conservation plan. The goal is now 18% reduction by 2042 from pre-2022 demand levels. This is a county-wide goal and is relative to the projected use.
12	Conserve Southwest Utah	10	Table 1-2	Background	Only a slight decrease in total water demand per year per ERC is projected over the 50-year planning period (0.79 AF/Yr-ERC in 2025 to 0.61 AF/Yr-ERC in 2075). There should be a greater decrease because new construction limits irrigated turf, along with other implemented water conservation measures, such as advanced metering infrastructure (AMI). Additionally, tiered water rates, if implemented above a reasonable base use allocation, should further promote less water use per ERC. Table 1.2 does not correlate with the objectives stated in Section 1.2.3.	These suggested measures are included in the District's conservation plans and are accounted for in the demand projections in Table 1-2. The text and table in Section 1.1.2 (p. 1-4) were revised to clarify.
13	Conserve Southwest Utah	10	Table 1-2	Background	Also, there is an increase in projected potable water demand from 2025 to 2075 of 420 gpd/ERC to 439 gpd/ERC, respectively. How could this be if water conservation measures increase over the 50-year period? It seems water demand per ERC should decrease over the 50-year planning period.	The reductions in demand due to conservation measures are primarily associated with outdoor potable and secondary demands. Potable demands per ERC remain relatively static, but do see some slight decreases and increases because of new builds that have little outdoor demand and shifting some existing outdoor potable demand to secondary irrigation supply sources as that supply becomes available. A footnote was added to Table 1-2 (Section 1.1.2, p. 1-4) to clarify. The ERCs in Table 1-2 (Section 1.1.2, p. 1-4) were updated to reflect the current estimates.

Num-ber	Commentor(s)	Page (PDF)	Section	Resource	Comment	Response
14	Conserve Southwest Utah	11	Figure 1-2	Background	The 2025 La Verkin and Toquerville potable water supply is shown to be almost 4,000 acre-feet, whereas Table 1-1 shows the 2025 potable water supply for these two municipalities as 1,200 acre-feet. In both cases, however, there is no time period given for the acre-feet. Please include a time period for the acre-feet labeled in the table and the figure.	Figure 1-2 shows total supply and demand values, the figure caption was corrected. Supply values are annual values, the table and figure were revised to clarify (Section 1.1.1, p. 1-3).
15	Conserve Southwest Utah	11	Figure 1-2	Background	Also, rectify or explain the difference between the values listed in Table 1-1 versus the values shown in Figure 1-2. Table 1-1 shows no increase in potable water supply for the two municipalities over the 50-year planning period and Figure 1-2 shows a slight increase in potable water supply over the same period.	Figure 1-2 (Section 1.1.3, p. 1-5) shows total supply and demand values; the figure caption was corrected.
16	Conserve Southwest Utah	12	1.2.3	Purpose and Need	Objectives 4, 5 and 6 listed in this subsection are critical to the Project being successful. Therefore, specific actions, potential policies, public education initiatives, design considerations, and other proposed ideas should be added to the text to convey a better understanding of how the Project will be implemented to achieve its goals. One suggestion is to list goals and then specific objectives for achieving the goals.	The text was clarified to note that other District plans are not part of the Proposed Action evaluated in this EA. A reference to these plans was added to the text in Section 1.2.3 (p. 1-6).
17	Conserve Southwest Utah	13-20	2.1.2	Description of Alternatives	Confirm that the Utah Geological Survey Division of Utah DNR will be engaged and provide evaluations for all proposed pipelines, pump stations, reservoirs and treatment facilities.	All facility designs and proposed operations will be reviewed and approved by applicable state and local agencies. No change was made to the EA.
18	Conserve Southwest Utah	13-20	2.1.2	Description of Alternatives	To what seismic standard will pipelines, pump stations, reservoirs and treatment facilities be built given the potential loss of services and property damage if facilities were to lose functionality from an earthquake?	All facilities will be designed to meet or exceed applicable local and state building codes and other applicable standards/requirements. These requirements will be determined during final design. No change was made to the EA.

Num-ber	Commentor(s)	Page (PDF)	Section	Resource	Comment	Response
19	Conserve Southwest Utah	13-20	2.1.2	Description of Alternatives	What is the expected annual loss of water in acre-feet and percentage of storage from evaporation for the proposed La Verkin Pond and the Chief Toquer Reservoir that is under construction? Do projected available water supplies account for water evaporation at reservoirs?	The Eastside Reuse System assumes a 12% loss in supply due to treatment processes, conveyance leaks, and evaporation. No change was made to the EA.
20	Conserve Southwest Utah	13-20	2.1.2	Description of Alternatives	How will pipeline water leaks be detected and monitored? Do projected available water supplies account for losses due to leakage?	The Eastside Reuse System assumes a 12% loss in supply due to treatment processes, conveyance leaks, and evaporation. Leaks will be detected and repaired under planned operations and maintenance activities, as explained in Section 2.1.2.7. No change was made to the EA.
21	Conserve Southwest Utah	18	2.1.2.4	Description of Alternatives	Is backup electrical power recommended for the proposed facility? If so, please add it to the description and indicate the form of backup electrical power proposed or the options being considered.	Backup electrical power would not be included in the pump stations. The text in Sections 2.1.2.3 and 2.1.2.4 (p. 2-6) were revised to clarify.
22	Conserve Southwest Utah	18	2.1.2.5	Description of Alternatives	Please elaborate on the technologies proposed for the advanced water purification demonstration facility. For example, will activated carbon or ion exchange systems be used. Will disinfection be included? What waste materials will be generated from advanced purification and how will those materials be managed? Will this facility be able to produce potable water in the future?	Additional detail was added to Section 2.1.2.5 (p. 2-6).
23	Conserve Southwest Utah	21	2.2	Alternatives Considered but Eliminated	Second sentence, other than “excessive hard surface”, ‘geological condition’ is not mentioned as a criterion for evaluating alignment and location of proposed facilities. Assessing geological conditions is essential in selecting alignment and location of proposed facilities.	Geology was considered in the siting of proposed facilities. The text in Section 2.2 (p. 2-9) was revised to clarify. Geotechnical conditions will be further assessed in Final Design.
24	Conserve Southwest Utah	21	2.2	Alternatives Considered but Eliminated	Was direct potable reuse considered? If not, why not, and if it was, why was it eliminated?	Potable reuse and other reuse strategies (e.g., direct injection to groundwater aquifers) to use non-potable reuse water from CPWRF were eliminated due to the availability and proximity of exchange opportunities and secondary demands in the La Verkin/Toquerville area. Other reuse strategies would have similar impacts, such as conveyance lines or expanded treatment facilities, but would have higher costs. Section 2.2 (p. 2-9) was revised to clarify.

Num-ber	Commentor(s)	Page (PDF)	Section	Resource	Comment	Response
25	Conserve Southwest Utah	25-27	3.3	General Methodology	<p>There is no description of ANY of the field surveys, nor any data on what percent of the total impacted acreage was surveyed, nor the qualifications of the surveyors. Additionally, there is no data provided as to whether these surveys were conducted at appropriate times of the year (i.e., breeding/nesting season, migratory seasons, monsoon, etc.). At a minimum, each of these sections should contain a summary of the work conducted, with additional details placed in the appendices.</p> <p>As an overarching comment, the EA mentions various, different field surveys and data collection efforts that were conducted to develop this draft assessment. Consider seriously adding a separate appendix that details these field findings. It would provide additional technical credibility to the statements, approaches, and conclusions made in the EA.</p>	A Biological Data Summary Appendix (Appendix D) was added in the Final EA report. The Appendix describes survey methods, periods, staff qualifications, and results for plants, wildlife, and aquatic resources surveys.
26	Conserve Southwest Utah	27 - 28	3.4.1	Cultural	We would have expected this programmatic agreement to be completed and appended to this EA.	Reclamation will discuss the Tribe's concerns during government to government consultation. Appendix E was created in the EA to document SHPO letters to date.
27	Conserve Southwest Utah	32	3.6.2	General Vegetation	The descriptor "limited verification" lacks sufficient detail for the purposes of this EA and needs to be quantified. How much field verification was done; specifically, what percentage of total Study Area and how was distributed within and across the Study Area?	Vegetation communities in general were not confirmed during field surveys. However, there was verification of rare plant habitats in areas that were accessible. A Biological Data Summary Appendix (Appendix D) was added in the Final EA report. Plant surveys are described in the Baseline Special Status Plant Species Survey Report in Appendix D.
28	Conserve Southwest Utah	33	3.6.3	General Vegetation	Who determines "where appropriate"? Who will determine the seed mixes?	Restoration activities will be completed in coordination with private and municipal landowners. No state or federal lands would be affected. The text in Section 3.6.3.2 (p. 3-13) was edited to clarify.
29	Conserve Southwest Utah	42	3.10.1	Riparian and Wetland	Field-based delineation must be quantified, how much and by whom. There should be a Field Survey in the Appendix.	A Biological Data Summary Appendix (Appendix D) was added in the Final EA report. The Aquatic Resources Delineation Report in Appendix D describes survey methods, periods, and results (with maps) for aquatic resources surveys.

Num-ber	Commentor(s)	Page (PDF)	Section	Resource	Comment	Response
30	Conserve Southwest Utah	43	3.10.2	Riparian and Wetland	What kind of evaluation was done, how much of the riparian areas were surveyed and how?	A Biological Data Summary Appendix (Appendix D) was added in the Final EA report. The Aquatic Resources Delineation Report in Appendix D describes survey methods, periods, and results (with maps) for aquatic resources surveys.
31	Conserve Southwest Utah	47	3.11.2	Special Status Species	How will these other species be addressed? Are there considerations for nesting/breeding seasons that should be included even if they were not observed during field surveys?	Per the EPMs, the District will work with the appropriate state agency to determine applicable avoidance and minimization measures or other conservation activities. Avoidance and minimization measures may include buffers around documented specimens or construction timing restrictions. Conservation measures may include relocation. A reference to the EPMs in Appendix B was added to Section 3.11.3 (p. 3-27).
32	Conserve Southwest Utah	50	3.12.2.1	Threatened and Endangered Species, and Migratory Birds	Why is this a 2-mile radius compared to the other field surveys for just the Area of Potential Effect (APE)? What is considered the center of the project from which this 2-mile radius was determined, or is it 2 miles from the boundary of the entire project?	UDWR's Wildlife Habitat Assessment Tool provided data up to 2.0 miles from project features. This data was used in the desktop analysis to be comprehensive. The text in Section 3-12-2-1 (p. 3-29) was clarified. A footnote was added to Table 3-3 (Section 3.3, p. 3-6) to explain that survey buffers were applied to pipeline centerlines and boundaries of above ground features
33	Conserve Southwest Utah	51-54	Table 3-13	Threatened and Endangered Species, and Migratory Birds	The overall comment is how and when were these field studies conducted? What percent of the total project area was surveyed, and what were the surveyor's qualifications for conducting said surveys?	A Biological Data Summary Appendix (Appendix D) was added in the Final EA report. The Baseline Wildlife Survey Report in Appendix D describes survey methods, periods, qualifications, and results (with maps) for wildlife species.
34	Conserve Southwest Utah	55	3.12.2.2	Threatened and Endangered Species, and Migratory Birds	If all migratory seasons are taken into consideration, the only allowable period for construction is September 1 through December 31.	Per the EPMs, as feasible and applicable, the District will conduct initial clearing outside of the migratory bird nesting seasons. If the nesting seasons cannot be avoided, implementation of nest surveys prior to construction activities and the establishment of species-specific disturbance buffers around active nests would reduce effects. No change was made to the EA.
35	Conserve Southwest Utah	60	3.12.3	Threatened and Endangered Species, and Migratory Birds	Has funding been appropriated for this maintenance? If so, for how many years? Long-term maintenance is critical to the prevention of invasive species.	Restoration activities will be conducted in accordance with easement agreements with private landowners. An appropriate seeding program will developed during final design, per EPM #37 in Appendix B. Monitoring of restored areas will be conducted in coordination with private landowners and easement agreements, per EPM #38. The text in Section 3.12.3.1 (p. 3-37) was revised to clarify.

Num-ber	Commentor(s)	Page (PDF)	Section	Resource	Comment	Response
36	Conserve Southwest Utah	2	Appendix B	Air Quality	These are broad statements about project dust control and air quality compliance. Washington County has many ongoing construction projects that invariably contribute to negatively-impacted air quality for particulate matter, other priority pollutants, and greenhouse gases. Detailed air monitoring and control measures are needed for this project.	Additional detail regarding dust control measures was added to EPM #1 in Appendix B (p. 2).
37	Conserve Southwest Utah	3	Appendix B	Cultural	How will this plan and its elements be communicated to contractors and subcontractors and its performance verified? Who will keep and maintain records?	See EPM #4 regarding a worker education program. No change was made to the EA.
38	Conserve Southwest Utah	4	Appendix B	Migratory Birds (including Raptors)	If all migratory seasons are taken into consideration, the only allowable period for construction is September 1 through December 31. Other mitigative field measures may assist in lengthening this narrow time window of construction, subject to approval by the appropriate state and Federal agencies (i.e., Utah DNR, US Fish & Wildlife etc.).	Per the EPMs, as feasible and applicable, the District will conduct initial clearing outside of the migratory bird nesting seasons. If the nesting seasons cannot be avoided, implementation of nest surveys prior to construction activities and the establishment of species-specific disturbance buffers around active nests would reduce effects. No change was made to the EA.
39	Conserve Southwest Utah	5	Appendix B	Mojave Desert Tortoise	This is the kind of certification and record-keeping needed for some of the non-tortoise worker training measures mentioned earlier in Appendix B.	See Environmental Protection Measure #4 regarding a planned worker education program to facilitate contractor compliance. No change was made to the EA.
40	Conserve Southwest Utah	5	Appendix B	Mojave Desert Tortoise	The same type of meeting should be done for all other training measures.	See Environmental Protection Measure #4 regarding a planned worker education program to facilitate contractor compliance. No change was made to the EA.
41	Conserve Southwest Utah	9	Appendix B	Noise	Will there be a noise monitoring plan developed and implemented for the construction phase?	Noise EPMs will be communicated to contractors per EPM #4. A noise monitoring plan will not be implemented. Blasting is not anticipated for the proposed option, however, if additional geotechnical investigations show that blasting would be required, then per EPM #13 blasting will be conducted and managed to avoid damage to nearby facilities, properties, or sensitive cultural sites. Blast noise monitoring will be conducted if blasting will be in the vicinity of occupied properties, wildlife areas, or sensitive public uses. No change was made to the EA.

Num-ber	Commentor(s)	Page (PDF)	Section	Resource	Comment	Response
42	Conserve Southwest Utah	10	Appendix B	Restoration	How long will this post-restoration monitoring occur. It typically takes a minimum of 2 years and up to 5 years to re-establish desert vegetation.	Restoration activities and durations will be conducted in accordance with easement agreements with private landowners. Monitoring of restored areas will be conducted in coordination with private landowners and easement agreements. The text in EPM #38 was revised to clarify.
43	Conserve Southwest Utah	11	Appendix B	Stormwater and Erosion Control	General Permit for Stormwater Discharges Associated with Construction Activity  Will the General Contractor obtain and conform to this permit? Will the WCWCD Project Manager verify that stormwater and erosion control measures were done correctly?	The Contractor will obtain the permit and the District will ensure compliance. This was clarified in the EPM #40 in Appendix B (p. 7).
44	Conserve Southwest Utah	11	Appendix B	Stormwater and Erosion Control	A site-specific Stormwater Pollution Prevention Plan (SWPPP)  Will the WCWCD or the General Contractor develop this plan? Who will monitor the performance of this plan?	The Contractor will obtain the permit and the District will ensure compliance. This was clarified in the EPM #41 in Appendix B (p. 7).
45	Conserve Southwest Utah	11	Appendix B	Stormwater and Erosion Control	SPCC Plan (40 CFR 112)  Will the WCWCD or the General Contractor develop this plan? Who will monitor the performance of this plan?	The Contractor will obtain the permit and the District will ensure compliance. This was clarified in the EPM #42 in Appendix B (p. 7).
46	Conserve Southwest Utah	11	Appendix B	Traffic/Roads	For designated desert tortoise areas, isn't the maximum speed limit 15 miles per hour? Please verify.	EPM #48 was revised as suggested in Appendix B (p. 7).
47	Conserve Southwest Utah	All	EA	EA	For an Environmental Impact Statement (EIS) not to be needed as a next step in the NEPA process, doesn't the Environmental Assessment (EA) have to result in a 'Findings of No Significant Impact (FONSI)?  This draft EA is well-organized and appears to include all the required elements. However, it lacks significant detail on many of the Environmental Protection Measures (EPMs) it states will be implemented. How can a FONSI determination be made for this EA when these EPMs are not detailed?	Reclamation has disclosed the effects of the proposed action and have addressed the public comments on the Draft EA. Reclamation's decision is to complete FONSI for the Proposed Action. No change was made to the EA.

Num-ber	Commentor(s)	Page (PDF)	Section	Resource	Comment	Response
48	Paiute Indian Tribe of Utah	27-29, 3	3.4, Appendix B	Cultural	The EA's treatment of cultural resources, particularly those deemed ineligible for the National Register of Historic Places (NRHP), is deeply concerning. Ineligibility does not equate to insignificance. Sites that have been heavily disturbed still hold cultural, spiritual, and historical value to our people.	Reclamation will discuss the Tribe's concerns during government to government consultation. Cultural monitors will be used during construction and restoration activities. Cultural monitoring was added to EPM #16 in Appendix B (p. 3) and to the text in Section 3.4.3 (p. 3-8).
49	Paiute Indian Tribe of Utah	27-29, 3	3.4, Appendix B	Cultural	We recommend the inclusion of Paiute cultural monitors throughout all phases of construction and staging to ensure respectful treatment of ancestral lands and artifacts.	Reclamation will discuss the Tribe's concerns during government to government consultation. Cultural monitors will be used during construction and restoration activities. Cultural monitoring was added to EPM #16 in Appendix B (p. 3) and to the text in Section 3.4.3 (p. 3-8).
50	Paiute Indian Tribe of Utah	27-29, 3	3.4, Appendix B	Cultural	The absence of meaningful tribal consultation to date violates the spirit of government-to-government coordination and undermines the trust responsibilities outlined in federal law.	Reclamation will discuss the Tribe's concerns during government to government consultation.
51	Paiute Indian Tribe of Utah	27-29, 3	3.4, Appendix B	Cultural	We specifically request that the legacy of Chief Toquer and the cultural significance of the Virgin River corridor be acknowledged and protected.	Reclamation will discuss the Tribe's concerns during government to government consultation. An acknowledgment of the significance of other resources to the Tribe was made in Section 3.7 (p. 3-14).
52	Paiute Indian Tribe of Utah	30 - 31, 47-48	3.5, 3.11	General Fish and Wildlife and Sensitive Species	The proposed project area is home to mule deer, kit fox, and other species that are culturally significant and ecologically sensitive.	Reclamation will discuss the Tribe's concerns during government to government consultation. An acknowledgment of the significance of other resources to the Tribe was made in Section 3.7 (p. 3-14). The text in Section 3.5.2 (p. 3-9) was revised to note the cultural significance of area species.
53	Paiute Indian Tribe of Utah	30 - 31, 47-48	3.5, 3.11	General Fish and Wildlife and Sensitive Species	Construction, staging, and increased human activity pose risks to habitat fragmentation, migration patterns, and species viability.	Reclamation will discuss the Tribe's concerns during government to government consultation. An acknowledgment of the significance of other resources to the Tribe was made in Section 3.7 (p. 3-14). A description of temporary effects to movement corridors was added to Section 3.5.3 (p. 3-10) and Section 3.11.1 (p. 3-26).
54	Paiute Indian Tribe of Utah	30 - 31, 47-48	3.5, 3.11	General Fish and Wildlife and Sensitive Species	We urge the Bureau to conduct species-specific impact assessments and implement mitigation strategies that prioritize habitat preservation.	Reclamation will discuss the Tribe's concerns during government to government consultation. Desktop and pedestrian surveys conducted for wildlife species are described in Section 3.11 and Section 3.12. Additional preconstruction surveys will be completed for migratory birds and desert tortoise, as described in the EPMs in Appendix B. All mitigation will be in accordance to existing laws and regulations. No change was made to the EA.

Num-ber	Commentor(s)	Page (PDF)	Section	Resource	Comment	Response
55	Paiute Indian Tribe of Utah	32-34, 23-24	3.6, 3.1	Vegetation, Geology, Soils, and Hazardous Materials	The EA lacks sufficient detail on how construction will affect native vegetation, soil stability, and potential exposure to hazardous materials.	See EPM #35 through and #39 regarding vegetation and soil restoration and protection measures during construction. No change was made to the EA.  Table 3-1 describes how hazardous materials are not located in the general Study Area (area to be disturbed during construction). See EPM #8 and #42 regarding implementation of a Spill Prevention, Control, and Countermeasures or SPCC plan, which would reduce and mitigate risks associated with hazardous materials used for construction (e.g., fuel). No change was made to the EA.
56	Paiute Indian Tribe of Utah	32-34, 23-24	3.6, 3.1	Vegetation, Geology, Soils, and Hazardous Materials	These elements [native vegetation, soil stability, and potential exposure to hazardous materials] are interconnected with tribal stewardship practices and must be addressed with greater transparency and precaution.	Reclamation will discuss the Tribe's concerns during government to government consultation. An acknowledgment of the significance of other resources to the Tribe was made in Section 3.7 (p. 3-14).
57	Paiute Indian Tribe of Utah	23-24	3.1	Resources	The Virgin River is not only a hydrological resource but a cultural lifeline for the Shivwits Band, whose water rights are federally recognized.	Reclamation will discuss the Tribe's concerns during government to government consultation. An acknowledgment of the significance of other resources to the Tribe was made in Section 3.7 (p. 3-14). The Proposed Action would not affect streamflows in the Virgin River or its tributaries, and other effects to hydrology and water quality would be negligible, as noted in Table 3-1.
58	Paiute Indian Tribe of Utah	23-24	3.1	Resources	The reuse system's potential to alter flow regimes, increase sedimentation, or degrade water quality must be thoroughly analyzed.	The Proposed Action would not affect streamflows in the Virgin River or its tributaries, and other effects to hydrology and water quality would be negligible, as noted in Table 3-1 (Section 3.1, p. 3-1). No change was made to the EA.
59	Paiute Indian Tribe of Utah	23-24	3.1	Resources	We request a hydrological impact study that includes tribal water allocations and treaty obligations under the Shivwits Band Water Rights Settlement Act of 2000.	The Proposed Action would not affect streamflows in the Virgin River or its tributaries, and other effects to hydrology and water quality would be negligible, as noted in Table 3-1. The Shivwits Band water rights would not be affected. Table 3-1 was revised to clarify.
60	Paiute Indian Tribe of Utah	35	3.7	Indian Trust Assets	The EA's assertion that no Indian Trust Assets (ITAs) will be affected is premature and unsubstantiated	Reclamation will discuss the Tribe's concerns during government to government consultation. No change was made to the EA.
61	Paiute Indian Tribe of Utah	35	3.7	Indian Trust Assets	The Virgin River, its tributaries, and surrounding lands are part of our spiritual and subsistence landscape. Any degradation constitutes a breach of trust.	Reclamation will discuss the Tribe's concerns during government to government consultation. An acknowledgment of the significance of other resources to the Tribe was made in Section 3.7 (p. 3-14).

Num-ber	Commentor(s)	Page (PDF)	Section	Resource	Comment	Response
62	Paiute Indian Tribe of Utah	36-38	3.8	Noise and Vibration	Construction-related noise and vibration can disturb wildlife and desecrate sacred spaces.	Reclamation will discuss the Tribe's concerns during government to government consultation. An acknowledgment of the significance of other resources to the Tribe was made in Section 3.7 (p. 3-14).
63	Paiute Indian Tribe of Utah	36-38	3.8	Noise and Vibration	Temporary staging areas must be sited with tribal input to avoid inadvertent damage to cultural or ecological resources.	Reclamation will discuss the Tribe's concerns during government to government consultation. Cultural monitors will be used during construction and restoration activities. Cultural monitoring was added to EPM #16 in Appendix B (p. 3) and to the text in Section 3.4.3 (p. 3-8).
64	Utah Department of Environmental Quality	23-24	3.1	Resources	The EA should include further clarification and support regarding the proposed selected discharge location, La Verkin Creek. The DWQ conducted a waste load analysis for a Utah Pollutant Discharge Elimination System (UPDES) permit and determined that La Verkin Creek was the least favorable option for effluent discharge. The EA should provide additional details explaining why this discharge location was chosen for the Project particularly regarding considerations of water quality.	The EA references La Verkin Creek as the preferred discharge as this matches the UPDES permit for the Confluence Park Water Reclamation Facility. The effluent discharge location of the Confluence Park Water Reclamation Facility is not part of the Proposed Action. No change was made to the EA.
65	Utah Department of Environmental Quality	23-24	3.1	Resources	The EA in Table 3-1, which reviewed the effects of the Proposed Action for the Project, stated that operations of the Proposed Action for the Project, including exchanges, would not affect stream water quality. Support for this statement should be included in the EA.	Additional detail was added to Table 3-1 (Section 3.1, p. 3-1).

Num-ber	Commentor(s)	Page (PDF)	Section	Resource	Comment	Response
66	Utah Department of Environmental Quality	13-18	2.1.2	Description of Alternatives	The EA also proposes constructing a lined La Verkin Pond, adjacent to the Creek, for the purpose of effluent storage and sediment settlement. The EA indicates that this will be filled with water from the Quail Creek pipeline, which can carry heavy sediment loads at certain times of year. The DWQ is concerned about the potential for leaks in the lined pond and the risk of tearing during maintenance, which could negatively affect aquatic resources. Specifically, sediment discharges from the pond could be extremely harmful to aquatic life, including the endangered Woundfin fish. The EA should include all environmental impacts associated with the pond, including liner failures and discharges.	Additional detail was added to the project description in Section 2.1.2.2 (p. 2-4) regarding the liner and design/construction requirements. Additional rationale was added to Table 3.1 in Section 3.1 (p. 3-1).
67	Utah Department of Environmental Quality	13-18	2.1.2	Description of Alternatives	Section 3.5, which addresses the Affected Environment and Environmental Consequences, does not address any water quality concerns from the pond or the discharge location. The EA should explore effluent storage and sediment treatment alternatives.	See responses to Comment #64 and Comment #66.
68	Utah Department of Environmental Quality	18	2.1.2.5	Description of Alternatives	The Advanced Water Purification Facility lacks a detailed description in the EA. Chief Toquer Reservoir is in the process of obtaining UPDES permits from the DWQ. The EA should provide an in-depth explanation of the Advanced Water Purification Facility, address water quality concerns, and outline how it will mitigate impacts on the anticipated beneficial uses of the proposed Chief Toquer Reservoir. The future beneficial uses of the reservoir, when completed, will retain the current classes of 2B, 3A, and 4, and may also include 2A for recreational purposes.	The Proposed Action includes an Advance Water Purification Demonstration Facility, which is described in Section 2.1.2.5. The minimal water produced from this facility would be used for public education purposes, secondary irrigation in the proposed demonstration gardens, replaced into the CPWRF to La Verkin Pond Pipeline with other Proposed Action non-potable reuse supply, or returned to the Confluence Park Water Reclamation Facility. The Advanced Water Purification Demonstration Facility would not affect Chief Toquer Reservoir operations. Text was added to Section 2.1.2.5 (p. 2-6) to clarify.

<b>Num -ber</b>	<b>Commentor(s)</b>	<b>Page (PDF)</b>	<b>Section</b>	<b>Resource</b>	<b>Comment</b>	<b>Response</b>
69	Utah Department of Environmental Quality	18	2.1.2.5	Description of Alternatives	Additionally, an up-to-date Reuse Project Plan must be submitted to DWQ before the described Advanced Water Purification Facility, among other proposed reuse facilities, can begin operations.	The District will work with UDWQ to submit the required plans and permits for the Advanced Water Purification Demonstration facility. No change was made to the EA.



— BUREAU OF —  
RECLAMATION

Final Environmental Assessment

# **Appendix D – Biological Data Summary Report**

Baseline Wildlife Survey Report

Baseline Special Status Plant Species

Aquatic Resources Delineation Report

## **Eastside Reuse System, Washington County, Utah**

Provo Area Office – Upper Colorado Basin Region

February 2026



# Baseline Wildlife Survey Report

Eastside Reuse System, Washington County, Utah



Stantec Consulting Services Inc.

Prepared for:  
Bureau of Reclamation, Provo Area Office –  
Upper Colorado Basin Region  
and  
Washington County Water Conservancy  
District  
Prepared by:  
Stantec Consulting Services Inc.

Date:  
November 2025  
Project/File:  
Eastside Reuse System

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## Acronyms / Abbreviations

Acronym / Abbreviation	Full Name
ac	acre(s)
CPWRF	Confluence Park Water Reclamation Facility
CTR	Chief Toquer Reservoir
DETO	Mojave desert tortoise
District	Washington County Water Conservancy District
EA	Environmental Assessment
ft	feet/foot
m	meter(s)
mi	mile(s)
Stantec	Stantec Consulting Services Inc.
SWFL	southwestern willow flycatcher
System	Eastside Reuse System
TSWS	Toquerville Secondary Water System
UDWR	Utah Division of Wildlife Resources
USFWS	United States Fish and Wildlife Service
YBCU	yellow-billed cuckoo



# 1 Introduction

The Washington County Water Conservancy District (District) and its regional partners propose to (1) augment potable water supplies in Washington County, Utah, by conveying non-potable reuse water to irrigation users in exchange for current irrigation sources to be used as potable supply, and 2) supplement secondary irrigation deliveries with non-potable reuse water. The Eastside Reuse System (hereafter referred to as the System) would help meet the future water supply needs of the region and would include the construction of the Confluence Park Water Reclamation Facility (CPWRF) to La Verkin Pond Pipeline, the La Verkin Pond, La Verkin Pond to Toquerville Secondary Water System (TSWS) Pipeline and Pump Station, the TSWS Pond to Chief Toquer Reservoir (CTR) Pump Station, and an Advanced Water Purification Demonstration Facility. The System roughly extends from La Verkin to Toquerville, Utah and is sited on private lands.

Stantec Consulting Services Inc. (Stantec) performed baseline biological surveys in 2025 to support the System's Environmental Assessment (EA). This report describes Stantec's methodology and results for wildlife-related field surveys that were completed in coordination with the District and appropriate land and resource management agencies. Wildlife field surveys were completed based on the proposed System layout, including three La Verkin Pond to TSWS Pipeline alternatives, as of March 2025. The System's EA would evaluate areas of disturbance associated with the construction of the components discussed above and the System layout as of August 2025 (hereafter to referred to as the Study Area). Minor adjustments occurred between iterations of proposed layouts and primarily consisted of staging area location corrections which the species-specific survey areas encompassed.

Stantec utilized a 150-foot (ft) disturbance buffer, or 75-ft buffer on each side of the System's centerline, to guide surveys.<sup>1</sup> Proposed parcels associated with permanent disturbance (e.g., ponds) and additional temporary disturbance (e.g., laydown yards, staging areas) were evaluated separately, as warranted, dependent on species-specific protocols and proximity to the proposed right-of-way. Species-specific survey areas presented in this report represent the geospatial extent of field data collection based on published survey protocols and do not represent the total "action area" that may be required for analysis in the EA. However, survey areas presented are adequate for field data collection to inform the EA's baseline conditions.

This report details species-specific surveys performed for special status wildlife (species listed under the Endangered Species Act) with the potential to occur in the Study Area (UDWR 2025a; USFWS 2025a). Not all wildlife species analyzed in the EA were included in baseline survey field efforts. Coordination with the U.S. Fish and Wildlife Service (USFWS) during the scoping and planning phase of System development provided concurrence that a desktop assessment was appropriate for those species during the development of the EA (i.e., Mexican spotted owl [*Strix occidentalis lucida*], California condor [*Gymnogyps californianus*], Virgin River chub [*Gila seminuda (=robusta)*], woundfin [*Plagopterus argentissimus*],

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<sup>1</sup> After the surveys were completed, the right-of-way, or potential disturbance area of the proposed pipelines was changed to 100 ft (50 ft on each side of centerline). The original survey area (minimum of 150 ft) was used in this baseline survey report except where otherwise stated for data calculations.



monarch butterfly [*Danaus plexippus*], and Suckley's bumble bee [*Bombus suckleyi*] (USFWS 2025b). However, Stantec recorded relevant habitat information and any incidental observations, if present, of additional sensitive wildlife species during the surveys specified in this report.

## 2 Methods

This section details the System's focal species and associated species-specific protocols that were used in the desktop assessments and field surveys. The species-specific survey areas utilized in this report are displayed in **Appendix A**. Due to the prevalence of privately owned land parcels within and surrounding the Study Area and some associated land access restrictions, field efforts were limited to areas of approval at the time of surveys.

### 2.1 Southwestern Willow Flycatcher

Stantec completed a preliminary desktop assessment of potentially suitable habitat for southwestern willow flycatcher (*Empidonax traillii extimus*; SWFL) within a 2,774-ft survey corridor (1,387 ft each side of the System centerline), regardless of land jurisdiction. The 2,774-ft survey corridor accounted for a 150-ft workspace buffer (75 ft on each side of the centerline) and the recommended 1,312-ft (400-meters [m]; 0.25-mile [mi]) survey buffer beyond potential disturbance (BOR 2020). The survey area utilized for field verification was determined based on the results of a preliminary desktop habitat suitability assessment (hereafter referred to as the SWFL Survey Area).

Stantec also reviewed designated critical habitat for the species and coordinated with the USFWS and Utah Division of Wildlife Resources (UDWR) to receive SWFL nesting occurrence data. This baseline information was paired with the desktop habitat suitability assessment and field verification of suitable habitat to inform the need to coordinate with the appropriate resource agencies for presence/absence surveys.

During field verification efforts, potentially suitable habitat for SWFL was evaluated by following the natural history descriptions defined in *A Natural History Summary and Survey Protocol for the Southwestern Willow Flycatcher* (Sogge et al. 2010). An experienced biologist evaluated potentially suitable riparian habitat for the presence of the following "suitable" characteristics during the field verification survey component:

- Standing water or moist soils in the immediate area
- Dense stands of native riparian trees including:
  - Willow (*Salix* spp.) and Fremont's cottonwood (*Populus fremontii*); presence of nonnative, but suitable tree species including tamarisk (*Tamarix* spp.) and Russian olive (*Elaeagnus angustifolia*); or a mix of other native and nonnative riparian trees that form a closed canopy

The biologist also evaluated existing disturbance at each field verified site (e.g., sites that were deemed potentially suitable through the desktop assessment). Disturbance would include livestock grazing, human-modification, scouring from flash floods, urban sprawl and development, or recreational vehicle or pedestrian use. The second page (habitat description) of the *Appendix 1: Willow Flycatcher Survey and Detection Form* in Sogge et al. (2010) was used to record area-specific suitability characteristics.



## 2.2 Yellow-billed Cuckoo

Stantec completed a preliminary desktop assessment of potentially suitable habitat for yellow-billed cuckoo (*Coccyzus americanus*; YBCU) within a 5,400-ft survey corridor (2,700 ft on each side of the System centerline) regardless of land jurisdiction. The 5,400-ft survey corridor accounted for a 150-ft workspace buffer (75 ft on each side of the centerline) and the recommended 2,625-ft (800-m; 0.5-mi) survey buffer that extends beyond System activities and accounts for potential impacts from noise, light, and human disturbance (USFWS 2017). The survey area for field verification was determined based on the results of the desktop habitat suitability assessment (hereafter referred to as the YBCU Survey Area).

Stantec also reviewed designated critical habitat for the species and coordinated with the UDWR and USFWS to receive YBCU nesting occurrence data. This baseline information was paired with the desktop habitat suitability assessment and field verification of suitable habitat to inform the need to coordinate with the appropriate resource agencies for presence/absence surveys.

An experienced biologist evaluated potential suitable breeding, nesting, and foraging habitat for YBCU by following the natural history descriptions and survey protocol as defined in *A Natural History Summary and Survey Protocol for the Western Distinct Population Segment of the Yellow-billed Cuckoo* (Halterman et al. 2015) and the *Guidelines for the Identification and Evaluation of Suitable Habitat for Western Yellow-billed Cuckoo in Utah* (USFWS 2017). Mapped potentially suitable riparian habitat was assessed for the presence of the following “suitable” characteristics during the field verification component:

- Predominantly multi-layered vegetation, with riparian canopy trees and at least one layer of understory shrubby vegetation that include:
  - Riparian overstory and understory vegetation may include cottonwood (*Populus* spp.), willow, alder (*Alnus* spp.), walnut (*Juglans* spp.), boxelder (*Acer* spp.), sycamore (*Plantanus* spp.), ash (*Fraxinus* spp.), mesquite (*Prosopis* spp.), tamarisk, and Russian olive
  - Although the species will nest in tamarisk, the occurrence (suitability) decreases rapidly as the amount of tamarisk cover increases
- Patches of multi-layered vegetation (as described above) are at least 12 acres (ac) or greater in size and are separated from other patches of suitable habitat by at least 300 m
- Somewhere within a patch, the multi-layered vegetation (as described above) is at least 100 m wide by 100 m long (eliminates patches that may be long enough to meet 12 ac but are too narrow to be suitable)
- Open areas, or gaps of multi-layered vegetation within a patch are less than 300 m in size

The biologist also evaluated existing disturbance at each field verified site (e.g., sites that were deemed potentially suitable through the desktop assessment). Disturbance would include livestock grazing, human-modification, scouring from flash floods, urban sprawl and development, or recreational vehicle or pedestrian use. The USFWS' *Yellow-billed Cuckoo "Survey Site Description Form"* was used to record area specific suitability characteristics.



## 2.3 Mojave Desert Tortoise

Stantec completed a preliminary desktop assessment of potentially suitable habitat for Mojave desert tortoise (*Gopherus agassizii*; DETO) by following spatial guidance as described in *Preparing for Any Action That May Occur Within the Range of the Mojave Desert Tortoise (Gopherus agassizii)* (USFWS 2018a). Under the “Linear Project Survey” methodology, Stantec evaluated an area that extends 731 ft (223 m) on each side of the System centerline (total survey area width of approximately 1,462 ft). This distance accounted for the 150 ft wide workspace buffer (75 ft each side of the centerline) and an anticipated maximum DETO relocation buffer (during construction) of 656 ft (200 m). Stantec also systematically evaluated permanent disturbance areas associated with the construction of the La Verkin Pond and Advanced Water Purification Demonstration Facility.

The final survey area and transect routes used in the field survey component were determined based on the results of the preliminary desktop habitat suitability assessment. Biologists completed field surveys and pedestrian transect methodology within potentially suitable habitat for DETO and did not complete field surveys in unsuitable habitat, which included highly developed areas and areas determined to be unsuitable during field verification. Field surveys were primarily completed following the Linear Project Survey methodology described in USFWS (2018a) which recommends 5 (five), 10-m wide belt transects distributed throughout a survey area, with one transect on the System centerline and two on each side of the centerline, spaced equal distances across the 1,462 ft (446 m) survey area in areas of linear disturbance. In the limited, non-linear areas of proposed permanent disturbance, surveyors followed 10-m wide belt transects throughout the designated boundaries. Combined, these areas comprised the overall DETO Survey Area.

Stantec documented evidence of DETO presence such as scat, burrows, tracks, carcasses, courtship rings, drinking depressions, and live animals while completing transect surveys. The *Desert Tortoise (Mojave Population) Field Manual* (USFWS 2009) provides the basis for data collection including the data sheet Stantec used to record evidence of presence. Evidence documented by Stantec was georeferenced using a GPS unit capable of sub-meter accuracy. If observed, live DETO were not handled or disturbed. Biologists also delineated suitable habitat within the DETO Survey Area based on an unsuitable-low-medium-high scale following the methods described in Appendix A of USFWS (2018b).

Although the USFWS methodology allows for year-round surveys, biologists completed the DETO field surveys during the desert tortoise’s “most active” period from March 15 – May 15 (USFWS 2018b). Stantec also ensured surveys were completed when air temperatures were below 104 degrees Fahrenheit.



## 3 Results

This section details the various species-specific results from the associated desktop assessments and field survey efforts. The species-specific survey areas utilized in this report are displayed in **Appendix A**. The surveyor qualifications are summarized in **Appendix B**. A cumulative list of documented wildlife observations during fieldwork is provided in **Appendix C**.

### 3.1 Southwestern Willow Flycatcher

USFWS-designated critical habitat for the SWFL in Utah includes the Virgin River and its 100-year floodplain from the Arizona state line upstream to Berry Springs (located just upstream of the State Route 9 Bridge over the Virgin River), which is more than 6 mi southwest from the Study Area. Southern Utah contains the north-central limit of the species' breeding range which includes relatively small, isolated, and widely dispersed locales of riparian habitat within a vast arid region (USFWS 2002). Data on nest locations from the UDWR confirmed that there were no identified nests within the Project area and a 2-mi buffer from 2013 – 2024 (UDWR 2025b).

Within the Study Area and a 0.25-mi buffer (SWFL Survey Area), approximately 155 ac were mapped as potentially suitable riparian habitat for the species during the preliminary desktop assessment (see **Appendix A, Figure 1**). Mapped potential habitat was primarily associated with Ash Creek and La Verkin Creek. Where land access was available, field surveys assessed the suitability of the desktop-mapped riparian habitat. Stantec completed the field verification effort in July 2025.

Along Ash Creek, each verification site was classified as native broadleaf dominated habitat. The upper stretch that enters the SWFL Survey Area and crosses the System's La Verkin Pond to TWSW Pipeline – East Option lacked surface water at the time of survey and lacked understory density. The riparian habitat was very linear and did not meet the minimum habitat patch size to be considered suitable for breeding SWFL support. Ash (*Fraxinus* spp.) and cottonwoods were present but also lacked suitable density, and tamarisk was only present in small patches (less than 5% of the overall vegetation complex).

The lower stretch of Ash Creek that crosses the System's La Verkin Pond to TWSW Pipeline – Middle / West Options primarily lacked surface water within the stream channel at the time of the survey but contained pooling and surface water in areas of human-modification. Large cottonwoods comprised a moderately dense canopy, with willows and ash comprising a moderately dense understory. However, the patches of riparian habitat were primarily linear and narrow in size and only met requirements for potential patch size nesting suitability. Human alteration and maintenance activities affected overall vegetation composition and density.

The portions of La Verkin Creek that enter the SWFL Survey Area and follow the southern extents of all three La Verkin Pond to TWSW Pipeline Options contained surface water at the time of the survey and were considered native broadleaf dominated habitat. Cottonwoods, ash, and willows were identified along the creek; however, the canopy and understory layers were considered sparse and riparian habitat was limited to a narrow 15-ft corridor of the creek (lacked sufficient density and width for nesting suitability). Large scouring flood events at sufficient frequency and magnitude appear to prevent the overall maturation



and maintenance of suitable vegetative characteristics for species' nesting, in addition to human maintenance and thinning repressing the vegetation density.

Riparian habitat following the lower stretches of La Verkin Creek and the CPWRF to La Verkin Pond Pipeline was a mixed native/exotic community, with vegetation dominated by ash, willow, tamarisk, and Russian olive. This stretch of habitat lacked sufficient height, overstory, understory density, and patch size to be considered suitable for nesting. Additionally, scouring events and active human maintenance appeared to repress vegetation.

Based on the combination of a desktop assessment, supplemental nesting data as provided by UDWR, and field verification survey effort, it was determined that suitable nesting/breeding habitat for SWFL was absent from the SWFL Survey Area and follow-up presence/absence surveys for the species were not completed.

## **3.2 Yellow-billed Cuckoo**

USFWS-designated critical habitat for YBCU does not exist in the vicinity of the Study Area. In Washington County, YBCUs are only known as rare summer visitors. Based on agency correspondence, the UDWR had no recent records of YBCU occurrence in the Study Area and surrounding vicinity, with the most recent breeding record occurring more than 20 years ago near St. George, Utah (UDWR 2025b).

Within the Study Area and a 0.5-mi buffer (YBCU Survey Area), approximately 245 ac were mapped as potentially suitable riparian habitat for the species based on the preliminary desktop assessment (see **Appendix A, Figure 1**). Mapped potential habitat was primarily associated with Ash Creek and La Verkin Creek. Where land access was available, field surveys assessed the suitability of desktop-mapped riparian habitat.

The field verification effort was completed in July 2025. During the field verification surveys (performed concurrently with SWFL habitat suitability surveys), Stantec determined that the mapped riparian zones within the YBCU Survey Area primarily contained native broadleaf vegetation with large cottonwoods comprising sparse to moderately dense canopies, and willows and ash comprising sparse to moderately dense understories. The patches of riparian habitat along Ash Creek and La Verkin Creek were also primarily linear and narrow (see Section 3.1). Overall, potential habitat patches lacked dense tracts of regenerating riparian vegetation with dense canopy cover and were not larger than 12 ac in size to be considered suitable for YBCU nesting and breeding. Additionally, habitat was commonly degraded from scouring events and human alteration.

The lower stretch of Ash Creek that crosses the System's La Verkin Pond to TWSW Pipeline – Middle / West Options contained one patch of riparian habitat, located downstream of the existing road crossing, which contained a suitable patch size of large cottonwoods, willows, and ash surrounding open water features which was determined to have the potential to attract YBCUs. However, the patch lacked adequate canopy and understory density to be considered suitable nesting habitat due to human maintenance, and/or proximity to another suitable nesting patch of habitat. The overall YBCU Survey Area lacked a combination of the characteristics considered suitable for YBCU nesting habitat. Based on the combination of a desktop assessment, supplemental nesting data as provided by UDWR, and the field verification survey effort,



Stantec determined that suitable nesting/breeding habitat for YBCU was absent from the YBCU Survey Area, and follow-up presence/absence surveys for the species were not completed.

### 3.3 Mojave Desert Tortoise

The System is located within the Upper Virgin River Recovery Unit as established for DETO, with the nearest designated critical habitat located approximately 1.3 mi southwest of the Study Area (**Appendix A, Figure 2**). Stantec completed the DETO field survey effort in April 2025, which aligned with the “most active” period for the species (USFWS 2018b). Approximately 1,380 ac were surveyed for tortoises and their habitat.

Across the complete DETO Survey Area, 595.8 ac were determined to be “Medium Quality Habitat,” and 677.1 ac were determined to be “Unsuitable Habitat.” No areas were determined to be “Low Quality Habitat” or “High Quality Habitat.” An additional 106.8 ac were located within the DETO Survey Area that could not be surveyed due to land access restrictions (7.7% of the total DETO Survey Area) and were designated as “Potentially Suitable Habitat / No Access.” These areas were considered potentially suitable and would also be considered Medium Quality Habitat in the implementation of monitoring for the species. **Appendix A, Figure 2** displays the various mapped habitat categories relative to the System components.

Areas of mapped Medium Quality Habitat along the eastern portions of the DETO Survey Area were greater than 35 ac in size, lacked human disturbance, and contained preferred shrub species for cover (e.g., ephedra [*Ephedra nevadensis*], creosote bush [*Larrea tridentata*]). However, shrub cover transitioned into stands of blackbrush (*Coleogyne ramosissima*) which is also utilized by the species but begins to constitute less suitable habitat. The area also contained preferred native perennials and/or annuals for foraging (e.g., dense stands of big galleta [*Pleuraphis rigida*], purple threeawn [*Aristida purpurea*]). Soils were comprised of sandy, sandy-gypsum, or sandy-clay components which would support burrowing by DETO. However, soils were generally considered to have a high level of rock/gravel content to support egg laying. The eastern-most edges of the DETO Survey Area that overlapped the Hurricane Cliffs (i.e., dense, rocky hillsides) were not considered conducive for burrowing or nesting.

Mapped Medium Quality Habitat along the western portions of the DETO Survey Area also contained preferred shrub species and primarily included more contiguous stands of creosote bush, ephedra, and threadleaf snakeweed (*Gutierrezia microcephala*). Moderate levels of native annuals and perennials were also present for foraging (e.g., desert globemallow [*Sphaeralcea ambigua*], purple threeawn). Non-native vegetation included cheatgrass (*Bromus tectorum*) and redstem stork's bill (*Erodium cicutarium*). Rocky soils were considered less conducive for burrowing and nesting. The areas also lacked human disturbance and were greater than 35 ac in size.

Based on the August 2025 System layout and an updated 100-ft buffer of disturbance associated with the construction of the various La Verkin Pond to TWSW Pipeline options, there would be a range of 30.23 – 33.67 ac of temporary disturbance within suitable or potentially suitable habitat for DETO. A total of 10.16 ac of permanent disturbance (removal) would be associated with construction regardless of pipeline route option, 7.29 ac of which would be in Medium Quality Habitat. **Table 1** displays acreage of disturbance by land jurisdiction and proposed pipeline option.



**Baseline Wildlife Survey Report**  
3 Results

Table 1. Mojave Desert Tortoise Habitat Summary

Land Ownership	Medium Quality Habitat – Temporary Effects (acres)	Unsuitable Habitat – Temporary Effects (acres)	Potentially Suitable/No Access – Temporary Effects (acres)	Medium Quality Habitat – Permanent Effects (acres)	Unsuitable Habitat – Permanent Effects (acres)
<b>East Option</b>					
Private	14.03	32.92	9.23	7.29	2.84
Municipally Owned	0.63	0.24	0	0	0
District	5.18	0.11	0	0	0
Road	0.04	10.62	0	0	0.03
No Parcel Data	0.65	0.75	1.05	0	0
<b>Total</b>	<b>20.53</b>	<b>44.64</b>	<b>10.28</b>	<b>7.29</b>	<b>2.87</b>
<b>Middle Option</b>					
Private	24.31	36.15	0	7.29	2.84
Municipally Owned	0.63	2.81	0	0	0
District	2.54	0.11	0	0	0
Road	1.77	11.03	0	0	0.03
No Parcel Data	0.98	1.88	0	0	0
<b>Total</b>	<b>30.23</b>	<b>51.98</b>	<b>0</b>	<b>7.29</b>	<b>2.87</b>
<b>West Option</b>					
Private	22.05	38.34	0	7.29	2.84
Municipally Owned	9.06	2.81	0	0	0
District	1.53	0.11	0	0	0.0
Road	0.04	10.99	0	0	0.03
No Parcel Data	0.99	1.88	0	0	0
<b>Total</b>	<b>33.67</b>	<b>54.13</b>	<b>0</b>	<b>7.29</b>	<b>2.87</b>

Note: High and Low Quality Habitat was not located / mapped within the DETO Survey Area.

Stantec completed pedestrian transect surveys in all areas designated as Medium Quality Habitat. No tortoise burrows or sign were identified within the DETO Survey Area.



## **4 References**

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# **Appendix A Figures**



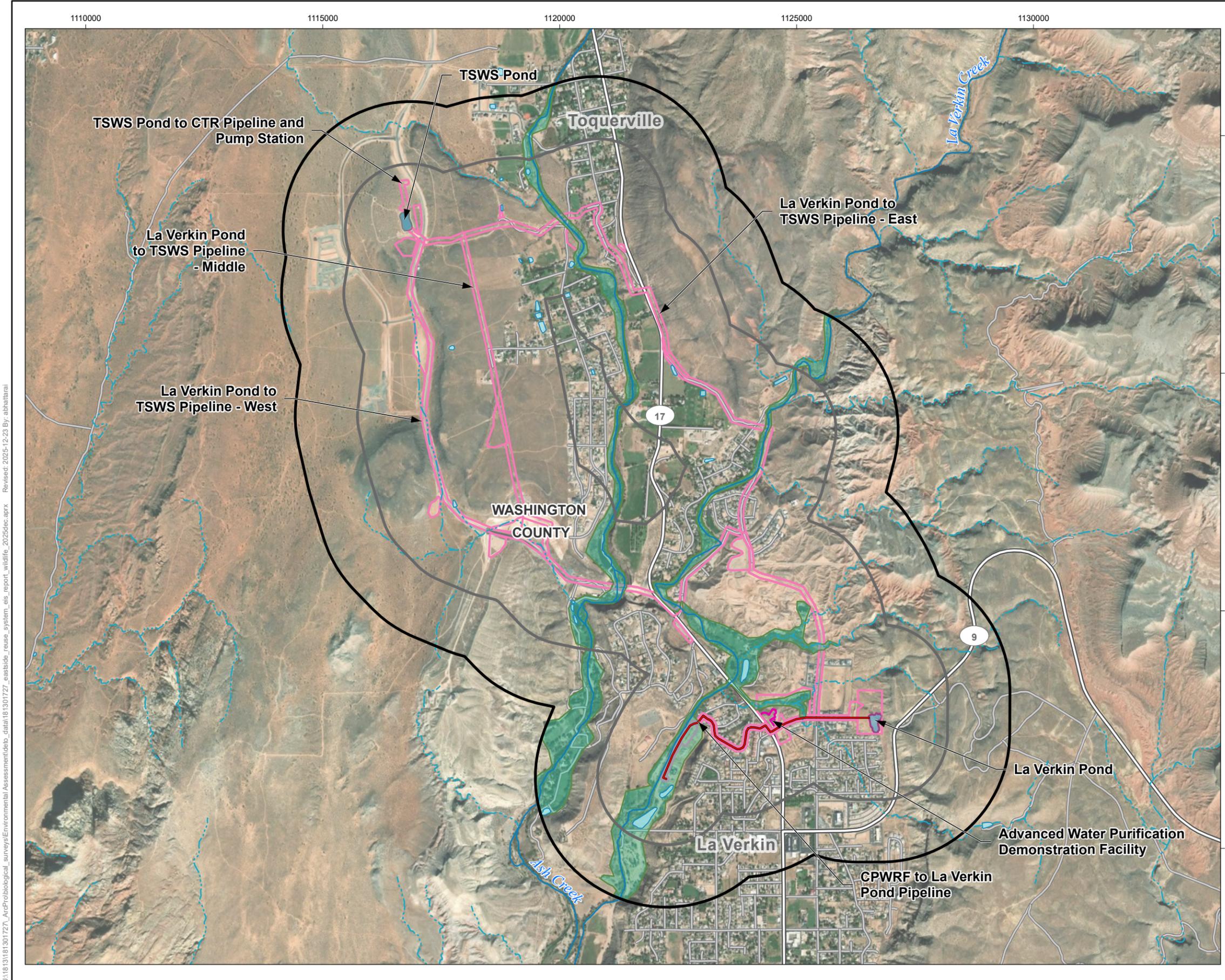
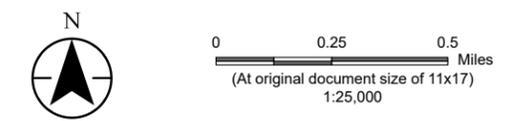


Figure No. **1**  
 Title  
**Southwestern Willow Flycatcher and Yellow-billed Cuckoo 2025 Habitat Survey Data**  
 Client/Project  
 Washington County Water Conservancy District  
 Eastside Reuse System  
 Project Location  
 Washington County, UT  
 Prepared by AB on 2025-11-17  
 TR by DG on 2025-11-19  
 IR by KG on 2025-11-20



- Infrastructure**
- Proposed System Centerline
  - Proposed Reservoir
- Disturbance Area**
- Permanent
  - Temporary
- Survey Data**
- Potential Suitable Habitat
  - SWFL Survey Area
  - YBCU Survey Area
- National Hydrography Dataset**
- ~ Perennial Stream
  - - - Ephemeral/Intermittent Stream
  - Waterbody
- Road or Highway**
- Secondary Road
  - Local Road



**Notes**

1. Coordinate System: NAD 1983 2011 StatePlane Utah South FIPS 4303 Ft Intl
2. Maps and north arrow are oriented to true north
3. Data Sources: Stantec Data, 2025; Washington County Parcel Data, 2025; Utah Geospatial Resource Center, 2025; Bureau of Land Management, 2024; National Hydrography Dataset, 2025
4. Background: Esri World Imagery



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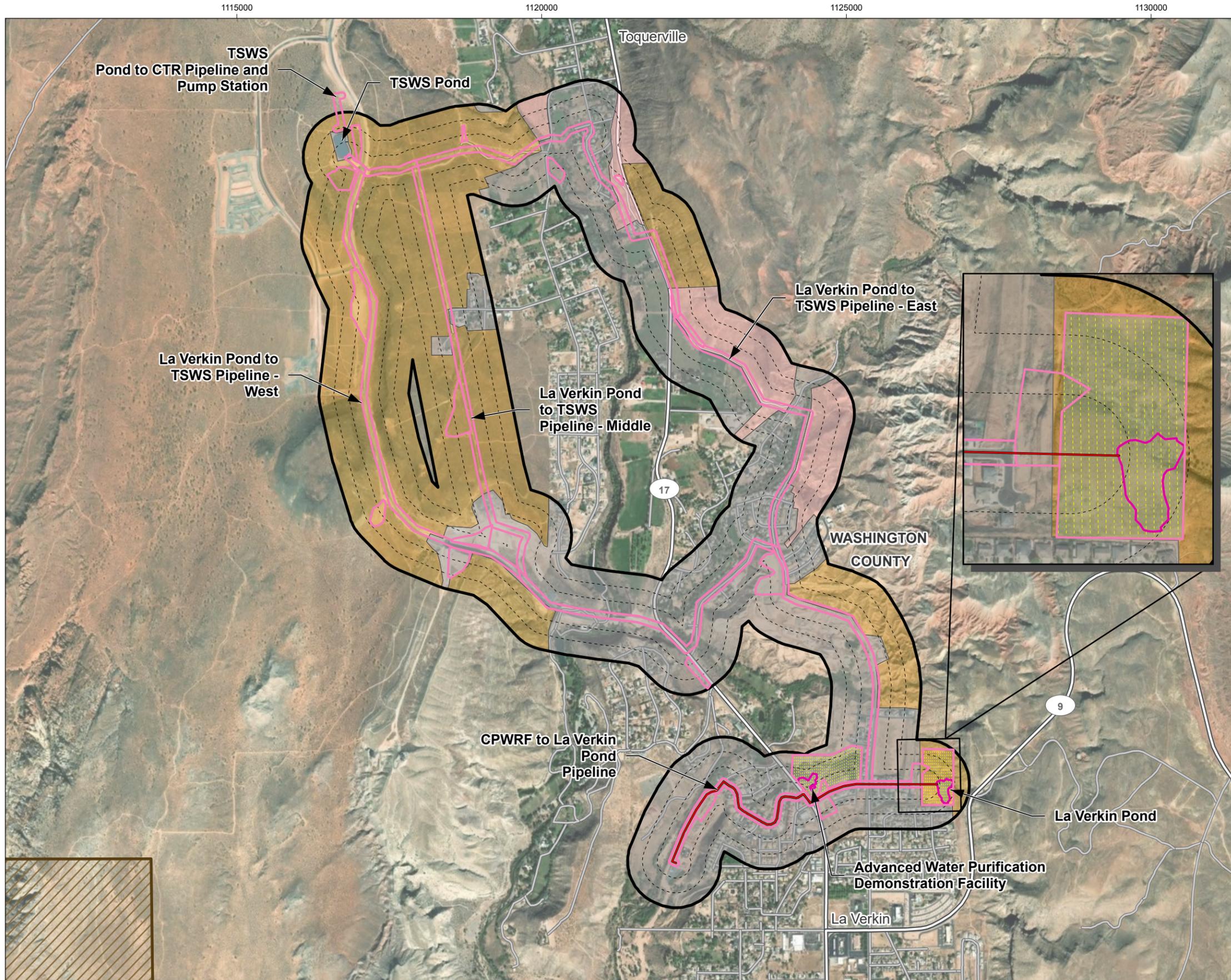
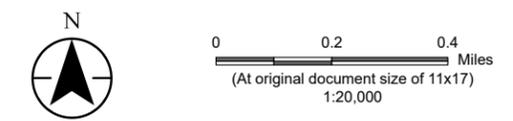


Figure No. **2**  
Title  
**Mojave Desert Tortoise 2025 Survey Data**

Client/Project  
Washington County Water Conservancy District  
Eastside Reuse System

Project Location  
Washington County, UT

Prepared by AB on 2025-11-17  
TR by DG on 2025-11-19  
IR by KG on 2025-11-20



**Infrastructure**  
Proposed System Centerline  
Proposed Reservoir

**Disturbance Area**  
Permanent  
Temporary

**Survey Data**  
DETO Survey Area  
DETO Linear Survey Transect  
DETO Survey 10-m Transect  
USFWS DETO Critical Habitat

**DETO Field-Verified Habitat**  
Medium  
Potentially Suitable / No Access  
Unsuitable

**Road or Highway**  
Secondary Road  
Local Road



**Notes**  
1. Coordinate System: NAD 1983 2011 StatePlane Utah South FIPS 4303 Ft Intl  
2. Maps and north arrow are oriented to true north  
3. Data Sources: Stantec Data, 2025; Washington County Parcel Data, 2025; Utah Geospatial Resource Center, 2025; Bureau of Land Management, 2024; United States Fish and Wildlife Service  
4. Background: Esri World Imagery



## Appendix B Surveyor Qualifications



### **Seth Topham**

Mr. Topham has more than 25 years of experience working as a wildlife biologist and botanist in the Intermountain and Southwest Regions. He has specialized experience working with threatened, endangered, candidate species, and BLM sensitive species. That experience includes significant work with the Mojave desert tortoise, southwestern willow flycatcher, Utah prairie dog, and dwarf bear-claw poppy. Mr. Topham is an authorized desert tortoise biologist that has worked with the species in the St. George region since 1989. He has worked on numerous projects in Utah, Arizona, and Nevada since that time and has been on multiple permits authorizing handling and relocation of desert tortoise. Mr. Topham has spent over 11,000 hours conducting clearance surveys and has handled over 300 desert tortoises in his career. He has also completed USFWS trainings and performs surveys for southwestern willow flycatcher and yellow-billed cuckoo.

### **Greg Sharp**

Mr. Sharp has extensive experience working as a wildlife biologist and an environmental regulatory compliance monitor. He has 24 years of experience utilizing various survey techniques to assess the presence and/or monitor the status of many protected plant and animal species. Mr. Sharp is an authorized desert tortoise biologist that has worked with the species on numerous projects in Utah, Nevada, and Arizona since 2008. He has spent over 8,000 hours conducting clearance surveys and has handled over 120 desert tortoises under permits. Mr. Sharp has also attended the USFWS training for southwestern willow flycatcher and has experience completing species-specific surveys since 2001.



## Appendix C Incidental Observations



**Baseline Wildlife Survey Report**  
**Appendix C Incidental Observations**

Table C-1 *Incidental Wildlife Observations from Surveys*

Scientific Name	Common Name
<b>Birds</b>	
<i>Falco sparverius</i>	American Kestrel
<i>Pipilo aberti</i>	Abert's Towhee
<i>Turdus migratorius</i>	American Robin
<i>Calypte anna</i>	Anna's Hummingbird
<i>Myiarchus cinerascens</i>	Ash-throated Flycatcher
<i>Hirundo rustica</i>	Barn Swallow
<i>Thryomanes bewickii</i>	Bewick's Wren
<i>Sayornis nigricans</i>	Black Phoebe
<i>Archilochus alexandri</i>	Black-chinned Hummingbird
<i>Amphispiza bilineata</i>	Black-throated Sparrow
<i>Polioptila caerulea</i>	Blue-gray Gnatcatcher
<i>Icterus bullockii</i>	Bullock's Oriole
<i>Psaltiriparus minimus</i>	Bushtit
<i>Catherpes mexicanus</i>	Canyon Wren
<i>Phalaenoptilus nuttallii</i>	Common Poorwill
<i>Corvus corax</i>	Common Raven
<i>Geothlypis trichas</i>	Common Yellowthroat
<i>Accipiter cooperii</i>	Cooper's Hawk
<i>Calypte costae</i>	Costa's Hummingbird
<i>Toxostoma crissale</i>	Crissal Thrasher
<i>Junco hyemalis</i>	Dark-eyed Junco
<i>Streptopelia decaocto</i>	Eurasian Collared-Dove
<i>Sturnus vulgaris</i>	European Starling
<i>Callipepla gambelii</i>	Gambel's Quail
<i>Geococcyx californianus</i>	Greater Roadrunner
<i>Quiscalus mexicanus</i>	Great-tailed Grackle
<i>Pipilo chlorurus</i>	Green-tailed Towhee
<i>Eremophila alpestris</i>	Horned Lark
<i>Carpodacus mexicanus</i>	House Finch
<i>Passer domesticus</i>	House Sparrow
<i>Charadrius vociferus</i>	Killdeer
<i>Lanius ludovicianus</i>	Loggerhead Shrike
<i>Vermivora luciae</i>	Lucy's Warbler
<i>Anas platyrhynchos</i>	Mallard
<i>Zenaida macroura</i>	Mourning Dove
<i>Colaptes auratus</i>	Northern Flicker
<i>Mimus polyglottos</i>	Northern Mockingbird
<i>Vermivora celata</i>	Orange-crowned Warbler
<i>Buteo jamaicensis</i>	Red-tailed Hawk
<i>Agelaius phoeniceus</i>	Red-winged Blackbird
<i>Salpinctes obsoletus</i>	Rock Wren
<i>Amphispiza belli</i>	Sage Sparrow
<i>Sayornis saya</i>	Say's Phoebe



**Baseline Wildlife Survey Report**  
**Appendix C Incidental Observations**

<b>Scientific Name</b>	<b>Common Name</b>
<i>Melospiza melodia</i>	Song Sparrow
<i>Pipilo maculatus</i>	Spotted Towhee
<i>Piranga rubra</i>	Summer Tanager
<i>Cathartes aura</i>	Turkey Vulture
<i>Auriparus flaviceps</i>	Verdin
<i>Poocetes gramineus</i>	Vesper Sparrow
<i>Tachycineta thalassina</i>	Violet-green Swallow
<i>Sialia mexicana</i>	Western Bluebird
<i>Tyrannus verticalis</i>	Western Kingbird
<i>Sturnella neglecta</i>	Western Meadowlark
<i>Zonotrichia leucophrys</i>	White-crowned Sparrow
<i>Aphelocoma woodhouseii</i>	Woodhouse's Scrub-Jay
<i>Dendroica petechia</i>	Yellow Warbler
<i>Dendroica coronata</i>	Yellow-rumped Warbler
<b>Mammals</b>	
<i>Amмосpermophilus leucurus</i>	White-tailed Antelope Squirrel
<i>Canis latrans</i>	Coyote
<i>Lepus californicus</i>	Black-tailed Jackrabbit
<i>Odocoileus hemionus</i>	Mule Deer
<i>Otospermophilus variegatus</i>	Rock Squirrel
<i>Sylvilagus audubonii</i>	Desert Cottontail
<i>Vulpes macrotis</i>	Kit Fox
<b>Reptiles</b>	
<i>Crotaphytus bicinctores</i>	Great Basin Collared Lizard
<i>Gambelia wislizenii</i>	Long-nosed Leopard Lizard
<i>Phrynosoma platyrhinos</i>	Desert Horned Lizard
<i>Sceloporus magister</i>	Desert Spiny Lizard
<i>Uta stansburiana</i>	Common Side-blotched Lizard



**With every community, we redefine what's possible.**

Stantec is a global leader in sustainable engineering, architecture, and environmental consulting. The diverse perspectives of our partners and interested parties drive us to think beyond what's previously been done on critical issues like climate change, digital transformation, and future-proofing our cities and infrastructure. We innovate at the intersection of community, creativity, and client relationships to advance communities everywhere, so that together we can redefine what's possible.

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# 2025 Special Status Plant Species Clearance Survey Report

Eastside Reuse System, Washington County, Utah



Stantec Consulting Services Inc.

Prepared for:  
Bureau of Reclamation, Provo Area Office –  
Upper Colorado Basin Region  
and  
Washington County Water Conservancy  
District  
Prepared by:  
Stantec Consulting Services Inc.

Date:  
December 2025  
Project/File:  
Eastside Reuse System

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## Acronyms / Abbreviations

Acronym / Abbreviation	Full Name
BLM	Bureau of Land Management
District	Washington County Water Conservancy District
EA	Environmental Assessment
ESA	Endangered Species Act
ft	foot (feet)
GPS	global positioning system
IPaC	Information for Planning and Consultation Tool
ROW	right-of-way
Stantec	Stantec Consulting Services Inc.
System	Eastside Reuse System
TSWS	Toquerville Secondary Water System
USFWS	U.S. Fish and Wildlife Service



# 1 Introduction

The Washington County Water Conservancy District (District) and its regional partners proposed to (1) augment potable water supplies in Washington County, Utah by conveying non-potable reuse water to irrigation users in exchange for current irrigation sources to be used as potable supply, and (2) supplement secondary irrigation deliveries with non-potable reuse water. The Eastside Reuse System (hereinafter referred to as the System) would include the construction of the Confluence Park Water Reclamation Facility to La Verkin Pond Pipeline, the La Verkin Pond, La Verkin Pond to Toquerville Secondary Water System (TSWS) Pipeline and Pump Station, the TSWS Pond to Chief Toquer Reservoir Pump Station, and an Advanced Water Purification Demonstration Facility. The System roughly extends from La Verkin to Toquerville, Utah and is sited on private lands (**Appendix A, Figure 1**).

Stantec Consulting Services Inc. (Stantec) performed baseline biological surveys in 2025 to support the System's Environmental Assessment (EA). This report describes Stantec's methodology and results for special status plant species. This report also discusses noxious weeds and milkweed (*Asclepias*) species due to the interest in those plants by the District and land and resource management agencies. For the purposes of this report, special status plant species are those species that occur on the Bureau of Land Management (BLM) sensitive plant list for the St. George Field Office or the Endangered Species Act (ESA). Field surveys were completed based on the proposed System layout, including three La Verkin Pond to TSWS Pipeline alternatives, as of March 2025. The System's EA would evaluate areas of disturbance associated with the construction of the components discussed above and the System layout as of August 2025. Minor adjustments occurred between iterations of proposed layouts and primarily consisted of staging area location corrections.

Stantec used a 150-foot (ft) right-of-way buffer<sup>1</sup> and the U.S. Fish and Wildlife Service (USFWS) recommended 300-ft survey buffer beyond potential disturbance to develop the special status plant Assessment Area. For the purposes of this report the Assessment Area is the geographical extent in which Stantec reviewed federal plant lists for species applicability and review. The Assessment Area covers the three System alternatives and proposed parcels associated with permanent disturbance (e.g., ponds) and additional temporary disturbance (e.g., laydown yards, staging areas; **Appendix A, Figure 1**). The current disturbance footprint would not affect BLM land. However, the recommended 300-ft survey buffer (USFWS 2011) overlaps 12.5 acres of BLM land. BLM special status plant species were only assessed on BLM lands within the Assessment Area.

---

<sup>1</sup> After the surveys were completed, the right-of-way, or potential disturbance area of the proposed pipelines was changed to 100 ft (50 ft on each side of centerline). The original survey area (minimum of 150 ft) was used in this baseline survey report except where otherwise stated for data calculations.



## 2 Field Survey Methods

### 2.1 Special Status Species

Stantec completed special status plant surveys based on methods described in *Survey Protocols Required for NEPA/ESA Compliance for BLM Special Status Plant Species* (BLM 2009). Based on these protocols Stantec’s field survey consisted of intuitive controlled transects to identify suitable habitat for special status plants. The field survey was restricted to BLM-administered lands that overlap the Assessment Area (hereafter referred to as the BLM Survey Area). If suitable habitat was identified, a clearance level survey would be completed with parallel pedestrian transects throughout the area of suitable habitat searching for the special status plant species. Surveyor qualifications are provided in **Appendix B**.

Desktop reviews of BLM and ESA plant lists identified the potential occurrence of three special status plant species, all of which are BLM special status species within the Washington County and St. George Field Office (BLM 2018). No ESA-listed species were identified as potentially occurring within the Assessment Area through the USFWS Information for Planning and Consultation Tool (IPaC) (USFWS 2025). Species carried forward for field survey along with their protected status and flowering period, are described below in **Table 1**.

Table 1. Special Status Plants Species Carried Forward for Field Surveys

Common Name	Species Name	Listing Designation	Flowering Period
Gould’s camissonia	<i>Camissonia gouldii</i>	BLM – S	Mid-May – early June
Gumbo milkvetch	<i>Astragalus ampullarius</i>	BLM – S	April – May or early June
Parry’s petalonyx	<i>Petalonyx parryi</i>	BLM – S	April – June

**Key:** BLM – S = BLM Sensitive Species

### 2.2 Noxious Weeds

The term “noxious weed” is defined by the Utah Commissioner of Agriculture and Food as any plant harmful to public health, crops, livestock, land, or other property (Utah Code 4-17-S102). Noxious weed species are listed according to Utah state law and are organized based on their distribution and threat level to state resources as defined in the Utah Noxious Weed Act. These species are officially designated as injurious to public health, agriculture, recreation, wildlife, or property (Shelly and Petroff 1999). Recording the location of noxious weeds can reduce the likelihood of spreading these problematic species through the application of responsible construction practices.

Noxious weeds were documented when encountered in conjunction with special status plant, aquatic resource, and wildlife surveys throughout the field season of 2025. If encountered, noxious weeds were mapped using a handheld device and global positioning system (GPS) capable of sub-meter accuracy.



## 2.3 Milkweed

Milkweed are herbaceous plants that occur in a wide range of habitats including native plant communities, residential yards, and disturbed areas such as roadsides (Xerces 2019). Milkweed plants are a required host plant for the monarch butterfly (*Danaus plexippus*) which is a species proposed for listing as threatened under the ESA (USFWS 2024). The locations of milkweed plants were recorded (if located) to supplement the EA's assessment of the monarch butterfly.

Milkweed was documented if observed during the special status plant, aquatic resource, and wildlife surveys throughout the field season of 2025. If encountered, milkweeds were mapped using a handheld device and GPS capable of sub-meter accuracy. If any milkweed were observed to have monarch butterflies on the plant, or observed flying and feeding nearby, the number of butterflies observed would be recorded.

## 3 Results

Stantec completed clearance surveys for special status plants in May 2025. No special status plant species were identified during Stantec's surveys within the BLM Survey Area. One noxious weed occurrence (four individuals) was observed on private land within the Assessment Area near the proposed La Verkin Pond. No milkweed species were observed within the Assessment Area. The location of the noxious weed population is provided in **Appendix A, Figure 2**.

### 3.1 Special Status Species

No special status plants were identified within the BLM Survey Area. Intuitive controlled pedestrian transects were walked within the BLM Survey Area were safe to do so near steep cliffs, but no meandering transects were walked on the east of State Highway 9 due to the steep cliff and safety concerns. The BLM Survey Area was dominated by native shrub cover with understories of annual non-native invasives, such as cheatgrass (*Bromus tectorum*). Dominant native species consisted of creosote bush (*Larrea tridentata*), common fishhook cactus (*Mammillaria tetracistra*), purple threeawn (*Aristida purpurea*), and threadleaf snakeweed (*Gutierrezia microcephala*).

### 3.2 Noxious Weeds

One noxious weed species was identified within the Survey Area, Scotch thistle (*Onopordum acanthium*). Scotch thistle is classified in Utah as a Class 3: Containment species. It readily forms larger infestations with time, and the State of Utah classifies this species as posing a threat to agricultural industry and its products (UDAF 2025). Scotch thistle was identified on private land at one location and consisted of a population of four individuals (**Appendix A, Figure 2**).



### 3.3 Milkweed

No milkweed were observed within the Assessment Area during Stantec's field surveys. Milkweed often require specific moisture levels to germinate and persist on the landscape (Xerces 2014; 2019) and lower-than-average rainfall from October 2024 to May 2025 may have affected milkweed germination within the region (WRCC 2025, Weather Underground 2025).

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Xerces. 2019. Milkweeds of Nevada & Utah. Publication 19-028\_01. Available online at: <https://www.xerces.org/sites/default/files/publications/19-028.pdf>.



## **Appendix A Figures**



U:\1813181301727\_ArcProbiological\_surveys\Environmental\_Assessment\veg\_analysis\181301727\_wcovd\_eastside\_system\_rate\_plant\_figures\_eis\_baseline.aprx Revised: 2025-12-04 By: abhattaral

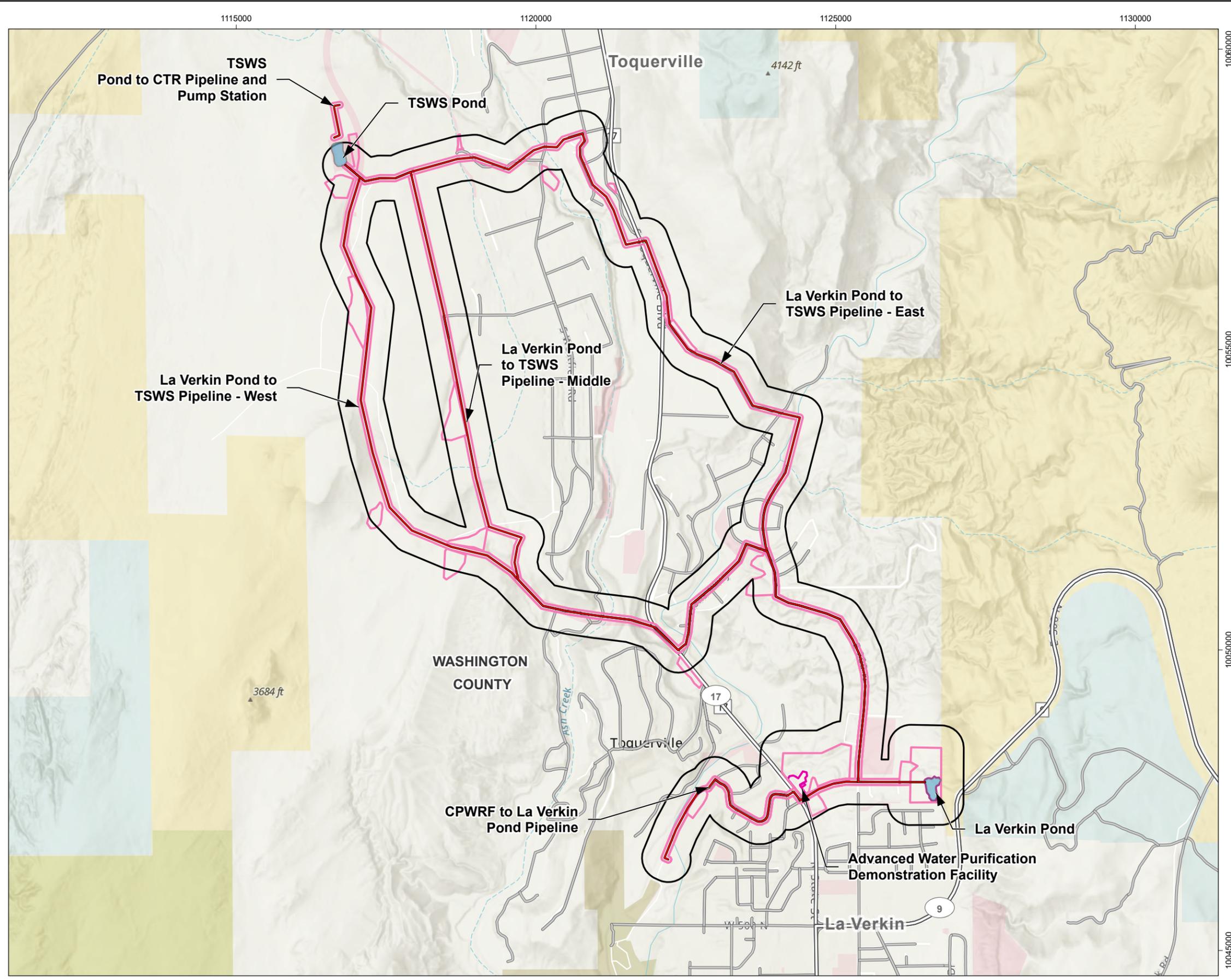


Figure No. **1**  
Title **Special Status Plant Survey - Overview**

Client/Project  
Washington County Water Conservancy District  
Eastside Reuse System

Project Location  
Washington County, UT  
Prepared by AB on 2025-11-12  
TR by DG on 2025-11-19  
IR by JM on 2025-11-20



- Infrastructure**
  - Proposed System Centerline
  - Proposed Reservoir
- Assessment Area**
  - Assessment Area
- Disturbance Area**
  - Permanent
  - Temporary
- Road or Highway**
  - Secondary Road
  - Local Road
- Land Ownership**
  - Bureau of Land Management
  - Municipal
  - Mining Claim
  - Private
  - Road
  - Shivwits Reservation
  - State
  - US Forest Service
  - Unknown
  - Water Body



**Notes**  
1. Coordinate System: NAD 1983 2011 StatePlane Utah South FIPS 4303 Ft Intl  
2. Maps and north arrow are oriented to true north  
3. Data Sources: Stantec Data, 2025; Washington County Parcel Data, 2025; Utah Geospatial Resource Center, 2025; Bureau of Land Management, 2024  
4. Background: Esri World Topographic Map and Hillshade



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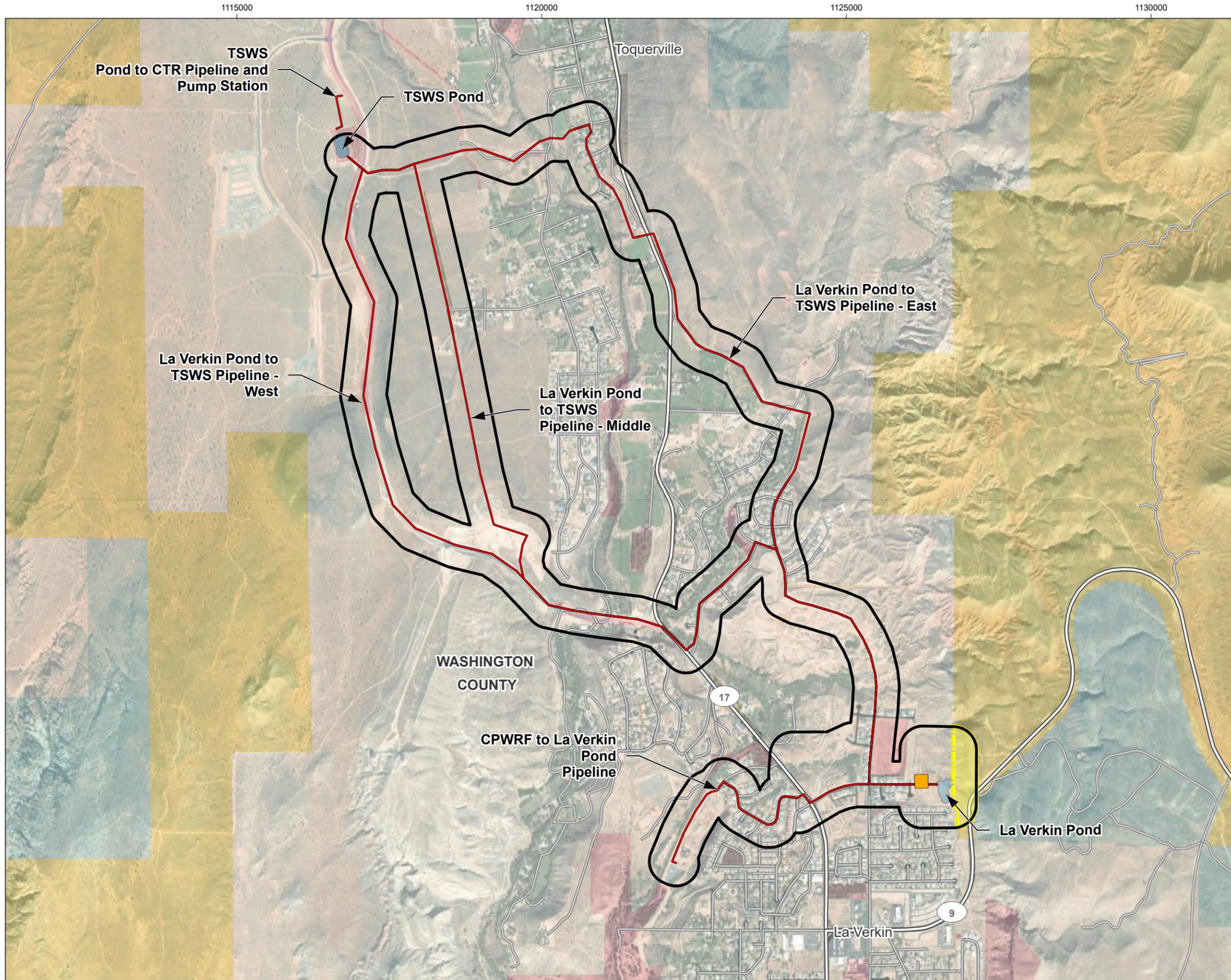


Figure No. **2**  
Title  
**Special Status Plant Survey - Results**

Client/Project  
Washington County Water Conservancy District  
Eastside Reuse System

Project Location  
Washington County, UT  
Prepared by AB on 2025-09-18  
TR by DG on 2025-09-19  
IR by JM on 2025-09-22



- Infrastructure**
- Proposed System Centerline
  - Proposed Reservoir
  - Assessment Area
  - BLM Survey Area

- Survey Result**
- Noxious Weed Point
  - Scotch Thistle

- Road or Highway**
- Secondary Road
  - Local Road

- Land Ownership**
- Bureau of Land Management
  - Municipal
  - Mining Claim
  - Private
  - Road
  - Shivwits Reservation
  - State
  - US Forest Service
  - Unknown
  - Water Body



- Notes**
- Coordinate System: NAD 1983 2011 StatePlane Utah South FIPS 4303 Ft Intl
  - Maps and north arrow are oriented to true north
  - Data Sources: Stantec Data, 2025; Washington County Parcel Data, 2025; Utah Geospatial Resource Center, 2025; Bureau of Land Management, 2024
  - Background: Esri World Imagery



## Appendix B Surveyor Qualifications



## 2025 Special Status Plant Species Clearance Survey Report Appendix B Surveyor Qualifications

### **Jacob Moss**

Mr. Moss is a botanist with a B.S. in Botany from Cal Poly Humboldt in Arcata, California and has 10 years of experience managing and leading field efforts for botanical surveys in multiple states across the U.S. west. He specializes in rare and sensitive plant species within the Great Basin ecoregion of Nevada and Utah and routinely works on small and large projects for the federal and private sectors in relation to energy transmission, solar, natural gas, and fiber optic lines. Mr. Moss is current on the Uintah Basin Rare Plant Surveyor training and was the field crew leader for this project.

Mr. Moss was the sole botanical surveyor within the BLM Survey Area.

### **Seth Topham**

Mr. Topham has 20+ years of experience working as a biologist/botanist on projects in Utah, Nevada, Arizona, California, and Idaho. Mr. Topham has specialized experience working with threatened, endangered, and candidate species and otherwise considered sensitive plant and animal species. Mr. Topham has attended the Uintah Basin Rare Plant Surveyor Training multiple times and has kept current on the training over his career. Mr. Topham has been authorized as a Qualified Botanist for threatened and endangered plants in Utah since January 2021.

Mr. Topham collected noxious weed data and searched for milkweed within the Assessment Area during wildlife surveys.

### **Daniel Jasperson**

Mr. Jasperson is an environmental scientist with 7 years of experience in ecology, biological surveys, wetland delineations, and plant identification. Mr. Jasperson has assisted in and led field data collection efforts for a variety of wetland delineation, habitat and vegetation mapping, rare plant surveys within Nevada and Utah, and wetland mitigation bank monitoring projects. Mr. Jasperson has a B.S. in Biology from the University of Wisconsin, Madison and is current on the Uintah Basin Rare Plant Surveyor training.

Mr. Jasperson searched for noxious weeds and milkweed within the Assessment Area during aquatic resource surveys.



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# Aquatic Resources Delineation Report

Eastside Reuse System, Washington County, Utah



Stantec Consulting Services Inc.

Prepared for:  
Bureau of Reclamation, Provo Area Office –  
Upper Colorado Basin Region  
and  
Washington County Water Conservancy  
District  
Prepared by:  
Stantec Consulting Services Inc.

Date:  
November 2025  
Project/File:  
Eastside Reuse System

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## Executive Summary

The Washington County Water Conservancy District and its regional partners are planning to extend county water supplies through agricultural exchange and indirect potable reuse. This Eastside Reuse System (System) is vital to meet the future water supply needs of the region. This aquatic resource delineation report describes Stantec Consulting Services Inc.'s (Stantec's) methods and results for aquatic resource delineation for the System's due diligence and permitting efforts.

Wetland determinations and the delineation of wetland boundaries were based on criteria described in the *Corps of Engineers Wetland Delineation Manual* (USACE 1987), subsequent guidance documents and publications, and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0* (USACE 2008a). Additionally, stream presence or absence was based on criteria described in the USACE's *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (USACE 2008b) and the *Streamflow Duration Assessment Method for the Arid West and Western Mountains of the United States* (Mazor et al. 2024).

No wetlands were identified within the aquatic resource delineation Survey Area. Stantec identified and delineated three stream segments in the field and digitally mapped four stream segments via aerial imagery (due to land access restrictions). Additionally, four waterbodies with an OHWM were mapped within the Survey Area; three in the field and one digitally. **Table 1** provides a summary of Stantec's findings.

*Table 1 Executive Summary - Aquatic Resource Summary*

Feature ID	Cowardin Code / Flow Type	Latitude / Longitude <sup>1</sup>	Size <sup>2,3</sup> (acres)	Size <sup>2</sup> (linear feet)
<b>Wetlands</b>				
None	N/A	N/A	0.00	N/A
<b>Streams</b>				
ST-01 (La Verkin Creek)	PER	37°12'59.87"N / 113°16'46.09"W	0.17	637.60
ST-02 (Unnamed)	INT	37°13'6.16"N / 113°16'16.25"W	<0.01	353.41
ST-03 (Ash Creek)	INT	37°13'29.71"N / 113°17'1.58"W	0.10	427.27
ST-04 (Ash Creek)	INT	37°14'46.90"N / 113°17'17.20"W	0.10	440.80
ST-05 (La Verkin Creek)	PER	37°13'58.25"N / 113°16'25.24"W	0.40	1,459.83



**Aquatic Resource Delineation Report**  
Executive Summary

<b>Feature ID</b>	<b>Cowardin Code / Flow Type</b>	<b>Latitude / Longitude <sup>1</sup></b>	<b>Size <sup>2,3</sup> (acres)</b>	<b>Size <sup>2</sup> (linear feet)</b>
ST-06 <sup>4</sup> (La Verkin Creek)	PER	37°13'33.14"N / 113°16'45.81"W	0.65	2,346.00
ST-07 (Unnamed)	EPH	37°13'17.44"N / 113°16'80.24"W	0.04	490.35
<b>Stream Total</b>			<b>1.47</b>	<b>6,155.26</b>
<b>Waterbodies</b>				
<b>OW-01</b>	N/A	37°12'48.12"N / 113°16'49.28"W	0.03	N/A
<b>OW-02</b>	N/A	37°13'40.75"N / 113°16'35.63"W	0.09	N/A
<b>OW-03</b>	N/A	37°14'44.63"N / 113°17'57.29"W	0.73	N/A
<b>OW-04</b>	N/A	37°13'25.41"N / 113°16'13.17"W	0.58	N/A
<b>Waterbody Total</b>			<b>1.43</b>	<b>N/A</b>

**Key:**

EPH = ephemeral flow classification  
 INT = intermittent flow classification  
 PER = perennial flow classification  
 N/A = Not applicable

**Notes:**

- <sup>1</sup> Latitude and longitude represent an approximate center point.  
<sup>2</sup> Size of features within the Survey Area.  
<sup>3</sup> Stream acreage assumes a consistent OHWM width.  
<sup>4</sup> Two segments of La Verkin Creek (ST-06) are combined due to extremely close proximity to one another.



## **Acronyms / Abbreviations**

<b>Acronym / Abbreviation</b>	<b>Full Name</b>
HUC	Hydrologic Unit Code
NAIP	National Agriculture Imagery Program
NHD	National Hydrography Dataset
NRCS	U.S. Department of Agriculture Natural Resources Conservation Service
NWI	National Wetlands Inventory
OHWM	ordinary high-water mark
Stantec	Stantec Consulting Services Inc
Survey Area	Areas with a 400-foot survey corridor of the System East Side Project centerline and non-linear footprints
System	Washington County Eastside Reuse System
U.S.	United States
USACE	U.S. Army Corp of Engineers
USGS	United States Geological Survey
WCWCD	Washington County Water Conservancy District



# 1 Introduction

## 1.1 Purpose

The purpose of the System is to 1) augment potable water supplies by conveying non-potable reuse water to irrigation users in exchange for current irrigation sources to be used as potable supply, and 2) supplement secondary irrigation deliveries with non-potable reuse water.

The purpose of this report is to describe the aquatic resources existing on-site and the connectivity to off-site waters of those aquatic resources. This report contains the methods used to delineate on-site, a summary of aquatic resources, and supplemental information (e.g., figures, data sheets, photographs).

## 1.2 Applicant Contact Information

Washington County Water Conservancy District (WCWCD)  
533 Waterworks Drive  
St. George, Utah 84770  
(435) 673-3617

**Applicant's Consultant Information**  
Stantec Consulting Services Inc. (Stantec)  
150 N 200 E, Suite 201  
St. George, Utah 84770

# 2 Project Description and Location

The System's proposed pipeline routes and infrastructure footprints are within the cities of Toquerville and La Verkin Utah and includes the following facilities:

- Confluence Park Water Reclamation Facility (CPWRF) to La Verkin Pond Pipeline (approximately 6,700 feet)
- La Verkin Pond (approximately 2 acres)
- La Verkin Pond to Toquerville Secondary Water System (TSWS) Pipeline and Pump Station (up to approximately 20,000 feet)
- TSWS Pond to Chief Toquer Reservoir Pump Station (<1 acre)
- Advanced Water Purification Demonstration Facility (approximately 2 acres)

The System footprint is displayed in **Appendix A, Figure 1**. The System's preliminary design is displayed in **Appendix A, Figure 2**.



## Aquatic Resource Delineation Report

The System's Survey Area (further described in Section 2.1) overlaps two HUC-12 sub-watersheds: the Lower La Verkin Creek and the Wet Sandy-Ash Creek. The Survey Area primarily occurs on private lands within municipal, residential, commercial, and light-agricultural areas. The System has a general center point located of the following latitude and longitude: 37° 14' 11.31" N, 113° 17' 4.8264" W. Due to the Survey Area's size, section, township, and range information can be made available upon request.

The Survey Area can be accessed from St. George, Utah by taking Interstate-15 north to Exit 16 and continuing east onto UT-9/W State Street. Continue north on N State Street to the Survey Area's southern and western boundaries.

### 2.1 Survey Area Description

Stantec completed delineation surveys for aquatic resources (i.e., wetlands, streams, springs, open waters) within a 400-foot survey corridor (200 feet on each side of the Washington County Eastside Reuse System [System] centerline and non-linear footprints), regardless of land jurisdiction (assuming right-of-entry was granted on private land). This survey corridor is hereafter referred to as the Survey Area. The Survey Area accounts for a proposed 75-foot workspace and a 125-foot buffer beyond potential disturbance for each side of the System centerline and non-linear footprints. However, Stantec did not survey within residential or commercial lots (or similar highly developed areas) or on land without private landowner approval. The aquatic resources Survey Area are displayed in **Appendix A, Figure 1**.

## 3 Methods

### 3.1 Desktop Review

Stantec's aquatic resource delineation consisted of a desktop review of public data as well as on-site verification and delineation of wetlands, streams, and open waters within the Survey Area. The desktop review was conducted to preliminarily map features potentially present within the Survey Area.

The initial steps in locating aquatic resources included a review of the following data:

- National Wetlands Inventory (NWI) data
- U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) soil survey data
- United States Geological Survey (USGS) National Hydrography Dataset (NHD) data
- National Agriculture Imagery Program (NAIP) aerial imagery

These data sources provided geo-spatial information on wetlands, streams, open waters, and hydric soils that may occur within the Survey Area. Potential aquatic resources identified through desktop review included those areas identified as wetlands or waterbodies by NWI data, areas mapped as having hydric soils, and areas mapped as having streams or waterbodies by the NHD data and USGS topographic



quadrangle maps. These areas were investigated on-site between April 3<sup>rd</sup> and April 11<sup>th</sup>, 2025, and again between June 24<sup>th</sup> and June 26<sup>th</sup>, 2025. Field delineation methodology is described separately as a general approach and by aquatic resource type in the subsections below. Publicly available aquatic resources and soils data are displayed in **Appendix A, Figures 3 and 4**.

### 3.2 Wetlands

Wetland determinations and the delineation of wetland boundaries were based on criteria described in the *Corps of Engineers Wetland Delineation Manual* (USACE 1987), subsequent guidance documents and publications, and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0* (USACE 2008a). According to these procedures, areas that, under normal circumstances, reflect a predominance of hydrophytic vegetation (i.e., water-loving vegetation), hydric soils (formed under conditions of saturation, flooding or ponding long enough to develop anaerobic conditions in the A/B horizons), and wetland hydrology (e.g., inundated or saturated soils) are considered wetlands. If found, the boundary of each wetland was delineated by walking the perimeter of the wetland with a GPS unit capable of sub-50-centimeter accuracy (e.g., Arrow 100+ GNSS receiver).

If wetlands were located, data was collected from wetland determination sample points in each wetland and for paired representative, adjacent non-wetland areas. A minimum of one wetland sample point and one upland sample point would be evaluated at each wetland location. Additionally, if located, wetlands would be classified using the Cowardin et al. (1979) system. Climatic conditions, an evaluation required on the USACE wetland determination data form, were determined prior to field surveys using Environmental Protection Agency's antecedent precipitation tool.

### 3.3 Riparian Areas

Riparian areas are vegetated zones that form a transition between stream communities and upland areas. These areas typically exhibit vegetation and physical characteristics associated with permanent sources of surface or subsurface water. These areas may or may not meet all three USACE criteria for wetlands, and, within an individual system, may contain wetland and non-wetland areas and still be considered riparian. In southern Utah, riparian areas are often characterized by a distinct zone of shrubs or trees such as willow (*Salix spp.*), cottonwood (*Populus spp.*), and salt cedar (*Tamarix spp.*). Stantec qualitatively determined the presence or absence of riparian areas based on the description above. If located, riparian areas were delineated by walking the perimeter of the riparian habitat with a GPS unit capable of sub-50-centimeter accuracy and/or using aerial imagery to define the extent of riparian buffer.

### 3.4 Streams and Waterbodies

#### 3.4.1 Streams

"Blue line" streams identified on USGS topographic maps and in the NHD were investigated during on-site delineations. Stream presence or absence was based on criteria described in the USACE's *A Field Guide to the Identification of the Ordinary High-Water Mark (OHWM) in the Arid West Region of the*



## Aquatic Resource Delineation Report

Western United States (USACE 2008b) and the *Streamflow Duration Assessment Method for the Arid West and Western Mountains of the United States* (Mazor et al. 2024). Streams were assigned a flow status based on Mazor et al. (2024) as either ephemeral, intermittent, or perennial. Data forms were completed following the guidance described in the *Updated Datasheet for the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (USACE 2010). If found, the centerline of streams were delineated by walking the center of the stream with a GPS unit capable of sub-50-centimeter accuracy (e.g., Arrow 100+ GNSS receiver). If centerline delineation was not feasible or safe, delineations were made for each bank and a centerline added during data post-processing.

Human-made and natural upland drainage swales and channels were mapped to document hydrological connectivity between other aquatic resources or to document significant hydrological features that did not meet USACE aquatic resource standards. Stantec also recorded the locations of culvert and storm drains when observed. These hydrologic infrastructure may or may not be associated with surface waters.

### 3.4.2 Waterbodies

Waterbodies such as playas, livestock ponds, natural lakes were searched for based on the “open water” definition provided by the USACE as, “*An area that, during a year with normal patterns of precipitation, has standing or flowing water for sufficient duration to establish an ordinary high water mark. Aquatic vegetation within the area of standing or flowing water is either non-emergent, sparse, or absent. Vegetated shallows are considered to be open waters*” (USACE undated). If found, open water features were delineated by walking the perimeter of the feature along the OHWM and recording the location of the OHWM with a GPS unit capable of sub-50-centimeter accuracy (e.g., Arrow 100+ GNSS receiver).

## 4 Existing Conditions

### 4.1 Landscape Setting

The Survey Area encompasses approximately 448 acres<sup>1</sup> and is situated at the intersection of several Level IV ecoregions: Creosote Bush-Dominated Basins, Escarpments, and the Sand Deserts (Woods et al. 2001). The change from the Escarpments and Sand Deserts ecoregions of the Colorado Plateau to the Creosote Bush-Dominated Basins ecoregion of the Mojave Basin and Range represent a distinct change in vegetative communities, hydrological influences, and topography. In this area the Colorado Plateau’s eroded and deeply dissected tablelands, mesas, and benches give way to lower elevation alluvial fans and basins with interspersed mountains. Vegetative communities dominated by pinyon-

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<sup>1</sup> Out of the 488 acres within the Survey Area, 185 (41%) were not surveyed in the field due to land access restrictions.



juniper woodlands at higher elevations in the east change to creosote bush, blackbrush, big sagebrush, desert grasses and eventually Mojave desert communities further south (Woods et al. 2001).

Elevation is highest in the norther portion of the Survey Area at approximately 3,500 feet above mean sea level and is lowest in the southern end at approximately 3,000 feet above mean sea level. Streams within the Survey Area generally flow north to south before eventually converging with the Virgin River. Land use is primarily residential and commercial; however, most of the System’s western and central route “options” are used for light-agriculture, grazing, or remain semi-natural. Human alteration is prevalent in the form of roads, homes, businesses and light-agriculture.

## **4.2 Soils**

Stantec used the NRCS SSURGO database to evaluate and map soils within the Survey Area and reviewed relevant data to guide and inform aquatic resource investigation and delineation. Based on NRCS guidance, hydric soils were evaluated based on the hydric component composition classifications provided in **Table 2**.

*Table 2 NRCS Hydric Soil Classification Categories*

<b>Percent Hydric Soil Component</b>	<b>Hydric Soil Classification</b>
100	Hydric
67 – 99	Predominantly Hydric
34 – 66	Partially Hydric
1 – 33	Predominantly Non-Hydric
0	Non-Hydric

**Source:** NRCS 2013

NRCS mapped soils within the Survey Area are provided in **Table 3** and displayed in **Appendix A, Figure 3**. Most soils mapped within the Survey Area are well drained and non-hydric. Partially hydric soils within the Survey Area are restricted to the La Verkin Creek and Ash Creek floodplains / riparian areas. Given the regional geographic context of the System and Survey Area, the majority non-hydric soil makeup is expected and supports other evidence of a generally arid landscape with wet conditions restricted to major drainages.



## Aquatic Resource Delineation Report

Table 3 Mapped NRCS Soils within the Survey Area

Soil Unit Name	Slope	Drainage Class	Hydric Classification	Acres within Survey Area
Cave very gravelly sandy loam	2 – 7	Well drained	Predominantly Nonhydric	18.70
Eroded land-Shalet complex	N/A	N/A	Non-hydric	41.50
Fluvaquents and torrifuvents, sandy	N/A	Poorly drained	Partially Hydric	32.40
Gravel pits	N/A	N/A	Non-hydric	0.30
Hobog-Rock land association	N/A	Well drained	Non-hydric	11.40
Isom cobbly sandy loam	3 – 30	Well drained	Non-hydric	3.50
Junction fine sandy loam	2 – 5	Well drained	Non-hydric	6.00
Leeds silty clay loam	1 – 2	Well drained	Non-hydric	21.90
Leeds silty clay loam	5 – 10	Well drained	Non-hydric	16.90
Rock outcrop	N/A	N/A	Non-hydric	5.80
Rough broken land	N/A	N/A	Non-hydric	52.60
Stony colluvial land	N/A	N/A	Non-hydric	104.30
Tobler fine sandy loam	N/A	Well drained	Non-hydric	35.20
Tobler silty clay loam	N/A	Well drained	Non-hydric	17.20
Winkel gravelly fine sandy loam	1 – 8	Well drained	Non-hydric	81.10

Source: Soil Survey Staff 2025

### 4.3 Hydrology

La Verkin Creek is a tributary of the Virgin River that originates north of Zion National Park. The stream exits the western park boundary and flows through Bureau of Land Management-administered lands and private lands near La Verkin before its confluence with the Virgin River. Wildfires and stream channelization have impacted the stream and its riparian corridor. Surface flow throughout most of the stream length is considered perennial.

Ash Creek is a tributary of the Virgin River that extends along Interstate-15 from southern Iron County to the city of St. George. Surface water flow within the upper part of Ash Creek is typically perennial; however, water seeps into fractures surrounding and within the OHWM of Ash Creek Reservoir. This reduces the surface water volume downstream of the reservoir. Below Ash Creek Reservoir Ash Creek is mostly ephemeral between southern Iron county and northern Washington County parallel to Interstate-15.



## 5 Aquatic Resources

The following sections detail the findings of Stantec’s aquatic resources delineation surveys. Photographs as aquatic resources are provided in **Appendix B**. A full plant list from on-site surveys is provided in **Appendix C**. Aquatic resource data forms are provided in **Appendix D**.

### 5.1 Wetlands

Stantec did not observe wetland conditions within the Survey Area during on-site field surveys in 2025. This includes a determination that riparian areas were uplands and not streamside / fringe wetlands.

### 5.2 Riparian Areas

Stantec identified and mapped one riparian area associated with an ephemeral stream (ST-02) while in the field. An additional six riparian areas were mapped via offsite aerial imagery. Together these seven riparian areas total 17.34 acres within the Survey Area. Most of these areas correspond to La Verkin Creek and Ash Creek intersecting portions of the Survey Area (**Appendix A, Figure 6**). None of these areas were classified as wetlands based on USACE criteria.

### 5.3 Streams and Waterbodies

Stantec identified and delineated three streams in the field and digitally mapped four streams via aerial imagery (due to land access restrictions). Additionally, four waterbodies with an OHWM were mapped within the Survey Area, three in the field and one digitally. Human-made channels were evaluated for on OHWM, but the totality of evidence indicated that the features do not meet USACE stream criteria. Streams and waterbodies within the Survey Area are summarized in **Table 4** and individually described in the sections below. These features are displayed in the map set of **Appendix A, Figure 6**.



## Aquatic Resource Delineation Report

Table 4 Aquatic Resource Summary

Feature ID	Cowardin Code / Flow Type	Latitude / Longitude <sup>1</sup>	Size <sup>2,3</sup> (acres)	Size <sup>2</sup> (linear feet)
<b>Streams</b>				
ST-01 (La Verkin Creek)	PER	37°12'59.87"N / 113°16'46.09"W	0.17	637.60
ST-02 (Unnamed)	INT	37°13'6.16"N / 113°16'16.25"W	<0.01	353.41
ST-03 (Ash Creek)	INT	37°13'29.71"N / 113°17'1.58"W	0.10	427.27
ST-04 (Ash Creek)	INT	37°14'46.90"N / 113°17'17.20"W	0.10	440.80
ST-05 (La Verkin Creek)	PER	37°13'58.25"N / 113°16'25.24"W	0.40	1,459.83
ST-06 <sup>4</sup> (La Verkin Creek)	PER	37°13'33.14"N / 113°16'45.81"W	0.65	2,346.00
ST-07 (Unnamed)	EPH	37°13'17.44"N / 113°16'80.24"W	0.04	490.35
<b>Stream Total</b>			<b>1.47</b>	<b>6,155.26</b>
<b>Waterbodies</b>				
<b>OW-01</b>	N/A	37°12'48.12"N / 113°16'49.28"W	0.03	N/A
<b>OW-02</b>	N/A	37°13'40.75"N / 113°16'35.63"W	0.09	N/A
<b>OW-03</b>	N/A	37°14'44.63"N / 113°17'57.29"W	0.73	N/A
<b>OW-04</b>	N/A	37°13'25.41"N / 113°16'13.17"W	0.58	N/A
<b>Waterbody Total</b>			<b>1.43</b>	<b>N/A</b>

**Key:**

EPH = ephemeral flow classification

INT = intermittent flow classification

PER = perennial flow classification

N/A = Not applicable

**Notes:**

<sup>1</sup> Latitude and longitude represent an approximate center point.

<sup>2</sup> Size of features within the Survey Area.

<sup>3</sup> Stream acreage assumes a consistent OHWM width.

<sup>4</sup> Two segments of La Verkin Creek (ST-06) are combined due to extremely close proximity to one another.

### 5.3.1 ST-01, ST-05, and ST-06 (La Verkin Creek)

Stantec digitally mapped three separate segments of La Verkin Creek (ST-01, ST-05, and ST-06) as the stream entered and exited the Survey Area at various locations without land access authorization.

Within the Survey Area perennial flow conditions were documented. La Verkin Creek's riparian buffer areas were mapped via offsite aerial imagery due to lack of access restriction issues. However, Stantec anticipates that these areas exhibit upland conditions based on a totality of evidence from the surrounding



landscape and aerial imagery review. A photo of La Verkin Creek (from public roads) is available in **Appendix B**. Due to land access restrictions, Stantec only recorded one OHWM data form for La Verkin Creek from a publicly accessible area overlooking the stream.

### 5.3.2 ST-02 (Unnamed)

ST-02 is an intermittent stream originating from a storm drain outflow pipe fed by local stormwater and residential irrigation runoff. ST-02 is surrounded by heavy tree cover and little understory cover associated with a riparian area. The stream flows through a small riparian area before losing its discernable OHWM. A photo of ST-02 is available in **Appendix B**. Data forms for ST-02 are provided in **Appendix D**.

### 5.3.3 ST-03 and ST-04 (Ash Creek)

Stantec digitally mapped two separate segments of Ash Creek (ST-03 and ST-04) as the stream entered and exited the Survey Area at various locations without land access authorization.

Two springs near Toquerville, Utah (Toquerville Springs and Ash Creek Spring) contribute surface water that creates intermittent conditions within the Survey Area. A photo of Ash Creek is available in **Appendix B**. Due to land access restrictions, Stantec did not complete an OHWM data form for Ash Creek.

### 5.3.4 ST-07 (Unnamed)

ST-07 is a heavily incised ephemeral stream with a strongly defined bed and bank that originates from a canyon east of the Survey Area. The stream flows westward under E 200 N until its convergence with La Verkin Creek. This stream and the surrounding landscape are actively being modified by land clearing / grading. A photo of ST-07 is available in **Appendix B**. Data forms for ST-07 are provided in **Appendix D**.

### 5.3.5 Open Waters

Stantec documented four open water features (e.g., ponds, lakes, retention basins) meeting USACE OHWM criteria within the Survey Area. These include the Toquerville Secondary Water System pond, a pond used in the Interstate Rock – La Verkin Pit operations and two stormwater / flood control basins near residential and commercial development. A representative photo of OW-01 is provided in **Appendix B**.



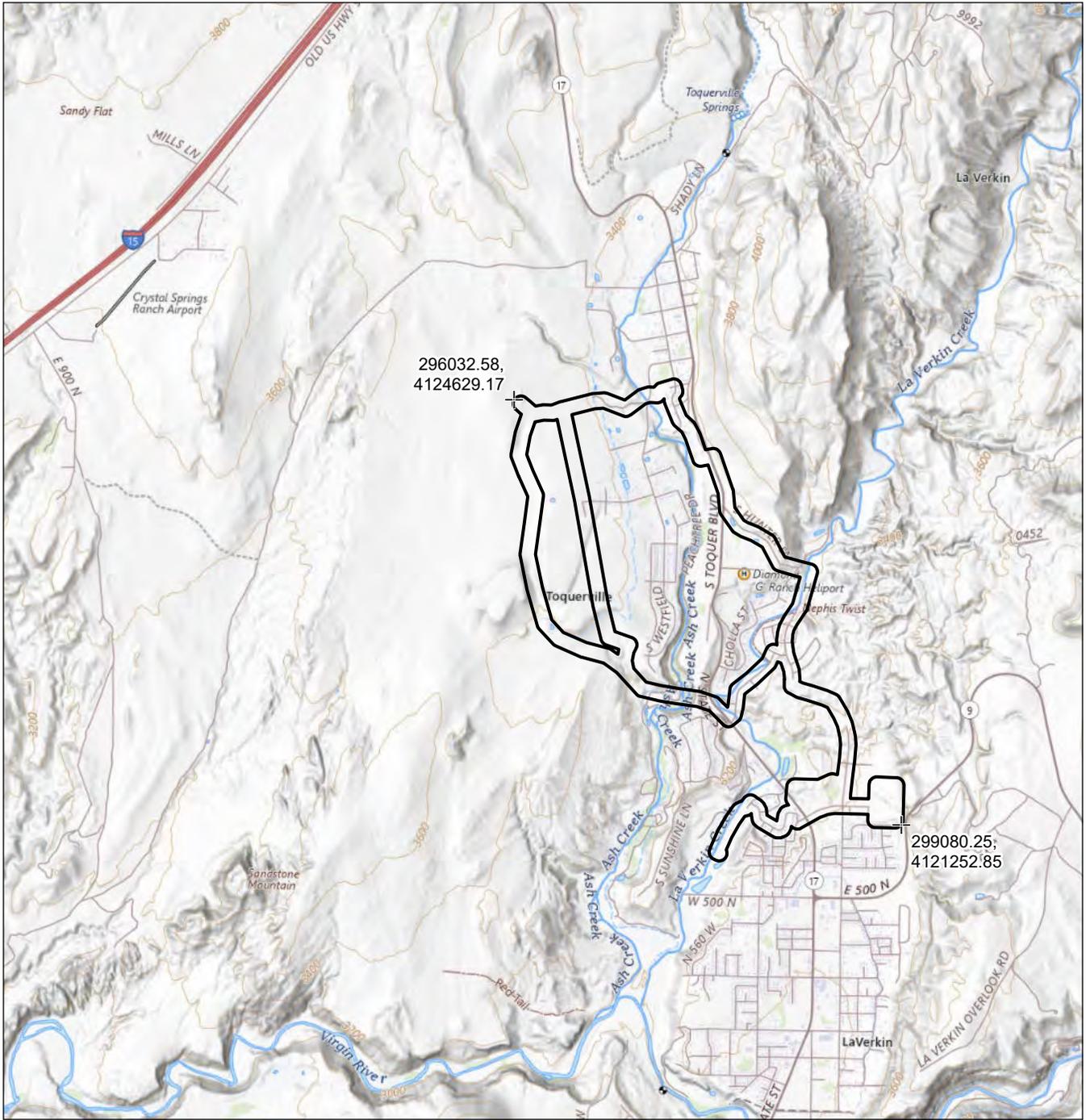
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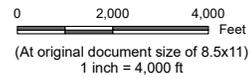
## **Appendix A Figures**

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**Legend**

-  Survey Area
-  Map Reference Control Points

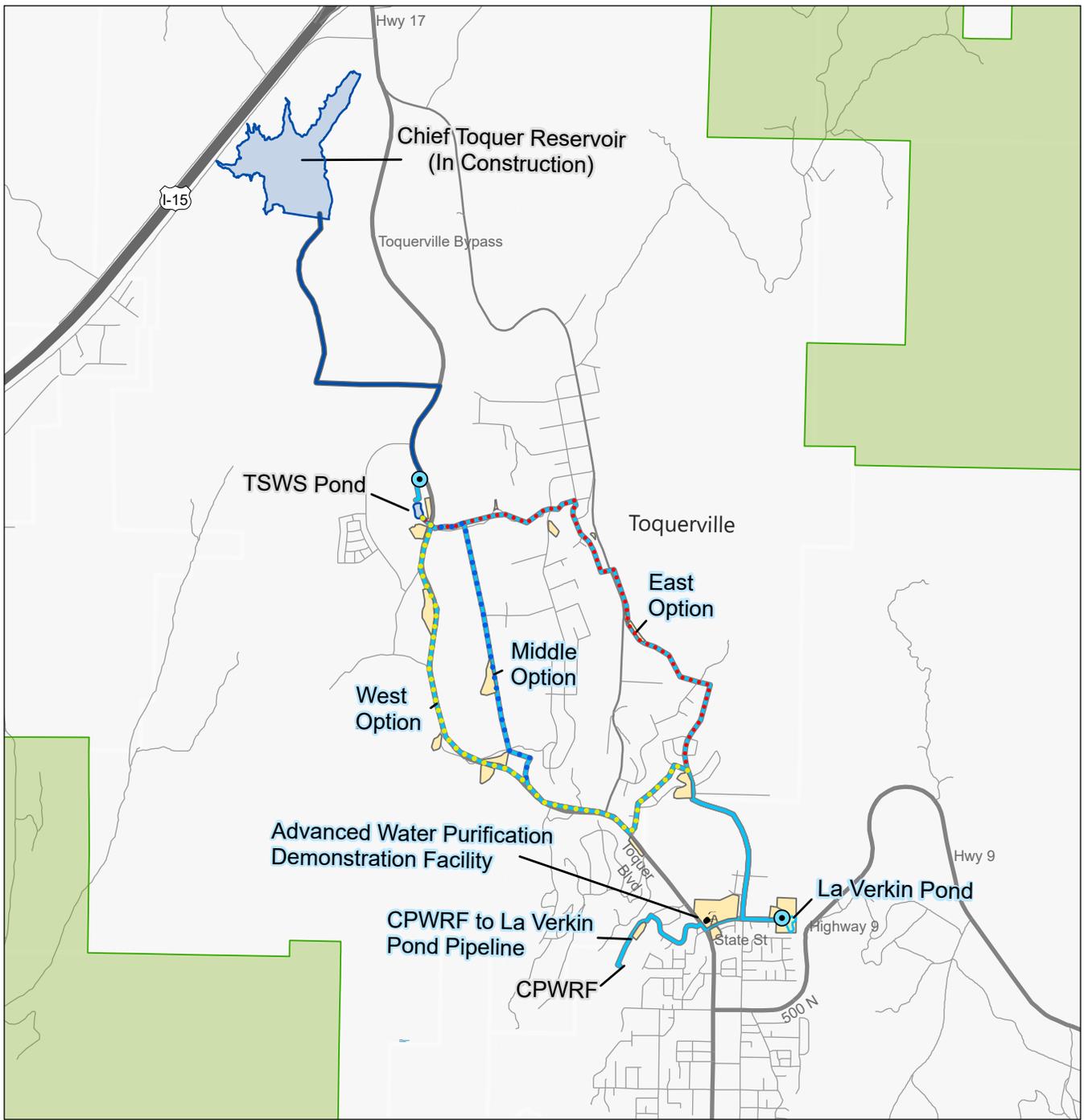


Project Location Washington County, UT Prepared by KR on 9/11/2025  
 TR by BT on 9/11/2025  
 Client/Project WCVCD Regional Reuse Purification System IR by DS on 9/11/2025  
 181301727

**Notes**  
 1. Coordinate System: NAD 1983 StatePlane Utah South FIPS 4303 Feet  
 2. Data Sources: Stantec, WCVCD, USGS  
 3. Background: USGS The National Map, Hurricane Quadrangle

Figure No. **1**  
 Title **Project Vicinity**

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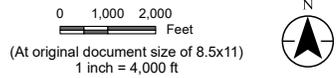


**Notes**  
 1. Coordinate System: NAD 1983 2011 StatePlane Utah South FIPS 4303 Ft Intl  
 2. Data Sources: Stantec, WCWCD  
 3. Background: Esri Human Geography Base

**Legend**

- Proposed Features**
- Demonstration Facility
  - Pump Station
  - Pipeline – Common to all Alternatives
  - Pipeline - East
  - Pipeline - Middle
  - Pipeline - West
  - Staging Area
  - Waterbody

- Existing Features**
- Pipeline
  - Waterbody
  - BLM Recreation Management Area
  - Urban Areas

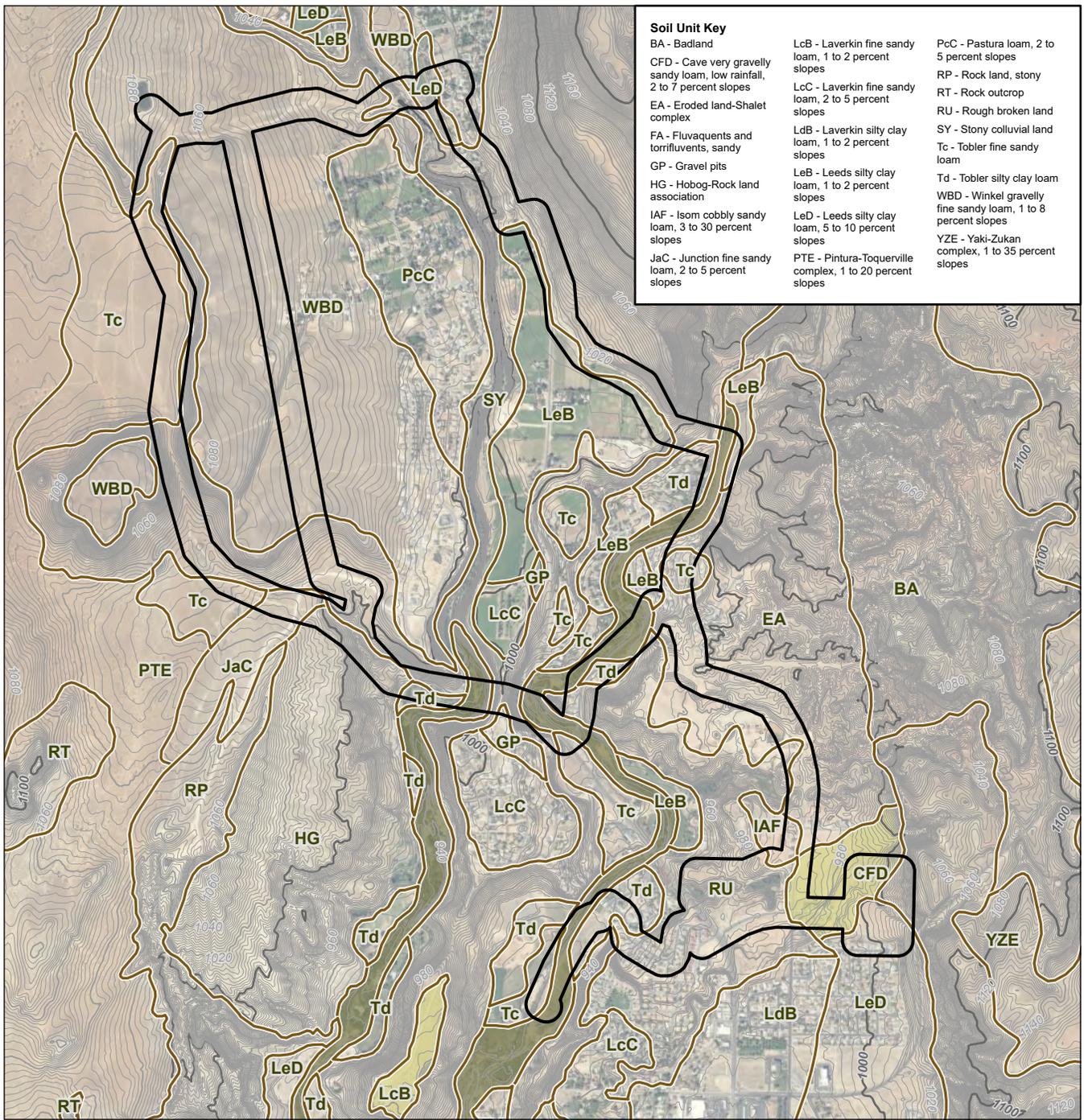


*Project Location* Washington County, UT  
 Prepared by KR on 10/30/2025  
 TR by BT on 10/30/2025  
 IR by DS on 10/30/2025  
*Client/Project* WCWCD Regional Reuse Purification System  
 181301727

*Figure No.* 2  
*Title* Preliminary Design

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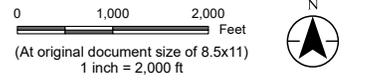
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Soil Unit Key		
BA - Badland	LcB - Laverkin fine sandy loam, 1 to 2 percent slopes	PcC - Pastura loam, 2 to 5 percent slopes
CFD - Cave very gravelly sandy loam, low rainfall, 2 to 7 percent slopes	LcC - Laverkin fine sandy loam, 2 to 5 percent slopes	RP - Rock land, stony
EA - Eroded land-Shalet complex	LdB - Laverkin silty clay loam, 1 to 2 percent slopes	RT - Rock outcrop
FA - Fluvaquents and torrifluents, sandy	LeB - Leeds silty clay loam, 1 to 2 percent slopes	RU - Rough broken land
GP - Gravel pits	LeD - Leeds silty clay loam, 5 to 10 percent slopes	SY - Stony colluvial land
HG - Hobog-Rock land association	LeD - Leeds silty clay loam, 1 to 2 percent slopes	Tc - Toler fine sandy loam
IAF - Isom cobbly sandy loam, 3 to 30 percent slopes	PTE - Pintura-Toquerville complex, 1 to 20 percent slopes	Td - Toler silty clay loam
JaC - Junction fine sandy loam, 2 to 5 percent slopes		WBD - Winkel gravelly fine sandy loam, 1 to 8 percent slopes
		YZE - Yaki-Zukan complex, 1 to 35 percent slopes



- Legend**
- Survey Area
  - Soil Unit Boundary
- Contour Interval**
- 100-foot
  - 20-foot
  - 2-foot
- Soil Hydric Rating**
- Non-Hydric
  - Predominantly Non-Hydric
  - Partially Hydric



Project Location: Washington County, UT  
 Prepared by KR on 9/10/2025  
 TR by BT on 9/10/2025  
 IR by DS on 9/10/2025

Client/Project: WCWCD  
 Regional Reuse Purification System

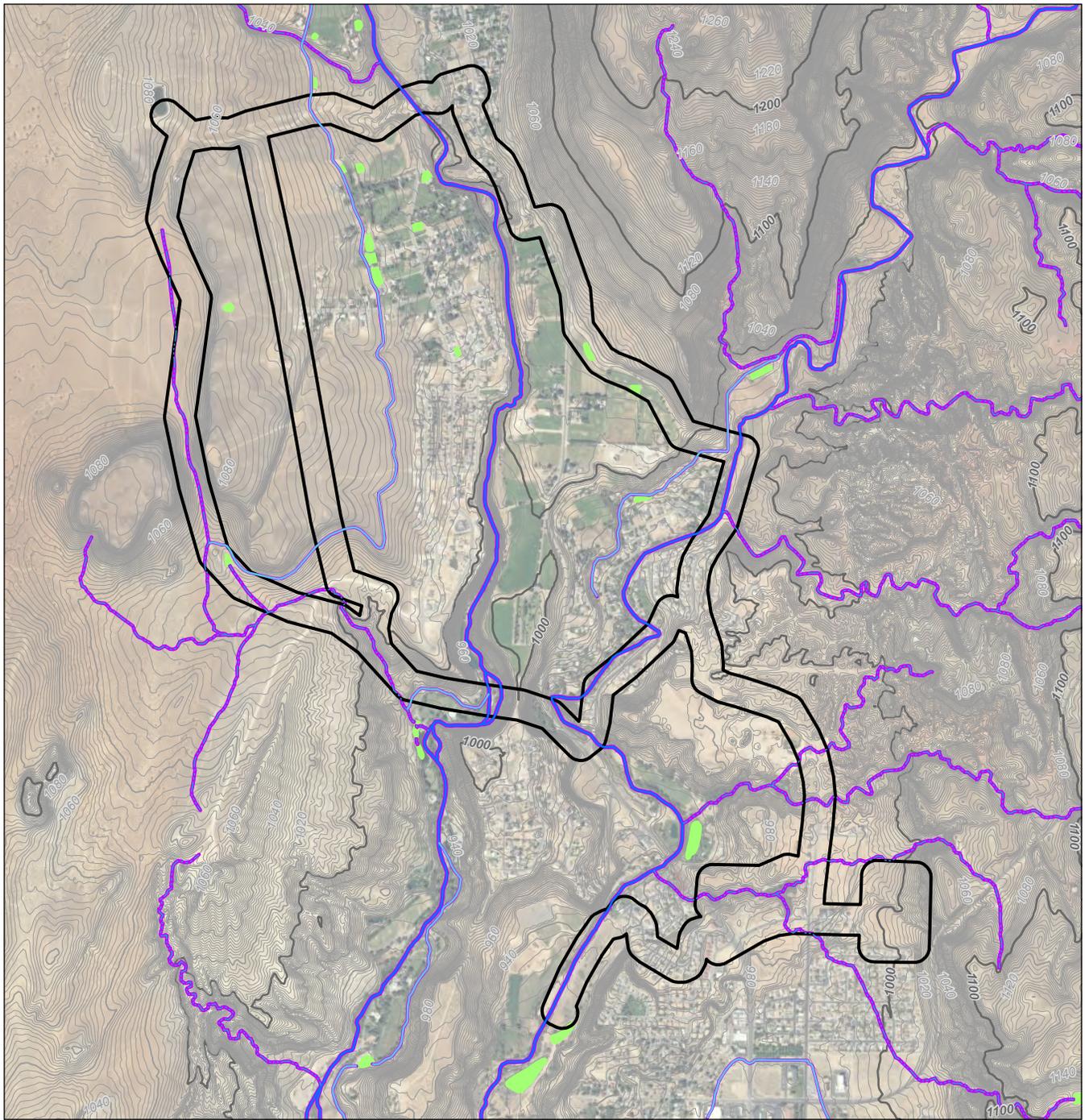
Figure No. 3

Title: NRCS Soil Survey Data and Hydric Ratings

**Notes**

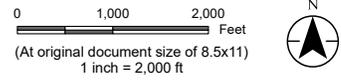
1. Coordinate System: NAD 1983 StatePlane Utah South FIPS 4303 Feet
2. Data Sources: Stantec, WCWCD, NRCS
3. Background: NAIP Imagery, 9/15/2021

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- Legend**
- Survey Area
  - NHD Flowline**
    - Perennial
    - - - Ephemeral
    - Canal Ditch
  - NWI Wetland**
    - Freshwater Pond
    - Riverine

- Contour Interval**
- 100-foot
  - 20-foot
  - 2-foot

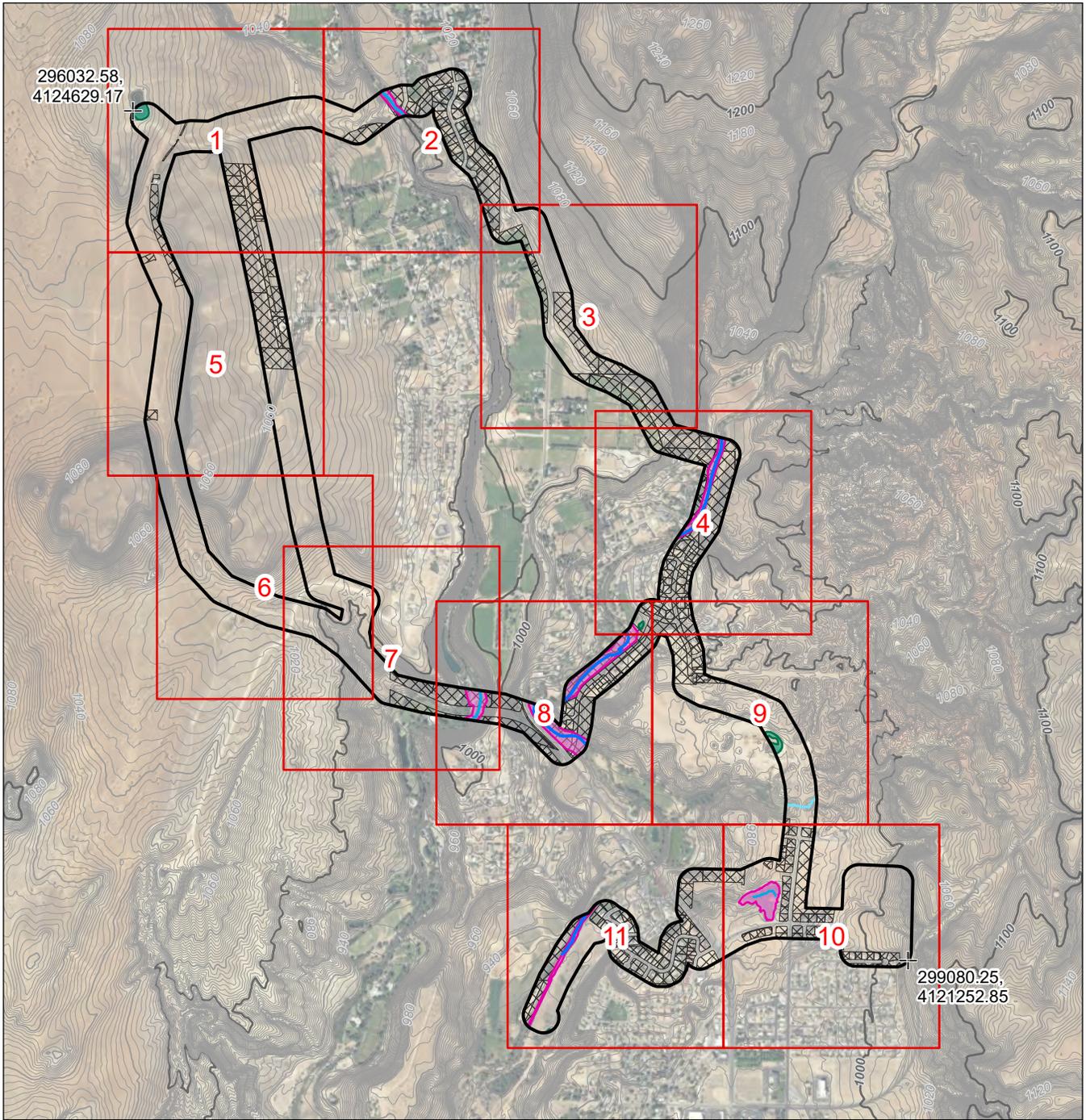


*Project Location* Washington County, UT  
*Client/Project* WCWCD Regional Reuse Purification System  
*Prepared by* KR on 9/11/2025  
*TR by* BT on 9/11/2025  
*IR by* DS on 9/11/2025  
 181301727

**Notes**  
 1. Coordinate System: NAD 1983 StatePlane Utah South FIPS 4303 Feet  
 2. Data Sources: Stantec, WCWCD, USGS  
 3. Background: NAIP Imagery, 9/15/2021

**Figure No.**  
**4**  
**Title**  
**NWI and NHD Features**

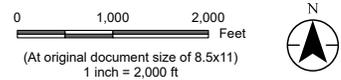
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**Notes**  
 1. Coordinate System: NAD 1983 StatePlane Utah South FIPS 4303 Feet  
 2. Data Sources: Stantec, WCWCD  
 3. Background: NAIP Imagery, 9/15/2021

- Legend**
- Survey Area
  - Survey Area Not Accessible
  - + Map Reference Control Points
- Contour Interval**
- 100-foot
  - 20-foot
  - 2-foot

- Field Collected Data**
- Stream - Perennial (1.22 acres)
  - Stream - Intermittent (0.21 acres)
  - Stream - Ephemeral (0.04 acres)
  - Open Water (1.43 acres)
  - Riparian Area (17.34 acres)



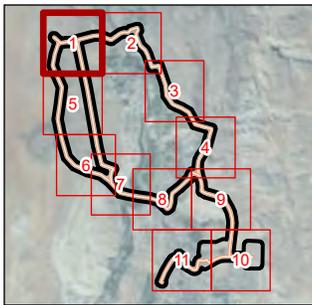
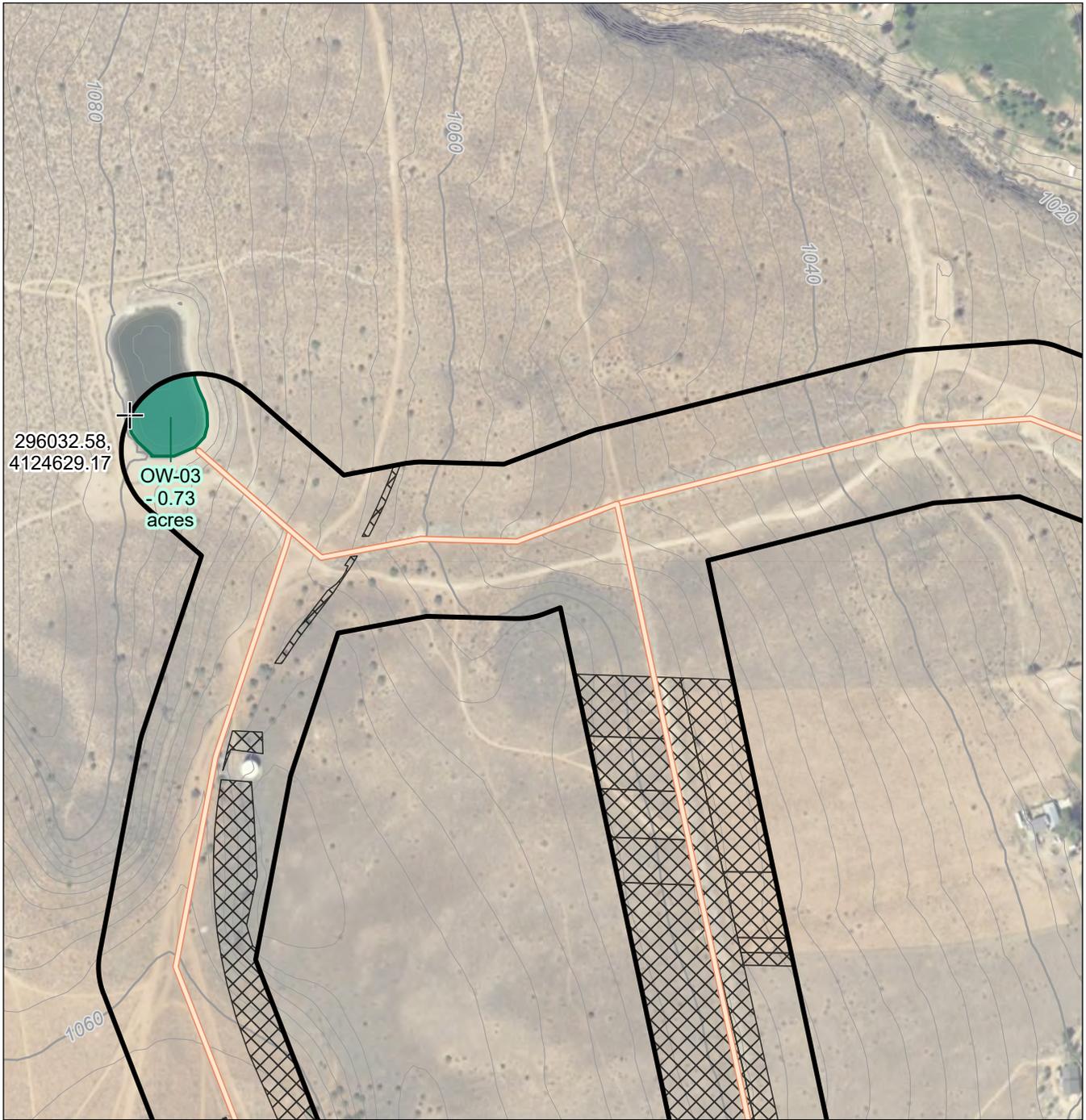
**Project Location** Washington County, UT  
**Client/Project** WCWCD Regional Reuse Purification System

Prepared by KR on 2025-11-04  
 TR by BT on 2025-11-04  
 IR by DS on 2025-11-04  
 181301727

**Figure No.** 5  
**Title** Aquatic Resources - Index Key

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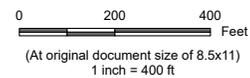


**Notes**  
 1. Coordinate System: NAD 1983 StatePlane Utah  
 South FIPS 4303 Feet  
 2. Data Sources: Stantec, WCWCD  
 3. Background: NAIP Imagery, 9/15/2021

- Legend**
- Survey Area
  - Survey Area Not Accessible
  - Proposed System Pipeline
  - Map Reference Control Points
- Contour Interval**
- 20-foot
  - 2-foot

**Field Collected Data**

- Open Water



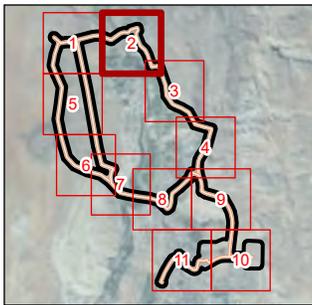
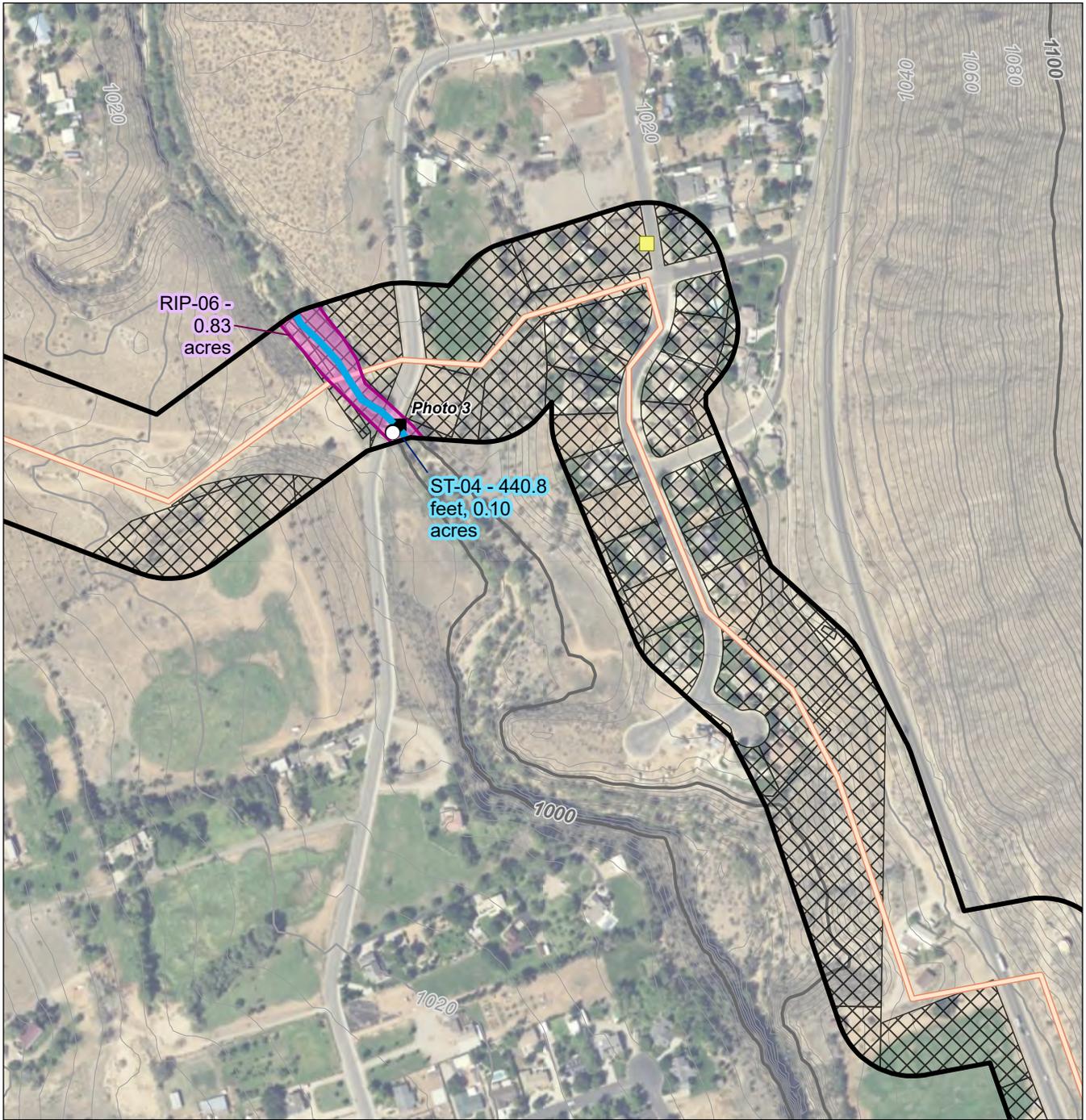
*Project Location* Washington County, UT  
*Client/Project* WCWCD Regional Reuse Purification System

Prepared by KR on 2025-11-04  
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*Figure No.*  
**6-1**

**Aquatic Resources - Detail**

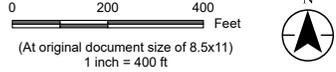
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**Notes**  
 1. Coordinate System: NAD 1983 StatePlane Utah  
 South FIPS 4303 Feet  
 2. Data Sources: Stantec, WCWCD  
 3. Background: NAIP Imagery, 9/15/2021

- Legend**
- Survey Area
  - Survey Area Not Accessible
  - Proposed System Pipeline
- Contour Interval**
- 100-foot
  - 20-foot
  - 2-foot

- Field Collected Data**
- Photo Location with Direction
  - Storm Drain
  - Stream - Intermittent
  - Riparian Area



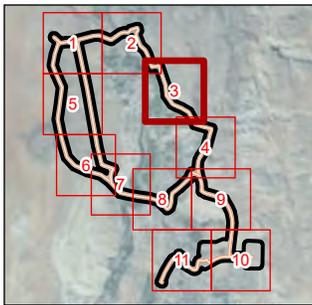
*Project Location* Washington County, UT  
*Client/Project* WCWCD Regional Reuse Purification System

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*Figure No.* 6-2  
*Title* Aquatic Resources - Detail

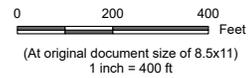
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- Legend**
- Survey Area
  - Survey Area Not Accessible
  - Proposed System Pipeline
- Contour Interval**
- 100-foot
  - 20-foot
  - 2-foot

**Field Collected Data**



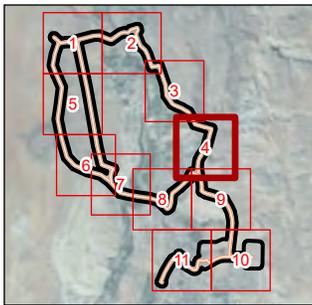
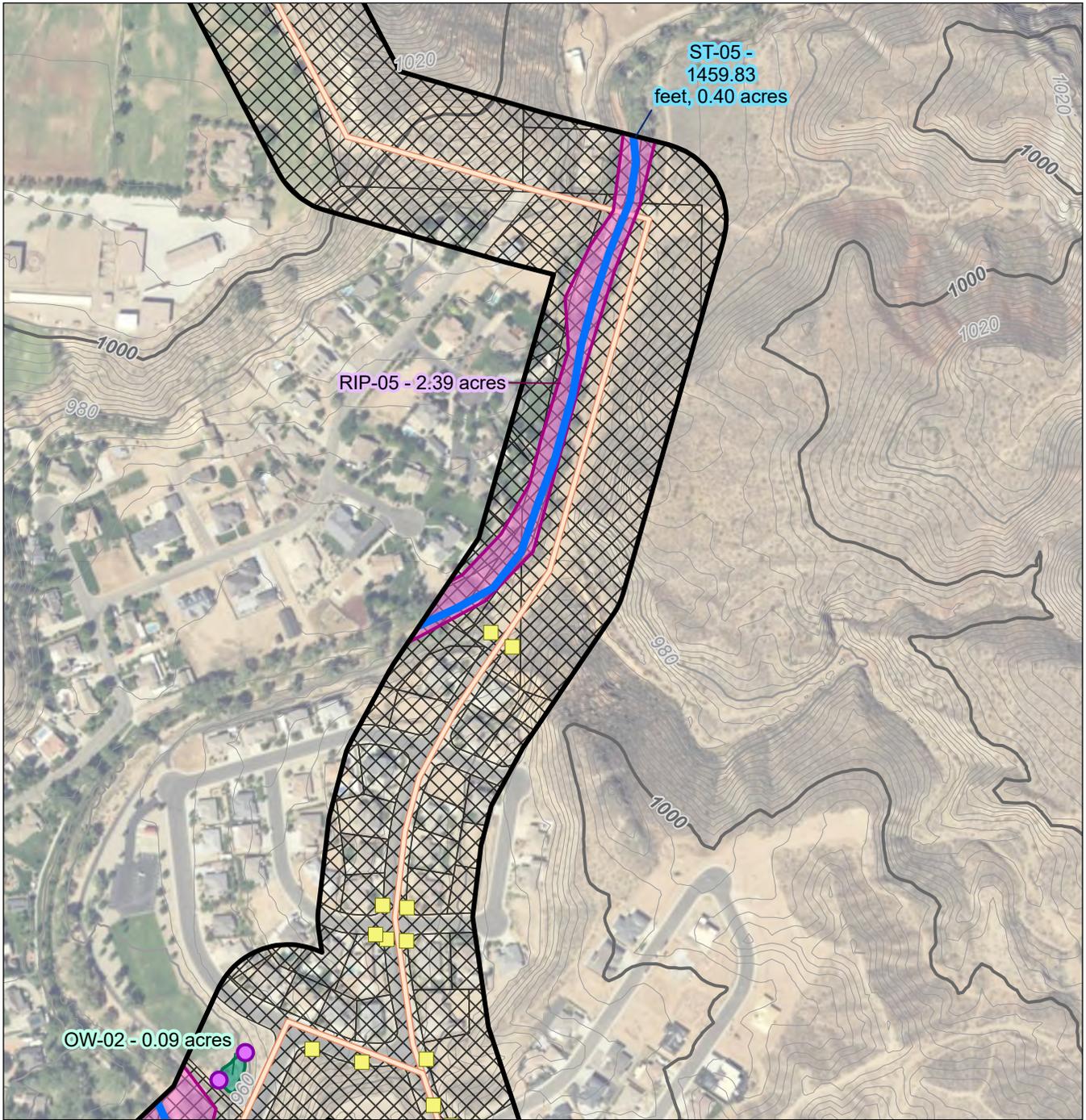
*Project Location* Washington County, UT  
*Client/Project* WCWCD Regional Reuse Purification System  
 Prepared by KR on 2025-11-04  
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 IR by DS on 2025-11-04  
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*Figure No.* 6-3  
*Title* Aquatic Resources - Detail

- Notes**
1. Coordinate System: NAD 1983 StatePlane Utah South FIPS 4303 Feet
  2. Data Sources: Stantec, WCWCD
  3. Background: NAIP Imagery, 9/15/2021

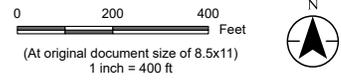
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- Legend**
- Survey Area
  - Survey Area Not Accessible
  - Proposed System Pipeline
- Contour Interval**
- 100-foot
  - 20-foot
  - 2-foot

- Field Collected Data**
- Culvert
  - Storm Drain
  - Stream - Perennial
  - Open Water
  - Riparian Area



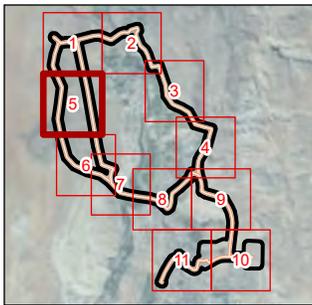
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*Client/Project* WCWCD Regional Reuse Purification System  
*Figure No.* 6-4  
*Title* Aquatic Resources - Detail

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 1. Coordinate System: NAD 1983 StatePlane Utah South FIPS 4303 Feet  
 2. Data Sources: Stantec, WCWCD  
 3. Background: NAIP Imagery, 9/15/2021

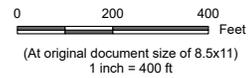
Disclaimer: This document has been prepared based on information provided by others as cited in the Notes section. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result. Stantec assumes no responsibility for data supplied in electronic format, and the recipient accepts full responsibility for verifying the accuracy and completeness of the data.

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- Legend**
- Survey Area
  - Survey Area Not Accessible
  - Proposed System Pipeline
- Contour Interval**
- 20-foot
  - 2-foot

- Field Collected Data**
- Upland Drainage Feature



*Project Location* Washington County, UT  
*Client/Project* WCWCD Regional Reuse Purification System

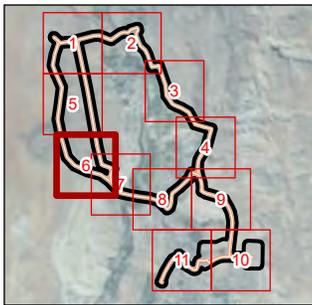
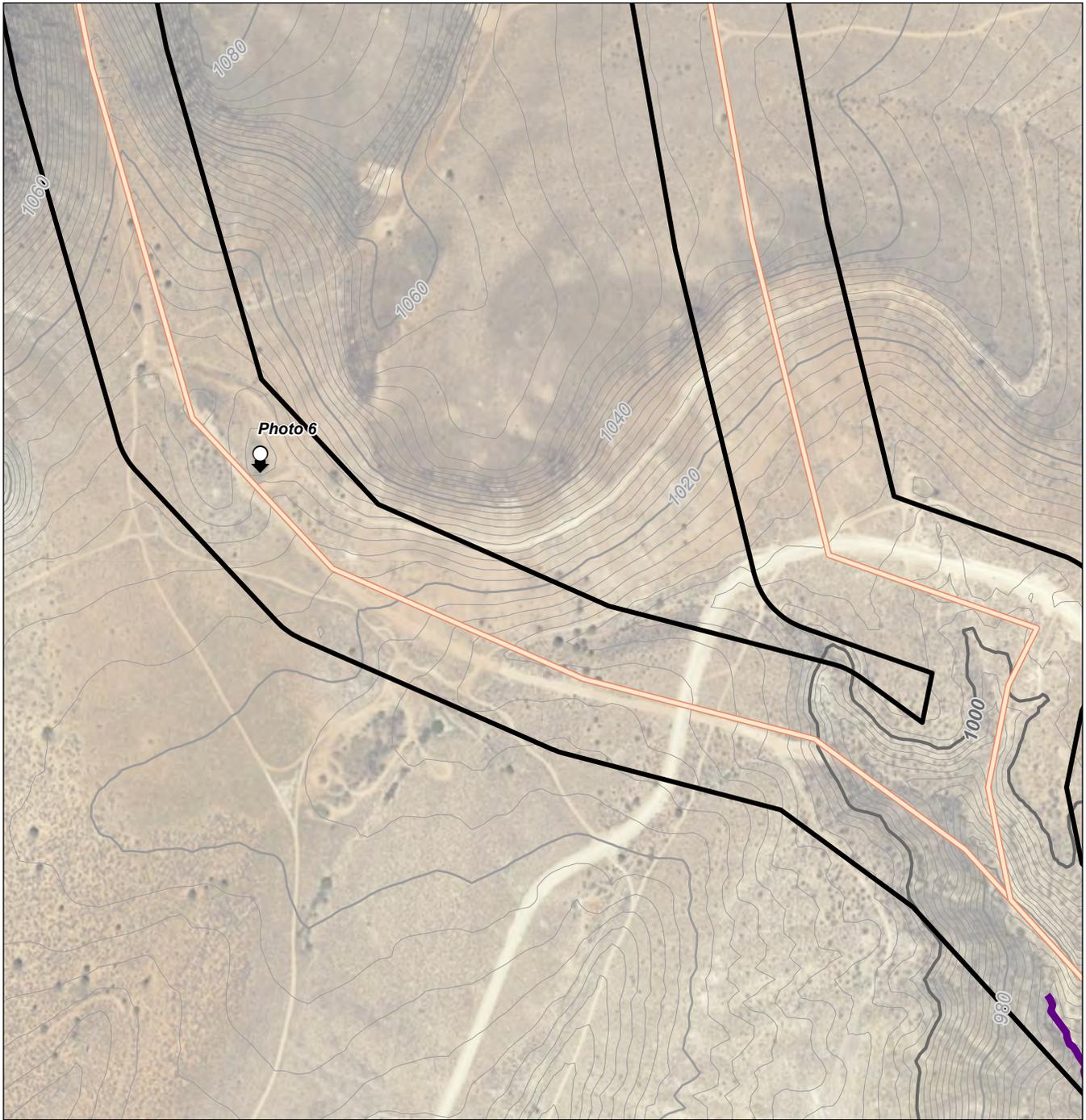
Prepared by KR on 2025-11-04  
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 IR by DS on 2025-11-04  
 181301727

*Figure No.*  
**6-5**

*Title*  
**Aquatic Resources - Detail**

- Notes**
1. Coordinate System: NAD 1983 StatePlane Utah South FIPS 4303 Feet
  2. Data Sources: Stantec, WCWCD
  3. Background: NAIP Imagery, 9/15/2021

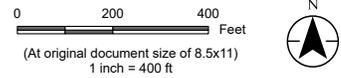
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**Notes**  
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 2. Data Sources: Stantec, WCWCD  
 3. Background: NAIP Imagery, 9/15/2021

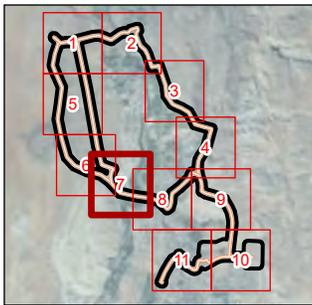
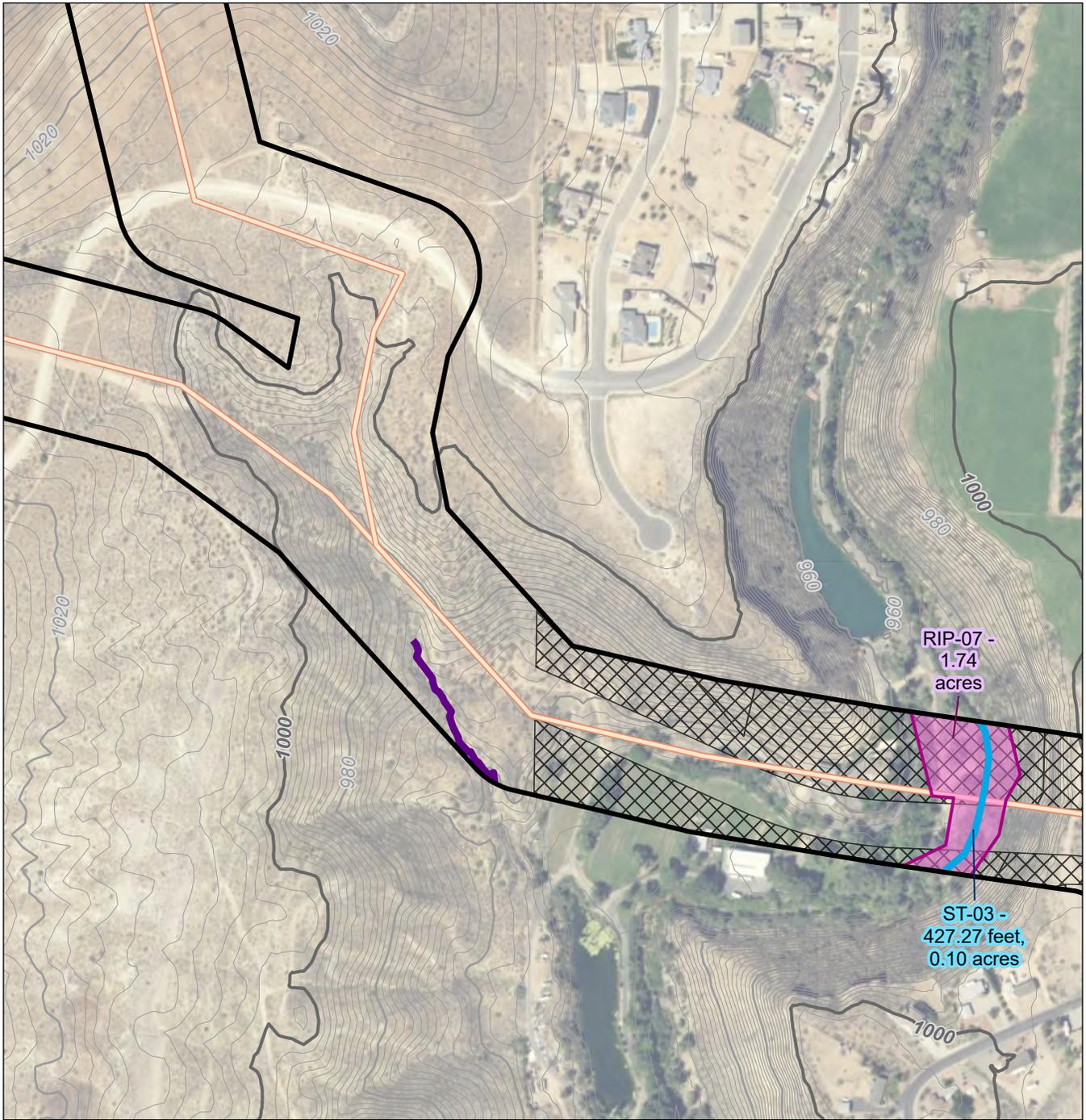
- Legend**
- Survey Area
  - Proposed System Pipeline
- Contour Interval**
- 100-foot
  - 20-foot
  - 2-foot

- Field Collected Data**
- Photo Location with Direction
  - Upland Drainage Feature



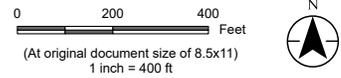
*Project Location* Washington County, UT  
*Client/Project* WCWCD Regional Reuse Purification System  
 Prepared by KR on 2025-11-04  
 TR by BT on 2025-11-04  
 IR by DS on 2025-11-04  
 181301727

*Figure No.* 6-6  
*Title* Aquatic Resources - Detail



- Legend**
- Survey Area
  - Survey Area Not Accessible
  - Proposed System Pipeline
- Contour Interval**
- 100-foot
  - 20-foot
  - 2-foot

- Field Collected Data**
- Upland Drainage Feature
  - Stream - Intermittent
  - Riparian Area



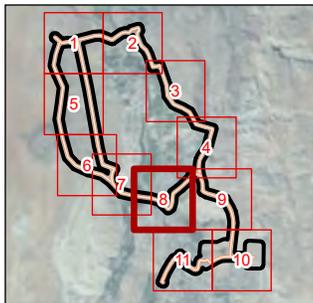
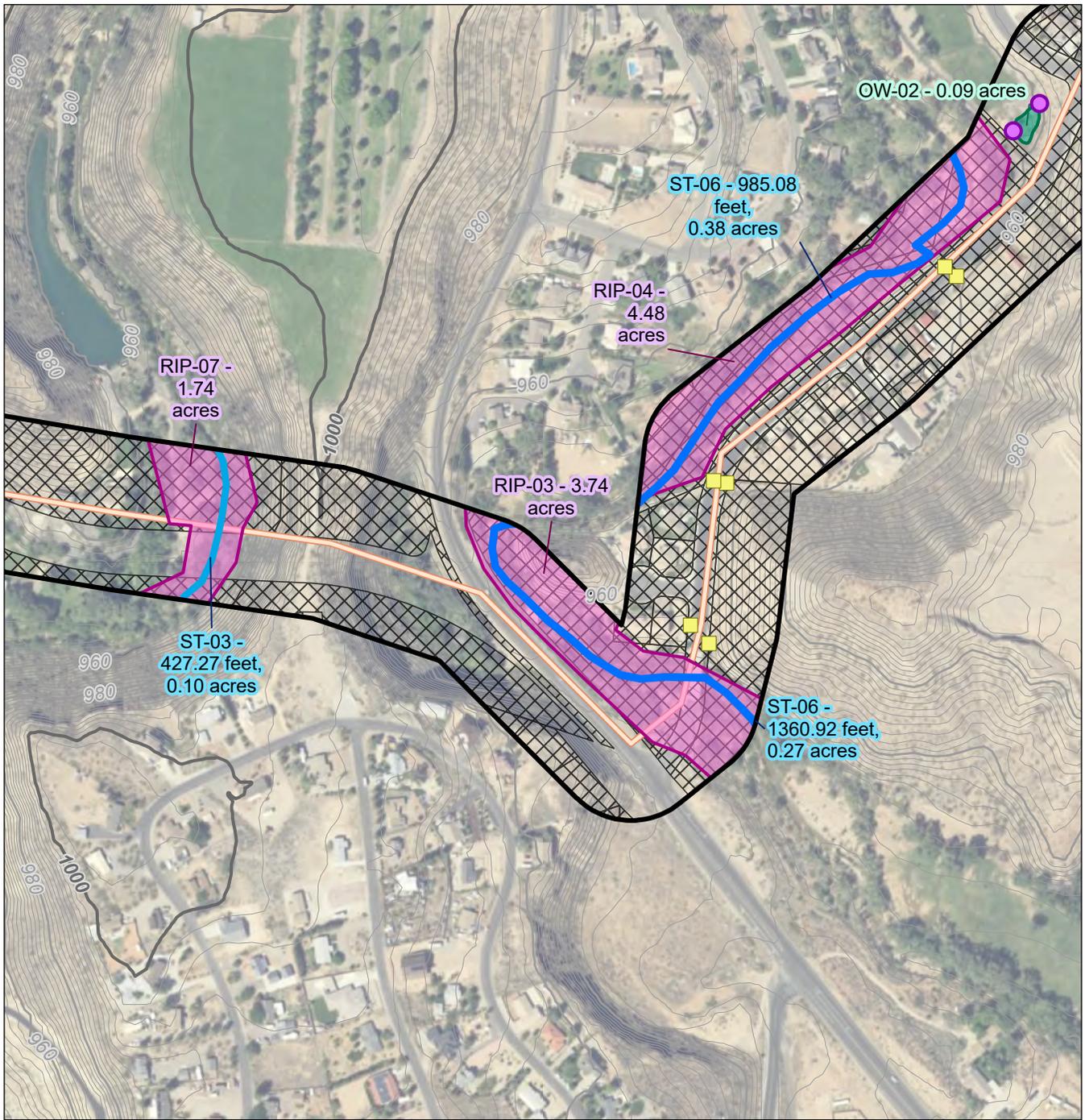
*Project Location* Washington County, UT  
 Prepared by KR on 2025-11-04  
 TR by BT on 2025-11-04  
 IR by DS on 2025-11-04

*Client/Project* WCWCD  
 Regional Reuse Purification System

*Figure No.* 6-7  
*Title* Aquatic Resources - Detail

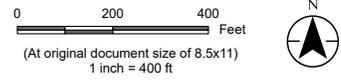
**Notes**  
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 South FIPS 4303 Feet  
 2. Data Sources: Stantec, WCWCD  
 3. Background: NAIP Imagery, 9/15/2021

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- Legend**
- Survey Area
  - Survey Area Not Accessible
  - Proposed System Pipeline
- Contour Interval**
- 100-foot
  - 20-foot
  - 2-foot

- Field Collected Data**
- Culvert
  - Storm Drain
  - Stream - Perennial
  - Stream - Intermittent
  - Open Water
  - Riparian Area



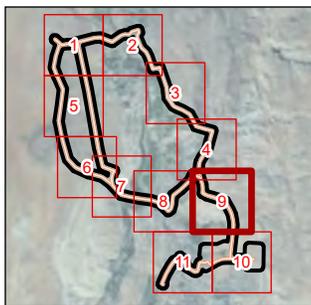
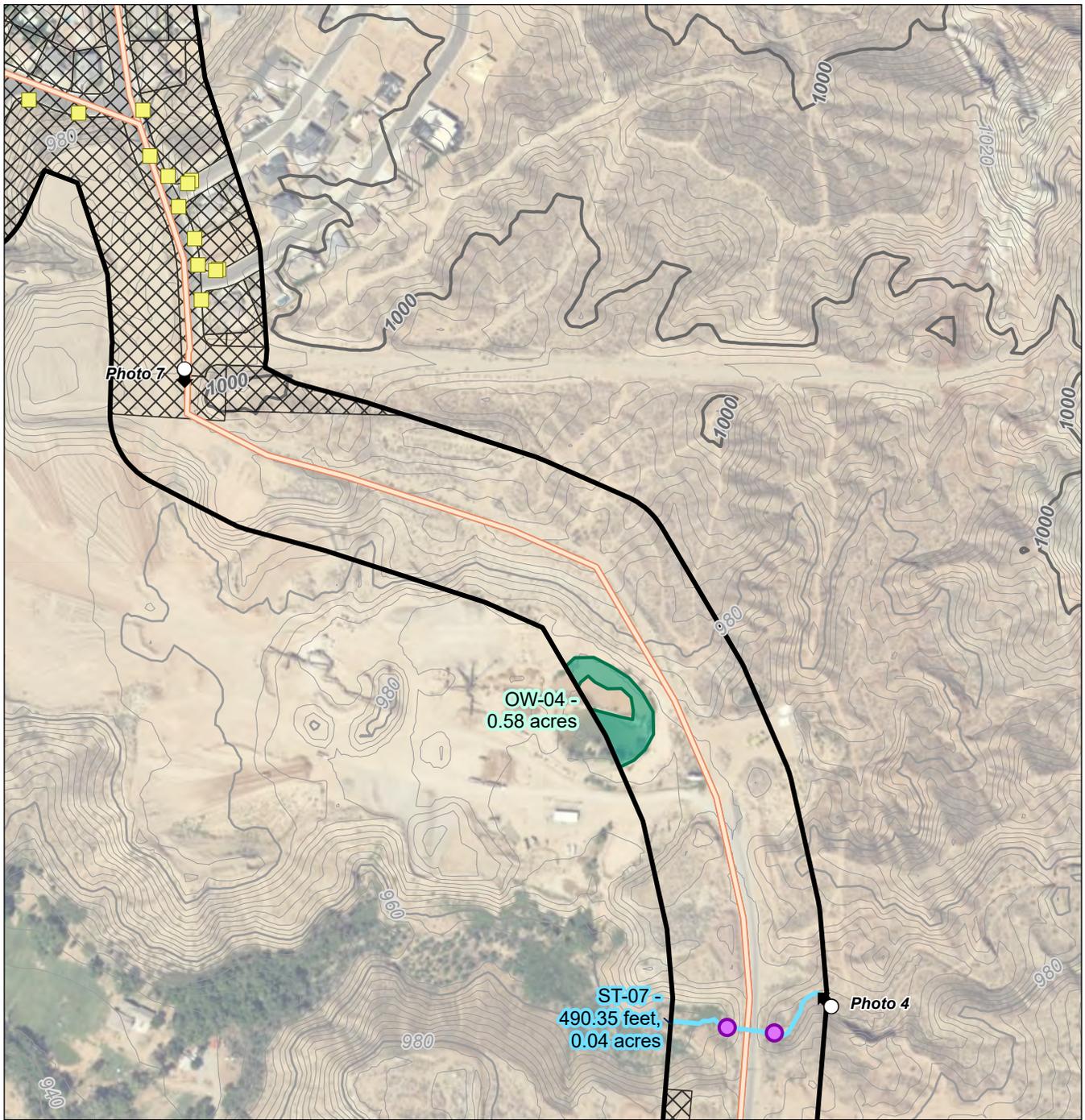
*Project Location* Washington County, UT  
*Client/Project* WCWCD Regional Reuse Purification System

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*Figure No.* **6-8**  
*Title* **Aquatic Resources - Detail**

**Notes**  
 1. Coordinate System: NAD 1983 StatePlane Utah South FIPS 4303 Feet  
 2. Data Sources: Stantec, WCWCD  
 3. Background: NAIP Imagery, 9/15/2021

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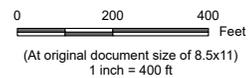


**Legend**

- Survey Area
- Survey Area Not Accessible
- Proposed System Pipeline
- Contour Interval**
- 100-foot
- 20-foot
- 2-foot

**Field Collected Data**

- Photo Location with Direction
- Culvert
- Storm Drain
- Stream - Ephemeral
- Open Water



*Project Location* Washington County, UT  
 Prepared by KR on 2025-11-04  
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 IR by DS on 2025-11-04

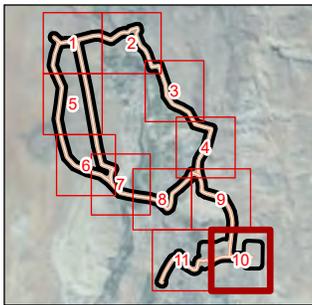
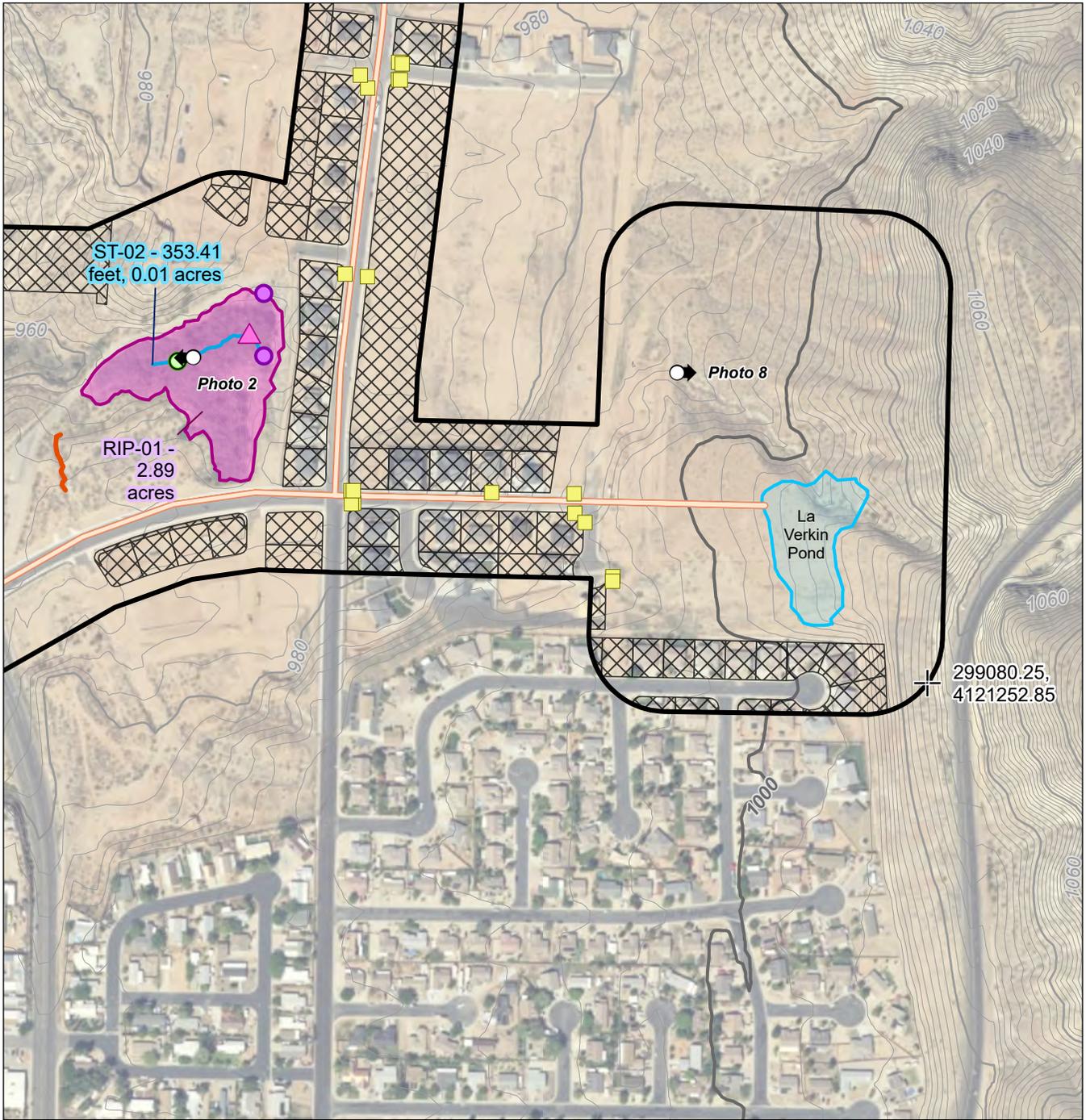
*Client/Project* WCWCD  
 Regional Reuse Purification System  
 181301727

*Figure No.*  
**6-9**

*Title*  
**Aquatic Resources - Detail**

- Notes**
1. Coordinate System: NAD 1983 StatePlane Utah South FIPS 4303 Feet
  2. Data Sources: Stantec, WCWCD
  3. Background: NAIP Imagery, 9/15/2021

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**Notes**  
 1. Coordinate System: NAD 1983 StatePlane Utah South FIPS 4303 Feet  
 2. Data Sources: Stantec, WCWCD  
 3. Background: NAIP Imagery, 9/15/2021

**Legend**

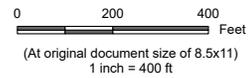
- Survey Area
- Survey Area Not Accessible
- Proposed System Pipeline
- Map Reference Control Points
- Contour Interval**
- 100-foot
- 20-foot
- 2-foot

**Field Collected Data**

- Photo Location with Direction
- USACE Sample Point
- OHWM & Streamflow Data Form Collection Point
- Culvert
- Storm Drain
- Erosional Feature
- Stream - Intermittent
- Riparian Area

**Proposed Features**

- Waterbody



**Project Location**  
 Washington County, UT

**Client/Project**  
 WCWCD  
 Regional Reuse Purification System

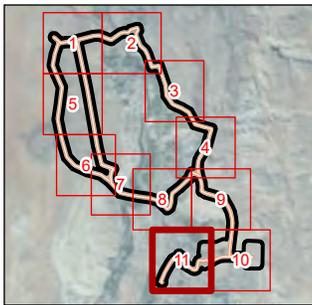
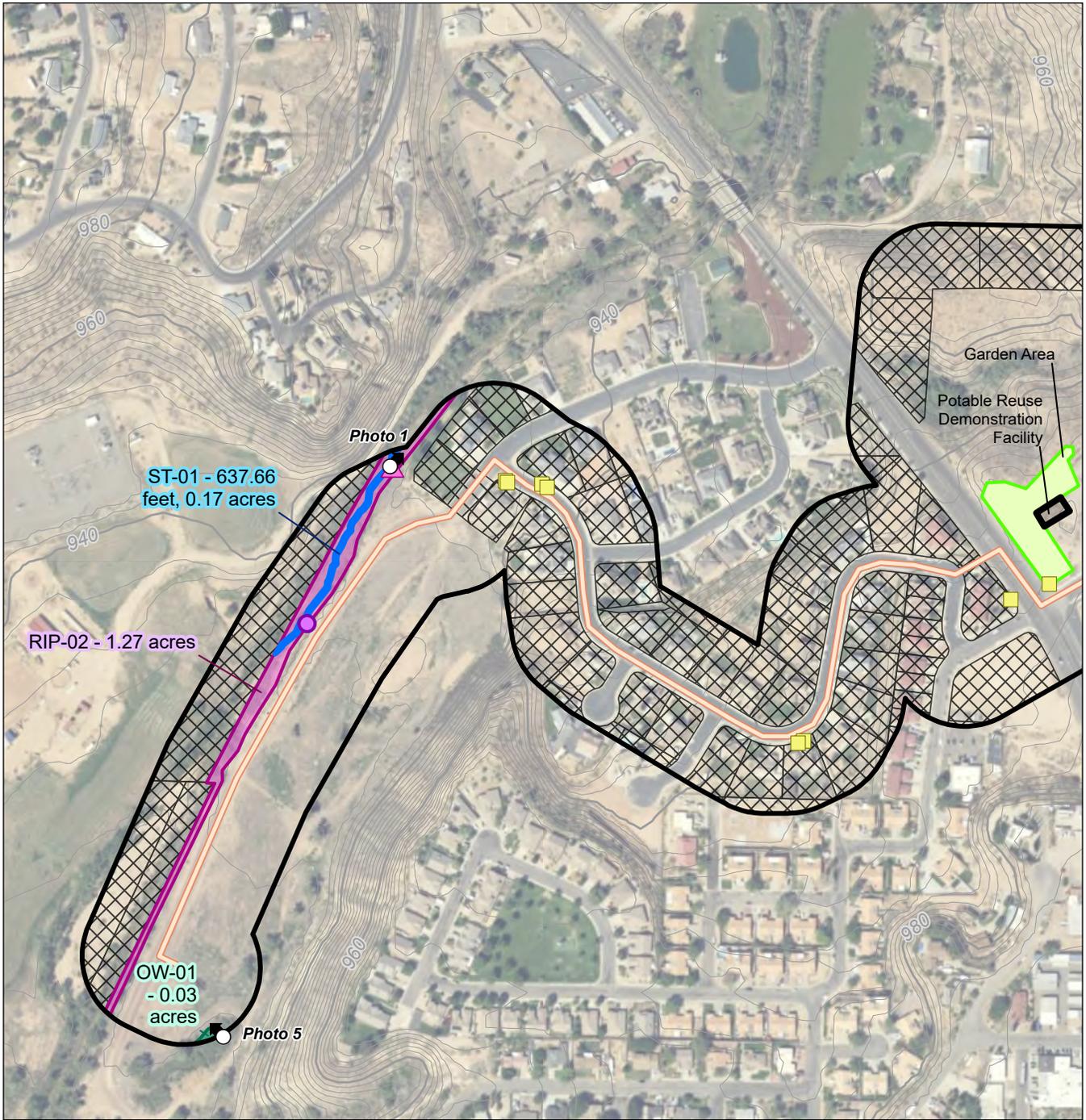
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 IR by DS on 2025-11-04  
 181301727

Figure No.  
**6-10**

Title  
**Aquatic Resources - Detail**

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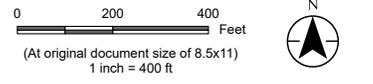
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**Notes**  
 1. Coordinate System: NAD 1983 StatePlane Utah South FIPS 4303 Feet  
 2. Data Sources: Stantec, WCWCD  
 3. Background: NAIP Imagery, 9/15/2021

- Legend**
- Survey Area
  - Survey Area Not Accessible
  - Proposed System Pipeline
- Contour Interval**
- 20-foot
  - 2-foot

- Field Collected Data**
- Photo Location with Direction
  - OHWM & Streamflow Data Form Collection Point
  - Culvert
  - Storm Drain
  - Stream - Perennial
  - Open Water
  - Riparian Area
- Proposed Features**
- Demonstration Facility
  - Garden Area



**Stantec**

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*Project Location* Washington County, UT  
*Client/Project* WCWCD Regional Reuse Purification System

---

*Figure No.* 6-11  
*Title* Aquatic Resources - Detail

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## **Appendix B Photographs**

## Aquatic Resource Delineation Report



**Photo 1.** La Verkin Creek (ST-01, ST-05, and ST-06). Photo taken along ST-01.



**Photo 2.** ST-02, an intermittent stream originating from a residential stormwater drain.



**Photo 3.** Ash Creek (ST-03 and ST-04). Photo taken along ST-04 from a public bridge.



**Photo 4.** ST-07, an ephemeral stream originating from a canyon east of the Survey Area.



**Photo 5.** OW-01, a commercial retention pond near La Verkin Creek.



**Photo 6.** Upland conditions along the western portion of the Survey Area.

## Aquatic Resource Delineation Report



**Photo 7.** Active construction along the eastern portion of the Survey Area.



**Photo 8.** Upland conditions along the western portion of the Survey Area.

## **Appendix C Plant List**

## Aquatic Resource Delineation Report

Common Name	Scientific Name	Wetland Indicator Status	
	<i>Achnatherum hymenoides</i>	Indian ricegrass	UPL
	<i>Artemisia tridentata</i> ssp. <i>wyomingensis</i>	Wyoming big sagebrush	N/A
	<i>Atriplex canescens</i>	fourwing saltbush	N/A
	<i>Atriplex confertifolia</i>	shadscale saltbush	N/A
	<i>Baccharis salicina</i>	willow baccharis	FACW
	<i>Baileya multiradiata</i>	desert marigold	N/A
	<i>Bromus rubens</i>	red brome	N/A
	<i>Bromus tectorum</i>	cheatgrass	N/A
	<i>Chamaesyce albomarginata</i>	whitemargin sandmat	N/A
	<i>Chrysothamnus viscidiflorus</i>	yellow rabbitbrush	N/A
	<i>Coleogyne ramosissima</i>	blackbrush	N/A
	<i>Cylindropuntia echinocarpa</i>	Wiggin's cholla	N/A
	<i>Echinocereus engelmannii</i>	Engelmann's hedgehog cactus	N/A
	<i>Elaeagnus angustifolia</i>	Russian olive	FAC
	<i>Ephedra nevadensis</i>	Nevada jointfir	N/A
	<i>Eriogonum inflatum</i>	desert trumpet	N/A
	<i>Erodium cicutarium</i>	redstem stork's bill	N/A
	<i>Eruca vesicaria</i>	rocketsalad	N/A
	<i>Fraxinus anomala</i>	singleleaf ash	N/A
	<i>Fraxinus velutina</i>	velvet ash	FAC
	<i>Halogeton glomeratus</i>	saltlover	N/A
	<i>Helianthus annuus</i>	annual sunflower	FACU
	<i>Heliotropium curassavicum</i>	salt heliotrope	FACU
	<i>Hordeum murinum</i>	mouse barley	FACU
	<i>Hymenoclea salsola</i>	burrobrush	N/A
	<i>Juncus arcticus</i>	arctic rush	N/A
	<i>Krascheninnikovia lanata</i>	winterfat	N/A
	<i>Larrea tridentata</i>	creosote bush	N/A
	<i>Lycium andersonii</i>	water jacket	N/A
	<i>Malcolmia africana</i>	African mustard	N/A
	<i>Mammillaria tetrancistra</i>	common fishhook cactus	N/A
	<i>Melilotus officinalis</i>	sweetclover	FACU
	<i>Mirabilis multiflora</i>	Colorado four o'clock	N/A
	<i>Opuntia aurea</i>	golden pricklypear	N/A
	<i>Opuntia polyacantha</i> var. <i>erinacea</i>	grizzlybear pricklypear	N/A
	<i>Phacelia crenulata</i>	cleftleaf wildheliotrope	N/A

## Aquatic Resource Delineation Report

Common Name	Scientific Name	Wetland Indicator Status
<i>Phacelia palmeri</i>	Palmer's phacelia	N/A
<i>Phragmites australis</i>	common reed	FACW
<i>Pleuraphis jamesii</i>	James' galleta	N/A
<i>Pluchea sericea</i>	arrowweed	FACW
<i>Poa annua</i>	annual bluegrass	FAC
<i>Populus fremontii</i>	Fremont cottonwood	FACW
<i>Prosopis pubescens</i>	screwbean mesquite	FAC
<i>Psoralea fremontii</i>	Fremont's dalea	N/A
<i>Rhus trilobata</i>	skunkbush sumac	N/A
<i>Rumex hymenosepalus</i>	canagire dock	N/A
<i>Salix exigua</i>	narrowleaf willow	FACW
<i>Salix laevigata</i>	red willow	FACW
<i>Sarcobatus vermiculatus</i>	greasewood	FACU
<i>Sisymbrium altissimum</i>	tall tumbledustard	FACU
<i>Solanum elaeagnifolium</i>	silverleaf nightshade	N/A
<i>Sphaeralcea parvifolia</i>	small-leaf globemallow	N/A
<i>Stanleya pinnata</i>	desert princesplume	N/A
<i>Tamarix chinensis</i>	five-stamen tamarisk	FAC
<i>Ulmus pumila</i>	Siberian elm	UPL
<i>Xanthium strumarium</i>	rough cocklebur	FAC
<i>Yucca baccata</i>	bannana yucca	N/A

**Key:** FAC = Facultative, FACU = Facultative upland, FACW = Facultative wetland, OBL = Obligate wetland, UPL = upland

**Notes:** <sup>1</sup> Species indicator status that were not available (N/A) were considered UPL unless otherwise noted.

## **Appendix D Data Forms**

## Beta Arid West Streamflow Duration Assessment Method

### General site information

Project name or number: WCWCD Reuse Program		
Site code or identifier:	Assessor(s): D. Jasperson, D. Rowe	
Waterway name: ST-01		Visit date: April 7, 2025 3:30 PM
Current weather conditions (check one) <input type="checkbox"/> Storm/heavy rain <input type="checkbox"/> Steady rain <input type="checkbox"/> Intermittent rain <input type="checkbox"/> Snowing <input type="checkbox"/> Cloudy (___ % cover) <input checked="" type="checkbox"/> Clear/Sunny	Notes on current or recent weather conditions (e.g., precipitation in previous week): Apt is 11, normal. dry season but region in extreme drought	Coordinates at downstream end (decimal degrees): Lat (N): 37.217482 Long (W): -113.278825 Datum: WGS84
Surrounding land-use within 100 m (check one or two): <input type="checkbox"/> Urban/industrial/residential <input type="checkbox"/> Agricultural (farmland, crops, vineyards, pasture) <input type="checkbox"/> Developed open-space (e.g., golf course) <input checked="" type="checkbox"/> Forested <input type="checkbox"/> Other natural <input type="checkbox"/> Other: _____	Describe reach boundaries: Project boundary	
Mean channel width (m) 5	Reach length (m): 40x width; min 40 m; max 200 m. 205	Enter photo ID, or check if completed Top down: image_td-20250407-213159.jpg Mid down: Bottom up: Mid up:
Disturbed or difficult conditions (check all that apply): <input type="checkbox"/> Recent flood or debris flow <input checked="" type="checkbox"/> Stream modifications (e.g., channelization) <input type="checkbox"/> Diversions <input type="checkbox"/> Discharges <input checked="" type="checkbox"/> Drought <input type="checkbox"/> Vegetation removal/limitations <input type="checkbox"/> Other (explain in notes) <input type="checkbox"/> None	Notes on disturbances or difficult site conditions: Stream channellized, very straight. Region in extreme drought. Likely flow is base flow.	
Observed hydrology: 100 % of reach with surface flow 100 % of reach with sub-surface or surface flow 0 # of isolated pools	Comments on observed hydrology: Baseflow	

### Site sketch:



### 1. Hydrophytic plant species

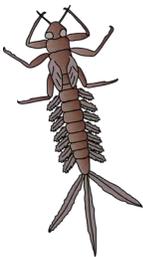
Record up to 5 hydrophytic plant species (FACW or OBL in the **Arid West** regional wetland plant list) within the assessment area: **within the channel or up to one half-channel width**. Explain in notes if species has an odd distribution (e.g., covers less than 2% of assessment area, long-lived species solely represented by seedlings, or long-lived species solely represented by specimens in decline), or if there is uncertainty about the identification. Enter photo ID, or check if photo is taken.

Check if applicable:  No vegetation in assessment area  No hydrophytes in assessment area

Species	Odd distribution?	Notes	Photo ID
Salix exigua	No		hpd_image-20250407-213656.jpg
Baccharis salicina			hpd_image-20250407-213723.jpg
Phragmites australis			

Notes on hydrophytic vegetation:

### 2 and 3. Aquatic invertebrates

<p><b>2. How many aquatic invertebrates are quantified in a 15-minute search?</b></p> <p>Number of individuals quantified: <input type="checkbox"/> None <input checked="" type="checkbox"/> 1 to 19 <input type="checkbox"/> 20 +</p> <p>(Do not count mosquitos)</p> <p>Photo ID: ai_image-20250407-213952.jpg</p>	<p><b>3. Is there evidence of aquatic stages of EPT (Ephemeroptera, Plecoptera and Trichoptera)?</b></p> <p style="text-align: center;"><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Ephemeroptera larva Image credit: <a href="#">Dieter Tracey</a></p> </div> <div style="text-align: center;">  <p>Plecoptera larva <a href="#">Tracey Saxby</a></p> </div> <div style="text-align: center;">  <p>Trichoptera larva <a href="#">Tracey Saxby</a></p> </div> </div>
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Notes on aquatic invertebrates:

Many insects present. Evidence of case-making caddisflies

### 4. Algal Cover

<p><b>Are algae found on the streambed?</b></p> <p><input type="checkbox"/> Check if <i>all</i> observed algae appear to be deposited from an upstream source.</p>	<p><input type="checkbox"/> Not detected  <input type="checkbox"/> Yes, &lt; 10% cover                  Yes, ≥ 10% (check <input checked="" type="checkbox"/> Yes in single indicator below)</p>	<p>Notes on algae cover:</p>	<p>Photo ID: ac_image-20250407-214146.jpg</p>
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### 5. Are single indicators observed?

Indicator	Present	Notes	Photo ID
Fish	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No, no fish <input type="checkbox"/> No, only non-native mosquitofish		
Algae cover ≥ 10%	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		ac_image-20250407-214146.jpg

**Supplemental information** E.g., aquatic or semi-aquatic amphibians, snakes, or turtles; iron-oxidizing bacteria and fungi; etc.

**Photo log**

Indicate if any other photos taken during the assessment

<b>Photo ID</b>	<b>Description</b>
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**Additional notes about the assessment:**

**Classification:** Perennial

1. Hydrophytic plant species	2. Aquatic invertebrates	3. EPT taxa	4. Algae	5. Single indicators • fish present • algae cover $\geq$ 10%	Classification	
None	None	Absent	Absent	Absent	<b>Ephemeral</b>	
			Present	Present	<b>At least intermittent</b>	
	Few (1-19)	Absent	Absent	Absent	<b>Less than Perennial</b>	
			Present	Present	<b>At least intermittent</b>	
		Present	Absent		<b>Intermittent</b>	
			Present		<b>Perennial</b>	
	Many (20+)	Absent	Absent	Absent	<b>Ephemeral</b>	
			Present	Present	<b>At least intermittent</b>	
		Present	Absent		<b>Ephemeral</b>	
			Present		<b>At least intermittent</b>	
	Few (1-2)	None				<b>Intermittent</b>
		Few (1-19)	Absent			<b>Intermittent</b>
Present			Absent		<b>Intermittent</b>	
Many (20+)		Absent			<b>Perennial</b>	
		Present	Absent		<b>Intermittent</b>	
Present			Present		<b>Perennial</b>	
					<b>Intermittent</b>	
Many (3+)		None				<b>Intermittent</b>
	Few (1-19)	Absent	Absent		<b>Intermittent</b>	
		Present	Present		<b>Perennial</b>	
	Present				<b>Perennial</b>	
					<b>Perennial</b>	

Shading provided to enhance readability by increasing the contrast between neighboring cells; empty cells indicate the classification will not change with additional information however it is recommended that all five indicators be measured and recorded during every assessment.

## Beta Arid West Streamflow Duration Assessment Method

### General site information

Project name or number: WCWCD Reuse Program		
Site code or identifier:	Assessor(s): D. Jaspersen, D. Rowe	
Waterway name: ST-02		Visit date: April 10, 2025 9:13 AM
Current weather conditions (check one) <input type="checkbox"/> Storm/heavy rain <input type="checkbox"/> Steady rain <input type="checkbox"/> Intermittent rain <input type="checkbox"/> Snowing <input type="checkbox"/> Cloudy (___ % cover) <input checked="" type="checkbox"/> Clear/Sunny	Notes on current or recent weather conditions (e.g., precipitation in previous week): Apt is 11, normal. Dry season, region in extreme drought	Coordinates at downstream end (decimal degrees): Lat (N): 37.218562 Long (W): -113.270505 Datum: WGS84
Surrounding land-use within 100 m (check one or two): <input type="checkbox"/> Urban/industrial/residential <input type="checkbox"/> Agricultural (farmland, crops, vineyards, pasture) <input type="checkbox"/> Developed open-space (e.g., golf course) <input checked="" type="checkbox"/> Forested <input type="checkbox"/> Other natural <input type="checkbox"/> Other: _____	Describe reach boundaries: Culvert to project boundary.	
Mean channel width (m) 1	Reach length (m): 40x width; min 40 m; max 200 m. 108	Enter photo ID, or check if completed Top down: image_td-20250410-152323.jpg      Mid down: image_md-20250410-152520.jpg Mid up: image_mu-20250410-152432.jpg      Bottom up: image_bu-20250410-153029.jpg
Disturbed or difficult conditions (check all that apply): <input type="checkbox"/> Recent flood or debris flow <input checked="" type="checkbox"/> Stream modifications (e.g., channelization) <input type="checkbox"/> Diversions <input type="checkbox"/> Discharges <input checked="" type="checkbox"/> Drought <input type="checkbox"/> Vegetation removal/limitations <input type="checkbox"/> Other (explain in notes) <input type="checkbox"/> None	Notes on disturbances or difficult site conditions: Stream begins at culvert with likely stormwater source from neighborhood uphill. Region in extreme drought.	
Observed hydrology: 100 % of reach with surface flow 100 % of reach with sub-surface or surface flow 0 # of isolated pools	Comments on observed hydrology: Very low flow or sometimes stagnant. Appears to be less flow now than earlier in year based on dead algae distribution.	

### Site sketch:



### 1. Hydrophytic plant species

Record up to 5 hydrophytic plant species (FACW or OBL in the **Arid West** regional wetland plant list) within the assessment area: **within the channel or up to one half-channel width**. Explain in notes if species has an odd distribution (e.g., covers less than 2% of assessment area, long-lived species solely represented by seedlings, or long-lived species solely represented by specimens in decline), or if there is uncertainty about the identification. Enter photo ID, or check if photo is taken.

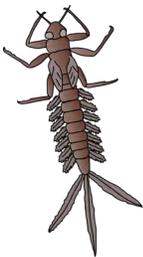
Check if applicable:       No vegetation in assessment area       No hydrophytes in assessment area

Species	Odd distribution?	Notes	Photo ID
Baccharis salicina			hpd_image-20250410-151737.jpg
Salix laevigata			hpd_image-20250410-162239.jpg
Juncus balticus	No		hpd_image-20250410-151823.jpg

Notes on hydrophytic vegetation:

All few and mostly at top of reach, down reach many fav but no FACW or OBL species.

### 2 and 3. Aquatic invertebrates

<p><b>2. How many aquatic invertebrates are quantified in a 15-minute search?</b></p> <p>Number of individuals quantified:    <input checked="" type="checkbox"/> None              <input type="checkbox"/> 1 to 19              <input type="checkbox"/> 20 +</p> <p>(Do not count mosquitos)</p> <p>Photo ID:</p>	<p><b>3. Is there evidence of aquatic stages of EPT (Ephemeroptera, Plecoptera and Trichoptera)?</b></p> <p style="text-align: center;"><input type="checkbox"/> Yes   <input checked="" type="checkbox"/> No</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Ephemeroptera larva Image credit: <a href="#">Dieter Tracey</a></p> </div> <div style="text-align: center;">  <p>Plecoptera larva <a href="#">Tracey Saxby</a></p> </div> <div style="text-align: center;">  <p>Trichoptera larva <a href="#">Tracey Saxby</a></p> </div> </div>
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Notes on aquatic invertebrates:

Substrate difficult to work with to identify potential insects. Did not observe any in stream.

### 4. Algal Cover

<p><b>Are algae found on the streambed?</b></p> <p><input type="checkbox"/> Check if <u>all</u> observed algae appear to be deposited from an upstream source.</p>	<p><input type="checkbox"/> Not detected  <input checked="" type="checkbox"/> Yes, &lt; 10% cover              Yes, ≥ 10% (check  <input type="checkbox"/> Yes in single indicator below)</p>	<p>Notes on algae cover:</p>	<p>Photo ID:</p>
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### 5. Are single indicators observed?

Indicator	Present	Notes	Photo ID
Fish	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No, no fish <input type="checkbox"/> No, only non-native mosquitofish		
Algae cover ≥ 10%	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		

**Supplemental information** E.g., aquatic or semi-aquatic amphibians, snakes, or turtles; iron-oxidizing bacteria and fungi; etc.

**Photo log**

Indicate if any other photos taken during the assessment

<b>Photo ID</b>	<b>Description</b>
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**Additional notes about the assessment:**

**Classification:** Intermittent

1. Hydrophytic plant species	2. Aquatic invertebrates	3. EPT taxa	4. Algae	5. Single indicators • fish present • algae cover $\geq$ 10%	Classification	
None	None	Absent	Absent	Absent	<b>Ephemeral</b>	
			Present	Present	<b>At least intermittent</b>	
	Few (1-19)	Absent	Absent	Absent	<b>Less than Perennial</b>	
			Present	Present	<b>At least intermittent</b>	
		Present	Absent		<b>Intermittent</b>	
			Present		<b>Perennial</b>	
	Many (20+)	Absent	Absent	Absent	<b>Ephemeral</b>	
			Present	Present	<b>At least intermittent</b>	
		Present	Absent		<b>Ephemeral</b>	
			Present		<b>At least intermittent</b>	
	Few (1-2)	None				<b>Intermittent</b>
		Few (1-19)	Absent			<b>Intermittent</b>
Present			Absent		<b>Intermittent</b>	
Many (20+)		Absent			<b>Perennial</b>	
		Present	Absent		<b>Intermittent</b>	
Present			Present		<b>Perennial</b>	
				<b>Intermittent</b>		
Many (3+)	None				<b>Intermittent</b>	
	Few (1-19)	Absent	Absent		<b>Intermittent</b>	
		Present	Present		<b>Perennial</b>	
	Present				<b>Perennial</b>	
					<b>Perennial</b>	

Shading provided to enhance readability by increasing the contrast between neighboring cells; empty cells indicate the classification will not change with additional information however it is recommended that all five indicators be measured and recorded during every assessment.

## Beta Arid West Streamflow Duration Assessment Method

### General site information

Project name or number: WCWCD Reuse Program		
Site code or identifier:	Assessor(s): D.Rowe	
Waterway name: ST-07		Visit date: June 26, 2025 12:33 PM
Current weather conditions (check one) <input type="checkbox"/> Storm/heavy rain <input type="checkbox"/> Steady rain <input type="checkbox"/> Intermittent rain <input type="checkbox"/> Snowing <input type="checkbox"/> Cloudy (___ % cover) <input checked="" type="checkbox"/> Clear/Sunny	Notes on current or recent weather conditions (e.g., precipitation in previous week): 85F, 0.01 inches of rain in last week. APT is 13, normal. Dry season, region in extreme drought.	Coordinates at downstream end (decimal degrees): Lat (N): 37.221791 Long (W): -113.268614 Datum: WGS84
Surrounding land-use within 100 m (check one or two): <input type="checkbox"/> Urban/industrial/residential <input type="checkbox"/> Agricultural (farmland, crops, vineyards, pasture) <input type="checkbox"/> Developed open-space (e.g., golf course) <input type="checkbox"/> Forested <input type="checkbox"/> Other natural <input checked="" type="checkbox"/> Other: Industrial owned Interstate Rock Company	Describe reach boundaries: Top of reach is within small ravine, bottom is at a 10ft diameter culvert.	
Mean channel width (m) 1.5	Reach length (m): 40x width; min 40 m; max 200 m. 71	Enter photo ID, or check if completed Top down: image_td-20250626-183714.jpg      Mid down: image_md-20250626-184548.jpg Mid up: image_mu-20250626-184555.jpg      Bottom up: image_bu-20250626-184443.jpg
Disturbed or difficult conditions (check all that apply): <input type="checkbox"/> Recent flood or debris flow <input type="checkbox"/> Stream modifications (e.g., channelization) <input type="checkbox"/> Diversions <input type="checkbox"/> Discharges <input checked="" type="checkbox"/> Drought <input type="checkbox"/> Vegetation removal/limitations <input checked="" type="checkbox"/> Other (explain in notes) <input type="checkbox"/> None	Notes on disturbances or difficult site conditions: May be affected by anthropogenic terrain modifications.	
Observed hydrology: 0 % of reach with surface flow 0 % of reach with sub-surface or surface flow 0 # of isolated pools	Comments on observed hydrology: None	

### Site sketch:



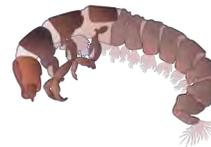
### 1. Hydrophytic plant species

Record up to 5 hydrophytic plant species (FACW or OBL in the **Arid West** regional wetland plant list) within the assessment area: **within the channel or up to one half-channel width**. Explain in notes if species has an odd distribution (e.g., covers less than 2% of assessment area, long-lived species solely represented by seedlings, or long-lived species solely represented by specimens in decline), or if there is uncertainty about the identification. Enter photo ID, or check if photo is taken.

Check if applicable:       No vegetation in assessment area       No hydrophytes in assessment area

Species	Odd distribution?	Notes	Photo ID
Notes on hydrophytic vegetation:			

### 2 and 3. Aquatic invertebrates

<p><b>2. How many aquatic invertebrates are quantified in a 15-minute search?</b></p> <p>Number of individuals quantified:    <input checked="" type="checkbox"/> None            <input type="checkbox"/> 1 to 19            <input type="checkbox"/> 20 +</p> <p>(Do not count mosquitos)</p> <p>Photo ID:</p>	<p><b>3. Is there evidence of aquatic stages of EPT (Ephemeroptera, Plecoptera and Trichoptera)?</b></p> <p style="text-align: center;"><input type="checkbox"/> Yes    <input checked="" type="checkbox"/> No</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Ephemeroptera larva Image credit: <a href="#">Dieter Tracey</a></p> </div> <div style="text-align: center;">  <p>Plecoptera larva <a href="#">Tracey Saxby</a></p> </div> <div style="text-align: center;">  <p>Trichoptera larva <a href="#">Tracey Saxby</a></p> </div> </div>
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Notes on aquatic invertebrates:

### 4. Algal Cover

<p><b>Are algae found on the streambed?</b></p> <p><input type="checkbox"/> Check if <i>all</i> observed algae appear to be deposited from an upstream source.</p>	<p><input checked="" type="checkbox"/> Not detected  <input type="checkbox"/> Yes, &lt; 10% cover              Yes, ≥ 10% (check  <input type="checkbox"/> Yes in single indicator below)</p>	<p>Notes on algae cover:</p>	<p>Photo ID:</p>
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### 5. Are single indicators observed?

Indicator	Present	Notes	Photo ID
Fish	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No, no fish <input type="checkbox"/> No, only non-native mosquitofish		
Algae cover ≥ 10%	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		

**Supplemental information** E.g., aquatic or semi-aquatic amphibians, snakes, or turtles; iron-oxidizing bacteria and fungi; etc.

### Photo log

Indicate if any other photos taken during the assessment

<b>Photo ID</b>	<b>Description</b>
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**Additional notes about the assessment:**

**Classification:** Ephemeral

1. Hydrophytic plant species	2. Aquatic invertebrates	3. EPT taxa	4. Algae	5. Single indicators • fish present • algae cover $\geq$ 10%	Classification	
None	None	Absent	Absent	Absent	<b>Ephemeral</b>	
			Present	Present	<b>At least intermittent</b>	
	Few (1-19)	Absent	Absent	Absent	<b>Less than Perennial</b>	
			Present	Present	<b>At least intermittent</b>	
		Present	Absent		<b>Intermittent</b>	
			Present		<b>Perennial</b>	
	Many (20+)	Absent	Absent	Absent	<b>Ephemeral</b>	
			Present	Present	<b>At least intermittent</b>	
		Present	Absent		<b>Ephemeral</b>	
			Present		<b>At least intermittent</b>	
	Few (1-2)	None				<b>Intermittent</b>
		Few (1-19)	Absent			<b>Intermittent</b>
Present			Absent		<b>Intermittent</b>	
Many (20+)		Absent				<b>Perennial</b>
			Present	Absent		<b>Intermittent</b>
		Present				<b>Perennial</b>
			Present			<b>Intermittent</b>
Many (3+)		None				<b>Intermittent</b>
	Few (1-19)	Absent	Absent		<b>Intermittent</b>	
		Present	Present		<b>Perennial</b>	
	Many (20+)					<b>Perennial</b>
						<b>Perennial</b>

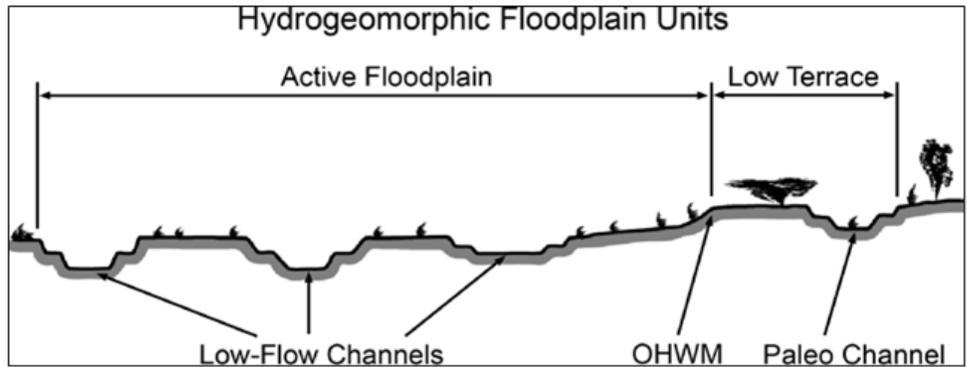
Shading provided to enhance readability by increasing the contrast between neighboring cells; empty cells indicate the classification will not change with additional information however it is recommended that all five indicators be measured and recorded during every assessment.

## Arid West Ephemeral and Intermittent Streams OHWM Datasheet

<b>Project:</b> WCWCD Reuse Program	<b>Date:</b> 04/07/2025	<b>Time:</b> 15:21
<b>Project Number:</b> 181301727	<b>Town:</b> Saint George	<b>State:</b> UT
<b>Stream:</b> ST-01	<b>Photo begin file#:</b> <b>Photo end file#:</b>	
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Do normal circumstances exist on the site?	<b>Location Details:</b> Near La Verkin, UT.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	Is the site significantly disturbed?	
<b>Projection:</b>		<b>Datum:</b> WGS84
<b>Coordinates:</b> 37.21748, -113.27883		
<b>Potential anthropogenic influences on the channel system:</b> Channelization, possible dams outside of project area. Likely drawdown and run off affecting stream.		
<b>Brief site description:</b> Private lands. New normal is channelized stream, very straight. APT is 11, normal. Dry season, region in extreme drought.		

**Checklist of resources (if available):**

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> Aerial photography<br>Date:<br><input checked="" type="checkbox"/> Topographic maps<br><input type="checkbox"/> Geologic maps<br><input type="checkbox"/> Vegetation maps<br><input checked="" type="checkbox"/> Soils maps<br><input type="checkbox"/> Rainfall/precipitation maps<br><input type="checkbox"/> Existing delineation(s) for site<br><input checked="" type="checkbox"/> Global positioning system (GPS)<br><input type="checkbox"/> Other studies | <input type="checkbox"/> Stream gage data<br>Gage number:<br>Period of record:<br><input type="checkbox"/> History of recent effective discharges<br><input type="checkbox"/> Results of flood frequency analysis<br><input type="checkbox"/> Most recent shift-adjusted rating<br><input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event |
|---|---|

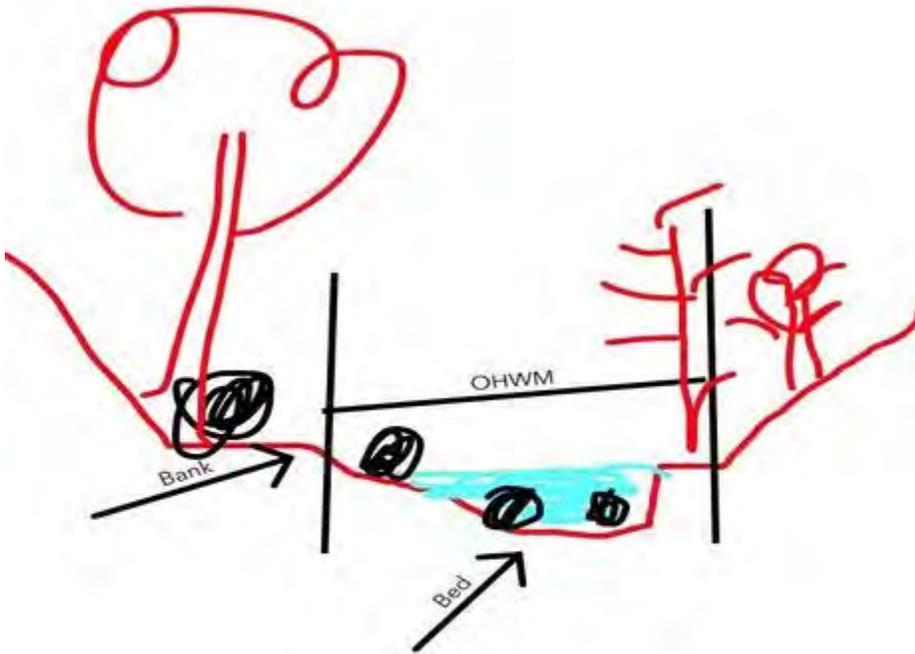


**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
  - a) Record the floodplain unit and GPS position.
  - b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
  - c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> Mapping on aerial photograph | <input checked="" type="checkbox"/> GPS |
| <input type="checkbox"/> Digitized on computer                   | <input type="checkbox"/> Other:         |

Cross Section Drawing:



**OHWM**

GPS point: 0, 0

**Indicators:**

- |  |   |
|--|---|
| <input type="checkbox"/> Change in average sediment texture    | <input checked="" type="checkbox"/> Break in bank slope |
| <input type="checkbox"/> Change in vegetation species          | <input type="checkbox"/> Other:                         |
| <input checked="" type="checkbox"/> Change in vegetation cover |   |

**Comments:**

**Floodplain unit:**

Low-Flow Channel

Active Floodplain

Low Terrace

GPS point: 0, 0

**Characteristics of the floodplain unit:**

Average sediment texture: Boulder

Total veg cover: 9%

Tree: 2%

Shrub: 5%

Herb: 2%

**Community successional stage:**

NA

Mid (herbaceous, shrubs, saplings)

Early (herbaceous & seedlings)

Late (herbaceous, shrubs, mature trees)

**Indicators:**

Mudcracks

Soil development

Ripples

Surface relief

Drift and/or debris

Other:

Presence of bed and bank

Benches

**Comments:**

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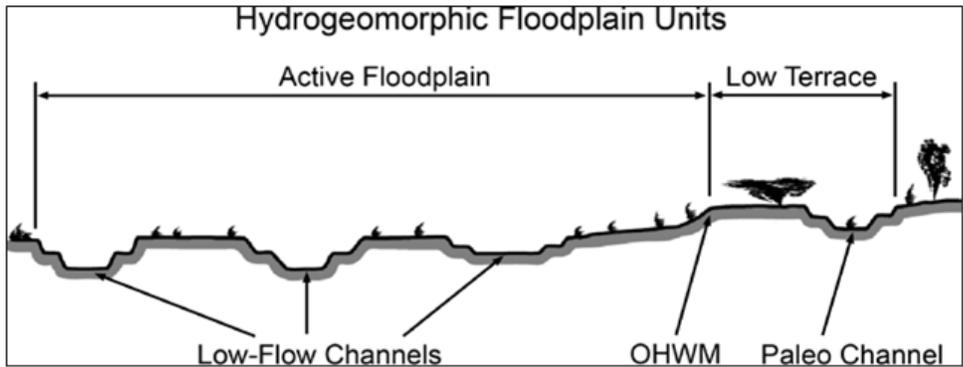
## Arid West Ephemeral and Intermittent Streams OHWM Datasheet

<b>Project:</b> WCWCD Reuse Program	<b>Date:</b> 04/10/2025	<b>Time:</b> 09:37
<b>Project Number:</b> 181301727	<b>Town:</b> Saint George	<b>State:</b> UT
<b>Stream:</b> ST-02	<b>Photo begin file#:</b> <b>Photo end file#:</b>	
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N      Do normal circumstances exist on the site?	<b>Location Details:</b> Toquerville, UT	
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N      Is the site significantly disturbed?	<b>Projection:</b>	<b>Datum:</b> WGS84
<b>Potential anthropogenic influences on the channel system:</b> Culverts and potential for increased runoff in storm events		

**Brief site description:** Private land with riparian area surrounding intermittent stream. Stream is mainly fed from stormwater, neighborhood watering, and surface relief. Apt is 11, normal. Dry season, region in extreme drought.

**Checklist of resources (if available):**

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> Aerial photography<br>Date:<br><input checked="" type="checkbox"/> Topographic maps<br><input type="checkbox"/> Geologic maps<br><input type="checkbox"/> Vegetation maps<br><input checked="" type="checkbox"/> Soils maps<br><input type="checkbox"/> Rainfall/precipitation maps<br><input type="checkbox"/> Existing delineation(s) for site<br><input checked="" type="checkbox"/> Global positioning system (GPS)<br><input type="checkbox"/> Other studies | <input type="checkbox"/> Stream gage data<br>Gage number:<br>Period of record:<br><input type="checkbox"/> History of recent effective discharges<br><input type="checkbox"/> Results of flood frequency analysis<br><input type="checkbox"/> Most recent shift-adjusted rating<br><input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event |
|---|---|

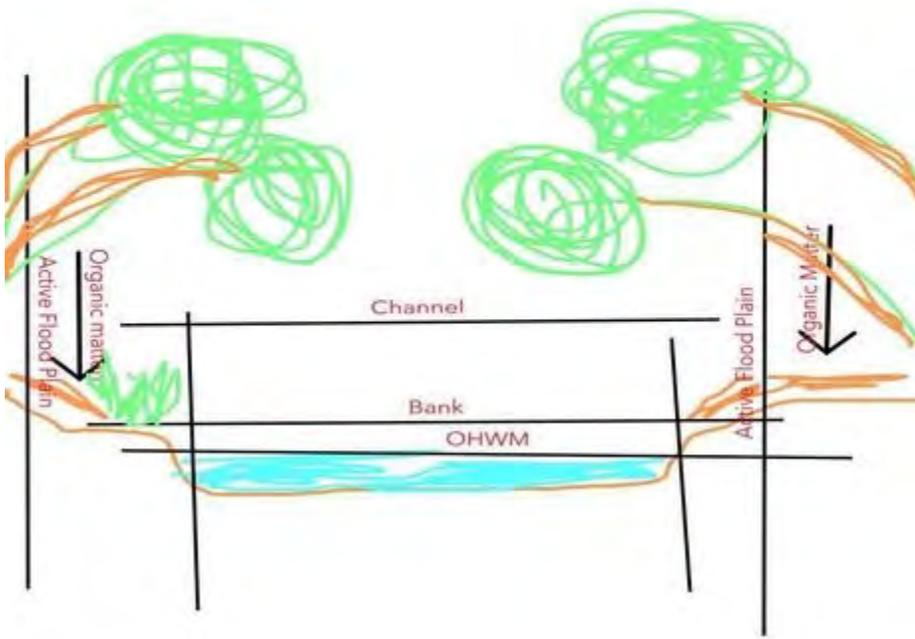


**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
  - a) Record the floodplain unit and GPS position.
  - b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
  - c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:

- |   |   |
|---|---|
| <input type="checkbox"/> Mapping on aerial photograph | <input checked="" type="checkbox"/> GPS |
| <input type="checkbox"/> Digitized on computer        | <input type="checkbox"/> Other:         |

**Cross Section Drawing:**



**OHWM**

GPS point: 0, 0

**Indicators:**

- |  |   |
|--|---|
| <input type="checkbox"/> Change in average sediment texture      | <input checked="" type="checkbox"/> Break in bank slope |
| <input checked="" type="checkbox"/> Change in vegetation species | <input type="checkbox"/> Other:                         |
| <input checked="" type="checkbox"/> Change in vegetation cover   |   |

**Comments:** Low shrub and herbaceous cover due to such high tree cover.

**Floodplain unit:**

Low-Flow Channel

Active Floodplain

Low Terrace

GPS point: 0, 0

**Characteristics of the floodplain unit:**

Average sediment texture: Medium silt

Total veg cover: **95%** Tree: **70%** Shrub: **20%** Herb: **5%**

**Community successional stage:**

NA

Mid (herbaceous, shrubs, saplings)

Early (herbaceous & seedlings)

Late (herbaceous, shrubs, mature trees)

**Indicators:**

Mudcracks

Soil development

Ripples

Surface relief

Drift and/or debris

Other:

Presence of bed and bank

Benches

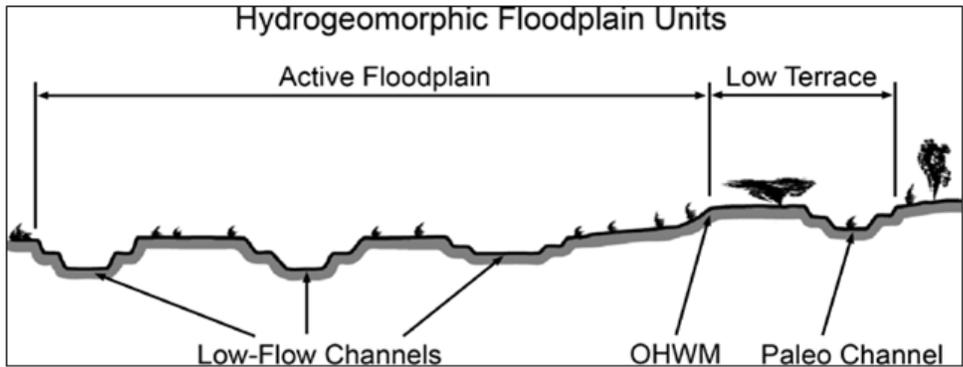
**Comments:**

## Arid West Ephemeral and Intermittent Streams OHWM Datasheet

<b>Project:</b> WCWCD Reuse Program	<b>Date:</b> 06/26/2025	<b>Time:</b> 12:25
<b>Project Number:</b> 181301727	<b>Town:</b> Saint George	<b>State:</b> UT
<b>Stream:</b> ST-07	<b>Photo begin file#:</b> <b>Photo end file#:</b>	
<input checked="" type="checkbox"/> <b>Y</b> <input type="checkbox"/> <b>N</b> Do normal circumstances exist on the site?	<b>Location Details:</b> Inside gravel pit area. Stream area dumped with trash. Terrestrial area around stream is highly disturbed.	
<input checked="" type="checkbox"/> <b>Y</b> <input type="checkbox"/> <b>N</b> Is the site significantly disturbed?	<b>Projection:</b>	<b>Datum:</b> WGS84
<b>Potential anthropogenic influences on the channel system:</b> Culverts, potential for increased runoff.		
<b>Brief site description:</b> Inside small, vegetated ravine. Opens up before reaching culvert. APT is 13, normal. Dry season, region in extreme drought.		

**Checklist of resources (if available):**

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> Aerial photography<br>Date:<br><input checked="" type="checkbox"/> Topographic maps<br><input type="checkbox"/> Geologic maps<br><input type="checkbox"/> Vegetation maps<br><input checked="" type="checkbox"/> Soils maps<br><input type="checkbox"/> Rainfall/precipitation maps<br><input checked="" type="checkbox"/> Existing delineation(s) for site<br><input checked="" type="checkbox"/> Global positioning system (GPS)<br><input type="checkbox"/> Other studies | <input type="checkbox"/> Stream gage data<br>Gage number:<br>Period of record:<br><input type="checkbox"/> History of recent effective discharges<br><input type="checkbox"/> Results of flood frequency analysis<br><input type="checkbox"/> Most recent shift-adjusted rating<br><input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event |
|--|---|



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
  - a) Record the floodplain unit and GPS position.
  - b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
  - c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:

- |   |   |
|---|---|
| <input type="checkbox"/> Mapping on aerial photograph | <input checked="" type="checkbox"/> GPS |
| <input type="checkbox"/> Digitized on computer        | <input type="checkbox"/> Other:         |

**Cross Section Drawing:**



**OHW**

GPS point: 0, 0

**Indicators:**

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> Change in average sediment texture | <input checked="" type="checkbox"/> Break in bank slope |
| <input checked="" type="checkbox"/> Change in vegetation species       | <input type="checkbox"/> Other:                         |
| <input checked="" type="checkbox"/> Change in vegetation cover         |   |

**Comments:**

**Floodplain unit:**

Low-Flow Channel

Active Floodplain

Low Terrace

GPS point: 0, 0

**Characteristics of the floodplain unit:**

Average sediment texture: Coarse sand

Total veg cover: **75%** Tree: **0%** Shrub: **50%** Herb: **25%**

**Community successional stage:**

NA

Mid (herbaceous, shrubs, saplings)

Early (herbaceous & seedlings)

Late (herbaceous, shrubs, mature trees)

**Indicators:**

Mudcracks

Soil development

Ripples

Surface relief

Drift and/or debris

Other:

Presence of bed and bank

Benches

**Comments:** Very well-defined bed and bank

**With every community, we redefine what's possible.**

Stantec is a global leader in sustainable engineering, architecture, and environmental consulting. The diverse perspectives of our partners and interested parties drive us to think beyond what's previously been done on critical issues like climate change, digital transformation, and future-proofing our cities and infrastructure. We innovate at the intersection of community, creativity, and client relationships to advance communities everywhere, so that together we can redefine what's possible.

**Stantec Consulting Services Inc.**

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— BUREAU OF —  
RECLAMATION

Final Environmental Assessment

# **Appendix E – State Historic Preservation Office Letters**

## **Eastside Reuse System, Washington County, Utah**

Provo Area Office – Upper Colorado Basin Region

February 2026



Spencer J. Cox  
Governor

Deidre M. Henderson  
Lieutenant Governor

Donna Law  
Interim Executive Director



Christopher Merritt  
State Historic Preservation Officer  
Utah State Historic Preservation Office

September 11, 2025

Rick Baxter  
Area Manager  
Bureau of Reclamation

RE: Class III Cultural Resource Inventory for the Washington County Eastside Reuse System, Phase I

For future correspondence, please reference Case No. 25-1865

Dear Rick Baxter,

The Utah State Historic Preservation Office received your submission and request for our comment on the above-referenced undertaking on September 05, 2025.

We concur with your determination of effect for this undertaking.

This letter serves as our comment on the determinations you have made within the consultation process specified in §36CFR800.4. If you have questions, please contact me at (801) 535-2502 or by email at [rmcgrath@utah.gov](mailto:rmcgrath@utah.gov).

Sincerely,

Ryan McGrath  
Compliance Archaeologist



Spencer J. Cox  
*Governor*

Deidre M. Henderson  
*Lieutenant Governor*

Donna Law  
*Interim Executive Director*



Christopher Merritt  
*State Historic Preservation Officer*  
*Utah State Historic Preservation Office*

December 31, 2025

Ryan Luke  
Area Manager  
BOR

RE: Class III Cultural Resource Inventory for the Washington County Eastside Reuse System, Phase II, Washington County, Utah

For future correspondence, please reference Case No. 25-2479

Dear Ryan Luke,

The Utah State Historic Preservation Office received your submission and request for our comment on the above-referenced undertaking on December 31, 2025.

We concur with your determinations of eligibility and effect for this undertaking.

This letter serves as our comment on the determinations you have made within the consultation process specified in §36CFR800.4. If you have questions, please contact me at (801) 535-2502 or by email at [rmcgrath@utah.gov](mailto:rmcgrath@utah.gov).

Sincerely,

Ryan McGrath  
Compliance Archaeologist



— BUREAU OF —  
RECLAMATION

Final Environmental Assessment

# **Appendix F – Indian Trust Assets**

## **Eastside Reuse System, Washington County, Utah**

Provo Area Office – Upper Colorado Basin Region

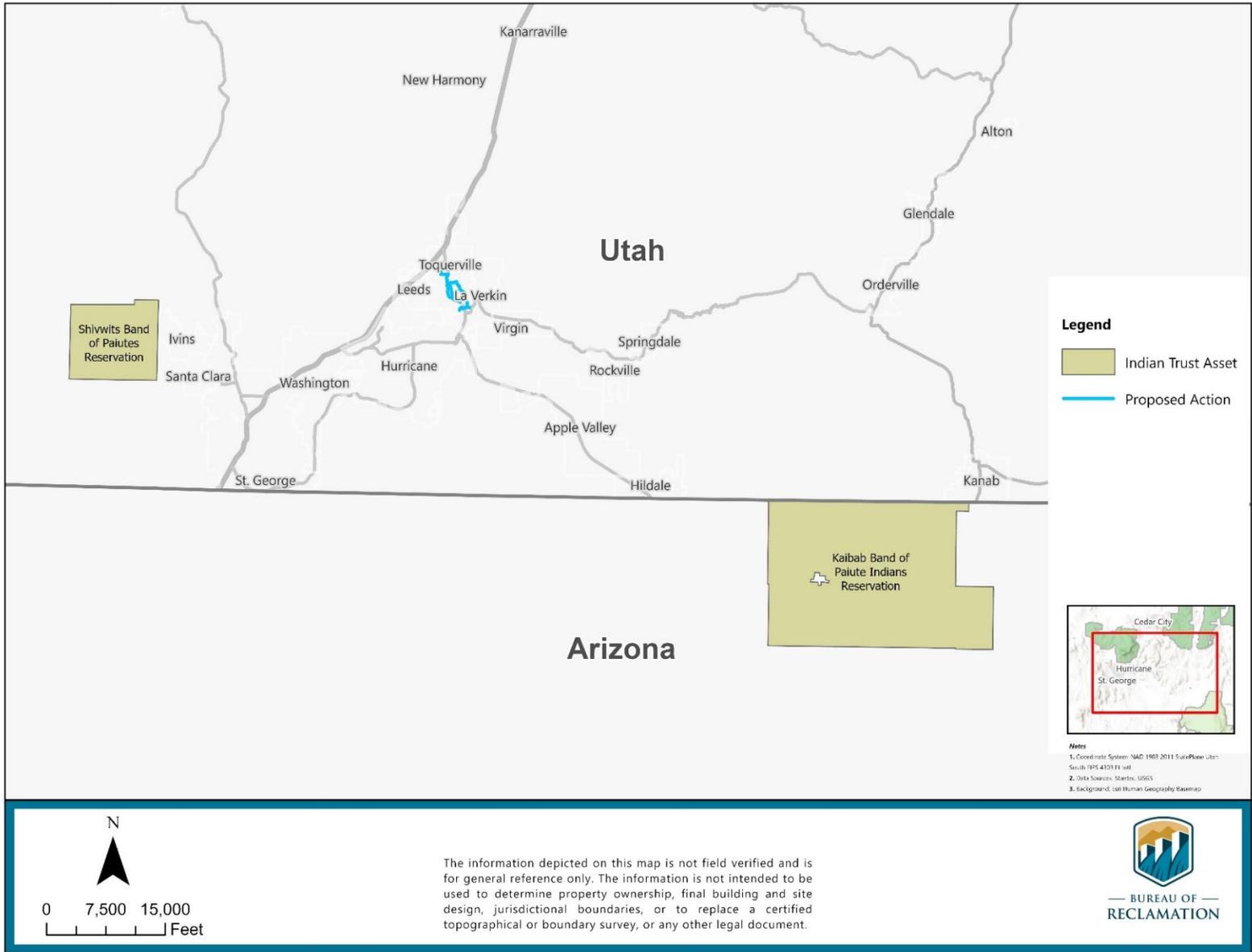
February 2026



Indian Trust Assets (ITAs) are legal interests in property held in trust by the United States for Indian tribes or individuals. Trust assets may include lands, minerals, hunting and fishing rights, traditional gathering grounds, and water rights. The Department of the Interior's policy is to recognize and fulfill its legal obligations to identify, protect, and conserve the trust resources of federally recognized Indian tribes and tribal members, and to consult with tribes on a government-to-government basis, whenever plans or actions affect tribal trust resources, trust assets, or tribal safety (see Departmental manual, 512 DM 2).

Under this policy, as well as Reclamation's ITA policy, Reclamation is committed to carrying out its activities in a manner which avoids adverse effects on ITAs when possible, and to mitigate or compensate for such effects when it cannot. All effects on ITAs, even those considered nonsignificant, must be discussed in the trust analyses in NEPA compliance documents and appropriate compensation or mitigation must be implemented. Effects on ITAs are evaluated by assessing how the action affects the use and quality of ITAs. Any action that adversely affects the use, value, quality or enjoyment of an ITA is considered to have an adverse effect on the resources.

There are no known ITAs in the Study Area vicinity, Figure 1-1 shows the Proposed Action's distant proximity to ITAs in the regional area. Reclamation anticipates that the Proposed Action would have no foreseeable adverse effects on ITAs.



**Figure 1-1. Indian Trust Assets**

2 – February 2026