HYBRID MEETING NOTICE
Truckee Meadows Stormwater Permit Coordinating Committee

DATE: **August 25, 2022**
TIME: **9:15 A.M.**
PLACE: **CITY OF RENO, CITY HALL**
6TH FLOOR CONFERENCE ROOM
1 EAST FIRST STREET
RENO, NEVADA 89501
(There is parking available in Parking Garage above the First Floor)

Members

Jennifer Heeran, Chair
Alex Mayorga
Theresa Jones
James Pehrson
Kevin Porter
Cody McDougall

Public Notice

This agenda has been physically posted in compliance with NRS 241.020(3)(notice of meetings) at Reno City Hall – 1 East First Street, Washoe County Administration Building – 1001 East 9th Street and Sparks City Hall – 431 Prater Way. In addition, this agenda has been electronically posted in compliance with NRS 241.020(3) at http://www.reno.gov, and NRS 232.2175 at https://notice.nv.gov/. To obtain further documentation regarding posting, please contact Tara Aufiero at aufierot@reno.gov.

Members of the Committee may participate in this meeting using the zoom video conference platform.

Members of the public may participate in the meeting by registering through the below zoom link which will provide the meeting ID number and call-in phone number.

Virtual link: https://us06web.zoom.us/meeting/register/tZwvf-uvqj8pE9AcwiMcyhKqHnLH4JU9cTib
In Person: 1 East First Street, 6th Floor Conference Room

Accommodations

Reasonable efforts will be made to assist and accommodate individuals with disabilities attending the meeting. Please contact Tara Aufiero at (775) 333-7751 at least 48 hours in advance so that arrangements can be made.

Supporting Materials

Staff reports and supporting material for the meeting are available by contacting Tara Aufiero at (775) 333-7751 or aufierot@reno.gov and on the City's website at Reno.Gov. Pursuant to NRS 241.020(9), supporting material is made available to the general public at the same time it is provided to the public body.

Order of Business

The presiding officer shall determine the order of the agenda and all questions of parliamentary procedure at the meeting. Items on the agenda may be taken out of order. The public body may combine two or more agenda items for consideration; remove an item from the agenda; or delay discussion relating to an item on the agenda at any time. See, NRS 241.020(2)(c)(6). Items scheduled to be heard at a specific time will be heard no earlier than the stated time, but may be heard later.

In Person Public Comment

Public comment, whether on items listed on the agenda or general public comment, is limited to three (3) minutes per person. Unused time may not be reserved by the speaker, nor allocated to another speaker. No action may be taken

on a matter raised under general public comment until the matter is included on an agenda as an item on which action may be taken.

Virtual Public Comment

No action may be taken on a matter raised under general public comment until the matter is included on a subsequent agenda as an action item.

Pursuant to NRS 241.023, those wishing to submit public comment may do so by contacting Theresa Jones by sending an email to jonest@reno.gov or by leaving a voicemail at 775-334-3311, or at the meeting during virtual public comment. Public comment is limited to three (3) minutes per person. Comments received prior to 4:00 p.m. on the day preceding the meeting will be transcribed, provided to the Board/Commission/Committee for review, and entered into the record. Comments received after 4:00 pm on the day preceding the meeting will be provided to the Board/Commission/Committee for review prior to adjournment, and entered into the record.

A. Introductory Items

A.1 **Call To Order/Roll Call**

A.2 **Public Comment** – This item is for either public comment on any action item or for any general public comment and is limited to no more than three (3) minutes for each commentator.

A.3 **Approval Of The Agenda (For Possible Action)** – August 25, 2022

A.4 **Approval Of The Minutes (For Possible Action)** – July 28, 2022

B. Business Items

B.1 Review and possible approval for payment of below invoices. The City will pay the invoices and seek 75% reimbursement from the Water Management Fund from the Western Regional Water Commission and 25% reimbursement from the Nevada Department of Transportation per the Interlocal Agreements. (For Possible Action)

(i) USGS Invoice #90995814, dated July 15, 2022, in the amount of $3,233.00 related to Stormwater Monitoring for FY22/23.

B.2 Review and possible approval for payment of below invoices and receipt. The City will seek reimbursement from the Water Management Fund from the Western Regional Water Commission per the Interlocal Agreement. (For Possible Action)

(i) City of Reno staffing reimbursement for FY21/22, in the amount of $73,363.30 related to support of the SWPCC.

B.3 Presentation, review, discussion and possible approval of the draft 2022 Project Reach Watershed Assessment Memorandums, prepared by NCE. Reaches include sections of Chalk Creek, Galena Creek, Jones, Creek, North Truckee Drain, South Evans Creek, and Steamboat Creek. (For Possible Action)

C. Standing Agenda Items (Not For Action)

C.1 Stormwater Management Program activities including but not limited to Construction, Industrial, Monitoring, Public Outreach, Maintenance, IDDE, and Post Construction elements in support of the Truckee Meadows Storm Water Program.

(i) A new organization is needed to lead the Annual Tahoe Truckee Snapshot Day (Lower Truckee Reach), an educational-focused citizen science program where teams of volunteers collect data used for watershed monitoring, and identifying potential restoration areas. SWPCC is in discussion with KTMB about sharing

responsibilities for the program, next spring.

C.2 Update on Nevada Division of Environmental Protection's activities regarding federal, state, and local matters.

C.3 Update on Nevada Department of Transportation activities regarding MS4 activities.

C.4 Updates on grants and funding opportunities and projects, public presentations, volunteer opportunities and events, trainings, workshops, and conferences.

(i) Grant: Carson Truckee Water Conservancy District – Deadline: see website;
(ii) Grant: NDEP 319(h) Nonpoint Source Grant – Open 8/15/22 – 9/23/22;
(iii) Grant: Conserve Nevada program Grant – Pre-apps due 8/15/22;
(iv) CASQA Eighteenth Annual Conference, Palm Springs, CA; October 24 - 26, 2022

D. Discussion and possible direction on setting the next regular meeting for September 22, 2022 at 9:15 a.m. (For Possible Action).

E. **Public Comment** - This is for general public comment limited to items that do not appear on the agenda and is limited to no more than three (3) minutes for each commentator.

F. **Adjournment** (For Possible Action)

MEETING MINUTES
TRUCKEE MEADOWS STORMWATER PERMIT COORDINATING COMMITTEE

Thursday, July 28, 2022

The regular meeting of the Truckee Meadows Stormwater Permit Coordinating Committee (SWPCC) was held virtually and in person in the City Hall 6th Floor Conference Room at 1 East First Street, Reno, Nevada, and conducted the following business:

A. Introductory Items

A.1 Call to Order/Roll Call

The meeting was called to order by Chair Porter at 9:15 a.m. and a quorum was present.

Members Present: Jennifer Heeran, Chair; Theresa Jones, SWPCC Coordinator; Alex Mayorga; James Pehrson; Kevin Porter

Members Absent: Cody McDougall

Staff and Guests Present: Susan Ball Rothe, Legal Counsel; Nick Brothers, City of Reno; Chad Praul, Environmental Incentives; Megan Murray; Molly Daniels, Environmental Incentives; Birgit Widegren, Western Regional Water Commission (WRWC); Mitch Cowles, Nevada Division of Environmental Protection (NDEP); Iris Jehle-Peppard; Kristi Black, NDEP

A.2 Public Comment

None

A.3 **Approval of Agenda** (For Possible Action) - July 28, 2022

CHAIR HEERAN MADE A MOTION TO APPROVE THE AGENDA, SECONDED BY COORDINATOR JONES. THE MOTION CARRIED UNANIMOUSLY WITH FIVE (5) MEMBERS PRESENT.

A.4 **Approval of the Minutes** (For Possible Action) - June 23, 2022

MEMBER MAYORGA MADE A MOTION TO APPROVE THE MINUTES, SECONDED BY MEMBER PORTER. THE MOTION CARRIED UNANIMOUSLY WITH FIVE (5) MEMBERS PRESENT.

B. Business Items

B.1 **Review and possible approval for payment of below invoices. The City will pay the invoices and seek 75% reimbursement from the Water Management Fund from the Western Regional Water Commission and 25% reimbursement from the Nevada Department of Transportation per the Interlocal Agreements.** (For Possible Action)

(i) USGS Invoice #90995814, dated July 15, 2022, in the amount of $3,233.00 related to Stormwater Monitoring for the 1st Quarter of FY23

(ii) Balance Invoice # 213136-0622, dated June 30, 2022, in the amount of $4,097.92 related to Stormwater Monitoring for FY21/22

(iii) NCE Invoice #167252506, dated July 14, 2022, in the amount of $27,940.00 related to Watershed Assessments to Tributaries to the Truckee River

CHAIR HEERAN MADE A MOTION TO APPROVE, SECONDED BY MEMBER PEHRSON. THE MOTION CARRIED UNANIMOUSLY WITH FIVE (5) MEMBERS PRESENT.

B.2 Review and possible approval for payment of below invoice. The City will seek reimbursement from the Water Management Fund from the Western Regional Water Commission per the Interlocal Agreement. (For Possible Action)

(i) NDEP Invoice #6265, dated April 22, 2022, in the amount of $1,276.00 for Annual Review and Services Fees for Permit NVS000001

CHAIR HEERAN MADE A MOTION TO APPROVE, SECONDED BY COORDINATOR JONES. THE MOTION CARRIED UNANIMOUSLY WITH FIVE (5) MEMBERS PRESENT.

B.3 Review, discussion, and possible action regarding the draft Water Quality Crediting Program Booklet outlining essential program elements including eligibility, crediting, operations, and policies. (For Possible Action)

Chad Praul, Environmental Incentives, gave a presentation on the program elements included in the Water Quality Crediting Program Booklet and answered questions regarding the program.

There was discussion regarding the recommendation for a program administrator and Mr. Praul clarified that it is most cost effective to find someone to be a neutral player that can make quick decisions.

Molly Daniels, Environmental Incentives, gave a presentation on the eligibility element of the program.

Mr. Praul stated they are looking for help and guidance as to what would be acceptable to the regulator and what will be practical for the dischargers to credit individual projects by type.

Ms. Daniels reviewed the feedback form included in the packet. One feedback form per agency should be returned by August 19.

No action was taken.

B.4 Review of 4th Quarter SWPCC budget (April through June)

Coordinator Jones reviewed the budget report included in the packet. There were no questions.

B.5 Review, discussion, and possible approval of final revisions to the Annual Report Financial Questionnaire template. (For Possible Action)

Coordinator Jones reviewed the final revisions made to the Annual Report Financial Questionnaire template that were discussed at the last SWPCC meeting.

Member Porter requested that the line items that ask for the model and quantity of equipment be highlighted so they are easier to see.

MEMBER PORTER MADE A MOTION TO APPROVE, WITH THE REQUESTED HIGHLIGHTING REVISION TO THE EQUIPMENT MODELS AND QUANTITIES, SECONDED BY CHAIR HEERAN. THE MOTION CARRIED UNANIMOUSLY WITH FIVE (5) MEMBERS PRESENT.

C. Standing Agenda Items (Not For Action)

C.1 Stormwater Management Program activities including but not limited to Construction, Industrial, Monitoring, Public Outreach, Maintenance, IDDE, and Post Construction elements in support of the Truckee Meadows Stormwater Program.

Coordinator Jones reported that NCE was ready to present their tributary templates this month and that has been moved to the August SWPCC meeting.

C.2 Update on Nevada Division of Environmental Protection's (NDEP) activities regarding federal, state, and local matters.

Mitch Cowles, NDEP, reported that the construction general permit is out for public comment. He also provided updates on NDEP staff changes.

Kristi Black, NDEP, reported that the fact sheet details all of the changes from the old permit to the new permit.

C.3 Update on Nevada Department of Transportation (NDOT) activities regarding MS4 activities.

None

C.4 Updates on grants and funding opportunities and projects, public presentations, volunteer opportunities and events, trainings, workshops, and conferences.

(i) CASQA Eighteenth Annual Conference, Palm Springs, CA; October 24 - 26, 2022

Coordinator Jones stated this is a great conference to attend.

(ii) City of Reno to represent SWPCC by participating and presenting in the following education programs:

- Great Basin Outdoor School – Adventure Day Camp

D. Discussion and possible direction on setting the next regular meeting for August 25, 2022 at 9:15 a.m. (For Possible Action)

The next regular meeting date will be August 25, 2022 at 9:15 a.m.

E. Public Comment

None

F. Adjournment (For Possible Action)

The meeting was adjourned at 11:01 a.m.

Respectfully submitted by,
Christine Birmingham, Recording Secretary

MEETING REPORT

Truckee Meadows Water Quality Crediting Update Meeting Summary

DATE	July 28, 2022, from 9:20 to 10:45 AM
LOCATION	Reno City Hall with virtual participants via Zoom
CORRESPONDENCE LIST	**City of Reno**: Theresa Jones, Nick Brothers, Susan Rothe, Tara Aufiero, James Pehrson; **Washoe County:** Jennifer Herran; Alex Mayorga **City of Sparks**: Kevin Porter, **NDEP:** Birgit Widegren, Kristie Black, Mitch Cowles; **Environmental Incentives [Facilitators]:** Chad Praul, Molly Daniels, Megan Murray; **Other Organizations**: Kara Steeland (TMWA), Sarah Davenport (NCE), Kimberly Rigdon (WRWC), Iris Jehle-Peppard (One Truckee River)

MEETING OBJECTIVES

Update stakeholders on the Truckee Meadows Water Quality Crediting Program elements.

- Stakeholders gain awareness of essential crediting program concepts and can provide their input following the meeting.
- Concerns about program resourcing are addressed.

DECISIONS

As this was a program update, there were no official items to vote on or provide a level of agreement.

ACTION ITEMS

TITLE	LEAD	DUE DATE
Meet with stakeholders individually to answer detailed questions after initial review	Chad + Molly	8/25//2022
Submit consolidated agency comments on draft "Booklet" using feedback file provided	Each agency rep	8/19/2022
Present all comments at next SWPCC meeting	Chad or Molly	8/24/2022

KEY POINTS FROM STAKEHOLDERS

There is general understanding of the program's process and benefits, but specific details need further consideration as stakeholders make their internal reviews.

- EI reminded stakeholders that this program is an environmentally beneficial, cost-effective solution when asked by a stakeholder about the program purpose.
- There was extensive discussion and several questions surrounding roles, responsibilities, and program process, but no consensus or defined path.
- At least one permittee was very supportive of exploring this program. Eventually coordination between the cities, county, and NDEP are needed because this program will have implications to their compliance strategies.

Transparency is key.

- Stakeholders expressed transparency concerns about credit tracking, such as price and access to information.
- Stakeholder feedback will be consolidated and presented at a future SWPCC meeting.

MEETING MATERIALS

Participants were provided the program booklet as part of their meeting packet.

SESSION DETAILS (REPEATED FOR REFERENCE)

SESSION ITEM	DESCRIPTION
Welcome	Consultants review the objectives and agenda
Program Booklet Review	Consultants present the program elements and invite questions
Stakeholder Feedback Request	Consultants review stakeholder assignment
Program Process	Consultants present the estimated timeline for meetings and deliverables
Closing & Next Steps	Consultants review action items, parking lot items, and next steps

DI-1040

UNITED STATES DEPARTMENT OF THE INTERIOR
DOWN PAYMENT (BILL) REQUEST

Bill #: 90995814
Customer: 6000001960
Date: 07/15/2022
Due Date: 09/13/2022

Make Remittance Payable To: U.S. Geological Survey
Billing Contact: Helen Houston Phone: 775-887-7605

Remit Payment To: United States Geological Survey
P.O. Box 6200-27
Portland, OR 97228-6200

RECEIVED
JUL 18 2022
CITY OF RENO
Public Works Department

Payer: CITY OF RENO
PUBLIC WORKS DEPARTMENT
7TH FLOOR, CITY HALL/PO BOX 1900
RENO NV 89505

Additional forms of payment may be accepted. Please email GS-A-HQ_RMS@USGS.GOV or call 703-648-7683 for additional information.

To pay through Pay.gov go to https://www.pay.gov.

Checks must be made payable to U.S. Geological Survey. Please detach the top portion or include bill number on all remittances.

Amount of Payment: $ _____

Date	Description	Qty	Unit Price		Amount
			Cost	Per	
07/15/2022	Quarterly billing for joint funding agreement 21ZJJFA00120; Surface water monitoring program on the North Truckee Drain Cust POC: Theresa Jones; 775-334-2350 USGS POC: Megan Poff; 702-564-4526 21ZJJFA00120	1	3,233.00	1	3,233.00
				Amount Due this Bill:	3,233.00

Accounting Classification:
Sales Order: 99982
Sales Office: GWZJ
Customer: 6000001960
Accounting #: 11265716

TIN: *****0201

Project Transaction Report

G/L Date Range 07/01/21 - 06/30/22
Exclude Sub Ledger Detail
Sorted By Project - G/L Account - Date

G/L Date	Journal	Journal Type	Sub Ledger	Description	Source/Reference	Revenue	Debit Amount	Credit Amount	Actual Balance	Net Change
I700021-00103 - STORM WATER PROGRAM TRUCKEE MEADOWS, Project Mgmt/Admin								Year-to-Date	$0.00	
40000-4000-4040-7102-0000 - Regular salaries										
07/01/2021										
	2022-00000069	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202114	Payroll Post		2,921.52		2,921.52	
07/01/2021										
	2022-00000473	JE	GL	Reverse June portion of Payroll Post Biweekly 202114	PAYROLL			2,712.84	208.68	
07/15/2021										
	2022-00000338	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202115	Payroll Post		1,469.52		1,678.20	
07/29/2021										
	2022-00000601	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202116	Payroll Post		1,469.09		3,147.29	
08/12/2021										
	2022-00000843	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202117	Payroll Post		1,297.63		4,444.92	
08/26/2021										
	2022-00001126	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202118	Payroll Post		1,293.01		5,737.93	
09/09/2021										
	2022-00001364	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202119	Payroll Post		1,285.27		7,023.20	
09/23/2021										
	2022-00001598	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202120	Payroll Post		1,900.03		8,923.23	
10/07/2021										
	2022-00001896	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202121	Payroll Post		1,560.26		10,483.49	
10/21/2021										
	2022-00002158	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202122	Payroll Post		1,895.41		12,378.90	
11/04/2021										
	2022-00002459	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202123	Payroll Post		1,416.50		13,795.40	
11/18/2021										
	2022-00002711	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202124	Payroll Post		1,048.85		14,844.25	
12/10/2021										
	2022-00002975	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202125	Payroll Post		1,717.69		16,561.94	

12/16/2021							
	2022-00003346	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202126	Payroll Post	2,386.54	18,948.48
12/30/2021							
	2022-00003599	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20221	Payroll Post	1,245.04	20,193.52
01/13/2022							
	2022-00003981	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20222	Payroll Post	1,482.93	21,676.45
01/27/2022							
	2022-00004319	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20223	Payroll Post	1,833.59	23,510.04
02/10/2022							
	2022-00004628	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20224	Payroll Post	2,729.31	26,239.35
02/24/2022							
	2022-00004804	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20225	Payroll Post	1,650.16	27,889.51
03/10/2022							
	2022-00005284	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20226	Payroll Post	1,884.44	29,773.95
03/24/2022							
	2022-00005581	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20227	Payroll Post	2,177.43	31,951.38
04/07/2022							
	2022-00005920	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20228	Payroll Post	1,694.42	33,645.80
04/21/2022							
	2022-00006298	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20229	Payroll Post	4,479.58	38,125.38
05/05/2022							
	2022-00006504	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202210	Payroll Post	2,235.63	40,361.01
05/19/2022							
	2022-00006892	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202211	Payroll Post	1,518.82	41,879.83
06/02/2022							
	2022-00006983	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202212	Payroll Post	1,211.88	43,091.71
06/16/2022							
	2022-00007458	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202213	Payroll Post	1,795.70	44,887.41
06/30/2022							
	2023-00000051	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202214	Payroll Post	1,378.10	46,265.51

Project Transaction Report

G/L Date Range 07/01/21 - 06/30/22
Exclude Sub Ledger Detail
Sorted By Project - G/L Account - Date

G/L Date	Journal	Journal Type	Sub Ledger	Description	Source/Reference	Revenue	Debit Amount	Credit Amount	Actual Balance	Net Change
					40000-4000-4040-7102-0000 Total		$48,978.35	$2,712.84	$46,265.51	
40000-4000-4040-7202-0000 - Retirement										
07/01/2021										
	2022-00000069	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202114	Payroll Post		854.54		47,120.05	
07/01/2021										
	2022-00000473	JE	GL	Reverse June portion of Payroll Post Biweekly 202114	PAYROLL			793.50	46,326.55	
07/15/2021										
	2022-00000338	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202115	Payroll Post		429.83		46,756.38	
07/29/2021										
	2022-00000601	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202116	Payroll Post		429.70		47,186.08	
08/12/2021										
	2022-00000843	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202117	Payroll Post		386.04		47,572.12	
08/26/2021										
	2022-00001126	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202118	Payroll Post		384.67		47,956.79	
09/09/2021										
	2022-00001364	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202119	Payroll Post		382.37		48,339.16	
09/23/2021										
	2022-00001598	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202120	Payroll Post		565.26		48,904.42	
10/07/2021										
	2022-00001896	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202121	Payroll Post		464.18		49,368.60	
10/21/2021										
	2022-00002158	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202122	Payroll Post		563.88		49,932.48	
11/04/2021										
	2022-00002459	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202123	Payroll Post		421.41		50,353.89	
11/18/2021										
	2022-00002711	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202124	Payroll Post		312.03		50,665.92	
12/10/2021										
	2022-00002975	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202125	Payroll Post		511.02		51,176.94	

12/16/2021							
	2022-00003346	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202126	Payroll Post	710.00	51,886.94
12/30/2021							
	2022-00003599	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20221	Payroll Post	370.40	52,257.34
01/13/2022							
	2022-00003981	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20222	Payroll Post	441.17	52,698.51
01/27/2022							
	2022-00004319	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20223	Payroll Post	545.49	53,244.00
02/10/2022							
	2022-00004628	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20224	Payroll Post	811.97	54,055.97
02/24/2022							
	2022-00004804	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20225	Payroll Post	490.92	54,546.89
03/10/2022							
	2022-00005284	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20226	Payroll Post	560.62	55,107.51
03/24/2022							
	2022-00005581	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20227	Payroll Post	647.78	55,755.29
04/07/2022							
	2022-00005920	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20228	Payroll Post	504.08	56,259.37
04/21/2022							
	2022-00006298	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20229	Payroll Post	1,332.67	57,592.04
05/05/2022							
	2022-00006504	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202210	Payroll Post	665.10	58,257.14
05/19/2022							
	2022-00006892	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202211	Payroll Post	451.85	58,708.99
06/02/2022							
	2022-00006983	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202212	Payroll Post	360.53	59,069.52
06/16/2022							
	2022-00007458	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202213	Payroll Post	534.22	59,603.74
06/30/2022							
	2023-00000051	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202214	Payroll Post	409.99	60,013.73

Project Transaction Report

G/L Date Range 07/01/21 - 06/30/22
Exclude Sub Ledger Detail
Sorted By Project - G/L Account - Date

G/L Date	Journal	Journal Type	Sub Ledger	Description	Source/Reference	Revenue	Debit Amount	Credit Amount	Actual Balance	Net Change
					40000-4000-4040-7202-0000 Total		$14,541.72	$793.50	$60,013.73	
40000-4000-4040-7204-0000 - Group insurance										
07/15/2021										
	2022-00000338	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202115	Payroll Post		540.16		60,553.89	
08/12/2021										
	2022-00000843	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202117	Payroll Post		518.32		61,072.21	
09/09/2021										
	2022-00001364	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202119	Payroll Post		508.52		61,580.73	
10/07/2021										
	2022-00001896	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202121	Payroll Post		630.82		62,211.55	
11/18/2021										
	2022-00002711	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202124	Payroll Post		369.00		62,580.55	
12/16/2021										
	2022-00003346	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202126	Payroll Post		823.43		63,403.98	
01/13/2022										
	2022-00003981	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20222	Payroll Post		537.69		63,941.67	
02/10/2022										
	2022-00004628	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20224	Payroll Post		923.95		64,865.62	
03/10/2022										
	2022-00005284	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20226	Payroll Post		686.89		65,552.51	
04/07/2022										
	2022-00005920	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20228	Payroll Post		620.92		66,173.43	
05/19/2022										
	2022-00006892	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202211	Payroll Post		564.71		66,738.14	
06/16/2022										
	2022-00007458	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202213	Payroll Post		683.35		67,421.49	
					40000-4000-4040-7204-0000 Total		$7,407.76	$0.00	$67,421.49	
40000-4000-4040-7205-0000 - Life insurance										
07/15/2021										

G/L Date	Journal	Journal Type	Sub Ledger	Description	Source/Reference	Revenue	Debit Amount	Credit Amount	Actual Balance	Net Change
	2022-00000338	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202115	Payroll Post		10.44		67,431.93	
08/12/2021										
	2022-00000843	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202117	Payroll Post		9.24		67,441.17	
09/09/2021										
	2022-00001364	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202119	Payroll Post		9.15		67,450.32	
10/07/2021										
	2022-00001896	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202121	Payroll Post		11.11		67,461.43	
11/18/2021										
	2022-00002711	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202124	Payroll Post		7.47		67,468.90	
12/16/2021										
	2022-00003346	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202126	Payroll Post		16.99		67,485.89	
01/13/2022										
	2022-00003981	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20222	Payroll Post		10.56		67,496.45	
02/10/2022										
	2022-00004628	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20224	Payroll Post		19.90		67,516.35	
03/10/2022										
	2022-00005284	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20226	Payroll Post		13.49		67,529.84	
04/07/2022										
	2022-00005920	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20228	Payroll Post		12.13		67,541.97	
05/19/2022										
	2022-00006892	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202211	Payroll Post		10.87		67,552.84	
06/16/2022										
	2022-00007458	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202213	Payroll Post		12.86		67,565.70	
					40000-4000-4040-7205-0000 Total		$144.21	$0.00	$67,565.70	
40000-4000-4040-7210-0000 - Employer medicare contributions										
07/01/2021										
	2022-00000069	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202114	Payroll Post		40.82		67,606.52	
07/01/2021										

Project Transaction Report

G/L Date Range 07/01/21 - 06/30/22
Exclude Sub Ledger Detail
Sorted By Project - G/L Account - Date

G/L Date	Journal	Journal Type	Sub Ledger	Description	Source/Reference	Revenue	Debit Amount	Credit Amount	Actual Balance	Net Change
	2022-00000473	JE	GL	Reverse June portion of Payroll Post Biweekly 202114	PAYROLL			37.90	67,568.62	
07/15/2021										
	2022-00000338	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202115	Payroll Post		19.17		67,587.79	
07/29/2021										
	2022-00000601	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202116	Payroll Post		18.63		67,606.42	
08/12/2021										
	2022-00000843	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202117	Payroll Post		16.33		67,622.75	
08/26/2021										
	2022-00001126	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202118	Payroll Post		16.05		67,638.80	
09/09/2021										
	2022-00001364	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202119	Payroll Post		16.25		67,655.05	
09/23/2021										
	2022-00001598	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202120	Payroll Post		24.57		67,679.62	
10/07/2021										
	2022-00001896	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202121	Payroll Post		19.53		67,699.15	
10/21/2021										
	2022-00002158	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202122	Payroll Post		25.95		67,725.10	
11/04/2021										
	2022-00002459	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202123	Payroll Post		18.69		67,743.79	
11/18/2021										
	2022-00002711	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202124	Payroll Post		13.94		67,757.73	
12/10/2021										
	2022-00002975	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202125	Payroll Post		22.83		67,780.56	
12/16/2021										
	2022-00003346	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202126	Payroll Post		31.95		67,812.51	
12/30/2021										
	2022-00003599	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20221	Payroll Post		16.35		67,828.86	
01/13/2022										

Project Transaction Report

G/L Date Range 07/01/21 - 06/30/22
Exclude Sub Ledger Detail
Sorted By Project - G/L Account - Date

G/L Date	Journal	Journal Type	Sub Ledger	Description	Source/Reference	Revenue	Debit Amount	Credit Amount	Actual Balance	Net Change
	2022-00003981	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20222	Payroll Post		19.45		67,848.31	
01/27/2022										
	2022-00004319	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20223	Payroll Post		23.86		67,872.17	
02/10/2022										
	2022-00004628	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20224	Payroll Post		36.61		67,908.78	
02/24/2022										
	2022-00004804	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20225	Payroll Post		21.12		67,929.90	
03/10/2022										
	2022-00005284	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20226	Payroll Post		24.42		67,954.32	
03/24/2022										
	2022-00005581	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20227	Payroll Post		28.41		67,982.73	
04/07/2022										
	2022-00005920	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20228	Payroll Post		21.91		68,004.64	
04/21/2022										
	2022-00006298	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20229	Payroll Post		64.11		68,068.75	
05/05/2022										
	2022-00006504	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202210	Payroll Post		29.10		68,097.85	
05/19/2022										
	2022-00006892	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202211	Payroll Post		19.52		68,117.37	
06/02/2022										
	2022-00006983	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202212	Payroll Post		15.44		68,132.81	
06/16/2022										
	2022-00007458	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202213	Payroll Post		22.84		68,155.65	
06/30/2022										
	2023-00000051	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202214	Payroll Post		17.43		68,173.08	
					40000-4000-4040-7210-0000 Total		$645.28	$37.90	$68,173.08	
40000-4000-4040-7212-0000 - Long Term Disability										
07/15/2021										
	2022-00000338	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202115	Payroll Post		10.08		68,183.16	

G/L Date	Journal	Journal Type	Sub Ledger	Description	Source/Reference	Revenue	Debit Amount	Credit Amount	Actual Balance	Net Change
08/12/2021										
	2022-00000843	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202117	Payroll Post		9.39		68,192.55	
09/09/2021										
	2022-00001364	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202119	Payroll Post		9.24		68,201.79	
10/07/2021										
	2022-00001896	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202121	Payroll Post		11.38		68,213.17	
11/18/2021										
	2022-00002711	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202124	Payroll Post		6.99		68,220.16	
12/16/2021										
	2022-00003346	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202126	Payroll Post		15.71		68,235.87	
01/13/2022										
	2022-00003981	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20222	Payroll Post		10.07		68,245.94	
02/10/2022										
	2022-00004628	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20224	Payroll Post		18.12		68,264.06	
03/10/2022										
	2022-00005284	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20226	Payroll Post		13.07		68,277.13	
04/07/2022										
	2022-00005920	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20228	Payroll Post		11.79		68,288.92	
05/19/2022										
	2022-00006892	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202211	Payroll Post		10.68		68,299.60	
06/16/2022										
	2022-00007458	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202213	Payroll Post		12.83		68,312.43	
					40000-4000-4040-7212-0000 Total		$139.35	$0.00	$68,312.43	
40000-4000-4040-7214-0000 - Deferred Compensation										
07/01/2021										
	2022-00000069	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202114	Payroll Post		88.97		68,401.40	
07/01/2021										
	2022-00000473	JE	GL	Reverse June portion of Payroll Post Biweekly 202114	PAYROLL			82.62	68,318.78	

Project Transaction Report

G/L Date Range 07/01/21 - 06/30/22
Exclude Sub Ledger Detail
Sorted By Project - G/L Account - Date

G/L Date	Journal	Journal Type	Sub Ledger	Description	Source/Reference	Revenue	Debit Amount	Credit Amount	Actual Balance	Net Change
07/15/2021										
	2022-00000338	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202115	Payroll Post		19.12		68,337.90	
07/29/2021										
	2022-00000601	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202116	Payroll Post		8.80		68,346.70	
08/12/2021										
	2022-00000843	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202117	Payroll Post		4.40		68,351.10	
09/09/2021										
	2022-00001364	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202119	Payroll Post		5.87		68,356.97	
09/23/2021										
	2022-00001598	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202120	Payroll Post		22.01		68,378.98	
10/07/2021										
	2022-00001896	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202121	Payroll Post		2.93		68,381.91	
10/21/2021										
	2022-00002158	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202122	Payroll Post		17.61		68,399.52	
11/04/2021										
	2022-00002459	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202123	Payroll Post		24.94		68,424.46	
11/18/2021										
	2022-00002711	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202124	Payroll Post		19.07		68,443.53	
12/10/2021										
	2022-00002975	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202125	Payroll Post		33.75		68,477.28	
12/16/2021										
	2022-00003346	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202126	Payroll Post		48.42		68,525.70	
12/30/2021										
	2022-00003599	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20221	Payroll Post		20.54		68,546.24	
01/13/2022										
	2022-00003981	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20222	Payroll Post		22.01		68,568.25	
01/27/2022										
	2022-00004319	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20223	Payroll Post		24.94		68,593.19	
02/10/2022										

G/L Date	Journal	Journal Type	Sub Ledger	Description	Source/Reference	Revenue	Debit Amount	Credit Amount	Actual Balance	Net Change
	2022-00004628	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20224	Payroll Post		57.96		68,651.15	
02/24/2022										
	2022-00004804	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20225	Payroll Post		10.27		68,661.42	
03/10/2022										
	2022-00005284	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20226	Payroll Post		17.61		68,679.03	
03/24/2022										
	2022-00005581	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20227	Payroll Post		27.88		68,706.91	
04/07/2022										
	2022-00005920	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20228	Payroll Post		14.67		68,721.58	
04/21/2022										
	2022-00006298	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 20229	Payroll Post		129.85		68,851.43	
05/05/2022										
	2022-00006504	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202210	Payroll Post		26.41		68,877.84	
05/19/2022										
	2022-00006892	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202211	Payroll Post		10.27		68,888.11	
06/02/2022										
	2022-00006983	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202212	Payroll Post		5.87		68,893.98	
06/16/2022										
	2022-00007458	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202213	Payroll Post		6.60		68,900.58	
06/30/2022										
	2023-00000051	JE	HR	Payroll Post Bi-Weekly Bi-Weekly 202214	Payroll Post		3.23		68,903.81	
					40000-4000-4040-7214-0000 Total		$674.00	$82.62	$68,903.81	
					I700021-00103 Total		$72,530.67	$3,626.86	$68,903.81	

I700021-09000 - STORM WATER PROGRAM TRUCKEE MEADOWS, Misc Contract/Other Payments — Year-to-Date $0.00

40000-4000-4040-7400-1000 - Outside services-personnel

07/30/2021										
	2022-00000442	JE	AP	A/P Invoice Entry	Accounts Payable		31.72		31.72	
09/24/2021										
	2022-00001515	JE	AP	A/P Invoice Entry	Accounts Payable		63.44		95.16	

Project Transaction Report

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Exclude Sub Ledger Detail
Sorted By Project - G/L Account - Date

G/L Date	Journal	Journal Type	Sub Ledger	Description	Source/Reference	Revenue	Debit Amount	Credit Amount	Actual Balance	Net Change
10/08/2021										
	2022-00001710	JE	AP	A/P Invoice Entry	Accounts Payable		47.58		142.74	
10/15/2021										
	2022-00001963	JE	AP	A/P Invoice Entry	Accounts Payable		79.30		222.04	
12/03/2021										
	2022-00002889	JE	AP	A/P Invoice Entry	Accounts Payable		47.58		269.62	
12/10/2021										
	2022-00003064	JE	AP	A/P Invoice Entry	Accounts Payable		118.95		388.57	
12/23/2021										
	2022-00003362	JE	AP	A/P Invoice Entry	Accounts Payable		55.51		444.08	
02/04/2022										
	2022-00004330	JE	AP	A/P Invoice Entry	Accounts Payable		103.08		547.16	
02/18/2022										
	2022-00004623	JE	AP	A/P Invoice Entry	Accounts Payable		39.65		586.81	
04/01/2022										
	2022-00005582	JE	AP	A/P Invoice Entry	Accounts Payable		63.44		650.25	
05/06/2022										
	2022-00006431	JE	AP	A/P Invoice Entry	Accounts Payable		103.08		753.33	
06/17/2022										
	2022-00007223	JE	AP	A/P Invoice Entry	Accounts Payable		79.30		832.63	
					40000-4000-4040-7400-1000 Total		$832.63	$0.00	$832.63	
					I700021-09000 Total		$832.63	$0.00	$832.63	
					Grand Totals		$73,363.30	$3,626.86		

Project Transaction Report

G/L Date Range 07/01/21 - 06/30/22
Exclude Sub Ledger Detail
Sorted By Project - G/L Account - Date

G/L Date	Journal	Journal Type	Sub Ledger	Description	Source/Reference	Revenue	Debit Amount	Credit Amount	Actual Balance	Net Change
I700021-00103 - STORM WATER PROGRAM TRUCKEE MEADOWS, Project Mgmt/Admin								Year-to-Date	$0.00	
40000-4000-4040-7102-0000 - Regular salaries							48,978.35	2,712.84	46,265.51	
40000-4000-4040-7202-0000 - Retirement							14,541.72	793.50	60,013.73	
40000-4000-4040-7204-0000 - Group insurance							7,407.76	.00	67,421.49	
40000-4000-4040-7205-0000 - Life insurance							144.21	.00	67,565.70	
40000-4000-4040-7210-0000 - Employer medicare contributions							645.28	37.90	68,173.08	
40000-4000-4040-7212-0000 - Long Term Disability							139.35	.00	68,312.43	
40000-4000-4040-7214-0000 - Deferred Compensation							674.00	82.62	68,903.81	
					I700021-00103 Total		$72,530.67	$3,626.86	$68,903.81	
I700021-09000 - STORM WATER PROGRAM TRUCKEE MEADOWS, Misc Contract/Other Payments								Year-to-Date	$0.00	
40000-4000-4040-7400-1000 - Outside services-personnel							832.63	.00	832.63	
					I700021-09000 Total		$832.63	$0.00	$832.63	
					Grand Totals		$73,363.30	$3,626.86		

MEMORANDUM

Date:	June 30, 2022
To:	Theresa Jones, City of Reno
From:	Debra Lemke, Scott Kobs, and Sarah Davenport, NCE
Subject:	2022 Chalk Creek Lancer Steet to Mae Anne Avenue Project Reach Assessment Draft Memorandum

This technical memorandum presents mapped field data, field observations, and preliminary recommendations for restoration and improvement projects along Chalk Creek within the project reach between Lancer Street and Mae Anne Avenue (**Appendix A, Figure 1**). The project reach was selected based on a review of the *2020 Watershed Management and Protection Plan for Tributaries to the Truckee River* (2020 Plan) (NCE, 2020) Tributary Project list; this project list was developed in coordination with the Truckee Meadows Stormwater Permit Coordinating Committee as potential projects that may be submitted for 319(h) funding (**Appendix B, Project Count #2**). In addition, Chalk Creek has been assessed under previous watershed assessments for tributaries of the Truckee River.

BACKGROUND

Beginning in 2003, watershed assessments have been performed along tributaries of the Truckee River throughout the Truckee Meadows. The tributary assessments were prepared using the Proper Functioning Condition (PFC) methodology presented in the U.S. Department of the Interior Bureau of Land Management document titled *Riparian Area Management, A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas* (BLM, 1998). This methodology evaluates hydrology, vegetation, erosion/deposition to determine the functional rating of the evaluated reach. Tributaries were divided into established reaches and have been assessed on a rotating basis since 2003.

Chalk Creek is on the 303(d) list of impaired waters. **Table 1** provides the 303(d) water quality impairment, impaired use, and the total maximum daily loads (TMDL) priority for Chalk Creek.

Table 1. Section 303(d) Tributary List

Waterbody Name	Size (Miles)	Standard Not Meeting (Impairment)	Impaired Use	TMDL Priority
Chalk Creek	4.1	Nitrate SV AQL	AQL	Low
		Orthophosphate SV	AQL, RWC	Low
		Phosphorus total AA	AQL, RWC	Low
		Selenium 96-hour	AQL	Low
		Sulfur SV	MDS	Low
		TDS AA	MDS	Low
		Temperature SV	AQL	Low

AA = annual average, AQL= aquatic life, MDS = municipal domestic supply, RWC = recreation involving contact with water, SV = single value, TDS = Total Dissolved Solids

Source: NDEP, Bureau of Water Quality Planning. 2019. *Nevada 2016-2018 Water Quality Integrated Report Assessment Period – October 1, 2009 through September 30, 2016*

The project reach for the 2022 effort represents a 2,258-foot section of the larger 9,350 foot Chalk Creek Upper West Reach (**Appendix A, Figure 1**). The Chalk Creek Upper West Reach was last assessed in 2016 and was given a PFC rating of nonfunctional. The Upper West Reach includes the following previously documented issues within the 2022 project reach (**Appendix A, Figure 2**):

- A moderate headcut at a concrete grade control structure
- Channel incision downstream of a stormwater outfall, downstream of the concrete grade control structure
- A moderate headcut at Valley Wood Drive culvert terminus
- Channel incision downstream of the Valley Wood Drive culvert
- Easily erodible and bare banks
- Presence of tall whitetop (*Lepidium latifolium*) and thistle upstream of Mae Anne Avenue
- Lack of riparian corridor upstream of Mae Anne Avenue

The 2022 project reach was selected due to the documented headcuts, channel incision, erosion issues, lack of upland and riparian vegetation, and the presence of non-native vegetation.

2022 Project Reach Assessment

The PFC methodology was used to evaluate hydrology, vegetation, erosion, and/or deposition within the project reach to maintain consistency with previous assessment efforts. In addition, representative photographs were taken and observation points were recorded.

The project reach assessment was conducted on February 28, 2022. Overall, the project reach remains nonfunctional as previously documented issues persist and new erosion issues have developed. Within the project reach multiple headcuts, lateral migration of the channel, excessive erosion due to both channel and headcut migration, and lack of riparian vegetation were observed. Noxious weed species and approximate areas were estimated

and mapped. Field observations and mapped areas are presented in **Appendix A**, **Figure 3** and described below in more detail. Representative photos are located in **Appendix C**, and the photo locations are depicted on **Appendix A**, **Figure 4**.

Lancer Street to Valley Wood Drive

At the northern limit of the project reach a concrete grade control structure is present. Immediately upstream and extending to the grade control structure is a previously unmapped colony of tall whitetop. As previously documented in 2016 a vertical drop exists at the structure and in 2022 was measured to be 24-inches. Since 2016, a new channel has formed upstream and west of the grade control structure. At this western edge of the grade control structure, the structure is not keyed into a stable bank, which allowed a new channel to form. This newly formed channel bypasses the grade control structure (on the west) and allows upward migration of the headcut (**Appendix C, Photo 2**) that previously ended at the structure. The newly formed channel is 24-inches deep at the temporary footbridge (which appears to be built by homeowners to access the grade control structure at the western edge). This upward migration poses significant risk to the vertical stability of the reach upstream of the grade control.

Both overhead and underground utilities cross Chalk Creek in the 2022 project reach. Within the vicinity of the overhead utilities, vegetation (upland and riparian) had been removed along the utility corridor and extended to the flow line of the channel.

Just upstream of the overhead utility crossing is a grade break in the channel slope, and the channel transitions to an area of deposition downstream of the grade break.

Downstream of the overhead utility crossing is an area of previously unmapped tall whitetop, and two new headcuts were identified.

Valley Wood Drive to Mae Anne Avenue

Downstream of Valley Wood Drive there is an 18-inch vertical drop at the end of the grouted riprap apron. The extent of the drop appears stable based on previous observations ranging from 1 to 2 feet. Both riparian and upland vegetation growth are limited due to brush removal and mowing. Upland vegetation is limited to the eastern side of the channel. Three established grade control structures exist in this section of the project reach, they are two path crossings with culverts and one grouted riprap section that is connected to an existing valley gutter. Flow at the path crossings is limited due to sedimentation in the existing culverts. The ground surface throughout this section was saturated and potentially indicates high groundwater.

PRELIMINARY RECOMMENDATIONS

Based on the field work accomplished during the 2022 project reach assessment, below are preliminary recommendations to stabilize this portion of Chalk Creek. Specifically, these preliminary recommendations have the potential to reduce the erosion, headcutting, and channel incision, and increase vegetation complexity through noxious weed control and native plantings. These preliminary recommendations are also depicted on **Appendix A, Figure 5**.

- Extend grade control structure to the west, re-align channel to the original channel location, re-grade/fill in the newly formed western channel, add riprap below the grade control structure for channel stabilization downstream of the grade control structure
- Revegetate upland slopes
- Plant riparian vegetation along channel
- Reconstruct culvert apron (downstream of Valley Wood Drive) to connect to channel and provide energy dissipation
- Implement noxious weed control
- Evaluate potential for the construction of treatment wetlands for nuisance dry weather flows and TDS
- Coordinate with utilities to limit removal of stabilizing riparian vegetation at the channel

Table 2 presents a concept-level cost estimate for each of the preliminary recommendations. These concept-level costs were prepared using professional engineering judgement and GIS to estimate quantities.

Table 2. Concept Level Cost Estimate

Item	CONSTRUCTION COST ESTIMATE			
	Unit	Quantity	Unit Cost	Total
Base Items				
Noxious Weed Control (3x Years)	AC	< 1	$3,000.00	$3,000.00
Extend Grade Control	LF	30	$150.00	$4,500.00
Channel Stabilization / Riprap Drop Structure Downstream of Grade Control	SF	100	$45.00	$4,500.00
Remove and Regrade Upstream Channel at Grade Control	LF	50	$45.00	$2,250.00
Reconstruct Downstream Culvert Apron (Grouted Riprap)	SF	100	$60.00	$6,000.00
SUBTOTAL				$20,250.00
Alternative 1				
Revegetate (Upland)	SY	4,450	$5.00	$22,250.00
Revegetate (Riparian)	SY	6,750	$30.00	$202,500.00
SUBTOTAL				$224,750.00
Alternative 2				
Construct Treatment Wetland (Grading & Planting)	SY	5,200	$85.00	$442,000.00
Revegetate (Upland)	SY	4,450	$5.00	$22,250.00
Revegetate (Riparian)	SY	2,300	$30.00	$69,000.00
SUBTOTAL				$533,250.00
Totals			**Base & Alt 1**	**Base & Alt 2**
SUBTOTAL			$245,000.00	$553,500.00
General Conditions (e.g., Mobilization/Demobilization/Other)		15%	$36,800.00	$83,100.00
Construction Contingency		30%	$73,500.00	$166,100.00
Price Contingency / Inflation		25%	$61,300.00	$138,400.00
Construction Subtotal			$416,600.00	$941,100.00
Technical Studies, Planning, Design, Permitting, CM		30%	$125,000.00	$282,400.00
	PROJECT TOTAL		**$541,600.00**	**$1,223,500.00**

Notes:

AC = Acres, LF = Linear Feet, SF = Square Feet, SY = Square Yards

Minimum area of 1 ac used for noxious weed control

Assume riparian areas require erosion control fabric or functional equivalent

The 2020 Plan provides the process and framework to propose projects to the Nevada Division of Environmental Protection for 319(h) funding. To support the 319(h) application, a Tributary Project Template was developed (Appendix C of the 2020 Plan) and is further explained in Section 8.0 of the 2020 Plan. This memorandum will support the City of Reno's development of a project for 319(h) funding and support completion of the Tributary Project Template. To find out more information on 319(h) funding please also see NDEP's 319(h) webpage (https://ndep.nv.gov/water/rivers-streams-lakes/nonpoint-source-pollution-management-program/cwa-319h-grants).

Appendix A:

- Figure 1: Project Reach Overview
- Figure 2: Historic Observations (2016)
- Figure 3: Field Observations (2022)
- Figure 4: Photo Locations
- Figure 5: Improvement Concepts

Appendix B: Tributary Project list

Appendix C: Representative Photographs

Appendix A

FIGURE 1: PROJECT REACH OVERVIEW

FIGURE 2: HISTORIC OBSERVATIONS (2016)

FIGURE 3: FIELD OBSERVATIONS (2022)

FIGURE 4: PHOTO LOCATIONS

FIGURE 5: IMPROVEMENT CONCEPTS

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	CHALK CREEK Project Reach Overview	N 1 in. = 1,000 ft. 0 500 1,000 ft.				FIGURE 1
SOURCE Bing Hybrid Basemap		JOB NUMBER 167.25.25	DRAWN skobs/sdavenport	DATE 6/3/2022	REVISED 6/28/2022	APPROVED dlemke

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	CHALK CREEK Historic Observations (2016)					FIGURE 2
SOURCE Bing Hybrid Basemap; CDM Smith 2016; TMSWPCC	JOB NUMBER 167.25.25	DRAWN skobs/cvaz	DATE 6/14/2022	REVISED 6/28/2022	APPROVED dlemke	

N

1 in. = 250 ft.

0 125 250 ft.

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	CHALK CREEK Field Observations (2022)			N 1 in. = 250 ft. 0 125 250 ft.		FIGURE 3
SOURCE Bing Hybrid Basemap		JOB NUMBER 167.25.25	DRAWN skobs/cvaz	DATE 6/14/2022	REVISED 6/28/2022	APPROVED dlemke

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CHALK CREEK

Photo Locations

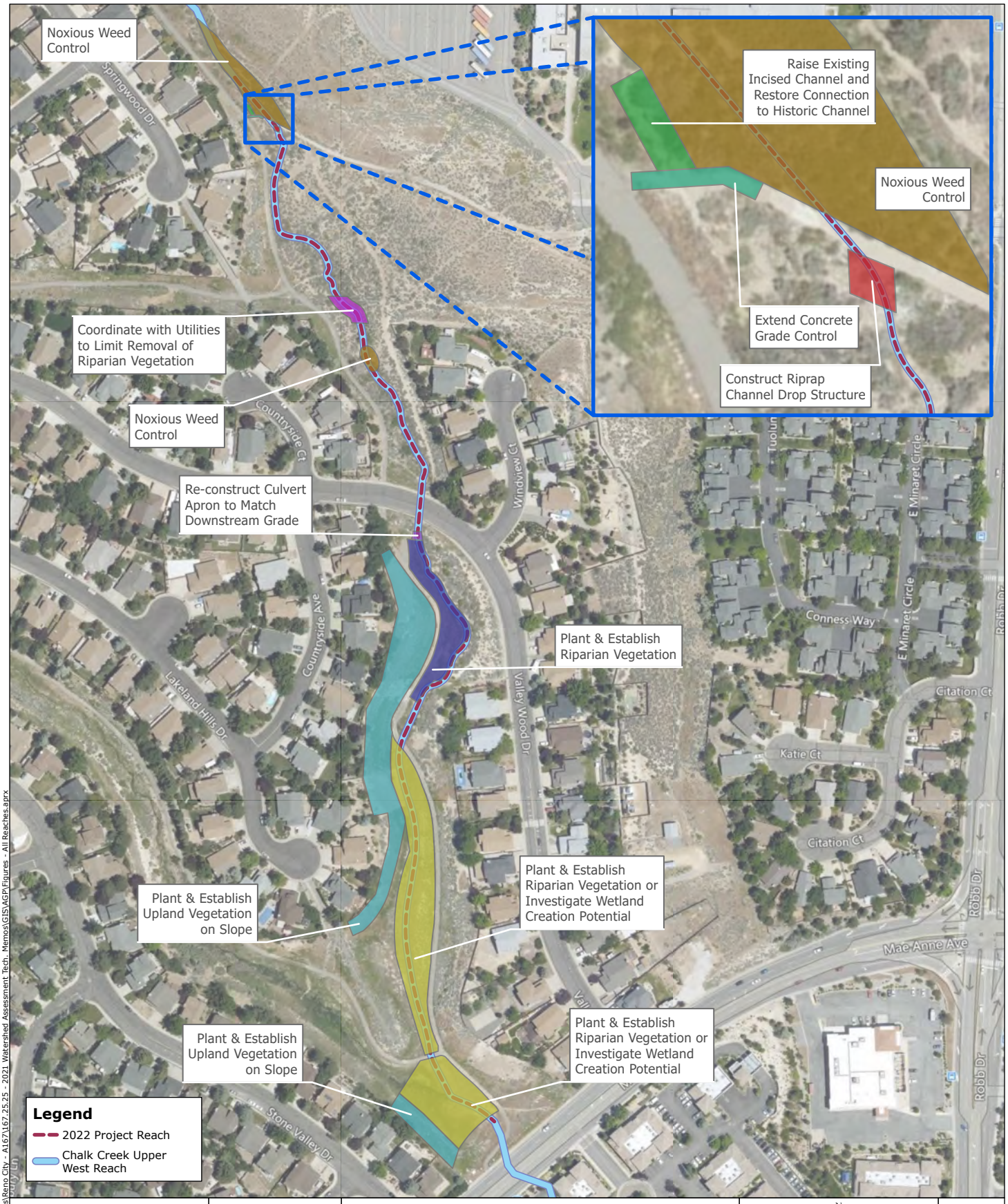
N

1 in. = 250 ft.

0 125 250 ft.

FIGURE 4

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Hybrid Basemap	167.25.25	skobs/cvaz	6/6/2022	6/28/2022	dlemke



Document Path: P:\Active Projects\Reno City - A167\167.25.25 - 2021 Watershed Assessment Tech. Memos\GIS\AGP\Figures - All Reaches.aprx

	CHALK CREEK Improvement Concepts					FIGURE 5
SOURCE Bing Hybrid Basemap	JOB NUMBER 167.25.25	DRAWN skobs/cvaz	DATE 6/14/2022	REVISED 6/28/2022	APPROVED dlemke	

N

1 in. = 250 ft.

0 125 250 ft.

Appendix B

TRIBUTARY PROJECT LIST

Appendix B - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
1	City of Reno	Chalk	Saphire Ridge Way to West 7th Street	Soils and hydromodification has caused severe bank incision, resulting in erosion and sediment loading.	Restore and stabilize channel through erosion and grade control measures.	This is City property. The erosion blanket in place has failed and there is an alternative intake upstream of TMWA Chalk Bluff.	TBD	TBD	Drafted
2	City of Reno	Chalk	Valleywood to Mae Ann	This is a vegetation project with a section devoid of vegetation and subject to erosion.	Remove white top and restore vegetation. A stormwater basin may need to be created. Bank stabilization near multiuse path may be needed.	This is City property. There is an alternative intake upstream of TMWA Chalk Bluff.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
3	City of Reno	Alum	Within Caughlin Ranch HOA Property	Persistent severe incision/erosion is present and lawn landscaping has effected the stream channel.	Restore channel and establish grade controls may be needed.	Most of the restoration is located on a anHOA property. There is potential for a partnership with Nevada Land Trust.	TBD	TBD	Proposed
4	City of Reno	Alum	Chrissie Caughlin Park	Flooding contributes sediment load from upstream and causes erosion though the park. There is a direct connection to Truckee River immediately downstream.	Provide sediment capture and stormwater treatment on City property with the use of a constructed wetland or stormwater basin.	One limitation is that this project likely requires projects to address upstream reaches of Alum Creek before addressing this location.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
5	City of Reno	Weed Mitigation	Areas identified in assessments	Areas of invasive weeds maybe due to reduction of native materials and therefore erosion concern and herbicide use.	Chanel restoration by stabilization materials or revegetation. Volunteer based weed abatement. Adopt a section.	Potential to engage community and partners in community wide effort. Possibilities include weeding day, adopt a reach, and restoration projects.	TBD	TBD	Proposed
6	City of Reno	MS4 Outlet Erosion Mitigation Project	Multiple locations as identified in assessments	Erosion is present at the end of the pipe where the storm drain discharges into each respective tributary.	Rip rap or energy dissipation at multiple outfalls.	This could be a lumped contract with several locations identified for correction.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
7	City of Sparks	North Truckee Drain	Spanish Springs Dam to I-80 box culvert	High flow events have caused erosion and sediment loading throughout the tributary.	Erosion and sediment control improvements are needed as well as a reestablishment of the flowline.	This would be a multiphase project.	TBD	TBD	Proposed
8	City of Sparks	North Truckee Drain	Spanish Springs Dam to I-80 box culvert	Invasive weeds and vegetation are present throughout the tributary.	Weed and vegetation abatement, as well as channel stabilization are needed.	This would be a multiphase project. There is an opportunity for public outreach regarding water quality and education about the tributary and river system.	TBD	TBD	Drafted

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
9	City of Sparks	North Truckee Drain	Baring Drive to Lillard Drive	Sediment and debris impacts from storm drain outfalls are located throughout high density residential areas.	Stormwater treatment devices should be installed at major outfalls.	Project would include establishing a maintenance schedule to inspect and clean the treatment vaults periodically and before storm events.	TBD	TBD	Proposed
10	Washoe County	South Evans	Through Anderson Park, Del Monte Lane to Bonde Lane	Historical hydromodification causes frequent flooding, resulting in erosion and sediment loading.	Restore channel and floodplain through park setting.	The downstream reach was previously restored. Water rights and diversions from the creek could pose potential challenge to this project.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
11	Washoe County	Galena	Lower Reach – I-580 bridge to Steamboat Creek	Erosion, undercutting, noxious weeds, hydromodification, and sediment loading are present along the project site.	Restore reach, channel and floodplain.	There are opportunities for a public/private partnership. This is likely a large, multiphase project.	TBD	TBD	Proposed
12	Washoe County	Jones	Callahan Ranch Road to Galena Creek	Persistent severe incision/erosion are present.	A restoration of the channel and an establishment of grade controls are likely needed.	There are opportunities for a public/private partnership.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
13	Washoe County	Alum	Through Betsy Caughlin Donnelly Park	Flooding contributes sediment loading from upstream and causes erosion through the park. There is also a direct connection to Truckee River immediately downstream.	Controlling upstream sediment and restoring the channel and floodplain through the park setting are likely needed.	It is likely that the upstream reaches of Alum Creek need to be addresed before addressing this location.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
14	Washoe County	Whites	Timberline Drive to Legend Trail	High flows cause erosion and sediment loading in multiple tributary drainages to Whites Creek.	Erosion and sediment control and drainage improvements are likely needed.	Continuing development in this area will likely exacerbate issues. Sediment loading may also have impacts on a new TMWA treatment plant on Whites Creek.	TBD	TBD	Proposed

Appendix C

Representative Photographs

Photo 1. Standing downstream and looking upstream at concrete grade control structure. The historic channel crossed the existing structure at this location until the formation of western channel (Photo 2). Flow from Chalk Creek has undercut the existing concrete.

Photo 2. Western channel bypassing concrete grade control (Photo 1).

Photo 3. Previously unmapped tall whitetop (*Lepidium latifolium*) upstream of concrete grade control structure (Photo 1).

Photo 4. Valley Wood Drive culvert with 18-inch headcut downstream of the grouted riprap apron.

Photo 5. Floodplain and upland slope west of channel between Mae Anne Avenue and Valley Wood Drive lack vegetation.

Photo 6. Chalk Creek looking upstream (north) south of Valley Wood Drive. Eastern bank has healthy upland vegetation. Western side of greenway lacks riparian and upland vegetation (also shown in Photo 5).

Photo 7. Chalk Creek looking downstream near Valley Wood Drive. Eastern bank has healthy upland vegetation. Western side of greenway lacks riparian and upland vegetation. Channel appears incised and disconnected from floodplain.

Photo 8. Chalk Creek looking downstream at Mae Anne Avenue outlet structure.

Photo 9. Chalk Creek looking upstream from outlet structure north of Mae Anne Avenue.

MEMORANDUM

Date:	June 30, 2022
To:	Theresa Jones, City of Reno
From:	Debra Lemke, Scott Kobs, and Sarah Davenport NCE
Subject:	2022 Galena Creek at I-580 Bridge Project Reach Assessment Draft Memorandum

This technical memorandum presents mapped field data, field observations, and preliminary recommendations for restoration and improvement projects along Galena Creek within the project reach beginning immediately upstream and ending immediately downstream of the I-580 bridge (**Appendix A, Figure 1**). The project reach was selected based on a review of the *2020 Watershed Management and Protection Plan for Tributaries to the Truckee River* (2020 Plan) (NCE, 2020) Tributary Project list; this project list was developed in coordination with the Truckee Meadows Stormwater Permit Coordinating Committee as potential projects that may be submitted for 319(h) funding (**Appendix B, Project Count #11**). In addition, Galena Creek has been assessed under previous watershed assessments for tributaries of the Truckee River.

BACKGROUND

Beginning in 2003, watershed assessments have been performed along tributaries of the Truckee River throughout the Truckee Meadows. The tributary assessments were prepared using the Proper Functioning Condition (PFC) methodology presented in the U.S. Department of the Interior Bureau of Land Management document titled *Riparian Area Management, A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas* (BLM, 1998). This methodology evaluates hydrology, vegetation, erosion, and/or deposition to determine the functional rating of the evaluated reach. Tributaries were divided into established reaches and have been assessed on a rotating basis since 2003.

The project reach for the 2022 effort represents a 560 foot section of the larger 10,980 foot Galena Creek Middle Reach (**Appendix A, Figure 1**). The project reach is at the downstream end of the Middle Reach where the creek transitions from a confined channel within a canyon to the valley floor. The Galena Creek Middle Reach was last assessed in 2015 and was given a PFC rating of functional-at-risk. The engineered channel had been identified as a critical point of interest, and photos and observations were documented in 2016 and 2017. The previously documented issues within the 2022 project reach include (**Appendix A, Figure 2**):

- The extent of erosion and undermining of vertical concrete retaining walls has worsened during the period between 2015-2017
- There is active bank cutting upstream and downstream of the engineered channel
- Presence of noxious weeds were documented including tall whitetop (*Lepidium latifolium*), and cheatgrass (*Bromus tectorum*), and goldenrod (*Solidago spp.*)

The 2022 project reach was selected due to the documented undercutting of structural elements of the engineered channel, noxious weeds, and bank cutting.

2022 PROJECT REACH ASSESSMENT

The project reach assessment was conducted on March 22, 2022. While the Lower and Middle Galena Creek reaches have been rated as functional-at-risk, the engineered channel section of the creek has been documented to have several issues as discussed above. The documented issues continue to persist and continued erosion throughout the project reach could result in failure of the engineered channel and contribute significant amounts of sediment to the creek. Failure of the engineered channel could allow for lateral mitigation of Galena Creek that may impact the structural integrity of the I-580 bridge footings. Field observations and mapped areas are presented in **Appendix A, Figure 3** and described below in more detail. Representative photos are located in **Appendix C**, and the photo locations are depicted on **Appendix A, Figure 4**.

Upstream and downstream of the engineered channel are locations where bank cutting appears to be actively eroding the outer meanders of the creek and riparian vegetation is lacking. These sections have steep banks with loose erodible soil.

The creek within the engineered rectangular channel under the I-580 bridge has incised and is now significantly below the vertical concrete walls. The creek has undermined approximately 110 feet of the northern concrete channel wall and 40 feet of the southern channel wall. It is estimated that the concrete wall to the north is suspended up to 6 feet above the existing channel. Access to the northern wall was not possible due to the existing creek flow line and safety concerns. The southern wall was accessible and was measured to be suspended up to 4 feet. The creek has eroded up to 6 feet behind the front face of the northern wall and 3 feet of the southern wall. The creek has been documented to be actively eroding the walls since 2015. Failure of the concrete walls could allow the banks to further unravel under the bridge and further lateral migration of the channel.

Vertical migration of the creek through the engineered reach appears stable due to the presence of bedrock. The upper third of the engineered reach has formed step pools and is vertically stable **(Appendix C, Photo 2 and 4)**. Deposition still occurs after the angle point within the engineered channel.

A storm drain outfall upstream of the I-580 bridge and on the southern side of the channel is being undermined and the outfall pipe is partially blocked with sediment and rocks.

Noxious weeds within the channel were present in the areas of deposition and matched previously mapped extents.

While in the field, Washoe County staff mentioned the existing diversion structure for irrigation and grade control should be investigated in a future assessment.

PRELIMINARY RECOMMENDATIONS

Based on the field work accomplished during the 2022 project reach assessment, below are preliminary recommendations to stabilize this portion of Galena Creek. Specifically, these preliminary recommendations are limited to mitigating future undermining through the engineered channel and further site specific review would need to be completed to know the extent of repairs required. These preliminary recommendations are also depicted on **Appendix A, Figure 5**:

- Repair/stabilize undermined section of the engineered channel
- Stabilize slopes and establish vegetation where active bank cutting is occurring
- Repair undermined riprap outfall and clear debris and rocks from storm drain pipe
- Implement noxious weed control

Table 1 presents a concept-level cost estimate for each of the preliminary recommendations. These concept-level costs are based on professional engineering judgement and GIS was used to estimate quantities.

Table 1. Concept Level Cost Estimate

	CONSTRUCTION COST ESTIMATE			
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Noxious Weed Control (3x Years)	AC	< 1	$3,000.00	$3,000.00
Place Riprap Boulders (Areas of Undermining)	LF	150	$300.00	$45,000.00
Repair Undermined Outfall	LS	1	$2,500.00	$2,500.00
Slope Stabilization & Revegetation Along Channel (Riparian)	SY	200	$90.00	$18,000.00
Slope Stabilization & Revegetation Outside of Channel (Upland)	SY	500	$15.00	$7,500.00
SUBTOTAL				$68,500.00
Totals				
SUBTOTAL				$68,500.00
General Conditions (e.g., Mobilization/Demobilization/Other)			15%	$10,300.00
Construction Contingency			30%	$20,600.00
Price Contingency / Inflation			25%	$17,200.00
Construction Subtotal				$116,600.00
Technical Studies, Planning, Design, Permitting, CM			30%	$6,700.00
			PROJECT TOTAL	**$123,300.00**

Notes:
AC = Acres, LF = Linear Feet, SF = Square Feet
Minimum area of 1 ac used for noxious weed control
Assume riparian areas require placement of cobble / rocks

The 2020 Plan provides the process and framework to propose projects to the Nevada Division of Environmental Protection for 319(h) funding. To support the 319(h) application, a Tributary Project Template was developed (Appendix C of the 2020 Plan) and is further explained in Section 8.0 of the 2020 Plan. This memorandum will support Washoe County's development of a project for 319(h) funding and support completion of the Tributary Project

Template. To find out more information on 319(h) funding please also see NDEP's 319(h) webpage (https://ndep.nv.gov/water/rivers-streams-lakes/nonpoint-source-pollution-management-program/cwa-319h-grants).

Appendix A:

- Figure 1: Project Reach Overview
- Figure 2: Historic Observations (2015, 2016, & 2017)
- Figure 3: Field Observations (2022)
- Figure 4: Photo Locations
- Figure 5: Improvement Concepts

Appendix B: Tributary Project list

Appendix C: Representative Photographs

Appendix A

FIGURE 1: PROJECT REACH OVERVIEW

FIGURE 2: HISTORIC OBSERVATIONS (2015, 2016, & 2017)

FIGURE 3: FIELD OBSERVATIONS (2022)

FIGURE 4: PHOTO LOCATIONS

FIGURE 5: IMPROVEMENT CONCEPTS

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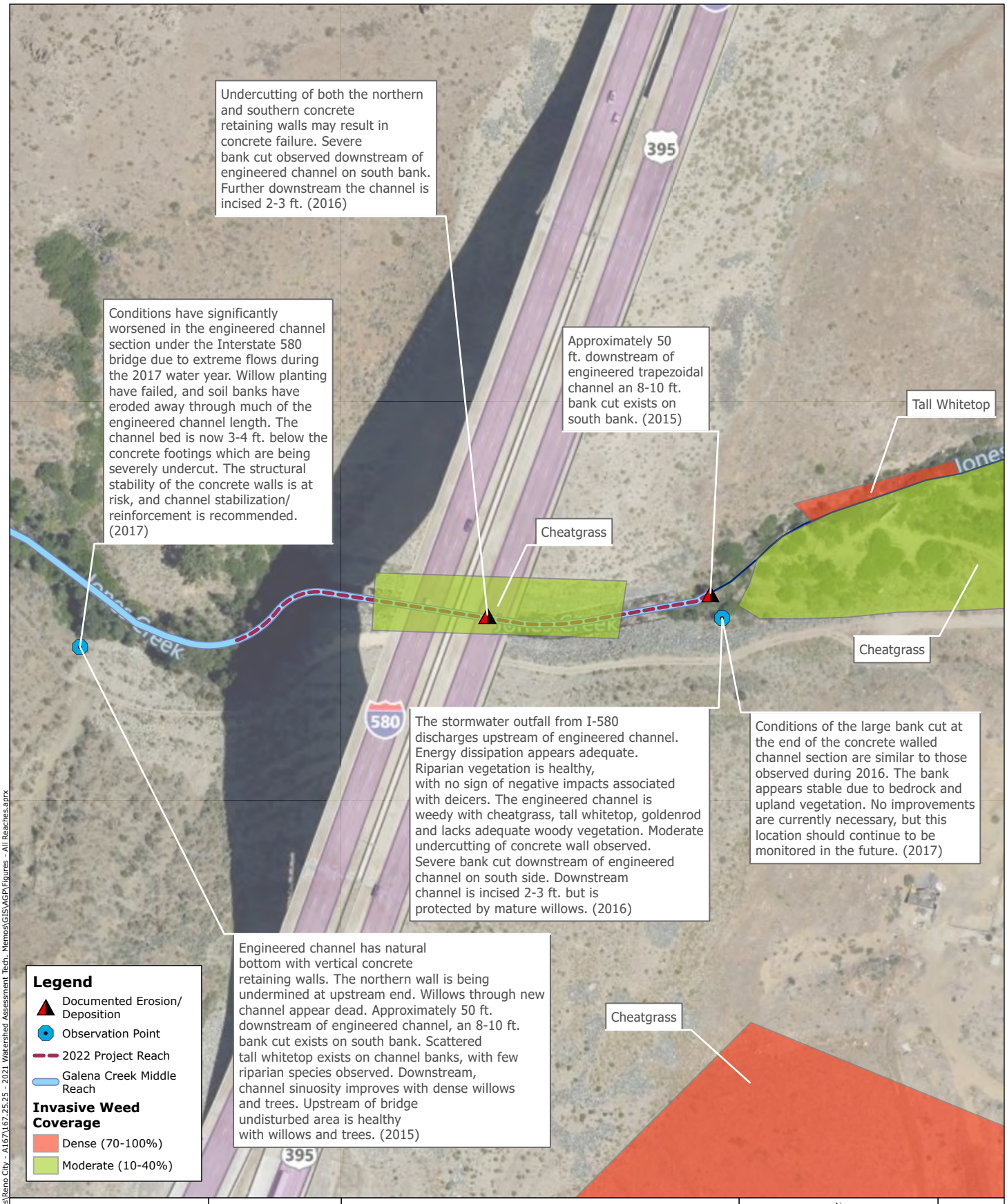
NCE	GALENA CREEK AT I-580 BRIDGE Project Reach Overview	N 1 in. = 1,200 ft. 0 600 1,200 ft.				FIGURE 1
SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED	
Bing Hybrid Basemap	167.25.25	skobs/sdavenport	6/14/2022	6/28/2022	dlemke	



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GALENA CREEK AT I-580 BRIDGE

Historic Observations (2015, 2016, & 2017)

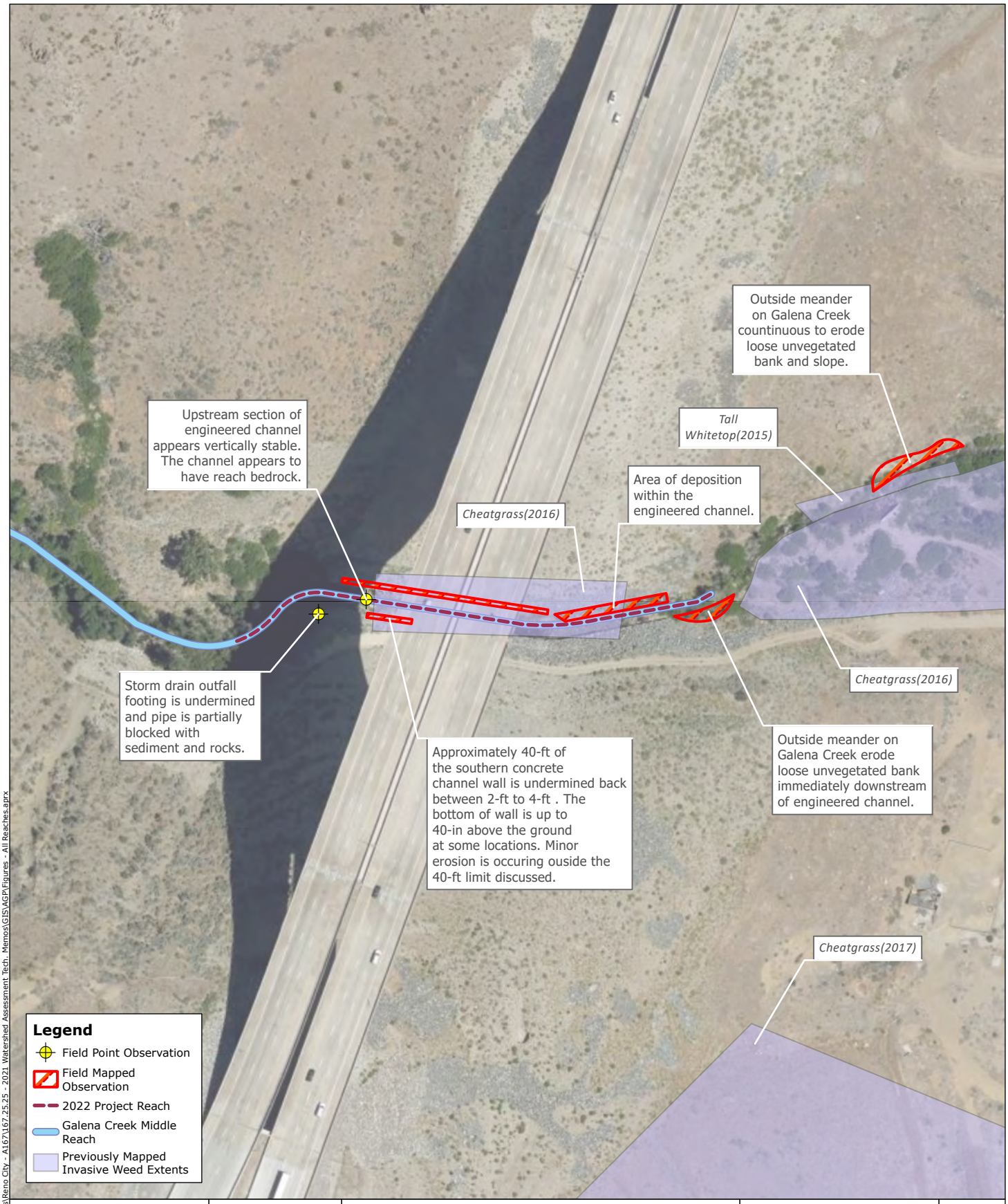
N

1 in. = 150 ft.

0 50 100 150 ft.

FIGURE 2

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Hybrid Basemap; CDM Smith 2015-2017; TMSWPCC	167.25.25	skobs/cvaz	6/17/2022	6/28/2022	dlemke



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GALENA CREEK AT I-580 BRIDGE

Field Observations (2022)

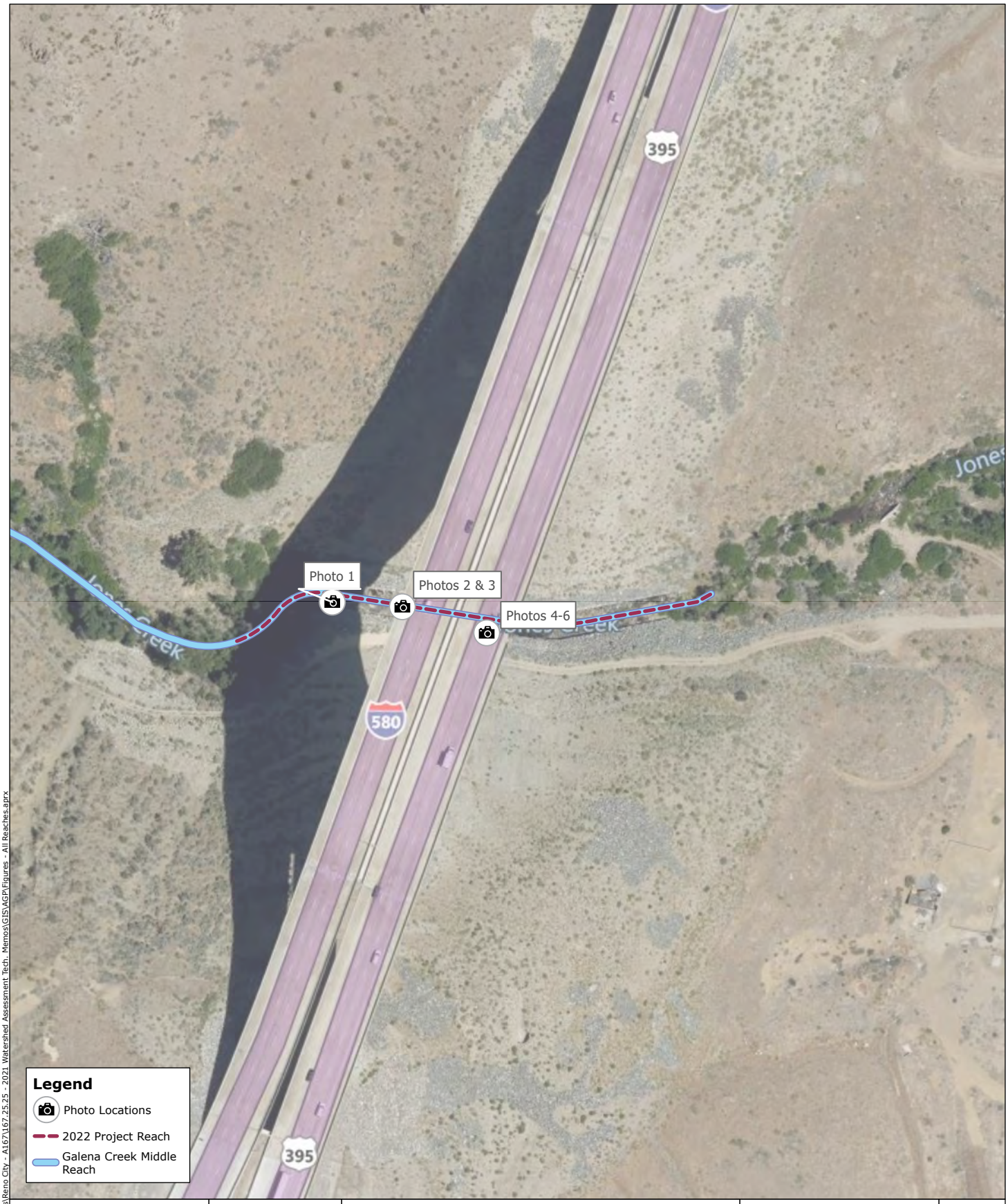
N

1 in. = 150 ft.

0 50 100 150 ft.

FIGURE 3

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Aerial Basemap; CDM Smith 2015-2017; TMSWPCC	167.25.25	skobs/cvaz	6/17/2022	6/24/2022	dlemke



GALENA CREEK AT I-580 BRIDGE

Photo Locations

N

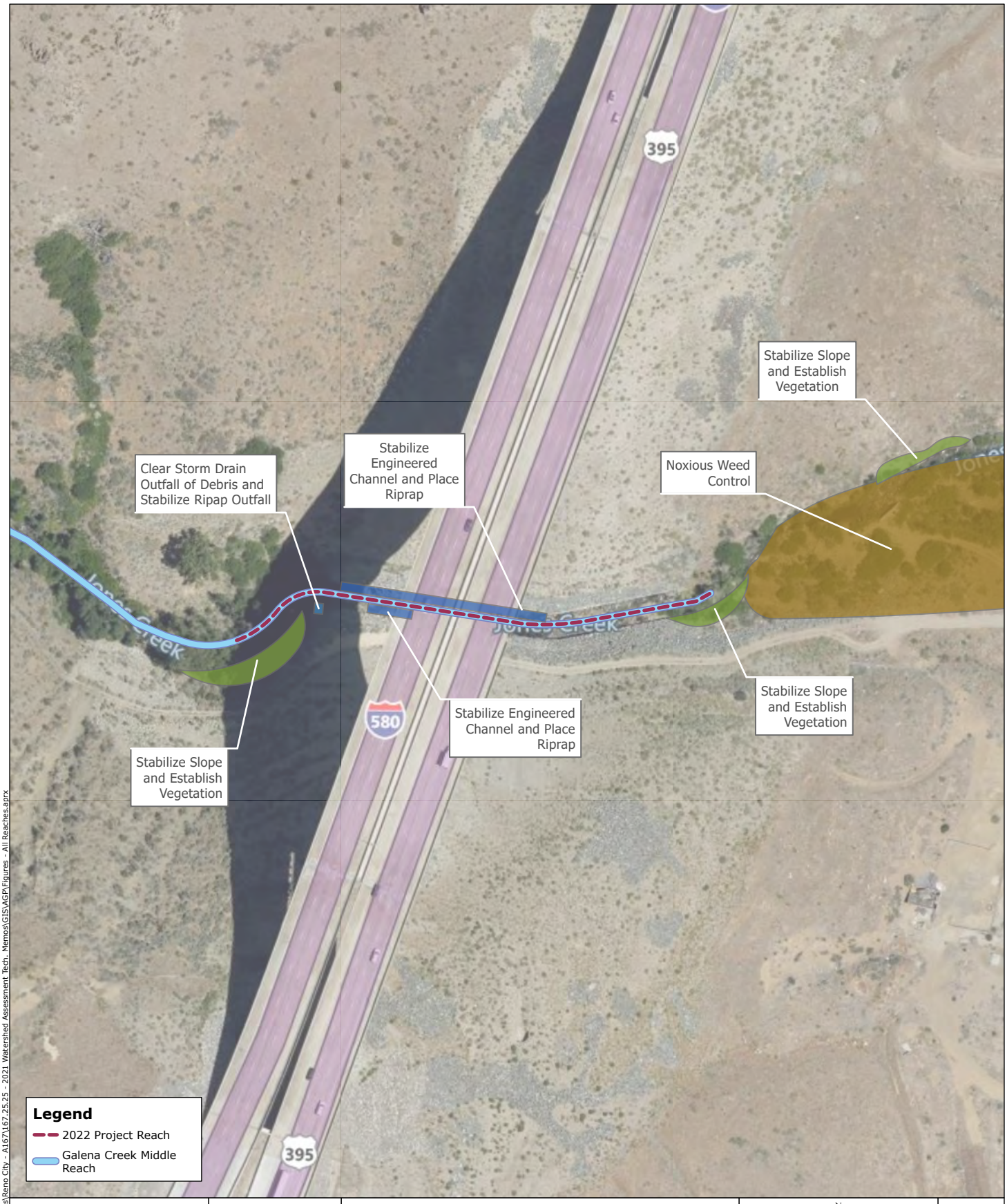
1 in. = 150 ft.

0 50 100 150 ft.

FIGURE 4

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Hybrid Basemap	167.25.25	skobs/cvaz	6/6/2022	6/24/2022	dlemke

Document Path: P:\Active Projects\Reno City - A167\167.25.25 - 2021 Watershed Assessment Tech. Memos\GIS\AGP\Figures - All Reaches.aprx



GALENA CREEK AT I-580 BRIDGE

Improvement Concepts

N

1 in. = 150 ft.

0 75 150 ft.

FIGURE 5

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Hybrid Basemap	167.25.25	skobs/cvaz	6/16/2022	6/28/2022	dlemke

Document Path: P:\Active Projects\Reno City - A167\167.25.25 - 2021 Watershed Assessment Tech. Memos\GIS\AGP\Figures - All Reaches.aprx

Appendix B

TRIBUTARY PROJECT LIST

Appendix B - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

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Appendix C

Representative Photographs

Photo 1. An upstream storm drain outfall is blocked with debris and rocks. The outfall footing is being undermined.

Photo 2. Galena Creek looking upstream in the section of engineered channel under the I-580 bridge. The concrete walls are undermined and stand 4 feet tall. It was estimated that the northern wall (right) has been undermined between 4 and 8 feet from the front face and is suspended up to 6 feet above the existing channel bottom. Access along the way was limited, and observations were made from the southern bank.

Photo 3. Galena Creek looking downstream in the section of engineered channel under the I-580 bridge. Galena Creek is actively migrating laterally within the section of engineered channel and eroding under the concrete walls on both banks.

Photo 4. Looking upstream from outside the engineered channel.

Photo 5. Looking north at the engineered channel.

Photo 6. Looking downstream from outside the engineered channel.

MEMORANDUM

Date:	June 30, 2022
To:	Theresa Jones, City of Reno
From:	Debra Lemke, Scott Kobs, and Sarah Davenport, NCE
Subject:	2022 Jones Creek Callahan Ranch Road Project Reach Assessment Draft Memorandum

This technical memorandum presents mapped field data, field observations, and preliminary recommendations for restoration and improvement projects along Jones Creek within the project reach between Callahan Ranch Road to Galena Creek (**Appendix A, Figure 1**). The project reach was selected based on a review of the *2020 Watershed Management and Protection Plan for Tributaries to the Truckee River* (2020 Plan) (NCE, 2020) Tributary Project list; this project list was developed in coordination with the Truckee Meadows Stormwater Permit Coordinating Committee as potential projects that may be submitted for 319(h) funding (**Appendix B, Project Count #12**). In addition, Jones Creek has been assessed under previous watershed assessments for tributaries of the Truckee River.

BACKGROUND

Beginning in 2003, watershed assessments have been performed along tributaries of the Truckee River throughout the Truckee Meadows. The tributary assessments were prepared using the Proper Functioning Condition (PFC) methodology presented in the U.S. Department of the Interior Bureau of Land Management document titled Riparian Area Management, A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas (BLM, 1998). This methodology evaluates hydrology, vegetation, erosion, and/or deposition to determine the functional rating of the evaluated reach. Tributaries were divided into established reaches and have been assessed on a rotating basis since 2003.

The project reach for the 2022 effort represents a 1,700-foot section of the larger 3,925-foot Jones Creek Lower Reach (**Appendix A, Figure 1**). The Jones Creek Lower Reach was last assessed in 2015 and was given a PFC rating of nonfunctional. The Lower Reach includes the following previously documented issues within the 2022 project reach (**Appendix A, Figure 2**):

- The channel downstream of Callahan Ranch Road to the confluence with Galena Creek is incised between 5 to 6 feet
- Significant bank cutting has been observed throughout the creek, where slopes are unprotected. In unprotected areas, steep banks are eroding and there is widening of the channel and floodplain
- The channel alignment, banks, and floodplain are moderately weedy

- There is noxious weed presence of knapweed (Centaurea spp.), curly dock (*Rumex crispus*), tall whitetop (*Lepidium latifolium*), and thistle

The 2022 project reach was selected due to the documented channel incision and the presence of noxious weeds.

2022 Project Reach Assessment

Jones Creek was only observed from Callahan Ranch Road because access was not secured with the private landowners and the project reach is fully on private property. In total, there are three private parcels located on the south side of Jones Creek and nine private parcels on the north side. Due to limited access, PFC was not conducted for the 2022 project reach. Representative photographs were taken, and observation points were recorded from Callahan Ranch Road.

The project reach assessment was conducted on March 22, 2022. Overall, the project reach remains nonfunctional as previously documented issues persist. Downstream of Callahan Ranch Road the channel banks remain near vertical, between 5 to 7 feet high. The severely incised channel remains disconnected from the historic floodplain.

Upstream of Callahan Ranch Road the channel runs parallel to the road in a straightened channel before flowing into two culverts under Callahan Ranch Road. The channel runs perpendicular to the culvert crossings. A 36-inch by 54-inch corrugated metal pipe (CMP) arch conveys low flows, and a secondary 36-inch diameter concrete pipe conveys high flows. The inverts of the 36-inch pipe are set above the CMP arch. There is a 32-inch vertical drop from the outfall of the CMP culvert to the flowline of Jones Creek. The outfall appears stable with large boulders.

In addition, some stream banks visible from the road lacked riparian vegetation.

Field observations are presented in **Appendix A, Figure 3**. Representative photos are located in **Appendix C,** and the photo locations are depicted on **Appendix A, Figure 4.**

Due to a lack of access, a desktop review was conducted and is presented below.

Desktop Review

A high-level desktop review of available aerial imagery was competed due to the lack of access during the 2022 site visit. The 2022 project reach is located completely within private property. The desktop review complements field observations that were made from public right-of-way and previously completed assessments.

Significant lateral migration of Jones Creek can be seen within the aerial imagery historical record. Four snapshots taken from Google Earth above the confluence with Galena Creek show the channel evolution from June 2016 to November 2018, see below. The largest change can be seen on the below images between the June 2018 and November 2018 dates. On July 20, 2018, 1.29 inches of precipitation was recorded at the Reno-Tahoe Airport. This was the largest event recorded between June 2018 and November 2018. Looking at one section of bank (indicated within the red oval on the November 2018 image) approximately 150 square feet of bank was eroded and assuming a bank height of 5 to 7

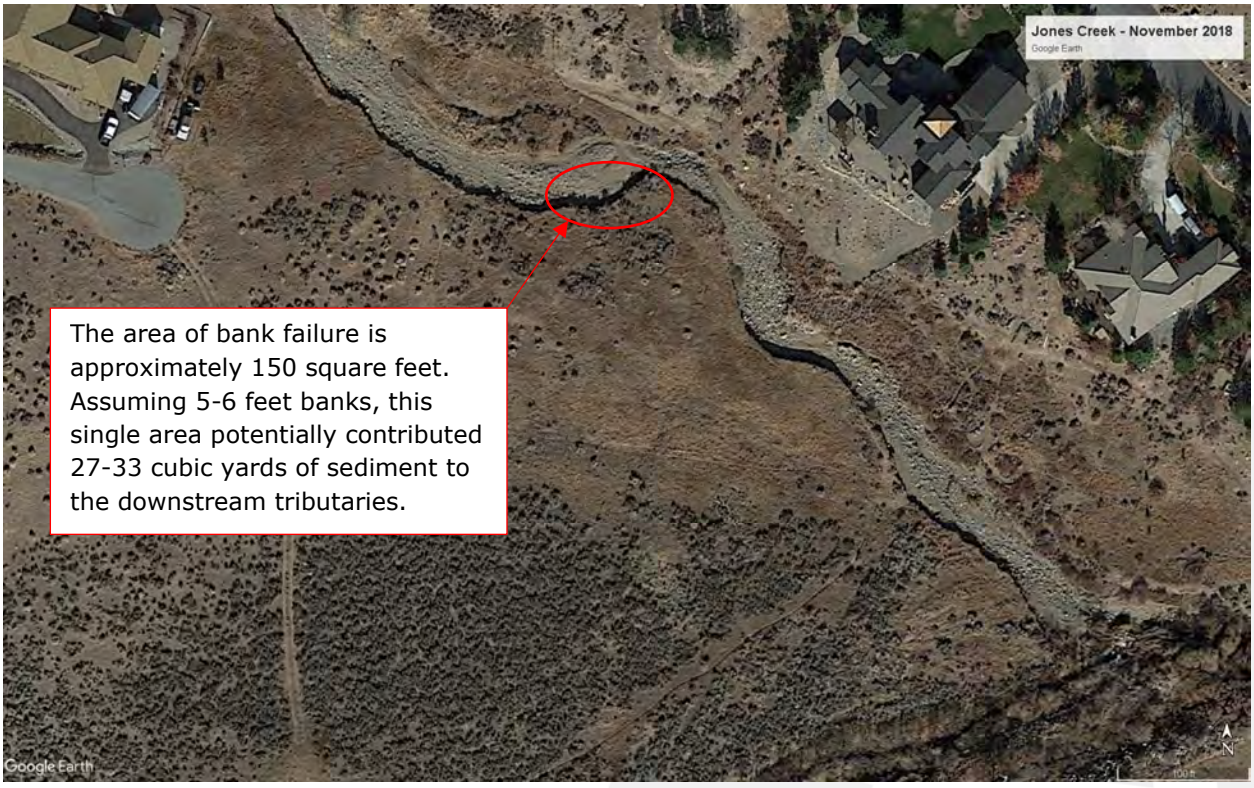
feet, a range based on previous tributary assessments, between 30 to 40 cubic yards of sediment were potentially pushed through the downstream tributaries.

No headcuts were documented during the previous 2015 tributary assessment. These observations suggest the reach is vertically stable from the confluence of Galena Creek to Callahan Ranch Road. However, during large events lateral migration of the channel and widening of the new lower floodplain occurs. It is expected that these changes will persist until an adequately sized accessible lower floodplain is established within the incised channel. The channel has become disconnected from the historic floodplain and will continue to form a new lower floodplain within the channel. Future peak flows and large precipitation events will continue to shape this channel and new lower floodplain.


Jones Creek - June 2016
Google Earth
Google Earth
N


Jones Creek - August 2017
Google Earth
Google Earth
N


Jones Creek - June 2018
Google Earth
Google Earth
N


Jones Creek - November 2018
Google Earth
The area of bank failure is approximately 150 square feet. Assuming 5-6 feet banks, this single area potentially contributed 27-33 cubic yards of sediment to the downstream tributaries.
Google Earth
N

PRELIMINARY RECOMMENDATIONS

Based on the field work and desktop review accomplished for the 2022 project reach assessment, below are preliminary recommendations to stabilize this portion of Jones Creek. Specifically, these preliminary recommendations have the potential to reduce creek velocities and lateral migration of the channel as well as reducing erosion and downstream sediment loading. These preliminary recommendations are also depicted on **Appendix A, Figure 5**:

- Establish riparian vegetation on unvegetated banks and within the newly formed lower floodplain
- Alternatively, existing banks could be regraded and the channel widened prior to establishing vegetation within the reach

Any improvements along the channel would require coordination with the 13 private property owners.

Table 1 presents a concept level cost estimate for each of the preliminary recommendations. These concept-level costs were prepared using professional engineering judgement and GIS to estimate quantities.

Table 1. Concept Level Cost Estimate

	CONSTRUCTION COST ESTIMATE			
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Base Item				
Revegetate Lower Floodplain Meanders (Riparian)	LF	1,700	$10.00	$17,000.00
SUBTOTAL				$17,000.00
Alternative 1 - Regrade Cut Banks & Revegetate				
Grading (Regrade Vertical Banks)	CY	5,700	$25.00	$142,500.00
Slope Stabilization & Revegetation Outside of Floodplain (Upland)	SY	6,200	$15.00	$93,000.00
SUBTOTAL				$235,500.00
Totals			**Base Items**	**Base + Alt 1**
SUBTOTAL			$17,000.00	$235,500.00
General Conditions (e.g., Mobilization/Demobilization/Other)		15%	$2,600.00	$35,400.00
Construction Contingency		30%	$5,100.00	$70,700.00
Price Contingency / Inflation		25%	$4,300.00	$58,900.00
Construction Subtotal			$29,000.00	$400,500.00
Technical Studies, Planning, Design, Permitting, CM		30%	$8,700.00	$120,200.00
		PROJECT TOTAL	**$37,700.00**	**$520,700.00**

Notes:

CY = Cubic Yard, LF = Linear Feet, SY = Square Yard

Alt 1 Assumptions: Riparian vegetation will occur within existing channel along the outside edge of meanders

Alt 2 Assumptions: Grading quantity assume average channel incision of 5.5-ft and target side slope of 3:1 for both left and right bank

A project reach of 1,700-ft was used for estimating quantities

Assume riparian planting areas does not require import of materials such as large cobble / rocks

The 2020 Plan provides the process and framework to propose projects to the Nevada Division of Environmental Protection for 319(h) funding. To support the 319(h) application, a Tributary Project Template was developed (Appendix C of the 2020 Plan) and is further explained in Section 8.0 of the 2020 Plan. This memorandum will support the Washoe County's development of a project for 319(h) funding and support completion of the Tributary Project Template. To find out more information on 319(h) funding please also see NDEP's 319(h) webpage (https://ndep.nv.gov/water/rivers-streams-lakes/nonpoint-source-pollution-management-program/cwa-319h-grants).

Appendix A:

- Figure 1: Project Reach Overview
- Figure 2: Historic Observations (2015)
- Figure 3: Field Observations (2022)
- Figure 4: Photo Locations
- Figure 5: Improvement Concepts

Appendix B: Tributary Project list

Appendix C: Representative Photographs

Appendix A

FIGURE 1: PROJECT REACH OVERVIEW
FIGURE 2: HISTORIC OBSERVATIONS (2015)
FIGURE 3: FIELD OBSERVATIONS (2022)
FIGURE 4: PHOTO LOCATIONS
FIGURE 5: IMPROVEMENT CONCEPTS

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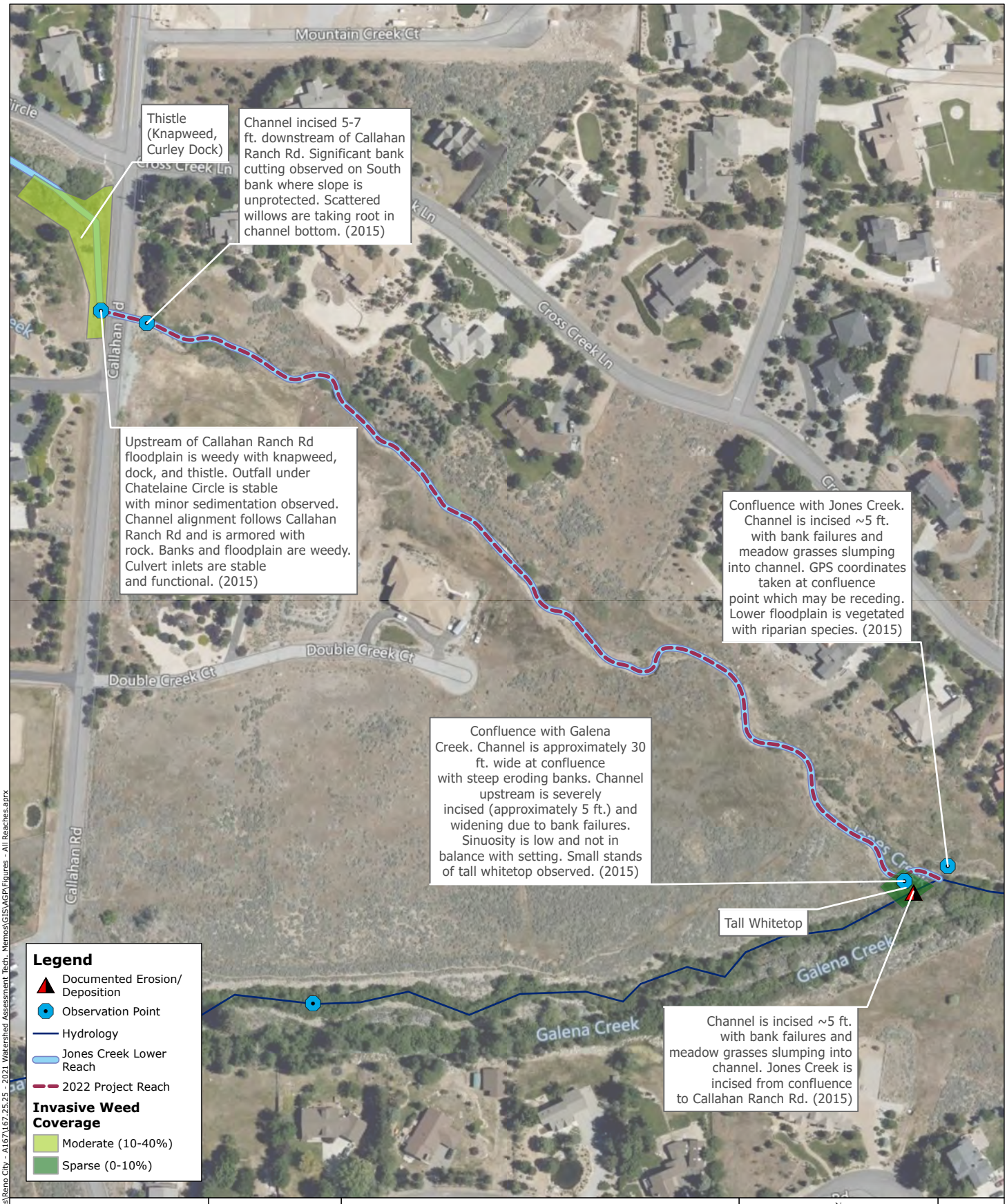
	JONES CREEK Project Reach Overview	N 1 in. = 500 ft. 0 250 500 ft.	FIGURE 1			
SOURCE Bing Hybrid Basemap	JOB NUMBER 167.25.25	DRAWN skobs/sdavenport	DATE 6/14/2022	REVISED 6/29/2022	APPROVED dlemke	



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JONES CREEK

Historic Observations (2015)

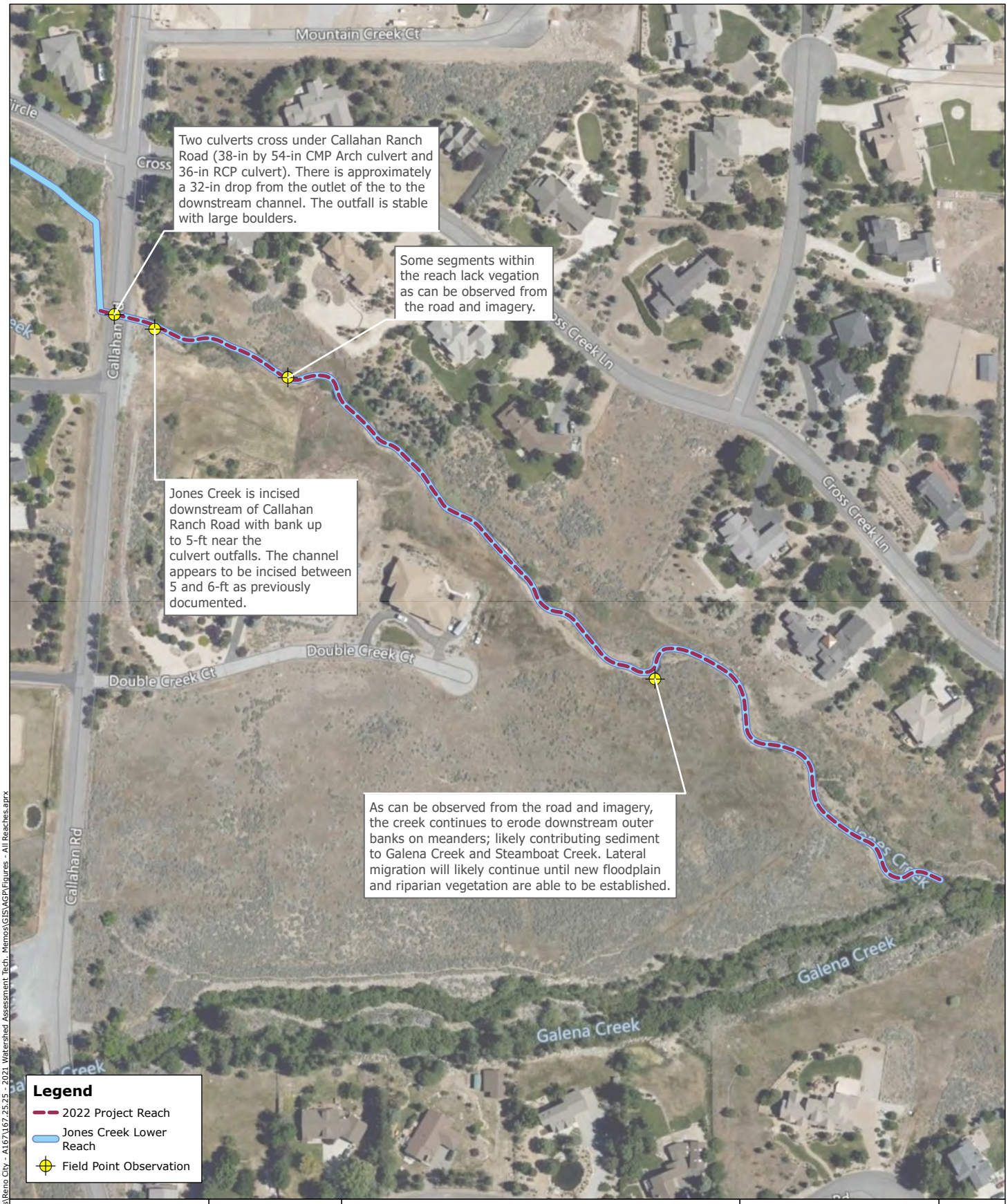
N

1 in. = 200 ft.

0 100 200 ft.

FIGURE 2

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Hybrid Basemap; CDM Smith 2015; TMSWPCC	167.25.25	skobs	6/14/2022	6/29/2022	dlemke



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JONES CREEK

Field Observations (2022)

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0 100 200 ft.

FIGURE 3

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Aerial Basemap	167.25.25	skobs/cvaz	6/14/2022	6/29/2022	dlemke

Document Path: P:\Active Projects\Reno City - A167\167.25.25 - 2021 Watershed Assessment Tech. Memos\GIS\AGP\Figures - All Reaches.aprx

	JONES CREEK Photo Locations	N 1 in. = 200 ft. 0 100 200 ft.	FIGURE 4			
SOURCE Bing Aerial Basemap	JOB NUMBER 167.25.25	DRAWN skobs/sdavenport	DATE 6/6/2022	REVISED 6/29/2022	APPROVED dlemke	

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Appendix B

Tributary Project List

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Appendix C

Representative Photographs

Photo 1. Upstream of Callahan Ranch Road, Jones Creek runs parallel to the road. The channel is lined with large cobble and check dams are present.

Photo 2. A 38-inch by 54-inch arch corrugated metal pipe (CMP) and 36-inch concrete culvert convey flow under Callahan Ranch Road. The CMP culvert inverts are set below the concrete culvert and convey low flows.

Photo 3. Looking downstream from Callahan Ranch Road. Willows are present on the left bank. The right bank is eroding and is approximately 5-feet tall.

MEMORANDUM

Date:	June 30, 2022
To:	Theresa Jones, City of Reno
From:	Debra Lemke, Scott Kobs, and Sarah Davenport, NCE
Subject:	2022 North Truckee Drain Spanish Springs Dam to Disc Drive Project Reach Assessment Draft Memorandum

This technical memorandum presents mapped field data, field observations, and recommendations for restoration and improvement projects along the North Truckee Drain within the project reach between Spanish Springs Dam and Disc Drive (**Appendix A, Figure 1**). The project reach was selected based on a review of the *2020 Watershed Management and Protection Plan for Tributaries to the Truckee River* (2020 Plan) (NCE, 2020) Tributary Project list; this project list was developed in coordination with the Truckee Meadows Stormwater Permit Coordinating Committee as potential projects that may be submitted for 319(h) funding (**Appendix B, Project Count #8**). In addition, the North Truckee Drain has been assessed under previous watershed assessments for tributaries of the Truckee River.

BACKGROUND

Beginning in 2003, watershed assessments have been performed along tributaries of the Truckee River throughout the Truckee Meadows. The tributary assessments were prepared using the Proper Functioning Condition (PFC) methodology presented in the U.S. Department of the Interior Bureau of Land Management document titled *Riparian Area Management, A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas* (BLM, 1998). This methodology evaluates hydrology, vegetation, erosion, and/or deposition to determine the functional rating of the evaluated reach. Tributaries were divided into established reaches and have been assessed on a rotating basis since 2003.

The project reach for the 2022 effort represents a 10,185-foot section of the North Truckee Drain (**Appendix A, Figure 1**). The project reach is split across the North Truckee Drain Upper (A) Reach and Middle (B) Reach. Approximately 6,105-feet of the larger 14,860-foot Upper (A) Reach and 4,080-feet of the larger 7,195-foot Middle (B) Reach were assessed. The Upper (A) Reach was last assessed in 2015 and the Lower (B) Reach was last assessed in 2016. Both reaches were given a PFC rating of functional-at-risk. The two reaches include the following previously documented issues within the 2022 project reach (**Appendix A, Figures 2A and 2B**):

- Presence of noxious weeds were documented including tall whitetop (*Lepidium latifolium*), cheatgrass (*Bromus tectorum*), salt cedar (*Tamarix* sp.), purple loosestrife (*Lythrum salicaria*), Russian thistle (*Salsola tragus*), Russian olive (*Elaeagnus angustifolia*), and smotherweed (*Bassia* sp.)
- Erosion areas with loose, unvegetated soil and aggregate base

The 2022 project reach was selected due to the presence of non-native vegetation.

2022 Project Reach Assessment

The PFC methodology was used to evaluate hydrology, vegetation, and erosion/deposition within the project reach to maintain consistency with previous assessment efforts. In addition, representative photographs were taken, and observation points were recorded.

The project reach assessment was conducted on March 1, 2022. Overall, the project reach remains functional-at-risk as previously documented noxious weed issues persist. In general, the constructed channel appears to be in balance with its setting.

Noxious weeds still dominate a significant portion of the channel throughout the project reach. In two locations previously unmapped purple loosestrife infestations were documented. Continued expansion of the purple loosestrife will continue to dominate the reach and outcompete native vegetation. In some areas (**Appendix C, Photo 6**) mowing/cutting serves as weed control. Only new noxious weed infestations were mapped. Existing infestations and mapping were used to determine where areas of potential expansion of invasives are occurring.

Previously documented unvegetated areas with loose soil persist. Smotherweed was not observed in these areas likely due to the season that the assessment was completed.

Stockpiles of loose soil and yard debris were observed along the channel edge along the Kiley Ranch Golf Course (**Appendix C, Photo 3**).

Field observations and mapped areas are presented in **Appendix A, Figures 3A and 3B**. Representative photos are located in **Appendix C**, and the photo locations are depicted on **Appendix A, Figure 4**.

Recommendations

Based on the field work accomplished during the 2022 project reach assessment, below are recommendations for this reach of the North Truckee Drain. Specifically, these recommendations will increase vegetation complexity through noxious weed control and limit potential point source sediment and nutrient loading issues:

- Implement noxious weed control
- Public outreach and education / best management practices implementation at Kiley Ranch Golf Course

Table 1 presents a concept level cost estimate for each of the recommendations. These concept-level costs were prepared using professional engineering judgement and GIS to estimate quantities.

Table 1. Concept Level Cost Estimate

Item	COST ESTIMATE			
	Unit	**Quantity**	**Unit Cost**	**Total**
Noxious Weed Control (3x Years)	AC	15	$3,000.00	$45,000.00
SUBTOTAL				$45,000.00
Total				
SUBTOTAL				$45,000.00
General Conditions (e.g., Mobilization/Demobilization/Other)			15%	$6,800.00
Construction Contingency			30%	$13,500.00
Price Contingency / Inflation			25%	$11,300.00
Construction Subtotal				$76,600.00
Contractor Coordination and Management			15%	$3,400.00
			PROJECT TOTAL	**$80,000.00**

Note: AC = Acre

The 2020 Plan provides the process and framework to propose projects to the Nevada Division of Environmental Protection for 319(h) funding. To support the 319(h) application, a Tributary Project Template was developed (Appendix C of the 2020 Plan) and is further explained in Section 8.0 of the 2020 Plan. This memorandum will support the City of Spark's development of a project for 319(h) funding and support completion of the Tributary Project Template. To find out more information on 319(h) funding please also see NDEP's 319(h) webpage (https://ndep.nv.gov/water/rivers-streams-lakes/nonpoint-source-pollution-management-program/cwa-319h-grants).

Appendix A:

Figure 1: Project Reach Overview

Figure 2A: Historic Observations Upper (A) Reach (2016)

Figure 2B: Historic Observations Middle (B) Reach (2015)

Figure 3A: Field Observations Upper (A) Reach (2022)

Figure 3B: Field Observations Middle (B) Reach (2022)

Figure 4: Photo Locations

Appendix B: Tributary Project list

Appendix C: Representative Photographs

Appendix A

FIGURE 1: PROJECT REACH OVERVIEW

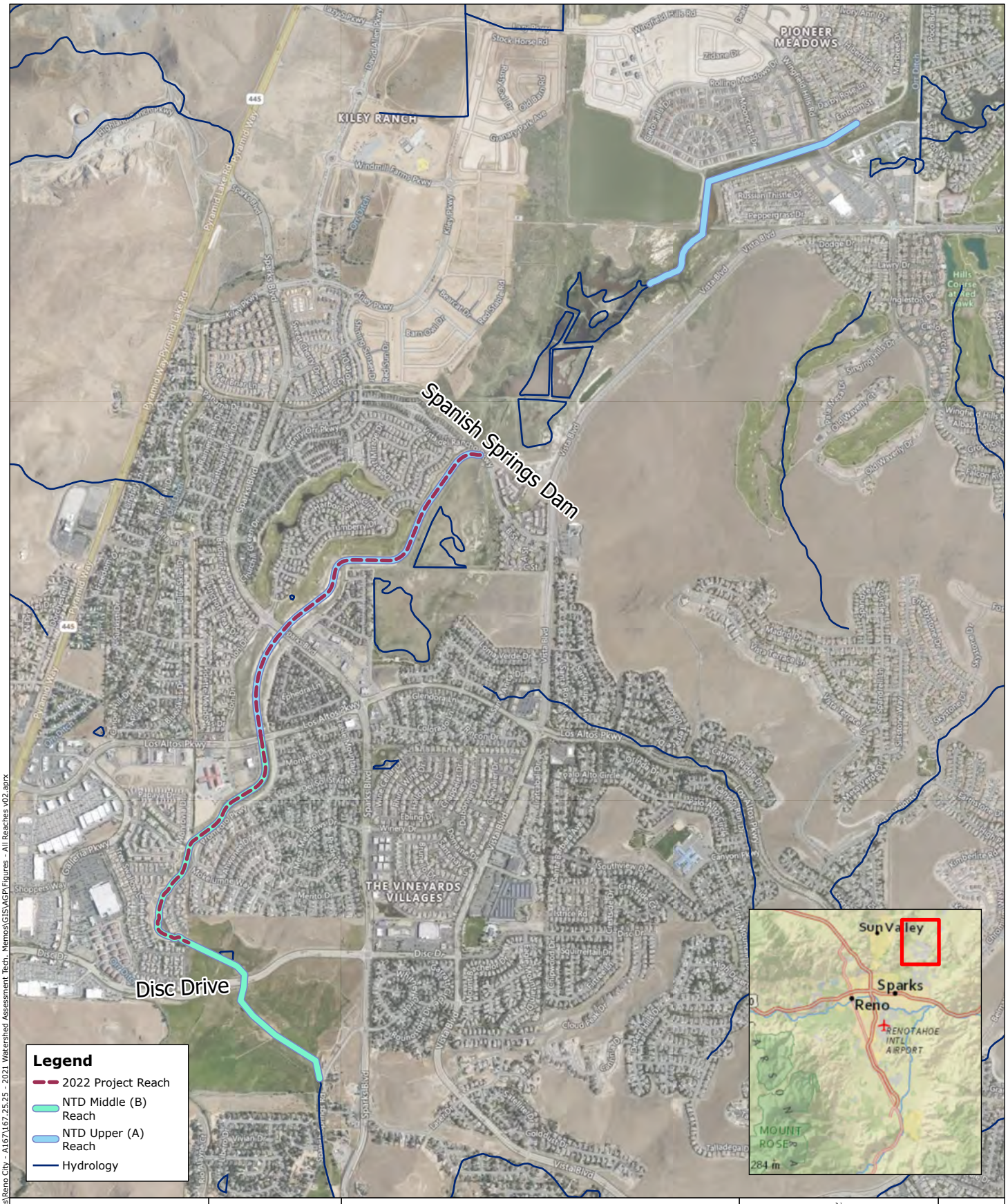
FIGURE 2A: HISTORIC OBSERVATIONS UPPER (A) REACH (2016)

FIGURE 2B: HISTORIC OBSERVATIONS MIDDLE (B) REACH (2015)

FIGURE 3A: FIELD OBSERVATIONS UPPER (A) REACH (2022)

FIGURE 3B: FIELD OBSERVATIONS MIDDLE (B) REACH (2022)

FIGURE 4: PHOTO LOCATIONS



NORTH TRUCKEE DRAIN (NTD)

Project Reach Overview

N

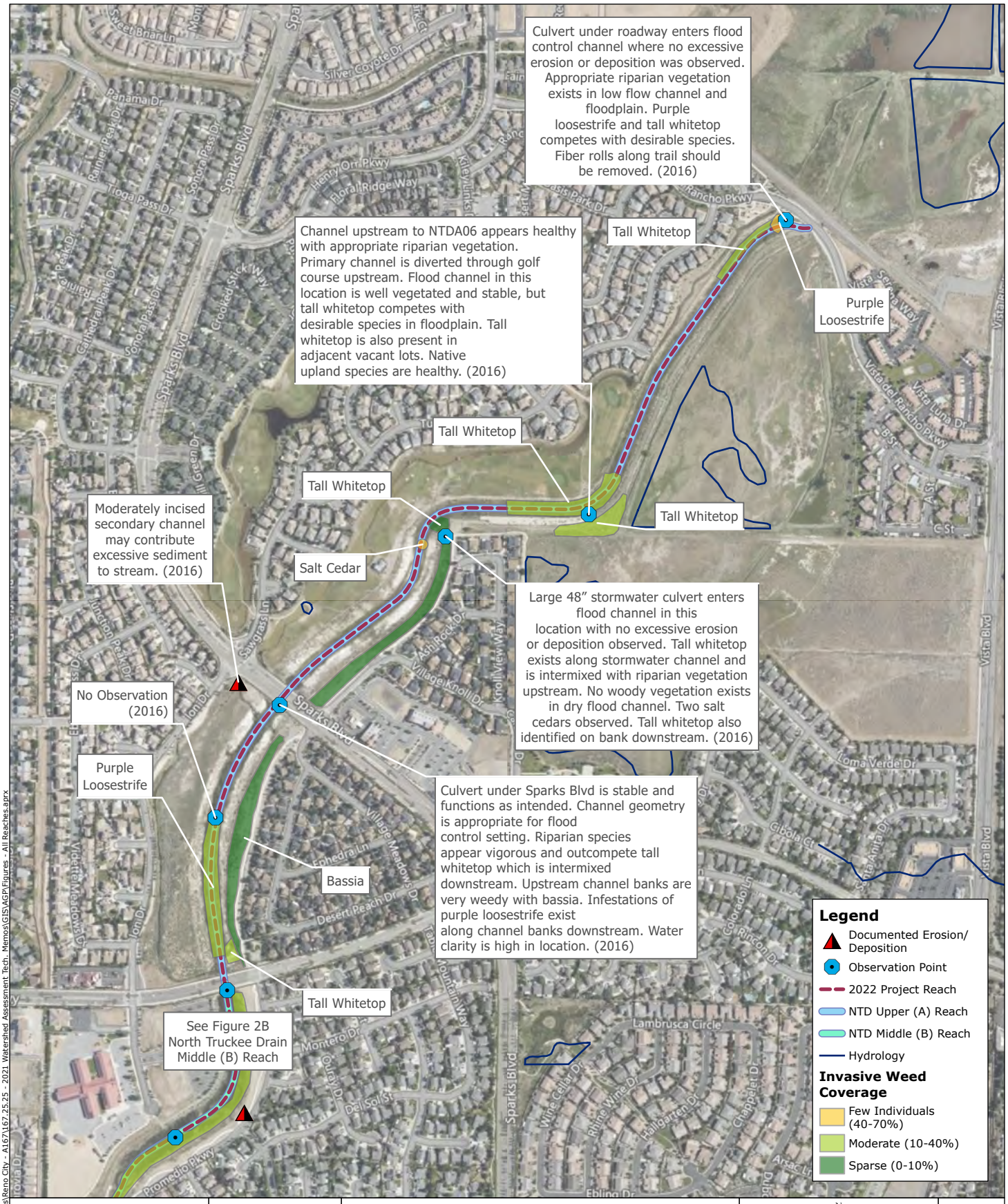
1 in. = 2,000 ft.

0 1,000 2,000 ft.

FIGURE 1

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Hybrid Basemap	167.25.25	skobs/sdavenport	6/14/2022	6/28/2022	dlemke

Document Path: P:\Active Projects\Reno City - A167\167.25.25 - 2021 Watershed Assessment Tech. Memos\GIS\AGP\Figures - All Reaches v02.aprx



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NORTH TRUCKEE DRAIN

Historic Observations Upper (A) Reach (2016)

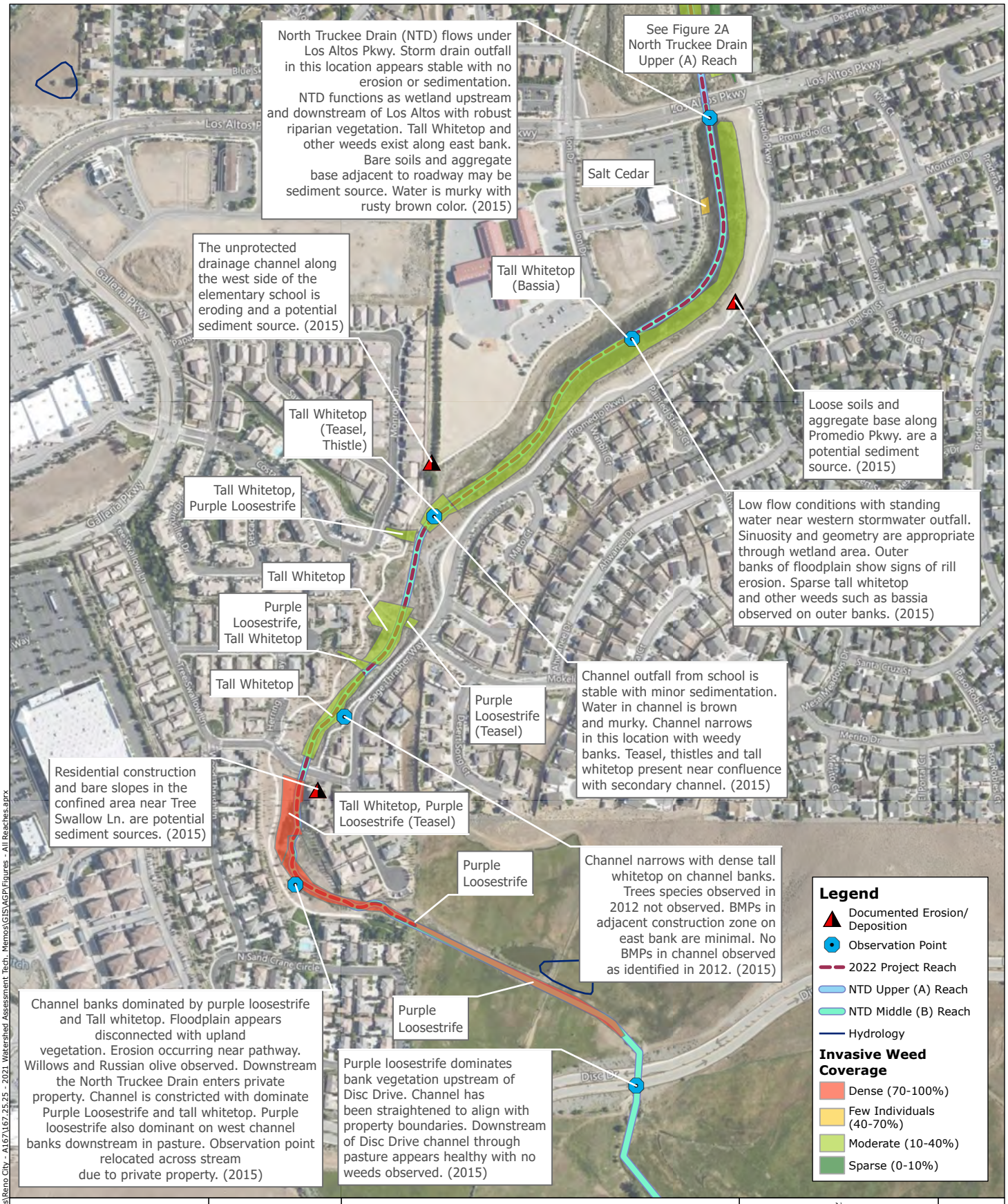
N

1 in. = 750 ft.

0 375 750 ft.

FIGURE 2A

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Aerial Basemap	167.25.25	skobs/sdavenport	6/14/2022	6/28/2022	dlemke



NORTH TRUCKEE DRAIN

Historic Observations Middle (B) Reach (2015)

N

1 in. = 500 ft.

0 250 500 ft.

FIGURE 2B

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Hybrid Basemap; CDM Smith 2015; TMSWPCC	167.25.25	skobs/sdavenport	6/14/2022	6/28/2022	dlemke

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NORTH TRUCKEE DRAIN

Field Observations Upper (A) Reach (2022)

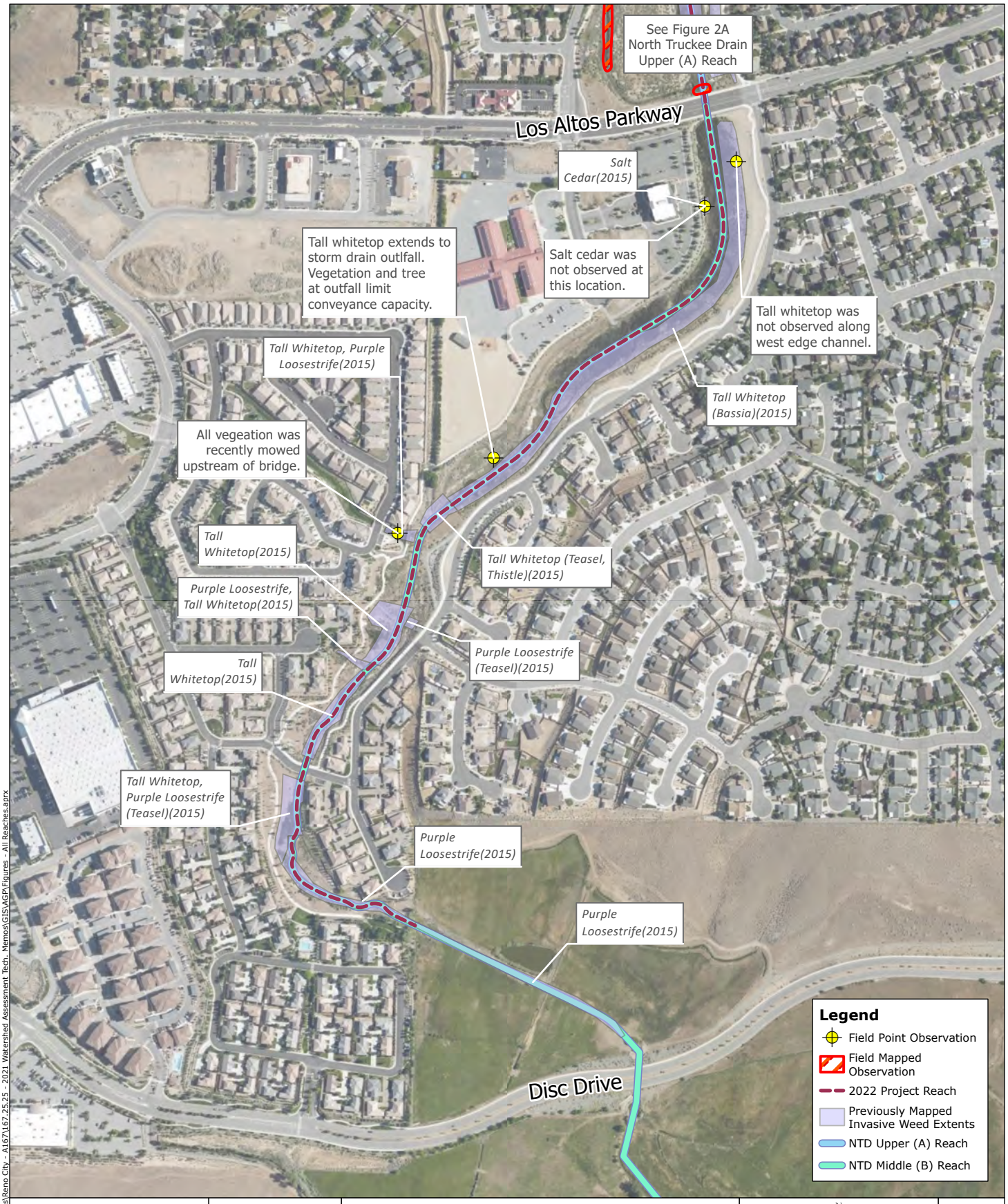
N

1 in. = 750 ft.

0 250 500 750 ft.

FIGURE 3A

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Aerial Basemap; CDM Smith 2016; TMSWPCC	167.25.25	skobs/sdavenport	6/17/2022	6/24/2022	dlemke



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NORTH TRUCKEE DRAIN

Field Observations Middle (B) Reach (2022)

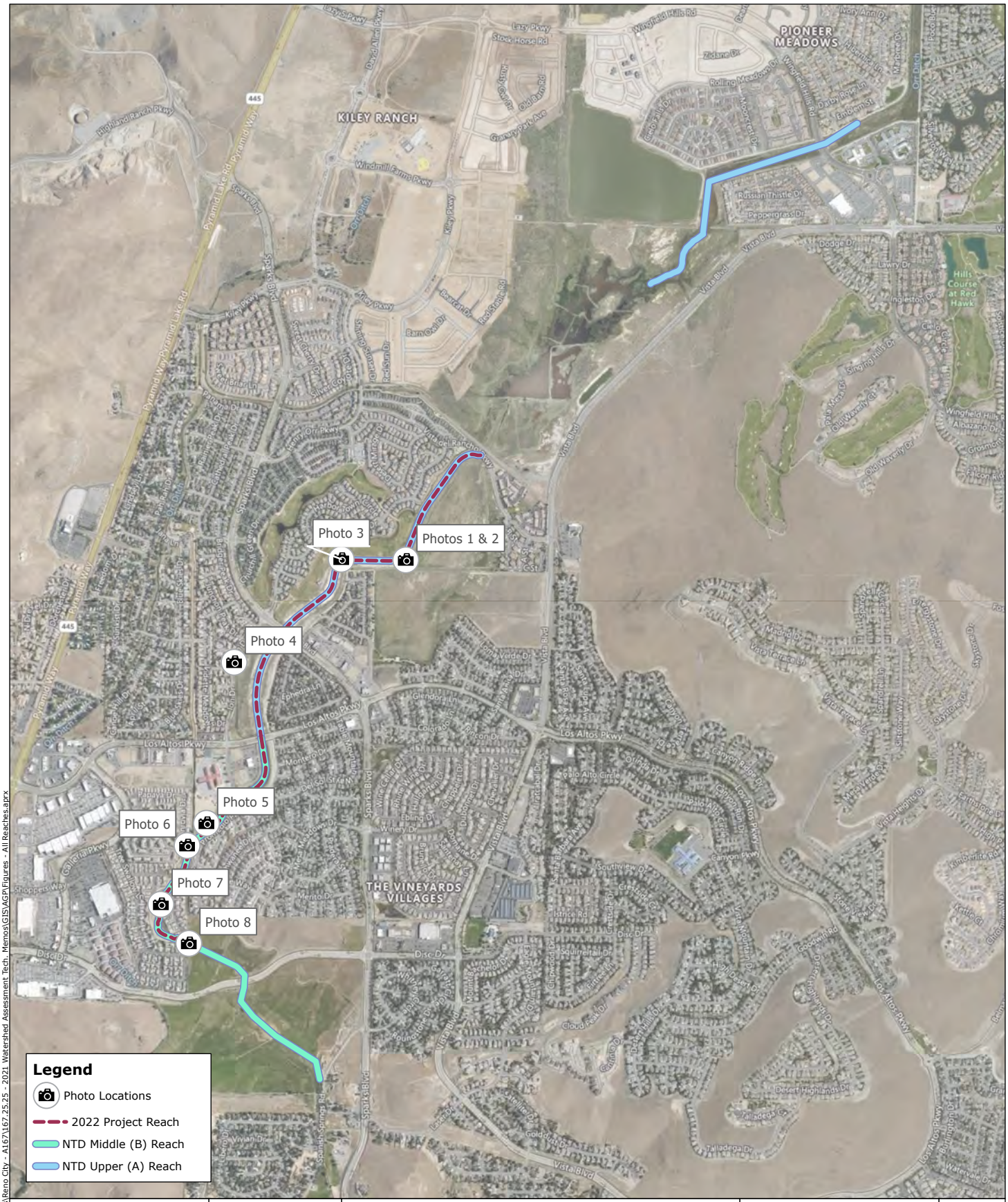
N

1 in. = 500 ft.

0 250 500 ft.

FIGURE 3B

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Aerial Basemap; CDM Smith 2015; TMSWPCC	167.25.25	skobs/sdavenport	6/17/2022	6/28/2022	dlemke



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City of Sparks

RENO

NCE

NORTH TRUCKEE DRAIN

Photo Locations

N

1 in. = 2,000 ft.

0 1,000 2,000 ft.

FIGURE 4

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Hybrid Basemap	167.25.25	skobs/sdavenport	6/6/2022	6/28/2022	dlemke

Appendix B

Tributary Project List

Appendix B - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
1	City of Reno	Chalk	Saphire Ridge Way to West 7th Street	Soils and hydromodification has caused severe bank incision, resulting in erosion and sediment loading.	Restore and stabilize channel through erosion and grade control measures.	This is City property. The erosion blanket in place has failed and there is an alternative intake upstream of TMWA Chalk Bluff.	TBD	TBD	Drafted
2	City of Reno	Chalk	Valleywood to Mae Ann	This is a vegetation project with a section devoid of vegetation and subject to erosion.	Remove white top and restore vegetation. A stormwater basin may need to be created. Bank stabilization near multiuse path may be needed.	This is City property. There is an alternative intake upstream of TMWA Chalk Bluff.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
3	City of Reno	Alum	Within Caughlin Ranch HOA Property	Persistent severe incision/erosion is present and lawn landscaping has effected the stream channel.	Restore channel and establish grade controls may be needed.	Most of the restoration is located on a anHOA property. There is potential for a partnership with Nevada Land Trust.	TBD	TBD	Proposed
4	City of Reno	Alum	Chrissie Caughlin Park	Flooding contributes sediment load from upstream and causes erosion though the park. There is a direct connection to Truckee River immediately downstream.	Provide sediment capture and stormwater treatment on City property with the use of a constructed wetland or stormwater basin.	One limitation is that this project likely requires projects to address upstream reaches of Alum Creek before addressing this location.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
5	City of Reno	Weed Mitigation	Areas identified in assessments	Areas of invasive weeds maybe due to reduction of native materials and therefore erosion concern and herbicide use.	Chanel restoration by stabilization materials or revegetation. Volunteer based weed abatement. Adopt a section.	Potential to engage community and partners in community wide effort. Possibilities include weeding day, adopt a reach, and restoration projects.	TBD	TBD	Proposed
6	City of Reno	MS4 Outlet Erosion Mitigation Project	Multiple locations as identified in assessments	Erosion is present at the end of the pipe where the storm drain discharges into each respective tributary.	Rip rap or energy dissipation at multiple outfalls.	This could be a lumped contract with several locations identified for correction.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
7	City of Sparks	North Truckee Drain	Spanish Springs Dam to I-80 box culvert	High flow events have caused erosion and sediment loading throughout the tributary.	Erosion and sediment control improvements are needed as well as a reestablishment of the flowline.	This would be a multiphase project.	TBD	TBD	Proposed
8	City of Sparks	North Truckee Drain	Spanish Springs Dam to I-80 box culvert	Invasive weeds and vegetation are present throughout the tributary.	Weed and vegetation abatement, as well as channel stabilization are needed.	This would be a multiphase project. There is an opportunity for public outreach regarding water quality and education about the tributary and river system.	TBD	TBD	Drafted

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
9	City of Sparks	North Truckee Drain	Baring Drive to Lillard Drive	Sediment and debris impacts from storm drain outfalls are located throughout high density residential areas.	Stormwater treatment devices should be installed at major outfalls.	Project would include establishing a maintenance schedule to inspect and clean the treatment vaults periodically and before storm events.	TBD	TBD	Proposed
10	Washoe County	South Evans	Through Anderson Park, Del Monte Lane to Bonde Lane	Historical hydromodification causes frequent flooding, resulting in erosion and sediment loading.	Restore channel and floodplain through park setting.	The downstream reach was previously restored. Water rights and diversions from the creek could pose potential challenge to this project.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
11	Washoe County	Galena	Lower Reach – I-580 bridge to Steamboat Creek	Erosion, undercutting, noxious weeds, hydromodification, and sediment loading are present along the project site.	Restore reach, channel and floodplain.	There are opportunities for a public/private partnership. This is likely a large, multiphase project.	TBD	TBD	Proposed
12	Washoe County	Jones	Callahan Ranch Road to Galena Creek	Persistent severe incision/erosion are present.	A restoration of the channel and an establishment of grade controls are likely needed.	There are opportunities for a public/private partnership.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
13	Washoe County	Alum	Through Betsy Caughlin Donnelly Park	Flooding contributes sediment loading from upstream and causes erosion through the park. There is also a direct connection to Truckee River immediately downstream.	Controlling upstream sediment and restoring the channel and floodplain through the park setting are likely needed.	It is likely that the upstream reaches of Alum Creek need to be addresed before addressing this location.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
14	Washoe County	Whites	Timberline Drive to Legend Trail	High flows cause erosion and sediment loading in multiple tributary drainages to Whites Creek.	Erosion and sediment control and drainage improvements are likely needed.	Continuing development in this area will likely exacerbate issues. Sediment loading may also have impacts on a new TMWA treatment plant on Whites Creek.	TBD	TBD	Proposed

Appendix C

Representative Photographs

Photo 1. North Truckee Drain looking upstream at POI NTDA06.

Photo 2. North Truckee Drain looking downstream at POI NTDA06. Tall whitetop (*Lepidium latifolium*) dominates the floodplain adjacent to the low flow channel.

Photo 3. Soil and landscaping debris stockpiles along the west bank of the North Truckee Drain.

Photo 4. Looking south along a storm drain channel west of the North Truckee Drain. Tall whitetop (*Lepidium latifolium*) dominates the banks of the storm drain channel.

Photo 5. Overgrown storm drain outfall near Miguel Sepulveda Elementary School.

Photo 6. Drainage channel to the west of the North Truckee Drain was recently cleared. The area was documented to have purple loosestrife (*Lythrum salicaria*) and tall whitetop (*Lepidium latifolium*) in 2015.

Photo 7. Looking downstream from Tree Swallow Lane. Purple loosestrife (*Lythrum salicaria*) dominate both the left and right banks.

Photo 8. North Truckee Drain looking downstream at the pasture at the end of the project reach limits. Purple loosestrife (*Lythrum salicaria*) dominates the bank as observed from the property line.

MEMORANDUM

Date:	June 30, 2022
To:	Theresa Jones, City of Reno
From:	Debra Lemke, Scott Kobs, and Sarah Davenport, NCE
Subject:	2022 South Evans Creek Anderson Park Project Reach Assessment Draft Memorandum

This technical memorandum presents mapped field data, field observations, and preliminary recommendations for restoration and improvement projects along South Evans Creek within the project reach between Del Monte Lane and Bonde Lane (**Appendix A, Figure 1**). The project reach was selected based on a review of the *2020 Watershed Management and Protection Plan for Tributaries to the Truckee River* (2020 Plan) (NCE, 2020) Tributary Project list; this project list was developed in coordination with the Truckee Meadows Stormwater Permit Coordinating Committee as potential projects that may be submitted for 319(h) funding (**Appendix B, Project Count #10**). In addition, South Evans Creek has been assessed under previous watershed assessments for tributaries of the Truckee River.

BACKGROUND

Beginning in 2003, watershed assessments have been performed along tributaries of the Truckee River throughout the Truckee Meadows. The tributary assessments were prepared using the Proper Functioning Condition (PFC) methodology presented in the U.S. Department of the Interior Bureau of Land Management document titled *Riparian Area Management, A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas* (BLM, 1998). This methodology evaluates hydrology, vegetation, erosion/deposition to determine the functional rating of the evaluated reach. Tributaries were divided into established reaches and have been assessed on a rotating basis since 2003.

South Evans Creek is on the 303(d) list of impaired waters. **Table 1** provides the 303(d) water quality impairment, impaired use, and the TMDL priority for South Evans Creek.

Table 1. Section 303(d) Tributary List

Waterbody Name	Size (Miles)	Standard Not Meeting (Impairment)	Impaired Use	TMDL Priority
Evans Creek	0.76	*E. coli* AGM	RWC	Low

AGM = annual geometric mean
RWC = recreation involving contact with water

Source: NDEP, Bureau of Water Quality Planning. *2019. Nevada 2016-2018 Water Quality Integrated Report Assessment Period - October 1, 2009 through September 30, 2016*

The project reach for the 2022 effort represents a 1,192-foot section of the larger 7,170-foot South Evans Middle Reach (**Appendix A, Figure 1**). The South Evans Creek Middle Reach was last assessed in 2015 and was given a PFC rating of functional-at-risk. The Middle Reach includes the following previously documented issues within the 2022 project reach (**Appendix A, Figure 2**):

- Channel incision where South Evans Creek enters Anderson Regional Park
- Bank erosion throughout the upper half of the Washoe County owned pasture
- Presence of noxious weeds such as musk thistle (*Carduus nutans*) and tall whitetop (*Lepidium latifolium*)
- Deteriorating culvert crossing at Bonde Lane and Anderson Regional Park

The 2022 project reach was selected due to the documented channel incision, erosion issues, and the presence of non-native vegetation.

2022 Project Reach Assessment

The PFC methodology was used to evaluate hydrology, vegetation, erosion, and/or deposition within the project reach to maintain consistency with previous assessment efforts. In addition, representative photographs were taken, and observation points were recorded.

The project reach assessment was conducted on February 28, 2022. Overall, the project reach remains functional-at-risk. Previously documented issues persist and overall changes appeared to be limited from the previous assessment, except for a culvert replacement at Bonde Lane.

Within the project reach, lateral migration of the channel into the southern pasture continues. Vertical banks are up to 32-inches tall at some locations. The southern banks are actively being undercut and failing throughout the upper half of the project reach (**Appendix C, Photo 2**).

Vegetation is generally lacking throughout the upper half of the project reach (**Appendix C, Photo 1 and 2**). Willows are observed where South Evans Creek enters Anderson Regional Park (**Appendix C, Photo 3**).

An improvised diversion structure has been constructed approximately halfway through the project reach (**Appendix C, Photo 4**) to force flows southeast through the pasture.

Downstream of the improvised diversion structure flows are dispersed throughout the pasture. The dense vegetation through this lower half is stable and able to prevent erosion/incision of the channel. It is unknown if the natural course of the channel is through the pasture or towards the northeast and along the parcel line. The previously mapped musk thistle (*Carduus nutans*) infestation was still present. Yellow star thistle (*Centaurea solstitialis*) and cocklebur (*Xanthium* sp.*)* were also observed in the previously mapped area.

The previously documented deteriorated culvert at the entrance to Anderson Regional Park from Bonde Lane has been replaced. It appears that flows from the creek have overtopped the culvert crossing and caused erosion at the downstream end (**Appendix C, Photo 5**).

Field observations and mapped areas are presented in **Appendix A, Figure 3**. Representative photos are located in **Appendix C**, and the photo locations are depicted on **Appendix A, Figure 4**.

PRELIMINARY RECOMMENDATIONS

Based on the field work accomplished during the 2022 project reach assessment, below are preliminary recommendations to stabilize this portion of South Evans Creek. Specifically, these preliminary recommendations have the potential to reduce the erosion and increase vegetation complexity through noxious weed control and native plantings. These preliminary recommendations are also depicted on **Appendix A, Figure 5**:

- Layback, stabilize the southern bank, and establish riparian vegetation
- Construct formal diversion structure or remove improvised diversion structure and unused channel
- Construct bypass channel to prevent overtopping and erosion of Bonde Lane culvert crossing
- Implement noxious weed control
- Coordinate grazing within riparian zone to balance plant growth/establishment needs and grazing needs

Table 2 presents a concept-level cost estimate for each of the preliminary recommendations. These concept-level costs were prepared using professional engineering judgement and GIS to estimate quantities.

Table 2. Concept Level Cost Estimate

Item	CONSTRUCTION COST ESTIMATE			
	Unit	Quantity	Unit Cost	Total
Base Items				
Noxious Weed Control (3x Years)	AC	< 1	$3,000.00	$3,000.00
Grading (Regrade Vertical Banks)	CY	275	$25.00	$6,875.00
Revegetate (Pasture/Upland)	SY	250	$5.00	$1,250.00
Revegetation Along Channel w/ Stabilization (Riparian)	SY	300	$90.00	$27,000.00
Construct Diversion Structure	LS	1	$5,000.00	$5,000.00
Construct Overflow/Bypass Channel	SF	1,100	$10.00	$11,000.00
SUBTOTAL				$54,125.00
Add/Deduct Items				
Construct Diversion Structure (Deduct)	LS	(1)	$5,000.00	-$5,000.00
Grading (Fill & Remove Secondary Channel) (Add)	SY	300	$10.00	$3,000.00
SUBTOTAL				-$2,000.00
Totals			**Base Items**	**Add/Deduct**
SUBTOTAL			$54,125.00	$52,125.00
General Conditions (e.g., Mobilization/Demobilization/Other)		15%	$8,200.00	$7,900.00
Construction Contingency		30%	$16,300.00	$15,700.00
Price Contingency / Inflation		25%	$13,600.00	$13,100.00
Construction Subtotal			$92,225.00	$88,825.00
Technical Studies, Planning, Design, Permitting, CM		30%	$27,700.00	$26,700.00
	PROJECT TOTAL		**$119,925.00**	**$115,525.00**

Notes:

AC = Acre, CY = Cubic Yard, LS = Lump Sum, SF = Square Feet, SY = Square Yard

Minimum area of 1 ac used for noxious weed control

Grading quantity assume average channel incision of 3-ft and target side slope of 3:1 for the south bank.

Assume riparian areas require placement of cobble / rocks

The 2020 Plan provides the process and framework to propose projects to the Nevada Division of Environmental Protection for 319(h) funding. To support the 319(h) application, a Tributary Project Template was developed (Appendix C of the 2020 Plan) and is further explained in Section 8.0 of the 2020 Plan. This memorandum will support the Washoe County's development of a project for 319(h) funding and support completion of the Tributary Project Template. To find out more information on 319(h) funding please also see NDEP's 319(h) webpage (https://ndep.nv.gov/water/rivers-streams-lakes/nonpoint-source-pollution-management-program/cwa-319h-grants).

Appendix A:

- Figure 1: Project Reach Overview
- Figure 2: Historic Observations (2015)
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Appendix B: Tributary Project list

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Appendix A

FIGURE 1: PROJECT REACH OVERVIEW

FIGURE 2: HISTORIC OBSERVATIONS (2015)

FIGURE 3: FIELD OBSERVATIONS (2022)

FIGURE 4: PHOTO LOCATIONS

FIGURE 5: IMPROVEMENT CONCEPTS

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WASHOE COUNTY, NEVADA 1861

CITY OF RENO

NCE

SOUTH EVANS CREEK

Project Reach Overview

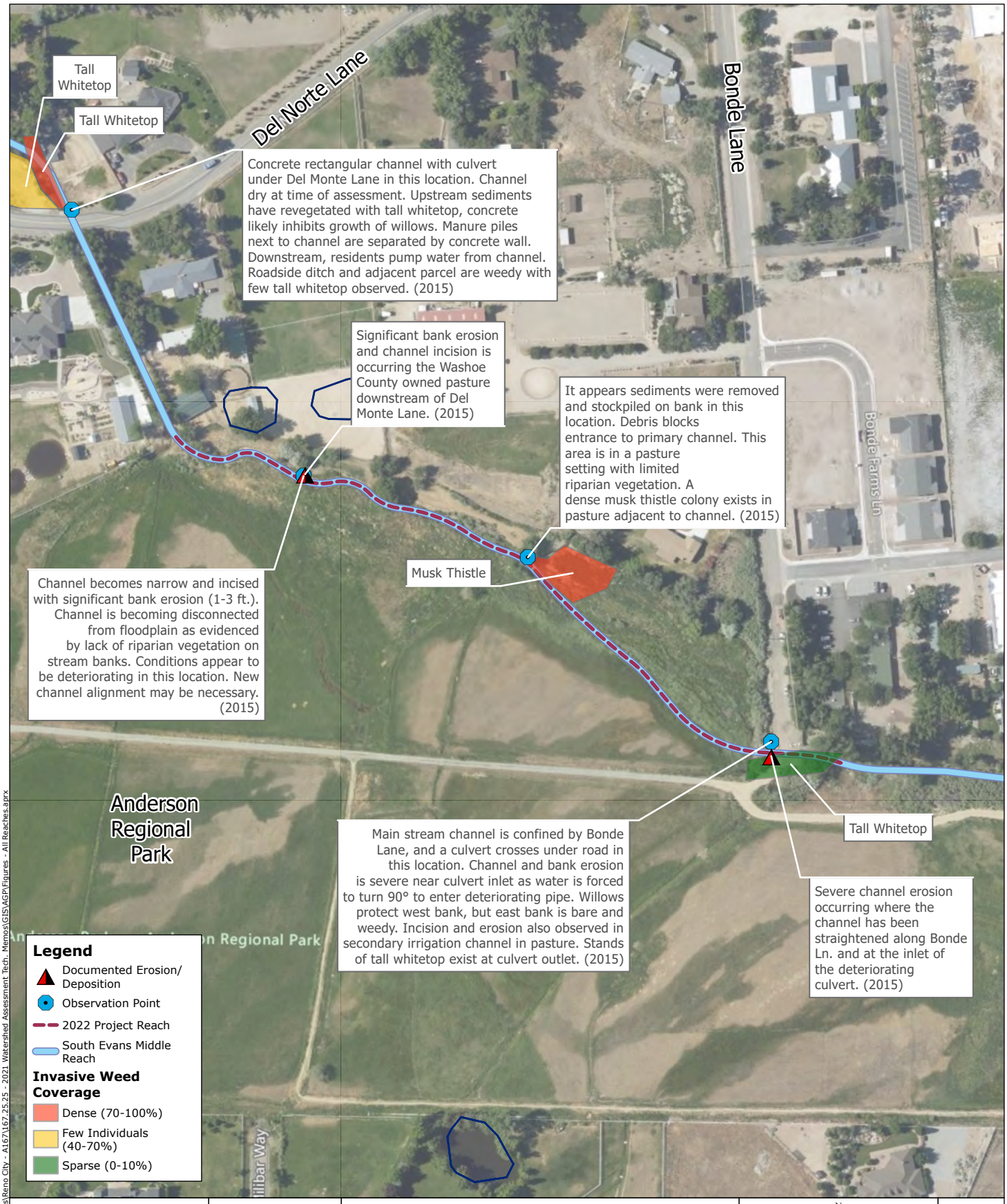
N

1 in. = 1,000 ft.

0 500 1,000 ft.

FIGURE 1

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Hybrid Basemap	167.25.25	skobs/sdavenport	6/14/2022	6/29/2022	dlemke



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SOUTH EVANS CREEK

Historic Observations (2015)

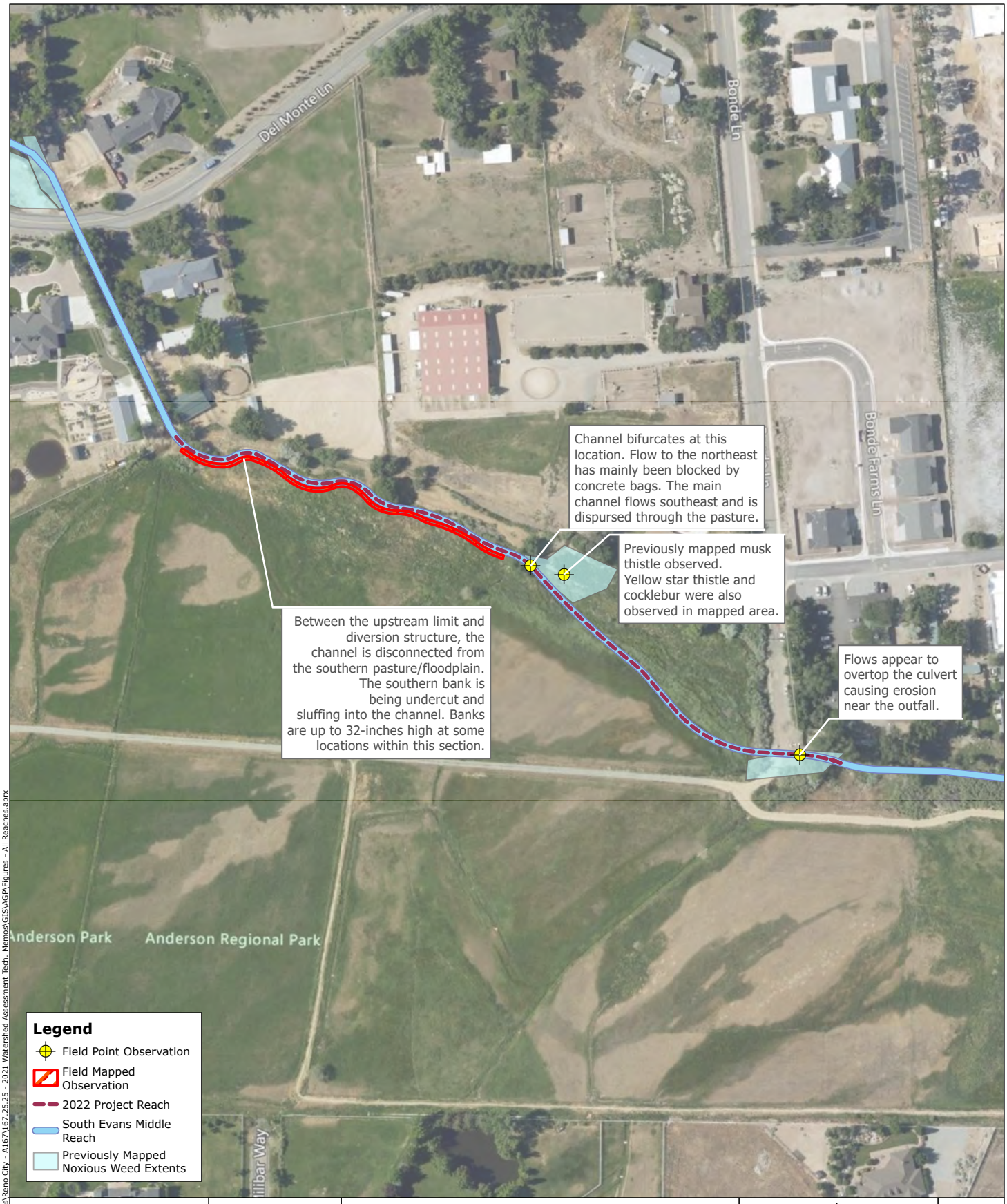
N

1 in. = 200 ft.

0 100 200 ft.

FIGURE 2

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Hybrid Basemap; CDM Smith 2015; TMSWPCC	167.25.25	skobs/sdavenport	6/14/2022	6/29/2022	dlemke



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SOUTH EVANS CREEK

Field Observations (2022)

N

1 in. = 200 ft.

0 100 200 ft.

FIGURE 3

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Hybrid Basemap	167.25.25	skobs/cvaz	6/16/2022	6/29/2022	dlemke

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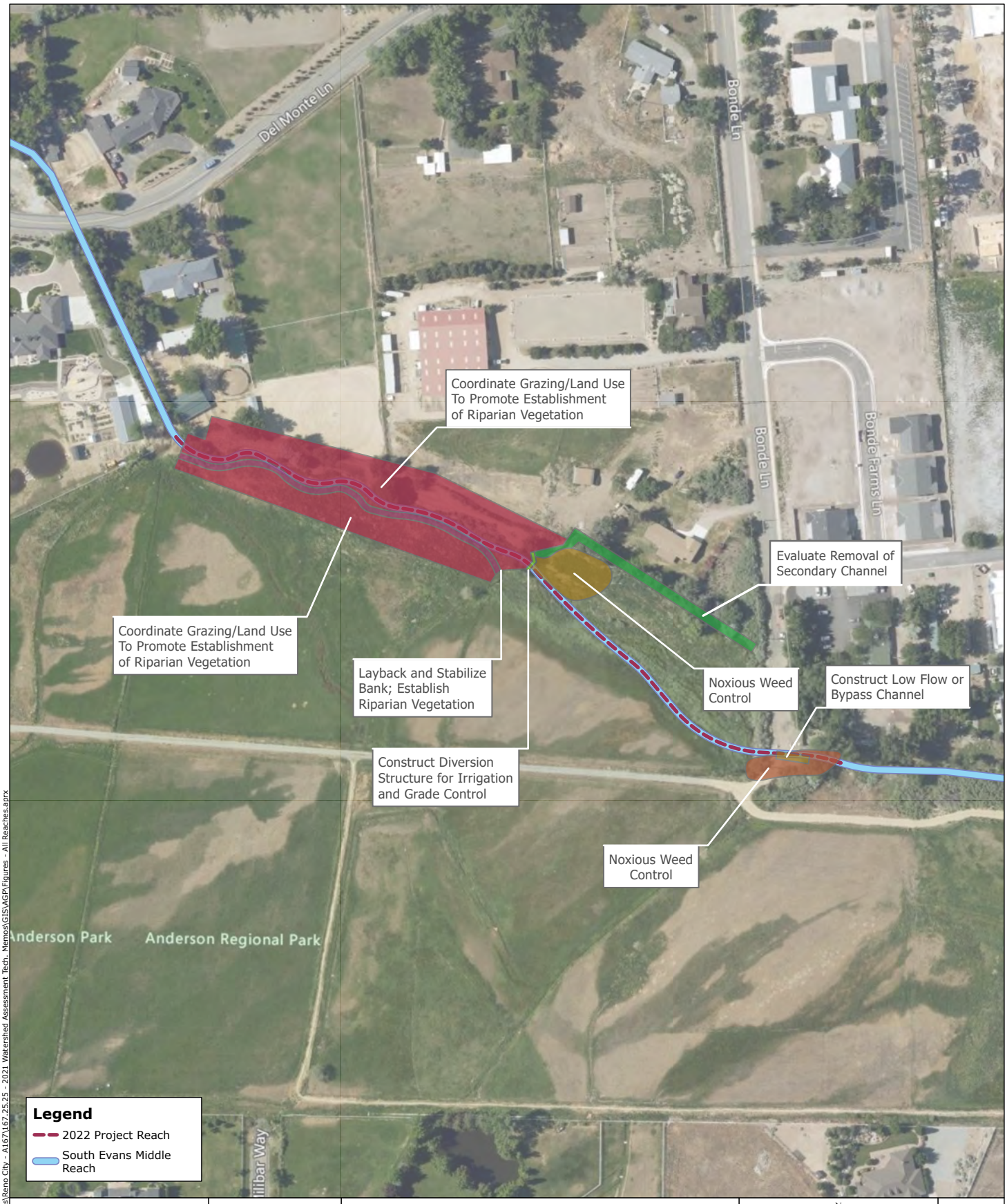
	SOUTH EVANS CREEK Photo Locations	N 1 in. = 200 ft. 0 100 200 ft.	FIGURE 4			
SOURCE Bing Hybrid Basemap	JOB NUMBER 167.25.25	DRAWN skobs/cvaz	DATE 6/6/2022	REVISED 6/24/2022	APPROVED dlemke	



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SOUTH EVANS CREEK

Improvement Concepts

N

1 in. = 200 ft.

0 100 200 ft.

FIGURE 5

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Hybrid Basemap	167.25.25	skobs/cvaz	6/14/2022	6/29/2022	dlemke

Appendix B

Tributary Project List

Appendix B - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
1	City of Reno	Chalk	Saphire Ridge Way to West 7th Street	Soils and hydromodification has caused severe bank incision, resulting in erosion and sediment loading.	Restore and stabilize channel through erosion and grade control measures.	This is City property. The erosion blanket in place has failed and there is an alternative intake upstream of TMWA Chalk Bluff.	TBD	TBD	Drafted
2	City of Reno	Chalk	Valleywood to Mae Ann	This is a vegetation project with a section devoid of vegetation and subject to erosion.	Remove white top and restore vegetation. A stormwater basin may need to be created. Bank stabilization near multiuse path may be needed.	This is City property. There is an alternative intake upstream of TMWA Chalk Bluff.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
3	City of Reno	Alum	Within Caughlin Ranch HOA Property	Persistent severe incision/erosion is present and lawn landscaping has effected the stream channel.	Restore channel and establish grade controls may be needed.	Most of the restoration is located on a anHOA property. There is potential for a partnership with Nevada Land Trust.	TBD	TBD	Proposed
4	City of Reno	Alum	Chrissie Caughlin Park	Flooding contributes sediment load from upstream and causes erosion though the park. There is a direct connection to Truckee River immediately downstream.	Provide sediment capture and stormwater treatment on City property with the use of a constructed wetland or stormwater basin.	One limitation is that this project likely requires projects to address upstream reaches of Alum Creek before addressing this location.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
5	City of Reno	Weed Mitigation	Areas identified in assessments	Areas of invasive weeds maybe due to reduction of native materials and therefore erosion concern and herbicide use.	Chanel restoration by stabilization materials or revegetation. Volunteer based weed abatement. Adopt a section.	Potential to engage community and partners in community wide effort. Possibilities include weeding day, adopt a reach, and restoration projects.	TBD	TBD	Proposed
6	City of Reno	MS4 Outlet Erosion Mitigation Project	Multiple locations as identified in assessments	Erosion is present at the end of the pipe where the storm drain discharges into each respective tributary.	Rip rap or energy dissipation at multiple outfalls.	This could be a lumped contract with several locations identified for correction.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
7	City of Sparks	North Truckee Drain	Spanish Springs Dam to I-80 box culvert	High flow events have caused erosion and sediment loading throughout the tributary.	Erosion and sediment control improvements are needed as well as a reestablishment of the flowline.	This would be a multiphase project.	TBD	TBD	Proposed
8	City of Sparks	North Truckee Drain	Spanish Springs Dam to I-80 box culvert	Invasive weeds and vegetation are present throughout the tributary.	Weed and vegetation abatement, as well as channel stabilization are needed.	This would be a multiphase project. There is an opportunity for public outreach regarding water quality and education about the tributary and river system.	TBD	TBD	Drafted

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
9	City of Sparks	North Truckee Drain	Baring Drive to Lillard Drive	Sediment and debris impacts from storm drain outfalls are located throughout high density residential areas.	Stormwater treatment devices should be installed at major outfalls.	Project would include establishing a maintenance schedule to inspect and clean the treatment vaults periodically and before storm events.	TBD	TBD	Proposed
10	Washoe County	South Evans	Through Anderson Park, Del Monte Lane to Bonde Lane	Historical hydromodification causes frequent flooding, resulting in erosion and sediment loading.	Restore channel and floodplain through park setting.	The downstream reach was previously restored. Water rights and diversions from the creek could pose potential challenge to this project.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
11	Washoe County	Galena	Lower Reach – I-580 bridge to Steamboat Creek	Erosion, undercutting, noxious weeds, hydromodification, and sediment loading are present along the project site.	Restore reach, channel and floodplain.	There are opportunities for a public/private partnership. This is likely a large, multiphase project.	TBD	TBD	Proposed
12	Washoe County	Jones	Callahan Ranch Road to Galena Creek	Persistent severe incision/erosion are present.	A restoration of the channel and an establishment of grade controls are likely needed.	There are opportunities for a public/private partnership.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
13	Washoe County	Alum	Through Betsy Caughlin Donnelly Park	Flooding contributes sediment loading from upstream and causes erosion through the park. There is also a direct connection to Truckee River immediately downstream.	Controlling upstream sediment and restoring the channel and floodplain through the park setting are likely needed.	It is likely that the upstream reaches of Alum Creek need to be addresed before addressing this location.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
14	Washoe County	Whites	Timberline Drive to Legend Trail	High flows cause erosion and sediment loading in multiple tributary drainages to Whites Creek.	Erosion and sediment control and drainage improvements are likely needed.	Continuing development in this area will likely exacerbate issues. Sediment loading may also have impacts on a new TMWA treatment plant on Whites Creek.	TBD	TBD	Proposed

Appendix C

Representative Photographs

Photo 1. Looking southeast at the vertical bank of South Evans Creek. The channel is disconnected from the existing floodplain and pasture in the background.

Photo 2. Looking east standing at the top of the southern bank. The southern bank is actively being eroded and soil is slumping into South Evans Creek.

Photo 3. Looking upstream towards the adjacent private property. Willows stabilize the banks as South Evans Creek enters Anderson Regional Park.

Photo 4. Channel bifurcates at this location. Concrete ready-mix bags and t-post have been used to block flow towards the northeast and limit flow entering the private parcel to the north. Debris has collected on the makeshift improvised diversion structure.

Photo 5. Soil eroding from the downstream end of the 48-inch corrugated metal pipe culvert at the end of Bonde Lane and entrance to Anderson Regional Park.

MEMORANDUM

Date:	June 30, 2022
To:	Theresa Jones, City of Reno
From:	Debra Lemke, Scott Kobs, and Sarah Davenport, NCE
Subject:	2022 Steamboat Creek Watershed Assessment Draft Memorandum

This technical memorandum presents mapped field data, field observations, and preliminary recommendations for restoration and improvements along Steamboat Creek within the project reach at Rhodes Road (**Appendix A, Figure 1**). This project was selected by Washoe County due to an ongoing project in this area and the possibility to apply for 319(h) funding for this project. In addition, Steamboat Creek has been assessed under previous watershed assessments for tributaries of the Truckee River.

BACKGROUND

Beginning in 2003, watershed assessments have been performed along tributaries of the Truckee River throughout the Truckee Meadows. The tributary assessments were prepared using the Proper Functioning Condition (PFC) methodology presented in the U.S. Department of the Interior Bureau of Land Management document titled *Riparian Area Management, A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas* (BLM, 1998). This methodology evaluates hydrology, vegetation, erosion, and/or deposition to determine the PFC rating of the evaluated reach. Tributaries were divided into established reaches and have been assessed on a rotating basis since 2003.

The project reach for the 2022 effort represents a 250-foot section of the larger 82,300-foot Steamboat Creek Lower Reach (**Appendix A, Figure 1**). The Steamboat Creek Lower Reach was last assessed in 2017 and was given a PFC rating of functional-at-risk. The Lower Reach includes the following previously documented issues within the 2022 project reach (**Appendix A, Figure 2**):

- High energy flows from Steamboat Ditch have resulted in severe erosion
- Moderate bank cutting (~3 feet) exists downstream of Rhodes Road
- General bank erosion exists upstream and downstream of Rhodes Road crossing
- Presence of tall whitetop (*Lepidium latifolium*) and cheatgrass (*Bromus tectorum*)

The 2022 project reach was selected due to an ongoing project in this area and the possibility to apply for 319(h) funding to address documented erosion, bank cutting, and noxious weeds within the project reach.

2022 Project Reach Assessment

The PFC methodology was used to evaluate hydrology, vegetation, erosion, and/or deposition within the project reach to maintain consistency with previous assessment efforts. In addition, representative photographs were taken, and observation points were recorded.

The project reach assessment was conducted on March 22, 2022. Previously documented issues within the project reach persist and have been observed to be worsening.

Within the project reach the right bank downstream of the Rhodes Road crossing continues to erode and was measured to be 5 feet tall during the 2022 field assessment. In 2017, the banks in this area were previously documented to be approximately 3 feet tall. This change indicates that the channel is likely migrating west and actively eroding the bank, making it steeper. The west bank generally lacks any riparian vegetation and is being actively eroded. The east bank has willows established on the inside bend of the meander and several large cottonwoods.

The existing outfall for Steamboat Ditch is unconfined between the 48-inch culvert and Steamboat Creek. At Steamboat Creek there is a vertical drop where flows from Steamboat Ditch discharge into Steamboat Creek.

Tall whitetop was observed to be present within the area that was previously mapped.

Field observations and mapped areas are presented in **Appendix A, Figure 3**. Representative photos are located in **Appendix C**, and the photo locations are depicted on **Appendix A, Figure 4**.

Preliminary Recommendations

Based on the field work accomplished during the 2022 project reach assessment, below are preliminary recommendations to stabilize this portion of Steamboat Creek. Specifically, these preliminary recommendations have the potential to reduce the erosion and bank cutting and increase vegetation complexity through noxious weed control and native plantings. These preliminary recommendations are also depicted on **Appendix A, Figure 5**:

- Re-construct Steamboat Ditch outfall and improve hydraulic alignment within Steamboat Creek
- Layback banks and establish riparian vegetation downstream of Rhodes Road
- Noxious weed control
- Coordinate removal of existing USGS weir structure and installation of a USGS Station

Table 1 presents a concept level cost estimate for each of the preliminary recommendations. These concept level costs were developed by incorporating GIS to estimate quantities, and our professional judgement.

Table 1. Concept Level Cost Estimate

Item	CONSTRUCTION COST ESTIMATE			
	Unit	Quantity	Unit Cost	Total
Noxious Weed Control (3x Years)	AC	< 1	$3,000.00	$3,000.00
Grading (Regrade Vertical Bank)	CY	210	$25.00	$5,250.00
Revegetate (Pasture/Upland)	SY	125	$5.00	$625.00
Revegetation Along Channel w/ Stabilization (Riparian)	SY	125	$90.00	$11,250.00
Reconstruct Steamboat Ditch Outfall	SF	1,500	$15.00	$22,500.00
Remove USGS Weir Structure	LS	1	$10,000.00	$10,000.00
SUBTOTAL				$52,625.00
Total				
SUBTOTAL				$52,625.00
General Conditions (e.g., Mobilization/Demobilization/Other)			15%	$7,900.00
Construction Contingency			30%	$15,800.00
Price Contingency / Inflation			25%	$13,200.00
Construction Subtotal				$89,525.00
Technical Studies, Planning, Design, Permitting, CM			30%	$6,700.00
			PROJECT TOTAL	**$96,225.00**

Notes:

AC = Acre, CY = Cubic Yard, LS = Lump Sum, SF = Square Feet, SY = Square Yard

Minimum area of 1 ac used for noxious weed control

Grading quantity assume average channel incision of 5-ft and target side slope of 3:1 for the west bank.

Assume riparian areas require placement of cobble / rocks

The *2020 Watershed Management and Protection Plan for Tributaries to the Truckee River* (2020 Plan) (NCE, 2020) provides the process and framework to propose projects to the Nevada Division of Environmental Protection for 319(h) funding. To support the 319(h) application, a Tributary Project Template was developed (Appendix C of the 2020 Plan) and is further explained in Section 8.0 of the 2020 Plan. This memorandum will support the Washoe County's development of a project for 319(h) funding and support completion of the Tributary Project Template. To find out more information on 319(h) funding please also see NDEP's 319(h) webpage (https://ndep.nv.gov/water/rivers-streams-lakes/nonpoint-source-pollution-management-program/cwa-319h-grants).

Appendix A:

- Figure 1: Project Reach Overview
- Figure 2: Historic Observations (2017)
- Figure 3: Field Observations (2022)
- Figure 4: Photo Locations
- Figure 5: Improvement Concepts

Appendix B: Representative Photographs

Appendix A

FIGURE 1: PROJECT REACH OVERVIEW

FIGURE 2: HISTORIC OBSERVATIONS (2017)

FIGURE 3: FIELD OBSERVATIONS (2022)

FIGURE 4: PHOTO LOCATIONS

FIGURE 5: IMPROVEMENT CONCEPTS

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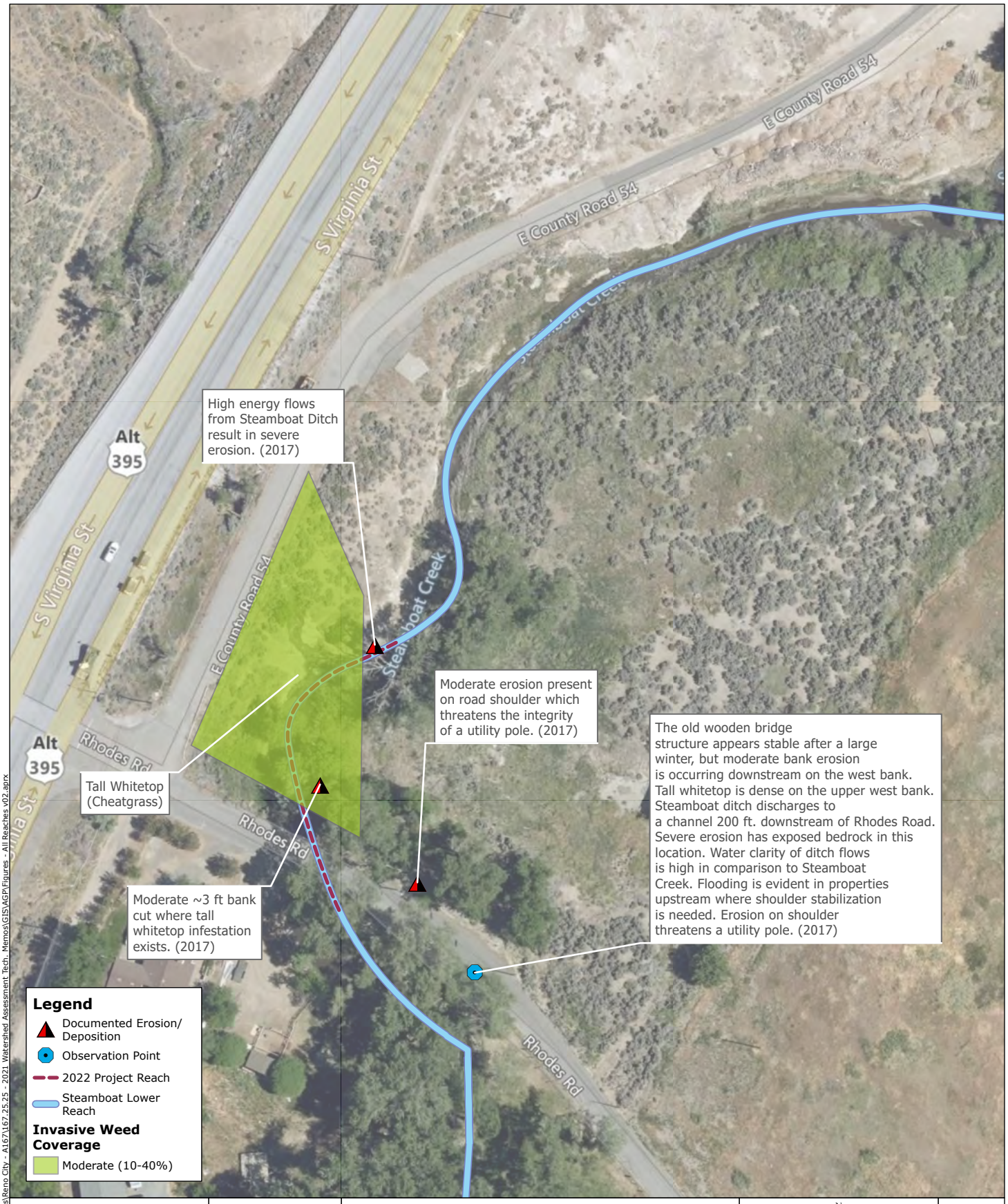
	STEAMBOAT CREEK Project Reach Overview	N 1 in. = 1,000 ft. 0 500 1,000 ft.	FIGURE 1			
SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED	
Bing Hybrid Basemap	167.25.25	skobs/sdavenport	6/14/2022	6/29/2022	-	



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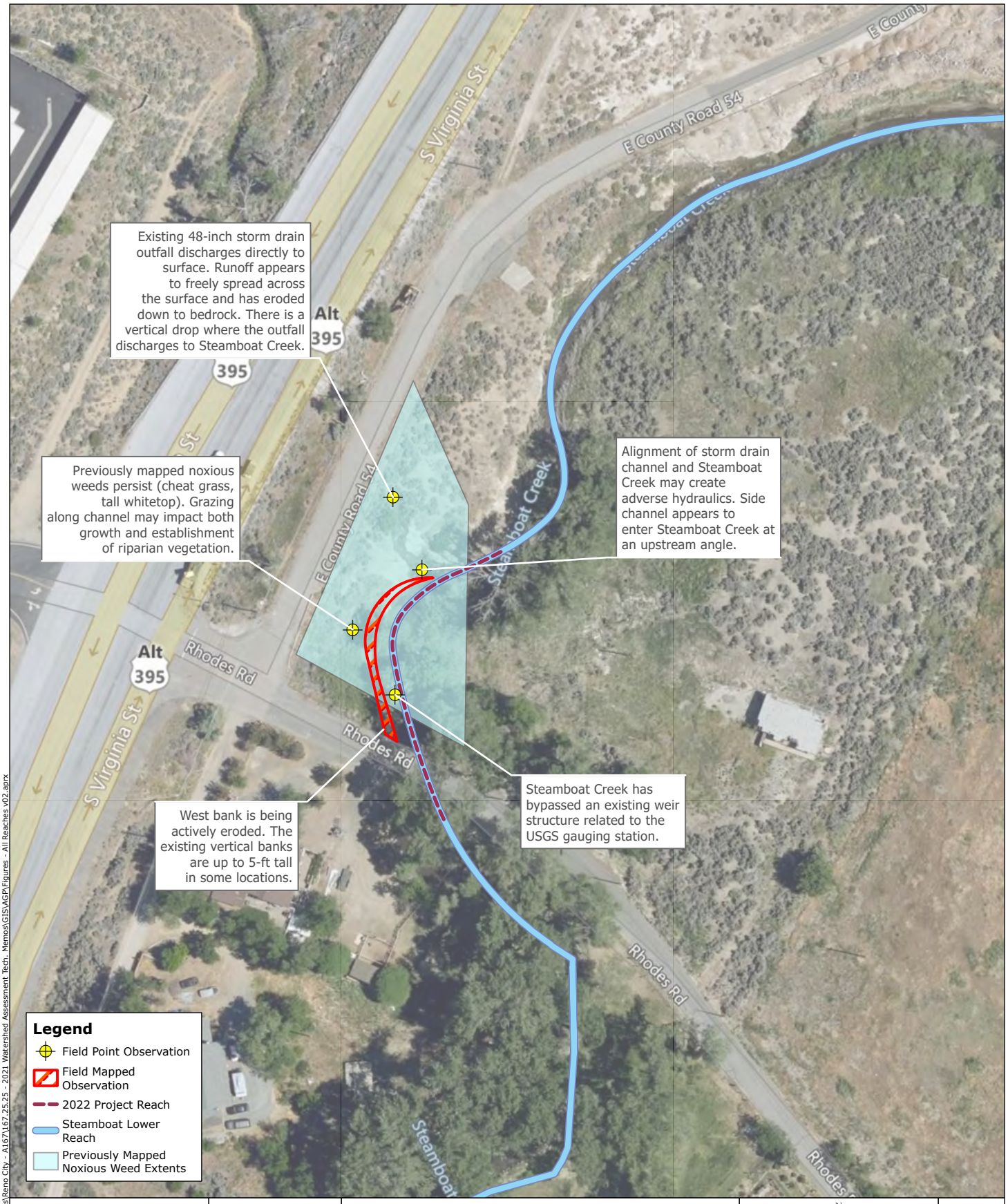
	STEAMBOAT CREEK Historic Observations (2017)					FIGURE 2
					1 in. = 100 ft. 0 50 100 ft.	
SOURCE Bing Hybrid Basemap; CDM Smith 2017; TMSWPCC		JOB NUMBER 167.25.25	DRAWN skobs/cvaz	DATE 6/14/2022	REVISED 6/29/2022	APPROVED -



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STEAMBOAT CREEK

Field Observations (2022)

N

1 in. = 100 ft.

0 50 100 ft.

FIGURE 3

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Hybrid Basemap	167.25.25	skobs/cvaz	6/16/2022	6/30/2022	-

NCE	STEAMBOAT CREEK Photo Locations			N 1 in. = 100 ft. 0 50 100 ft.		FIGURE 4
SOURCE Bing Hybrid Basemap		JOB NUMBER 167.25.25	DRAWN skobs/cvaz	DATE 6/16/2022	REVISED 6/29/2022	APPROVED -

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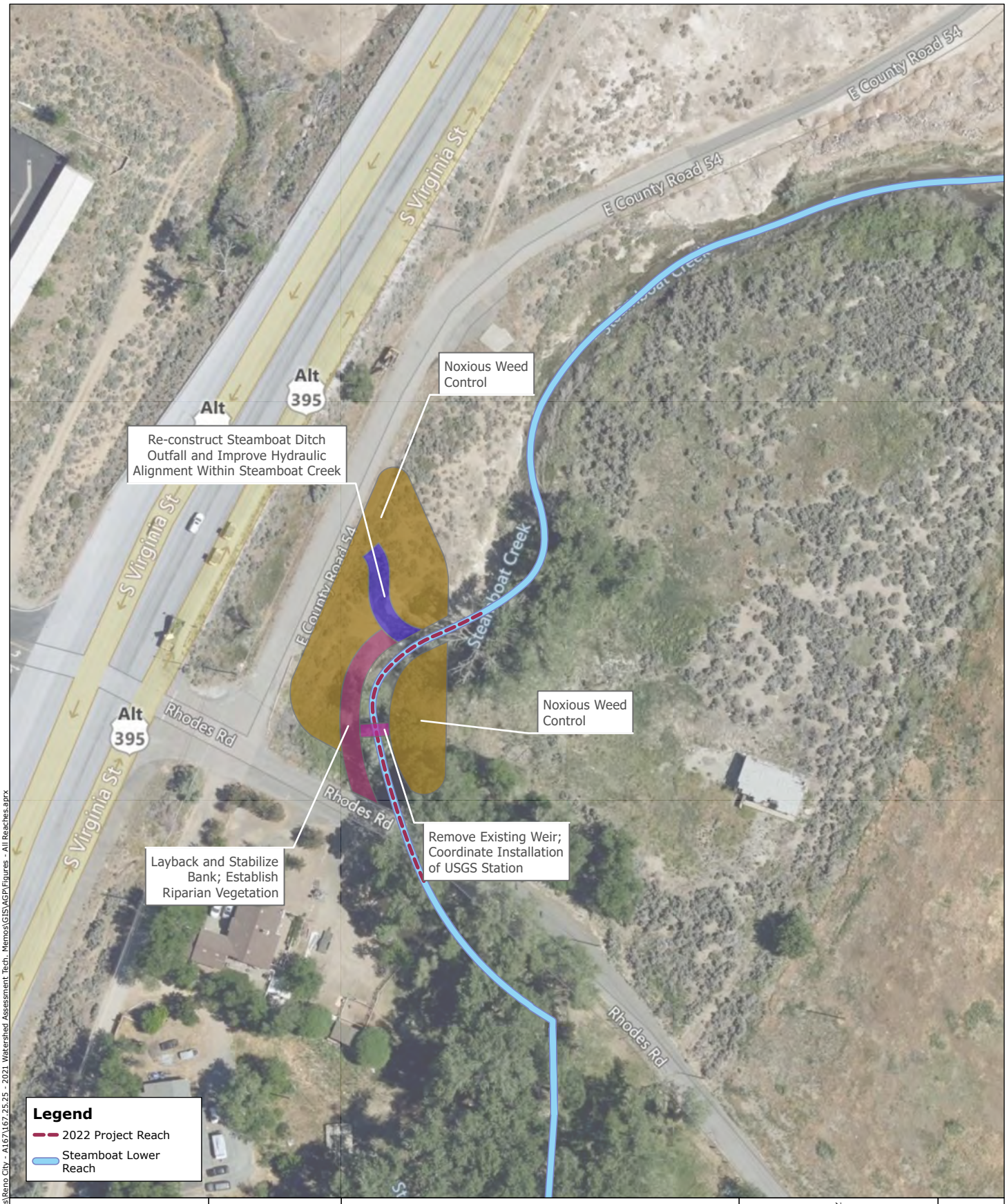

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STEAMBOAT CREEK

Improvement Concepts

N

1 in. = 100 ft.

0 50 100 ft.

FIGURE 5

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Hybrid Basemap	167.25.25	skobs/sdavenport	6/16/2022	6/30/2022	-

Appendix B

Representative Photographs

Photo 1. Rhodes Road crossing. There is active erosion near the footing of the wooden structure. Washoe County is currently working through the design phase to replace the existing structure.

Photo 2. Existing weir downstream of the USGS gauge station. The majority of flow in Steamboat Creek bypasses the existing weir.

Photo 3. Steamboat Creek looking downstream, immediately downstream of the existing weir structure. The channel is actively eroding the left bank. The bank is up to 5-feet tall in this location. The banks in this area were previously documented to be 3-feet tall.

Photo 4. Existing 48-inch culvert outfall from Steamboat Ditch discharges to a bare unconfined area to the west of Steamboat Creek.

MEMORANDUM

Date:	June 30, 2022
To:	Theresa Jones, City of Reno
From:	Debra Lemke, Scott Kobs, and Sarah Davenport, NCE
Subject:	2022 Chalk Creek Lancer Steet to Mae Anne Avenue Project Reach Assessment Draft Memorandum

This technical memorandum presents mapped field data, field observations, and preliminary recommendations for restoration and improvement projects along Chalk Creek within the project reach between Lancer Street and Mae Anne Avenue (**Appendix A, Figure 1**). The project reach was selected based on a review of the *2020 Watershed Management and Protection Plan for Tributaries to the Truckee River* (2020 Plan) (NCE, 2020) Tributary Project list; this project list was developed in coordination with the Truckee Meadows Stormwater Permit Coordinating Committee as potential projects that may be submitted for 319(h) funding (**Appendix B, Project Count #2**). In addition, Chalk Creek has been assessed under previous watershed assessments for tributaries of the Truckee River.

BACKGROUND

Beginning in 2003, watershed assessments have been performed along tributaries of the Truckee River throughout the Truckee Meadows. The tributary assessments were prepared using the Proper Functioning Condition (PFC) methodology presented in the U.S. Department of the Interior Bureau of Land Management document titled *Riparian Area Management, A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas* (BLM, 1998). This methodology evaluates hydrology, vegetation, erosion/deposition to determine the functional rating of the evaluated reach. Tributaries were divided into established reaches and have been assessed on a rotating basis since 2003.

Chalk Creek is on the 303(d) list of impaired waters. **Table 1** provides the 303(d) water quality impairment, impaired use, and the total maximum daily loads (TMDL) priority for Chalk Creek.

Table 1. Section 303(d) Tributary List

Waterbody Name	Size (Miles)	Standard Not Meeting (Impairment)	Impaired Use	TMDL Priority
Chalk Creek	4.1	Nitrate SV AQL	AQL	Low
		Orthophosphate SV	AQL, RWC	Low
		Phosphorus total AA	AQL, RWC	Low
		Selenium 96-hour	AQL	Low
		Sulfur SV	MDS	Low
		TDS AA	MDS	Low
		Temperature SV	AQL	Low

AA = annual average, AQL= aquatic life, MDS = municipal domestic supply, RWC = recreation involving contact with water, SV = single value, TDS = Total Dissolved Solids

Source: NDEP, Bureau of Water Quality Planning. 2019. *Nevada 2016-2018 Water Quality Integrated Report Assessment Period – October 1, 2009 through September 30, 2016*

The project reach for the 2022 effort represents a 2,258-foot section of the larger 9,350 foot Chalk Creek Upper West Reach (**Appendix A, Figure 1**). The Chalk Creek Upper West Reach was last assessed in 2016 and was given a PFC rating of nonfunctional. The Upper West Reach includes the following previously documented issues within the 2022 project reach (**Appendix A, Figure 2**):

- A moderate headcut at a concrete grade control structure
- Channel incision downstream of a stormwater outfall, downstream of the concrete grade control structure
- A moderate headcut at Valley Wood Drive culvert terminus
- Channel incision downstream of the Valley Wood Drive culvert
- Easily erodible and bare banks
- Presence of tall whitetop (*Lepidium latifolium*) and thistle upstream of Mae Anne Avenue
- Lack of riparian corridor upstream of Mae Anne Avenue

The 2022 project reach was selected due to the documented headcuts, channel incision, erosion issues, lack of upland and riparian vegetation, and the presence of non-native vegetation.

2022 Project Reach Assessment

The PFC methodology was used to evaluate hydrology, vegetation, erosion, and/or deposition within the project reach to maintain consistency with previous assessment efforts. In addition, representative photographs were taken and observation points were recorded.

The project reach assessment was conducted on February 28, 2022. Overall, the project reach remains nonfunctional as previously documented issues persist and new erosion issues have developed. Within the project reach multiple headcuts, lateral migration of the channel, excessive erosion due to both channel and headcut migration, and lack of riparian vegetation were observed. Noxious weed species and approximate areas were estimated

and mapped. Field observations and mapped areas are presented in **Appendix A**, **Figure 3** and described below in more detail. Representative photos are located in **Appendix C**, and the photo locations are depicted on **Appendix A**, **Figure 4**.

Lancer Street to Valley Wood Drive

At the northern limit of the project reach a concrete grade control structure is present. Immediately upstream and extending to the grade control structure is a previously unmapped colony of tall whitetop. As previously documented in 2016 a vertical drop exists at the structure and in 2022 was measured to be 24-inches. Since 2016, a new channel has formed upstream and west of the grade control structure. At this western edge of the grade control structure, the structure is not keyed into a stable bank, which allowed a new channel to form. This newly formed channel bypasses the grade control structure (on the west) and allows upward migration of the headcut (**Appendix C, Photo 2**) that previously ended at the structure. The newly formed channel is 24-inches deep at the temporary footbridge (which appears to be built by homeowners to access the grade control structure at the western edge). This upward migration poses significant risk to the vertical stability of the reach upstream of the grade control.

Both overhead and underground utilities cross Chalk Creek in the 2022 project reach. Within the vicinity of the overhead utilities, vegetation (upland and riparian) had been removed along the utility corridor and extended to the flow line of the channel.

Just upstream of the overhead utility crossing is a grade break in the channel slope, and the channel transitions to an area of deposition downstream of the grade break.

Downstream of the overhead utility crossing is an area of previously unmapped tall whitetop, and two new headcuts were identified.

Valley Wood Drive to Mae Anne Avenue

Downstream of Valley Wood Drive there is an 18-inch vertical drop at the end of the grouted riprap apron. The extent of the drop appears stable based on previous observations ranging from 1 to 2 feet. Both riparian and upland vegetation growth are limited due to brush removal and mowing. Upland vegetation is limited to the eastern side of the channel. Three established grade control structures exist in this section of the project reach, they are two path crossings with culverts and one grouted riprap section that is connected to an existing valley gutter. Flow at the path crossings is limited due to sedimentation in the existing culverts. The ground surface throughout this section was saturated and potentially indicates high groundwater.

PRELIMINARY RECOMMENDATIONS

Based on the field work accomplished during the 2022 project reach assessment, below are preliminary recommendations to stabilize this portion of Chalk Creek. Specifically, these preliminary recommendations have the potential to reduce the erosion, headcutting, and channel incision, and increase vegetation complexity through noxious weed control and native plantings. These preliminary recommendations are also depicted on **Appendix A, Figure 5**.

- Extend grade control structure to the west, re-align channel to the original channel location, re-grade/fill in the newly formed western channel, add riprap below the grade control structure for channel stabilization downstream of the grade control structure
- Revegetate upland slopes
- Plant riparian vegetation along channel
- Reconstruct culvert apron (downstream of Valley Wood Drive) to connect to channel and provide energy dissipation
- Implement noxious weed control
- Evaluate potential for the construction of treatment wetlands for nuisance dry weather flows and TDS
- Coordinate with utilities to limit removal of stabilizing riparian vegetation at the channel

Table 2 presents a concept-level cost estimate for each of the preliminary recommendations. These concept-level costs were prepared using professional engineering judgement and GIS to estimate quantities.

Table 2. Concept Level Cost Estimate

Item	CONSTRUCTION COST ESTIMATE			
	Unit	Quantity	Unit Cost	Total
Base Items				
Noxious Weed Control (3x Years)	AC	< 1	$3,000.00	$3,000.00
Extend Grade Control	LF	30	$150.00	$4,500.00
Channel Stabilization / Riprap Drop Structure Downstream of Grade Control	SF	100	$45.00	$4,500.00
Remove and Regrade Upstream Channel at Grade Control	LF	50	$45.00	$2,250.00
Reconstruct Downstream Culvert Apron (Grouted Riprap)	SF	100	$60.00	$6,000.00
SUBTOTAL				$20,250.00
Alternative 1				
Revegetate (Upland)	SY	4,450	$5.00	$22,250.00
Revegetate (Riparian)	SY	6,750	$30.00	$202,500.00
SUBTOTAL				$224,750.00
Alternative 2				
Construct Treatment Wetland (Grading & Planting)	SY	5,200	$85.00	$442,000.00
Revegetate (Upland)	SY	4,450	$5.00	$22,250.00
Revegetate (Riparian)	SY	2,300	$30.00	$69,000.00
SUBTOTAL				$533,250.00
Totals			**Base & Alt 1**	**Base & Alt 2**
SUBTOTAL			$245,000.00	$553,500.00
General Conditions (e.g., Mobilization/Demobilization/Other)		15%	$36,800.00	$83,100.00
Construction Contingency		30%	$73,500.00	$166,100.00
Price Contingency / Inflation		25%	$61,300.00	$138,400.00
Construction Subtotal			$416,600.00	$941,100.00
Technical Studies, Planning, Design, Permitting, CM		30%	$125,000.00	$282,400.00
	PROJECT TOTAL		**$541,600.00**	**$1,223,500.00**

Notes:

AC = Acres, LF = Linear Feet, SF = Square Feet, SY = Square Yards

Minimum area of 1 ac used for noxious weed control

Assume riparian areas require erosion control fabric or functional equivalent

The 2020 Plan provides the process and framework to propose projects to the Nevada Division of Environmental Protection for 319(h) funding. To support the 319(h) application, a Tributary Project Template was developed (Appendix C of the 2020 Plan) and is further explained in Section 8.0 of the 2020 Plan. This memorandum will support the City of Reno's development of a project for 319(h) funding and support completion of the Tributary Project Template. To find out more information on 319(h) funding please also see NDEP's 319(h) webpage (https://ndep.nv.gov/water/rivers-streams-lakes/nonpoint-source-pollution-management-program/cwa-319h-grants).

Appendix A:

- Figure 1: Project Reach Overview
- Figure 2: Historic Observations (2016)
- Figure 3: Field Observations (2022)
- Figure 4: Photo Locations
- Figure 5: Improvement Concepts

Appendix B: Tributary Project list

Appendix C: Representative Photographs

Appendix A

FIGURE 1: PROJECT REACH OVERVIEW

FIGURE 2: HISTORIC OBSERVATIONS (2016)

FIGURE 3: FIELD OBSERVATIONS (2022)

FIGURE 4: PHOTO LOCATIONS

FIGURE 5: IMPROVEMENT CONCEPTS

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	CHALK CREEK Project Reach Overview	N 1 in. = 1,000 ft. 0 500 1,000 ft.				FIGURE 1
SOURCE Bing Hybrid Basemap		JOB NUMBER 167.25.25	DRAWN skobs/sdavenport	DATE 6/3/2022	REVISED 6/28/2022	APPROVED dlemke

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	CHALK CREEK Historic Observations (2016)					FIGURE 2
SOURCE Bing Hybrid Basemap; CDM Smith 2016; TMSWPCC	JOB NUMBER 167.25.25	DRAWN skobs/cvaz	DATE 6/14/2022	REVISED 6/28/2022	APPROVED dlemke	

N

1 in. = 250 ft.

0 125 250 ft.

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	CHALK CREEK Field Observations (2022)			N 1 in. = 250 ft. 0 125 250 ft.		FIGURE 3
SOURCE Bing Hybrid Basemap		JOB NUMBER 167.25.25	DRAWN skobs/cvaz	DATE 6/14/2022	REVISED 6/28/2022	APPROVED dlemke

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CHALK CREEK

Photo Locations

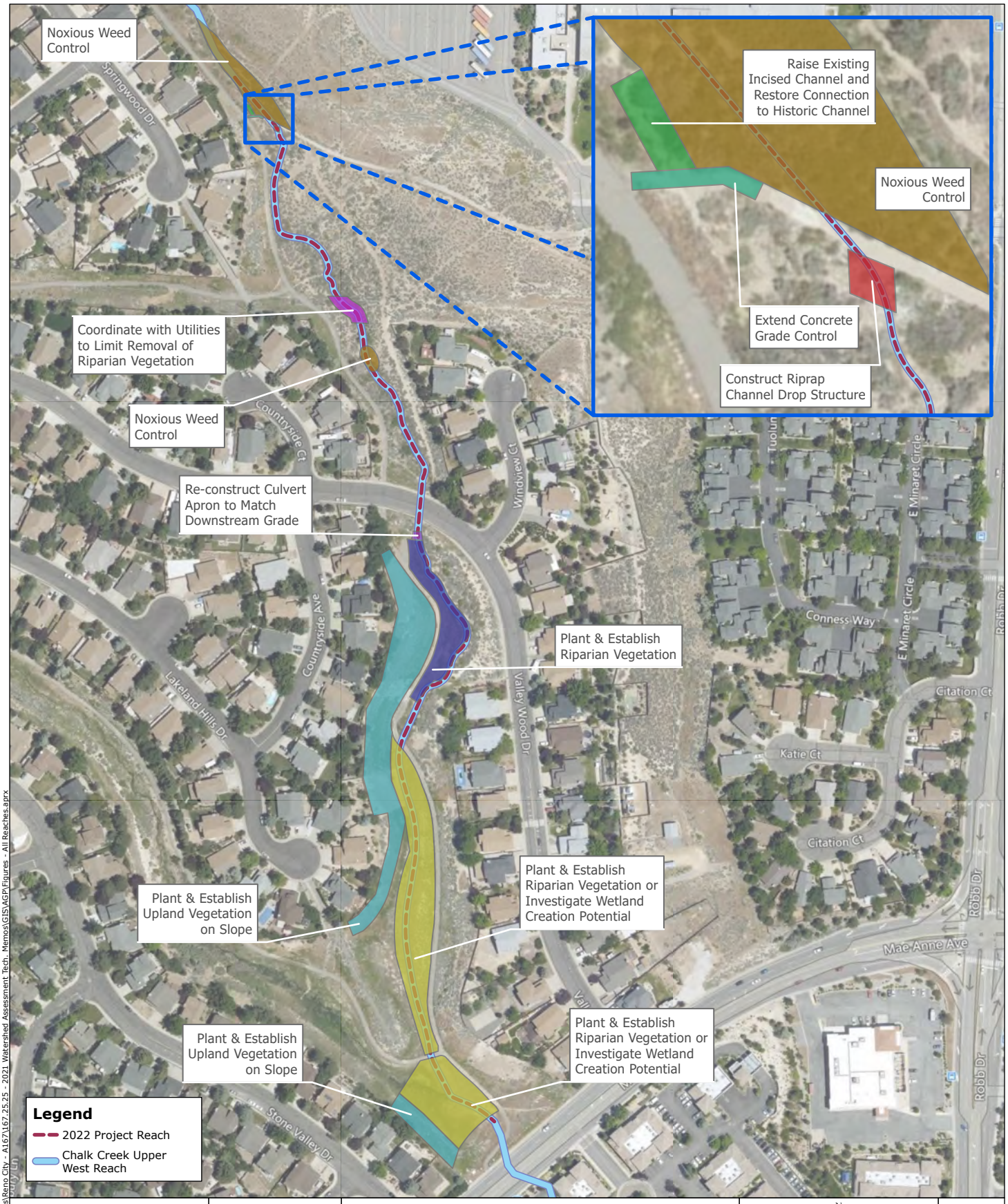
N

1 in. = 250 ft.

0 125 250 ft.

FIGURE 4

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Hybrid Basemap	167.25.25	skobs/cvaz	6/6/2022	6/28/2022	dlemke



Document Path: P:\Active Projects\Reno City - A167\167.25.25 - 2021 Watershed Assessment Tech. Memos\GIS\AGP\Figures - All Reaches.aprx

	CHALK CREEK Improvement Concepts					FIGURE 5
SOURCE Bing Hybrid Basemap	JOB NUMBER 167.25.25	DRAWN skobs/cvaz	DATE 6/14/2022	REVISED 6/28/2022	APPROVED dlemke	

N

1 in. = 250 ft.

0 125 250 ft.

Appendix B

TRIBUTARY PROJECT LIST

Appendix B - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
1	City of Reno	Chalk	Saphire Ridge Way to West 7th Street	Soils and hydromodification has caused severe bank incision, resulting in erosion and sediment loading.	Restore and stabilize channel through erosion and grade control measures.	This is City property. The erosion blanket in place has failed and there is an alternative intake upstream of TMWA Chalk Bluff.	TBD	TBD	Drafted
2	City of Reno	Chalk	Valleywood to Mae Ann	This is a vegetation project with a section devoid of vegetation and subject to erosion.	Remove white top and restore vegetation. A stormwater basin may need to be created. Bank stabilization near multiuse path may be needed.	This is City property. There is an alternative intake upstream of TMWA Chalk Bluff.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
3	City of Reno	Alum	Within Caughlin Ranch HOA Property	Persistent severe incision/erosion is present and lawn landscaping has effected the stream channel.	Restore channel and establish grade controls may be needed.	Most of the restoration is located on a anHOA property. There is potential for a partnership with Nevada Land Trust.	TBD	TBD	Proposed
4	City of Reno	Alum	Chrissie Caughlin Park	Flooding contributes sediment load from upstream and causes erosion though the park. There is a direct connection to Truckee River immediately downstream.	Provide sediment capture and stormwater treatment on City property with the use of a constructed wetland or stormwater basin.	One limitation is that this project likely requires projects to address upstream reaches of Alum Creek before addressing this location.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
5	City of Reno	Weed Mitigation	Areas identified in assessments	Areas of invasive weeds maybe due to reduction of native materials and therefore erosion concern and herbicide use.	Chanel restoration by stabilization materials or revegetation. Volunteer based weed abatement. Adopt a section.	Potential to engage community and partners in community wide effort. Possibilities include weeding day, adopt a reach, and restoration projects.	TBD	TBD	Proposed
6	City of Reno	MS4 Outlet Erosion Mitigation Project	Multiple locations as identified in assessments	Erosion is present at the end of the pipe where the storm drain discharges into each respective tributary.	Rip rap or energy dissipation at multiple outfalls.	This could be a lumped contract with several locations identified for correction.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
7	City of Sparks	North Truckee Drain	Spanish Springs Dam to I-80 box culvert	High flow events have caused erosion and sediment loading throughout the tributary.	Erosion and sediment control improvements are needed as well as a reestablishment of the flowline.	This would be a multiphase project.	TBD	TBD	Proposed
8	City of Sparks	North Truckee Drain	Spanish Springs Dam to I-80 box culvert	Invasive weeds and vegetation are present throughout the tributary.	Weed and vegetation abatement, as well as channel stabilization are needed.	This would be a multiphase project. There is an opportunity for public outreach regarding water quality and education about the tributary and river system.	TBD	TBD	Drafted

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
9	City of Sparks	North Truckee Drain	Baring Drive to Lillard Drive	Sediment and debris impacts from storm drain outfalls are located throughout high density residential areas.	Stormwater treatment devices should be installed at major outfalls.	Project would include establishing a maintenance schedule to inspect and clean the treatment vaults periodically and before storm events.	TBD	TBD	Proposed
10	Washoe County	South Evans	Through Anderson Park, Del Monte Lane to Bonde Lane	Historical hydromodification causes frequent flooding, resulting in erosion and sediment loading.	Restore channel and floodplain through park setting.	The downstream reach was previously restored. Water rights and diversions from the creek could pose potential challenge to this project.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
11	Washoe County	Galena	Lower Reach – I-580 bridge to Steamboat Creek	Erosion, undercutting, noxious weeds, hydromodification, and sediment loading are present along the project site.	Restore reach, channel and floodplain.	There are opportunities for a public/private partnership. This is likely a large, multiphase project.	TBD	TBD	Proposed
12	Washoe County	Jones	Callahan Ranch Road to Galena Creek	Persistent severe incision/erosion are present.	A restoration of the channel and an establishment of grade controls are likely needed.	There are opportunities for a public/private partnership.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
13	Washoe County	Alum	Through Betsy Caughlin Donnelly Park	Flooding contributes sediment loading from upstream and causes erosion through the park. There is also a direct connection to Truckee River immediately downstream.	Controlling upstream sediment and restoring the channel and floodplain through the park setting are likely needed.	It is likely that the upstream reaches of Alum Creek need to be addresed before addressing this location.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
14	Washoe County	Whites	Timberline Drive to Legend Trail	High flows cause erosion and sediment loading in multiple tributary drainages to Whites Creek.	Erosion and sediment control and drainage improvements are likely needed.	Continuing development in this area will likely exacerbate issues. Sediment loading may also have impacts on a new TMWA treatment plant on Whites Creek.	TBD	TBD	Proposed

Appendix C

Representative Photographs

Photo 1. Standing downstream and looking upstream at concrete grade control structure. The historic channel crossed the existing structure at this location until the formation of western channel (Photo 2). Flow from Chalk Creek has undercut the existing concrete.

Photo 2. Western channel bypassing concrete grade control (Photo 1).

Photo 3. Previously unmapped tall whitetop (*Lepidium latifolium*) upstream of concrete grade control structure (Photo 1).

Photo 4. Valley Wood Drive culvert with 18-inch headcut downstream of the grouted riprap apron.

Photo 5. Floodplain and upland slope west of channel between Mae Anne Avenue and Valley Wood Drive lack vegetation.

Photo 6. Chalk Creek looking upstream (north) south of Valley Wood Drive. Eastern bank has healthy upland vegetation. Western side of greenway lacks riparian and upland vegetation (also shown in Photo 5).

Photo 7. Chalk Creek looking downstream near Valley Wood Drive. Eastern bank has healthy upland vegetation. Western side of greenway lacks riparian and upland vegetation. Channel appears incised and disconnected from floodplain.

Photo 8. Chalk Creek looking downstream at Mae Anne Avenue outlet structure.

Photo 9. Chalk Creek looking upstream from outlet structure north of Mae Anne Avenue.

MEMORANDUM

Date:	June 30, 2022
To:	Theresa Jones, City of Reno
From:	Debra Lemke, Scott Kobs, and Sarah Davenport NCE
Subject:	2022 Galena Creek at I-580 Bridge Project Reach Assessment Draft Memorandum

This technical memorandum presents mapped field data, field observations, and preliminary recommendations for restoration and improvement projects along Galena Creek within the project reach beginning immediately upstream and ending immediately downstream of the I-580 bridge (**Appendix A, Figure 1**). The project reach was selected based on a review of the *2020 Watershed Management and Protection Plan for Tributaries to the Truckee River* (2020 Plan) (NCE, 2020) Tributary Project list; this project list was developed in coordination with the Truckee Meadows Stormwater Permit Coordinating Committee as potential projects that may be submitted for 319(h) funding (**Appendix B, Project Count #11**). In addition, Galena Creek has been assessed under previous watershed assessments for tributaries of the Truckee River.

BACKGROUND

Beginning in 2003, watershed assessments have been performed along tributaries of the Truckee River throughout the Truckee Meadows. The tributary assessments were prepared using the Proper Functioning Condition (PFC) methodology presented in the U.S. Department of the Interior Bureau of Land Management document titled *Riparian Area Management, A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas* (BLM, 1998). This methodology evaluates hydrology, vegetation, erosion, and/or deposition to determine the functional rating of the evaluated reach. Tributaries were divided into established reaches and have been assessed on a rotating basis since 2003.

The project reach for the 2022 effort represents a 560 foot section of the larger 10,980 foot Galena Creek Middle Reach (**Appendix A, Figure 1**). The project reach is at the downstream end of the Middle Reach where the creek transitions from a confined channel within a canyon to the valley floor. The Galena Creek Middle Reach was last assessed in 2015 and was given a PFC rating of functional-at-risk. The engineered channel had been identified as a critical point of interest, and photos and observations were documented in 2016 and 2017. The previously documented issues within the 2022 project reach include (**Appendix A, Figure 2**):

- The extent of erosion and undermining of vertical concrete retaining walls has worsened during the period between 2015-2017
- There is active bank cutting upstream and downstream of the engineered channel
- Presence of noxious weeds were documented including tall whitetop (*Lepidium latifolium*), and cheatgrass (*Bromus tectorum*), and goldenrod (*Solidago spp.*)

The 2022 project reach was selected due to the documented undercutting of structural elements of the engineered channel, noxious weeds, and bank cutting.

2022 PROJECT REACH ASSESSMENT

The project reach assessment was conducted on March 22, 2022. While the Lower and Middle Galena Creek reaches have been rated as functional-at-risk, the engineered channel section of the creek has been documented to have several issues as discussed above. The documented issues continue to persist and continued erosion throughout the project reach could result in failure of the engineered channel and contribute significant amounts of sediment to the creek. Failure of the engineered channel could allow for lateral mitigation of Galena Creek that may impact the structural integrity of the I-580 bridge footings. Field observations and mapped areas are presented in **Appendix A, Figure 3** and described below in more detail. Representative photos are located in **Appendix C**, and the photo locations are depicted on **Appendix A, Figure 4**.

Upstream and downstream of the engineered channel are locations where bank cutting appears to be actively eroding the outer meanders of the creek and riparian vegetation is lacking. These sections have steep banks with loose erodible soil.

The creek within the engineered rectangular channel under the I-580 bridge has incised and is now significantly below the vertical concrete walls. The creek has undermined approximately 110 feet of the northern concrete channel wall and 40 feet of the southern channel wall. It is estimated that the concrete wall to the north is suspended up to 6 feet above the existing channel. Access to the northern wall was not possible due to the existing creek flow line and safety concerns. The southern wall was accessible and was measured to be suspended up to 4 feet. The creek has eroded up to 6 feet behind the front face of the northern wall and 3 feet of the southern wall. The creek has been documented to be actively eroding the walls since 2015. Failure of the concrete walls could allow the banks to further unravel under the bridge and further lateral migration of the channel.

Vertical migration of the creek through the engineered reach appears stable due to the presence of bedrock. The upper third of the engineered reach has formed step pools and is vertically stable **(Appendix C, Photo 2 and 4)**. Deposition still occurs after the angle point within the engineered channel.

A storm drain outfall upstream of the I-580 bridge and on the southern side of the channel is being undermined and the outfall pipe is partially blocked with sediment and rocks.

Noxious weeds within the channel were present in the areas of deposition and matched previously mapped extents.

While in the field, Washoe County staff mentioned the existing diversion structure for irrigation and grade control should be investigated in a future assessment.

PRELIMINARY RECOMMENDATIONS

Based on the field work accomplished during the 2022 project reach assessment, below are preliminary recommendations to stabilize this portion of Galena Creek. Specifically, these preliminary recommendations are limited to mitigating future undermining through the engineered channel and further site specific review would need to be completed to know the extent of repairs required. These preliminary recommendations are also depicted on **Appendix A, Figure 5**:

- Repair/stabilize undermined section of the engineered channel
- Stabilize slopes and establish vegetation where active bank cutting is occurring
- Repair undermined riprap outfall and clear debris and rocks from storm drain pipe
- Implement noxious weed control

Table 1 presents a concept-level cost estimate for each of the preliminary recommendations. These concept-level costs are based on professional engineering judgement and GIS was used to estimate quantities.

Table 1. Concept Level Cost Estimate

	CONSTRUCTION COST ESTIMATE			
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Noxious Weed Control (3x Years)	AC	< 1	$3,000.00	$3,000.00
Place Riprap Boulders (Areas of Undermining)	LF	150	$300.00	$45,000.00
Repair Undermined Outfall	LS	1	$2,500.00	$2,500.00
Slope Stabilization & Revegetation Along Channel (Riparian)	SY	200	$90.00	$18,000.00
Slope Stabilization & Revegetation Outside of Channel (Upland)	SY	500	$15.00	$7,500.00
SUBTOTAL				$68,500.00
Totals				
SUBTOTAL				$68,500.00
General Conditions (e.g., Mobilization/Demobilization/Other)			15%	$10,300.00
Construction Contingency			30%	$20,600.00
Price Contingency / Inflation			25%	$17,200.00
Construction Subtotal				$116,600.00
Technical Studies, Planning, Design, Permitting, CM			30%	$6,700.00
			PROJECT TOTAL	**$123,300.00**

Notes:
AC = Acres, LF = Linear Feet, SF = Square Feet
Minimum area of 1 ac used for noxious weed control
Assume riparian areas require placement of cobble / rocks

The 2020 Plan provides the process and framework to propose projects to the Nevada Division of Environmental Protection for 319(h) funding. To support the 319(h) application, a Tributary Project Template was developed (Appendix C of the 2020 Plan) and is further explained in Section 8.0 of the 2020 Plan. This memorandum will support Washoe County's development of a project for 319(h) funding and support completion of the Tributary Project

Template. To find out more information on 319(h) funding please also see NDEP's 319(h) webpage (https://ndep.nv.gov/water/rivers-streams-lakes/nonpoint-source-pollution-management-program/cwa-319h-grants).

Appendix A:

- Figure 1: Project Reach Overview
- Figure 2: Historic Observations (2015, 2016, & 2017)
- Figure 3: Field Observations (2022)
- Figure 4: Photo Locations
- Figure 5: Improvement Concepts

Appendix B: Tributary Project list

Appendix C: Representative Photographs

Appendix A

FIGURE 1: PROJECT REACH OVERVIEW

FIGURE 2: HISTORIC OBSERVATIONS (2015, 2016, & 2017)

FIGURE 3: FIELD OBSERVATIONS (2022)

FIGURE 4: PHOTO LOCATIONS

FIGURE 5: IMPROVEMENT CONCEPTS

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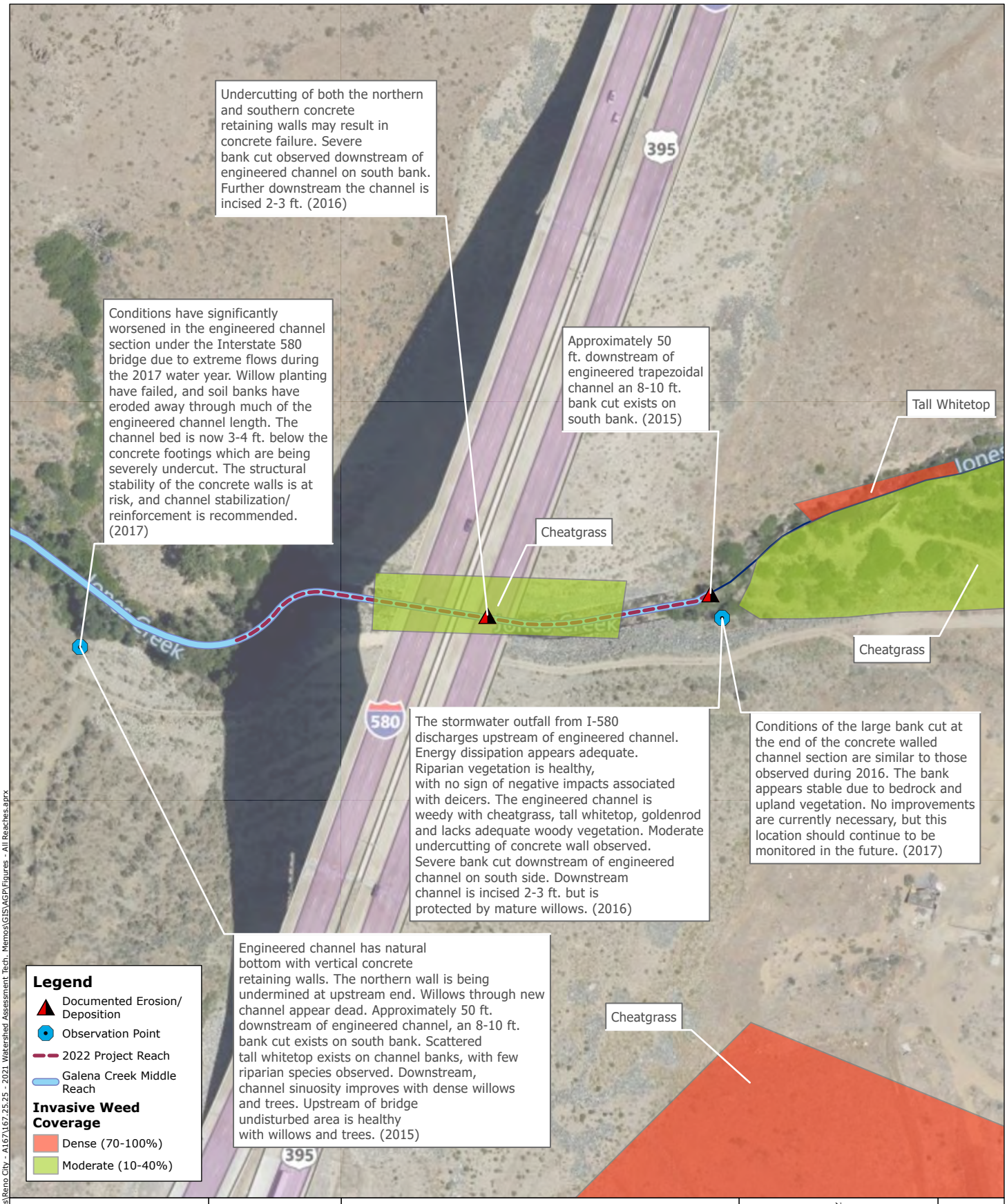
NCE	GALENA CREEK AT I-580 BRIDGE Project Reach Overview	N 1 in. = 1,200 ft. 0 600 1,200 ft.				FIGURE 1
SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED	
Bing Hybrid Basemap	167.25.25	skobs/sdavenport	6/14/2022	6/28/2022	dlemke	



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GALENA CREEK AT I-580 BRIDGE

Historic Observations (2015, 2016, & 2017)

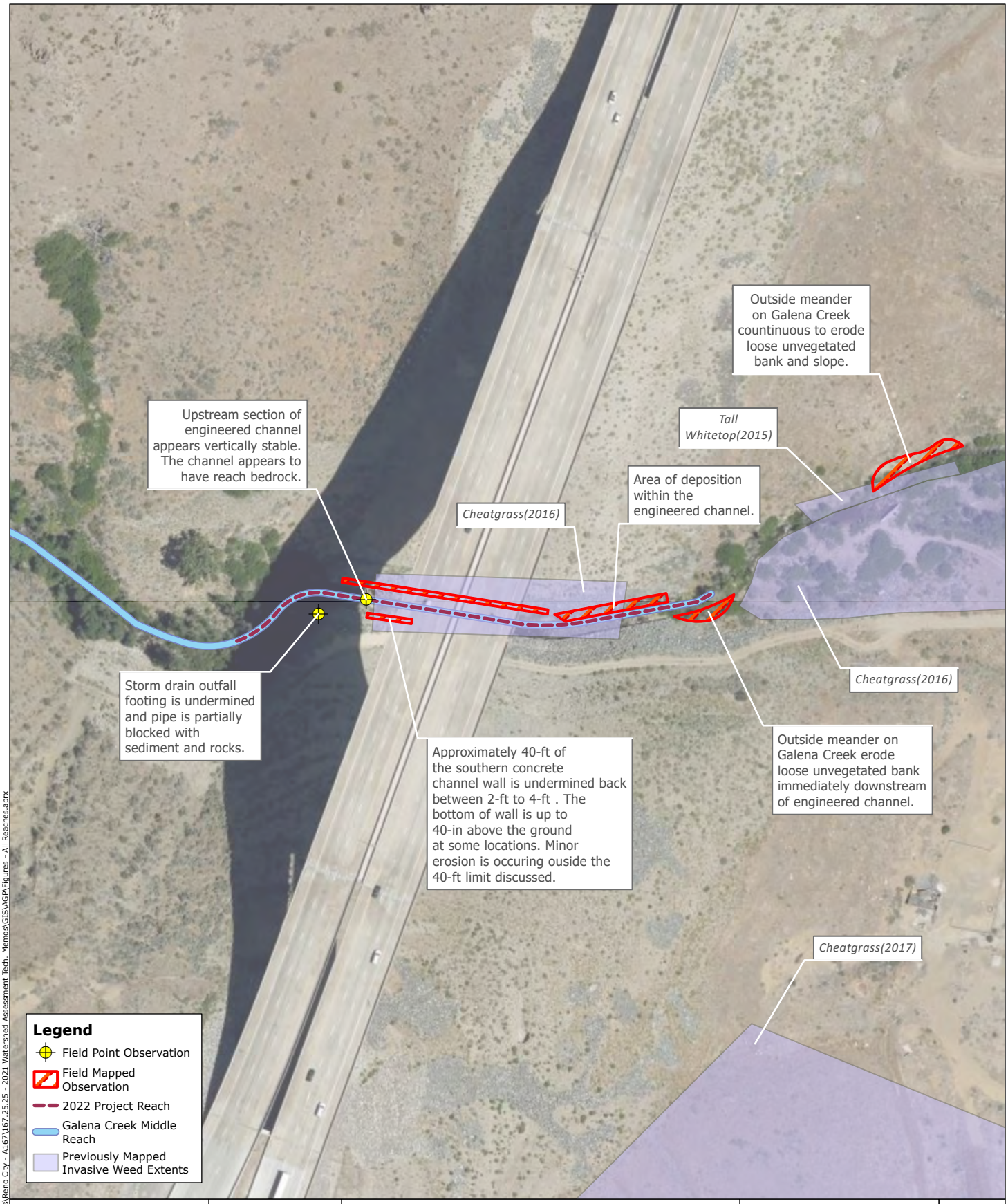
N

1 in. = 150 ft.

0 50 100 150 ft.

FIGURE 2

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Hybrid Basemap; CDM Smith 2015-2017; TMSWPCC	167.25.25	skobs/cvaz	6/17/2022	6/28/2022	dlemke



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GALENA CREEK AT I-580 BRIDGE

Field Observations (2022)

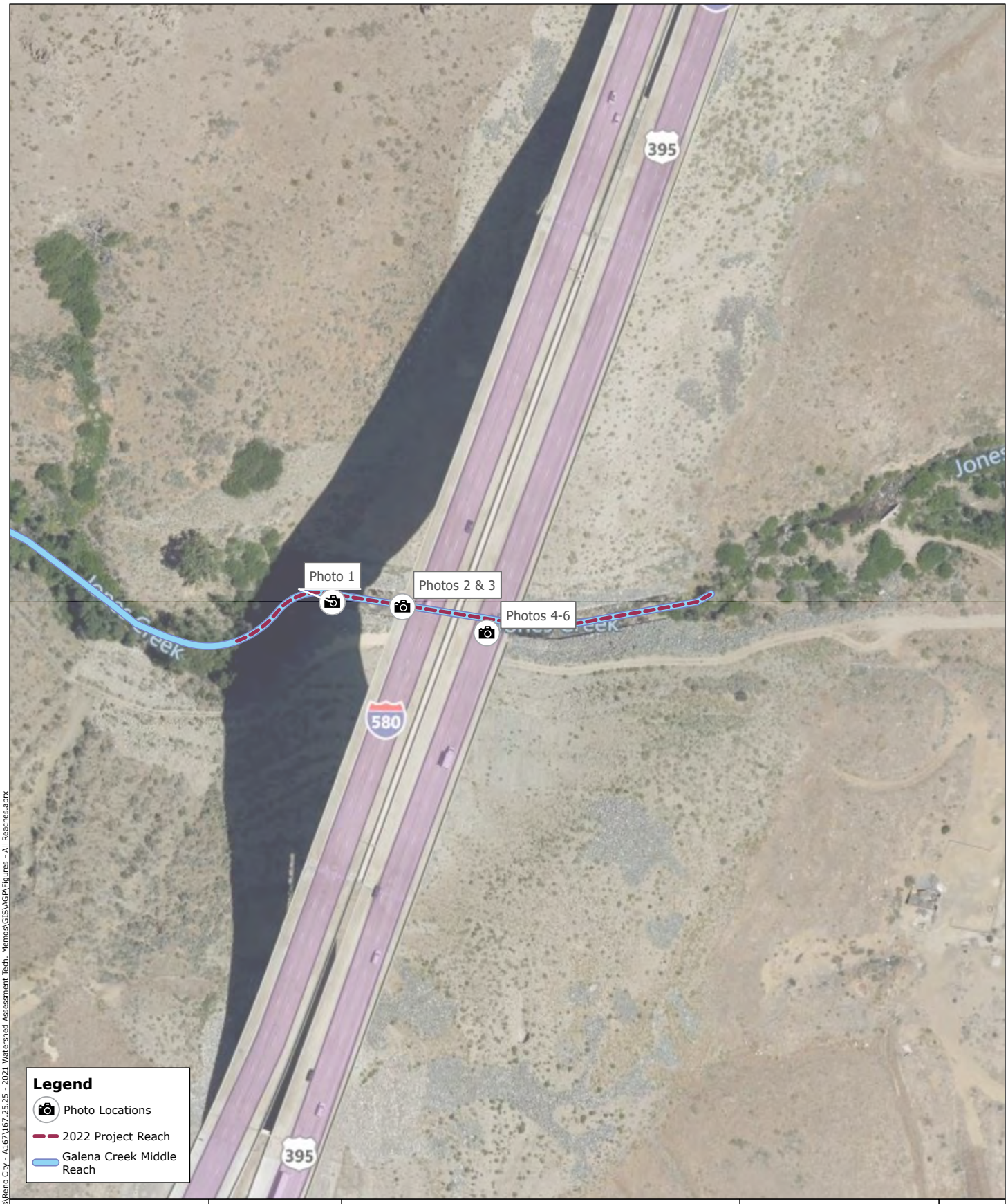
N

1 in. = 150 ft.

0 50 100 150 ft.

FIGURE 3

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Aerial Basemap; CDM Smith 2015-2017; TMSWPCC	167.25.25	skobs/cvaz	6/17/2022	6/24/2022	dlemke



GALENA CREEK AT I-580 BRIDGE

Photo Locations

N

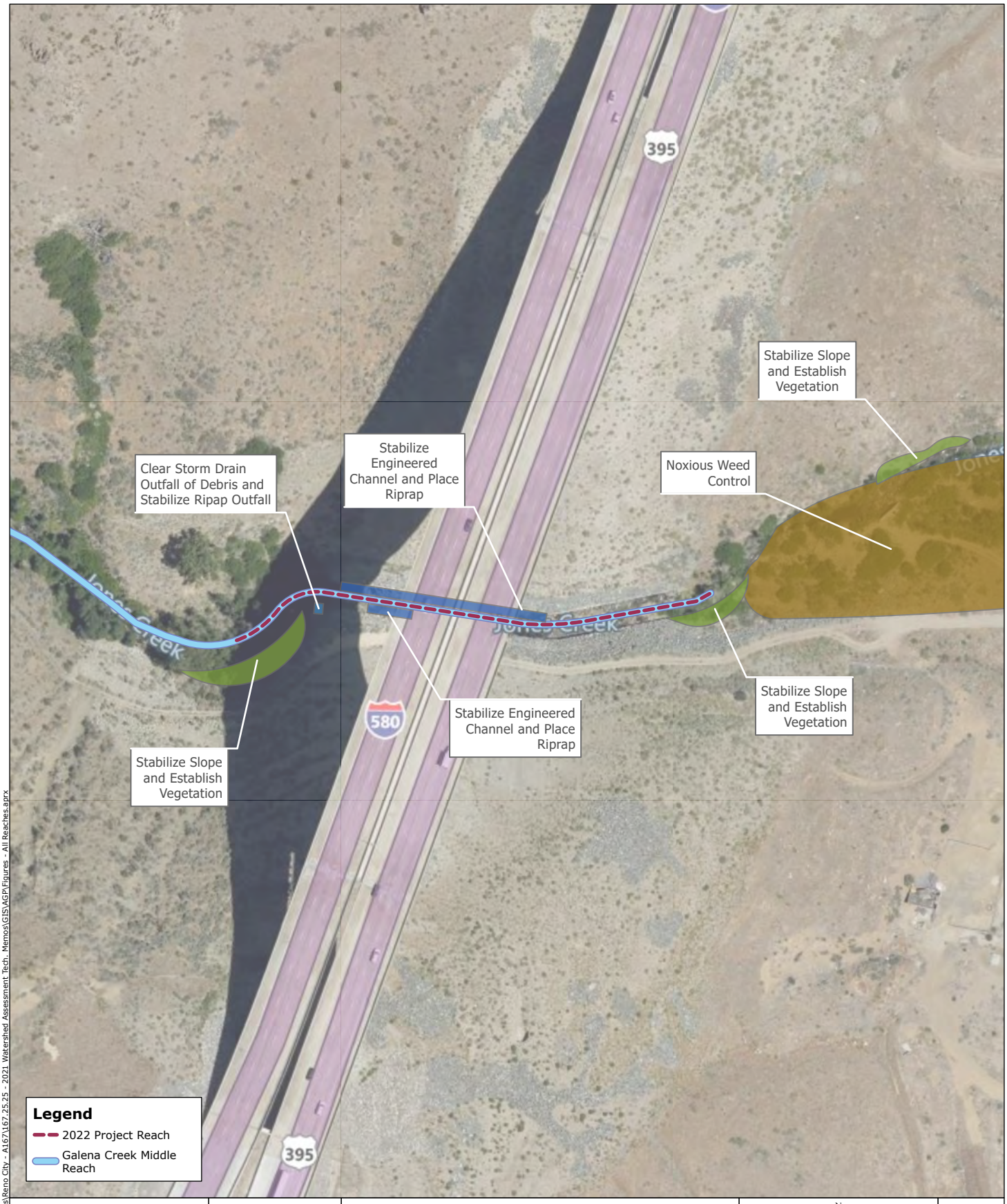
1 in. = 150 ft.

0 50 100 150 ft.

FIGURE 4

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Hybrid Basemap	167.25.25	skobs/cvaz	6/6/2022	6/24/2022	dlemke

Document Path: P:\Active Projects\Reno City - A167\167.25.25 - 2021 Watershed Assessment Tech. Memos\GIS\AGP\Figures - All Reaches.aprx



GALENA CREEK AT I-580 BRIDGE

Improvement Concepts

N

1 in. = 150 ft.

0 75 150 ft.

FIGURE 5

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Hybrid Basemap	167.25.25	skobs/cvaz	6/16/2022	6/28/2022	dlemke

Document Path: P:\Active Projects\Reno City - A167\167.25.25 - 2021 Watershed Assessment Tech. Memos\GIS\AGP\Figures - All Reaches.aprx

Appendix B

TRIBUTARY PROJECT LIST

Appendix B - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

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2	City of Reno	Chalk	Valleywood to Mae Ann	This is a vegetation project with a section devoid of vegetation and subject to erosion.	Remove white top and restore vegetation. A stormwater basin may need to be created. Bank stabilization near multiuse path may be needed.	This is City property. There is an alternative intake upstream of TMWA Chalk Bluff.	TBD	TBD	Proposed

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Appendix C

Representative Photographs

Photo 1. An upstream storm drain outfall is blocked with debris and rocks. The outfall footing is being undermined.

Photo 2. Galena Creek looking upstream in the section of engineered channel under the I-580 bridge. The concrete walls are undermined and stand 4 feet tall. It was estimated that the northern wall (right) has been undermined between 4 and 8 feet from the front face and is suspended up to 6 feet above the existing channel bottom. Access along the way was limited, and observations were made from the southern bank.

Photo 3. Galena Creek looking downstream in the section of engineered channel under the I-580 bridge. Galena Creek is actively migrating laterally within the section of engineered channel and eroding under the concrete walls on both banks.

Photo 4. Looking upstream from outside the engineered channel.

Photo 5. Looking north at the engineered channel.

Photo 6. Looking downstream from outside the engineered channel.

MEMORANDUM

Date:	June 30, 2022
To:	Theresa Jones, City of Reno
From:	Debra Lemke, Scott Kobs, and Sarah Davenport, NCE
Subject:	2022 Jones Creek Callahan Ranch Road Project Reach Assessment Draft Memorandum

This technical memorandum presents mapped field data, field observations, and preliminary recommendations for restoration and improvement projects along Jones Creek within the project reach between Callahan Ranch Road to Galena Creek (**Appendix A, Figure 1**). The project reach was selected based on a review of the *2020 Watershed Management and Protection Plan for Tributaries to the Truckee River* (2020 Plan) (NCE, 2020) Tributary Project list; this project list was developed in coordination with the Truckee Meadows Stormwater Permit Coordinating Committee as potential projects that may be submitted for 319(h) funding (**Appendix B, Project Count #12**). In addition, Jones Creek has been assessed under previous watershed assessments for tributaries of the Truckee River.

BACKGROUND

Beginning in 2003, watershed assessments have been performed along tributaries of the Truckee River throughout the Truckee Meadows. The tributary assessments were prepared using the Proper Functioning Condition (PFC) methodology presented in the U.S. Department of the Interior Bureau of Land Management document titled Riparian Area Management, A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas (BLM, 1998). This methodology evaluates hydrology, vegetation, erosion, and/or deposition to determine the functional rating of the evaluated reach. Tributaries were divided into established reaches and have been assessed on a rotating basis since 2003.

The project reach for the 2022 effort represents a 1,700-foot section of the larger 3,925-foot Jones Creek Lower Reach (**Appendix A, Figure 1**). The Jones Creek Lower Reach was last assessed in 2015 and was given a PFC rating of nonfunctional. The Lower Reach includes the following previously documented issues within the 2022 project reach (**Appendix A, Figure 2**):

- The channel downstream of Callahan Ranch Road to the confluence with Galena Creek is incised between 5 to 6 feet
- Significant bank cutting has been observed throughout the creek, where slopes are unprotected. In unprotected areas, steep banks are eroding and there is widening of the channel and floodplain
- The channel alignment, banks, and floodplain are moderately weedy

- There is noxious weed presence of knapweed (Centaurea spp.), curly dock (*Rumex crispus*), tall whitetop (*Lepidium latifolium*), and thistle

The 2022 project reach was selected due to the documented channel incision and the presence of noxious weeds.

2022 Project Reach Assessment

Jones Creek was only observed from Callahan Ranch Road because access was not secured with the private landowners and the project reach is fully on private property. In total, there are three private parcels located on the south side of Jones Creek and nine private parcels on the north side. Due to limited access, PFC was not conducted for the 2022 project reach. Representative photographs were taken, and observation points were recorded from Callahan Ranch Road.

The project reach assessment was conducted on March 22, 2022. Overall, the project reach remains nonfunctional as previously documented issues persist. Downstream of Callahan Ranch Road the channel banks remain near vertical, between 5 to 7 feet high. The severely incised channel remains disconnected from the historic floodplain.

Upstream of Callahan Ranch Road the channel runs parallel to the road in a straightened channel before flowing into two culverts under Callahan Ranch Road. The channel runs perpendicular to the culvert crossings. A 36-inch by 54-inch corrugated metal pipe (CMP) arch conveys low flows, and a secondary 36-inch diameter concrete pipe conveys high flows. The inverts of the 36-inch pipe are set above the CMP arch. There is a 32-inch vertical drop from the outfall of the CMP culvert to the flowline of Jones Creek. The outfall appears stable with large boulders.

In addition, some stream banks visible from the road lacked riparian vegetation.

Field observations are presented in **Appendix A, Figure 3**. Representative photos are located in **Appendix C,** and the photo locations are depicted on **Appendix A, Figure 4.**

Due to a lack of access, a desktop review was conducted and is presented below.

Desktop Review

A high-level desktop review of available aerial imagery was competed due to the lack of access during the 2022 site visit. The 2022 project reach is located completely within private property. The desktop review complements field observations that were made from public right-of-way and previously completed assessments.

Significant lateral migration of Jones Creek can be seen within the aerial imagery historical record. Four snapshots taken from Google Earth above the confluence with Galena Creek show the channel evolution from June 2016 to November 2018, see below. The largest change can be seen on the below images between the June 2018 and November 2018 dates. On July 20, 2018, 1.29 inches of precipitation was recorded at the Reno-Tahoe Airport. This was the largest event recorded between June 2018 and November 2018. Looking at one section of bank (indicated within the red oval on the November 2018 image) approximately 150 square feet of bank was eroded and assuming a bank height of 5 to 7

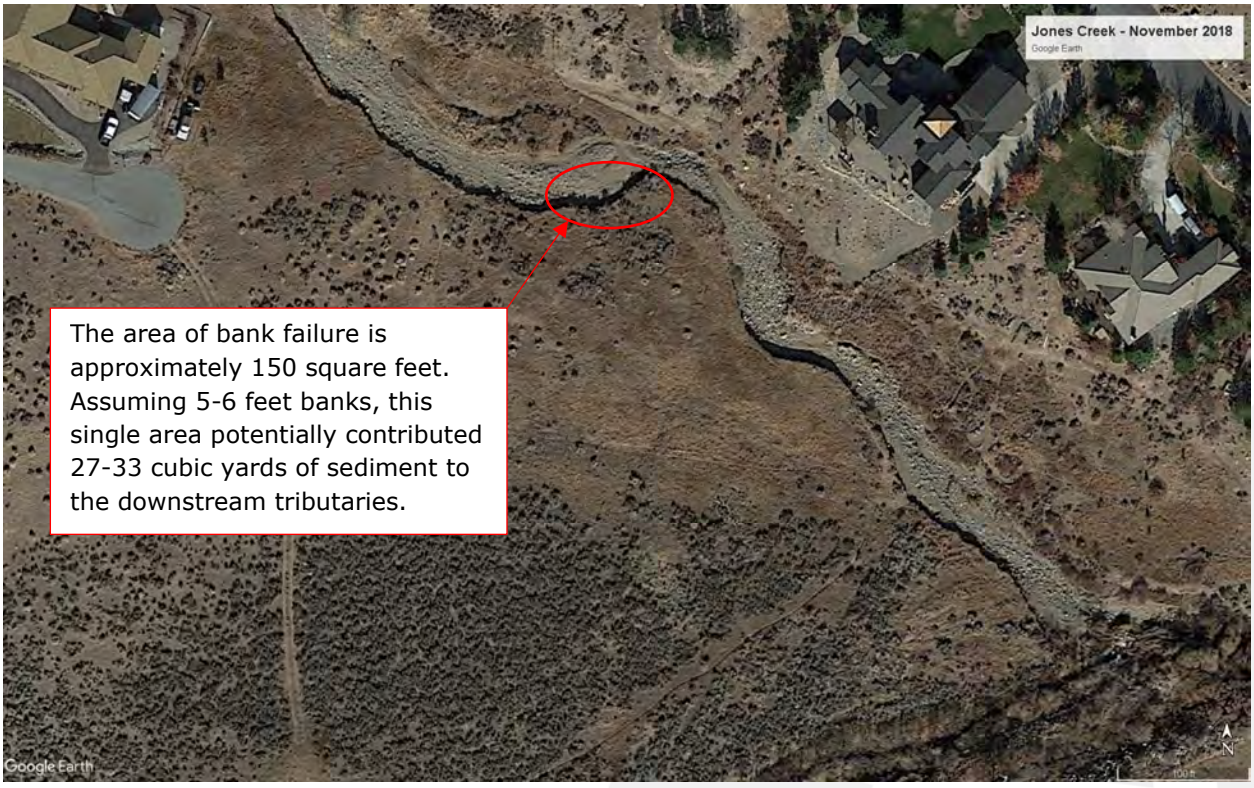
feet, a range based on previous tributary assessments, between 30 to 40 cubic yards of sediment were potentially pushed through the downstream tributaries.

No headcuts were documented during the previous 2015 tributary assessment. These observations suggest the reach is vertically stable from the confluence of Galena Creek to Callahan Ranch Road. However, during large events lateral migration of the channel and widening of the new lower floodplain occurs. It is expected that these changes will persist until an adequately sized accessible lower floodplain is established within the incised channel. The channel has become disconnected from the historic floodplain and will continue to form a new lower floodplain within the channel. Future peak flows and large precipitation events will continue to shape this channel and new lower floodplain.


Jones Creek - June 2016
Google Earth
Google Earth
N


Jones Creek - August 2017
Google Earth
Google Earth
N


Jones Creek - June 2018
Google Earth
Google Earth
N


Jones Creek - November 2018
Google Earth
The area of bank failure is approximately 150 square feet. Assuming 5-6 feet banks, this single area potentially contributed 27-33 cubic yards of sediment to the downstream tributaries.
Google Earth
N

PRELIMINARY RECOMMENDATIONS

Based on the field work and desktop review accomplished for the 2022 project reach assessment, below are preliminary recommendations to stabilize this portion of Jones Creek. Specifically, these preliminary recommendations have the potential to reduce creek velocities and lateral migration of the channel as well as reducing erosion and downstream sediment loading. These preliminary recommendations are also depicted on **Appendix A, Figure 5**:

- Establish riparian vegetation on unvegetated banks and within the newly formed lower floodplain
- Alternatively, existing banks could be regraded and the channel widened prior to establishing vegetation within the reach

Any improvements along the channel would require coordination with the 13 private property owners.

Table 1 presents a concept level cost estimate for each of the preliminary recommendations. These concept-level costs were prepared using professional engineering judgement and GIS to estimate quantities.

Table 1. Concept Level Cost Estimate

	CONSTRUCTION COST ESTIMATE			
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Base Item				
Revegetate Lower Floodplain Meanders (Riparian)	LF	1,700	$10.00	$17,000.00
SUBTOTAL				$17,000.00
Alternative 1 - Regrade Cut Banks & Revegetate				
Grading (Regrade Vertical Banks)	CY	5,700	$25.00	$142,500.00
Slope Stabilization & Revegetation Outside of Floodplain (Upland)	SY	6,200	$15.00	$93,000.00
SUBTOTAL				$235,500.00
Totals			**Base Items**	**Base + Alt 1**
SUBTOTAL			$17,000.00	$235,500.00
General Conditions (e.g., Mobilization/Demobilization/Other)		15%	$2,600.00	$35,400.00
Construction Contingency		30%	$5,100.00	$70,700.00
Price Contingency / Inflation		25%	$4,300.00	$58,900.00
Construction Subtotal			$29,000.00	$400,500.00
Technical Studies, Planning, Design, Permitting, CM		30%	$8,700.00	$120,200.00
		PROJECT TOTAL	**$37,700.00**	**$520,700.00**

Notes:

CY = Cubic Yard, LF = Linear Feet, SY = Square Yard

Alt 1 Assumptions: Riparian vegetation will occur within existing channel along the outside edge of meanders

Alt 2 Assumptions: Grading quantity assume average channel incision of 5.5-ft and target side slope of 3:1 for both left and right bank

A project reach of 1,700-ft was used for estimating quantities

Assume riparian planting areas does not require import of materials such as large cobble / rocks

The 2020 Plan provides the process and framework to propose projects to the Nevada Division of Environmental Protection for 319(h) funding. To support the 319(h) application, a Tributary Project Template was developed (Appendix C of the 2020 Plan) and is further explained in Section 8.0 of the 2020 Plan. This memorandum will support the Washoe County's development of a project for 319(h) funding and support completion of the Tributary Project Template. To find out more information on 319(h) funding please also see NDEP's 319(h) webpage (https://ndep.nv.gov/water/rivers-streams-lakes/nonpoint-source-pollution-management-program/cwa-319h-grants).

Appendix A:

- Figure 1: Project Reach Overview
- Figure 2: Historic Observations (2015)
- Figure 3: Field Observations (2022)
- Figure 4: Photo Locations
- Figure 5: Improvement Concepts

Appendix B: Tributary Project list

Appendix C: Representative Photographs

Appendix A

FIGURE 1: PROJECT REACH OVERVIEW
FIGURE 2: HISTORIC OBSERVATIONS (2015)
FIGURE 3: FIELD OBSERVATIONS (2022)
FIGURE 4: PHOTO LOCATIONS
FIGURE 5: IMPROVEMENT CONCEPTS

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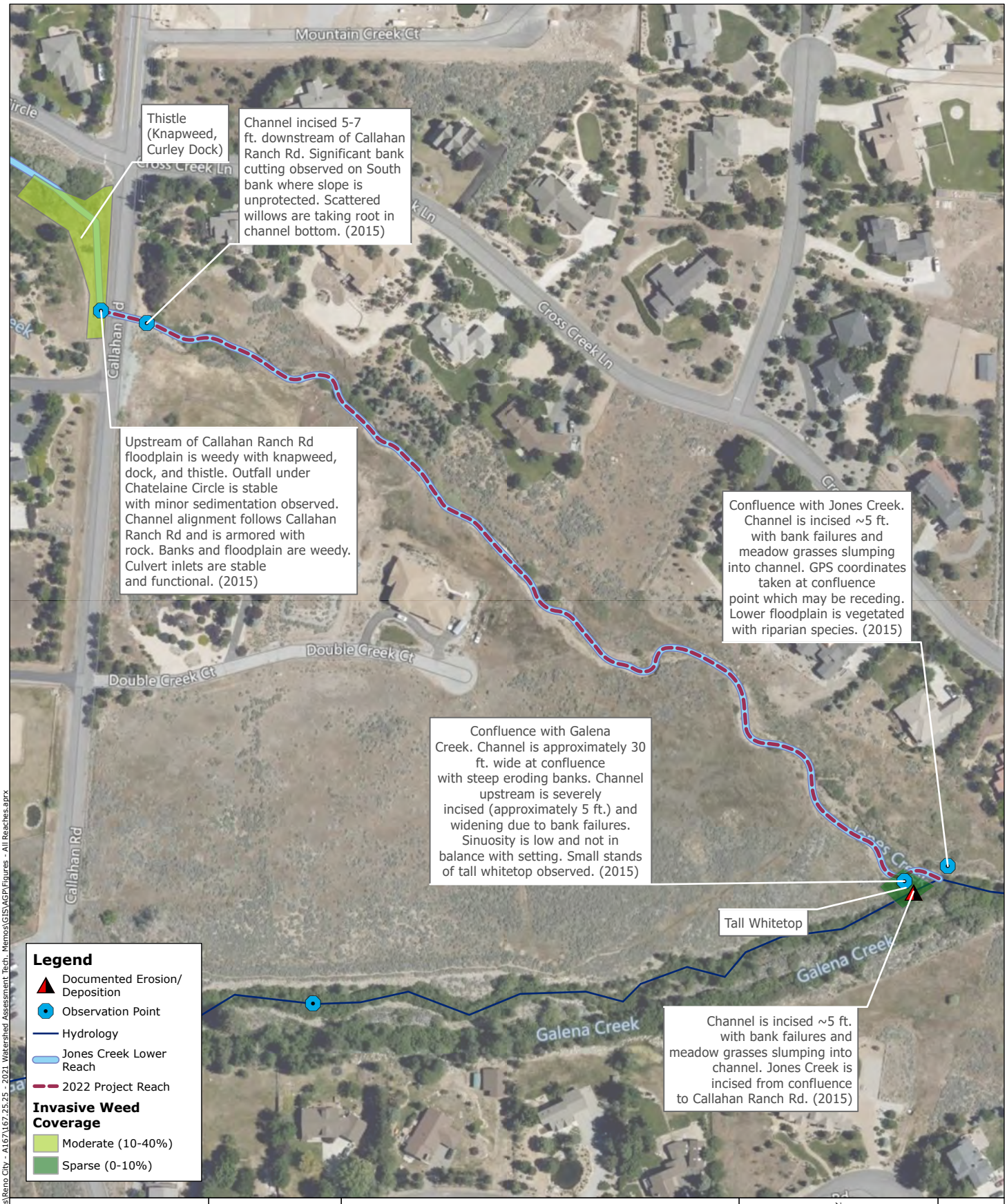
	JONES CREEK Project Reach Overview	N 1 in. = 500 ft. 0 250 500 ft.	FIGURE 1			
SOURCE Bing Hybrid Basemap	JOB NUMBER 167.25.25	DRAWN skobs/sdavenport	DATE 6/14/2022	REVISED 6/29/2022	APPROVED dlemke	



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JONES CREEK

Historic Observations (2015)

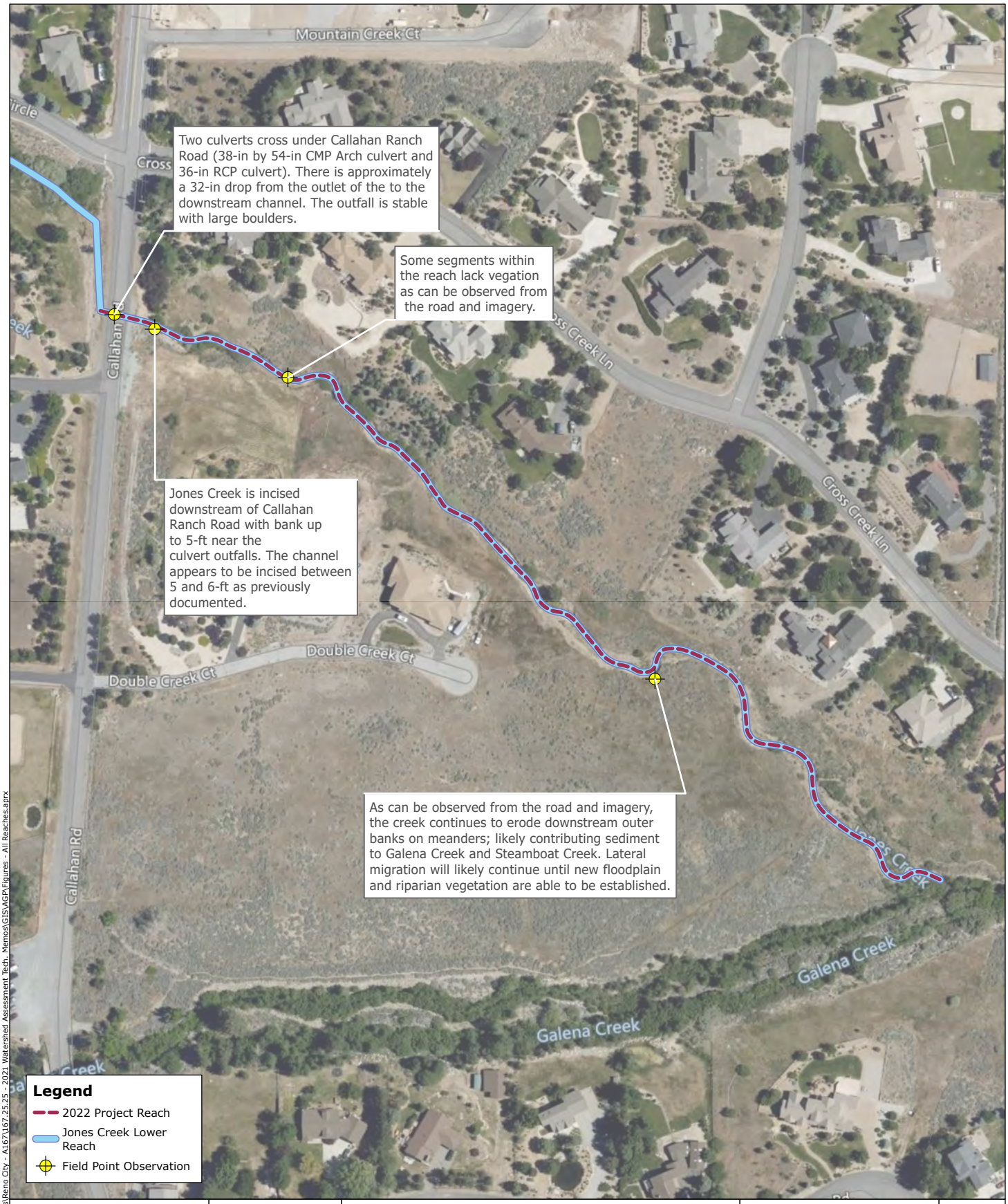
N

1 in. = 200 ft.

0 100 200 ft.

FIGURE 2

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Hybrid Basemap; CDM Smith 2015; TMSWPCC	167.25.25	skobs	6/14/2022	6/29/2022	dlemke



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JONES CREEK

Field Observations (2022)

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FIGURE 3

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Aerial Basemap	167.25.25	skobs/cvaz	6/14/2022	6/29/2022	dlemke

Document Path: P:\Active Projects\Reno City - A167\167.25.25 - 2021 Watershed Assessment Tech. Memos\GIS\AGP\Figures - All Reaches.aprx

	JONES CREEK Photo Locations	N 1 in. = 200 ft. 0 100 200 ft.	FIGURE 4			
SOURCE Bing Aerial Basemap	JOB NUMBER 167.25.25	DRAWN skobs/sdavenport	DATE 6/6/2022	REVISED 6/29/2022	APPROVED dlemke	

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Appendix B

Tributary Project List

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Appendix C

Representative Photographs

Photo 1. Upstream of Callahan Ranch Road, Jones Creek runs parallel to the road. The channel is lined with large cobble and check dams are present.

Photo 2. A 38-inch by 54-inch arch corrugated metal pipe (CMP) and 36-inch concrete culvert convey flow under Callahan Ranch Road. The CMP culvert inverts are set below the concrete culvert and convey low flows.

Photo 3. Looking downstream from Callahan Ranch Road. Willows are present on the left bank. The right bank is eroding and is approximately 5-feet tall.

MEMORANDUM

Date:	June 30, 2022
To:	Theresa Jones, City of Reno
From:	Debra Lemke, Scott Kobs, and Sarah Davenport, NCE
Subject:	2022 North Truckee Drain Spanish Springs Dam to Disc Drive Project Reach Assessment Draft Memorandum

This technical memorandum presents mapped field data, field observations, and recommendations for restoration and improvement projects along the North Truckee Drain within the project reach between Spanish Springs Dam and Disc Drive (**Appendix A, Figure 1**). The project reach was selected based on a review of the *2020 Watershed Management and Protection Plan for Tributaries to the Truckee River* (2020 Plan) (NCE, 2020) Tributary Project list; this project list was developed in coordination with the Truckee Meadows Stormwater Permit Coordinating Committee as potential projects that may be submitted for 319(h) funding (**Appendix B, Project Count #8**). In addition, the North Truckee Drain has been assessed under previous watershed assessments for tributaries of the Truckee River.

BACKGROUND

Beginning in 2003, watershed assessments have been performed along tributaries of the Truckee River throughout the Truckee Meadows. The tributary assessments were prepared using the Proper Functioning Condition (PFC) methodology presented in the U.S. Department of the Interior Bureau of Land Management document titled *Riparian Area Management, A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas* (BLM, 1998). This methodology evaluates hydrology, vegetation, erosion, and/or deposition to determine the functional rating of the evaluated reach. Tributaries were divided into established reaches and have been assessed on a rotating basis since 2003.

The project reach for the 2022 effort represents a 10,185-foot section of the North Truckee Drain (**Appendix A, Figure 1**). The project reach is split across the North Truckee Drain Upper (A) Reach and Middle (B) Reach. Approximately 6,105-feet of the larger 14,860-foot Upper (A) Reach and 4,080-feet of the larger 7,195-foot Middle (B) Reach were assessed. The Upper (A) Reach was last assessed in 2015 and the Lower (B) Reach was last assessed in 2016. Both reaches were given a PFC rating of functional-at-risk. The two reaches include the following previously documented issues within the 2022 project reach (**Appendix A, Figures 2A and 2B**):

- Presence of noxious weeds were documented including tall whitetop (*Lepidium latifolium*), cheatgrass (*Bromus tectorum*), salt cedar (*Tamarix* sp.), purple loosestrife (*Lythrum salicaria*), Russian thistle (*Salsola tragus*), Russian olive (*Elaeagnus angustifolia*), and smotherweed (*Bassia* sp.)
- Erosion areas with loose, unvegetated soil and aggregate base

The 2022 project reach was selected due to the presence of non-native vegetation.

2022 Project Reach Assessment

The PFC methodology was used to evaluate hydrology, vegetation, and erosion/deposition within the project reach to maintain consistency with previous assessment efforts. In addition, representative photographs were taken, and observation points were recorded.

The project reach assessment was conducted on March 1, 2022. Overall, the project reach remains functional-at-risk as previously documented noxious weed issues persist. In general, the constructed channel appears to be in balance with its setting.

Noxious weeds still dominate a significant portion of the channel throughout the project reach. In two locations previously unmapped purple loosestrife infestations were documented. Continued expansion of the purple loosestrife will continue to dominate the reach and outcompete native vegetation. In some areas (**Appendix C, Photo 6**) mowing/cutting serves as weed control. Only new noxious weed infestations were mapped. Existing infestations and mapping were used to determine where areas of potential expansion of invasives are occurring.

Previously documented unvegetated areas with loose soil persist. Smotherweed was not observed in these areas likely due to the season that the assessment was completed.

Stockpiles of loose soil and yard debris were observed along the channel edge along the Kiley Ranch Golf Course (**Appendix C, Photo 3**).

Field observations and mapped areas are presented in **Appendix A, Figures 3A and 3B**. Representative photos are located in **Appendix C**, and the photo locations are depicted on **Appendix A, Figure 4**.

Recommendations

Based on the field work accomplished during the 2022 project reach assessment, below are recommendations for this reach of the North Truckee Drain. Specifically, these recommendations will increase vegetation complexity through noxious weed control and limit potential point source sediment and nutrient loading issues:

- Implement noxious weed control
- Public outreach and education / best management practices implementation at Kiley Ranch Golf Course

Table 1 presents a concept level cost estimate for each of the recommendations. These concept-level costs were prepared using professional engineering judgement and GIS to estimate quantities.

Table 1. Concept Level Cost Estimate

Item	COST ESTIMATE			
	Unit	**Quantity**	**Unit Cost**	**Total**
Noxious Weed Control (3x Years)	AC	15	$3,000.00	$45,000.00
SUBTOTAL				$45,000.00
Total				
SUBTOTAL				$45,000.00
General Conditions (e.g., Mobilization/Demobilization/Other)			15%	$6,800.00
Construction Contingency			30%	$13,500.00
Price Contingency / Inflation			25%	$11,300.00
Construction Subtotal				$76,600.00
Contractor Coordination and Management			15%	$3,400.00
			PROJECT TOTAL	**$80,000.00**

Note: AC = Acre

The 2020 Plan provides the process and framework to propose projects to the Nevada Division of Environmental Protection for 319(h) funding. To support the 319(h) application, a Tributary Project Template was developed (Appendix C of the 2020 Plan) and is further explained in Section 8.0 of the 2020 Plan. This memorandum will support the City of Spark's development of a project for 319(h) funding and support completion of the Tributary Project Template. To find out more information on 319(h) funding please also see NDEP's 319(h) webpage (https://ndep.nv.gov/water/rivers-streams-lakes/nonpoint-source-pollution-management-program/cwa-319h-grants).

Appendix A:

Figure 1: Project Reach Overview

Figure 2A: Historic Observations Upper (A) Reach (2016)

Figure 2B: Historic Observations Middle (B) Reach (2015)

Figure 3A: Field Observations Upper (A) Reach (2022)

Figure 3B: Field Observations Middle (B) Reach (2022)

Figure 4: Photo Locations

Appendix B: Tributary Project list

Appendix C: Representative Photographs

Appendix A

FIGURE 1: PROJECT REACH OVERVIEW

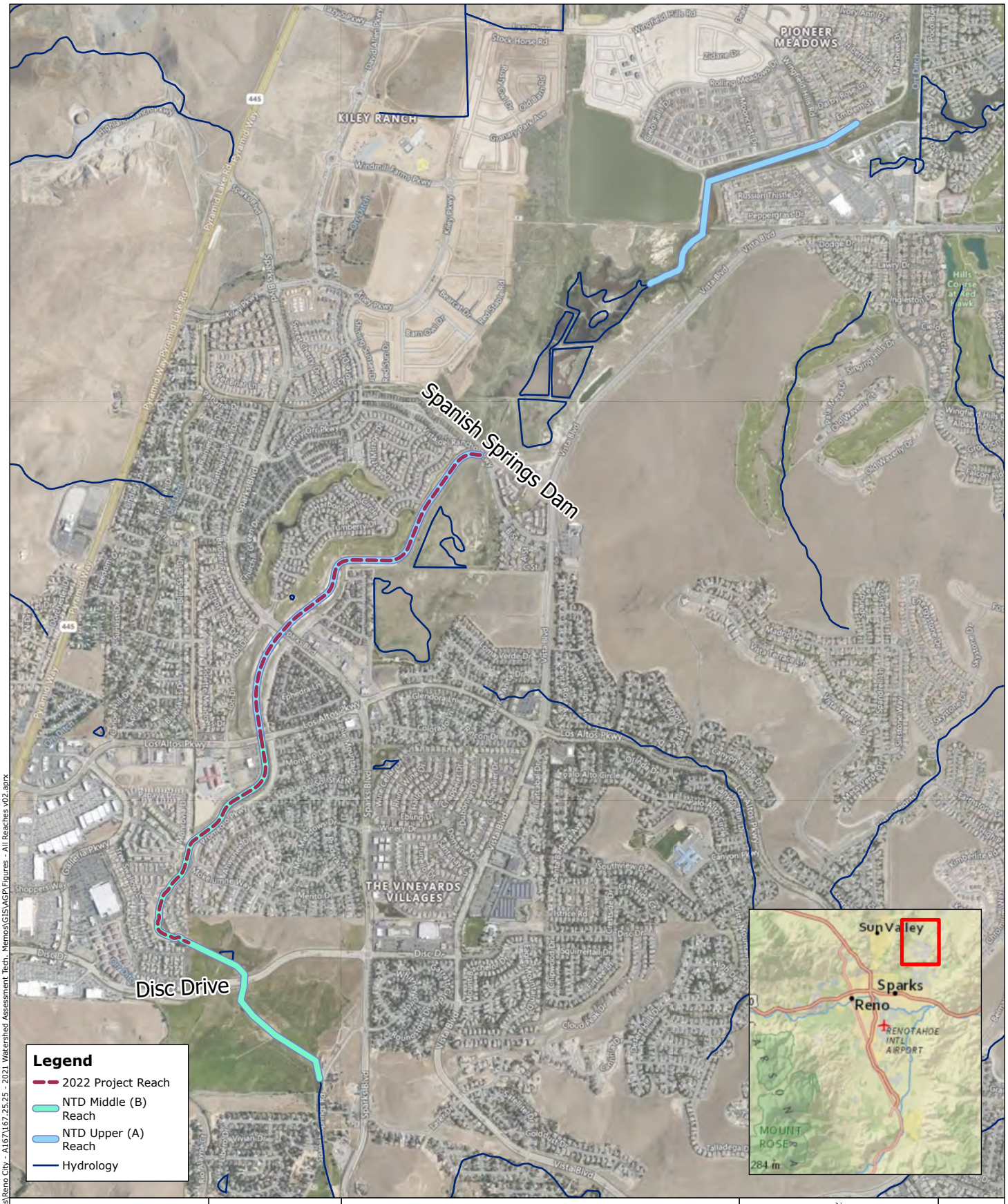
FIGURE 2A: HISTORIC OBSERVATIONS UPPER (A) REACH (2016)

FIGURE 2B: HISTORIC OBSERVATIONS MIDDLE (B) REACH (2015)

FIGURE 3A: FIELD OBSERVATIONS UPPER (A) REACH (2022)

FIGURE 3B: FIELD OBSERVATIONS MIDDLE (B) REACH (2022)

FIGURE 4: PHOTO LOCATIONS



NORTH TRUCKEE DRAIN (NTD)

Project Reach Overview

N

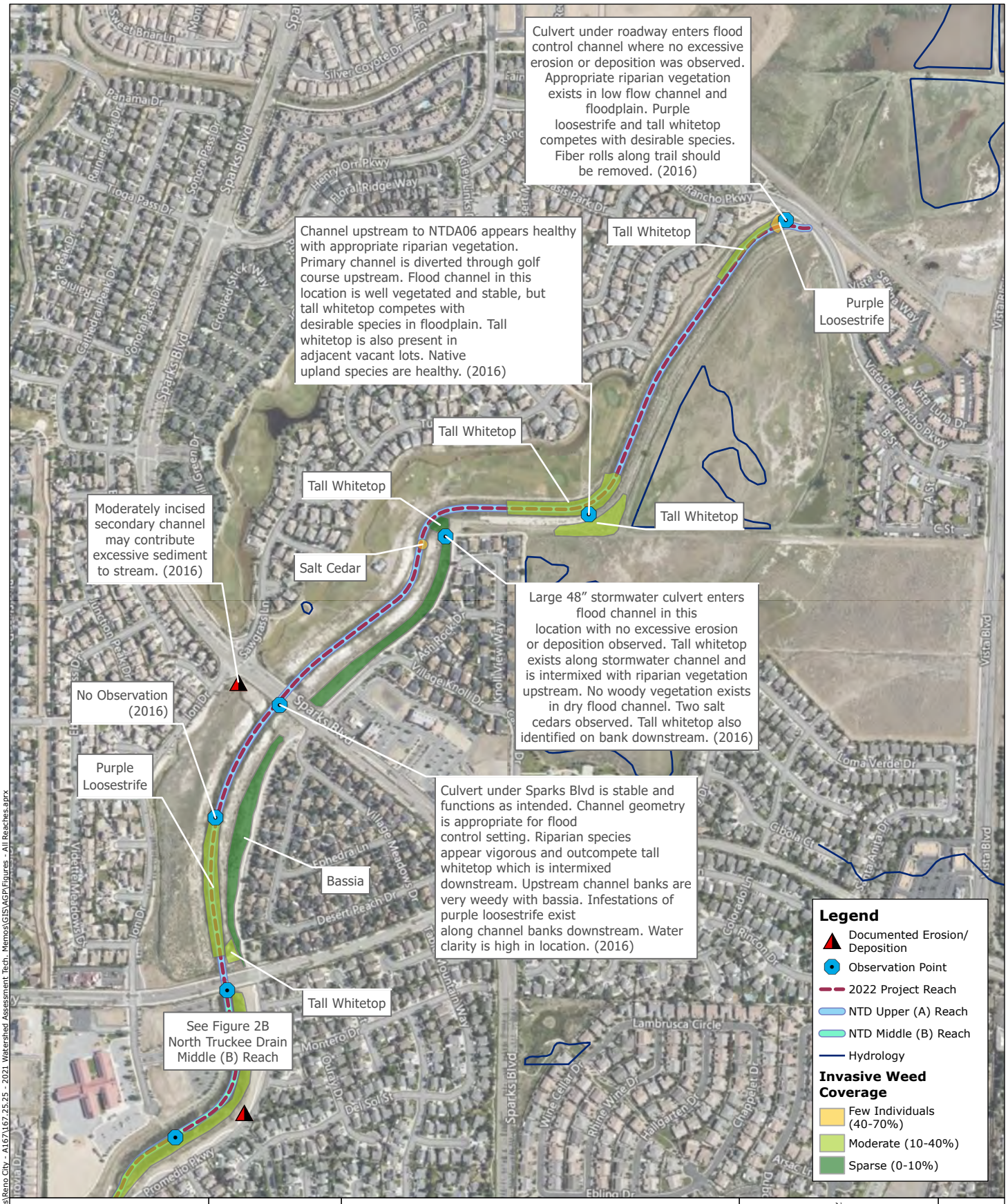
1 in. = 2,000 ft.

0 1,000 2,000 ft.

FIGURE 1

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Hybrid Basemap	167.25.25	skobs/sdavenport	6/14/2022	6/28/2022	dlemke

Document Path: P:\Active Projects\Reno City - A167\167.25.25 - 2021 Watershed Assessment Tech. Memos\GIS\AGP\Figures - All Reaches v02.aprx



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NORTH TRUCKEE DRAIN

Historic Observations Upper (A) Reach (2016)

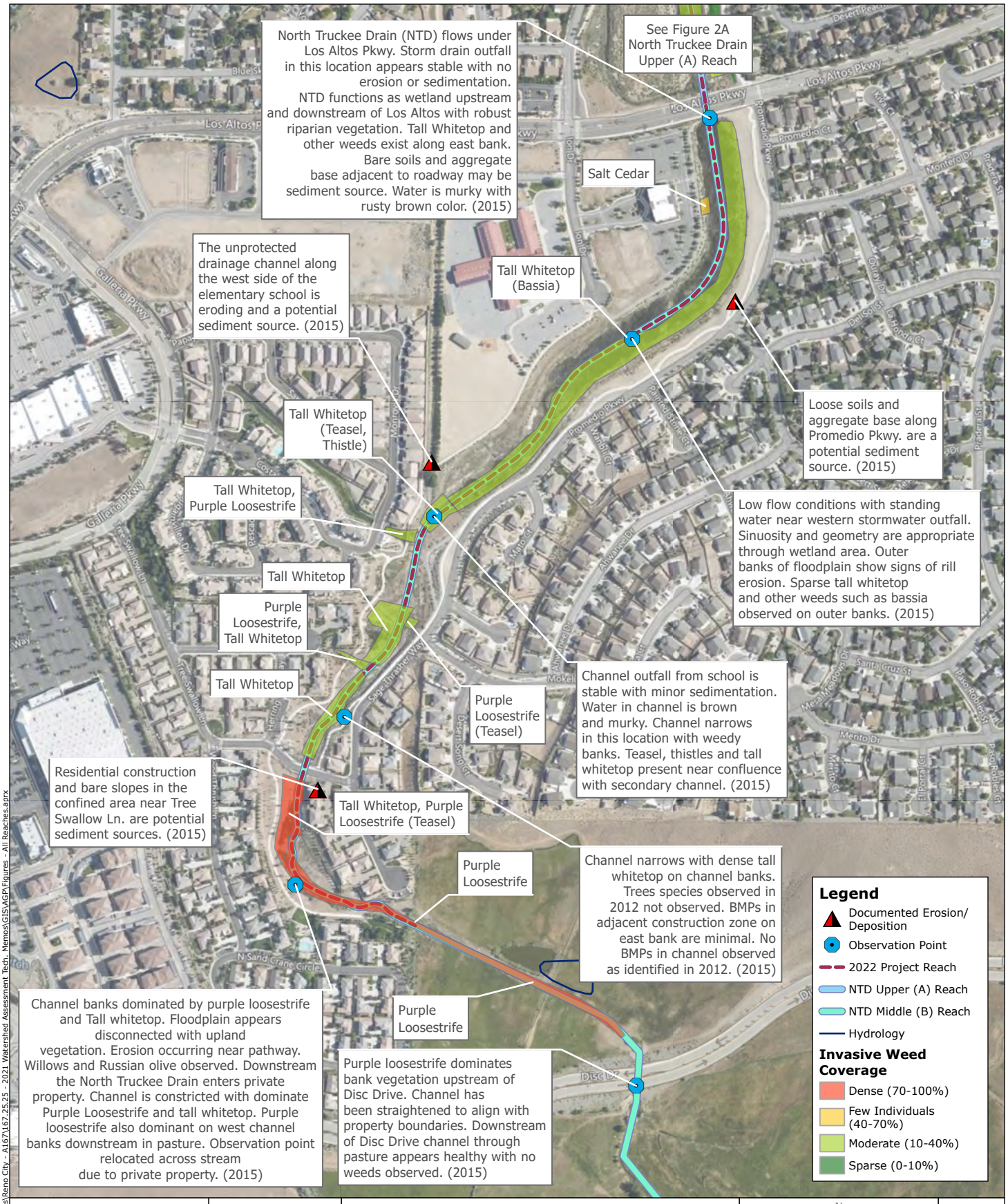
N

1 in. = 750 ft.

0 375 750 ft.

FIGURE 2A

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Aerial Basemap	167.25.25	skobs/sdavenport	6/14/2022	6/28/2022	dlemke



NORTH TRUCKEE DRAIN

Historic Observations Middle (B) Reach (2015)

N

1 in. = 500 ft.

0 250 500 ft.

FIGURE 2B

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Hybrid Basemap; CDM Smith 2015; TMSWPCC	167.25.25	skobs/sdavenport	6/14/2022	6/28/2022	dlemke

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NORTH TRUCKEE DRAIN

Field Observations Upper (A) Reach (2022)

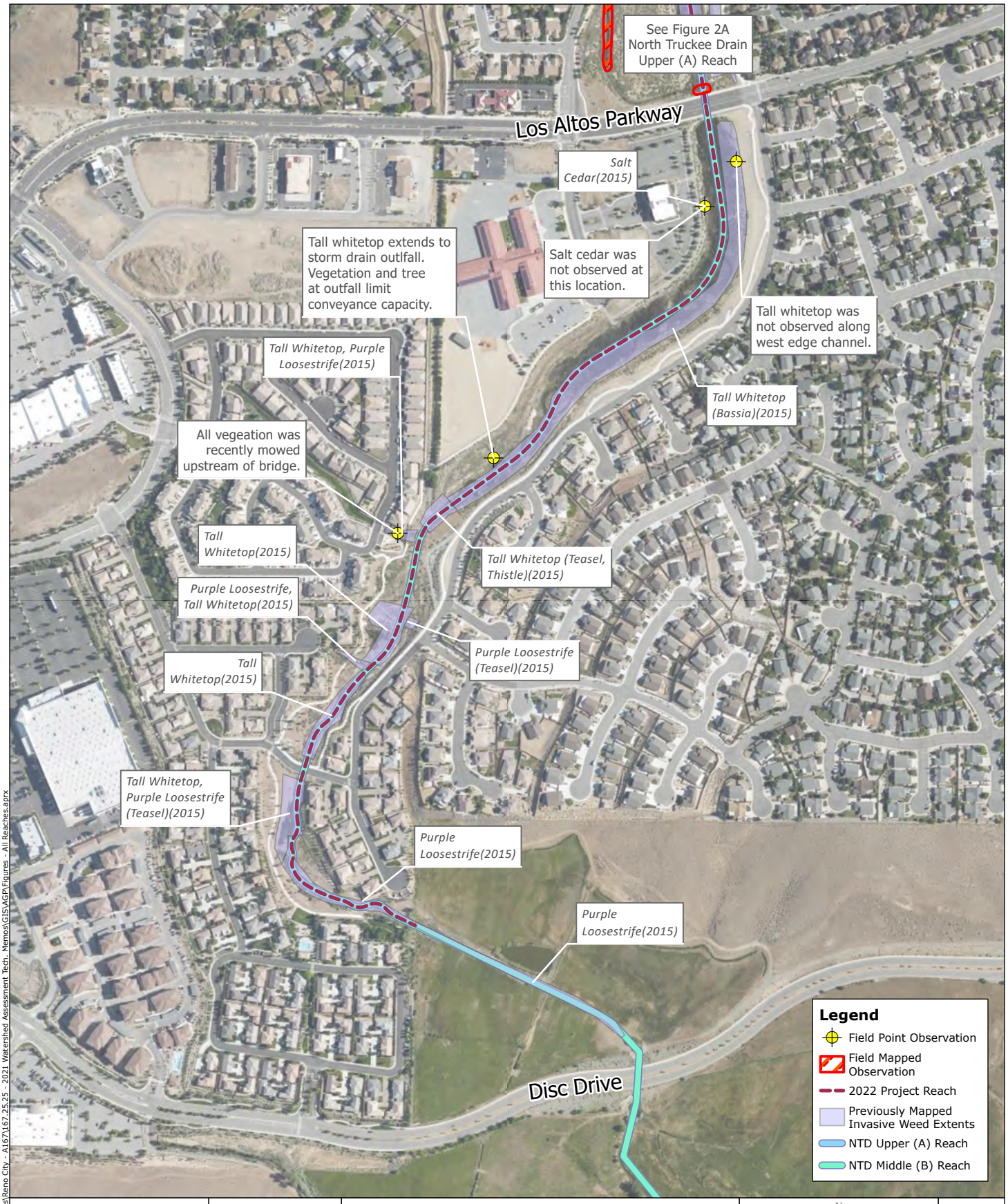
N

1 in. = 750 ft.

0 250 500 750 ft.

FIGURE 3A

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Aerial Basemap; CDM Smith 2016; TMSWPCC	167.25.25	skobs/sdavenport	6/17/2022	6/24/2022	dlemke



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NORTH TRUCKEE DRAIN

Field Observations Middle (B) Reach (2022)

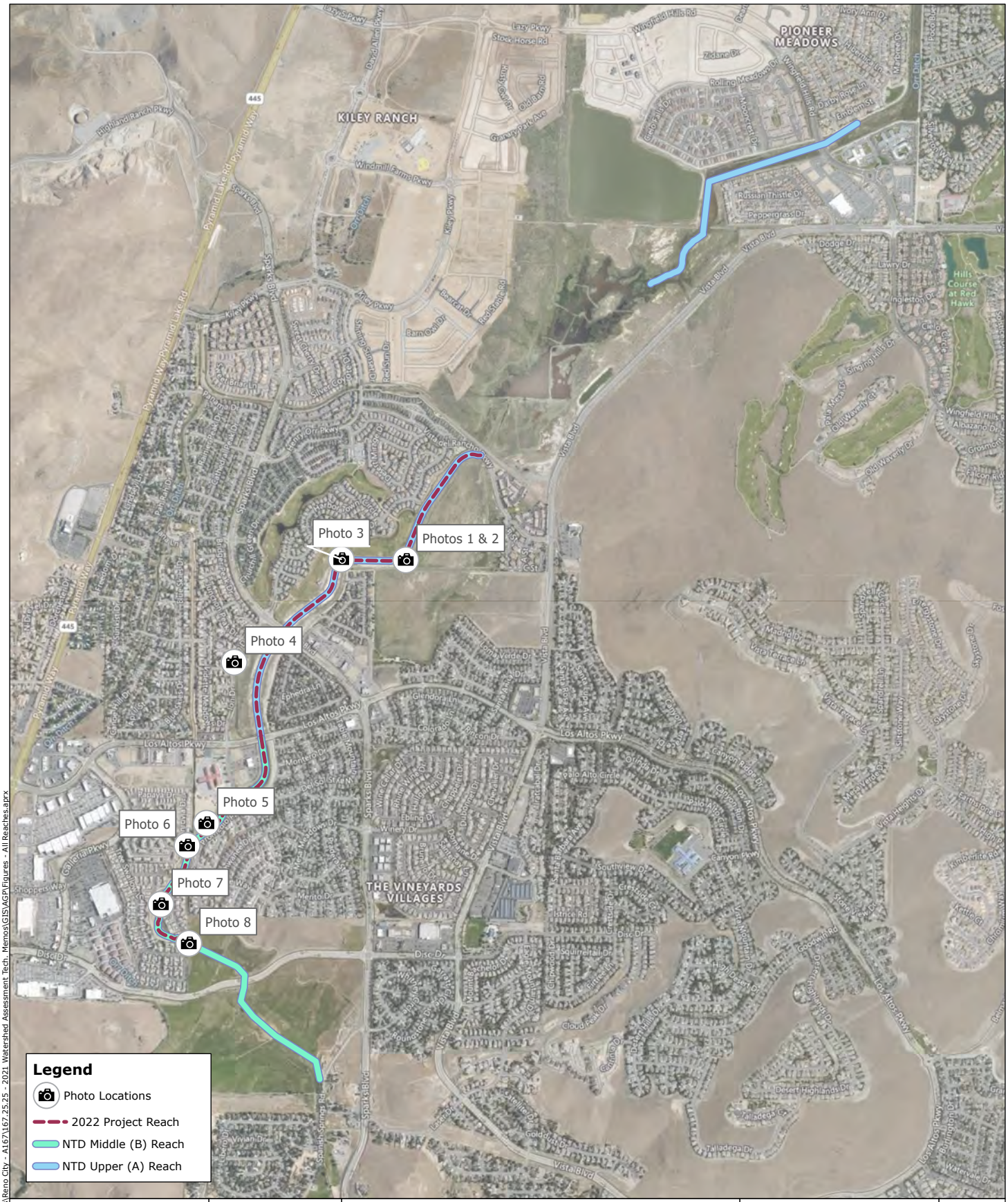
N

1 in. = 500 ft.

0 250 500 ft.

FIGURE 3B

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Aerial Basemap; CDM Smith 2015; TMSWPCC	167.25.25	skobs/sdavenport	6/17/2022	6/28/2022	dlemke



Document Path: P:\Active Projects\Reno City - A167\167.25.25 - 2021 Watershed Assessment Tech. Memos\GIS\AGP\Figures - All Reaches.aprx

City of Sparks

RENO

NCE

NORTH TRUCKEE DRAIN

Photo Locations

N

1 in. = 2,000 ft.

0 1,000 2,000 ft.

FIGURE 4

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Hybrid Basemap	167.25.25	skobs/sdavenport	6/6/2022	6/28/2022	dlemke

Appendix B

Tributary Project List

Appendix B - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
1	City of Reno	Chalk	Saphire Ridge Way to West 7th Street	Soils and hydromodification has caused severe bank incision, resulting in erosion and sediment loading.	Restore and stabilize channel through erosion and grade control measures.	This is City property. The erosion blanket in place has failed and there is an alternative intake upstream of TMWA Chalk Bluff.	TBD	TBD	Drafted
2	City of Reno	Chalk	Valleywood to Mae Ann	This is a vegetation project with a section devoid of vegetation and subject to erosion.	Remove white top and restore vegetation. A stormwater basin may need to be created. Bank stabilization near multiuse path may be needed.	This is City property. There is an alternative intake upstream of TMWA Chalk Bluff.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
3	City of Reno	Alum	Within Caughlin Ranch HOA Property	Persistent severe incision/erosion is present and lawn landscaping has effected the stream channel.	Restore channel and establish grade controls may be needed.	Most of the restoration is located on a anHOA property. There is potential for a partnership with Nevada Land Trust.	TBD	TBD	Proposed
4	City of Reno	Alum	Chrissie Caughlin Park	Flooding contributes sediment load from upstream and causes erosion though the park. There is a direct connection to Truckee River immediately downstream.	Provide sediment capture and stormwater treatment on City property with the use of a constructed wetland or stormwater basin.	One limitation is that this project likely requires projects to address upstream reaches of Alum Creek before addressing this location.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
5	City of Reno	Weed Mitigation	Areas identified in assessments	Areas of invasive weeds maybe due to reduction of native materials and therefore erosion concern and herbicide use.	Chanel restoration by stabilization materials or revegetation. Volunteer based weed abatement. Adopt a section.	Potential to engage community and partners in community wide effort. Possibilities include weeding day, adopt a reach, and restoration projects.	TBD	TBD	Proposed
6	City of Reno	MS4 Outlet Erosion Mitigation Project	Multiple locations as identified in assessments	Erosion is present at the end of the pipe where the storm drain discharges into each respective tributary.	Rip rap or energy dissipation at multiple outfalls.	This could be a lumped contract with several locations identified for correction.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
7	City of Sparks	North Truckee Drain	Spanish Springs Dam to I-80 box culvert	High flow events have caused erosion and sediment loading throughout the tributary.	Erosion and sediment control improvements are needed as well as a reestablishment of the flowline.	This would be a multiphase project.	TBD	TBD	Proposed
8	City of Sparks	North Truckee Drain	Spanish Springs Dam to I-80 box culvert	Invasive weeds and vegetation are present throughout the tributary.	Weed and vegetation abatement, as well as channel stabilization are needed.	This would be a multiphase project. There is an opportunity for public outreach regarding water quality and education about the tributary and river system.	TBD	TBD	Drafted

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
9	City of Sparks	North Truckee Drain	Baring Drive to Lillard Drive	Sediment and debris impacts from storm drain outfalls are located throughout high density residential areas.	Stormwater treatment devices should be installed at major outfalls.	Project would include establishing a maintenance schedule to inspect and clean the treatment vaults periodically and before storm events.	TBD	TBD	Proposed
10	Washoe County	South Evans	Through Anderson Park, Del Monte Lane to Bonde Lane	Historical hydromodification causes frequent flooding, resulting in erosion and sediment loading.	Restore channel and floodplain through park setting.	The downstream reach was previously restored. Water rights and diversions from the creek could pose potential challenge to this project.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
11	Washoe County	Galena	Lower Reach – I-580 bridge to Steamboat Creek	Erosion, undercutting, noxious weeds, hydromodification, and sediment loading are present along the project site.	Restore reach, channel and floodplain.	There are opportunities for a public/private partnership. This is likely a large, multiphase project.	TBD	TBD	Proposed
12	Washoe County	Jones	Callahan Ranch Road to Galena Creek	Persistent severe incision/erosion are present.	A restoration of the channel and an establishment of grade controls are likely needed.	There are opportunities for a public/private partnership.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
13	Washoe County	Alum	Through Betsy Caughlin Donnelly Park	Flooding contributes sediment loading from upstream and causes erosion through the park. There is also a direct connection to Truckee River immediately downstream.	Controlling upstream sediment and restoring the channel and floodplain through the park setting are likely needed.	It is likely that the upstream reaches of Alum Creek need to be addresed before addressing this location.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
14	Washoe County	Whites	Timberline Drive to Legend Trail	High flows cause erosion and sediment loading in multiple tributary drainages to Whites Creek.	Erosion and sediment control and drainage improvements are likely needed.	Continuing development in this area will likely exacerbate issues. Sediment loading may also have impacts on a new TMWA treatment plant on Whites Creek.	TBD	TBD	Proposed

Appendix C

Representative Photographs

Photo 1. North Truckee Drain looking upstream at POI NTDA06.

Photo 2. North Truckee Drain looking downstream at POI NTDA06. Tall whitetop (*Lepidium latifolium*) dominates the floodplain adjacent to the low flow channel.

Photo 3. Soil and landscaping debris stockpiles along the west bank of the North Truckee Drain.

Photo 4. Looking south along a storm drain channel west of the North Truckee Drain. Tall whitetop (*Lepidium latifolium*) dominates the banks of the storm drain channel.

Photo 5. Overgrown storm drain outfall near Miguel Sepulveda Elementary School.

Photo 6. Drainage channel to the west of the North Truckee Drain was recently cleared. The area was documented to have purple loosestrife (*Lythrum salicaria*) and tall whitetop (*Lepidium latifolium*) in 2015.

Photo 7. Looking downstream from Tree Swallow Lane. Purple loosestrife (*Lythrum salicaria*) dominate both the left and right banks.

Photo 8. North Truckee Drain looking downstream at the pasture at the end of the project reach limits. Purple loosestrife (*Lythrum salicaria*) dominates the bank as observed from the property line.

MEMORANDUM

Date:	June 30, 2022
To:	Theresa Jones, City of Reno
From:	Debra Lemke, Scott Kobs, and Sarah Davenport, NCE
Subject:	2022 South Evans Creek Anderson Park Project Reach Assessment Draft Memorandum

This technical memorandum presents mapped field data, field observations, and preliminary recommendations for restoration and improvement projects along South Evans Creek within the project reach between Del Monte Lane and Bonde Lane (**Appendix A, Figure 1**). The project reach was selected based on a review of the *2020 Watershed Management and Protection Plan for Tributaries to the Truckee River* (2020 Plan) (NCE, 2020) Tributary Project list; this project list was developed in coordination with the Truckee Meadows Stormwater Permit Coordinating Committee as potential projects that may be submitted for 319(h) funding (**Appendix B, Project Count #10**). In addition, South Evans Creek has been assessed under previous watershed assessments for tributaries of the Truckee River.

BACKGROUND

Beginning in 2003, watershed assessments have been performed along tributaries of the Truckee River throughout the Truckee Meadows. The tributary assessments were prepared using the Proper Functioning Condition (PFC) methodology presented in the U.S. Department of the Interior Bureau of Land Management document titled *Riparian Area Management, A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas* (BLM, 1998). This methodology evaluates hydrology, vegetation, erosion/deposition to determine the functional rating of the evaluated reach. Tributaries were divided into established reaches and have been assessed on a rotating basis since 2003.

South Evans Creek is on the 303(d) list of impaired waters. **Table 1** provides the 303(d) water quality impairment, impaired use, and the TMDL priority for South Evans Creek.

Table 1. Section 303(d) Tributary List

Waterbody Name	Size (Miles)	Standard Not Meeting (Impairment)	Impaired Use	TMDL Priority
Evans Creek	0.76	*E. coli* AGM	RWC	Low

AGM = annual geometric mean
RWC = recreation involving contact with water

Source: NDEP, Bureau of Water Quality Planning. *2019. Nevada 2016-2018 Water Quality Integrated Report Assessment Period - October 1, 2009 through September 30, 2016*

The project reach for the 2022 effort represents a 1,192-foot section of the larger 7,170-foot South Evans Middle Reach (**Appendix A, Figure 1**). The South Evans Creek Middle Reach was last assessed in 2015 and was given a PFC rating of functional-at-risk. The Middle Reach includes the following previously documented issues within the 2022 project reach (**Appendix A, Figure 2**):

- Channel incision where South Evans Creek enters Anderson Regional Park
- Bank erosion throughout the upper half of the Washoe County owned pasture
- Presence of noxious weeds such as musk thistle (*Carduus nutans*) and tall whitetop (*Lepidium latifolium*)
- Deteriorating culvert crossing at Bonde Lane and Anderson Regional Park

The 2022 project reach was selected due to the documented channel incision, erosion issues, and the presence of non-native vegetation.

2022 Project Reach Assessment

The PFC methodology was used to evaluate hydrology, vegetation, erosion, and/or deposition within the project reach to maintain consistency with previous assessment efforts. In addition, representative photographs were taken, and observation points were recorded.

The project reach assessment was conducted on February 28, 2022. Overall, the project reach remains functional-at-risk. Previously documented issues persist and overall changes appeared to be limited from the previous assessment, except for a culvert replacement at Bonde Lane.

Within the project reach, lateral migration of the channel into the southern pasture continues. Vertical banks are up to 32-inches tall at some locations. The southern banks are actively being undercut and failing throughout the upper half of the project reach (**Appendix C, Photo 2**).

Vegetation is generally lacking throughout the upper half of the project reach (**Appendix C, Photo 1 and 2**). Willows are observed where South Evans Creek enters Anderson Regional Park (**Appendix C, Photo 3**).

An improvised diversion structure has been constructed approximately halfway through the project reach (**Appendix C, Photo 4**) to force flows southeast through the pasture.

Downstream of the improvised diversion structure flows are dispersed throughout the pasture. The dense vegetation through this lower half is stable and able to prevent erosion/incision of the channel. It is unknown if the natural course of the channel is through the pasture or towards the northeast and along the parcel line. The previously mapped musk thistle (*Carduus nutans*) infestation was still present. Yellow star thistle (*Centaurea solstitialis*) and cocklebur (*Xanthium* sp.*)* were also observed in the previously mapped area.

The previously documented deteriorated culvert at the entrance to Anderson Regional Park from Bonde Lane has been replaced. It appears that flows from the creek have overtopped the culvert crossing and caused erosion at the downstream end (**Appendix C, Photo 5**).

Field observations and mapped areas are presented in **Appendix A, Figure 3**. Representative photos are located in **Appendix C**, and the photo locations are depicted on **Appendix A, Figure 4**.

PRELIMINARY RECOMMENDATIONS

Based on the field work accomplished during the 2022 project reach assessment, below are preliminary recommendations to stabilize this portion of South Evans Creek. Specifically, these preliminary recommendations have the potential to reduce the erosion and increase vegetation complexity through noxious weed control and native plantings. These preliminary recommendations are also depicted on **Appendix A, Figure 5**:

- Layback, stabilize the southern bank, and establish riparian vegetation
- Construct formal diversion structure or remove improvised diversion structure and unused channel
- Construct bypass channel to prevent overtopping and erosion of Bonde Lane culvert crossing
- Implement noxious weed control
- Coordinate grazing within riparian zone to balance plant growth/establishment needs and grazing needs

Table 2 presents a concept-level cost estimate for each of the preliminary recommendations. These concept-level costs were prepared using professional engineering judgement and GIS to estimate quantities.

Table 2. Concept Level Cost Estimate

Item	CONSTRUCTION COST ESTIMATE			
	Unit	Quantity	Unit Cost	Total
Base Items				
Noxious Weed Control (3x Years)	AC	< 1	$3,000.00	$3,000.00
Grading (Regrade Vertical Banks)	CY	275	$25.00	$6,875.00
Revegetate (Pasture/Upland)	SY	250	$5.00	$1,250.00
Revegetation Along Channel w/ Stabilization (Riparian)	SY	300	$90.00	$27,000.00
Construct Diversion Structure	LS	1	$5,000.00	$5,000.00
Construct Overflow/Bypass Channel	SF	1,100	$10.00	$11,000.00
SUBTOTAL				$54,125.00
Add/Deduct Items				
Construct Diversion Structure (Deduct)	LS	(1)	$5,000.00	-$5,000.00
Grading (Fill & Remove Secondary Channel) (Add)	SY	300	$10.00	$3,000.00
SUBTOTAL				-$2,000.00
Totals			**Base Items**	**Add/Deduct**
SUBTOTAL			$54,125.00	$52,125.00
General Conditions (e.g., Mobilization/Demobilization/Other)		15%	$8,200.00	$7,900.00
Construction Contingency		30%	$16,300.00	$15,700.00
Price Contingency / Inflation		25%	$13,600.00	$13,100.00
Construction Subtotal			$92,225.00	$88,825.00
Technical Studies, Planning, Design, Permitting, CM		30%	$27,700.00	$26,700.00
	PROJECT TOTAL		**$119,925.00**	**$115,525.00**

Notes:

AC = Acre, CY = Cubic Yard, LS = Lump Sum, SF = Square Feet, SY = Square Yard

Minimum area of 1 ac used for noxious weed control

Grading quantity assume average channel incision of 3-ft and target side slope of 3:1 for the south bank.

Assume riparian areas require placement of cobble / rocks

The 2020 Plan provides the process and framework to propose projects to the Nevada Division of Environmental Protection for 319(h) funding. To support the 319(h) application, a Tributary Project Template was developed (Appendix C of the 2020 Plan) and is further explained in Section 8.0 of the 2020 Plan. This memorandum will support the Washoe County's development of a project for 319(h) funding and support completion of the Tributary Project Template. To find out more information on 319(h) funding please also see NDEP's 319(h) webpage (https://ndep.nv.gov/water/rivers-streams-lakes/nonpoint-source-pollution-management-program/cwa-319h-grants).

Appendix A:

- Figure 1: Project Reach Overview
- Figure 2: Historic Observations (2015)
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FIGURE 1: PROJECT REACH OVERVIEW

FIGURE 2: HISTORIC OBSERVATIONS (2015)

FIGURE 3: FIELD OBSERVATIONS (2022)

FIGURE 4: PHOTO LOCATIONS

FIGURE 5: IMPROVEMENT CONCEPTS

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WASHOE COUNTY, NEVADA 1861

CITY OF RENO

NCE

SOUTH EVANS CREEK

Project Reach Overview

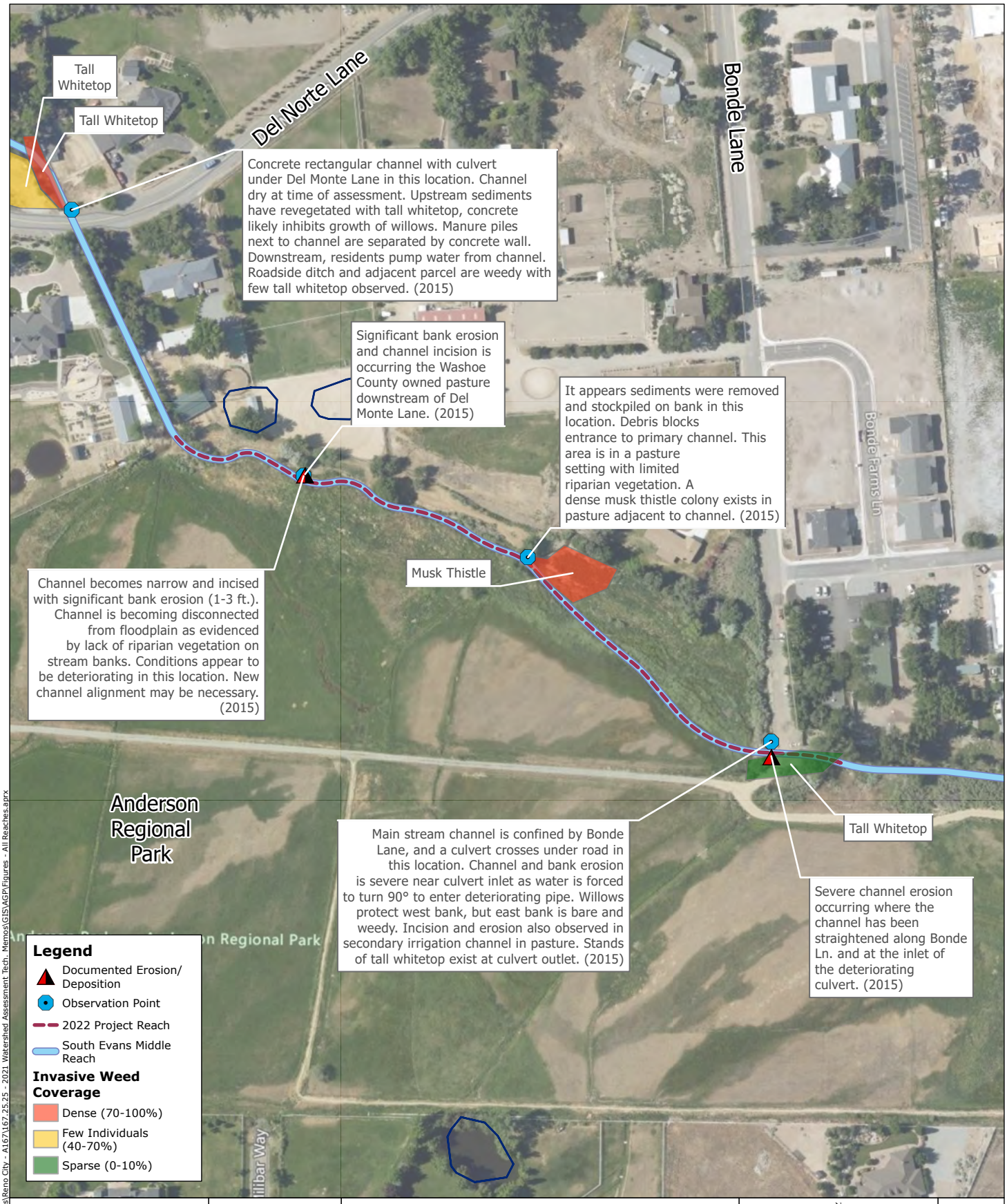
N

1 in. = 1,000 ft.

0 500 1,000 ft.

FIGURE 1

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Hybrid Basemap	167.25.25	skobs/sdavenport	6/14/2022	6/29/2022	dlemke



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SOUTH EVANS CREEK

Historic Observations (2015)

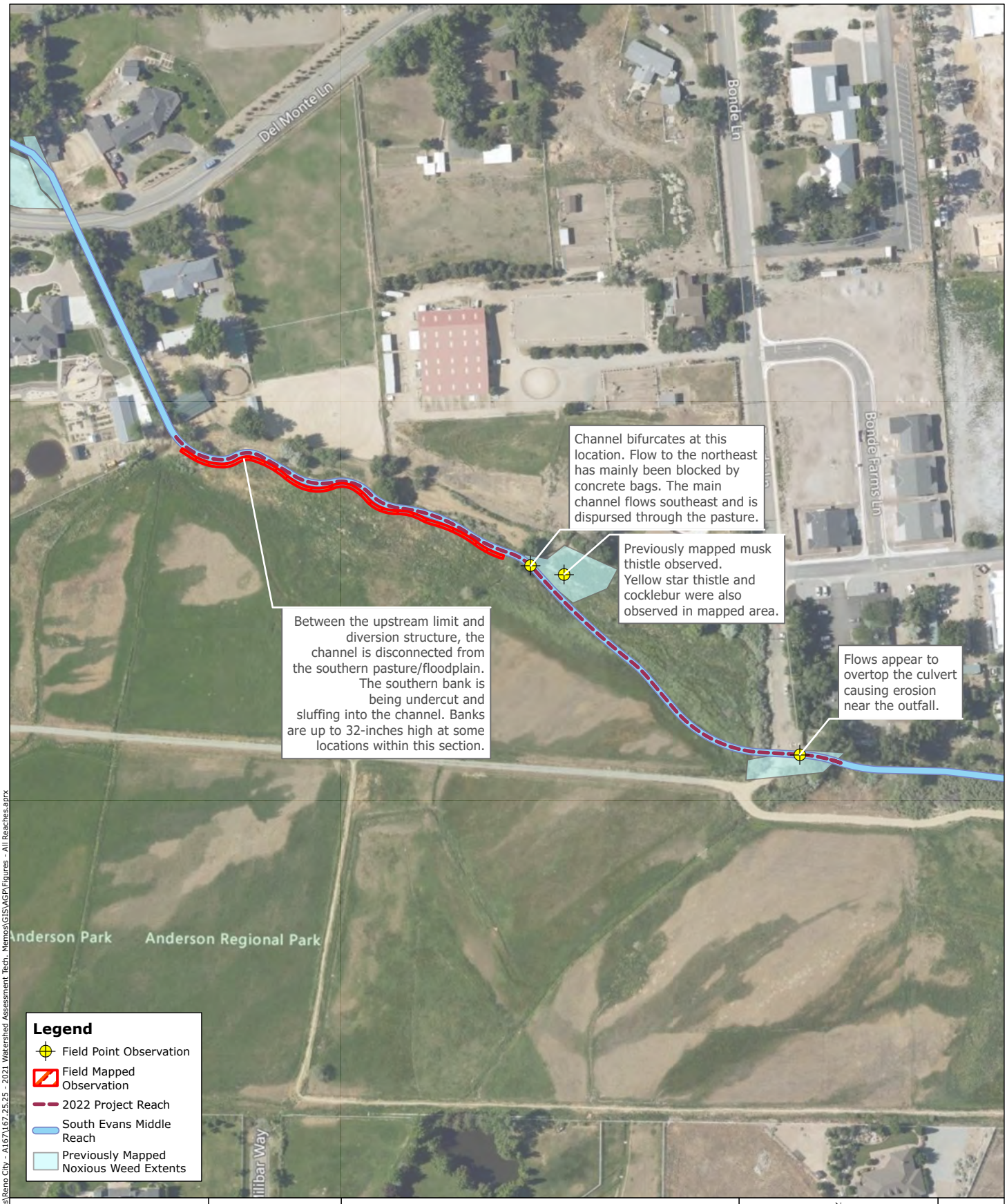
N

1 in. = 200 ft.

0 100 200 ft.

FIGURE 2

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Hybrid Basemap; CDM Smith 2015; TMSWPCC	167.25.25	skobs/sdavenport	6/14/2022	6/29/2022	dlemke



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SOUTH EVANS CREEK

Field Observations (2022)

N

1 in. = 200 ft.

0 100 200 ft.

FIGURE 3

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Hybrid Basemap	167.25.25	skobs/cvaz	6/16/2022	6/29/2022	dlemke

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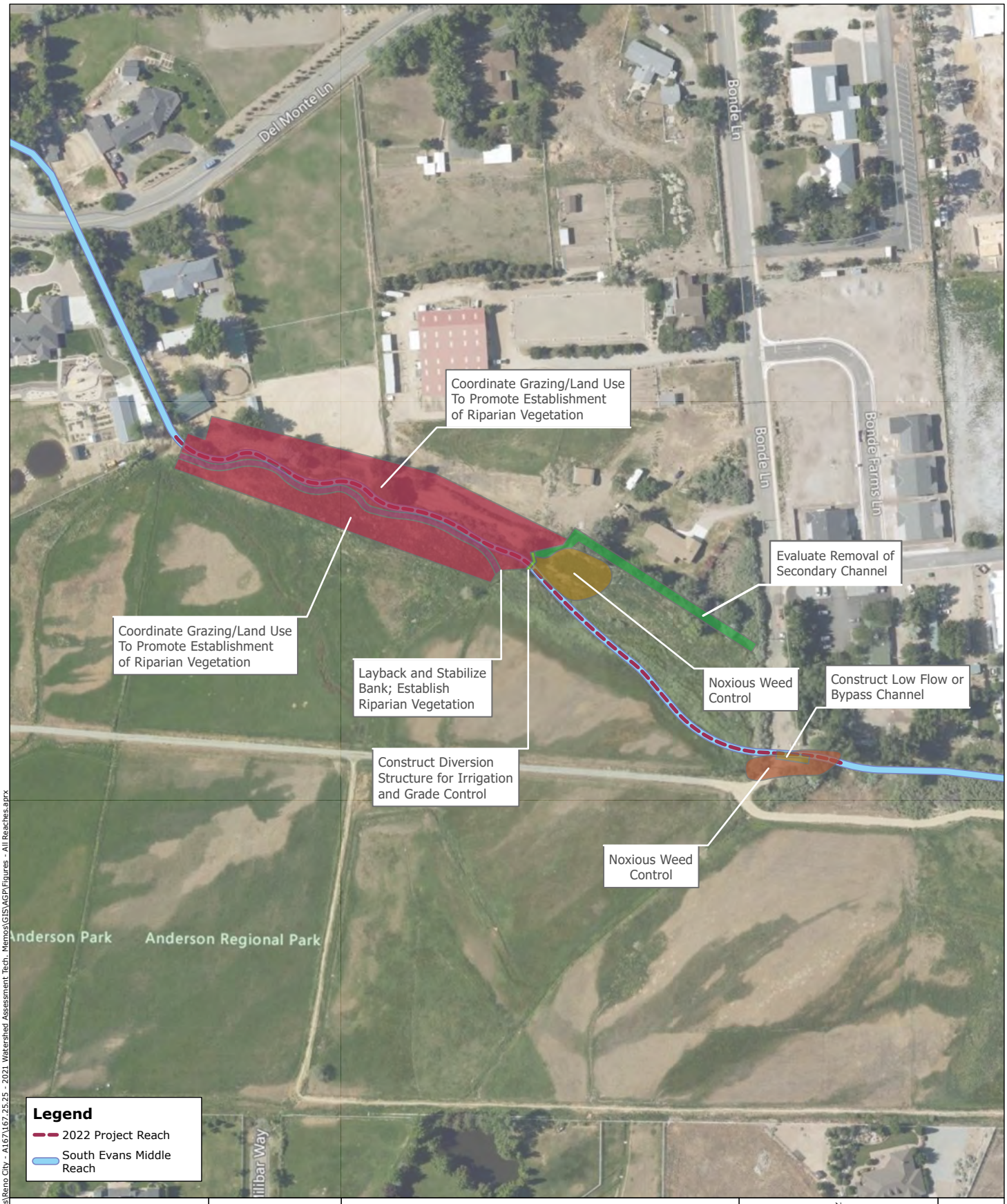
	SOUTH EVANS CREEK Photo Locations	N 1 in. = 200 ft. 0 100 200 ft.	FIGURE 4			
SOURCE Bing Hybrid Basemap	JOB NUMBER 167.25.25	DRAWN skobs/cvaz	DATE 6/6/2022	REVISED 6/24/2022	APPROVED dlemke	



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SOUTH EVANS CREEK

Improvement Concepts

N

1 in. = 200 ft.

0 100 200 ft.

FIGURE 5

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Hybrid Basemap	167.25.25	skobs/cvaz	6/14/2022	6/29/2022	dlemke

Appendix B

Tributary Project List

Appendix B - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
1	City of Reno	Chalk	Saphire Ridge Way to West 7th Street	Soils and hydromodification has caused severe bank incision, resulting in erosion and sediment loading.	Restore and stabilize channel through erosion and grade control measures.	This is City property. The erosion blanket in place has failed and there is an alternative intake upstream of TMWA Chalk Bluff.	TBD	TBD	Drafted
2	City of Reno	Chalk	Valleywood to Mae Ann	This is a vegetation project with a section devoid of vegetation and subject to erosion.	Remove white top and restore vegetation. A stormwater basin may need to be created. Bank stabilization near multiuse path may be needed.	This is City property. There is an alternative intake upstream of TMWA Chalk Bluff.	TBD	TBD	Proposed

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3	City of Reno	Alum	Within Caughlin Ranch HOA Property	Persistent severe incision/erosion is present and lawn landscaping has effected the stream channel.	Restore channel and establish grade controls may be needed.	Most of the restoration is located on a anHOA property. There is potential for a partnership with Nevada Land Trust.	TBD	TBD	Proposed
4	City of Reno	Alum	Chrissie Caughlin Park	Flooding contributes sediment load from upstream and causes erosion though the park. There is a direct connection to Truckee River immediately downstream.	Provide sediment capture and stormwater treatment on City property with the use of a constructed wetland or stormwater basin.	One limitation is that this project likely requires projects to address upstream reaches of Alum Creek before addressing this location.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
5	City of Reno	Weed Mitigation	Areas identified in assessments	Areas of invasive weeds maybe due to reduction of native materials and therefore erosion concern and herbicide use.	Chanel restoration by stabilization materials or revegetation. Volunteer based weed abatement. Adopt a section.	Potential to engage community and partners in community wide effort. Possibilities include weeding day, adopt a reach, and restoration projects.	TBD	TBD	Proposed
6	City of Reno	MS4 Outlet Erosion Mitigation Project	Multiple locations as identified in assessments	Erosion is present at the end of the pipe where the storm drain discharges into each respective tributary.	Rip rap or energy dissipation at multiple outfalls.	This could be a lumped contract with several locations identified for correction.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
7	City of Sparks	North Truckee Drain	Spanish Springs Dam to I-80 box culvert	High flow events have caused erosion and sediment loading throughout the tributary.	Erosion and sediment control improvements are needed as well as a reestablishment of the flowline.	This would be a multiphase project.	TBD	TBD	Proposed
8	City of Sparks	North Truckee Drain	Spanish Springs Dam to I-80 box culvert	Invasive weeds and vegetation are present throughout the tributary.	Weed and vegetation abatement, as well as channel stabilization are needed.	This would be a multiphase project. There is an opportunity for public outreach regarding water quality and education about the tributary and river system.	TBD	TBD	Drafted

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

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9	City of Sparks	North Truckee Drain	Baring Drive to Lillard Drive	Sediment and debris impacts from storm drain outfalls are located throughout high density residential areas.	Stormwater treatment devices should be installed at major outfalls.	Project would include establishing a maintenance schedule to inspect and clean the treatment vaults periodically and before storm events.	TBD	TBD	Proposed
10	Washoe County	South Evans	Through Anderson Park, Del Monte Lane to Bonde Lane	Historical hydromodification causes frequent flooding, resulting in erosion and sediment loading.	Restore channel and floodplain through park setting.	The downstream reach was previously restored. Water rights and diversions from the creek could pose potential challenge to this project.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
11	Washoe County	Galena	Lower Reach – I-580 bridge to Steamboat Creek	Erosion, undercutting, noxious weeds, hydromodification, and sediment loading are present along the project site.	Restore reach, channel and floodplain.	There are opportunities for a public/private partnership. This is likely a large, multiphase project.	TBD	TBD	Proposed
12	Washoe County	Jones	Callahan Ranch Road to Galena Creek	Persistent severe incision/erosion are present.	A restoration of the channel and an establishment of grade controls are likely needed.	There are opportunities for a public/private partnership.	TBD	TBD	Proposed

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13	Washoe County	Alum	Through Betsy Caughlin Donnelly Park	Flooding contributes sediment loading from upstream and causes erosion through the park. There is also a direct connection to Truckee River immediately downstream.	Controlling upstream sediment and restoring the channel and floodplain through the park setting are likely needed.	It is likely that the upstream reaches of Alum Creek need to be addresed before addressing this location.	TBD	TBD	Proposed

AppendixB - Status of Tributary Projects (Each of the projects contained in the table must be further developed if they are to be submitted for 319(h) funding)

Project Count	Entity	Creek	Approximate Location	Water Quality Issue	Proposed Management Measures	Comments	Date Submitted to NDEP 319(h) funding	Status of 319(h) Funding (TBD, Submitted, Accepted, Denied)	Status (Proposed, Drafted, Submitted, Approved for Funding, Constructed)
14	Washoe County	Whites	Timberline Drive to Legend Trail	High flows cause erosion and sediment loading in multiple tributary drainages to Whites Creek.	Erosion and sediment control and drainage improvements are likely needed.	Continuing development in this area will likely exacerbate issues. Sediment loading may also have impacts on a new TMWA treatment plant on Whites Creek.	TBD	TBD	Proposed

Appendix C

Representative Photographs

Photo 1. Looking southeast at the vertical bank of South Evans Creek. The channel is disconnected from the existing floodplain and pasture in the background.

Photo 2. Looking east standing at the top of the southern bank. The southern bank is actively being eroded and soil is slumping into South Evans Creek.

Photo 3. Looking upstream towards the adjacent private property. Willows stabilize the banks as South Evans Creek enters Anderson Regional Park.

Photo 4. Channel bifurcates at this location. Concrete ready-mix bags and t-post have been used to block flow towards the northeast and limit flow entering the private parcel to the north. Debris has collected on the makeshift improvised diversion structure.

Photo 5. Soil eroding from the downstream end of the 48-inch corrugated metal pipe culvert at the end of Bonde Lane and entrance to Anderson Regional Park.

MEMORANDUM

Date:	June 30, 2022
To:	Theresa Jones, City of Reno
From:	Debra Lemke, Scott Kobs, and Sarah Davenport, NCE
Subject:	2022 Steamboat Creek Watershed Assessment Draft Memorandum

This technical memorandum presents mapped field data, field observations, and preliminary recommendations for restoration and improvements along Steamboat Creek within the project reach at Rhodes Road (**Appendix A, Figure 1**). This project was selected by Washoe County due to an ongoing project in this area and the possibility to apply for 319(h) funding for this project. In addition, Steamboat Creek has been assessed under previous watershed assessments for tributaries of the Truckee River.

BACKGROUND

Beginning in 2003, watershed assessments have been performed along tributaries of the Truckee River throughout the Truckee Meadows. The tributary assessments were prepared using the Proper Functioning Condition (PFC) methodology presented in the U.S. Department of the Interior Bureau of Land Management document titled *Riparian Area Management, A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas* (BLM, 1998). This methodology evaluates hydrology, vegetation, erosion, and/or deposition to determine the PFC rating of the evaluated reach. Tributaries were divided into established reaches and have been assessed on a rotating basis since 2003.

The project reach for the 2022 effort represents a 250-foot section of the larger 82,300-foot Steamboat Creek Lower Reach (**Appendix A, Figure 1**). The Steamboat Creek Lower Reach was last assessed in 2017 and was given a PFC rating of functional-at-risk. The Lower Reach includes the following previously documented issues within the 2022 project reach (**Appendix A, Figure 2**):

- High energy flows from Steamboat Ditch have resulted in severe erosion
- Moderate bank cutting (~3 feet) exists downstream of Rhodes Road
- General bank erosion exists upstream and downstream of Rhodes Road crossing
- Presence of tall whitetop (*Lepidium latifolium*) and cheatgrass (*Bromus tectorum*)

The 2022 project reach was selected due to an ongoing project in this area and the possibility to apply for 319(h) funding to address documented erosion, bank cutting, and noxious weeds within the project reach.

2022 Project Reach Assessment

The PFC methodology was used to evaluate hydrology, vegetation, erosion, and/or deposition within the project reach to maintain consistency with previous assessment efforts. In addition, representative photographs were taken, and observation points were recorded.

The project reach assessment was conducted on March 22, 2022. Previously documented issues within the project reach persist and have been observed to be worsening.

Within the project reach the right bank downstream of the Rhodes Road crossing continues to erode and was measured to be 5 feet tall during the 2022 field assessment. In 2017, the banks in this area were previously documented to be approximately 3 feet tall. This change indicates that the channel is likely migrating west and actively eroding the bank, making it steeper. The west bank generally lacks any riparian vegetation and is being actively eroded. The east bank has willows established on the inside bend of the meander and several large cottonwoods.

The existing outfall for Steamboat Ditch is unconfined between the 48-inch culvert and Steamboat Creek. At Steamboat Creek there is a vertical drop where flows from Steamboat Ditch discharge into Steamboat Creek.

Tall whitetop was observed to be present within the area that was previously mapped.

Field observations and mapped areas are presented in **Appendix A, Figure 3**. Representative photos are located in **Appendix C**, and the photo locations are depicted on **Appendix A, Figure 4**.

Preliminary Recommendations

Based on the field work accomplished during the 2022 project reach assessment, below are preliminary recommendations to stabilize this portion of Steamboat Creek. Specifically, these preliminary recommendations have the potential to reduce the erosion and bank cutting and increase vegetation complexity through noxious weed control and native plantings. These preliminary recommendations are also depicted on **Appendix A, Figure 5**:

- Re-construct Steamboat Ditch outfall and improve hydraulic alignment within Steamboat Creek
- Layback banks and establish riparian vegetation downstream of Rhodes Road
- Noxious weed control
- Coordinate removal of existing USGS weir structure and installation of a USGS Station

Table 1 presents a concept level cost estimate for each of the preliminary recommendations. These concept level costs were developed by incorporating GIS to estimate quantities, and our professional judgement.

Table 1. Concept Level Cost Estimate

Item	CONSTRUCTION COST ESTIMATE			
	Unit	Quantity	Unit Cost	Total
Noxious Weed Control (3x Years)	AC	< 1	$3,000.00	$3,000.00
Grading (Regrade Vertical Bank)	CY	210	$25.00	$5,250.00
Revegetate (Pasture/Upland)	SY	125	$5.00	$625.00
Revegetation Along Channel w/ Stabilization (Riparian)	SY	125	$90.00	$11,250.00
Reconstruct Steamboat Ditch Outfall	SF	1,500	$15.00	$22,500.00
Remove USGS Weir Structure	LS	1	$10,000.00	$10,000.00
SUBTOTAL				$52,625.00
Total				
SUBTOTAL				$52,625.00
General Conditions (e.g., Mobilization/Demobilization/Other)			15%	$7,900.00
Construction Contingency			30%	$15,800.00
Price Contingency / Inflation			25%	$13,200.00
Construction Subtotal				$89,525.00
Technical Studies, Planning, Design, Permitting, CM			30%	$6,700.00
			PROJECT TOTAL	**$96,225.00**

Notes:

AC = Acre, CY = Cubic Yard, LS = Lump Sum, SF = Square Feet, SY = Square Yard

Minimum area of 1 ac used for noxious weed control

Grading quantity assume average channel incision of 5-ft and target side slope of 3:1 for the west bank.

Assume riparian areas require placement of cobble / rocks

The *2020 Watershed Management and Protection Plan for Tributaries to the Truckee River* (2020 Plan) (NCE, 2020) provides the process and framework to propose projects to the Nevada Division of Environmental Protection for 319(h) funding. To support the 319(h) application, a Tributary Project Template was developed (Appendix C of the 2020 Plan) and is further explained in Section 8.0 of the 2020 Plan. This memorandum will support the Washoe County's development of a project for 319(h) funding and support completion of the Tributary Project Template. To find out more information on 319(h) funding please also see NDEP's 319(h) webpage (https://ndep.nv.gov/water/rivers-streams-lakes/nonpoint-source-pollution-management-program/cwa-319h-grants).

Appendix A:

- Figure 1: Project Reach Overview
- Figure 2: Historic Observations (2017)
- Figure 3: Field Observations (2022)
- Figure 4: Photo Locations
- Figure 5: Improvement Concepts

Appendix B: Representative Photographs

Appendix A

FIGURE 1: PROJECT REACH OVERVIEW

FIGURE 2: HISTORIC OBSERVATIONS (2017)

FIGURE 3: FIELD OBSERVATIONS (2022)

FIGURE 4: PHOTO LOCATIONS

FIGURE 5: IMPROVEMENT CONCEPTS

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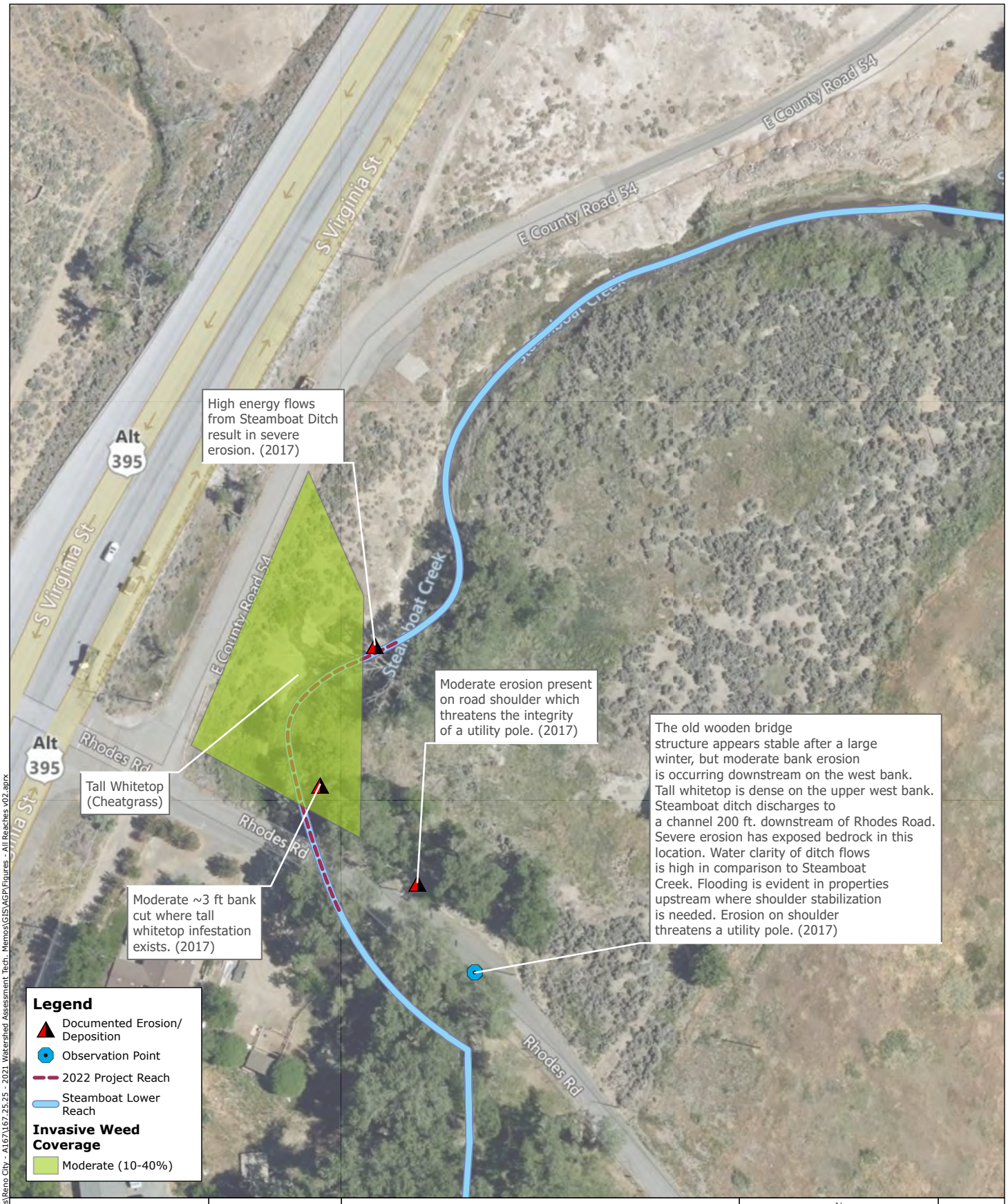
	STEAMBOAT CREEK Project Reach Overview	N 1 in. = 1,000 ft. 0 500 1,000 ft.	FIGURE 1			
SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED	
Bing Hybrid Basemap	167.25.25	skobs/sdavenport	6/14/2022	6/29/2022	-	



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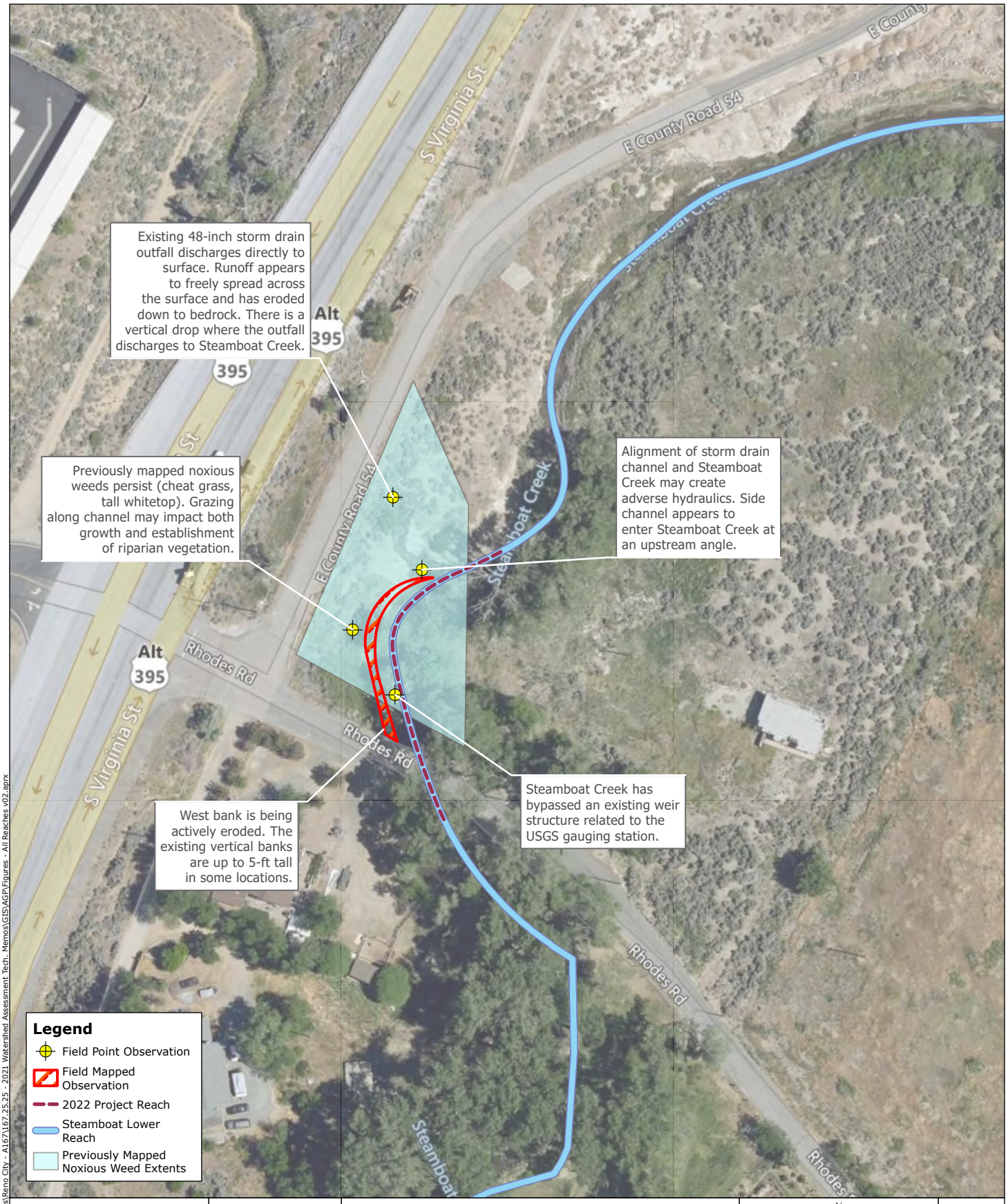
	STEAMBOAT CREEK Historic Observations (2017)					FIGURE 2
					1 in. = 100 ft. 0 50 100 ft.	
SOURCE Bing Hybrid Basemap; CDM Smith 2017; TMSWPCC		JOB NUMBER 167.25.25	DRAWN skobs/cvaz	DATE 6/14/2022	REVISED 6/29/2022	APPROVED -



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STEAMBOAT CREEK

Field Observations (2022)

N

1 in. = 100 ft.

0 50 100 ft.

FIGURE 3

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Hybrid Basemap	167.25.25	skobs/cvaz	6/16/2022	6/30/2022	-

NCE	STEAMBOAT CREEK Photo Locations			N 1 in. = 100 ft. 0 50 100 ft.		FIGURE 4
SOURCE Bing Hybrid Basemap		JOB NUMBER 167.25.25	DRAWN skobs/cvaz	DATE 6/16/2022	REVISED 6/29/2022	APPROVED -

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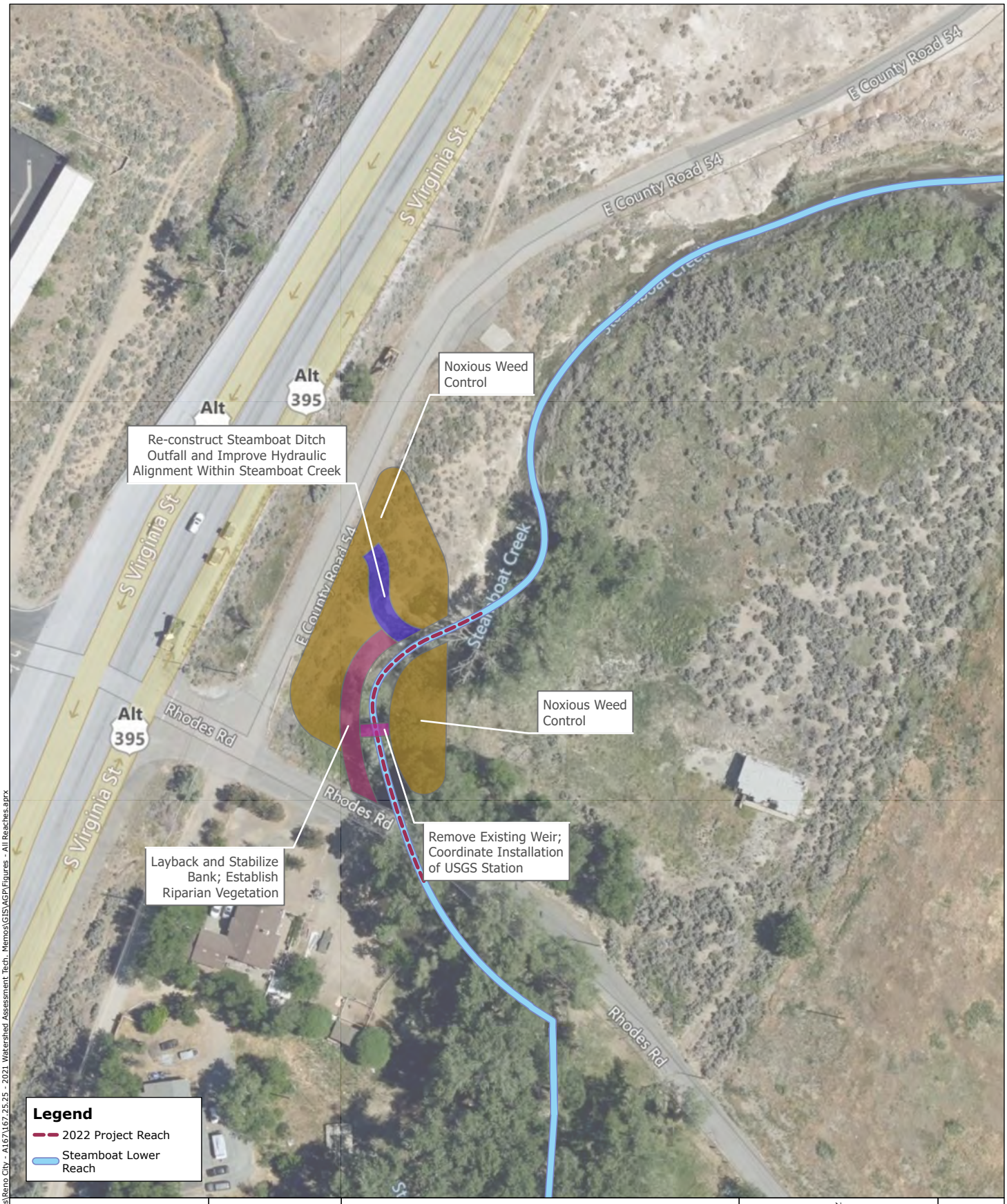

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STEAMBOAT CREEK

Improvement Concepts

N

1 in. = 100 ft.

0 50 100 ft.

FIGURE 5

SOURCE	JOB NUMBER	DRAWN	DATE	REVISED	APPROVED
Bing Hybrid Basemap	167.25.25	skobs/sdavenport	6/16/2022	6/30/2022	-

Appendix B

Representative Photographs

Photo 1. Rhodes Road crossing. There is active erosion near the footing of the wooden structure. Washoe County is currently working through the design phase to replace the existing structure.

Photo 2. Existing weir downstream of the USGS gauge station. The majority of flow in Steamboat Creek bypasses the existing weir.

Photo 3. Steamboat Creek looking downstream, immediately downstream of the existing weir structure. The channel is actively eroding the left bank. The bank is up to 5-feet tall in this location. The banks in this area were previously documented to be 3-feet tall.

Photo 4. Existing 48-inch culvert outfall from Steamboat Ditch discharges to a bare unconfined area to the west of Steamboat Creek.

21st Annual Snapshot Day Report

A Lake Tahoe Basin and Truckee Watershed Citizen Monitoring Event

(May 15, 2021)

Prepared by
Sarah Vidra
Tahoe Water Suppliers Association

Note: Excerpts Only
Full report located at:
http://tahoetruckeesnapshotday.org/wp-content/uploads/2022/03/Event-2021-Report_Final.pdf

Table of Contents

Introduction

What is Snapshot Day?

Snapshot Day is a one-day, volunteer-based event designed to collect data indicating watershed health at a single point in time. Trained Volunteer Team Leaders bring groups of other volunteers to various pre-determined sites to collect water quality data. 2021 was the 21st anniversary of Snapshot Day; however, as with many other aspects, this was not a "normal" year due to the global pandemic. Volunteer capacity was greatly reduced, thus the number of sites where monitoring was conducted was also lessened. Snapshot Day is sustained by support from dedicated staff, the funding of a few grants and donations, and by citizens who value the watershed they live in. It is important to note that citizen monitoring is designed to supplement existing agency monitoring efforts. All information is provided to the regulatory and resource management agencies whose responsibility it is to protect water quality in the Truckee River Watershed.

What are the objectives of Snapshot Day?

While there is a great deal of high-quality agency and university-sponsored monitoring in the Tahoe-Truckee region, there is still insufficient information to assess the status of all aquatic resources in the Truckee River Hydrologic Unit, including the Lake Tahoe Basin and the Truckee River Watersheds. With proper training and quality assurance, community members can help fill this void by providing valuable watershed management and pollution prevention information.

The primary goals of this effort are two-fold:

1. Promote environmental education and stewardship.
2. Collect valuable water quality information.

In regards to collecting water quality data, this effort aims to:

- Screen for water quality problems, including the identification of sources of pollution and detection of illegal activities (e.g., chemical spills, filling of wetlands, diversions, illicit discharges, destruction of stream environment zones (SEZs), non-compliance with ordinances or regulations in place to protect natural resources, etc.);
- Provide water quality data that may be compared to standards set by the TRPA and the States of California and Nevada;
- Provide water quality data that may be used in status and trend analyses; and
- Provide some pre and post data for evaluating the effectiveness of restoration activities.

Snapshot Day 2021

2021 Event Summary

Snapshot Day provides an annual opportunity to highlight citizen science's contributions to maintaining the Tahoe-Truckee region's environmental health. 2021 Snapshot Day's data demonstrates good water quality overall for the Tahoe-Truckee watershed.

In 2021, Snapshot Day reached its 21st anniversary. It remains one of the longest-running citizen watershed monitoring events on the West Coast of the United States. Snapshot Day continues to highlight successful engagement with the public in active watershed stewardship while providing valuable data to the responsible agencies. As previous data sets are compiled, and data storage is improved, this program can show long-term trends and better assist agencies in watershed conditions analysis.

Volunteers and locations

Snapshot Day 2021 was a collaborative effort between the North Shore Lake Tahoe, South Shore Lake Tahoe, the Middle Truckee River, and the Lower Truckee River.

Volunteer and monitoring site locations are as follows:

Table 1: Volunteer and monitoring site location numbers.

	Volunteers	Locations
South Shore Lake Tahoe	90	40
North Shore Lake Tahoe	12	11
Middle Truckee River	16	25
Lower Truckee River		4
Totals for 2017	**118**	**80**

This collaborative effort was sponsored by the Incline Village General Improvement District, the League to Save Lake Tahoe, the Truckee River Watershed Council, and the Great Basin Outdoor School. For an expanded list of involved organizations, resource partners, and education partners, please see **Appendix A**.

In 2021, volunteers gathered data at a total of 80 locations throughout the Truckee River watershed from south of Lake Tahoe to the Nevada State line. A list of site names and codes can be found in **Appendix B**.

Lake Tahoe Tributaries, South Shore

- Angora Creek
- Bijou Creek
- Burke Creek
- Cascade Creek
- Cold Creek
- Edgewood Creek
- Heavenly Valley Creek
- McFaul Creek
- Meeks Creek
- North Zephyr Creek
- South Zephyr Creek
- Tahoe Keys Marina
- Tallac Creek
- Taylor Creek
- Upper Truckee River
- Trout Creek

Lake Tahoe Tributaries, North Shore

- Burton Creek
- General Creek
- Griff Creek
- Hatchery Creek
- Lake Forest Creek
- Madden Creek
- McKinney Creek
- Quail Creek
- Rosewood Creek
- Secret Harbor Creek
- Tahoe City Urban Ditch

Truckee River Tributaries, Middle Truckee River

- Alder Creek
- Bear Creek
- Cold Stream
- Deep Creek
- Donner Creek
- East Martis Creek
- Main Stem, Truckee River
- Little Truckee River
- Martis Creek
- Pole Creek
- Prosser Creek
- Silver Creek
- Squaw Creek
- Trout Creek
- Union Valley Creek

Truckee River Tributaries, Lower Truckee River

- Galena Creek
- Thomas Creek
- Main Stem, Truckee River
- Whites Creek