DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO CA 95814-2922

April 25, 2024

Regulatory Division (SPK-2024-00156)

Regional Transportation Commission of Washoe County
Attn: Mr. Bryan Byrne
1105 Terminal Way
Reno, Nevada 89502
bbryne@rtcwashoe.com

Dear Mr. Byrne:

We are responding to your February 22, 2024, request for an approved jurisdictional determination for the *Lemmon Drive Improvement site*. The approximately 400-acre review area is located adjacent to the north and eastern boundaries of Swan Lake within Lemmon Valley, Latitude 39.66667, Longitude -119.83057, Washoe County, Nevada (*Enclosure 1*).

Based on available information, we concur with your aquatic resources delineation for the site, as depicted on the enclosed December 20, 2023 Aquatic Resource Overview Map prepared by Universal Engineering Sciences (UES; *Enclosure 2*). Four wetlands, totaling approximately 215.1 acres, and a 2,002 linear foot stream are present within the survey area. This letter verifies that the location and boundaries of wetlands were delineated consistent with the wetland definition at 33 CFR §328.3(c)(16), the 1987 *Corps of Engineers Wetlands Delineation Manual* (Wetlands Research Program Technical Report Y-87-1) and the applicable regional supplements; and the location and boundaries of non-tidal waters conform with the ordinary high water mark definition at 33 CFR §328.3(c)(7), Regulatory Guidance Letter 05-05, and any applicable regional guide.

We have determined that all aquatic resources within the review area are not waters of the U.S. regulated under Section 404 of the Clean Water Act or under Section 10 of the Rivers and Harbors Act. We are enclosing a copy of the Approved Jurisdictional Determination Memorandum for Record for your site (*Enclosure 3*). This approved jurisdictional determination is valid for five years from the date of this letter unless new information warrants revision of the determination before the expiration date.

If you object to this determination, you may request an administrative appeal under Corps regulations at 33 Code of Federal Regulations (CFR) Part 331. A *Notification of Appeal Process (NAP) and Request for Appeal (RFA) Form* is enclosed (*Enclosure 4*). If you request to appeal this determination, you must submit a completed RFA form to the South Pacific Division Office at the following address: Administrative Appeal Review

Officer, Army Corps of Engineers, South Pacific Division, CESPD-PDO, 1455 Market Street, 2052B, San Francisco, California 94103-1399, Telephone: 415-503-6574, FAX: 415-503-6646.

In order for an RFA to be accepted by the Corps, we must determine that the form is complete, that it meets the criteria for appeal under 33 CFR Part 331.5, and that the form was received by the Division Office within **60 days** of the date of the NAP. It is not necessary to submit an RFA form to the Division Office unless you object to the determination in this letter.

The delineation included herein has been conducted to identify the location and extent of the aquatic resource boundaries and/or the jurisdictional status of aquatic resources for purposes of the Clean Water Act for the particular site identified in this request. This delineation and/or jurisdictional determination may not be valid for the Wetland Conservation Provisions of the Food Security Act of 1985, as amended. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should discuss the applicability of a certified wetland determination with the local USDA service center, prior to starting work. We recommend that you provide a copy of this letter and notice to all other affected parties, including any individual who has an identifiable and substantial legal interest in the property.

Please refer to identification number SPK-2024-00156 in any correspondence concerning this project. If you have any questions, please contact Samuel Bohannon at the Reno Regulatory Field Office, 300 Booth Street, Room 3050, Reno, Nevada 89509-1328, by email at Samuel.T.Bohannon@usace.army.mil, or telephone at (775) 799-8232. For program information or to complete our Customer Survey, visit our website at www.spk.usace.army.mil/Missions/Regulatory.aspx.

Sincerely,

Michael Nepstad

Nancy A. Haley
Chief, Nevada Section

Enclosures

cc:
Ms. Jennifer Thomason, UES, jthomason@teamues.com
Mr. Chad Anson, CA Group, Inc., Chad.anson@c-agroup.com
Mr. Zachary Carter, Nevada Division of Environmental Protection, zcarter@ndep.nv.gov

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Washoe RTC Attn: Mr. Bryan Byrne		File No.: SPK-2024-00156	Date: April 25, 2024
Attached is:			See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)		A
	PROFFERED PERMIT (Standard Permit or Letter of permission)		B
	PERMIT DENIAL		C
→	APPROVED JURISDICTIONAL DETERMINATION		D
	PRELIMINARY JURISDICTIONAL DETERMINATION		E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at *http://www.usace.army.mil/cecw/pages/reg_materials.aspx* or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within **60 days** of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within **60 days** of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within **60 days** of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within **60 days** of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within **60 days** of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

Enclosure 4

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:	If you only have questions regarding the appeal process you may also contact:
Samuel Bohannon Regulatory Project Manager Nevada Section U.S. Army Corps of Engineers Phone: (775) 799-8232, FAX 916-557-7803 Email: Samuel.T.Bohannon@usace.army.mil	Travis Morse Administrative Appeal Review Officer U.S. Army Corps of Engineers South Pacific Division Phillip Burton Federal Building, Post Office Box 36023 450 Golden Gate Avenue San Francisco, California 94102 Phone: 970-243-1199x1014, FAX: 971-241-2358 Email: W.Travis.Morse@usace.army.mil

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a **15-day** notice of any site investigation and will have the opportunity to participate in all site investigations.

Signature of appellant or agent.	Date:	Telephone number:

Universal Engineering Sciences
4480 W. Hacienda Ave., Ste. 104
Las Vegas, NV 89118
p. 702.873.3478 | teamues.com

To:
USACE- Sacramento District
Reno Regulatory Office
300 Booth Street, Room 3050
Reno, NV 89509
spkregulatorymailbox@usace.army.mil

Date: February 15, 2024

Dear Reviewer,

Enclosed is a request for an Approved Jurisdictional Determination (AJD) for the Lemmon Drive Project, located along Lemmon Drive, Reno, Washoe County, Nevada near Latitude 39.666667° North, -119. 830572° West. The project proponent is the Regional Transportation Commission (RTC) of Washoe County. The 400-acre parcel was surveyed in September, October, and November 2023, and 2,002 linear feet/216.230 acres of aquatic resources comprised of one relatively permanent stream and five wetlands were documented across the Survey Area.

In evaluating the delineated aquatic resources under the 2023 revised definition of waters of the US (WOTUS), as amended on September 8, 2023, it is the opinion of UES that none of the aquatic resources located within the Survey Area are federally jurisdictional. Specifically, all streams are tributaries to and wetlands are adjacent to Swan Lake. Swan Lake is a closed basin, with no surface connection to any traditional navigable water (TNW). The Truckee River is the closest TNW to the project site, but there is no hydrologic connection between any of the delineated aquatic resources and the Truckee River. As discussed in the preamble of the 2023 revised definition of WOTUS, as amended, these tributaries are part of a system that never reaches a paragraph (a)(1) water and thus are not jurisdictional under this provision. The wetlands identified in the Survey Area are not adjacent to any paragraph (a)(1), (a)(2), or (a)(3) waters and would therefore not be jurisdictional.

Should you require any additional information please contact me at jthomason@teamues.com or 775-525-0384.

Respectfully,

Jennifer Thomason

Jennifer Thomason
Senior Environmental Scientist

Attachments:

1- Request Form
2- Aquatic Resources Delineation Report
3- ORM Upload Excel Spreadsheet

Lemmon Drive Project
Reno, Nevada

Aquatic Resources Delineation Report

February 2023

Acronyms and Abbreviations

amsl	Above mean sea level
APT	Antecedent Precipitation Tool
CWA	Clean Water Act
DSM	Digital Surface Model
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
HGM	Hydrogeomorphic
HUC	Hydrologic Unit Codes
IPaC	Information Planning and Consultation
L2	Lacustrine Littoral
NHD	National Hydrography Dataset
NOAA	National Oceanic and Atmospheric
NRCS	Natural Resource Conservation Service
NWI	National Wetland Inventory
OHWM	Ordinary High Water Mark
PSS	Palustrine-Scrub-Shrub
TNW	Traditional Navigable Water
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
UES	Universal Engineering Sciences, Inc.
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Service
Washoe RTC	Regional Transportation Commission of Washoe County
WOTUS	Waters of the United States

Table of Contents

CA Group, Inc
An Employee Owned Company

Tables

Figures

Executive Summary

The purpose of this evaluation is to delineate the aquatic features that are present within the Survey Area for the Lemmon Drive Traffic Improvements and Resiliency Project utilizing the current procedures so that the United State Army Corps of Engineers (USACE) may determine which aquatic features are waters of the United States (WOTUS) and are or are not federally jurisdictional under the Clean Water Act (CWA).

On October 17 and November 19, 2023, Universal Engineering Sciences' (UES) environmental scientists conducted field investigations to determine the extent of aquatic features occurring in the approximately 400-acre Survey Area. The delineation was conducted in accordance with 2008 "A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States" and the 1987 Corps of Engineers Wetlands Delineation Manual and Arid West Regional Supplement.

Approximately 2,002 linear feet/216.230 acres of aquatic resources were identified across the Survey Area. The aquatic resources were comprised of one relatively permanent stream totaling approximately 2,002 linear feet/1.100 acres and five wetlands totaling approximately 215.130 acres (Appendix A). All aquatic resources contribute to Swan Lake, a topographically isolated basin. This Aquatic Resources Delineation Report was completed in accordance with the USACE Sacramento District Minimum Standards for Delineation Reports, dated January 2016.

1.0 Introduction

The Regional Transportation Commission of Washoe County (Washoe RTC), in conjunction with the Nevada Department of Transportation and Federal Highway Administration is proposing a roadway improvement project along Lemmon Drive from Fleetwood Drive to Ramsey Way in Reno, Nevada. The Survey Area for the Lemmon Drive Project is located adjacent to the north and eastern sides of Swan Lake, Washoe County, Nevada. An aquatic resources delineation was completed by UES within the approximately 400-acre Survey Area on October 17 and November 19, 2023. The purpose of this report is to identify and describe aquatic resources and to identify known possible sensitive plants, fish, wildlife species, and cultural/historic properties within the Survey Area for review by the USACE.

Applicant:	Applicant Representative:	Agent(s):
Bryan Byrne	Chad Anson	Ms. Jennifer Thomason
Washoe RTC	CA Group, Inc.	UES
1105 Terminal Way, Suite #108	8630 Technology Way, Suite C	6995 Sierra Center Parkway
Reno, Nevada 89502	Reno, Nevada 89521	Reno, Nevada 89511
Phone: 775-335-1865	Phone: (775) 283-8394	Phone: (775) 525-0384
Email: BByrne@rtcwashoe.com	Email: Chad.anson@c-agroup.com	Email: jthomason@teamues.com

2.0 Location

The Survey Area is located in Washoe County, Nevada in the Lemmon Valley, off of Lemmon Drive (Highway 165), adjacent to the north and eastern boundaries of Swan Lake.

The approximate center of the project is located at 39.666667° North, -119.830572° West. The project is located on the United States Geological Survey (USGS) 7.5-minute 24K-topographic quadrangle, “Reno NE Quadrangle”.

2.1 Driving Directions

From the Reno USACE office, take I-80 East from Keystone Avenue and continue until exit US-395 North to Lemmon Drive, exit 74. Merge onto Lemmon Drive and take Lemmon Drive for 4 miles to the Survey Area.

Figure 1. Survey Area Location

Figure 2. Survey Area

3.0 Methods

Methods for delineating aquatic resources followed guidelines set forth by the USACE in the following documents:

- National Ordinary High Water Mark Field Delineation Manual for Rivers and Stream: Interim Version (Gabrielle C.L., et. al. 2022)
- A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States
- Corps of Engineers 1987 Wetland Delineation Manual
- Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)

Prior to the on-site delineation visit, reviews were conducted of the most recent and historical Google Earth imagery for the Survey Area (Appendix B). Historical and current topographic maps and hydrology from the National Wetlands Inventory (NWI) and National Hydrography Dataset (NHD) for the Survey Area were also reviewed prior to conducting the site visit (Appendix B). Survey location and supporting maps are also located in Appendix B.

Survey Area photographs were taken, with GPS coordinates and direction (Appendix C) during each of the three site visits described below. Dominant vegetation and general site features and conditions were identified, and a plant list generated and provided in Appendix D. Soil characteristics were also reviewed from the National Resources Conservation Service (NRCS) Web Soil Survey website prior to the on-site delineation visits (Appendix E).

On September 26, 2023, a team from Atkins visited the site and collected field data reported on Wetland Determination Data Sheets – Arid West Region (Appendix F). This data was used in verification of UES collected remote sensing data and analysis, as described below.

A UES pilot conducted a drone survey on October 17, 2023, to collect natural color imagery and elevation data. Photos taken by a drone-mounted Sony Rx1RII camera were processed using photogrammetric methods to produce high-resolution orthomosaic imagery, a digital surface model (DSM), and a shaded relief to visualize the DSM (Appendix B). A differential Global Navigation Satellite System (GNSS) location control system was used to maintain positional accuracy of the drone during data collection.

The drone-collected imagery was analyzed and compared to both current and historical satellite and aerial imagery to assist in verifying aquatic resources (e.g., stream bed, stream banks, vegetation changes, and wetland features) characteristics such as low flow channels, wetland boundaries, and changes in vegetation across the landscape. This data was also cross referenced against NWI data and field data collected by Atkins. A field survey was conducted by UES on November 19, 2023, to field verify the conclusions from this analysis.

The USACE Antecedent Precipitation Tool (APT) was utilized for the date of the site visits and this data was included in the appendices of this report (Appendix G) and is discussed further in the following Section of this report.

4.0 Existing Conditions

4.1 Landscape Setting

The Survey Area is located in the Sierra Nevada-Influenced Semiarid Hills and Basins terrain of the Central Basin and Range region (USEPA 2013). The steep topography of the area, the elevation of the surrounding area to the Survey Area, and the conditions during the site visit indicate flows are derived from snow melt and precipitation sources. The Survey Area is located within Lemon Valley. The topography across the Survey Area is relatively flat at an elevation of approximately 4,925 feet above mean sea level (amsl). Site conditions were verified during the site visit by collecting global positioning system data with elevations ranging between 4,919 feet amsl to 4,931 feet amsl across the Survey Area. Hydrophytic vegetation was prevalent and covered most of the Survey Area.

All areas within the Survey Area, and all aquatic resources, were accessible at the time of survey.

4.2 Aquatic Resources

The NRCS Web Soils Survey identified five soil units intersecting the Survey Area boundary (USDA 2023). The following soil units were identified and are listed in order of dominance within the survey area:

- Doten variant silty clay, strongly saline: Is not classified as a hydric soil, classified “none” for ponding and flooding and the water table is approximately 60 to 72 inches.
- Doten silty clay, 8 to 15 percent slopes: Is not classified as a hydric soil, classified “none” for ponding and flooding and the water table is approximately 60 to 72 inches.
- Doten silty clay, slightly saline: Is not classified as a hydric soil, classified “none” for ponding and flooding and the water table is approximately 60 to 72 inches.
- Sodic Endoaquents: Associated with playa landforms and classified as a hydric soil, rated with frequent flooding but no ponding, with 0 inches to the water table.
- Updike Loam: major components are not hydric, however a contrasting minor component soil unit, Cradelbaugh, is rated as hydric, classified “none” for ponding and flooding and the water table is approximately 48 to 72 inches.

Despite most of the soils descriptions not being hydric it appears that the urban development has increased runoff entering Swan Lake and as a result the adjacent wetlands are expanding. For the purposes of this assessment, in accordance with Chapter 5 of the Arid West Regional Supplement, the soils are considered to be problematic across the site due to the wetland areas being recently established. Through historic aerial imagery (Appendix B) the frequent, annual flooding of the area around Swan Lake is documented and the vegetative community supports the idea that these areas are converting to wetlands.

The vegetation community was consistent with riparian and wetland habitat types with swamp sandbur (*Crypsis schoenoides*) and bulrushes (*Schoenoplectus acutus and Shoenoplectus maritimus*) being some of the dominant vegetative species present across the Survey Area (Appendix D). Even the upland data point captured by the independent Atkins field assessment in September 2023, found hydrophytic vegetation and primary hydrologic indicators present as documented in the datasheets.

The Survey Area has experienced a higher-than-normal amount of precipitation in 2023. Through November 30, 2023, 10.06 inches of precipitation have been observed; compared to the average of 6.22 inches. (Figure 3). While the 30-day rolling average was normal for October and November, both were drier than their historical averages of 0.05 inches versus 0.5 inches, and 0.27 inches versus 0.62 inches, respectively, through November 30 (Figure 4) (NOAA 2023).A review of the APT results for the site visits conducted finds that the September and October (e.g., drone flight) site

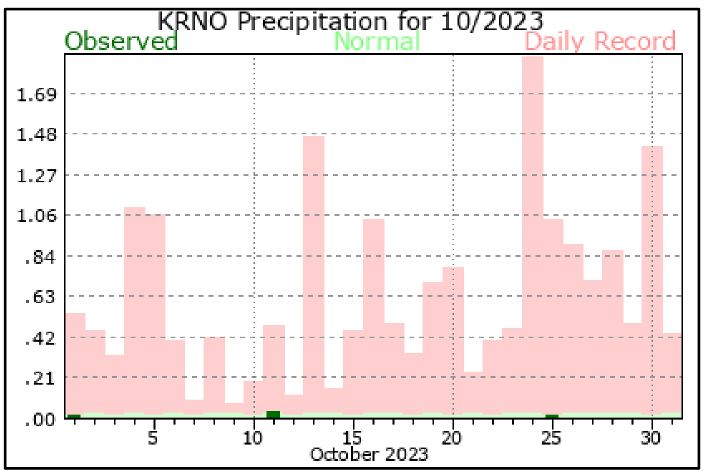


Figure 3. Precipitation totals for October 2023 recorded at the Reno area weather station (green). Daily Record graphs (pink) are highest recorded precipitation on record.

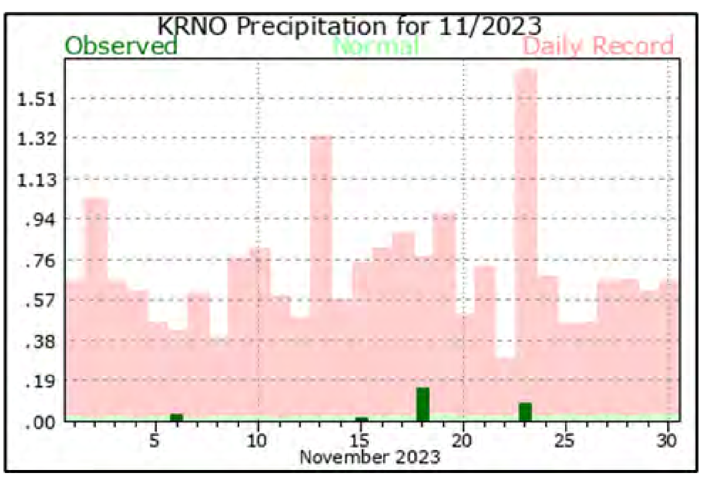


Figure 4. Precipitation totals for November 2023 recorded at the Reno area weather station (green). Daily Record graphs (pink) are highest recorded precipitation on record.

visits were conducted during the dry season, though the September visit was experiencing wetter than normal conditions. By October, the site conditions were reported as normal. The November visit was conducted during the wet season and the site conditions were reflective of normal conditions.

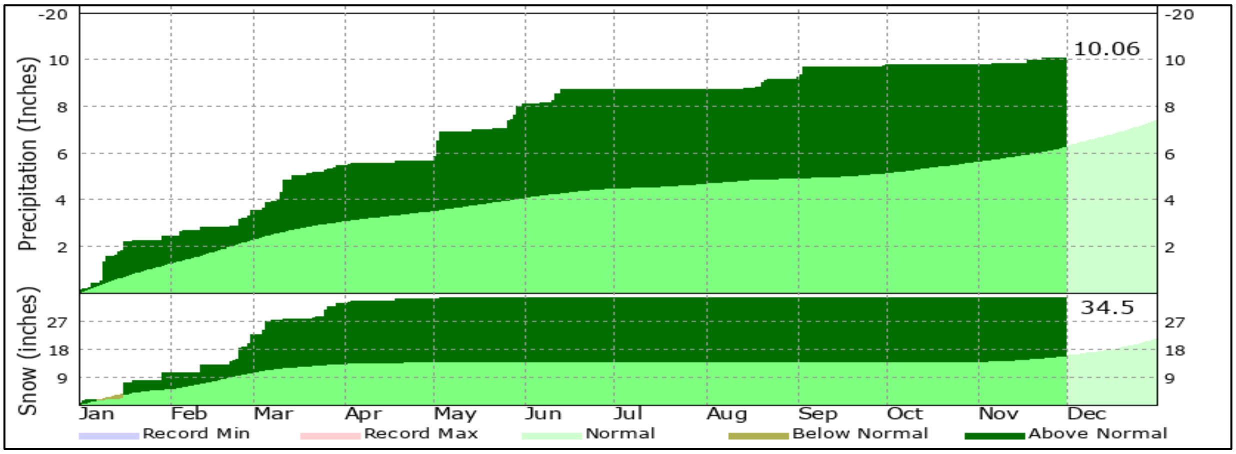


Figure 5. Precipitation total for 2023 through November 30 at the Reno area weather station.

For the reasons identified within this section, it is UES' professional opinion that the drone flight imagery collected and analyzed utilizing vegetative communities to identify the wetland boundaries is a conservative and appropriate approach for delineating the lateral extents of aquatic resources within the Survey Area. A more thorough discussion of how these tools were utilized in delineating each of the aquatic resources identified is provided below.

4.3 Overview

The NWI and NHD mapping (Appendix B) shows a similar result of aquatic features located within the Survey Area to those delineated by UES. One notable difference is the connecting features between Wetland B and Wetland E shown by NWI, which are now physically separated. The Survey Area is located within the topographically isolated basin of Swan Lake. Lacustrine littoral and wetland fringe were observed during the field investigations and are described further below. Hydrologic indicators were also present throughout the Survey Area in the dry areas. The Aquatic Resources Map is shown in Figure 5 and provided at scale in Appendix A

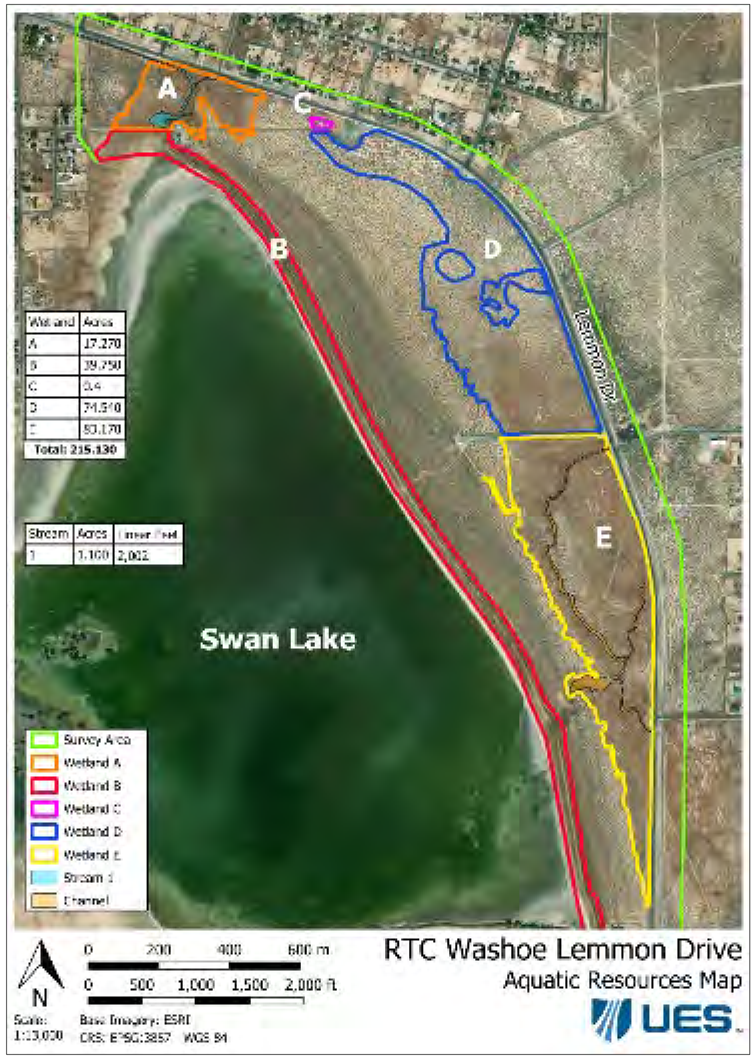


Figure 6. Aquatic Resources

4.3.1 Wetland A

Wetland A is located in the northwest portion of the Survey Area. It is bound by Lemmon Drive to the north and Wetland B to the south. It is classified as Cowardin, Palustrine-Scrub-Shrub (PSS) and hydrogeomorphic (HGM) code of Palustrine. At the time of the November survey, the feature was vegetated and not completely inundated, with wetland indicators including greener and thicker vegetation than surrounding uplands. OHWM indicators were also present. Wetland A measures 17.270 acres within the Survey Area. This feature experiences periodic changes in water levels, a fact evidenced by both aerial imagery and the drone data collected by UES. High resolution orthomosaic shows an easily distinguished line in vegetation along the eastern border of the wetland (Figure 6, image on left), while shaded relief imagery demarcates a change in elevation along the western border not as easily distinguished by vegetation alone (Figure 6, image on right).

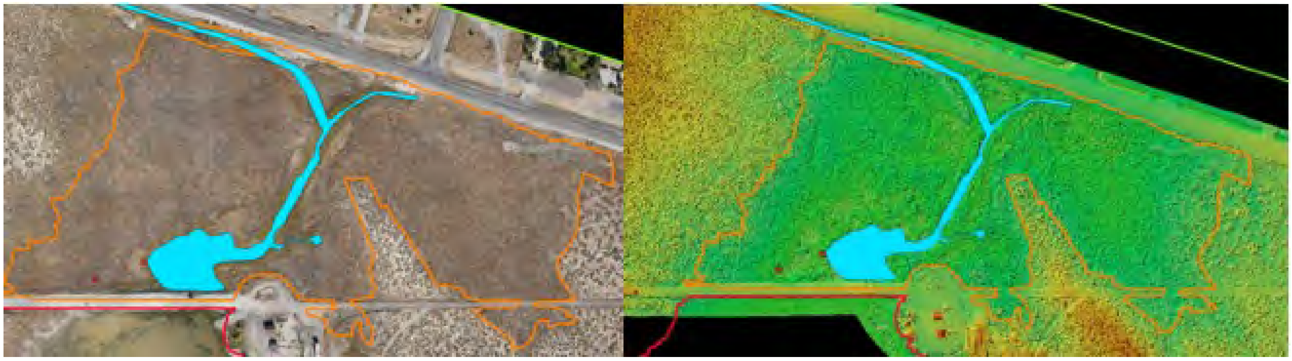


Figure 7. Wetland A boundary assessment. (Left) East boundary defined by vegetation, wetland data points in red. Source: UES orthomosaic drone imagery. (Right) West boundary defined by elevation, wetland data points in red. Source: UES shaded relief drone imagery.

A set of paired wetland data points was taken by Atkins in this area. One was taken closest to standing water inside Stream 1, and the other at a higher elevation, with less green, dense vegetation, and no obvious standing water. While the lower point had all of the indicators of a wetland, the higher point lacked hydric soil indicators. For the reasons discussed in Section 4.2, above, and summarized here UES delineated the boundaries of Wetland A based on the following:

- Upland development of roads and residential areas have concentrated and increased flows toward Swan Lake.
- Historical imagery shows areas of complete inundation and standing water much wider than wetland data points.
- This change in hydrology would not be reflected in soil development as these wetlands are being newly established.
- Corroborating indicators including NWI data, vegetation, and elevation.

4.3.2 Wetland B

Wetland B forms the western side of the Survey Area and includes part of the Swan Lake shoreline. Wetland B is bound by Swan Lake to the west and Wetland A on its north side. Swan Lake/Wetland B is classified as Cowardin, L2 Lacustrine Littoral and HGM code of Lacustrine Fringe. At the time of the November survey, the feature had standing water and wetland vegetation. Wetland B measures 39.750 acres within the Survey Area. Aerial imagery, UES shaded relief drone imagery, and NWI data all indicate similar boundaries for this feature.

As previously noted, Swan Lake is a topographically isolated basin. The feature is relatively permanent but lacks a surface water connection to any other waterway. The Truckee River is the nearest traditionally navigable waterway, but there is no surface water connection between Swan Lake and the Truckee River.

4.3.3 Wetland C

Wetland C is in the north-central portion of the Survey Area. It is bound by Lemmon Drive to the north and Wetland D to the south. It is not identified by NWI data. At the time of the November survey, the feature was dry with wetland indicators of vegetation similar to nearby wetlands. Hydrologic indicators were also present (i.e., mudcracks). Wetland C measures 0.4 acres within the Survey Area. This area was found to resemble the nearby Wetland D in physical and vegetative characteristics, as well as appearing periodically inundated with water in aerial imagery. Anthropogenic influences discussed in Wetland A above are the likely contributors to the development of Wetland C.

Figure 8. Wetland C (Pink) and its vegetative similarities to other nearby wetlands.

4.3.4 Wetland D

Wetland D is located in the northeast and east-central portion of the Survey Area. It is bound by Wetland C to the northwest, by Lemmon Drive to the north and east, and Wetland E to the south. Wetland D is classified as Cowardin PSS and HGM code of Palustrine. Hydrologic indicators were present (i.e., mudcracks). Wetland D measures 74.540 acres within the Survey Area.

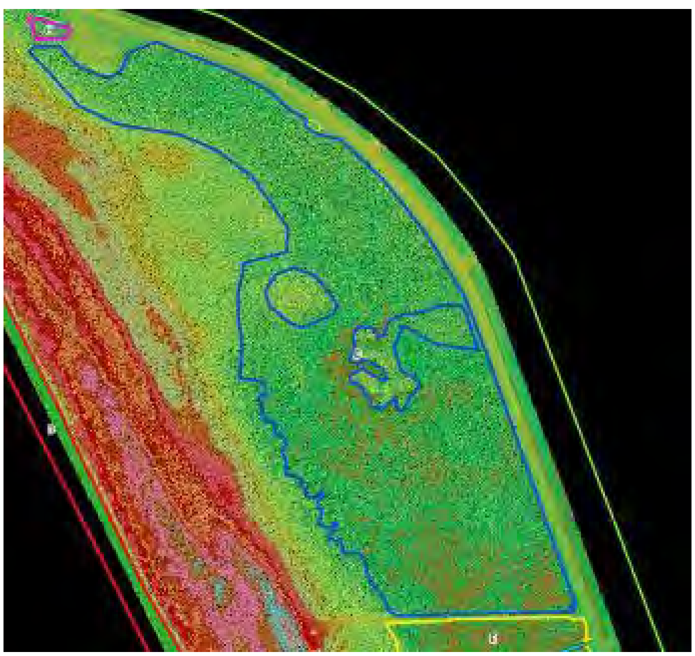


Figure 9. Consistent elevation across Wetland D, per UES shaded relief drone imagery.

The delineated boundary of Wetland D is significantly expanded in its northern extent compared to NWI data. This expansion aligns with shaded relief elevation modeling, as well as vegetative indicators. Two “islands” of non-wetland area have been excluded from the wetland boundary due to their higher elevation and lack of hydrophytic vegetation.

4.3.5 Wetland E

Wetland E is located in the central and southern portions of the Survey Area. It is bound by Wetland D to the north and Lemmon Drive to the east. Wetland E is classified as Cowardin PSS and HGM code of Palustrine. At the time of the November survey, the feature was dry with hydrophytic vegetation present. Hydrologic indicators were also present (i.e., mudcracks). Wetland E measures 83.170 acres within the Survey Area.

Figure 10. Earthen berm between Wetland E/ Channel 5 and Wetland B, per UES drone imagery.

Wetland E is nearly identical to the NWI data for this area. The exception here is that there is no longer a direct connection between Wetland E and Wetland B as is shown in historical aerial imagery. Orthomosaic drone imagery from UES shows an earthen berm lies between the two wetlands at the time of survey.

4.3.6 Stream 1

Stream 1 is an intermittent stream located at the northwest portion of the Survey Area and had standing water at the time of the October site visit. It is located along the south side of Lemmon Drive and runs west to east before turning south towards Swan Lake. Stream 1 appears to have been constructed or enhanced in 2004, based on historic imagery. After this date, water is visible intermittently in aerial imagery across the next two decades.

Figure 11. Active construction in Stream 1. Source: Google Earth, 2004.

The stream is influenced by stormwater drainage from the developed areas north and along Lemmon Drive. Culverts were observed along Lemmon Drive entering the Survey Area. Standing water was present and vegetation was observed along the banks during the November survey. OHWM indicators included break in slope and decreased vegetation. Stream 1 measures 2,002 linear feet/ 1.100 acres in the Survey Area. Stream 1 terminates at a purpose-built raised road, ponding in Wetland A, and does not connect to any downstream WOTUS.

4.3.7 Other Potential Aquatic Features

The following features were investigated due to their visual significance in aerial imagery, however none proved to be definable streams as the features did not have consistent OHWM characteristics. Corroborating photographs are included in Appendix C. These areas are all located within the above described wetland areas and are included in the overall acreage of that feature.

4.3.7.1 Channel 2

Channel 2 is an overflow channel between Stream 1 and a 20 foot wide circular depression that appeared in aerial imagery in 2020. The channel is apparently influenced by nuisance flows from a leaking water line. Both Channel 2 and the circular depression are encompassed by Wetland A. Channel 2 measures 116 linear feet.

4.3.7.2 Channel 3

Channel 3 is a low flow channel inside Wetland E. It was investigated as it resembled a possible riverine feature. Site investigations found Channel 3 to be a swale like feature, influenced by flows from the upstream stormwater system. Field investigations showed Channel 3 to possess no OHWM indicators beyond decreased vegetation and some light mud cracking in the area nearest the culvert below Lemmon Drive. Channel 3 measures 2,572 linear feet.

4.3.7.3 Channel 4

Channel 4 is a low flow channel at the bottom of Wetland E. Channel 4 conveys flows from the residential storm drainage system south into Channel 5. Site investigations found Channel 4 to hold no OHWM indicators, including a lack of bed and bank and no change in slope. Channel 4 measures 1,824 linear feet

4.3.7.4 Channel 5

Channel 5 is readily distinguished on satellite imagery, measuring over 100 feet at its widest point. Channels 3 and 4 both flow to Channel 5. Historically, this low flow channel would have connected Wetland E with Wetland B, but its flows have been severed by an earthen berm. Besides reduced vegetation in the channel, Channel 5 holds no other OHWM indicators, including a lack of bed and bank, and no break in slope. Channel 5 measures 985 linear feet.

4.4 Summary of Aquatic Resources

Table 1. Aquatic Resources within the Survey Area

AR Name	Cowardin	Location Coordinate (Decimal Degrees)		Size (Acreage)	Length (Feet)
		Latitude	Longitude		
Wetland A	PSS- Palustrine Scrub Shrub	39.673236	-119.843647	17.270	NA
Wetland B	L2-Lacustrine Littoral	39.664025	-119.837062	39.750	NA
Wetland C	PSS- Palustrine Scrub Shrub	39.672610	-119.839376	0.4	NA
Wetland D	PSS- Palustrine Scrub Shrub	39.667651	-119.834232	74.540	NA
Wetland E	PSS- Palustrine Scrub Shrub	39.660710	-119.830161	83.170	NA
Stream 1	R4-Riverine Intermittent	39.673910	-119.843776	1.100	2,002
			Total	**216.230**	**2,002**

5.0 Sensitive Plants, Fish, Wildlife, and Cultural/Historic Properties

The USFWS Information, Planning and Consulting website lists several species as potentially occurring within the Survey Area that are listed as threatened or endangered species under the Endangered Species Act or candidate species. The following is a list of threatened or endangered and candidate species identified within the Survey Area:

- Webber's Ivesia (*Ivesia webberi*): is a threatened plant species. While there is critical habitat defined for the species, the property area does not fall within the designated final critical habitat. The species typically only occurs in well documented populations in "sparsely vegetated areas, where competition for light and moisture with other species is low" (NatureServe Explorer 2023). The Survey Area is not within one of the documented population areas.
- Carson Wandering Skipper (*Pseudocopaeodes eunus obscurus*): is an insect that is listed as endangered. USFWS has not designated a critical habitat for this species. A species level survey will be performed and coordinated through the USFWS by the appropriate federal agency.
- Monarch Butterfly (*Danaus plexippus*): The Monarch Butterfly is a candidate species. While candidate species are not offered the same level of protection as listed species, the USFWS encourages project proponents to implement conservation measures where applicable. Monarch Butterflies may be present wherever Milkweed is found. While no Milkweed was noted during the field survey, it could be present within the Survey Area.

UES conducted a Class III cultural resources survey which is being coordinated for compliance with Section 106 of the National Historic Preservation Act through the appropriate federal agencies.

6.0 References

Deters, Jason C. 2022. "Antecedent Precipitation Tool (APT), Version 1.0." US Army Corps of Engineers, Engineer Research and Development Center, February. Accessed November 2023. https://github.com/erdc/Antecedent-Precipitation-Tool.

Environmetnal Labroatory. (1987). "Corps of Engineers Wetlands Delineation Manual," Technical REport Y-87-1, U.S. Army Engineer Waterways Experiement Station, Vickburg, MS.

Gabrielle, C. L., and et. al. 2022. *National Ordinary High Water Mark Field Delineation Manual for Rivers and Streams: Interim Version.* Hanover: US Army Engineer Research and Development Center/Cold Regions Research and Engineering Laboratory.

Google Earth. 2023. *Aerial and satellite imagery, elevations, site and area features.* October.

NatureServe Explorer. 2023. *Landing Page.* November 13. https://explorer.natureserve.org/.

NOAA. 2023. *National Weather Service. Reno Tahoe Climate Graphs.* Accessed November 30, 2023. https://www.weather.gov/rev/CliPlot.

USACE. n.d. "Aquatic Resources Delineation." *U.S. Army Corps of Engineers. Sacramento District Website.* Accessed November 2023. https://www.spk.usace.army.mil/Missions/Regulatory/Jurisdiction/Aquatic-Resources-Delineation/.

—. 2008. *Hydrogeomorphic Approach for Assessing Wetlands Functions. Lacustrine Fringe.* Accessed December 2023. https://wetlands.el.erdc.dren.mil/lacustrine.html.

—. 2008. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0),* ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-08-28. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

USDA. 2023. *Natural Resources Conservation Service. Soil Data Access Hydric Soils List.* November 10. https://www.nrcs.usda.gov/.

USEPA. 2013. *Level IV Ecoregions of the Conterminous United States.* Corvallis: U.S. EPA Office of Research Y Development (ORD) – National Health and Environmental Effects Research Laboratory (NHEERL).

USFWS. 2017. "Candidate Species. Section 4 of the Endangered Species Act." *U.S. Fish & Wildlife Service.* October. https://www.fws.gov/sites/default/files/documents/Candidate-Species.pdf.

—. 2023. "Information for Planning and Consultation." *U.S. Fish and Wildlife Service IPaC website.* November 21. https://ipac.ecosphere.fws.gov/location/A7SXJRZN7NBANCDS4JYKEJOO5E/resources.

—. n.d. "National Wetlands Mapper." *U.S. Fish and Wildlife.* Accessed November 15, 2023. https://www.fws.gov/program/national-wetlands-inventory/wetlands-mapper.

Appendices

Appendix A: Aquatic Resource Delineation Maps

Appendix B: Supporting Maps and Historical Aerials

Appendix C: Site Photographs

Appendix D: Plant List

Appendix E: NRCS Soil Report

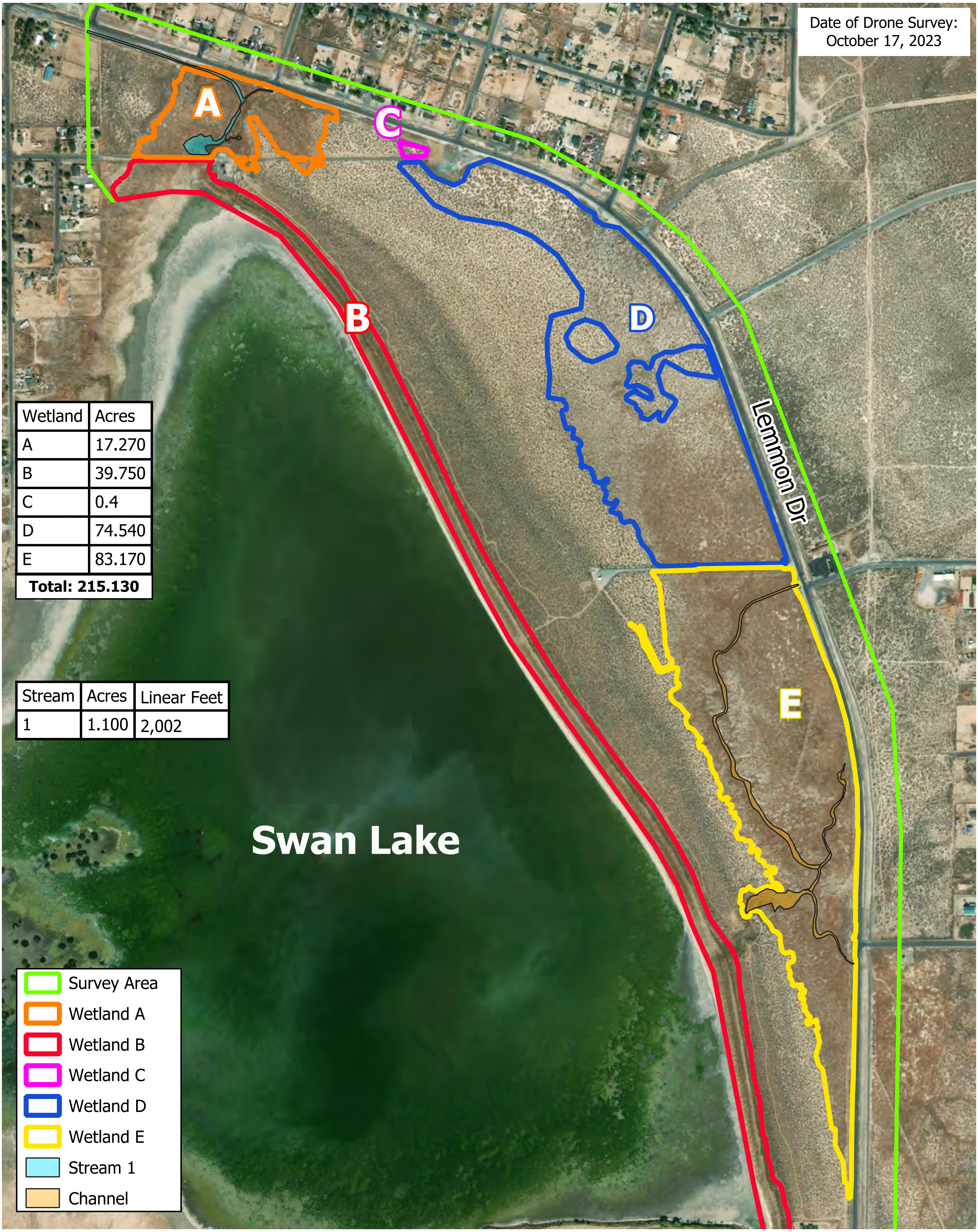
Appendix F: Wetland Datasheets

Appendix G: Antecedent Precipitation Tool Results

Appendix H: Property Access Memo

Appendix I: USACE Aquatic Resources Excel Sheet

Appendix A: Aquatic Resource Delineation Maps



Wetland	Acres
A	17.270
B	39.750
C	0.4
D	74.540
E	83.170
Total: 215.130	

Stream	Acres	Linear Feet
1	1.100	2,002

N

0 200 400 600 m

0 500 1,000 1,500 2,000 ft

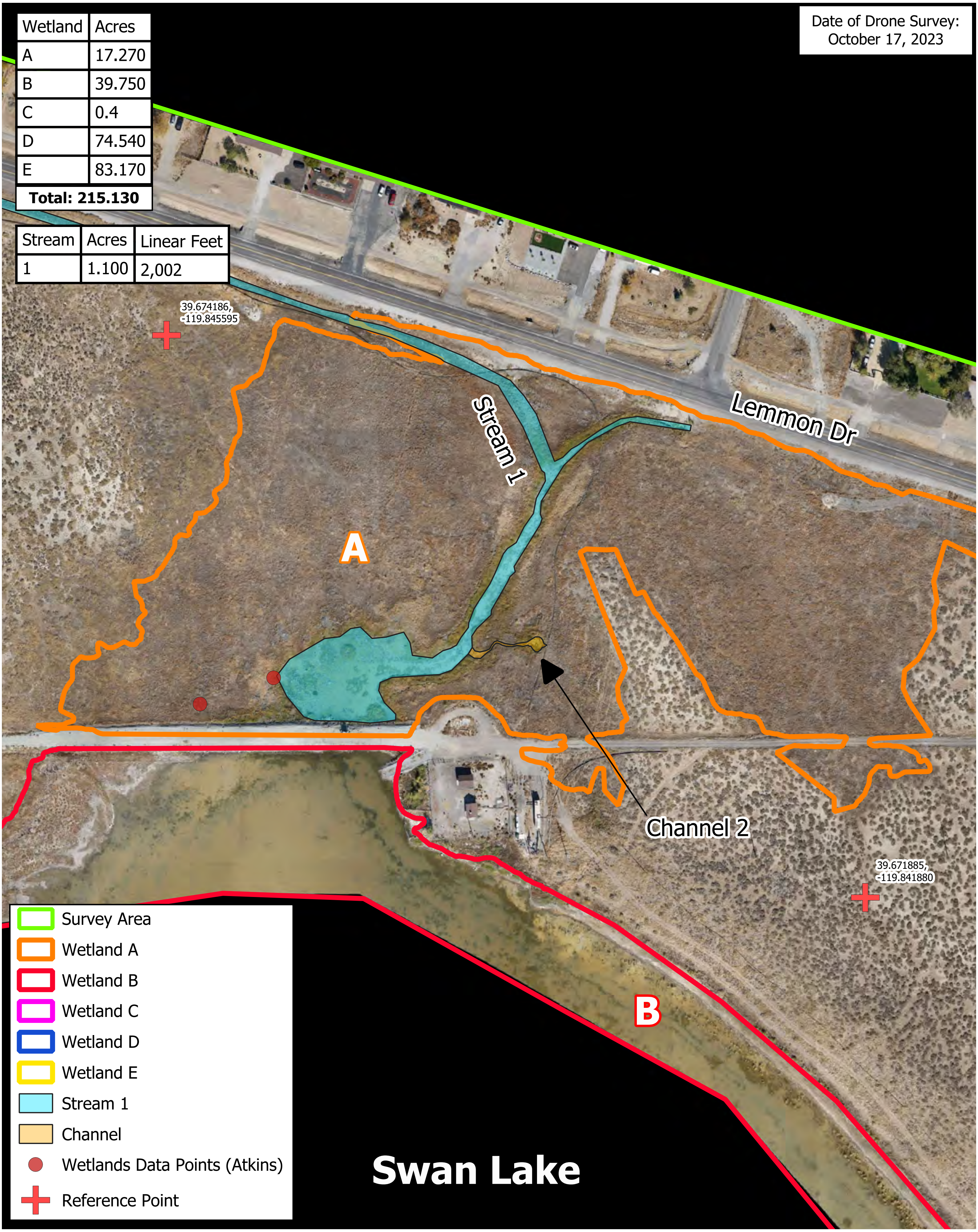
1 inch = 1,083 feet

Base Imagery: ESRI
CRS: EPSG:3857 - WGS 84

RTC Washoe Lemmon Drive
Aquatic Resources Map - Overview

Map Made:
December 20, 2023
R. Propson

UES



Wetland	Acres
A	17.270
B	39.750
C	0.4
D	74.540
E	83.170
Total: 215.130	

Stream	Acres	Linear Feet
1	1.100	2,002

0 30 60 90 m

0 100 200 300 ft

1 inch = 233 feet

Base Imagery: 2023 UES Orthomosaic Drone Imagery
CRS: EPSG:3857 - WGS 84

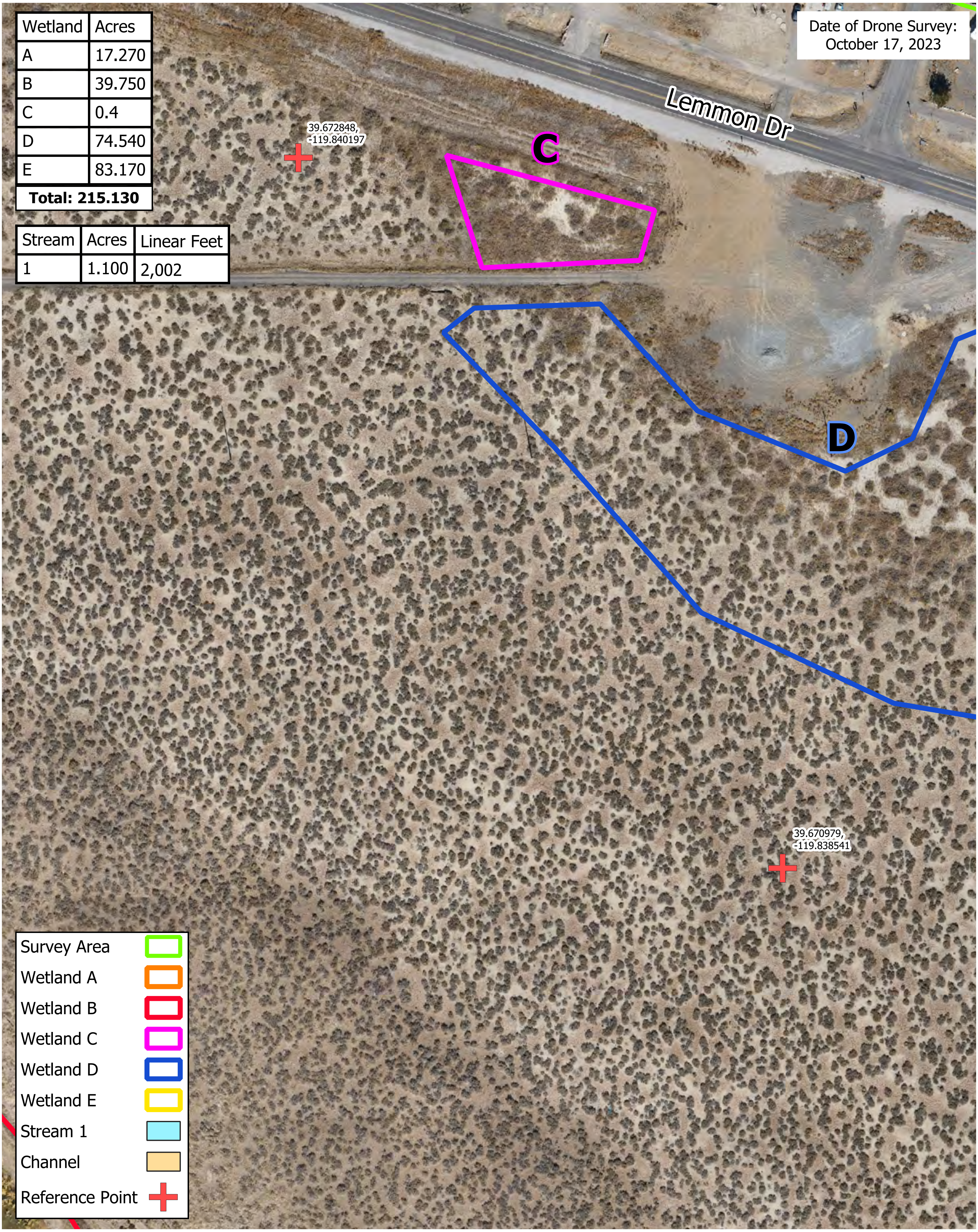
RTC Washoe Lemmon Drive
Aquatic Resources Map - Wetland A

Map Made:
December 20, 2023
R. Propson

UES

Wetland	Acres
A	17.270
B	39.750
C	0.4
D	74.540
E	83.170
Total: 215.130	

Stream	Acres	Linear Feet
1	1.100	2,002



N

0 30 60 90 m

0 100 200 300 ft

1 inch = 150 feet

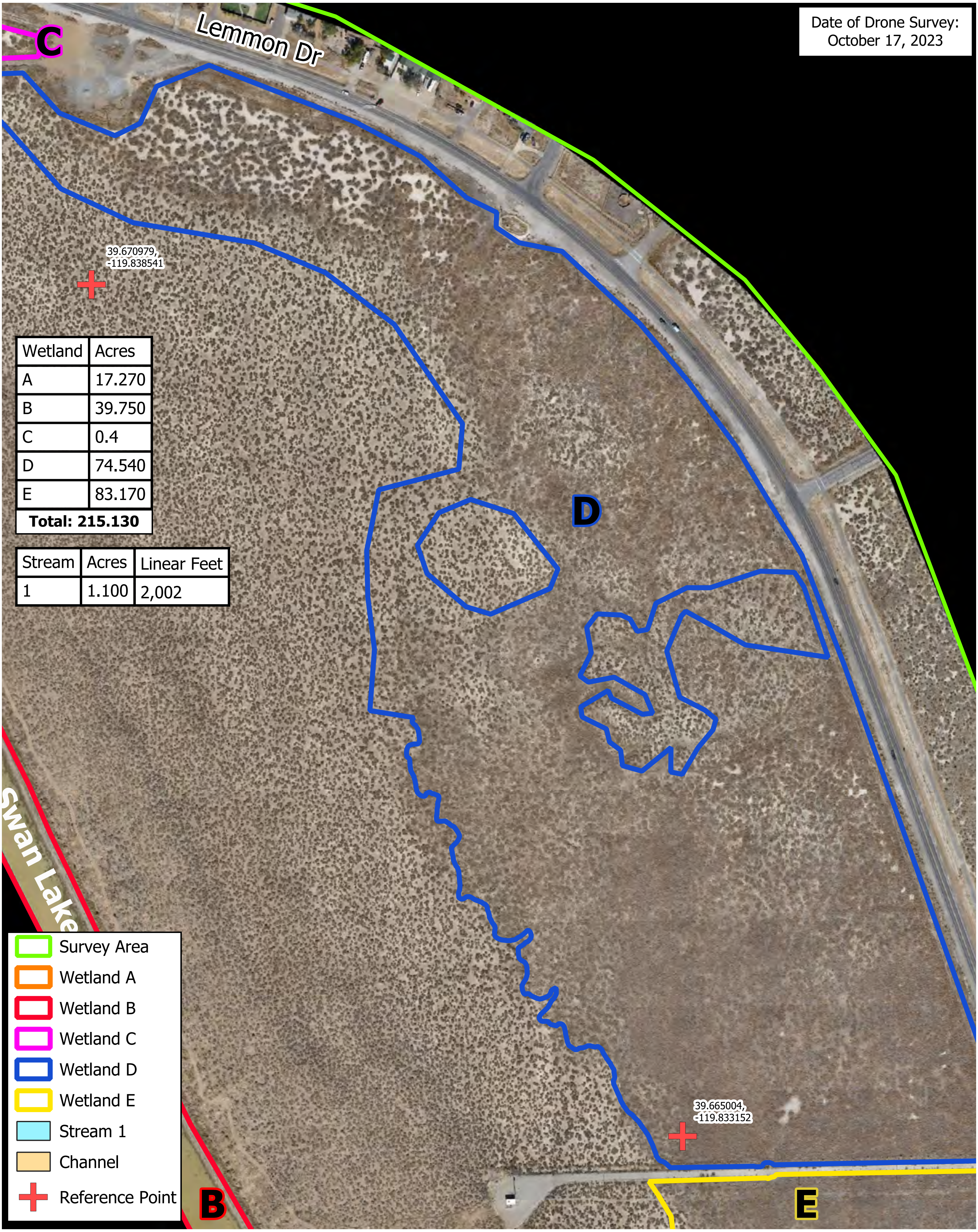
Base Imagery: 2023 UES Orthomosaic Drone Imagery

CRS: EPSG:3857 - WGS 84

RTC Washoe Lemmon Drive
Aquatic Resources Map - Wetland C

Map Made:
December 20, 2023
R. Propson

UES™



Wetland	Acres
A	17.270
B	39.750
C	0.4
D	74.540
E	83.170
Total: 215.130	

Stream	Acres	Linear Feet
1	1.100	2,002

N

0 100 200 m

0 200 400 600 ft

1 inch = 400 feet

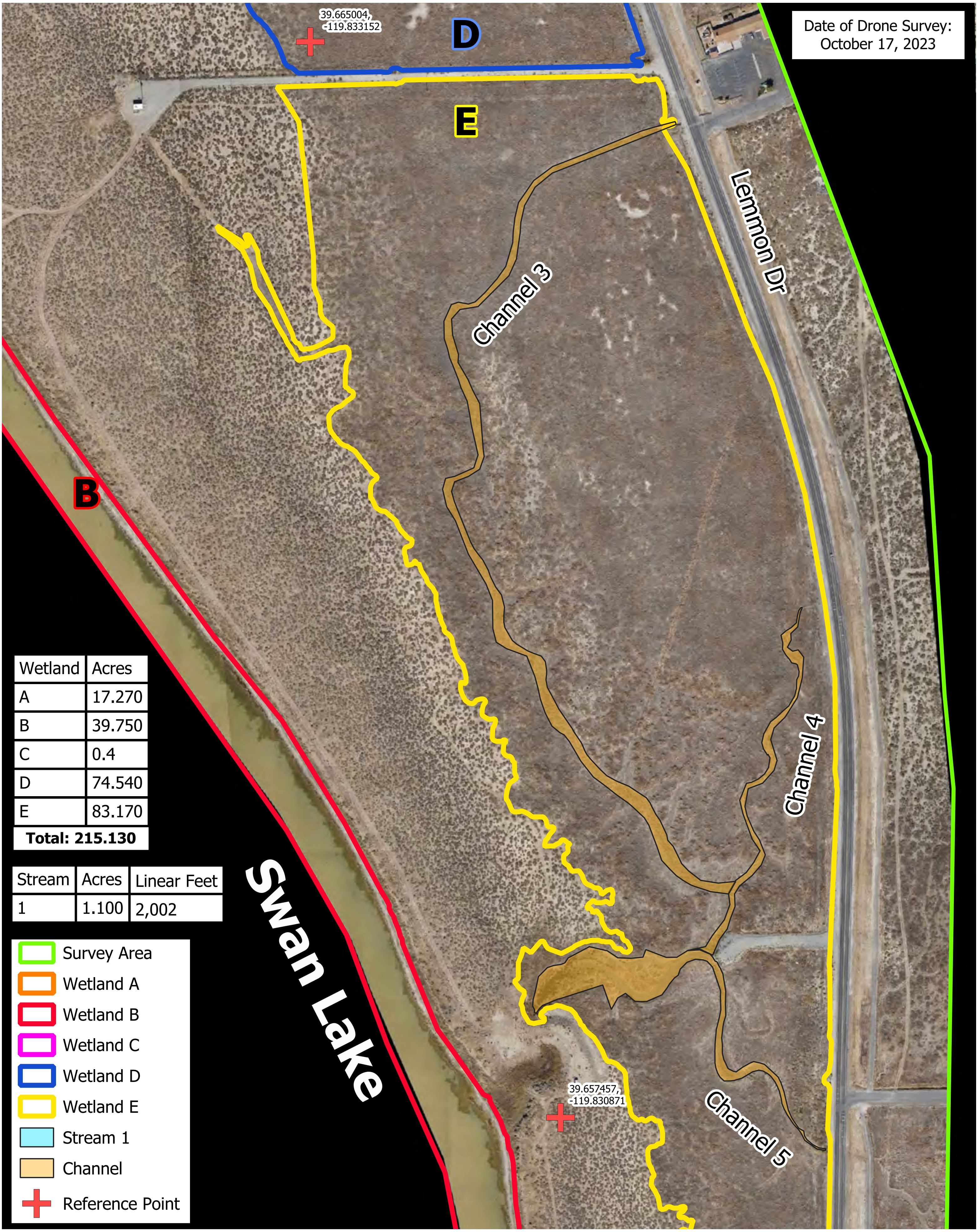
RTC Washoe Lemmon Drive

Aquatic Resources Map - Wetland D

Base Imagery: 2023 UES Orthomosaic Drone Imagery
CRS: EPSG:3857 - WGS 84

Map Made:
December 20, 2023
R. Propson

UES



Wetland	Acres
A	17.270
B	39.750
C	0.4
D	74.540
E	83.170
Total: 215.130	

Stream	Acres	Linear Feet
1	1.100	2,002

N

0 50 100 150 200 m

0 150 300 450 600 ft

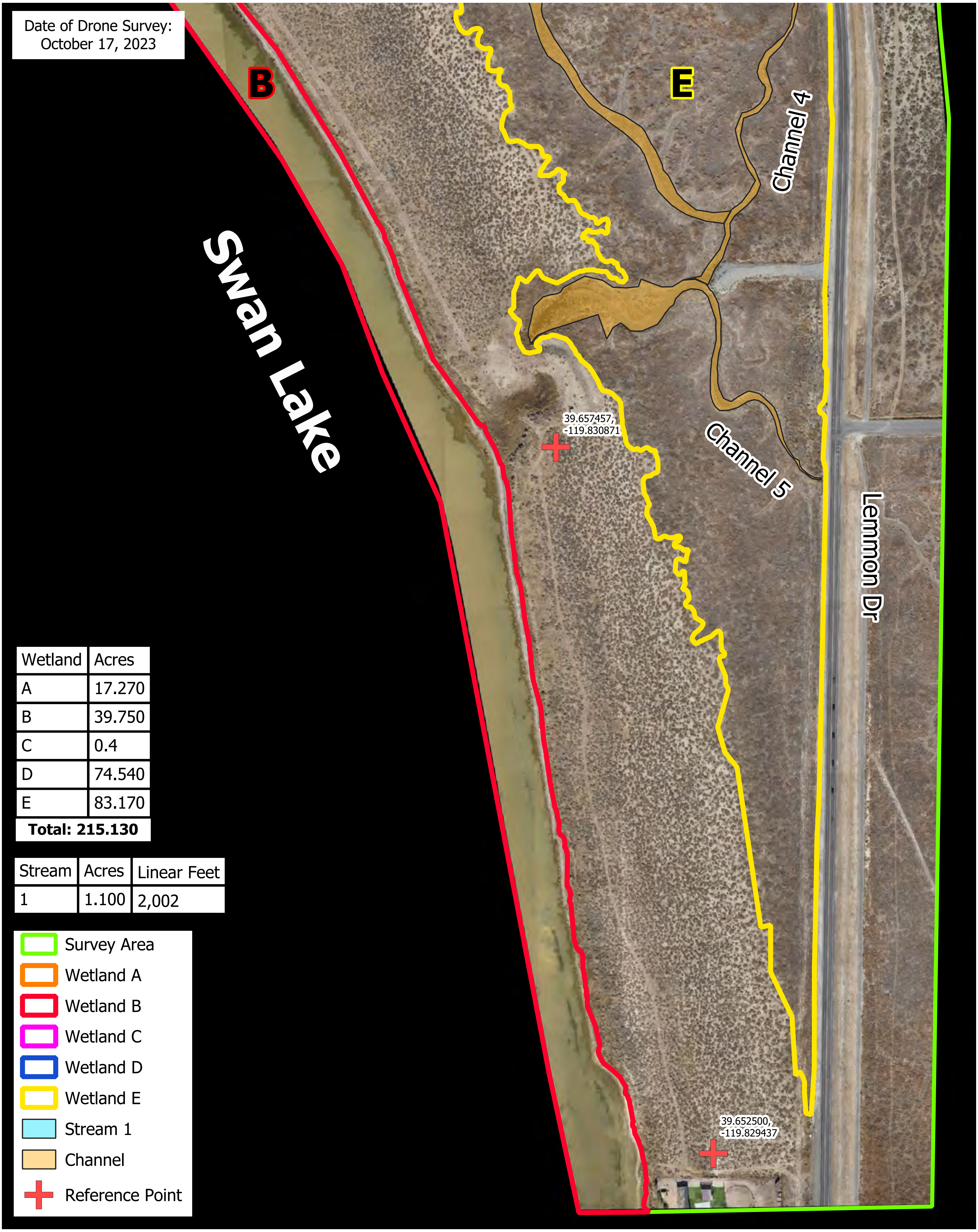
1 inch = 400 Feet

Base Imagery: 2023 UES Orthomosaic Drone Imagery
CRS: EPSG:3857 - WGS 84

RTC Washoe Lemmon Drive

Aquatic Resources Map - Wetland E North

Map Made:
December 20, 2023
R. Propson



Wetland	Acres
A	17.270
B	39.750
C	0.4
D	74.540
E	83.170
Total: 215.130	

Stream	Acres	Linear Feet
1	1.100	2,002

N

0 50 100 150 200 m

0 150 300 450 600 ft

1 inch = 400 Feet

RTC Washoe Lemmon Drive

Aquatic Resources Map - Wetland E South

Base Imagery: 2023 UES Orthomosaic Drone Imagery
CRS: EPSG:3857 - WGS 84

Map Made:
December 20, 2023
R. Propson

UES

Appendix B: Supporting Maps and Historical Imagery

Scale:
1:145,000

Base Imagery: Google Satellite
CRS: EPSG:3857 - WGS 84

RTC Washoe Lemmon Drive

Survey Location

UES

N

0 200 400 600 m

0 500 1,000 1,500 2,000 ft

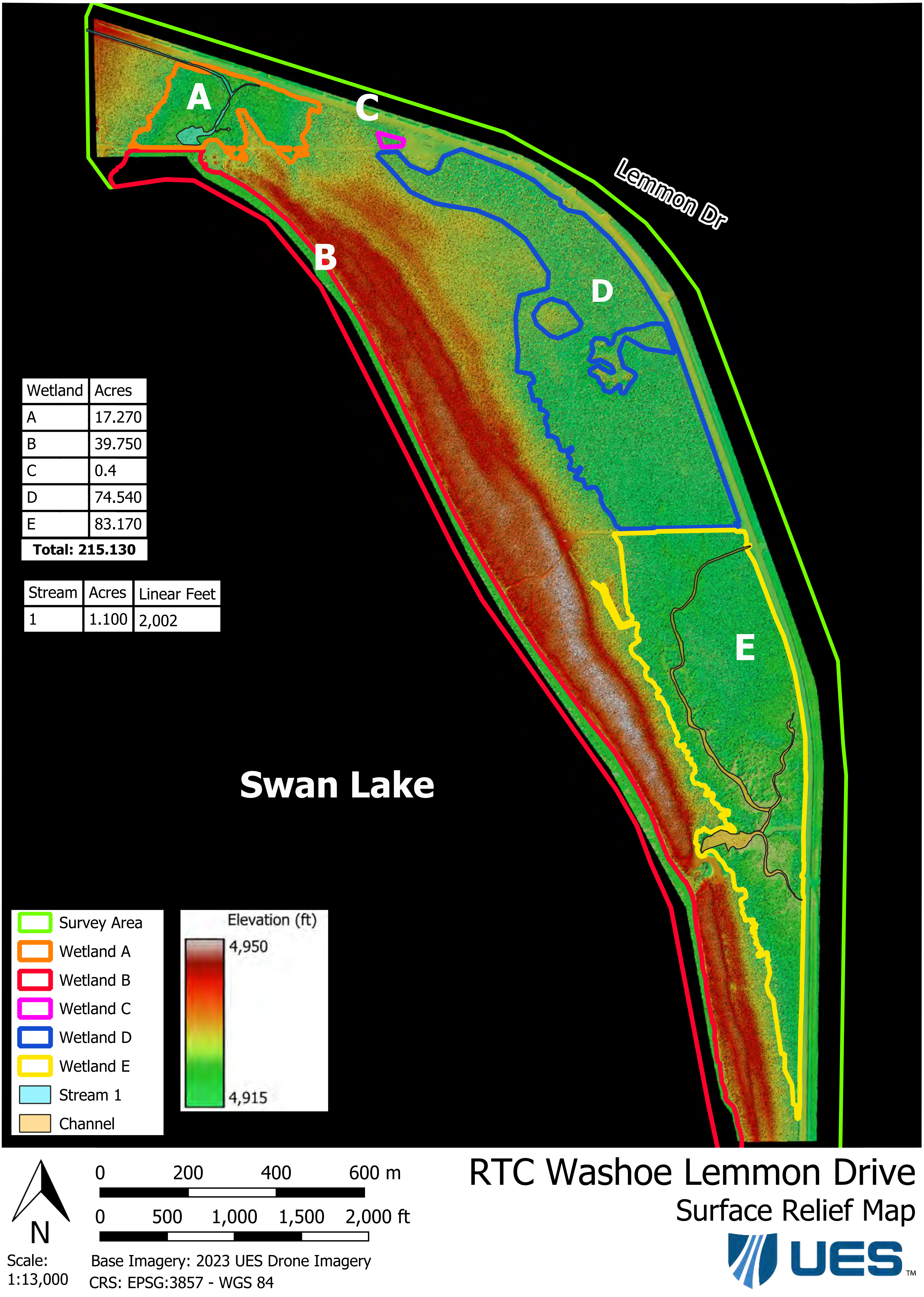
Scale:
1:15,000

Base Imagery: ESRI
CRS: EPSG:3857 - WGS 84

RTC Washoe Lemmon Drive

Survey Area

UES™



Wetland	Acres
A	17.270
B	39.750
C	0.4
D	74.540
E	83.170
Total: 215.130	

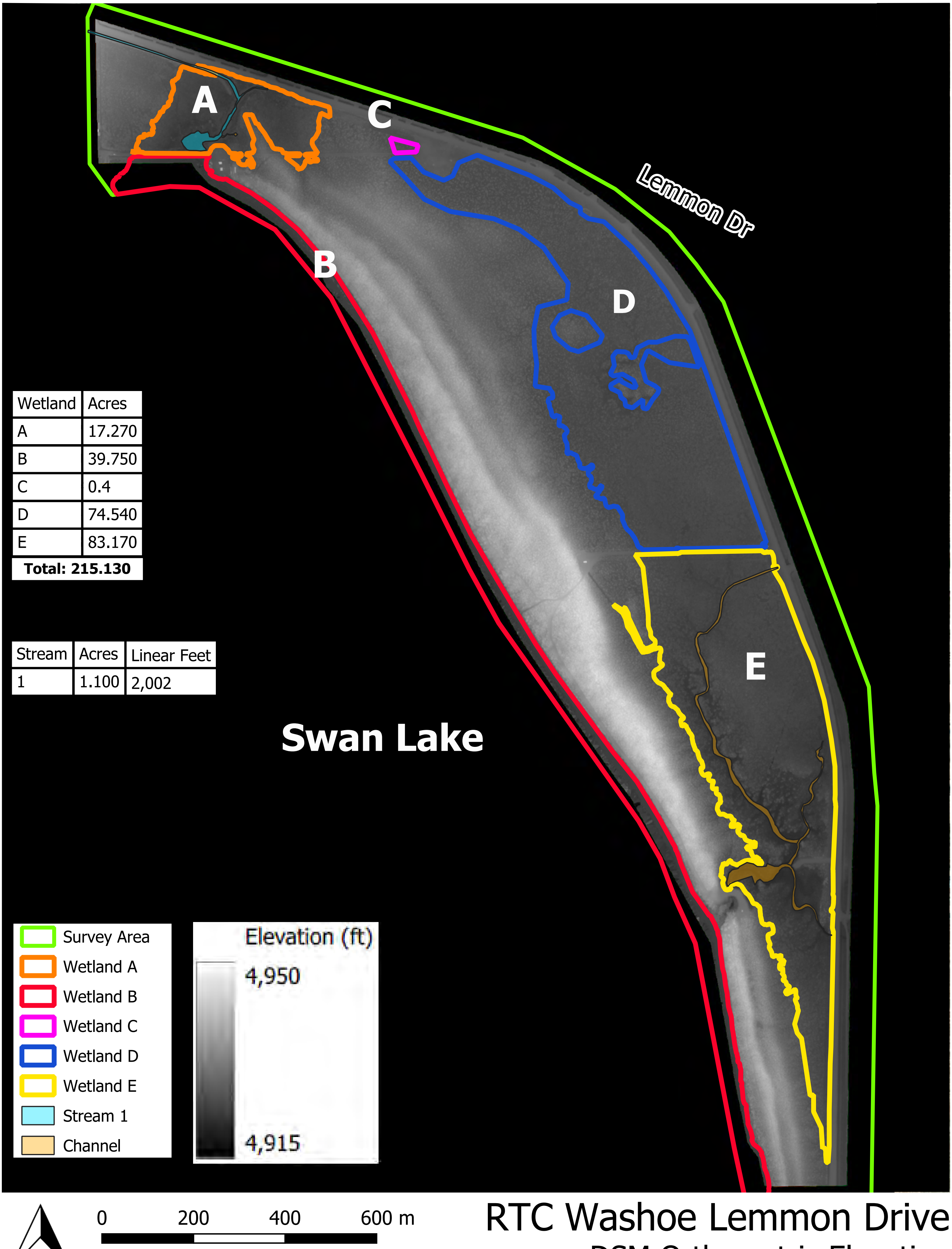
Stream	Acres	Linear Feet
1	1.100	2,002

Scale: 1:13,000

Base Imagery: 2023 UES Drone Imagery
CRS: EPSG:3857 - WGS 84

RTC Washoe Lemmon Drive
Surface Relief Map

UES



Wetland	Acres
A	17.270
B	39.750
C	0.4
D	74.540
E	83.170
Total: 215.130	

Stream	Acres	Linear Feet
1	1.100	2,002

Scale: 1:13,000

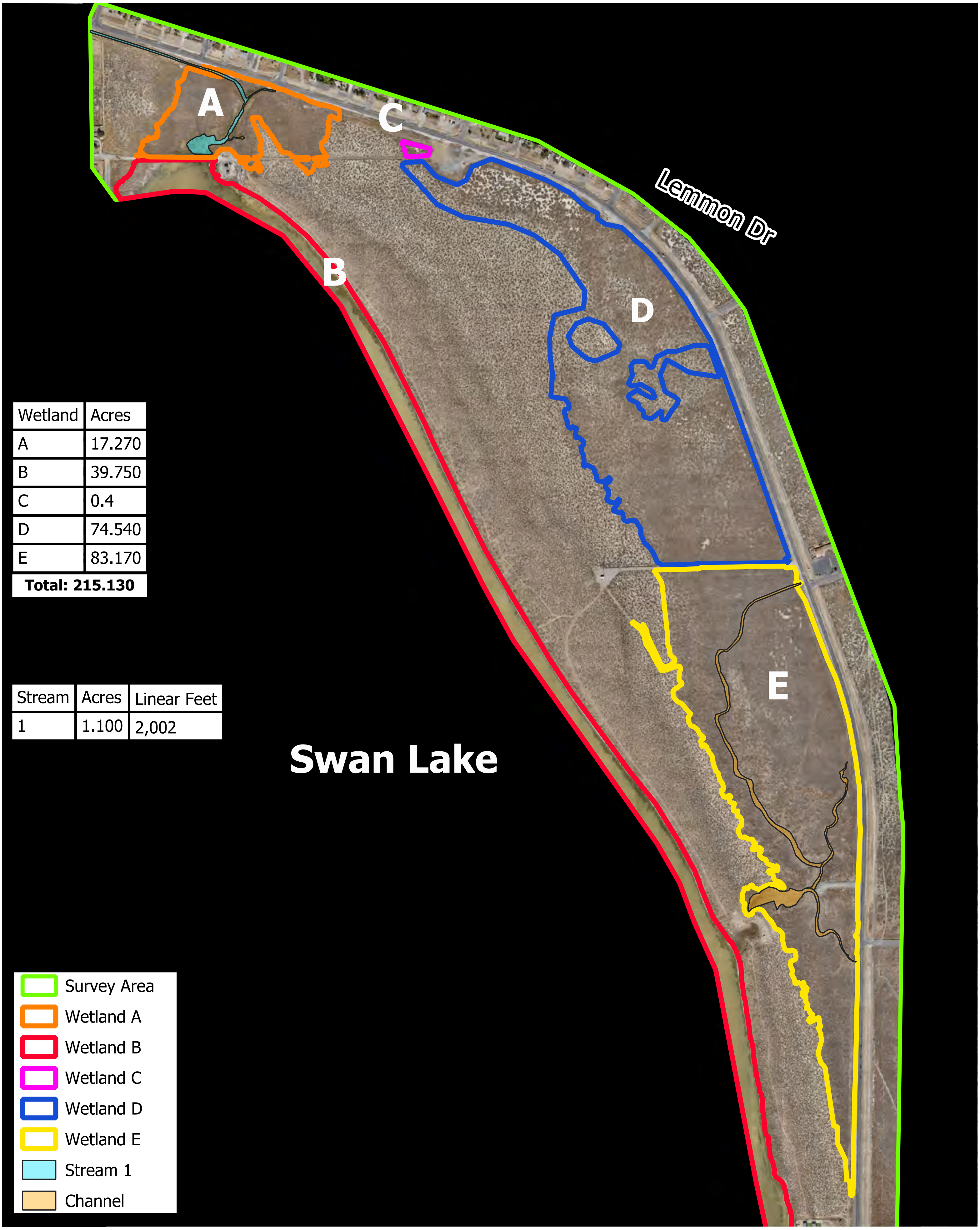
Base Imagery: 2023 UES Drone Imagery

CRS: EPSG:3857 - WGS 84

RTC Washoe Lemmon Drive

DSM Orthometric Elevation

UES



Wetland	Acres
A	17.270
B	39.750
C	0.4
D	74.540
E	83.170
Total: 215.130	

Stream	Acres	Linear Feet
1	1.100	2,002

N

0 200 400 600 m

0 500 1,000 1,500 2,000 ft

Scale: 1:13,000

Base Imagery: 2023 UES Orthomosaic Drone Imagery

CRS: EPSG:3857 - WGS 84

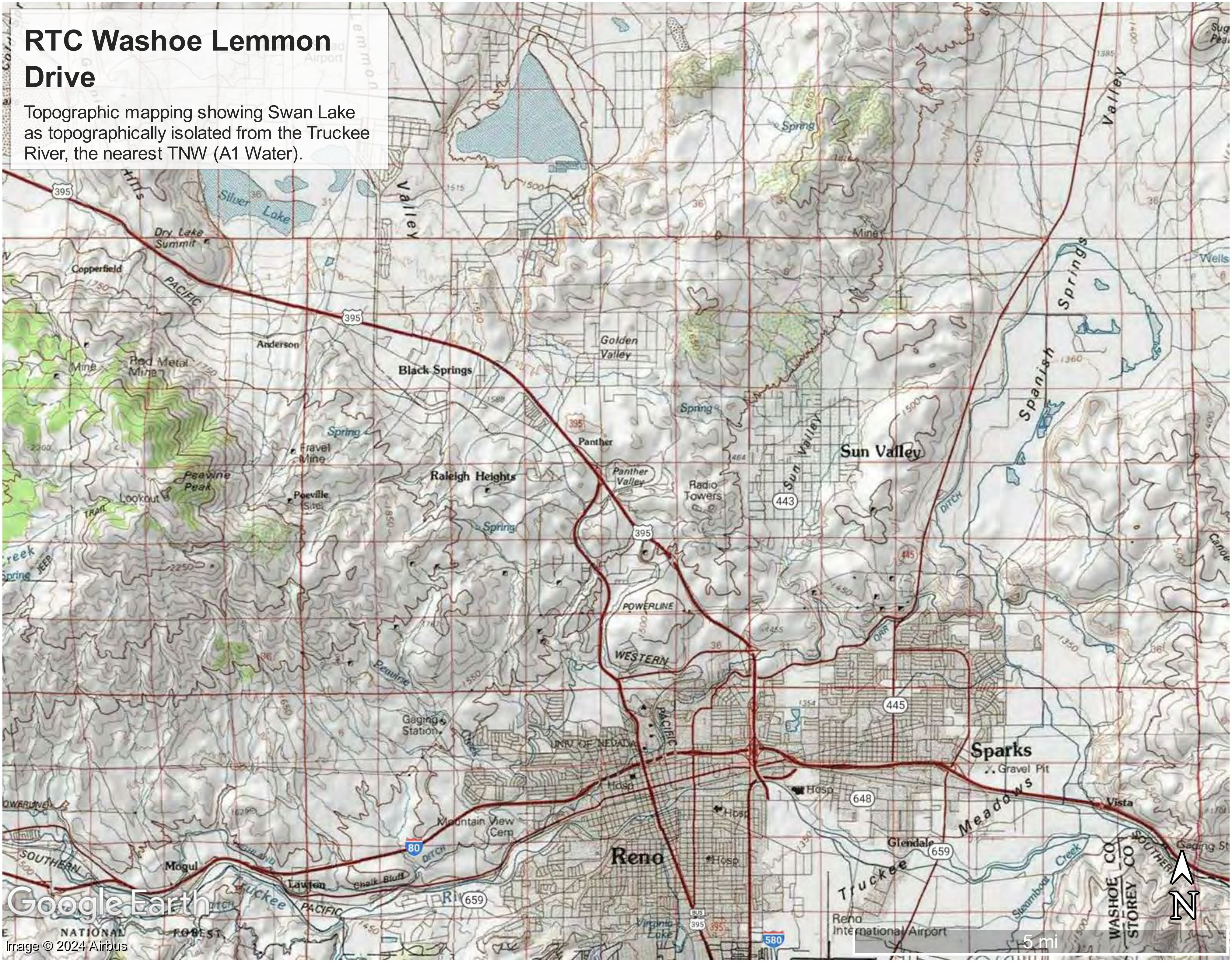
RTC Washoe Lemmon Drive

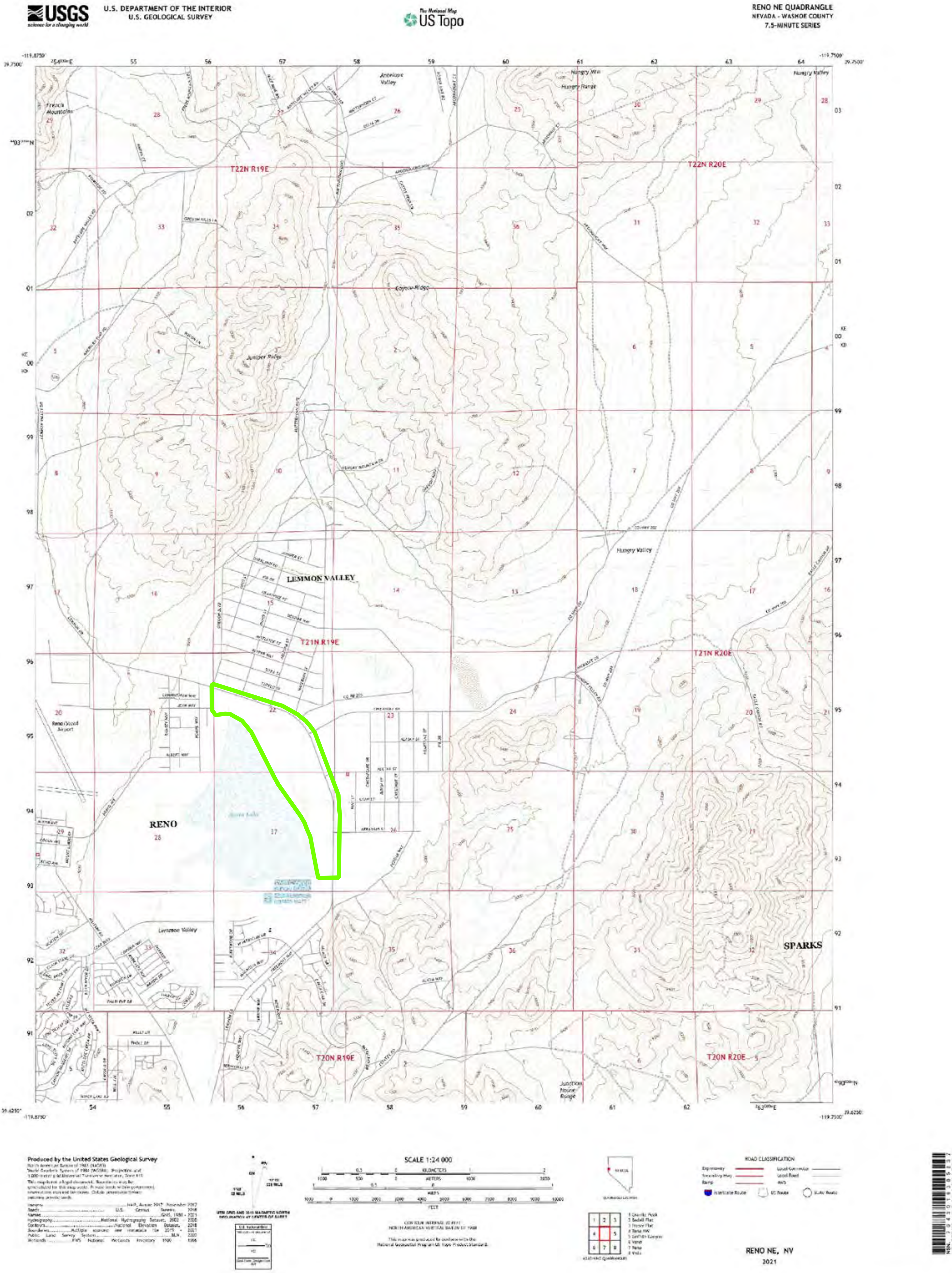
Aquatic Resources

UES™

RTC Washoe Lemmon Drive

Topographic mapping showing Swan Lake as topographically isolated from the Truckee River, the nearest TNW (A1 Water).





RTC Washoe Lemmon Drive

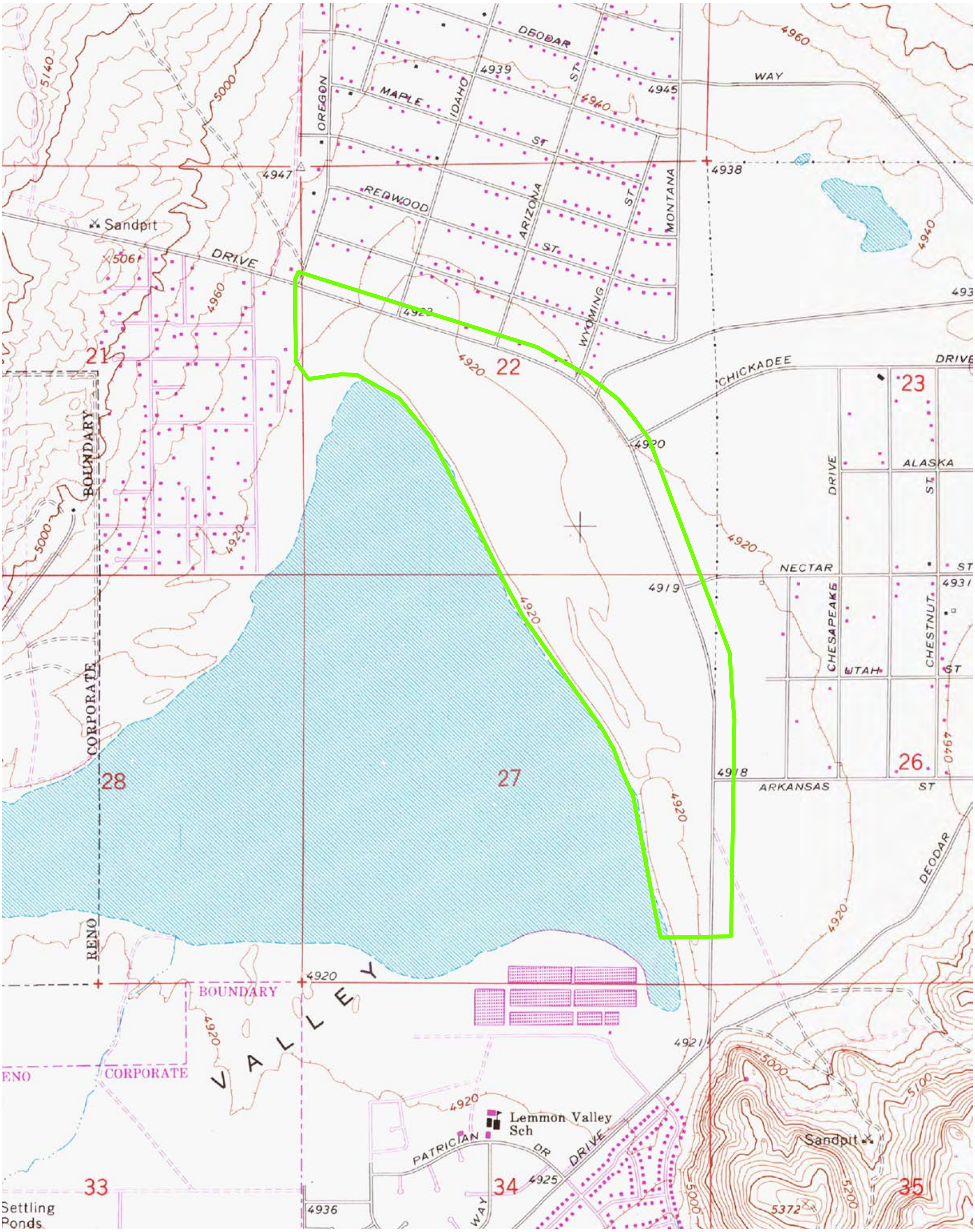
Reno NE Quadrangle

N

Base Imagery: USGS Topo
CRS: EPSG:3857 - WGS 84

Survey Area

UES



RTC Washoe Lemmon Drive

Northeast Reno Topographic Map

0 250 500 750 m

0 1,000 2,000 3,000 ft

N

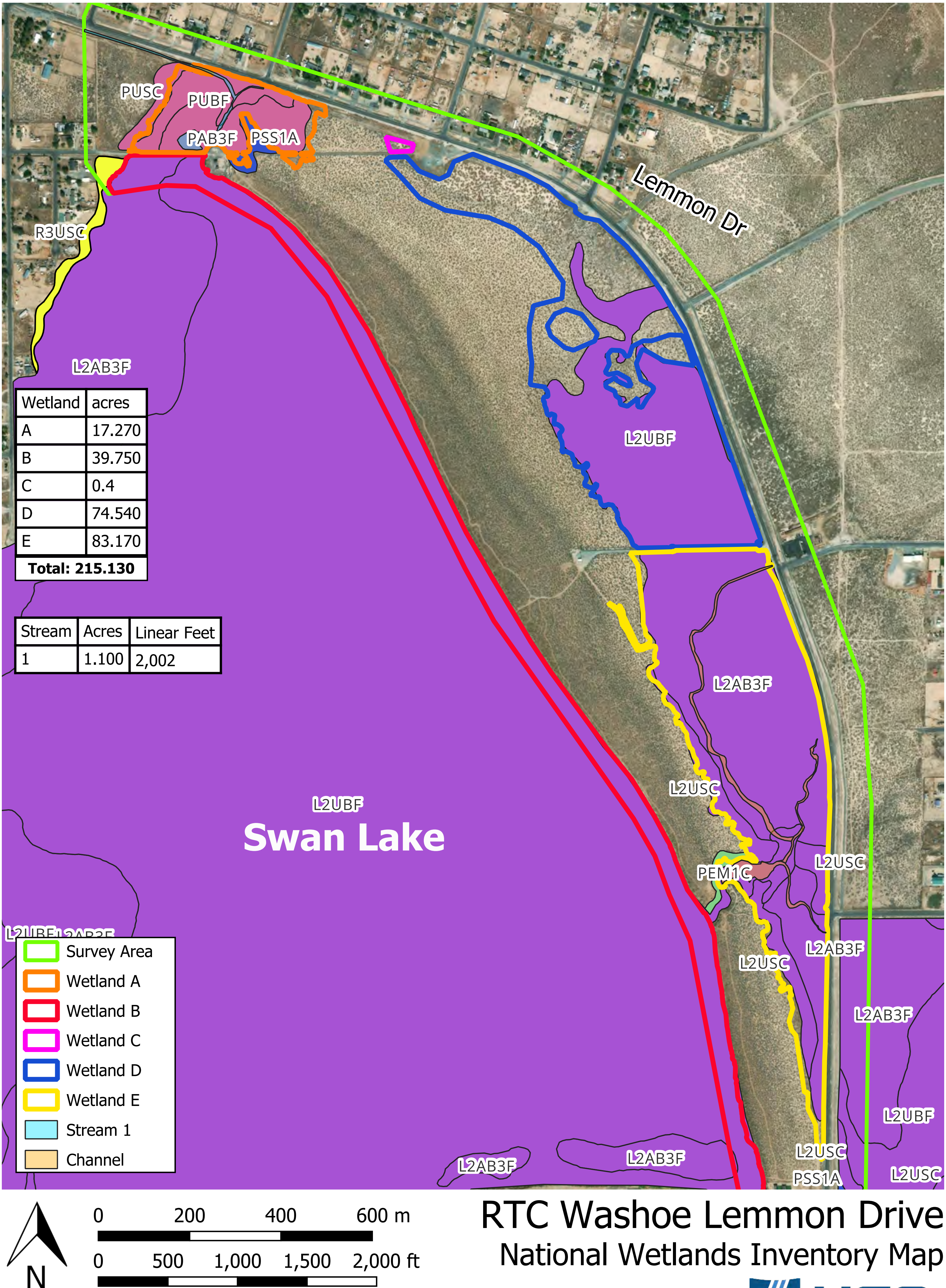
Scale: 1:24,000

Base Imagery: USGS Topo Maps

CRS: EPSG:3857 - WGS 84

Survey Area

UES



Wetland	acres
A	17.270
B	39.750
C	0.4
D	74.540
E	83.170
Total: 215.130	

Stream	Acres	Linear Feet
1	1.100	2,002

RTC Washoe Lemmon Drive

National Wetlands Inventory Map

UES

Scale: 1:13,000

Base Imagery: ESRI

CRS: EPSG:3857 - WGS 84

N

0 1 2 km

0 0.5 1 mi

Scale: 1:50,000

Base Imagery: ESRI
CRS: EPSG:3857 - WGS 84

RTC Washoe Lemmon Drive

National Hydrography Dataset - Flowlines

UES™

Lemmon Drive November '04
Active construction in Stream 1.
Lemmon Dr
Lemmon Dr
Lemmon Dr
Lemmon Dr
Lemmon Drive Frontage Rd
Idaho St
Idaho St
Jean Way
Jean Way
Jean Way
Google Earth
Image U.S. Geological Survey
400 ft
N

Lemmon Drive June '18

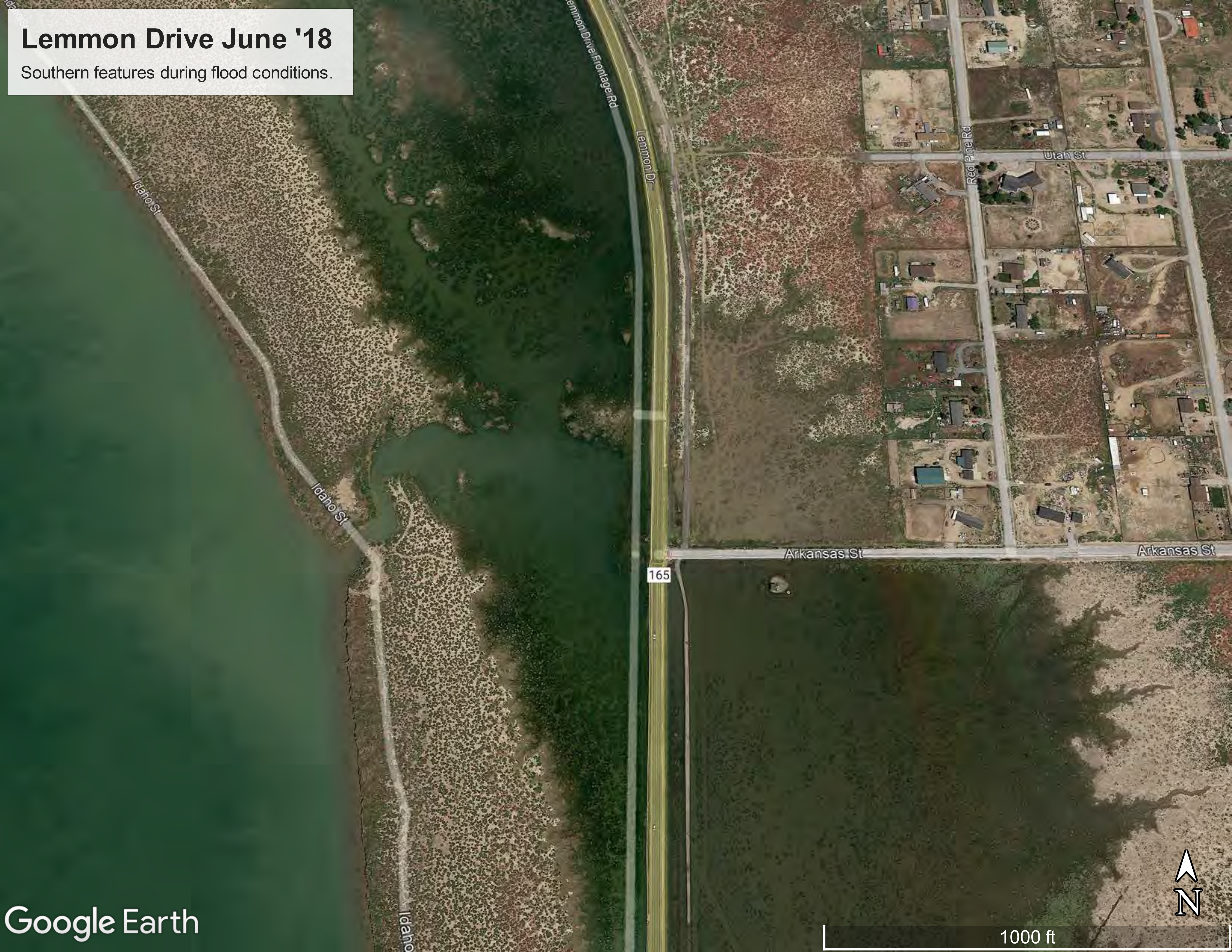
The region during flood conditions.

Lemmon Drive June '18

Northern features during flood conditions.

Lemmon Drive June '18

Southern features during flood conditions.



Lemmon Drive January '21

Northern features in normal conditions. Some pooling, but no visible flows in channels.

Lemmon Drive January '21

Southern features in normal conditions. Before the earthen levee was constructed

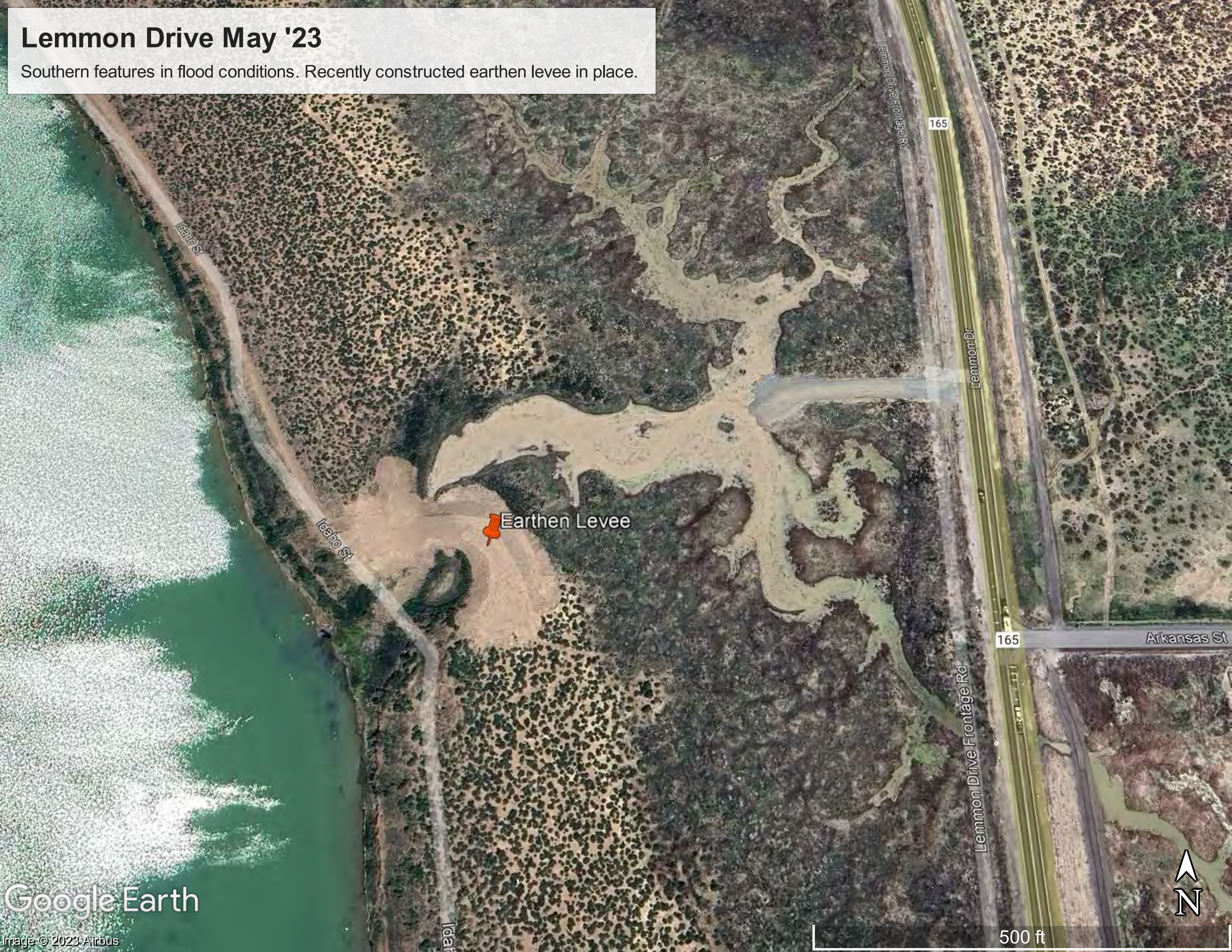

Lemmon Drive May '23
Sattelite imagery during flood conditions.
Legend
Lee wild game processing
165
Lemmon Dr
Battleborn Mobile RV Repair
205
Lemmon Dr
205
Timeless Wardrobe by Trish
Lemmon Dr
Lemmon Valley-Golden Valley
New Life Assembly of God
Lemmon Dr
Koehl's Taxidermy
165
N
Google Earth
Swan Lake Dr
Image © 2023 Airbus
4000 ft

Lemmon Drive May '23

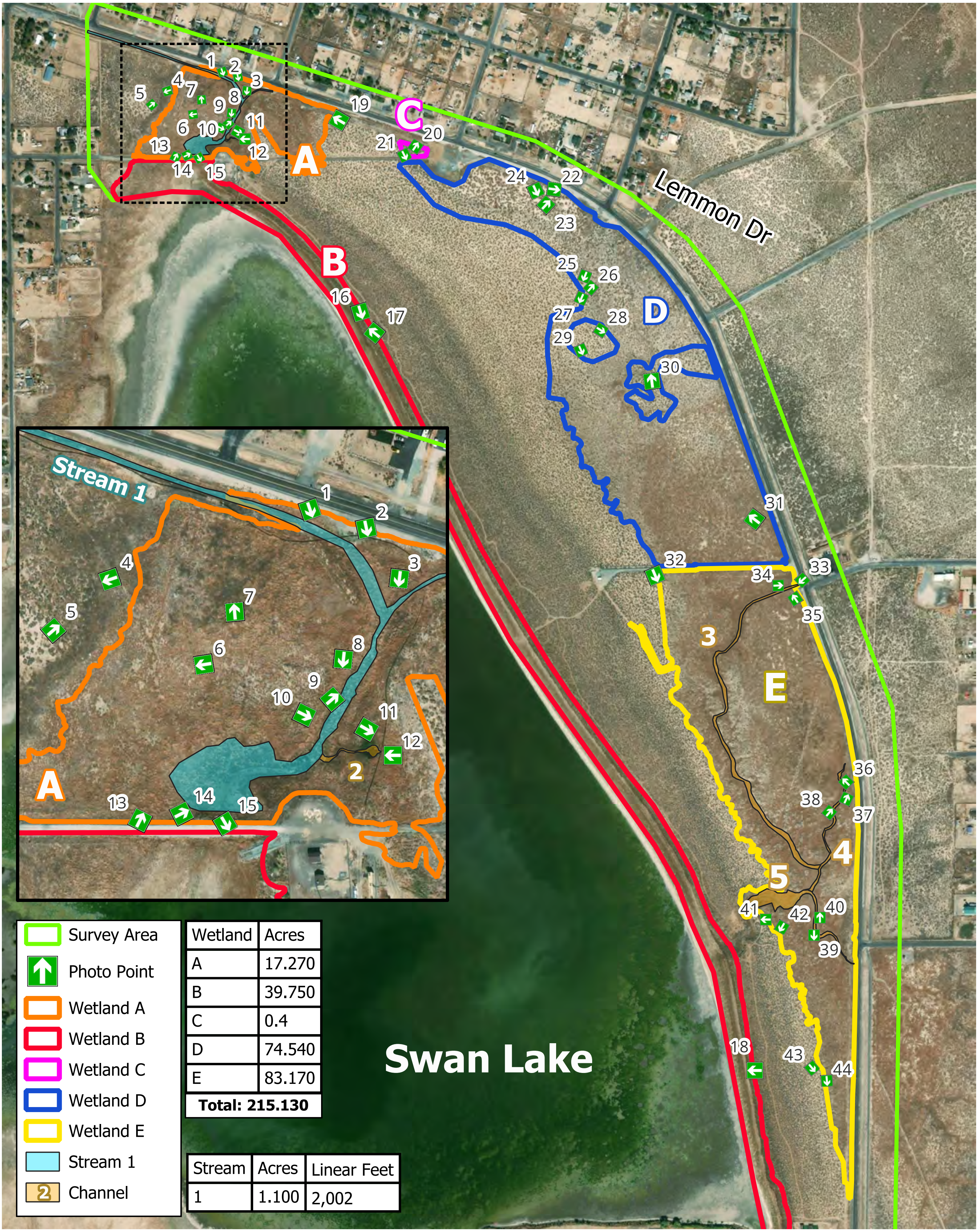
Northern features in flood conditions.

Lemmon Drive May '23

Southern features in flood conditions. Recently constructed earthen levee in place.



Appendix C: Site Photographs



Wetland	Acres
A	17.270
B	39.750
C	0.4
D	74.540
E	83.170
Total: 215.130	

Stream	Acres	Linear Feet
1	1.100	2,002

N

0 200 400 600 m

0 500 1,000 1,500 2,000 ft

Scale: 1:13,000

Base Imagery: ESRI

CRS: EPSG:3857 - WGS 84

RTC Washoe Lemmon Drive

Photolog Map

UES

Photo 1: A south facing view of Stream 1.

Photo 2: A view of the dominant macrophytes near Stream 1.

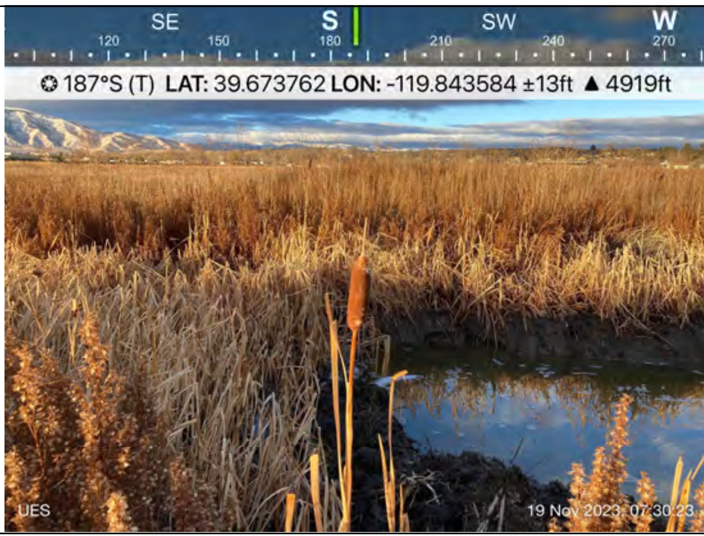


Photo 3: A south facing view of Stream 1. Aquatic macrophytes are shown in this photo.

Photo 4: A view west of the uplands near Wetland A.

Photo 5: A view northeast toward Lemmon Drive.

Photo 6: A view west of the vegetation on the west side of Wetland A.

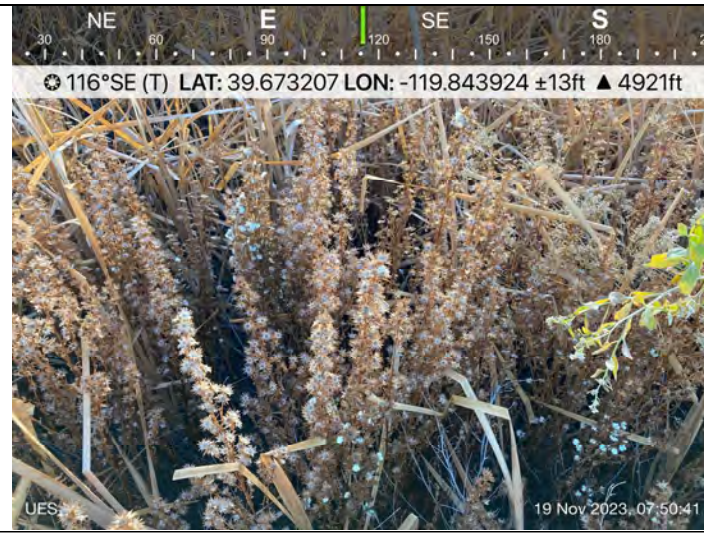
	
Photo 7: A close up view of the macrophytes in Wetland A.	Photo 8: A view of Stream 1 flowing through Wetland A.
	
Photo 9: Looking northweast towards Stream 1 flowing through Wetland A.	Photo 10: A view of vegetation representive of Stream 1 and Wetland A.
	
Photo 11: A view south of a pipe with a structure leak that feeds water downstream into the aquatic feature in Photo 12. Coordinates: 39.672981, -119.843563	Photo 12: A view west of ponding water with proliferating Eurasian watermill foil. The feature is fed by a pipe structure leak shown in Photo 11. Coordinates: 39.672898, -119.843494.

Photo 13: A view of the terminus of Stream 1. A gravel road causes Stream 1 to pool at this location.

Photo 14: A view northeast at the terminus of Stream 1. A gravel road aids in pooling water from Stream 1 at this location.

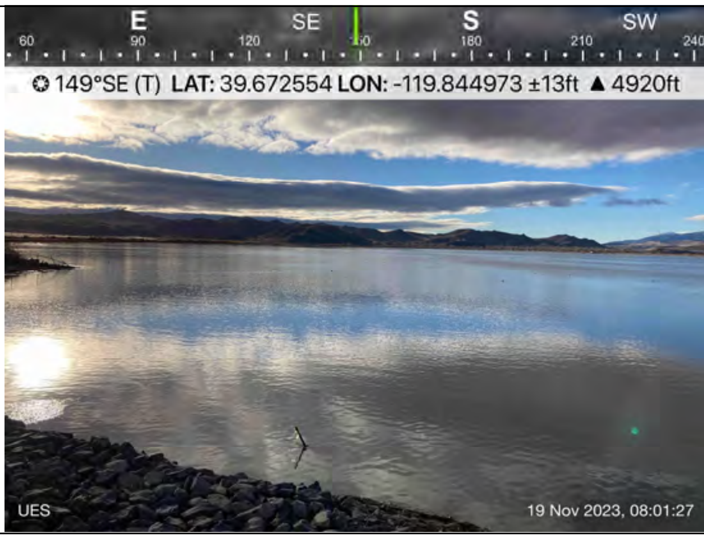


Photo 15: A view of Swan Lake from the end of Stream 1.

Photo 16: A view of Wetland B.

Photo 17: A view northwest of Wetland B.

Photo 18: A view west of the south end of Wetland B.

Photo 19: A view of Wetland A from its northeast corner.

Photo 20: A view northeast of Wetland C, the roadside ditch, and the residential development across Lemmon Drive.

Photo 21: A view of the gravel road bounding Wetland C to the south.

Photo 22: A view east of Wetland D near Lemmon Drive, where previous flows have left impressions on the landscape and vegetation.

Photo 23: A view northeast of soil cracks in Wetland D.

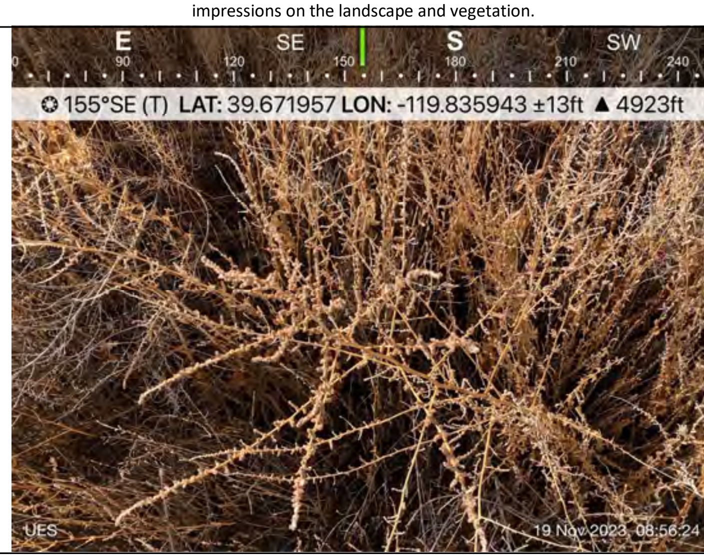


Photo 24: Vegetation representive of the northeastern boundary of Wetland D.

Photo 25: A photo taken from the center of Wetland D, facing south.

Photo 26: A view northeast of the consistent topography and vegetation of Wetland D.

Photo 27: Soil cracking and vegetation at the edge of Wetland D.

Photo 28: A view of vegetation, distinguishing a higher elevation "island" excluded from Wetland D.

Photo 29: A close up view of forensic vegetation observed near Wetland D.

Photo 30: A view of distinctive vegetation differences between Wetland D and an elevated "island".

Photo 31: A view of consistent topography and vegetation across Wetland D.

Photo 32: A view south of the vegetation distinguishing Wetland E on the left from uplands on the right.

Photo 33: A view of Channel 3 from the culvert under Lemmon Drive, and its lack of consistent OHWM indicators.

Photo 34: A view of the culvert that marks the start of Channel 3.

Photo 35: A view northwest across the imperceptible Channel 3.

Photo 36: A view northwest of Channel 4 and Wetland E.

Photo 37: A view northeast of the vegetation in Wetland E bordering Lemmon Drive.

Photo 38: A view northeast of Channel 4, and its lack of OHWM characteristics.

Photo 39: A view south across Wetland E.

Photo 40: A view north of Channel 5.

Photo 41: A view west of the earthen berm seperating Wetland E and Wetland B.

Photo 42: A view southwest of the earthen berm.

LAT: 39.655193 LON: -119.829314 ±13ft ▲ 4926ft

Photo 43: A view south of the vegetation in the uplands near Wetland E.

LAT: 39.655201 LON: -119.829333 ±13ft ▲ 4927ft

Photo 44: A view south of the line of vegetation delineating Wetland E on the right, and uplands on the left.

Appendix D: Plant List

Genus	Species	Common Name	WIS*
Chenopodium	*glaucum*	Oakleaf Goosefoot	FAC
Crypsis	*schoenoides*	Swamp Sandbur	FACW
Heliotropium	*curassavicum*	Salt Heliotrope	FACU
Lactuca	*serriola*	Prickly Lettuce	FACU
Myriophyllum	*spicatum*	Eurasian Water-Milfoil	OBL
Polygonum	*argyrocoleon*	Silverjoint Knotweed	FACW
Schoenoplectus	*acutus*	Hardstem Bulrush	OBL
Schoenoplectus	*maritimus*	Saltmarsh Bulrush	OBL
Symphyotrichum	*frondosum*	Heath Aster	FACW
Typha	*angustifolia*	Narrow-leaved Cattail	OBL

*Wetland Indicator Status (WIS):

Facultative (FAC) = occurs in aquatic resources 34-66% of time

Facultative Upland (FACU) = occurs in aquatic resources 1-33% of time

Facultative Wet (FACW) = occurs in aquatic resources 67-99% of time

Obligate (OBL)= occurs in aquatic resources >99% of time

Appendix E: NRCS Soil Report

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Washoe County, Nevada, South Part

Lemmon Drive

November 10, 2023

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map

Map Scale: 1:16,100 if printed on A portrait (8.5" x 11") sheet.

Meters: 0, 200, 400, 800, 1200

Feet: 0, 500, 1000, 2000, 3000

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Washoe County, Nevada, South Part
Survey Area Data: Version 20, Sep 8, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 21, 2021—Jun 23, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
121	Doten silty clay, 8 to 15 percent slopes	117.8	34.6%
150	Doten variant silty clay, slightly saline	65.6	19.3%
151	Doten variant silty clay, strongly saline	150.6	44.3%
240	Updike loam	1.2	0.4%
9902	Sodic Endoaquents, 0 to 1 percent slopes	5.0	1.5%
Totals for Area of Interest		**340.2**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Washoe County, Nevada, South Part

121—Doten silty clay, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: hxd8
Elevation: 4,500 to 5,500 feet
Mean annual precipitation: 8 to 10 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 100 to 110 days
Farmland classification: Not prime farmland

Map Unit Composition

Doten and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Doten

Setting

Landform: Lake terraces
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Lacustrine deposits

Typical profile

H1 - 0 to 21 inches: silty clay
H2 - 21 to 62 inches: clay

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 60 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: Moderate (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R026XY016NV - LOAMY 8-10 P.Z.
Hydric soil rating: No

Minor Components

Doten variant

Percent of map unit: 8 percent

Landform: Lake terraces
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: R026XY012NV - DRY FLOODPLAIN 8-10 P.Z.
Hydric soil rating: No

Updike

Percent of map unit: 7 percent
Landform: Lake terraces
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: R026XY012NV - DRY FLOODPLAIN 8-10 P.Z.
Hydric soil rating: No

150—Doten variant silty clay, slightly saline

Map Unit Setting

National map unit symbol: hxg7
Elevation: 4,500 to 5,500 feet
Mean annual precipitation: 8 to 10 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 100 to 110 days
Farmland classification: Not prime farmland

Map Unit Composition

Doten variant, slightly saline, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Doten Variant, Slightly Saline

Setting

Landform: Lake terraces
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Lacustrine deposites derived from mixed rock

Typical profile

H1 - 0 to 5 inches: silty clay
H2 - 5 to 72 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 60 to 72 inches
Frequency of flooding: None
Frequency of ponding: None

Calcium carbonate, maximum content: 10 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R026XY012NV - DRY FLOODPLAIN 8-10 P.Z.
Hydric soil rating: No

Minor Components

Updike

Percent of map unit: 5 percent
Landform: Lake terraces
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: R026XY012NV - DRY FLOODPLAIN 8-10 P.Z.
Hydric soil rating: No

Doten variant

Percent of map unit: 5 percent
Landform: Lake terraces
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: R026XY021NV - SODIC FLAT
Hydric soil rating: No

Greenbrae

Percent of map unit: 5 percent
Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: R026XY016NV - LOAMY 8-10 P.Z.
Hydric soil rating: No

151—Doten variant silty clay, strongly saline

Map Unit Setting

National map unit symbol: hxg8
Elevation: 4,500 to 5,500 feet
Mean annual precipitation: 8 to 10 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 100 to 110 days
Farmland classification: Not prime farmland

Map Unit Composition

Doten variant, strongly saline, and similar soils: 85 percent

Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Doten Variant, Strongly Saline

Setting

Landform: Lake terraces
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Lacustrine deposites derived from mixed rock

Typical profile

H1 - 0 to 5 inches: silty clay
H2 - 5 to 72 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 60 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Strongly saline (16.0 to 32.0 mmhos/cm)
Sodium adsorption ratio, maximum: 30.0
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R026XY021NV - SODIC FLAT
Hydric soil rating: No

Minor Components

Doten variant

Percent of map unit: 5 percent
Landform: Lake terraces
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: R026XY012NV - DRY FLOODPLAIN 8-10 P.Z.
Hydric soil rating: No

Updike

Percent of map unit: 5 percent
Landform: Lake terraces
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: R026XY012NV - DRY FLOODPLAIN 8-10 P.Z.
Hydric soil rating: No

Greenbrae

Percent of map unit: 5 percent

Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: R026XY016NV - LOAMY 8-10 P.Z.
Hydric soil rating: No

240—Updike loam

Map Unit Setting

National map unit symbol: hxhd
Elevation: 4,500 to 5,500 feet
Mean annual precipitation: 8 to 10 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 100 to 110 days
Farmland classification: Farmland of statewide importance, if irrigated

Map Unit Composition

Updike and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Updike

Setting

Landform: Lake terraces
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Mixed alluvium

Typical profile

H1 - 0 to 2 inches: loam
H2 - 2 to 20 inches: clay
H3 - 20 to 63 inches: stratified sandy clay loam to clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 48 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 45.0
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R026XY012NV - DRY FLOODPLAIN 8-10 P.Z.
Hydric soil rating: No

Minor Components

Cradlebaugh

Percent of map unit: 8 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R026XY001NV - MOIST FLOODPLAIN
Other vegetative classification: MOIST FLOODPLAIN (026XY001NV_2)
Hydric soil rating: Yes

Sagouspe

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R026XY013NV - SODIC FLOODPLAIN
Hydric soil rating: No

Doten

Percent of map unit: 2 percent
Landform: Lake terraces
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: R026XY021NV - SODIC FLAT
Hydric soil rating: No

9902—Sodic Endoaquents, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2z77j
Elevation: 3,850 to 4,250 feet
Mean annual precipitation: 4 to 6 inches
Mean annual air temperature: 51 to 55 degrees F
Frost-free period: 120 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

Sodic endoaquents and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sodic Endoaquents

Setting

Landform: Playas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Lacustrine deposits

Typical profile

An - 0 to 2 inches: silty clay loam
Cng - 2 to 79 inches: silty clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum content: 9 percent
Maximum salinity: Strongly saline (125.0 to 155.0 mmhos/cm)
Sodium adsorption ratio, maximum: 9,999.0
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: D
Ecological site: R028AY009NV - SALINE FLAT
Hydric soil rating: Yes

Minor Components

Typic udorthents, levees

Percent of map unit: 5 percent
Landform: Playas
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R028AY009NV - SALINE FLAT
Hydric soil rating: No

Typic udorthents

Percent of map unit: 5 percent
Landform: Playas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R028AY009NV - SALINE FLAT
Hydric soil rating: No

Sodic endoaquents, floodway

Percent of map unit: 5 percent
Landform: Playas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R028AY009NV - SALINE FLAT
Hydric soil rating: Yes

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Appendix F: Wetland Datasheets

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Arid West Region
See ERDC/EL TR-08-28; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Lemmon Drive City/County: Reno Sampling Date: 9/26/2023
Applicant/Owner: Washoe Regional Transportation Commission State: NV Sampling Point: UPL_3
Investigator(s): Hayden Ripple, Nathaniel Yost Section, Township, Range: S34 T21N R19E
Landform (hillside, terrace, etc.): Bench Local relief (concave, convex, none): Convex Slope (%): 3
Subregion (LRR): LRR D Lat: 39.67267708 Long: -119.84541756 Datum: WGS 84
Soil Map Unit Name: Doten variant silty clay, strongly saline (151) NWI classification: ______
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____
Hydric Soil Present?	Yes ____	No X
Wetland Hydrology Present?	Yes X	No ____

Is the Sampled Area within a Wetland? **Yes** ____ **No** X

Remarks:
Border of wetland and standing water. Incredibly dense and sticky clay.

VEGETATION – Use scientific names of plants.

Stratum	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
=Total Cover			
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
=Total Cover			
Herb Stratum (Plot size: 5)			
1. *Schoenoplectus maritimus*	40	Yes	OBL
2. *Symphyotrichum frondosum*	25	Yes	FACW
3. *Lactuca serriola*	15	No	FACU
4.			
5.			
6.			
7.			
8.			
=Total Cover	80		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
=Total Cover			

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	40	x 1 = 40
FACW species	25	x 2 = 50
FAC species	0	x 3 = 0
FACU species	0	x 4 = 0
UPL species	0	x 5 = 0
Column Totals:	65 (A)	90 (B)

Prevalence Index = B/A = 1.38

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%
____ Prevalence Index is ≤3.0[1]
____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:
Most vegetation is dead. Very dry.

SOIL

Sampling Point: UPL_3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 6/3	100					Loamy/Clayey	Incredibly dense and sticky

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) **(LRR C)**
___ 1 cm Muck (A9) **(LRR D)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) **(LRR C)**
___ 2 cm Muck (A10) **(LRR B)**
___ Iron-Manganese Masses (F12) **(LRR D)**
___ Reduced Vertic (F18)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: ___
Depth (inches): ___

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
Uniform color. Dense, light grey.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1) **(Nonriverine)**
X Sediment Deposits (B2) **(Nonriverine)**
X Drift Deposits (B3) **(Nonriverine)**
X Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
X Water-Stained Leaves (B9)
X Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Water Marks (B1) **(Riverine)**
___ Sediment Deposits (B2) **(Riverine)**
___ Drift Deposits (B3) **(Riverine)**
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___
Water Table Present? Yes ___ No X Depth (inches): ___
Saturation Present? Yes X No ___ Depth (inches): ___
(includes capillary fringe)

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Deep, wide soil cracks.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Arid West Region** See ERDC/EL TR-08-28; the proponent agency is CECW-CO-R	***OMB Control #: 0710-0024, Exp: 11/30/2024*** ***Requirement Control Symbol EXEMPT:*** ***(Authority: AR 335-15, paragraph 5-2a)***

Project/Site: Lemmon Drive City/County: Reno Sampling Date: 9/26/2023

Applicant/Owner: Washoe Regional Transportation Commission State: NV Sampling Point: WET_3

Investigator(s): Hayden Ripple, Nathaniel Yost Section, Township, Range: S34 T21N R19E

Landform (hillside, terrace, etc.): Basin Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): LRR D Lat: 39.67278442 Long: -119.84502604 Datum: WGS 84

Soil Map Unit Name: Doten variant silty clay, strongly saline (151) NWI classification: ____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are “Normal Circumstances” present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** X
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Border of wetland with standing water. Incredibly dense, sticky clay.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
		=Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Herb Stratum (Plot size: 5)			
1. *Schoenoplectus maritimus*	70	Yes	OBL
2. *Symphyotrichum frondosum*	15	No	FACW
3. *Typha angustifolia*	5	No	OBL
4.			
5.			
6.			
7.			
8.			
	90	=Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		=Total Cover	

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100.0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	75	x 1 = 75
FACW species	15	x 2 = 30
FAC species	0	x 3 = 0
FACU species	0	x 4 = 0
UPL species	0	x 5 = 0
Column Totals:	90 (A)	105 (B)

Prevalence Index = B/A = 1.17

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:
Plants furthest from water are dying of drought.

SOIL

Sampling Point: WET_3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-18	10YR 6/2	100					Loamy/Clayey	Incredibly dense and sticky

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) **(LRR C)**
___ 1 cm Muck (A9) **(LRR D)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) **(LRR C)**
___ 2 cm Muck (A10) **(LRR B)**
___ Iron-Manganese Masses (F12) **(LRR D)**
___ Reduced Vertic (F18)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: ___
Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:
Uniform color. Dense, light grey.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1) **(Nonriverine)**
X Sediment Deposits (B2) **(Nonriverine)**
X Drift Deposits (B3) **(Nonriverine)**
X Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
X Water-Stained Leaves (B9)
X Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Water Marks (B1) **(Riverine)**
___ Sediment Deposits (B2) **(Riverine)**
___ Drift Deposits (B3) **(Riverine)**
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Soil saturated to surface.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Arid West Region
See ERDC/EL TR-08-28; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Lemmon Drive City/County: Reno Sampling Date: 9/26/2023
Applicant/Owner: Washoe Regional Transportation Commission State: NV Sampling Point: UPL_4
Investigator(s): Hayden Ripple, Nathaniel Yost Section, Township, Range: S34 T21N R19E
Landform (hillside, terrace, etc.): Basin Local relief (concave, convex, none): Concave Slope (%): 5
Subregion (LRR): LRR D Lat: 39.65723305 Long: -119.82844798 Datum: WGS 84
Soil Map Unit Name: Doten variant silty clay, slightly saline (150) NWI classification: ____
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	X	
Hydric Soil Present?		X
Wetland Hydrology Present?	X	
Is the Sampled Area within a Wetland?		X

Remarks:
Paired upland point for a small wetland associated with an under-road culvert. Nearby wetland is dominated by large bulrushes.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
=Total Cover			
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
=Total Cover			
Herb Stratum (Plot size: 5)			
1. *Crypsis schoenoides*	40	Yes	FACW
2. *Polygonum argyrocoleon*	20	Yes	FAC
3. *Heliotropium curassavicum*	5	No	FACU
4. *Schoenoplectus maritimus*	5	No	OBL
5. *Lactuca serriola*	2	No	FACU
6.			
7.			
8.			
=Total Cover	72		
Woody Vine Stratum (Plot size:)			
1.			
2.			
=Total Cover			

% Bare Ground in Herb Stratum 28 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	40	x 2 =	80
FAC species	20	x 3 =	60
FACU species	7	x 4 =	28
UPL species	0	x 5 =	0
Column Totals:	72 (A)		173 (B)

Prevalence Index = B/A = 2.40

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks:
Most plants dead. Dry soil.

SOIL

Sampling Point: UPL_3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 6/3	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) **(LRR C)**
___ 1 cm Muck (A9) **(LRR D)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) **(LRR C)**
___ 2 cm Muck (A10) **(LRR B)**
___ Iron-Manganese Masses (F12) **(LRR D)**
___ Reduced Vertic (F18)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: ______
Depth (inches): ______

Hydric Soil Present? Yes ___ No X

Remarks:
Dry, crumbly. Many roots.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) **(Nonriverine)**
___ Sediment Deposits (B2) **(Nonriverine)**
___ Drift Deposits (B3) **(Nonriverine)**
X Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Water Marks (B1) **(Riverine)**
___ Sediment Deposits (B2) **(Riverine)**
___ Drift Deposits (B3) **(Riverine)**
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

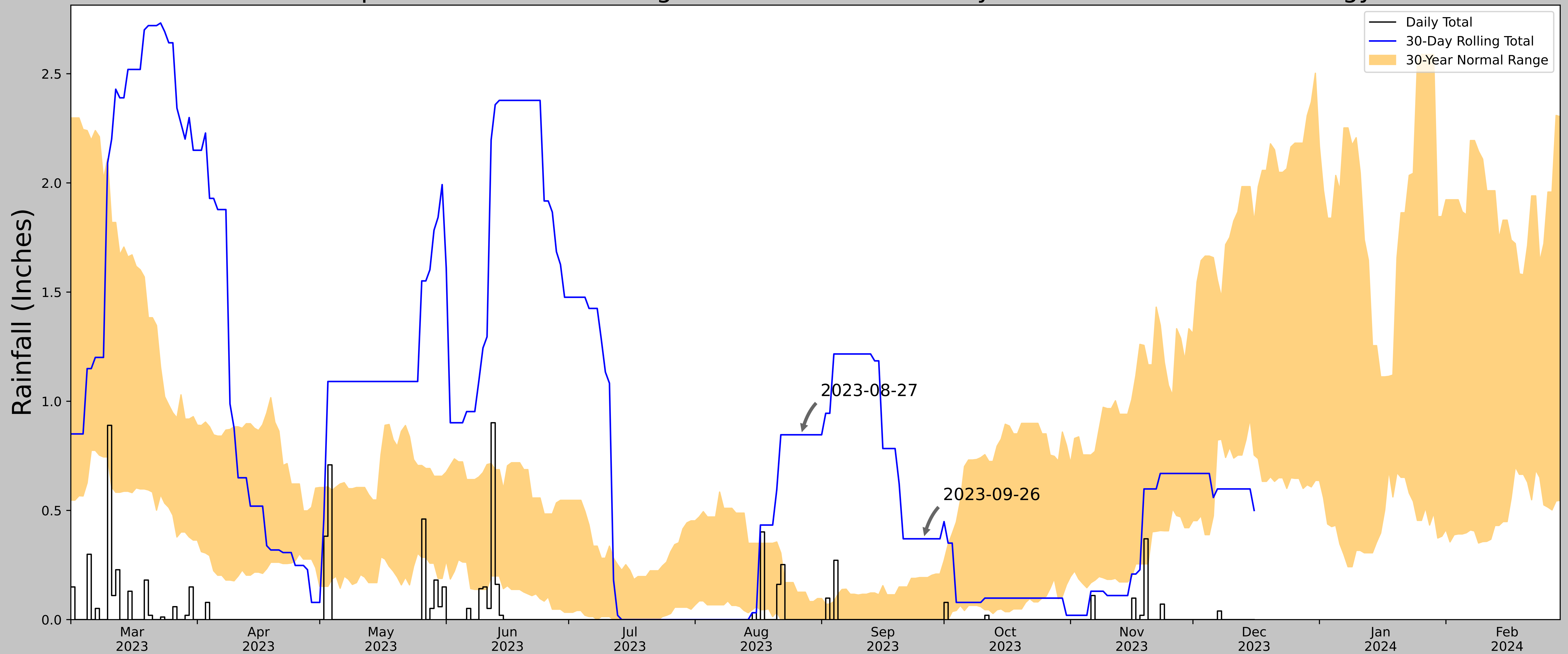
Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Appendix G: Antecedent Precipitation Tool Results

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	39.666667, -119.830572
Observation Date	2023-09-26
Elevation (ft)	4922.135
Drought Index (PDSI)	Extreme wetness
WebWIMP H_2O Balance	Dry Season

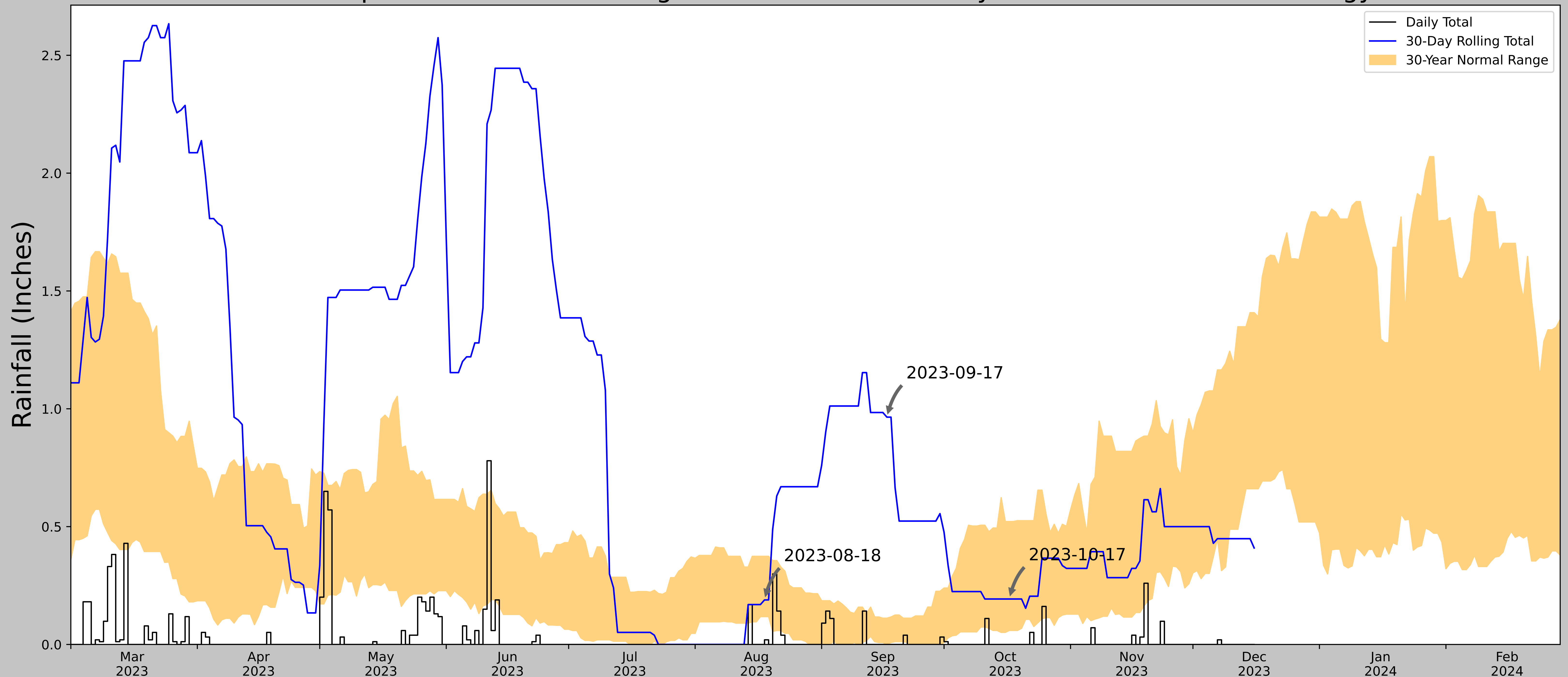
30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-09-26	0.0	0.19252	0.370079	Wet	3	3	9
2023-08-27	0.0	0.125591	0.846457	Wet	3	2	6
2023-07-28	0.056693	0.351969	0.0	Dry	1	1	1
Result							Wetter than Normal - 16

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
STEAD	39.6253, -119.8836	5101.05	4.016	178.915	2.526	10651	87
RENO 5.3 N	39.6155, -119.8317	5101.05	2.844	0.0	1.28	107	3
RENO 7.1 N	39.6418, -119.8299	4997.047	3.076	104.003	1.704	217	0
RENO 7.1 N	39.6418, -119.8309	4970.145	3.027	130.905	1.758	4	0
RENO 4.0 N	39.5963, -119.8086	5201.116	4.467	100.066	2.457	44	0
RENO 11.7 NW	39.6703, -119.9624	5054.134	5.219	46.916	2.593	1	0
RENO 3.9 W	39.542, -119.8958	5150.919	5.792	49.869	2.895	9	0
RENO WFO	39.5683, -119.7956	4986.877	6.121	114.173	3.453	271	0
SPARKS	39.5558, -119.7333	4356.956	9.333	744.094	11.144	48	0
RENO AP	39.5078, -119.7683	4404.856	10.18	696.194	11.668	1	0

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	39.666667, -119.830572
Observation Date	2023-10-17
Elevation (ft)	4922.135
Drought Index (PDSI)	Extreme wetness
WebWIMP H_2O Balance	Dry Season

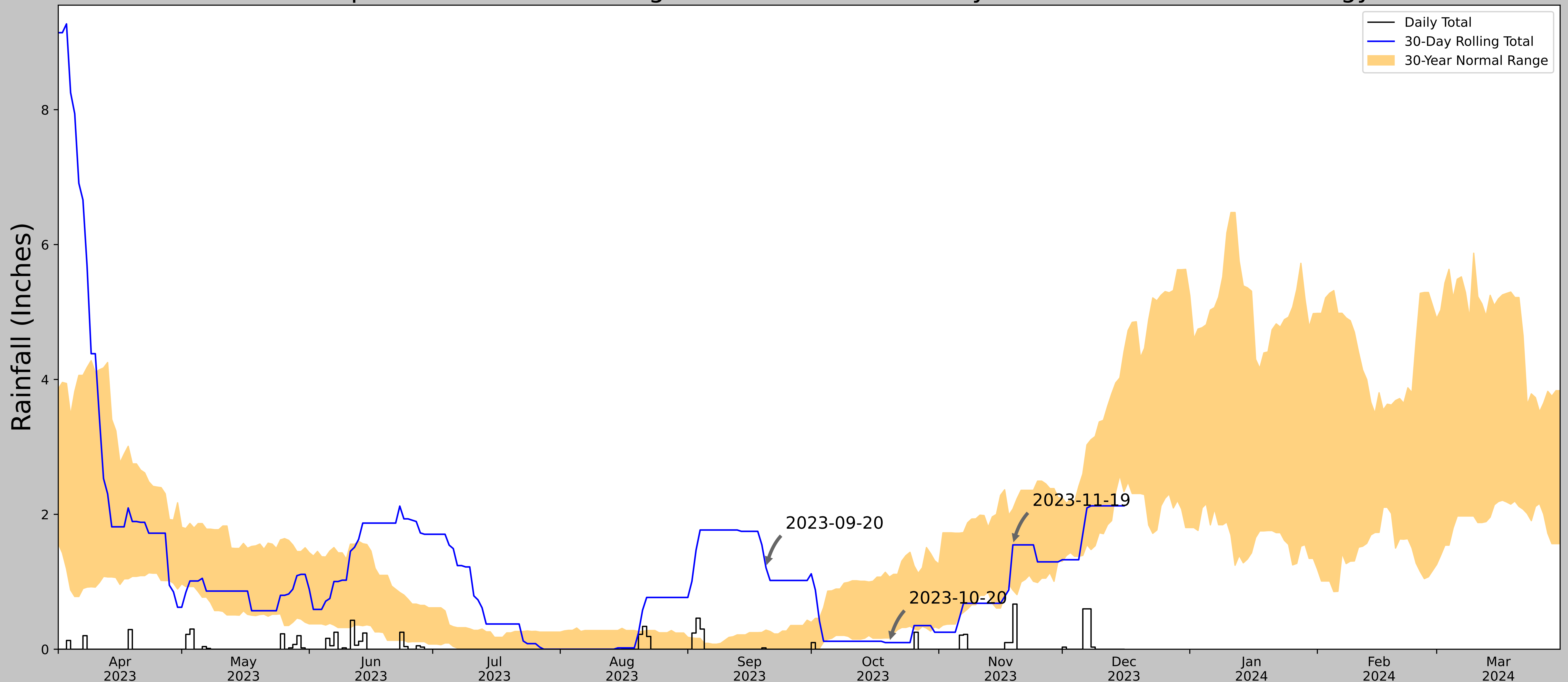
30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-10-17	0.059449	0.521654	0.192913	Normal	2	3	6
2023-09-17	0.0	0.111417	0.964567	Wet	3	2	6
2023-08-18	0.11811	0.374016	0.188976	Normal	2	1	2
Result							Normal Conditions - 14

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
RENO WFO	39.5683, -119.7956	4986.877	7.047	64.742	3.627	10012	90
RENO 1.4 NNE	39.5573, -119.8144	4901.903	1.257	84.974	0.672	1	0
STEAD	39.6253, -119.8836	5101.05	6.121	114.173	3.453	1290	0
SPARKS	39.5558, -119.7333	4356.956	3.429	629.921	3.703	48	0
RENO AP	39.5078, -119.7683	4404.856	4.426	582.021	4.568	1	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	39.666667, -119.830572
Observation Date	2023-11-19
Elevation (ft)	4922.135
Drought Index (PDSI)	Severe wetness
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-11-19	0.878346	2.078347	1.547244	Normal	2	3	6
2023-10-20	0.166929	1.069291	0.098425	Dry	1	2	2
2023-09-20	0.0	0.283465	1.208661	Wet	3	1	3
Result							Normal Conditions - 11

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
PORTOLA	39.8053, -120.4719	4850.066	35.396	72.069	18.479	10718	82
BECKWOURTH 3.3 E	39.8179, -120.3158	4958.99	8.331	108.924	4.656	65	8
VINTON	39.8056, -120.1858	4950.131	15.186	100.065	8.353	536	0
SIERRAVILLE RS	39.5833, -120.3706	4975.066	16.257	125.0	9.348	24	0
RENO 9.0 W	39.5184, -119.9935	4899.935	32.256	49.869	16.124	9	0

Appendix H: Property Access Memo

Memorandum

To: U.S. Army Corps of Engineers

From: Jennifer Thomason
UES, Senior Environmental Scientist

Date: December 2023

Subject: Lemmon Drive AJD, Reno, Washoe, Nevada Site Access Permission

Introduction

The Regional Transportation Commission (RTC) of Washoe County is proposing to construct roadway improvements along Lemmon Drive. An approved jurisdictional determination from the U.S. Army Corps of Engineers is being requested. It appears that none of the aquatic resources located within the Survey Area would be regulated under Section 404 of the Clean Water Act.

Property access for the purposes of conducting an aquatic resources delineation and collecting supportive data for an aquatic resources delineation report is required. Data to be collected includes photographs/videos, field conditions, and field samples including hydrologic, vegetative and soil samples.

Access

RTC of Washoe County grants the U.S. Army Corps of Engineers access to the property, with at least 48 hours' notice and escort by the approved agent. There are no other access restrictions.

Right of entry has been secured for privately owned lands around the project area and are attached. All other areas are publicly accessible.

Project: Lemmon Drive Traffic Improvements and Resiliency
RTC Project No.: 217001
Parcels: 0 W. Patrician Drive
0 Lemmon Drive
APNs: 080-461-30
080-671-55
080-671-56
080-671-57
080-721-04
080-722-03
080-730-16

RIGHT OF ENTRY AGREEMENT

THIS AGREEMENT, made this 19 day of October, 2023, between LANSING-ARCUS, LLC, hereinafter called the OWNER, and the REGIONAL TRANSPORTATION COMMISSION, hereinafter called the RTC,

WITNESSETH:

WHEREAS, the RTC is requesting permission to enter the above referenced Assessor's parcel in preparation for the proposed improvements to realign Lemmon Drive as part of the Lemmon Drive Traffic Improvement and Resiliency project in Reno, Washoe County; and

WHEREAS, such RTC's consultant, CA Group, and contracted subconsultants will cross over the lands owned by the OWNER for the purpose and accordance authorized by Nevada Revised Statute 37.050 provisions with notice to OWNER; and

WHEREAS, negotiations for the RTC's purchase of the necessary rights owned by the OWNER have not been concluded, this Right of Entry will help determine the necessary lands needed for the project; and

NOW, THEREFORE, it is mutually agreed that the OWNER hereby grants to the RTC the right to enter upon such land for the purpose of surveying, NEPA surveys, geotechnical drilling, and design layout and performing the incidents thereto. This right-of-entry is set to expire December 31, 2024. This grant shall limit the activities of the RTC and its consultant's purpose to that portion of the lands of the OWNER's said land being located in Washoe County, State of Nevada.

It is further understood and agreed that the OWNER will obtain permission and/or provide notice to any tenants as required by NRS 118A.330.

It is further understood that, to the extent provided by law, including but not limited to the provisions of Nevada Revised Statutes Chapter 41, the RTC will be responsible for any loss, damage, liability, cost or expense caused by the actions or non-actions of its employees, servants, or agents resulting from the use of said premises by the RTC and its consultants or any of its employees during the conduct of their work.

The RTC and/or its consultants/authorized agents shall exercise diligence not to unreasonably disrupt Owners or any tenant and their activities. Any locked gates required for access shall be opened and closed each day. In this regard, the parties agree that to the extent practical, travel shall be restricted to existing roads. All work relating to the work will be conducted between 6:00 a.m. and 6:00 p.m., excluding holidays or weekends. Any fences, gates, posts, markers, structures, or other property belonging to the OWNERS shall not be moved, disturbed, or changed without prior written approval. Upon completion of the work, the RTC and/or its Consultants will leave the subject parcels and property in its original condition that existed before permission to enter was granted, unless otherwise agreed to in writing;

All covenants and agreements herein contained shall extend to and be obligatory upon the heirs, executors, administrators, successors and assigns, as the case may be, of the respective parties.

As used herein, the term OWNER shall include the plural, as well as the singular, and the neuter, as well as the feminine and masculine.

This Agreement shall constitute the entire contract between the parties hereto and no modification hereof shall be binding upon the parties unless the same is in writing and signed by the respective parties hereto.

RTC's designated contact person is Michele Payne, phone number (775) 332-2144 and email: mpayne@rtcwashoe.com. Please provide the OWNER's best contact for the RTC's consultant to contact when they will be on site.

IN WITNESS WHEREOF the parties hereto have executed this agreement the day and year first above written.

LANSING-ARCUS, LLC

By: ______________________

Its: MANAGER

Contact Name: GREGORY P. LANSING

Contact Number: (858) 523-0719

If signer shall be a corporation, trust, partnership or other unnatural person, an authorized person must sign on behalf of the signer. The agreement must be executed by the person approved by the bylaws, articles, or a certified, stamped copy of a resolution of the board of directors as provided with the executed agreement.

REVIEWED AND RECOMMENDED BY:

DocuSigned by:

34A1800C54C142F...

Dale Keller, Director of Engineering

Project: Lemmon Drive Traffic Improvements and Resiliency
RTC Project No.: 217001
Parcels: 0 Lemmon Drive
11855 Jean Way
APNs: 080-671-52
080-722-01

RIGHT OF ENTRY AGREEMENT

THIS AGREEMENT, made this 10 day of October, 2023, between TRUCKEE MEADOWS WATER AUTHORITY, hereinafter called the OWNER, and the REGIONAL TRANSPORTATION COMMISSION, hereinafter called the RTC,

WITNESSETH:

WHEREAS, the RTC is requesting permission to enter the above referenced Assessor's parcel in preparation for the proposed improvements to realign Lemmon Drive as part of the Lemmon Drive Traffic Improvement and Resiliency project in Reno, Washoe County; and

WHEREAS, such RTC's consultant, CA Group, and contracted subconsultants will cross over the lands owned by the OWNER for the purpose and accordance authorized by Nevada Revised Statute 37.050 provisions with notice to OWNER; and

WHEREAS, negotiations for the RTC's purchase of the necessary rights owned by the OWNER have not been concluded, this Right of Entry will help determine the necessary lands needed for the project; and

NOW, THEREFORE, it is mutually agreed that the OWNER hereby grants to the RTC the right to enter upon such land for the purpose of surveying, NEPA surveys, and design layout and performing the incidents thereto. This right-of-entry is set to expire December 31, 2024. This grant shall limit the activities of the RTC and its consultant's purpose to that portion of the lands of the OWNER's said land being located in Washoe County, State of Nevada.

It is further understood and agreed that the OWNER will obtain permission and/or provide notice to any tenants as required by NRS 118A.330.

It is further understood that, to the extent provided by law, including but not limited to the provisions of Nevada Revised Statutes Chapter 41, the RTC will be responsible for any loss, damage, liability, cost or expense caused by the actions or non-actions of its employees, servants, or agents resulting from the use of said premises by the RTC and its consultants or any of its employees during the conduct of their work.

RTC assumes all risks of and full responsibility for losses, injuries, damages and/or death associated with or arising in connection with entry onto such land and shall indemnify, defend, and hold harmless TMWA and its officers, directors, and employees from and against any and all losses, claims, liabilities, damages to persons or property, costs and expenses, including reasonable attorneys' fees, made against or incurred by TMWA as a result of, or arising from, RTC's entry and use of the above identified land.

The RTC and/or its consultants/authorized agents shall exercise diligence not to unreasonably disrupt Owners or any tenant and their activities. RTC and/or its consultants/authorized agents shall contact Owner's representative no later than seventy-two (72) hours in advance to coordinate the security escort and access into the properties. In this regard, the parties agree that to the extent practical, travel shall be restricted to existing roads. All work relating to the work will be conducted between 8:00 a.m. and 5:00 p.m., excluding holidays or weekends. Any fences, gates, posts, markers, structures, or other property belonging to the OWNERS shall not be moved, disturbed, or changed without prior written approval. Upon completion of the work, the RTC and/or its Consultants will leave the subject parcels and property in its original condition that existed before permission to enter was granted, unless otherwise agreed to in writing;

All covenants and agreements herein contained shall extend to and be obligatory upon the heirs, executors, administrators, successors and assigns, as the case may be, of the respective parties.

As used herein, the term OWNER shall include the plural, as well as the singular, and the neuter, as well as the feminine and masculine.

This Agreement shall constitute the entire contract between the parties hereto and no modification hereof shall be binding upon the parties unless the same is in writing and signed by the respective parties hereto.

RTC's designated contact person is Michele Payne, phone number: (775) 332-2144 and email: mpayne@rtcwashoe.com. Please provide the OWNER's best contact for the RTC's consultant to contact when they will be on site.

IN WITNESS WHEREOF the parties hereto have executed this agreement the day and year first above written.

TRUCKEE MEADOWS WATER AUTHORITY

By: ______________________
John Enloe

Its: DIRECTOR NATURAL RESOURCES

Contact Name: Heather Edmunson, Lands Administrator

Contact Number: 775-762-4162 and hedmunson@tmwa.com (email)

If signer shall be a corporation, trust, partnership or other unnatural person, an authorized person must sign on behalf of the signer. The agreement must be executed by the person approved by the bylaws, articles, or a certified, stamped copy of a resolution of the board of directors as provided with the executed agreement.

REVIEWED AND RECOMMENDED BY:

DocuSigned by:

34A1600C54C142F...
Dale Keller, Director of Engineering

Appendix I: USACE Aquatic Resources Excel Sheet