ENVIRONMENTAL STUDY

Project Name: **US-89; Nicholls Rd Grade Separation, Frontage Rds.** PIN: **13480**

Project No.: **S-R199(198)** Job/Proj: **72124**

Prepared By: **Nicole Tolley**

For guidance in preparing this environmental study, refer to Chapter 4 of the UDOT Environmental Process Manual of Instruction:

http://www.udot.utah.gov/go/environmental

REQUIRED SIGNATURES

I have reviewed the information presented in this Environmental Study and I hereby attest that the document is complete and the details of the document are correct.

Reviewer (Signature): _____ **Date:** _____

Reviewer (Printed): _____

Firm/UDOT Region: _____

STATE FUNDED PROJECTS

As a result of this Environmental Study, UDOT finds that this project will NOT cause significant environmental impacts.

Approved: _____ **Date:** _____

UDOT Region Environmental Manager

1. Purpose and Need for Action

The Utah Department of Transportation (UDOT) has initiated an environmental study to analyze the need for transportation improvements at the US-89/Nicholls Road intersection in Fruit Heights, Utah (see attached Project Location Maps).

Purpose
The purpose of the project is to improve safety at the US-89/Nicholls Road intersection and to address mobility and connectivity in Fruit Heights.

Need
The existing US-89/Nicholls Road intersection is an at-grade, signalized intersection that has multiple crossing conflict points. Crossing conflict points pose more dangers to vehicle occupants because crashes in these areas generally involve side impacts. Side impacts have higher rates of fatalities and serious injuries because there is comparatively little vehicle protective structure to safeguard occupants in the struck vehicle.

Based on information obtained from UDOT Traffic and Safety, there were a total of 59 crashes at the US-89/Nicholls Road intersection from Jan 1, 2010 to September 30, 2016. Three of the crashes were classified as severe (incapacitating injury or fatality). Eliminating the existing crossing conflict points at this intersection would improve safety and reduce the number of severe crashes at this location.

Additionally, according to the Wasatch Front Regional Council's (WFRC) Travel Demand Model (TDM) the current (2014) average travel demand for US-89 in the study area is 40,569 vehicles per day (vpd). WFRC's TDM projects that by 2040, the travel demand on US-89 in the study area will be 66,900 vpd. US-89 will operate at Level-of-Service (LOS) F, or failing conditions, if no improvements are constructed.

2. Description

The Proposed Action includes (see attached Proposed Action Figure and Typical Sections):
- Constructing an overpass at the existing US-89 Nicholls Road at-grade intersection (US-89 over Nicholls Road). The overpass would improve safety by eliminating all crossing conflict points at the US-89/Nicholls Road intersection.
- Eliminating the existing access points to US-89 from Nicholls Road.
- Extending Lloyd Road from Eagle Way to Fence Post Road (over Bair Creek), to allow for traffic movement on the west side of US-89.
- Widening US-89 to accommodate one additional travel lane in each direction (re-striping for the new lanes will occur if adjacent US-89 segments are widened).

3. Public Hearing/Opportunity for Public Hearing

YES This project could result in public controversy or substantial impacts to adjacent properties, or substantially changes roadway geometry.

NO There are significant social, economic, environmental or other effects. If YES, a Categorical Exclusion is not applicable. Consult with UDOT Central Environmental Services.

NO UDOT/FHWA has determined that a public hearing is in the public interest.

If the answer to ANY of the above questions is YES, a public hearing or opportunity for a public hearing is required (attach documentation identifying date and location of hearing, summary of comments, and responses to substantial comments, or include certification of opportunity for hearing.)

The following types of public involvement have been provided:

YES Public Hearing in accordance with state and federal procedures

NO Opportunity for Public Hearing

NO Open House

NO Other:

YES Documentation is attached identifying the date and location of hearing, summary of comments, and responses to substantial comments; or the Certification of Opportunity for a Hearing is attached.

Comments: A Public Hearing will be held for the project on January 18, 2017.

4. Right-of-Way

YES Acquisition of Right-of-Way is required.

NO The right-of-way required is significant because of its size, location, use, or relationship to remaining property and abutting properties. (If the right-of-way required is significant, the project does not qualify as a Categorical Exclusion.)

Comments: The Proposed Action would require partial right-of-way acquisition from three properties: Davis Golf Course (1.6 acres), Nicholls Park (1.2 acres), and a residence on the northeast corner of the US-89/Nicholls Road intersection (0.009 acres).

5. Cultural

According to the UDOT Region NHPA/NEPA Specialist and/or the Architectural Historian, the Finding of Effect for the project is one of the following:

YES No historic properties affected

NO No adverse effect

NO Adverse effect

Project documentation for determination of eligibility and finding of effect consists of one of the following and is attached:

YES Memo from UDOT Region NEPA/NHPA Specialist and/or Architectural Historian stating a finding of No Historic Properties Affected.

NO SHPO concurrence with the Determinations of Eligibility and Finding of Effect AND memo from UDOT Region NEPA/NHPA Specialist and/or Architectural Historian stating a finding of No Adverse Effect or Adverse Effect.

YES Have letters for Native American Consultation been sent? Attach letters.

NO Have letters for federal and state agencies, CLGs, historical societies, etc. been sent? If so attach letters.

NO Do the impacts to historic properties require mitigation?

If YES, a signed Memorandum of Agreement (MOA) is attached.

Comments: One historic structure eligible for the NRHP is located near the study area. However, the Proposed Action would have no impact to this historic property and the finding of effect was determined to be "No historic properties affected".

Native American consultation was initiated through letters sent to the Eastern Shoshone Tribe of the Wind River Reservation, Shoshone-Bannock Tribes, Paiute Indian Tribe of Utah, Northwestern Band of Shoshone Nation, Uintah and Ouray Ute Tribes, and the Skull Valley Band of Goshute Indians (sent November 8, 2016). In addition, notification was also sent to those tribes with whom UDOT has Section 106 Programmatic Agreements: Cedar Band of Paiutes, Shivwits Band of Paiute Indian Tribe, and the Confederated Tribes of the Goshute Reservation (sent November 8, 2016). To date, none of the tribes have responded to these notifications. See attached Native American Consultation letters.

6. Paleontological

NO This project is one of the 16 types of projects listed in Stipulation III of the Memorandum of Understanding (MOU) with the Utah Geological Survey (UGS) that has no effect on paleontological resources and does not require notification to the UGS. If YES, a memo from the UDOT Region NEPA/NHPA Specialist is attached (can be included in cultural memo).

For all other projects, the UGS has been notified and has responded with the following (attach UGS letter and memo from the UDOT Region NEPA/NHPA Specialist):

YES There are no known paleontological localities in the area of potential effects and the formations in the project area have a low potential for containing fossil remains (Class 1 or 2).

NO Fossil-bearing formations (Class 3-5) and/or known paleontological localities are present in the area of potential effects, but the UDOT Region NEPA/NHPA Specialist (or paleontologist) has determined that they will not be affected by the project.

NO Fossil-bearing formations (Class 3-5) and/or known paleontological localities are present in the area of potential effects and may be affected by construction activities. A survey and/or monitoring by a qualified paleontologist is required.

Comments: See attached October 19, 2016 letter from the UGS.

7. Threatened, Endangered, or Candidate Species

For Federally or State Funded Projects:

YES Project will have **"no effect"** to T&E species, or their critical habitats, protected under the Endangered Species Act. If YES, attach **"no effect"** memo or review/comments (in the case of local government projects) from UDOT's Wildlife Biologist.

NO Project **"may affect, but is not likely to adversely affect"** T&E species, or their critical habitats, protected under the Endangered Species Act. If YES, attach BA and "concurrence" from the U.S. Fish and Wildlife Services (USFWS). List all mitigation/conservation measures.

NO Project **"may affect, and is likely to adversely affect"** threatened and endangered species, or their critical habitats, protected under the Endangered Species Act. If YES, attach BA and USFWS BO. List all mitigation/conservation measures.

NO The USFWS has issued a **"jeopardy"** opinion regarding this project. If YES, attach BA and BO as above. This project cannot go forward without being reconsidered.

Comments: See attached memo from UDOT's Wildlife Biologist.

8. Wildlife

NO Project has the potential to affect state-sensitive species, important wildlife habitat, big game migration routes, habitat connectivity, migratory birds, or fish spawning habitat or fish passage.

Memo from UDOT Wildlife Biologist is attached.

Comments: See attached memo from UDOT's Wildlife Biologist.

9. Invasive Species

If the project involves earthwork, grading or landscaping, there is potential to introduce or spread invasive weed species.

YES Based upon location, this project has the potential to introduce or spread invasive species included on the noxious weed list of the State of Utah and the county noxious weed lists.

10. Noise

Projects that may affect noise levels to adjacent receptors include changes in roadway alignment, roadway widening and the addition of traffic lanes.

YES This project has the potential to increase noise to adjacent receptors.

YES A noise study is attached.

Comments: The Proposed Action would result in noise levels increasing overall throughout the study area, with an average increase of 5.6 dBA. For the area near the Nicholls Road crossing, noise would actually decrease for about 13 receptors due to profile changes and the addition of safety barrier. The number of receptors that would be considered impacted by traffic noise is 41.

Noise walls of varying heights were analyzed for the Proposed Action at four locations along US-89; however, a noise wall at these locations would either not provide the required 8 dBA reduction to 75% of front-row receptors or would not be cost effective. Therefore, noise walls are not considered feasible and reasonable according to the UDOT Noise Abatement Policy. See attached Noise Study.

11. Wetlands, Water Resources, Storm Water, and Floodplains

Wetlands and Water Resources

NO The project is a type that does not have the potential to affect or cross Waters of the United States. If YES, no concurrence letter is needed.

YES Project affects waters of the United States (e.g. wetlands, mudflats, lakes, or perennial or ephemeral streams). If NO, have a UDOT Landscape Architect provide a concurrence letter stating they agree with the determination. In order to indicate "NO" on this question, answers to the following statements must also be "NO".

YES Project impacts perennial, intermittent, or ephemeral streams that have a riparian vegetation component. If YES, a Programmatic General Permit 40 (PGP40), also known as a Stream Alteration Permit, from the Utah Division of Water Rights will be required.

NO Project exceeds the impact limitations for streams or washes indentified in the PGP40. If YES, both a PGP40 and a separate Department of the Army permit will be required.

NO Project impacts an ephemeral wash not captured under PGP40 that has an ordinary high water mark (OHWM) with a connected flow to a downstream Traditional Navigable Water and the impact below the OHWM exceeds 1/10 of an acre per crossing. If YES, a Department of the Army permit will be required.

NO Project impacts a perennial or intermittent stream below the OHWM less than 1/10 of an acre per crossing. If YES, notification to the U.S. Army Corps of Engineers will be required.

NO Project impacts navigable waters of the United States (Lake Powell, Flaming Gorge Reservoir, Bear Lake, Green River - mouth to 20 miles above Green River Station, Colorado River - mouth of Castle Creek to Cataract Canyon - 4.5 miles below mouth of Green River) below the OHWN. If YES, a Section 10 Department of the Army permit will be required.

NO Project impacts jurisdictional wetlands. If YES, a Department of Army Nationwide Permit (NWP) will be required for wetland impacts under the 1/2 acre threshold; a Letter of Permission (LOP) will be required for wetland impacts between 1/2 and 1 acre; an Individual Permit (IP) will be required for impacts greater than 1 acre.

NO Project impacts non-jurisdictional wetlands. If YES, wetland mitigation may still be required under the federal policy of "no net loss." Consult UDOT Environmental Section.

Storm Water Runoff

YES Project disturbs 1 acre or more of ground surface.

If YES, a UPDES Storm Water Discharge Permit for Construction Activities is required from the Utah Division of Water Quality.

Floodplains

YES This project requires new construction or alteration of existing structures within the FEMA designated 100-year flood plain.

If YES, a Development Permit is required from the local permit official.

Comments: One jurisdictional waters of the U.S. was identified within the study area (Bair Creek). Bair Creek is an intermittent stream that crosses under US-89 through a concrete culvert. The Lloyd Road extension component of the Proposed Action would cross Bair Creek and could impact this waters of the U.S. The project will need to coordinate with the Utah Division of Water Rights to obtain the appropriate permit relevant to the type of work and amount of impacts.

There is also an isolated wetland located on the east side of US-89, just north of Green Road. However, the Proposed Action would have no impact to this wetland.

The Lloyd Road extension will cross the FEMA 100-year floodplain along Bair Creek. A floodplain development permit will be required from the local floodplain coordinator.

See attached Wetland Delineation and Waters of the U.S. Report.

12. Hazardous Waste

NO Has a visual inspection of the project area found substances that may be hazardous to human health and/or the environment?

YES This project involves excavation beyond or below the existing roadway footprint.

If YES to either question 1 or 2, then site investigations and coordination with DEQ may be necessary.

Comments: An on-site field review and a review of DEQ's Interactive Map (http://enviro.deq.utah.gov) and the EPA's EnviroMapper (www.epa.gov/emefdata/em4ef.home) on October 17, 2016 identified the following hazardous waste sites near the study area (see attached Proposed Action Map):

1. Davis Park Golf Course #3000320 at 1074 East Nicholls Road: 1 closed Underground Storage Tank (UST), 1 closed Leaking Underground Storage Tank (LUST)
2. Verizon Wireless at 1299 East Nicholls Road: Tier 2 Facility

Although impacting these hazardous waste sites is unlikely, if hazardous materials are encountered during work, all work would stop in the area of the contamination according to UDOT Standard Specification 01355 and the contractor would consult with UDOT and DEQ to determine the appropriate remedial measures.

13. Prime, Unique, Statewide, or Locally Important Farmland

Projects in areas whose land use maps indicate no current or future farming activities would not usually affect farmlands.

NO This project MAY affect Prime, Unique, Statewide, or Locally Important Farmlands.

N/A The Natural Resource Conservation Service letter and Form AD1006 are attached.

14. Air Quality

YES This project has the potential to increase particulate matter due to construction activities.

YES This project adds or alters roadway capacity or will result in increased traffic volumes at signalized intersections.

If YES, the Air Quality Supplement is attached.

Comments: See attached Air Quality Memo.

15. Relocations

NO There may be relocations of residences or businesses as a result of this project.

16. Land Use/Urban Policy

YES This project may affect land use or urban policy.

Comments: Section 6 of the LWCF Act of 1965 established a grant program for States and local governments to acquire and develop public outdoor recreation sites and facilities. Section 6(f)(3) of the LWCF Act requires these properties be maintained for public outdoor recreation use in perpetuity unless the DOI/NPS approves a replacement with land of at least equal value, location, and usefulness. A Section 6(f)(3) conversion occurs when an LWCF-assisted property is to be conveyed for a non-public outdoor recreation use, such as highway right of way or permanent easement.

The Proposed Action would require the conversion of approximately one acre of land from Nicholls Park, which is protected by Section 6(f) of the LWCF Act. This conversion would result from the extension of Lloyd Road. Coordination with the NPS regarding compliance with the policies and procedures for approval of the conversion proposal as required by the LWCF Act are ongoing.

17. Section 4(f) Properties

N/A Section 4(f) properties are impacted.

N/A An Individual Section 4(f) Evaluation AND written concurrence from UDOT Environmental Services on the Individual Section 4(f) determination is attached.

N/A A Programmatic Section 4(f) Evaluation AND written concurrence from UDOT Environmental Services on the Programmatic Section 4(f) determination is attached.

N/A The 4(f) property(s) is an historic property and the impact is considered **de minimis**.

N/A SHPO has concurred in writing on UDOT's **"no adverse effect"** determination to historic properties and has been notified of the intent to make a **de minimis** finding. Attach letter to SHPO and **de minimis** agreement letter.

N/A The 4(f) property(s) is a park, recreational area, wildlife or waterfowl refuge and the impact is considered **de minimis**.

N/A The official(s) with jurisdiction have concurred, in writing, that the project will **"not adversely affect"** the activities, features, and attributes that qualify the resource for protection under Section 4(f) and have been notified of the intent to make the **de minimis** impact finding. Letters are attached.

N/A The project sponsor has provided public notice and opportunity for public review and comment. Describe public involvement efforts in the comments below.

N/A Written concurrence from UDOT Environmental Services is attached.

18. Other Environmental Factors Considered

This Project, except as noted and explained in attachments, will have no disproportionate, serious or lasting effect on the following:

NO Visual

NO Social/Economic

NO Title VI and/or Environmental Justice

NO Natural Resources

NO Construction

NO Energy

NO Geology/Soils

NO Wild/Scenic Rivers

NO Ecology

Comments: See attached Visual Resource memo.

19. Conclusion

NO This project may have substantial controversy or significant impacts.

MITIGATION COMMITMENTS

CONSTRUCTION		Responsible
Air Quality	Requirements outlined in Standard Specification 01572 titled "Dust Control and Watering" will be followed.	Contractor
Cultural	UDOT Standard Spec 01355, Parts 3.7 and 3.8	Contractor
Hazardous Waste	UDOT Standard Specification 01355, Part 3.1	Contractor
Invasive Species	Supplemental Specification 02924S titled "Invasive Weed Control" will be included in the contract documents and outlines BMPs that will be incorporated.	Contractor
PRELIMINARY ENGINEERING		**Responsible**
Floodplains	The project will require new construction or alteration of existing structures within the FEMA 100-year floodplain. Therefore a flood plain development permit is required from the local community's permit official prior to construction.	Udot Region Environmental
Land Use	Obtain, dedicate, and maintain public outdoor recreation replacement property that is of reasonably equivalent value, usefulness, and location to the converted property. Coordinate with the NPS regarding compliance with the policies and procedures for approval of the conversion proposal as required by the LWCF Act.	Udot Region Environmental
Visual	Adhere to UDOT Aesthetic Guidelines.	Consultant Designer
Water Quality	The project will obtain a Stream Alteration Permit from the Utah Division of Water Rights.	Consultant Designer
Water Quality	The project will disturb 1 acre or more of ground surface. Therefore, a storm water pollution prevention plan (SWPPP) must be included in the plans.	Udot Region Environmental
Water Quality 2	UPDES Permit from the Division of Water Quality must be obtained prior to construction.	Contractor

AIR OUALITY SUPPLEMENT

Revised 3/2012

A. Regional Conformity Requirements

YES This project is in a non-attainment or maintenance area for carbon monoxide (CO), particulate matter (PM10 or PM2.5), or ozone (O_3).

If NO, no additional analysis is required.

If YES, the project must be included in a Metropolitan Planning Organization (MPO) conforming Long Range Plan (LRP) and Transportation Improvement Program (TIP). There must be no substantial changes to the project's design and scope since the conformity analysis. For questions, contact the UDOT Air Quality Program Coordinator.

B. Project Level Requirement

I. Carbon Monoxide (CO)

NO The project is in a non-attainment or maintenance area and affects intersections that are at level-of-service D, E or F or those that will change to D, E or F because of increased traffic volumes related to the project.

If NO, a CO Analysis is not required.

If YES, a CO hot-spot analysis of peak emissions is required using CAL3QHC and the EPA "MOVES" model. Attach results of analysis.

___ The CO hot-spot analysis shows compliance with the NAAQS.

___ The CO hot-spot analysis shows that the project will cause or contribute to new localized CO violations of the NAAQS, will increase the frequency or severity of existing violations, or will delay attainment of the NAAQS.

If YES, revise the signal timing data and re-run the analysis. If the NAAQS are still exceeded, compare the Build CO levels with No-Build CO levels for the design year. CO levels for the project must be less than or equal to the No-Build levels for the design year; otherwise the project must be modified.

II. Particulate Matter (PM2.5 and PM 10)

NO The project is in a non-attainment or maintenance area and involves a new or expanded highway and will have a significant number of diesel vehicles or significant increase in the number of diesel vehicles. An example is a facility with more than 125,000 annual average daily traffic (AADT) and 8% (10,000) or more is truck traffic.

NO The project is in a non-attainment or maintenance area and affects intersections that are at level-of service D, E or F with a significant number of diesel vehicles or affects intersections that will change to D, E or F because of increased traffic volumes from a significant number of diesel vehicles.

If NO to both of the above, a PM analysis is not required.

If YES to either of the above, a PM hot-spot analysis of peak emissions is required using CAL3QHCR and the EPA "MOVES" model. Attach analysis results.

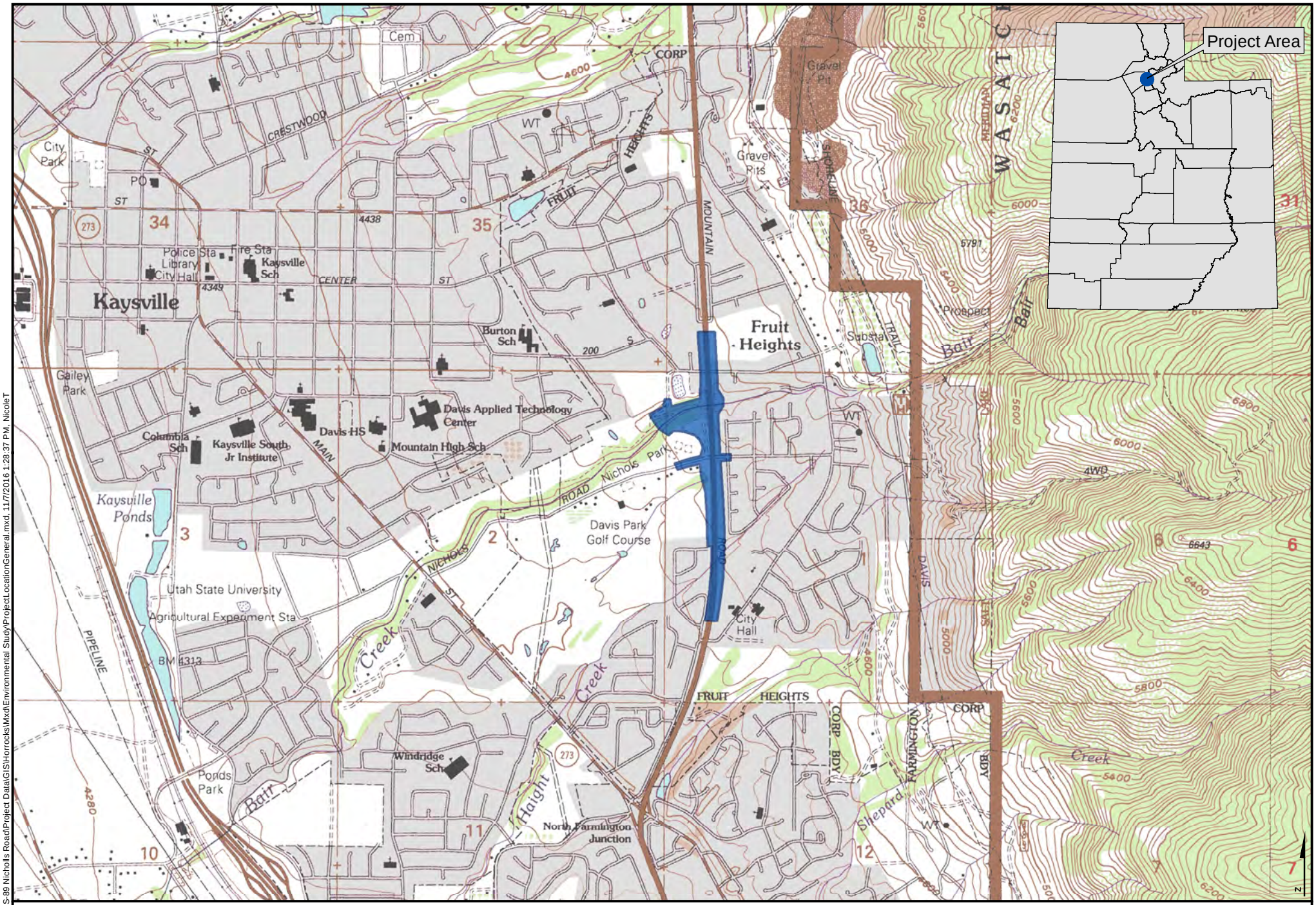
___ The PM hot-spot analysis shows compliance with the NAAQS.

___ The PM hot-spot analysis shows that the project will cause or contribute to new localized PM violations of the NAAQS, will increase the frequency or severity of existing violations, or will delay attainment of the NAAQS.

If YES, compare the Build PM levels with No-Build PM levels for the design year. PM levels for the project must be less than or equal to the No-Build levels for the design year; otherwise the project must be modified.

Attachments

- Project Location Maps
- Proposed Action Figure
- Typical Sections
- Cultural Resources Memo
- Native American Consultation Letters
- Utah Geological Survey Letter
- Threatened & Endangered Species “No Effect” Memo
- Noise Study
- Wetland Delineation and Waters of the U.S. Report
- Visual Impacts Assessment Memo
- Air Quality Memo



Legend

Study Area

US-89; Lloyd Road Extension and Nicholls Road, Fruit Heights, UT
Project No. S-R199(198)

Project Location Map

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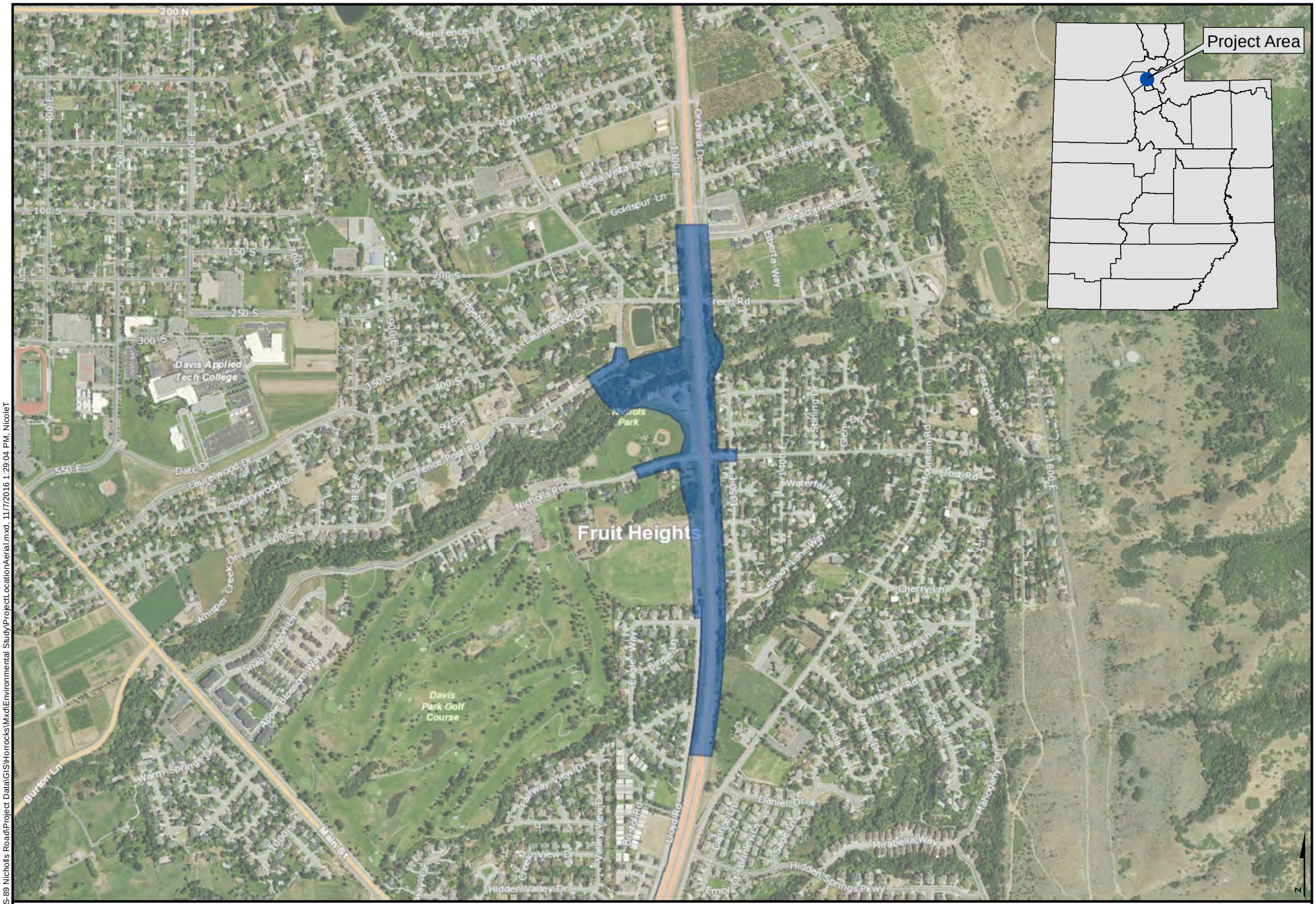

Legend

Study Area

US-89; Lloyd Road Extension and Nicholls Road, Fruit Heights, UT
Project No. S-R199(198)

Project Location Map

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Isolated Wetland
(Likely non-jurisdictional)

Historic Structure
No Historic
Properties Affected

Widening US-89 to accommodate one additional travel lane in each direction (re-striping for the new lanes will occur if adjacent US-89 segments are widened)

Construct crossing over Baer Creek

Hazardous Waste Site #2

Extend Lloyd Road from Eagle Way to Fence Post Road

Construct an overpass (US-89 over Nicholls Road) and eliminate the existing access points to US-89

Hazardous Waste Site #1

Laurelwood Dr
Lloyd Rd
1250 E
Howards Way
Rd
Baer Creek
Nicholls Park
400 S
Stirling Dr
Glen Dr
1400 E
Waterfall Way
Nicholls Rd
1350 E
Fruit Heights
Shady Lane Way
Davis Golf Course
Eagle Way
Birdie Ln
Bogey Dr
Hilda Dr
James

Study Area
Historic Structure Eligible for the NRHP
Noise Impact
Isolated Wetland
Waters of the U.S.
Hazardous Waste Site
Existing Section 6(f) Boundary

US-89; Lloyd Road Extension and Nicholls Road
Fruit Heights, UT
Project No. S-R199(198)
Proposed Action

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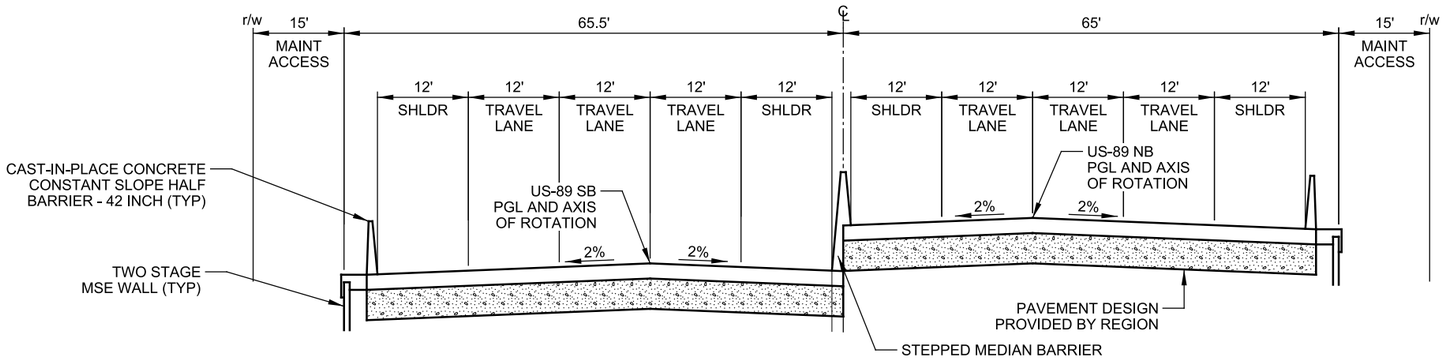
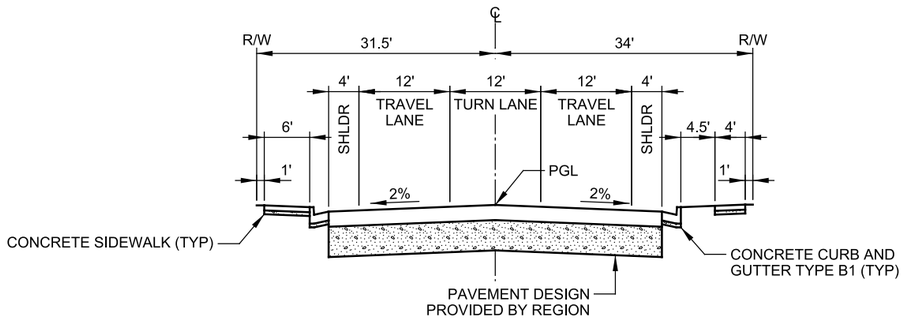


TYPICAL SECTION

US-89

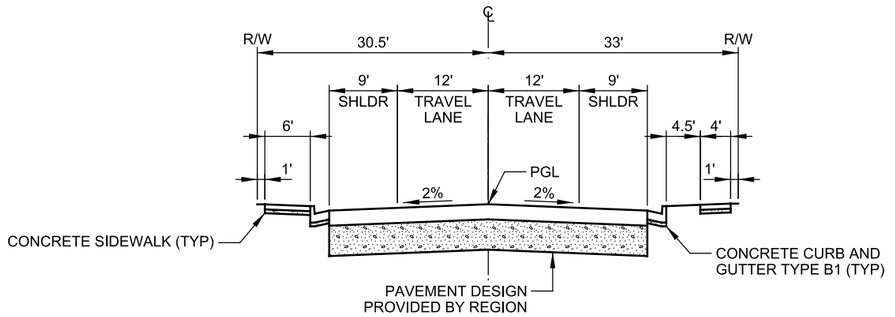
DESIGN SPEED 70 MPH
CLEAR ZONE 30 FT



TYPICAL SECTION

NICHOLLS RD AT INTERSECTION WITH LLOYD RD

DESIGN SPEED 30 MPH
CLEAR ZONE 14 FT

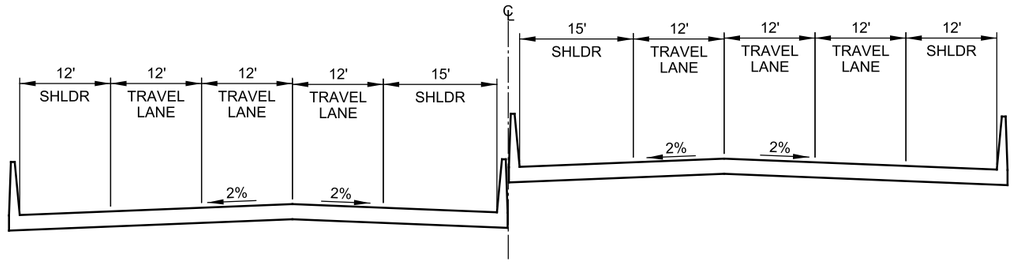


TYPICAL SECTION

NICHOLLS RD

DESIGN SPEED 30 MPH
CLEAR ZONE 14 FT

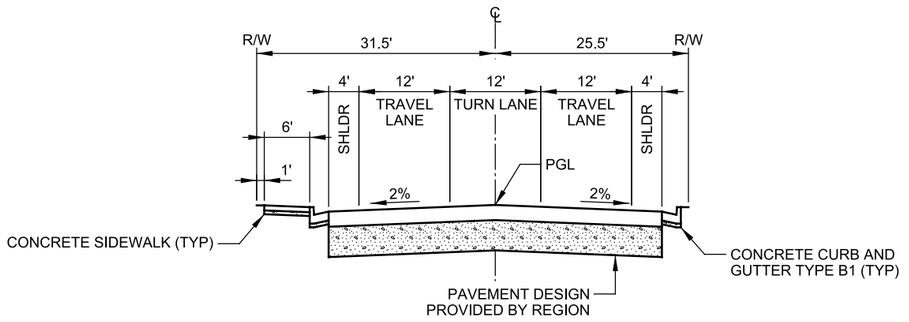
US-89/NICHOLLS RD
TYPICAL SECTIONS
12/1/2016



TYPICAL SECTION

US-89 STEPPED BRIDGE

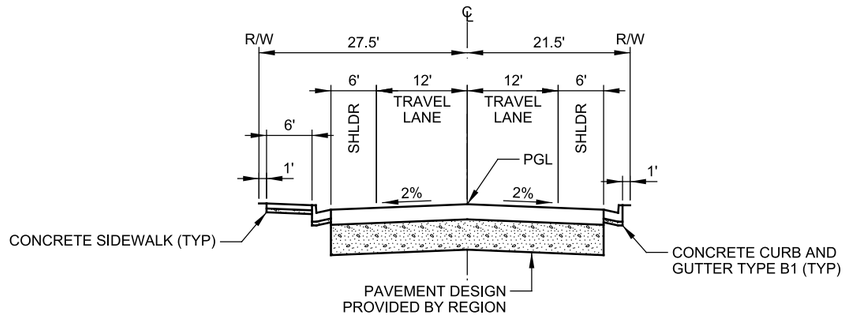
DESIGN SPEED 70 MPH
CLEAR ZONE 30 FT



TYPICAL SECTION

LLOYD RD AT INTERSECTION WITH NICHOLLS RD

DESIGN SPEED 30 MPH
CLEAR ZONE 14 FT



TYPICAL SECTION

LLOYD RD

DESIGN SPEED 30 MPH
CLEAR ZONE 14 FT

US-89/NICHOLLS RD
TYPICAL SECTIONS
12/1/2016

Cultural and Paleo Clearance with Tier 1 Screening Form

Federally funded projects classified as delegated categorical exclusions are processed in accordance with Stipulation II, Part A and Appendix B of the *Memorandum of Understanding, State Assumption of Responsibility for Categorical Exclusions (23 USC §326)*, by which the UDOT assumes responsibility, assigned by the FHWA, for ensuring compliance with Section 106 of the NHPA and with Section 4(f). Federally funded projects classified as documented categorical exclusions are approved by FHWA.

Pursuant to the *Second Amended Programmatic Agreement among the FHWA, the Utah SHPO, the ACHP, the USACE Sacramento District, and the UDOT Regarding Section 106 Implementation for Federal-Aid Transportation Projects in the State of Utah*, and the *Programmatic Agreement between the UDOT and the Utah SHPO Regarding Implementation of U.C.A. 9-8-404 for State Funded Transportation Projects in Utah*, UDOT has taken into account the effects of this undertaking on historic properties and has determined that the finding of effect is **No Historic Properties Affected**.

Pursuant to the *Memorandum of Understanding between the UDOT and the Utah Geological Survey Concerning Agency Responsibilities Pursuant to U.C.A. 79-3-508*, the UDOT has taken into account the effects of this undertaking on paleontological resources. If applicable, consultation letter from UGS is included in the environmental document.

PROJECT: PIN 13480—S-R199(198); US-89; Nicholls Rd Grade Separation, Frontage Rds, Kaysville City, Davis County.

DATE: December 8, 2016
PREPARER: Jonathan Dugmore, M.A.A.; Region 2 Archaeologist
CONTACT: 385-414-2066, jdugmore@utah.gov

PROJECT STIPULATIONS

1) Clearance is contingent upon the contractor adhering to the proposed scope of work and remaining within cleared areas. **Notify Region Environmental of any scope changes.**
2) *UDOT Standard Specification 01355 Part 3.7, Environmental Clearances by Contractor*
3) *UDOT Standard Specification 01355 Part 3.8, Discovery of Historical Archaeological, or Paleontological Objects, Features, Sites or Human Remains.* **Notify Region Environmental immediately of any discoveries during construction.**

PROJECT DESCRIPTION

UDOT is proposing to grade-separate the intersection of US-89 and Nicholls Road in Davis County. The project will include: construction of a structure carrying US-89 over Nicholls Road; lowering Nicholls Road under the proposed structure; eliminating access from Nicholls Road to US-89; the extension of Lloyd Road from Eagle Way to Fence Post Road, including a crossing of Baer Creek; and striping in left-turn lanes from Nicholls Road onto Lloyd Road. Work will require the full acquisition of one property and partial acquisitions from approximately 4 additional properties including a portion of Nicholls Park.

SCREENING PROCESS

Screened undertakings have the potential to affect historic properties, but have been determined by UDOT to require no further review or consultation under the Agreements. Screening may include any the following tasks and should be appropriate to the complexity, scale, and location of the undertaking. Documentation of the screening will be included in the project files, quarterly report submitted to SHPO, and environmental document.

Antiquities Project Number: U16HX0807PS

Literature Review

- ☐ Class I literature search (date completed and by whom):
- ☒ Records review (i.e. UDSH, UDOT, BLM, etc.): Preservation Pro
- ☐ Project plans
- ☐ As-built project plans
- ☒ Aerial photographs: Google Earth
- ☐ Historic Maps:
- ☐ Topographic Maps:
- ☐ ROW/Ownership/Parcel Data:
- ☐ Other:

Description of search results: The search was confined to the project APE which consists of the roadway prism along Lloyd Road (US-89) in addition to areas along Nicholls Road and Fence Post Road. No cultural properties were identified at this time.

Field Review

☒ Pedestrian survey (Class III) (survey interval): 15 meter transects
☐ Field review other than Class III (reconnaissance, windshield, etc.):
☐ Other:
☐ None

Description of survey results (If no field survey was conducted, explain why not):
Survey for this project was conducted by archaeologist Peter Steele of Horrocks Engineers. No cultural properties were located within the project area. Additionally, the potential for cultural resources in these areas is low due to urban development.

Supporting Documentation

Reports and/or forms generated from any cultural resource inventories shall be submitted quarterly to the Utah Division of State History (UDSH) for filing.

Title of report: An Archaeological Investigation for the US-89; Lloyd Road Extension and Nicholls Road State Environmental Study

Consultation

☐ Utah SHPO (including APE consultation):
☐ Certified Local Government (CLG):
☐ Tribes:
☐ State/Federal Agencies:
☐ Knowledgeable Informants:
☐ Other:
☒ None:

Description of consultation efforts (If no consultation was done, explain why not):
Native American consultation was initiated through letters sent to the Eastern Shoshone Tribe of the Wind River Reservation, Shoshone-Bannock Tribes, Paiute Indian Tribe of Utah, Northwestern Band of Shoshone Nation, Uintah and Ouray Ute Tribes, and the Skull Valley Band of Goshute Indians (sent November 8, 2016). In addition, notification was also sent to those tribes with whom UDOT has Section 106 Programmatic Agreements: Cedar Band of Paiutes, Shivwits Band of Paiute Indian Tribe, and the Confederated Tribes of the Goshute Reservation (sent November 8, 2016). To date, none of the tribes have responded to these notifications.

☐ Controversy based on historic preservation issues? If yes, consultation with SHPO and UDOT Central Environmental is required. Additional consultation with FHWA may be required.

Finding of Effect

The undertaking will result in the following finding of effect:

☒ No Historic Properties Affected: no cultural resources present
☐ No Historic Properties Affected: cultural resources present but none eligible
☐ No Historic Properties Affected: historic properties present, but are completely avoided by the undertaking and the potential for substantial indirect effects is very low

Description of impacts:
As no cultural resources are present in the APE, the UDOT has determined that this project will result in No Historic Properties Affected

UDOT Project Initial Tribal Notification Form
Section 106 Consultation

Date: November 8, 2016
UDOT Project: PIN 13480—S-R199(198); US-89; Nicholls Road Grade Separation, Frontage Roads, Kaysville City, Davis County.
Contact Name: Jonathan Dugmore
Address: 2010 South 2760 West, Salt Lake City, Utah 84104
Telephone: 385-414-2066
Email: jdugmore@utah.gov

Project Description

UDOT is proposing to grade-separate the intersection of US-89 and Nicholls Road in Davis County. The project will include: construction of a structure carrying US-89 over Nicholls Road; lowering Nicholls Road under the proposed structure; eliminating access from Nicholls Road to US-89; the extension of Lloyd Road from Eagle Way to Fence Post Road, including a crossing of Baer Creek; and striping in left-turn lanes from Nicholls Road onto Lloyd Road. Work will require the full acquisition of one property and partial acquisitions from approximately 4 additional properties including a portion of Nicholls Park.

Archaeological Potential (Prehistoric or Historic Sites)

- ☐ Known prehistoric sites in the project area
- ☐ Known historic sites in the project area
- ☐ Likely to find prehistoric sites in the project area
- ☐ Likely to find historic sites in the project area
- ☒ Unlikely to find prehistoric sites in the project area
- ☒ Unlikely to find historic sites in the project area
- ☐ No expected ground disturbance
- ☐ Other:

Additional Information/Comments

Tribal Information

Copies to:

Comments

1. Do you wish to be a Section106 consulting party on this project?	☐ Yes	☐ No	☐ Not Sure
2. If you do not wish to be a Section 106 consulting party, do you wish to continue to be involved in the development of this project?	☐ Yes	☐ No	☐ Not Sure
Note: If your answer is "Not Sure," UDOT will continue to provide information.			
3. Are you aware of any traditional religious or culturally important places in or near the project area?	☐ Yes	☐ No	☐ Not Sure
4. If yes, can you share details about the place (e.g., location and other characteristics) and any concerns you may have?	☐ Yes	☐ No	
5. Is this information sensitive?	☐ Yes	☐ No	

Additional Comments

Name of person completing this form, if different from above:
Signature: Date:

Identical copies of the Project Notification Form sent to the following recipients:

Original to:	CC to:
Mr. Darwin St. Clair Jr., Chairman Eastern Shoshone Tribe of the Wind River Reservation P.O. Box 538/15 North Fork Rd Fort Washakie, WY 82514	Ms. Glenda Trosper, Director, Cultural Center Eastern Shoshone Tribe of the Wind River Reservation P.O. Box 538/15 North Fork Rd Fort Washakie, WY 82514
	Mr. Wilfred Ferris, THPO Eastern Shoshone Tribe of the Wind River Reservation P.O. Box 538/15 North Fork Rd Fort Washakie, WY 82514
Mr. Blaine Edmo, Chair Shoshone-Bannock Tribes of Fort Hall P.O. Box 306 Pima Drive Fort Hall, ID 83203	Ms. Carolyn Smith, Cultural Resource Director Shoshone-Bannock Tribes of Fort Hall P.O. Box 306 Pima Drive Fort Hall, ID 83203
Ms. Corrina Bow, Tribal Chairperson Paiute Indian Tribe of Utah 440 North Paiute Drive Cedar City, UT 84721	Ms. Dorena Martineau, Cultural Resources Manager Paiute Indian Tribe of Utah 440 North Paiute Drive Cedar City, UT 84721
Mr. Shane Warner, Chairman Northwestern Band of Shoshone Nation 707 North Main Street Brigham City, UT 84302	Ms. Patty Timbimboo-Madsen, Cultural Specialist Northwestern Band of Shoshone Nation 707 North Main Street Brigham City, UT 84302
Mr. Shaun Chapoose, Chairperson Ute Indian Tribe of the Uintah and Ouray Ute Indian Reservation P.O. Box 190 Fort Duchesne, UT 84026	Ms. Betsy Chapoose, Director, Cultural Rights and Protection Ute Indian Tribe of the Uintah and Ouray Ute Indian Reservation P.O. Box 190 Fort Duchesne, UT 84026
Ms. Candace Bear, Chairwoman Skull Valley Band of Goshute Indians P.O. Box 448 Grantsville, UT 84029	None

Original to:	CC to:	Email to:
Ms. Lora Tom, Band Chairwoman Cedar Band of Paiutes 4655 North Utah Trail Enoch, UT 84720	Ms. Vala Parashonts, Cultural Resources Representative Cedar Band of Paiutes 533 South 640 West Cedar City, UT 84721	lora.tom@ihs.gov (Lora Tom)
Ms. Jetta Wood, Band Chairwoman Shivwits Band of Paiute Indian Tribe of Utah 6060 West 3650 North Ivins, UT 84738	Ms. Shanan Anderson, Cultural Resource Director Shivwits Band of Paiute Indian Tribe of Utah 6060 West 3650 North Ivins, UT 84738	lomeli20034@aol.com martineau@shivwits.org

Mr. Virgil Johnson, Chairman Confederated Tribes of the Goshute Reservation P.O. BOX 6104 195 Tribal Center Rd. Ibapah, UT 84034	Ms. Mary Pete-Freeman, Cultural Resources Coordinator Confederated Tribes of the Goshute Reservation P.O. BOX 6104 195 Tribal Center Rd. Ibapah, UT 84034	virgilwjohnson@yahoo.com marypete@goshutetribe.com

GARY R. HERBERT
Governor
SPENCER J. COX
Lieutenant Governor

State of Utah
DEPARTMENT OF NATURAL RESOURCES
MICHAEL R. STYLER
Executive Director
Utah Geological Survey
RICHARD G. ALLIS
State Geologist/Division Director

October 19, 2016

Peter Steele
Horrocks Engineers
2162 West Grove Parkway, Suite 400
Pleasant Grove UT 84062

RE: Paleontological File Search and Recommendations for the US-89; Nicholls Road Project, Davis County, Utah
U.C.A. 79-3-508 (Paleontological) Compliance; Request for Confirmation of Literature Search according to the UDOT/UGS Memorandum of Understanding.

Dear Peter:

I have conducted a paleontological file search for the US-89 grade separation over Nicholls Road and Lloyd Road from Eagle Way to Fence Post Drive Project in response to your email of October 19, 2016. This project qualifies for treatment under the UDOT/UGS executed Memorandum of Understanding.

There are no paleontological localities recorded in our files for this project area. Quaternary and Recent alluvial and lacustrine deposits that are exposed along this project right-of-way have a low potential for yielding significant fossil localities (PFYC 2). Unless fossils are discovered as a result of construction activities, this project should have no impact on paleontological resources.

If you have any questions, please call me at (801) 537-3311.

Sincerely,

Martha Hayden

Martha Hayden
Paleontological Assistant

1594 West North Temple, Suite 3110, PO Box 146100, Salt Lake City, UT 84114-6100
telephone (801) 537-3300 • facsimile (801) 537-3400 • TTY (801) 538-7458 • *geology.utah.gov*

Memorandum

To: Ryan Pitts, Environmental Specialist
Horrocks Engineers

From: Paul W. West, Environmental Biologist
UDOT Environmental Services

Date: January 11, 2017

Re: S-R199(198) – U.S. 89/Lloyd Road Extension and Nicholls Road, Fruit Heights, Davis County (PIN 13480)

CC Chris Lizotte – UDOT, Region 1
Ashley Green – UDWR Headquarters
Scott Walker – UDWR Northern Region
Pam Kramer – UDWR Northern Region
Lloyd Neeley – UDOT Maintenance
File

Encls.

I understand that the Utah Department of Transportation (UDOT) is proposing to replace the existing at-grade intersection of U.S. 89/Nicholls Road (approximate U.S. 89 M.P. 399) in Davis County with a grade separation intersection intersection (see location maps). The Proposed Action includes:

- Constructing an overpass at the existing U.S. 89/Nicholls Road at-grade intersection (U.S. 89 over Nicholls Road).
- Eliminating the existing access points to U.S. 89 from Nicholls Road.
- Extending Lloyd Road from Eagle Way to Fence Post Road, to allow for traffic movement on the west side of U.S. 89.
- Constructing a bridge over Baer Creek.

A review of the Utah Division of Wildlife Resources, Utah Natural Heritage Program (UDWR/UNHP) 2016 database, the National Hydrography Dataset, and recent aerial imagery of the project area, indicates that there may be suitable habitat for Yellow-billed cuckoos (*Coccyzus americanus*) within a half-mile of the project area. As a result, UDOT contracted with Horrocks Engineers to conduct an assessment of the project area to determine whether or not suitable habitat does exist there. According to the Horrocks report (November, 2016), they concluded that "No suitable breeding or nesting habitat for yellow-billed cuckoos was identified within the habitat assessment area for the proposed project" (see attached report).

In addition, according to the (UDWR/UNHP) 2016 database, we have concluded that no other federally listed, threatened, endangered or candidate species, or any critical habitat would be affected by this project.

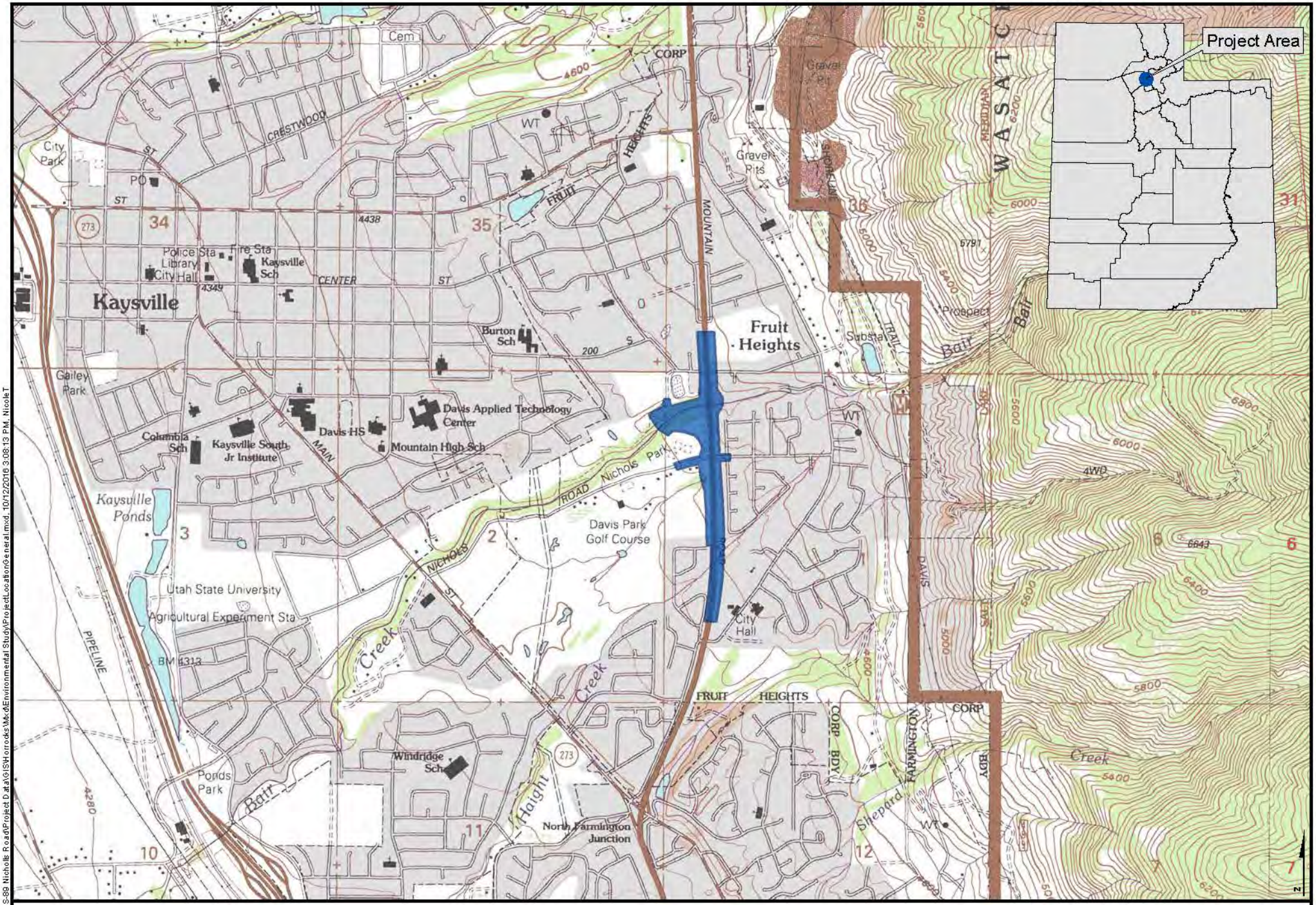
Inasmuch as this is a state funded project with no federal nexus of which I am aware, we are not required to obtain concurrence letters from the U.S. Fish and Wildlife Service. Therefore, I am issuing this memo in-lieu of their concurrence for your environmental documentation.

In addition, I have evaluated the above-referenced project with regard to Greater Sage Grouse (*Centrocercus urophasianus*) and migratory birds as required in the UDOT Environmental Manual of Instruction and by the Conservation plan for Greater Sage-grouse MOU between UDWR and UDOT.

Based on the Greater Sage Grouse 2015 mapping, it is my opinion that his project should not negatively affect Greater Sage Grouse.

Inasmuch as no trees or bushes will be removed and all work will be done on previously disturbed, cultivated, farmland, no migratory birds should be affected.

If you have any questions, please call me at 801-633-8747, or email me at paulwest@utah.gov.



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Legend

Study Area

US-89; Lloyd Road Extension and Nicholls Road, Fruit Heights, UT
Project No. S-R199(198)

Project Location Map

Legend

Study Area

US-89; Lloyd Road Extension and Nicholls Road, Fruit Heights, UT
Project No. S-R199(198)

Conceptual Design

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HORROCKS ENGINEERS

To: Naomi Kisen
Environmental Program Manager
Utah Department of Transportation

From: Ryan Pitts & Terry Johnson

Date: December 1, 2016

Memorandum

Subject: US-89 Nicholls Road State Environmental Study
UDOT Project No. SR-199(198) PIN 13480
Yellow-billed Cuckoo (Coccyzus americanus) Habitat Assessment

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INTRODUCTION

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study for US-89 and Nicholls Road in Fruit Heights, Utah. Planned improvements include replacing the existing at-grade intersection with a grade-separated intersection and completing Lloyd Road which runs parallel to US-89 along the west side by connecting the existing end points located both north and south of Nicholls Road. A yellow-billed cuckoo habitat assessment study was undertaken in an effort to determine the presence/absence of suitable habitat for listed species in compliance with the Endangered Species Act (ESA).

On October 3, 2014, the U.S. Fish and Wildlife Service listed the western distinct population of the yellow-billed cuckoo (Coccyzus americanus) as a threatened species and the rule went into effect on November 3, 2014. Davis County, Utah is identified as a county where the yellow-billed cuckoo is known to or believed to occur. Therefore, on November 22, 2016, Ryan Pitts and Terry Johnson of Horrocks Engineers conducted a habitat assessment for yellow-billed cuckoo. The habitat assessment area included approximately 32.17 acres of riparian habitat within one-half (0.5) mile of the proposed project (see attached map). The purpose of this memo is to report the results of the habitat assessment.

GENERAL HABITAT INFORMATION

Yellow-billed cuckoos are a riparian species with a very restrictive group of macro-habitat requirements (Laymon 1998). Cuckoos inhabit low and mid-elevation cottonwood-willow forests (*Populus spp.* – Salix spp.) with multilayered canopies. Habitats containing other riparian trees and shrubs are also utilized, including alder (*Alnus spp.*), box elder (*Acer negundo*), mesquite (*Prosopis spp.*), oak (*Quercus spp.*), seepwillow (*Baccharis spp.*), velvet ash (*Fraxinus velutina*), Mexican elderberry (*Sambuccus mexicanus*), Arizona sycamore (*Platnus wrightii*), Arizona walnut (*Juglans major*), netleaf hackberry (*Celtis reticulate*), and occasionally tamarisk (*Tamarix spp.*) (Halterman et al. 2015, Daw 2014).

In addition to being restricted by habitat type, the configuration and size of habitat is also important (Laymon 1998). Large patches of contiguous or nearly contiguous riparian habitat are required. Multilayered canopies are preferred as these environments create cooler, more humid conditions that are important to nesting success (Halterman et al. 2015, Daw 2014). Cuckoos generally select nest sites with mean canopy heights between 23 and 33 feet (7-10 meters). Riparian habitats with canopy heights less than 13 feet (4 meters) tall are considered unsuitable (Laymon 1998).

HABITAT ASSESSMENT METHODOLOGY

Habitat suitability was assessed using Guidelines for the Identification of Suitable Habitat for WYBCU in Utah as provided by USFWS Utah Field Office. Because surveyors only performed a habitat assessment and not a presence/absence survey, a Section 10(a) 1(A) recovery permit was not required.

Prior to the field visit, aerial imagery, topographical maps, and National Hydrography maps were used to identify riparian areas within one-half (0.5) mile of the proposed project. These preliminary searches identified potentially suitable habitat along Bair Creek, Haight Creek, and an unnamed drainage in the project area and the habitat assessment area.

Habitat conditions were assessed to identify patches of suitable yellow-billed cuckoo breeding and nesting habitat, suitable foraging habitat, and unsuitable habitat. These determinations were made using habitat suitability characteristics detailed in Guidelines for the Identification of Suitable Habitat for WYBCU in Utah. Characteristics of suitable breeding and nesting habitat include:

- Vegetation that is predominantly multi-layered, with riparian canopy trees and at least one layer of understory shrubby vegetation;
- Patches of multi-layered vegetation (as described above) that are at least 12 acres (5 ha) or greater in extent and separated from other patches of suitable habitat by at least 300 meters;
- Somewhere within a patch, the multi-layered riparian vegetation (as described above) should be at least 100 meters wide by 100 meters long; and,
- Open areas, or gaps of multi-layered vegetation within a patch are less than 300 meters.

Breeding and nesting cuckoos have been known to forage in riparian habitat patches containing only an overstory canopy, but foraging habitat must be located within 300 meters of suitable breeding and nesting habitat (Guidelines for the Identification of Suitable Habitat for WYBCU in Utah).

SITE DESCRIPTION

The project is located in a suburban residential development along the foothills of the Wasatch Range in Fruit Heights, Davis County, Utah. The only areas that have a riparian vegetation component within the habitat assessment area are the ravines comprising Bair Creek, Haight Creek, an unnamed drainage, and an area south of Nicholls Road near the intersection with US-89. Other vegetation is present on the sides of the ravines and in residential landscapes. This vegetation is primarily comprised of gamble oak (Q*uercus gambelii*) and typical residential landscape species (maple species (*acer spp.*), honey locust (*Gleditsia triacanthos*), ash species (*Fraxinus spp.*), elm species (*Ulmus spp.*), Austrian pine (*Pinus nigra*), blue spruce (*Picea pungens*), Norway spruce (*Picea abies*), juniper species (*juniperus spp.*), flower crabapple species, (*Malus spp.*), fruit trees (*Malus spp.* and *Prunus spp.*), none of which are considered riparian species.

RESULTS

Woody vegetation in the riparian areas consisted of introduced and native species. The upper canopies were primarily cottonwood and willow species between 50-60 feet tall. The understory was more diverse in height and species. The understory varied from 15-30 feet tall and included sapling cottonwood, alder, bird cherry, box elder, and Russian olive.

Of the six potentially suitable habitat patches identified within the habitat assessment area, only the Bair Creek – west patch contained multi-layered riparian vegetation greater than 12 acres in size, but did not reach 100 meters in width (see Table 1 and Table 2). None of the patches met all of the four criteria need for suitable habitat. Table 2 summarizes the habitat characteristics recorded at each of the five areas. See pages 4-8 for photographs of the areas evaluated.

CONCLUSION

No suitable breeding or nesting habitat for yellow-billed cuckoo was identified within the habitat assessment area for the proposed project.

Table 1: Patch Size

Patch ID	Size	Length	Narrowest Point in Meters & Widest Point	Average Width (based on three or more measurements)	Patch Has Multi-Layered Riparian Vegetation at Least 100 Meters by 100 Meters?
Bair Ck.-West Patch	14.24 ac	1,090 m	30 m 70 m	62 m	No
Bair Ck.-East Patch	3.86 ac	560 m	12 m 78 m	51 m	No
Nicholls Rd Patch	0.68 ac	95 m	10 m 46 m	39 m	No
Haight Ck.-West Patch	1.01 ac	117 m	16 m 53 m	42 m	No
Haight Ck.-East Patch	1.9 ac	250 m	14 m 59 m	50 m	No
Unnamed Drainage Patch	10.83 ac	1,123 m	8 m 92 m	60 m	No

Table 2: Patch Analysis

Patch ID	Multi-Layered Vegetation with Riparian Canopy Trees	Patch Contains Multi-Layered Riparian Vegetation > 12 Acres?	Patch Has Multi-Layered Riparian Vegetation at Least 100 Meters by 100 Meters?	Open Areas of Multi-Layered Vegetation Within the Patch Are < 300 Meters	Patch Habitat Suitability Determination
Bair Ck.-West Patch	Yes	Yes	No	No	Unsuitable Habitat
Bair Ck.-East Patch	Yes	No	No	No	Unsuitable Habitat
Nicholls Rd Patch	No	No	No	No	Unsuitable Habitat
Haight Ck.-West Patch	No	No	No	No	Unsuitable Habitat
Haight Ck.-East Patch	Yes	No	No	No	Unsuitable Habitat
Unnamed Drainage Patch	Yes	No	No	No	Unsuitable Habitat

Photo Point 1 - Looking East

Photo Point 1 - Looking North

Photo Point 2 - Looking East

Photo Point 2 - Looking North

Photo Point 2 - Looking South

Photo Point 2 - Looking West

Photo Point 3 - Looking East

Photo Point 3 - Looking West

Photo Point 4 - Looking Northeast

Photo Point 5 - Looking Northeast

Project Study Area

Habitat Assessment Area (1/2 Mile Buffer)

Riparian Area

US-89/Nicholls Road
Yellow-Billed Cuckoo Habitat Assessment

NOISE STUDY

1.0 INTRODUCTION

This Noise Analysis was prepared in accordance with 23 CFR §772 and the UDOT Noise Abatement Policy, last revised February 13, 2014.

1.1 DESCRIPTION OF PROJECT

The proposed action for this study includes improvements to US-89 in Fruit Heights, Utah and is located in Davis County (refer to Figure 1 for study area). These improvements include:

- Constructing an overpass at the existing US-89 Nicholls Road at-grade intersection (US-89 over Nicholls Road).
- Eliminating the existing access points to US-89 from NIcholls Road.
- Extending Lloyd Road from Eagle Way to Fence Post Road, to allow for traffic movement on the west side of US-89.
- Constructing a bridge over Bair Creek
- Widening of US-89 to accommodate a future six-lane cross-section.

Figure 1. Project Location Map

1.2 APPLICABILITY

The UDOT Noise Abatement Policy states that "noise abatement will be considered for all Type I projects where noise impacts are identified." Type I projects are projects that include any of the following: the construction of a highway at a new location, the physical alteration of an existing highway that substantially alters its alignment, the addition of a through traffic lane, the addition of an auxiliary lane, or the addition or relocation

of interchange lanes or ramps. This project is considered a Type I project because of the addition of travel lanes on US-89 and the change in profile due to the grade-separation of the US-89 and Nicholls Road intersection.

2.0 ANALYSIS OF TRAFFIC NOISE IMPACTS

Traffic noise is measured in A-weighted sound levels in decibels (dBA) which most closely approximates the way the human ear hears sounds at different frequencies (see Figure 2). Since traffic noise varies over time, the sound levels for this noise analysis are expressed as "equivalent levels" or Leq, representing the average sound level over a one hour period of time. Unless noted otherwise, all sound levels in this noise analysis are expressed in the hourly equivalent noise level.

2.1 NOISE ABATEMENT CRITERIA

FHWA has established Noise Abatement Criteria for several categories of land use activities (see Table 1). FHWA's noise criteria is based on sound levels that are considered to be an impact to nearby property owners, also known as receptors. Primary consideration is to be given for exterior areas where frequent human use occurs.

UDOT has developed a Noise Abatement Policy for transportation projects, which conforms to FHWA noise abatement requirements outlined in 23 CFR §772. UDOT's Noise Abatement Policy states that a traffic noise impact occurs when either 1) the future worst case noise level is equal to or greater than the UDOT Noise Abatement Criteria for specified land use categories or, 2) the future worst case noise level is greater than or equal to an increase of 10 dBA over the existing noise level.

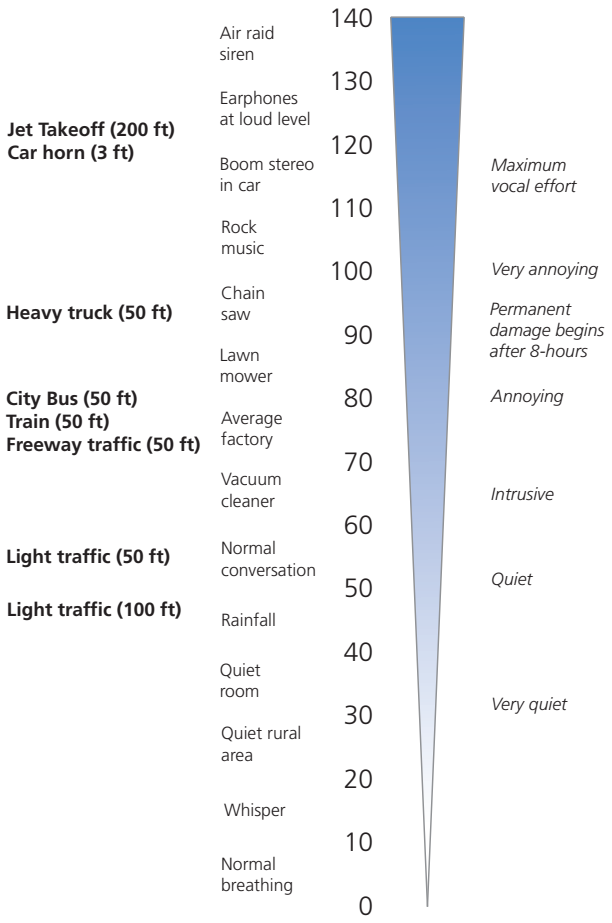


Figure 2. Sound Levels (in dBA) of Common Sounds (Compiled from Federal Transit Administration and Environmental Protection Agency Data)

Table 1: Noise Abatement Criteria

Activity Category	Leq (h)	Activity Description
A	56 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	66 (Exterior)	Residential.
C	66 (Exterior)	Active sports areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails and trail crossings.
D	51 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	71 (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	---	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	---	Undeveloped lands that are not permitted.

Source: UDOT Noise Abatement Policy

Noise impact and abatement analyses are required within Land Use Activity Categories A, B, C, D, and E (see Table 1) only when development exists or has been permitted (formal building permit issued prior to the date the final environmental decision document is approved). Activity Categories F and G include lands that are not sensitive to traffic noise. There are no impact criteria for these land use types and an analysis of noise impacts is not required.

2.2 NOISE SENSITIVE LAND USES

There are no Activity Category A land uses within the study area. Activity Category B land uses include all residences. Activity Category C land uses within the study area include two churches on Mountain Road, Nicholls Park, Harvey Park and various elements of the Davis Park Golf Course. The interior of the churches would be considered Activity Category D. There are no Activity Category E land uses within the study area. The UDOT Noise Policy states that a noise impact analysis will not be required for Activity Categories F and G.

2.3 EXISTING NOISE

The primary source of noise in the study area is automobile and truck traffic from US-89 and other roadways in the area. Existing traffic sound levels for each receptor in the study area were calculated using the Traffic Noise Model (TNM) 2.5 software using existing conditions (travel lane configurations and the posted speed limit). Existing noise levels were determined using the greatest hourly traffic noise conditions likely to occur on a regular basis, or Level-of-Service (LOS) C traffic volumes.

On-site measurements were made to verify the accuracy of the model and are shown in Table 2 and Figure 3. The number of receptors that currently experience a noise level that would be considered an impact is 20.

Table 2: Field Noise Measurements

Site #	Location	Field Noise Level (dBA)	TNM Output (dBA)	Difference
1	Nicholls Park Baseball Field	55.6	58.1	-2.5
2	670 Golden Circle Drive (backyard)	66.1	68.9	-2.8
3	450 South, end of cul-de-sac	51.6	53.5	-1.9
4	179 South 1250 East, east side of 1250 East	55.3	58.3	-3.0

2.4 PROPOSED ACTION NOISE

Projected traffic noise levels for the Proposed Action were calculated with TNM 2.5 software using build conditions (travel lane configurations and traffic volumes). Noise levels were determined using the greatest hourly traffic noise conditions likely to occur on a regular basis, or LOS C traffic volumes.

Noise levels resulting from the Proposed Action would rise somewhat throughout the study area, with the greatest increase being 9.2 dBA at Receptor B36 (see Figure 4). Some receptors near the proposed Nicholls Road bridge structure would actually receive a noise decrease (due to the profile change and addition of safety barrier), with the greatest decrease being -4.8 dBA at Receptor B90. Overall, the average increase in noise levels in the study area would be about 5.6 dBA. The number of receptors that would be considered impacted by traffic noise is 41.

Projected future worst case noise levels and impacted receptors can be seen in Figure 4 and Table 3.

2.5 SUMMARY

Table 3 shows a summary of Existing and Proposed Action noise levels (the letter on the Map Label represents the activity category). Refer to Figures 3 and 4 for receptor locations.

Table 3: Summary of Existing and Proposed Action Noise Levels

Map Label	Existing Noise Levels (dBA)	Impact	Proposed Action Noise Levels (dBA)	Impact
B09	67.4	Yes	75.3	Yes
B10	62.8	No	69.7	Yes
B11	63.1	No	66.5	Yes
B12	59.3	No	63.9	No
B13	56.7	No	62.4	No
B14	57.0	No	64.9	No
B15	55.2	No	62.7	No
B16	53.8	No	60.9	No
B17	52.3	No	59.1	No
B18	52.5	No	59.2	No
B19	53.8	No	61.0	No
B20	53.5	No	60.7	No
B21	52.2	No	58.9	No
B22	52.7	No	59.6	No
B23	59.4	No	67.4	Yes

Legend

Noise Measurement Location

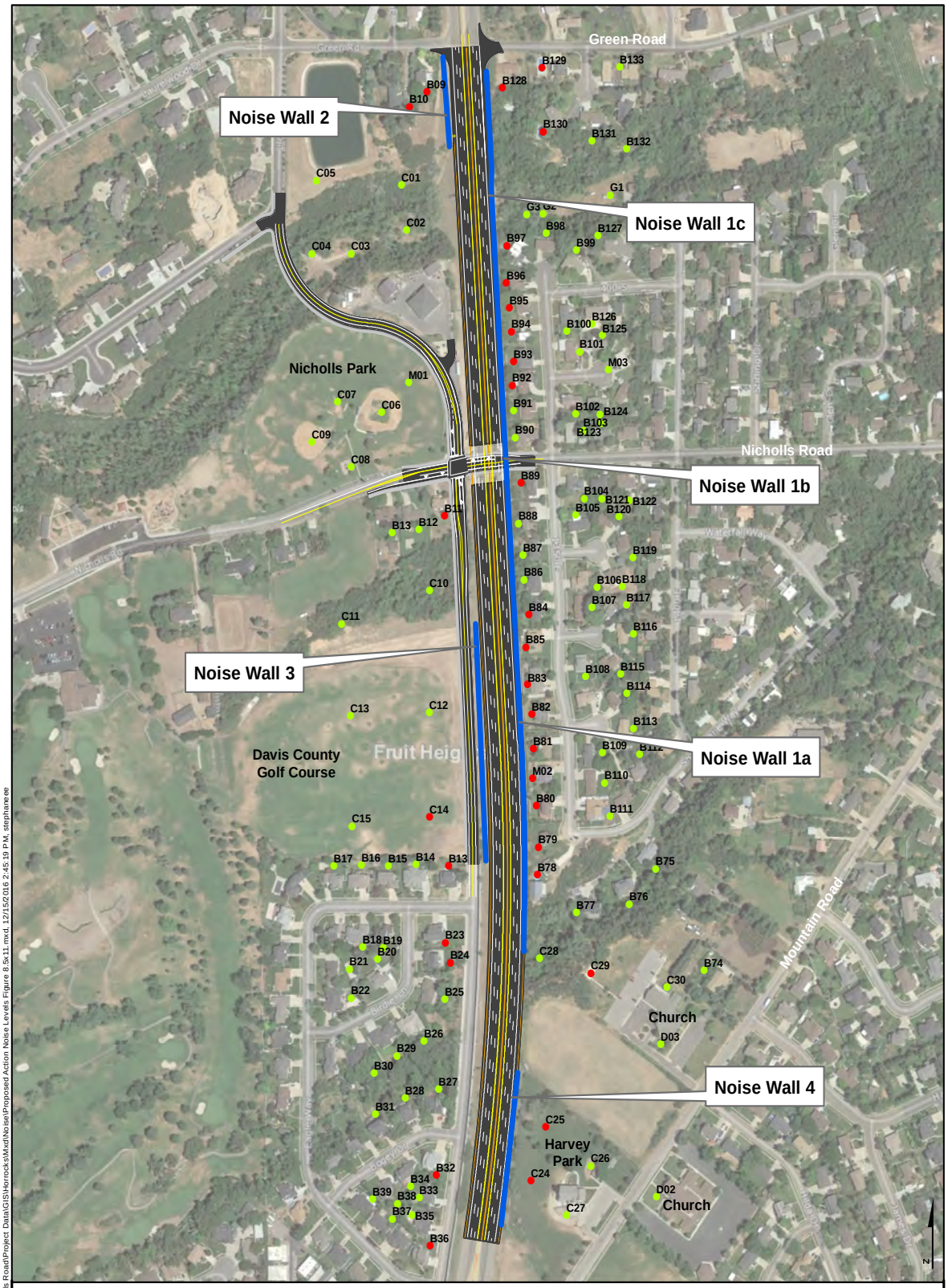
Receptors

Not Impacted Noise Receptor
Impacted Noise Receptor

US-89; Lloyd Road Extension and Nicholls Road, Fruit Heights, UT
Project No. S-R199(198)

Figure 3: Existing Noise Levels

C:\2016\PG-191_1609 US-89 Nicholls Road\Project Data\GIS\Horrocks\Mxd\Noise\Existing Noise Levels Figure 8.5x11.mxd, 1/27/2016 2:53:02 PM, stephaneee



Legend

Noise Wall Analyzed

Receptors

- Not Impacted Noise Receptor
- Impacted Noise Receptor

US-89; Lloyd Road Extension and Nicholls Road, Fruit Heights, UT
Project No. S-R199(198)

Figure 4: Proposed Action Noise Levels

O:\U2016\PG-191-1609 US-89 Nicholls Road\Project Data\GIS\Herrock\Mxd\Noise\Proposed Action Noise Levels Figure 8.5x11.mxd, 12/15/2016 2:45:19 PM, stephanee

Map Label	Existing Noise Levels (dBA)	Impact	Proposed Action Noise Levels (dBA)	Impact
B24	60.0	No	67.8	Yes
B25	56.9	No	64.3	No
B26	53.3	No	59.7	No
B27	56.1	No	63.7	No
B28	56.6	No	63.5	No
B29	52.0	No	59.0	No
B30	52.2	No	59.0	No
B31	52.8	No	59.8	No
B32	59.5	No	67.1	Yes
B33	58.1	No	65.5	No
B34	57.9	No	64.9	No
B35	56.6	No	64.5	No
B36	57.7	No	66.9	Yes
B37	56.0	No	63.3	No
B38	56.5	No	63.8	No
B39	55.3	No	62.4	No
B49	61.8	No	67.9	Yes
B50	64.4	No	70.2	Yes
B51	64.4	No	70.1	Yes
B52	64.6	No	70.3	Yes
B53	55.0	No	61.8	No
B54	54.6	No	61.4	No
B55	52.8	No	59.5	No
B56	53.2	No	59.8	No
B57	64.0	No	69.4	Yes
B58	63.5	No	69.2	Yes
B59	62.8	No	68.5	Yes
B60	61.3	No	67.1	Yes
B61	62.1	No	67.7	Yes
B62	60.2	No	66.1	Yes
B63	51.7	No	58.3	No
B64	52.0	No	58.7	No
B65	52.5	No	58.4	No
B66	51.8	No	58.4	No
B67	53.2	No	59.3	No
B68	51.9	No	58.3	No
B69	51.5	No	57.8	No
B70	51.5	No	57.8	No
B71	52.2	No	58.2	No
B72	57.5	No	63.2	No

Map Label	Existing Noise Levels (dBA)	Impact	Proposed Action Noise Levels (dBA)	Impact
B73	53.4	No	59.4	No
B74	51.7	No	59.8	No
B75	49.8	No	56.2	No
B76	52.8	No	58.0	No
B77	58.1	No	61.0	No
B78	69.0	Yes	77.5	Yes
B79	68.8	Yes	76.6	Yes
B80	68.9	Yes	72.9	Yes
B81	69.0	Yes	69.3	Yes
B82	68.7	Yes	68.2	Yes
B83	69.1	Yes	67.0	Yes
B84	67.1	Yes	66.3	Yes
B85	68.9	Yes	67.2	Yes
B86	65.5	No	62.8	No
B87	64.6	No	62.5	No
B88	64.6	No	62.3	No
B89	68.0	Yes	66.0	Yes
B90	69.7	Yes	64.9	No
B91	69.4	Yes	64.8	No
B92	69.4	Yes	66.8	Yes
B93	68.8	Yes	66.9	Yes
B94	69.2	Yes	68.8	Yes
B95	69.6	Yes	70.8	Yes
B96	70.0	Yes	70.9	Yes
B97	69.3	Yes	71.5	Yes
B98	57.9	No	63.1	No
B99	54.1	No	60.9	No
B100	56.7	No	65.3	No
B101	54.4	No	61.0	No
B102	55.3	No	61.7	No
B103	55.9	No	62.4	No
B104	54.3	No	59.4	No
B105	54.8	No	59.1	No
B106	55.2	No	62.4	No
B107	54.8	No	61.5	No
B108	54.6	No	60.8	No
B109	54.4	No	61.9	No
B110	53.0	No	60.0	No
B111	53.4	No	60.1	No
B112	53.5	No	61.1	No

Map Label	Existing Noise Levels (dBA)	Impact	Proposed Action Noise Levels (dBA)	Impact
B113	53.6	No	61.8	No
B114	53.8	No	62.0	No
B115	54.2	No	62.3	No
B116	53.5	No	62.2	No
B117	54.6	No	63.0	No
B118	54.7	No	62.9	No
B119	54.7	No	62.8	No
B120	53.7	No	61.5	No
B121	54.1	No	61.4	No
B122	53.4	No	61.2	No
B123	55.2	No	63	No
B124	55.3	No	63.3	No
B125	54.0	No	61.5	No
B126	53.9	No	61.2	No
B127	54.6	No	63.1	No
B128	68.7	Yes	76.0	Yes
B129	60.1	No	68.2	Yes
B130	60.7	No	69.2	Yes
B131	54.1	No	61.1	No
B132	50.2	No	56.8	No
B133	53.4	No	61.5	No
C01	59.1	No	62.9	No
C02	56.7	No	58.8	No
C03	53.9	No	58.3	No
C04	52.3	No	57.8	No
C05	53.8	No	60.7	No
C06	56.4	No	63.0	No
C07	53.9	No	61.7	No
C08	54.6	No	61.8	No
C09	52.7	No	61.1	No
C10	59.6	No	63.4	No
C11	53.6	No	59.8	No
C12	59.9	No	65.0	No
C13	54.2	No	60.7	No
C14	59.4	No	66.4	Yes
C15	53.7	No	60.9	No
C19	52.3	No	58.1	No
C20	61.1	No	65.4	No
C21	55.3	No	61.5	No
C22	53.5	No	59.7	No

Map Label	Existing Noise Levels (dBA)	Impact	Proposed Action Noise Levels (dBA)	Impact
C23	52.3	No	58.5	No
C24	65.5	No	68.1	Yes
C25	63.6	No	68.6	Yes
C26	57.2	No	63.4	No
C27	59.2	No	65.3	No
C28	62.5	No	62.2	No
C29	58.6	No	67.3	Yes
C30	53.5	No	61.4	No
D02	52.5	No	59.3	No
D03	53.5	No	61.2	No
M01	58.2	No	64.2	No
M02	69.1	Yes	70.5	Yes
M03	54.4	No	63.1	No
M04	59.2	No	67.6	Yes
G1	52.4	No	57.6	No
G2	58.3	No	61.5	No
G3	60.6	No	63.4	No

3.0 NOISE ABATEMENT

According to the UDOT Noise Abatement Policy, specific conditions must be met before traffic noise abatement is implemented. Noise mitigation must be considered feasible and reasonable. Some of the factors considered when determining if mitigation is feasible and reasonable include, but are not limited to, the following:

- **Engineering Considerations:** Engineering considerations such as safety, presence of cross streets, sight distance, access to adjacent properties, barrier height, topography, drainage, utilities, maintenance access and maintenance of the abatement measure must be taken into account as part of establishing feasibility.
- **Safety on Urban Non-Access Controlled Roadways:** To avoid a damaged wall from becoming a safety hazard, in the event of a failure, wall height shall be no greater than the distance from the back of curb to the face of proposed wall.
- **Noise Abatement Design Goal:** Every reasonable effort should be made to obtain substantial noise reductions. UDOT defines the minimum noise reduction (design goal) from proposed abatement measures to be 8 dBA or greater for at least 75% of front-row receptors.
- **Cost Effectiveness:** The cost used to determine reasonable mitigation for Activity Category B is $30,000 per benefited receptor. (A benefited receptor is a noise-sensitive receptor that is predicted to receive a minimum of 8 dBA of noise reduction as a result of noise abatement.) The cost used to determine reasonable mitigation for Activity Categories A, C, D, or E is $360 per linear foot.
- **Viewpoints of Property Owners and Residents:** As part of the final design phase, public balloting would take place if noise abatement measures appear to meet the criteria outlined in UDOT's Noise Abatement Policy.

Under UDOT's Noise Abatement Policy, only Type I projects are eligible for noise abatement measures. Type I projects are projects that include any of the following: the construction of a highway at a new location, the physical alteration of an existing highway that substantially alters its alignment, the addition of a through traffic lane, the addition of an auxiliary lane, or the addition or relocation of interchange lanes or ramps. The Proposed Action is a Type I project so noise abatement was considered. The types of noise mitigation measures considered included traffic management measures and noise barriers.

3.1 TRAFFIC MANAGEMENT MEASURES

Traffic management measures include reducing speed or signing for the restriction of compression brakes. According to the Highway Traffic Noise Analysis and Abatement Policy and Guidance report produced by FHWA, a reduction in speed of more than 20 mph is necessary for a noticeable decrease in noise levels. Therefore, speed reduction is not a reasonable abatement measure for this project because it is not consistent with the roadway classification.

3.2 NOISE BARRIERS

For a sound wall to be effective, it must be high enough and long enough to block the view of the noise source from the receptor's perspective. The Highway Traffic Noise Analysis and Abatement Policy and Guidance states that a good rule of thumb is that the noise barrier should extend four times as far in each direction as the distance from the receptor to the barrier. For instance, if the receptor is 50 feet from the proposed noise barrier, the barrier needs to extend at least 200 feet on either side of the receptor in order to shield the receptor from noise traveling past the ends of the barrier.

See below for a summary of the noise wall analysis. A more detailed noise wall analysis is in Appendix A.

Noise Wall 1

Noise Wall 1 would be located on the east side of US-89 starting at approximately 300 South, extending across the Nicholls Road bridge structure, and ending at approximately 700 South (see Figure 4). The wall would block noise from US-89 to the east-side residential subdivisions on the north and south sides of Nicholls Road. A 6-foot to 14-foot wall would not reduce noise levels by 8 dBA for any of the front row receptors. A 14-foot wall would reduce noise levels by 8 dBA for 14% of front row receptors. A 16-foot wall would reduce noice levels by 8 dBA for 29% of the front row receptors. Neither the 14-ft or 16-ft tall noise wall would reduce the noise levels by 8 dBA for 75% of the front-row receptors, as required by the UDOT Noise Abatement Policy. The wall was divided into segments to determine if a shorter wall configuration could meet the requirements of the UDOT Noise Abatement Policy, as follows:

Noise Wall 1a

Noise Wall 1a was evaluated for the east side of US-89, specifically to benefit front-row receptors south of Nicholls Road. The wall would block noise from the residences on Golden Circle Drive and Shady Lane Way, south of Nicholls Road. A 6-foot to 16-foot wall was modeled at this location and it was found that while a wall ranging in height from 8 ft to 16 ft would provide an 8 dBA reduction at Receptors 78, 79, 80, and E02, the cost was over $42,000 per benefitted receptor. Noise Wall 1a is not considered feasible and reasonable according to the UDOT Noise Abatement Policy (see Noise Wall 1a analysis in Appendix A).

Noise Wall 1c

Noise Wall 1c was evaluated for the east side of US-89, specifically to benefit front-row receptors north of Nicholls Road. The wall would block noise from the residences on Golden Circle Drive, north of Nicholls Road. A 6-foot to 16-foot wall was modeled at this location and it was found that a wall ranging in height from 6 ft to 16-ft would provide an 8 dBA reduction at only Receptor 95. Additionally, the cost was over $250,000 per benefitted receptor. Noise Wall 1c is not considered feasible and reasonable according to the UDOT Noise Abatement Policy (see Noise Wall 1c analysis in Appendix A).

Noise Wall 2

Noise Wall 2 would be located on the west side of US-89 south of Green Road. The wall would block noise from the residences at 1262 Green Road (Receptor B10) and 1282 Green Road Receptor (B09). A 6-foot to 16-foot wall would not reduce noise levels by 8 dBA for either of these receptors; therefore, Noise Wall 2 is not considered feasible and reasonable according to the UDOT Noise Abatement Policy (see Noise Wall 2 analysis in Appendix A).

Noise Wall 3

Noise Wall 3 would be located on the west side of US-89 adjacent to the Davis County Golf Course. The wall would block noise from the receptors at the golf course, Receptors C12-C14. A 6-foot to 16-foot wall would

not reduce noise levels by 8 dBA for any of these receptors; therefore, Noise Wall 3 is not considered feasible and reasonable according to the UDOT Noise Abatement Policy (see Noise Wall 3 analysis in Appendix A).

Noise Wall 4

Noise Wall 4 would be located on the east side of US-89 adjacent to Harvey Park. The wall would block noise from the receptors at the park, Receptors C24 and C25. A 6-foot to 16-foot wall would not reduce noise levels by 8 dBA for either of these receptors; therefore, Noise Wall 4 is not considered feasible and reasonable according to the UDOT Noise Abatement Policy (see Noise Wall 4 analysis in Appendix A).

4.0 CONSTRUCTION IMPACTS

Construction noise impacts are considered temporary and will be minimized through adherence to UDOT Standard Specification 01355 Environmental Compliance, Part 3.6 - Noise Control. Extended disruption of normal activities is not anticipated, since no receptors are expected to be exposed to construction noise for a long duration of time.

5.0 INFORMATION FOR LOCAL OFFICIALS

According to the UDOT Noise Abatement Policy, UDOT will inform local officials of noise compatible planning concepts and an estimate of future noise levels on undeveloped lands or properties within the project limits for Type I projects. There are no undeveloped lands within the project area.

6.0 CONCLUSION

The Proposed Action would result in noise levels increasing overall throughout the study area, with an average increase of 5.6 dBA. For the area near the Nicholls Road crossing, noise would actually decrease for about 13 receptors due to profile changes and the addition of safety barrier. The number of receptors that would be considered impacted by traffic noise is 41.

Noise walls of varying heights were analyzed for the Proposed Action at three locations along US-89; however, a noise wall at these locations would either not provide the required 8 dBA reduction to 75% of front-row receptors or would not be cost effective. Therefore, noise walls are not considered feasible and reasonable according to the UDOT Noise Abatement Policy.

APPENDIX A: NOISE WALL ANALYSIS

Noise Wall 1 - All

Wall Length: 2900 ft
Wall Cost per sq ft: $20
# of First Row Receivers: 21

Name	# of DU	ID	1st Row	# of 1st Row	6-ft Wall	Benefited	1st Row Benefitted Receptor	# 1st Row	# Benefited Receptors	8-ft Wall	Benefited	1st Row Benefitted Receptor	# 1st Row	# Benefited Receptors	10-ft Wall	Benefited	1st Row Benefitted Receptor	# 1st Row	# Benefited Receptors	12-ft Wall	Benefited	1st Row Benefitted Receptor	# 1st Row	# Benefited Receptors	14-ft Wall	Benefited	1st Row Benefitted Receptor	# 1st Row	# Benefited Receptors	16-ft Wall	Benefited	1st Row Benefitted Receptor	# 1st Row	# Benefited Receptors
B100	1	11		0	1.3	No	No	0	0	2.1	No	No	0	0	2.3	No	No	0	0	4.6	No	No	0	0	5.5	No	No	0	0	6.2	No	No	0	0
B101"	1	12		0	1.1	No	No	0	0	1.5	No	No	0	0	1.8	No	No	0	0	3.8	No	No	0	0	4.6	No	No	0	0	5	No	No	0	0
B102"	1	13		0	1.4	No	No	0	0	1.9	No	No	0	0	2.5	No	No	0	0	4.6	No	No	0	0	5.2	No	No	0	0	5.7	No	No	0	0
B103"	1	14		0	1.5	No	No	0	0	2	No	No	0	0	3	No	No	0	0	4.7	No	No	0	0	5.4	No	No	0	0	5.9	No	No	0	0
B104"	1	15		0	1.1	No	No	0	0	1.6	No	No	0	0	3.3	No	No	0	0	4	No	No	0	0	4.5	No	No	0	0	4.8	No	No	0	0
B105"	1	16		0	1.3	No	No	0	0	2	No	No	0	0	3.4	No	No	0	0	4	No	No	0	0	4.5	No	No	0	0	4.9	No	No	0	0
B106"	1	17		0	1.4	No	No	0	0	2	No	No	0	0	3.2	No	No	0	0	5.1	No	No	0	0	5.7	No	No	0	0	6	No	No	0	0
B107"	1	18		0	1.2	No	No	0	0	2.2	No	No	0	0	3.2	No	No	0	0	4.9	No	No	0	0	5.5	No	No	0	0	5.8	No	No	0	0
B108"	1	19		0	1.4	No	No	0	0	1.9	No	No	0	0	3.1	No	No	0	0	5.1	No	No	0	0	5.7	No	No	0	0	6	No	No	0	0
B109"	1	20		0	0.7	No	No	0	0	1.6	No	No	0	0	1.7	No	No	0	0	3.2	No	No	0	0	4.7	No	No	0	0	5.1	No	No	0	0
B110"	1	22		0	0.3	No	No	0	0	0.9	No	No	0	0	1	No	No	0	0	1.8	No	No	0	0	3.2	No	No	0	0	3.6	No	No	0	0
B111"	1	23		0	0.1	No	No	0	0	0.3	No	No	0	0	0.2	No	No	0	0	0.6	No	No	0	0	1.9	No	No	0	0	2.4	No	No	0	0
B112"	1	24		0	0.5	No	No	0	0	1.3	No	No	0	0	1.3	No	No	0	0	1.8	No	No	0	0	3.5	No	No	0	0	3.9	No	No	0	0
B113"	1	25		0	0.7	No	No	0	0	1.7	No	No	0	0	1.7	No	No	0	0	2.3	No	No	0	0	4.5	No	No	0	0	5	No	No	0	0
B114"	1	26		0	1.1	No	No	0	0	1.8	No	No	0	0	1.9	No	No	0	0	4	No	No	0	0	4.9	No	No	0	0	5.3	No	No	0	0
B115"	1	27		0	1.5	No	No	0	0	2	No	No	0	0	2.1	No	No	0	0	4.5	No	No	0	0	5.2	No	No	0	0	5.5	No	No	0	0
B116"	1	28		0	1.8	No	No	0	0	2.3	No	No	0	0	2.5	No	No	0	0	5	No	No	0	0	5.8	No	No	0	0	6.2	No	No	0	0
B117"	1	29		0	2	No	No	0	0	2.5	No	No	0	0	2.7	No	No	0	0	5.3	No	No	0	0	6.2	No	No	0	0	6.7	No	No	0	0
B118"	1	30		0	1.8	No	No	0	0	2.4	No	No	0	0	2.9	No	No	0	0	5.3	No	No	0	0	6.1	No	No	0	0	6.6	No	No	0	0
B119"	1	31		0	1.8	No	No	0	0	2.3	No	No	0	0	2.5	No	No	0	0	5	No	No	0	0	5.9	No	No	0	0	6.5	No	No	0	0
B120"	1	33		0	1.5	No	No	0	0	2.6	No	No	0	0	3.5	No	No	0	0	5.3	No	No	0	0	5.9	No	No	0	0	6.3	No	No	0	0
B121"	1	34		0	1.1	No	No	0	0	2.4	No	No	0	0	3.2	No	No	0	0	5	No	No	0	0	5.4	No	No	0	0	5.8	No	No	0	0
B122"	1	35		0	1.5	No	No	0	0	2	No	No	0	0	3	No	No	0	0	4.9	No	No	0	0	5.7	No	No	0	0	6.1	No	No	0	0
B123"	1	36		0	1.5	No	No	0	0	2	No	No	0	0	2.2	No	No	0	0	4.6	No	No	0	0	5.4	No	No	0	0	5.9	No	No	0	0
B124"	1	37		0	1.2	No	No	0	0	1.9	No	No	0	0	2	No	No	0	0	4.3	No	No	0	0	5.2	No	No	0	0	5.8	No	No	0	0
B125"	1	38		0	0.7	No	No	0	0	1.4	No	No	0	0	1.6	No	No	0	0	2.6	No	No	0	0	4	No	No	0	0	4.6	No	No	0	0
B126"	1	39		0	0.6	No	No	0	0	1.3	No	No	0	0	1.5	No	No	0	0	2.7	No	No	0	0	3.8	No	No	0	0	4.3	No	No	0	0
B127"	1	40		0	0.2	No	No	0	0	1	No	No	0	0	1.5	No	No	0	0	1.9	No	No	0	0	3	No	No	0	0	4.4	No	No	0	0
B128"	1	41	Yes	1	1.8	No	No	0	0	2.9	No	No	0	0	3.9	No	No	0	0	5	No	No	0	0	5.7	No	No	0	0	6	No	No	0	0
B129"	1	42		0	0.4	No	No	0	0	0.7	No	No	0	0	1.1	No	No	0	0	1.3	No	No	0	0	1.7	No	No	0	0	2.1	No	No	0	0
B130"	1	45		0	0.8	No	No	0	0	1.5	No	No	0	0	2.3	No	No	0	0	2.9	No	No	0	0	3.8	No	No	0	0	5.1	No	No	0	0
B131"	1	46		0	0.1	No	No	0	0	0.9	No	No	0	0	1.2	No	No	0	0	1.5	No	No	0	0	4	No	No	0	0	4.8	No	No	0	0
B132"	1	47		0	0.5	No	No	0	0	0.8	No	No	0	0	1.1	No	No	0	0	2.9	No	No	0	0	4	No	No	0	0	4.6	No	No	0	0
B133"	1	48		0	0.3	No	No	0	0	0.4	No	No	0	0	0.5	No	No	0	0	0.7	No	No	0	0	1.1	No	No	0	0	1.6	No	No	0	0
B75"	1	123		0	0.1	No	No	0	0	0.1	No	No	0	0	0.3	No	No	0	0	0.8	No	No	0	0	1	No	No	0	0	1.1	No	No	0	0
B76"	1	124		0	0	No	No	0	0	0.2	No	No	0	0	0.5	No	No	0	0	1.1	No	No	0	0	1.2	No	No	0	0	1.3	No	No	0	0
B77"	1	125		0	0.2	No	No	0	0	0.8	No	No	0	0	1.5	No	No	0	0	1.9	No	No	0	0	2.2	No	No	0	0	2.4	No	No	0	0
B78"	1	126	Yes	1	1.3	No	No	0	0	2.2	No	No	0	0	4.5	No	No	0	0	6.4	No	No	0	0	9	Yes	Yes	1	1	10.3	Yes	Yes	1	1
B79"	1	127	Yes	1	1.8	No	No	0	0	3.2	No	No	0	0	5.1	No	No	0	0	6.5	No	No	0	0	9.2	Yes	Yes	1	1	10.5	Yes	Yes	1	1
B80"	1	128	Yes	1	2.3	No	No	0	0	4.2	No	No	0	0	6.3	No	No	0	0	7.7	No	No	0	0	8.8	Yes	Yes	1	1	9.6	Yes	Yes	1	1
B81"	1	129	Yes	1	1.7	No	No	0	0	4	No	No	0	0	4.9	No	No	0	0	5.9	No	No	0	0	6.7	No	No	0	0	7.4	No	No	0	0
B82"	1	130	Yes	1	2.8	No	No	0	0	3.9	No	No	0	0	4.7	No	No	0	0	5.5	No	No	0	0	6.2	No	No	0	0	6.9	No	No	0	0
B83"	1	131	Yes	1	3.1	No	No	0	0	3.9	No	No	0	0	4.5	No	No	0	0	5.3	No	No	0	0	5.9	No	No	0	0	6.4	No	No	0	0
B84"	1	132	Yes	1	2.7	No	No	0	0	3.6	No	No	0	0	4.2	No	No	0	0	4.8	No	No	0	0	5.4	No	No	0	0	5.9	No	No	0	0
B85"	1	133	Yes	1	3	No	No	0	0	3.9	No	No	0	0	4.5	No	No	0	0	5.3	No	No	0	0	5.9	No	No	0	0	6.5	No	No	0	0
B86"	1	134	Yes	1	1.3	No	No	0	0	2	No	No	0	0	2.4	No	No	0	0	2.9	No	No	0	0	3.4	No	No	0	0	3.8	No	No	0	0
B87"	1	135	Yes	1	1.4	No	No	0	0	2	No	No	0	0	2.4	No	No	0	0	2.9	No	No	0	0	3.4	No	No	0	0	3.8	No	No	0	0
B88"	1	136	Yes	1	-3.4	No	No	0	0	-2.8	No	No	0	0	-2.4	No	No	0	0	-1.9	No	No	0	0	-1.4	No	No	0	0	-1	No	No	0	0
B89"	1	137	Yes	1	3	No	No	0	0	3.8	No	No	0	0	4.3	No	No	0	0	4.9	No	No	0	0	5.5	No	No	0	0	6	No	No	0	0
B90"	1	138	Yes	1	1.6	No	No	0	0	2.4	No	No	0	0	2.9	No	No	0	0	3.6	No	No	0	0	4.2	No	No	0	0	4.6	No	No	0	0
B91"	1	139	Yes	1	1.6	No	No	0	0	2.3	No	No	0	0	2.9	No	No	0	0	3.5	No	No	0	0	4.2	No	No	0	0	4.6	No	No	0	0
B92"	1	140	Yes	1	3.1	No	No	0	0	3.9	No	No	0	0	4.5	No	No	0	0	5.2	No	No	0	0	5.9	No	No	0	0	6.3	No	No	0	0
B93"	1	141	Yes	1	2.7	No	No	0	0	3.6	No	No	0	0	4.2	No	No	0	0	4.9	No	No	0	0	5.6	No	No	0	0	6.1	No	No	0	0
B94"	1	142	Yes	1	1.5	No	No	0	0	3.9	No	No	0	0	4.7	No	No	0	0	5.6	No	No	0	0	6.4	No	No	0	0	7	No	No	0	0
B95"	1	143	Yes	1	1.9	No	No	0	0	4.4	No	No	0	0	5.5	No	No	0	0	6.6	No	No	0	0	7.5	No	No	0	0	8.2	Yes	Yes	1	1
B96"	1	144	Yes	1	2	No	No	0	0	4.3	No	No	0	0	5.5	No	No	0	0	6.6	No	No	0	0	7.4	No	No	0	0	8.1	Yes	Yes	1	1
B97"	1	145	Yes	1	2.3	No	No	0	0	3.8	No	No	0	0	5.9	No	No	0	0	7	No	No	0	0	7.9	No	No	0	0	8.7	Yes	Yes	1	1
B98"	1	146		0	0.8	No	No	0	0	1.7	No	No	0	0	3.1	No	No	0	0	4.2	No	No	0	0	4.9	No	No	0	0	5.4	No	No	0	0
B99"	0	147		0	0.5	No	No	0	0	0.9	No	No	0	0	1.2	No	No	0	0	2.7	No	No	0	0	3.5	No	No	0	0	4	No	No	0	0
E02"	0	181	Yes	0	2.1	No	No	0	0	4.8	No	No	0	0	5.7	No	No	0	0	6.9	No	No	0	0	7.7	No	No	0	0	8.4	Yes	Yes	0	0
E03"	0	182		0	0.8	No	No	0	0	1.9	No	No	0	0	2	No	No	0	0	2.7	No	No	0	0	4.9	No	No	0	0	5.4	No	No	0	0
G1"	0	186		0	0.5	No	No	0	0	1.1	No	No	0	0	1.7	No	No	0	0	3.2	No	No	0	0	3.7	No	No	0	0	4.1	No	No	0	0
G2"	0	187		0	0.8	No	No	0	0	2.1	No	No	0	0	3	No	No	0	0	3.6	No	No	0	0	4.1	No	No	0	0	4.5	No	No	0	0
G3"	0	190		0	2.2	No	No	0	0	3.2	No	No	0	0	3.7	No	No	0	0	4.3	No	No	0	0	4.8	No	No	0	0	5.2	No	No	0	0
				# of First-Row Benefited:			0					0					0					0					3					6		
				% of First-Row Benefited:			0.0%					0.0%					0.0%					0.0%					14.3%					28.6%		
				Noise Abatement Design Goal:			No					No					No					No					No					No		
				# of Benefited:			0					0					0					0					3					6		
				Cost of Noise Wall:			$348,000.00					$464,000.00					$580,000.00					$696,000.00					$812,000.00					$928,000.00		
				Cost per Benefited Receiver:			-					-					-					-					$270,666.67					$154,666.67		
				Cost Effective:			No					No					No					No					No					No		
				Feasible and Reasonable:			**No**					**No**					**No**					**No**					**No**					**No**		

Noise Wall 1a (Optimized for Receptors E02, B80, B79, and B78)

			Wall Height:		
Wall Area:	9002	ft2	Points 3-4:	12	ft
Wall Cost per sq ft:	$20		Points 4-10:	14	ft
# of First Row Receivers:	5		Points 10-14:	16	ft
			Points 14-15:	12	ft
			Points 15-16:	8	ft

Name	# of DU	ID	1st Row	# of 1st Row	Reduction	Benefited	1st Row Benefitted Receptor	# 1st Row	# Benefited Receptors
B109	1	20		0	1	No	No	0	0
B110"	1	22		0	1.7	No	No	0	0
B111"	1	23		0	1.2	No	No	0	0
B112"	1	24		0	0.6	No	No	0	0
B75"	1	123		0	0.5	No	No	0	0
B76"	1	124		0	0.5	No	No	0	0
B77"	1	125		0	1.3	No	No	0	0
B78"	**1**	**126**	**Yes**	**1**	8.2	**Yes**	**Yes**	**1**	**1**
B79"	**1**	**127**	**Yes**	**1**	8.8	**Yes**	**Yes**	**1**	**1**
B80"	**1**	**128**	**Yes**	**1**	8.9	**Yes**	**Yes**	**1**	**1**
B81"	1	129	Yes	1	5.3	No	No	0	0
E02"	**1**	**181**	**Yes**	**1**	8	**Yes**	**Yes**	**1**	**1**

# of First-Row Benefited:	4
% of First-Row Benefited:	80.0%
Noise Abatement Design Goal:	Yes
# of Benefited:	4
Cost of Noise Wall:	$180,040.00
Cost per Benefited Receiver:	$45,010.00
Cost Effective:	No
Feasible and Reasonable:	**No**

Noise Wall 1c-2

Wall Area:	13103	ft	**Wall Height:**		
Wall Cost per sq ft:	$20		Points 1-2	6	ft
# of First Row Receivers:	6		Points 2-17	16	ft
			Points 17-18	10	ft
			Points 1-2	8	ft

Wall 1c

Name	# of DU	ID	1st Row	# of 1st Row	Reduction	Benefited	1st Row Benefitted Receptor	# 1st Row	# Benefited Receptors
B132	1	47		0	1.5	No	No	0	0
B131"	1	46		0	1.3	No	No	0	0
G1"	1	186		0	1.4	No	No	0	0
B127"	1	40		0	2.4	No	No	0	0
B99"	1	147		0	2.1	No	No	0	0
B102"	1	13		0	2	No	No	0	0
B103"	1	14		0	1.1	No	No	0	0
B123"	1	36		0	1	No	No	0	0
B124"	1	37		0	1.3	No	No	0	0
E03"	1	182		0	2.4	No	No	0	0
B125"	1	38		0	1.8	No	No	0	0
B101"	1	12		0	2.7	No	No	0	0
B126"	1	39		0	2	No	No	0	0
B100"	1	11		0	4.1	No	No	0	0
B90"	1	138		0	1.5	No	No	0	0
B91"	1	139		0	3.7	No	No	0	0
B92"	1	140	Yes	1	6	No	No	0	0
B93"	1	141	Yes	1	5.9	No	No	0	0
B94"	1	142	Yes	1	6.9	No	No	0	0
B95"	1	143	Yes	1	8	Yes	Yes	1	1
B96"	1	144	Yes	1	8	Yes	Yes	1	1
B97"	1	145	Yes	1	8	Yes	Yes	1	1
B98"	1	146		0	3.3	No	No	0	0
G2"	1	187		0	2.6	No	No	0	0
G3"	0	190		0	3.7	No	No	0	0
B130"	1	45		0	0.7	No	No	0	0
B128"	1	41		0	0	No	No	0	0

# of First-Row Benefited:	3
% of First-Row Benefited:	50.0%
Noise Abatement Design Goal:	Yes
# of Benefited:	3
Cost of Noise Wall:	$262,060.00
Cost per Benefited Receiver:	$87,353.33
Cost Effective:	No
Feasible and Reasonable:	**No**

Noise Wall 2

Wall Length: 295 ft
Wall Cost per sq ft: $20
# of First Row Receivers: 1

Name	# of DU	ID	1st Row	# of 1st Row	6-ft Wall	Benefited	1st Row Benefitted Receptor	# 1st Row	# Benefited Receptors	8-ft Wall	Benefited	1st Row Benefitted Receptor	# 1st Row	# Benefited Receptors	10-ft Wall	Benefited	1st Row Benefitted Receptor	# 1st Row	# Benefited Receptors	12-ft Wall	Benefited	1st Row Benefitted Receptor	# 1st Row	# Benefited Receptors	14-ft Wall	Benefited	1st Row Benefitted Receptor	# 1st Row	# Benefited Receptors	16-ft Wall	Benefited	1st Row Benefitted Receptor	# 1st Row	# Benefited Receptors
B09	1	9	Yes	1	1.7	No	No	0	0	2.8	No	No	0	0	3.8	No	No	0	0	4.8	No	No	0	0	5.4	No	No	0	0	5.8	No	No	0	0
B10	1	10		0	1	No	No	0	0	1.5	No	No	0	0	2	No	No	0	0	2.9	No	No	0	0	3.2	No	No	0	0	3.4	No	No	0	0
				# of First-Row Benefited:			0					0					0					0					0					0		
				% of First-Row Benefited:			0.0%					0.0%					0.0%					0.0%					0.0%					0.0%		
				Noise Abatement Design Goal:			No					No					No					No					No					No		
				# of Benefited:			0					0					0					0					0					0		
				Cost of Noise Wall:			$35,400.00					$47,200.00					$59,000.00					$70,800.00					$82,600.00					$94,400.00		
				Cost per Benefited Receiver:			-					-					-					-					-					-		
				Cost Effective:			No					No					No					No					No					No		
				Feasible and Reasonable:			**No**					**No**					**No**					**No**					**No**					**No**		

Noise Wall 3

Wall Length: 504 ft
Wall Cost per sq ft: $20
# of First Row Receivers: 2

Name	# of DU	ID	1st Row	# of 1st Row	6-ft Wall	Benefited	1st Row Benefitted Receptor	# 1st Row	# Benefited Receptors	8-ft Wall	Benefited	1st Row Benefitted Receptor	# 1st Row	# Benefited Receptors	10-ft Wall	Benefited	1st Row Benefitted Receptor	# 1st Row	# Benefited Receptors	12-ft Wall	Benefited	1st Row Benefitted Receptor	# 1st Row	# Benefited Receptors	14-ft Wall	Benefited	1st Row Benefitted Receptor	# 1st Row	# Benefited Receptors	16-ft Wall	Benefited	1st Row Benefitted Receptor	# 1st Row	# Benefited Receptors
C25	1	171	Yes	1	0.7	No	No	0	0	1.5	No	No	0	0	2.4	No	No	0	0	4	No	No	0	0	4.8	No	No	0	0	5.3	No	No	0	0
C24	1	170	Yes	1	0.2	No	No	0	0	0.8	No	No	0	0	2.1	No	No	0	0	3.9	No	No	0	0	4.6	No	No	0	0	5.2	No	No	0	0
				# of First-Row Benefited:			0					0					0					0					0					0		
				% of First-Row Benefited:			0.0%					0.0%					0.0%					0.0%					0.0%					0.0%		
				Noise Abatement Design Goal:			No					No					No					No					No					No		
				# of Benefited:			0					0					0					0					0					0		
				Linear Cost of Noise Wall:			$120.00					$160.00					$200.00					$240.00					$280.00					$320.00		
				Less than $360 per linear foot:			-					-					-					-					-					-		
				Cost Effective:			No					No					No					No					No					No		
				Feasible and Reasonable:			**No**					**No**					**No**					**No**					**No**					**No**		

Noise Wall 4

Wall Length: 781 ft
Wall Cost per sq ft: $20
# of First Row Receivers: 2

Name	# of DU	ID	1st Row	# of 1st Row	6-ft Wall	Benefited	1st Row Benefitted Receptor	# 1st Row	# Benefited Receptors	8-ft Wall	Benefited	1st Row Benefitted Receptor	# 1st Row	# Benefited Receptors	10-ft Wall	Benefited	1st Row Benefitted Receptor	# 1st Row	# Benefited Receptors	12-ft Wall	Benefited	1st Row Benefitted Receptor	# 1st Row	# Benefited Receptors	14-ft Wall	Benefited	1st Row Benefitted Receptor	# 1st Row	# Benefited Receptors	16-ft Wall	Benefited	1st Row Benefitted Receptor	# 1st Row	# Benefited Receptors
C14	1	160	Yes	1	1.6	No	No	0	0	2.4	No	No	0	0	3.6	No	No	0	0	4.1	No	No	0	0	4.5	No	No	0	0	4.7	No	No	0	0
C12	1	158	Yes	1	1.1	No	No	0	0	2.7	No	No	0	0	3.2	No	No	0	0	3.6	No	No	0	0	4	No	No	0	0	4.2	No	No	0	0
# of First-Row Benefited:							0					0					0					0					0					0		
% of First-Row Benefited:							0.0%					0.0%					0.0%					0.0%					0.0%					0.0%		
Noise Abatement Design Goal:							No					No					No					No					No					No		
# of Benefited:							0					0					0					0					0					0		
Linear Cost of Noise Wall:							$120.00					$160.00					$200.00					$240.00					$280.00					$320.00		
Less than $360 per linear foot:							-					-					-					-					-					-		
Cost Effective:							No					No					No					No					No					No		
Feasible and Reasonable:							**No**					**No**					**No**					**No**					**No**					**No**		

Wetland Delineation and Waters of the U.S. Report

In support of

US 89/ Nicholls Road Intersection

Prepared for:
Utah Department of Transportation
Region 1

Project No. S-R 199 (198)
Pin.13480

Prepared by:

Horrocks Engineers
2162 West Grove Parkway, Suite 400
Pleasant Grove, UT 84062

October 2016

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Project Introduction

Horrocks Engineers has prepared this Wetland Delineation and Waters of the U.S. Report in support of the Utah Department of Transportation's (UDOT) proposal to reconstruct the intersection of US-89 and Nicholls Road in Fruit Heights City, Davis County, Utah. The project is located in Sections 36, Township 4 North, Range 1 West, and Section 31 of Township 9 South of the Salt Lake Meridian. The coordinates for the beginning and end of the project are respectively Lat. 41.020075, Lng. -111.908644 and Lat. 41.032894, Lng. -111.908939.

The purpose of this report is to identify and map potential wetlands and waters of the U.S. in the delineation study area. For a project location map see Appendix A. The proposed improvements will need to consider impacts to wetlands and waters of the U.S (WOUS) as well as strategies for avoidance and minimization. Section 404 of the Clean Water Act regulates the discharge of dredged or fill material into navigable waters, which has been defined to include tributaries and adjacent wetlands. It is likely that the proposed roadway will have some impacts to wetlands and/or WOUS and a Section 404 permit will need to be obtained. Final determinations of wetland boundaries and jurisdictions as waters of the U.S. will be made by the Corps. All wetlands are considered and protected by the Federal Highway Administration (FHWA) under Executive Order (EO) 11990.

Directions to the Delineation Area

The proposed project site is along US-89 in Fruit Heights, Utah. To arrive at the project site from the Salt Lake City travel north on I-15 for approximately 16 miles. Keep right at the fork to continue on US-89 N, follow signs for I-84 E/South Ogden for 3.1 miles (see Appendix A for maps). The waters of the U.S. within the delineation study area are located within public right-of-way and as such can be verified by Corps' personnel without permission.

Site Description

The approximately 38.6-acre delineation study area is located in Fruit Heights, Utah along the foothills of the Wasatch Range. The study area mainly includes the existing right-of-way of US-89 and Nicholls Road, but also includes the Bair Creek ravine and adjacent residential areas that may be impacted by the project. Much of the area has been developed with the exception of the steeply sloped ravine, where Bair Creek flows east to west crossing under US-89 through the study area. The elevation within the study area ranges from 4495' and is 4605'.

Vegetation

Vegetation within the study area is typical of a residential development and the highway right-of-way supports and mix of introduced and native grasses. The Bair Creek ravine has an abundance of native gambel oak with cottonwoods and Woods' rose dominating in the riparian habitat. Hydrophytic vegetation consisting of coyote willow, reed canary grass, broad-leaf cat-tail, and three-square occurs in the roadside ditch where a stormwater outlet produces sufficient water to support wetland vegetation

growth. Table 1 lists common plants found within the delineation study area and their associated wetland indicator status.

Table 1: Common Plants in the Delineation Study Area

Common Name	Scientific Name	Wetland Indicator Status*
Hydrophytic Plants		
Three-Square	*Schoenoplectus pungens*	OBL
Broadleaf Cattail	*Typha latifolia*	OBL
Fringed Willowherb	*Epilobium ciliatum*	FACW
Reed Canary Grass	*Phalaris arundinacea*	FACW
Coyote Willow	*Salix exigua*	FACW
Narrowleaf Cottonwood	*Populus angustifolia*	FACW
Eastern Cottonwood	*Populus deltoides*	FAC
Upland Plants		
Tall Fescue	*Festuca arundinacea*	FACU
Woods' Rose	*Rosa woodsii*	FACU
Tall Wheatgrass	*Agropyron elongatum*	UP
Gambel Oak	*Quercus gambelli*	UP

**USACE 2016, National Wetland Plant List – Arid West*

Soils

The soil survey information compiled by NRCS identifies eight soil mapping units within the delineation study area. One of the soil series (Cobbly alluvial land) is included on the Utah Hydric Soils list (USDA 2010). See Table 2 for general soils information obtained from the NRCS Web Soil Survey. See Appendix C for attached soils map and legend.

Table 2: Soils in the Delineation Study Area

Soil Series Name	Percent Coverage of Study Area	Acres in Delineation Study Area	Hydric Soil?
Cobbly alluvial land	11.1%	4.3 acres	Yes
Hillfield-Timpanogos-Parleys complex, 20-30 percent slopes, eroded	2%	0.8 acres	No
Hillfield-Timpanogos-Parleys complex, 30-60 percent slopes, eroded	21.2%	8.2 acres	No
Kilbum gravely sandy loam, 3 to 6 percent slopes	18.7%	7.2 acres	No
Kilbum gravely sandy loam, 6 to 10 percent slopes	18.7%	7.2 acres	No
Kilbum gravely sandy loam, 10 to 20 percent slopes, eroded.	3%	1.1 acres	No
Timpanogos loam. 1 to 3 percent slopes	1.4%	0.5 acre	No

Timpanogos loam, 3 to 6 percent slopes	20.1%	7.8 acres	No
Totals	100%	38.6 acres	

NRCS Web Soil Survey (2016) websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

Hydrology

Existing sources of hydrology within the study area are mainly associated with Bair and Haight Creek and a stormwater outlet that drains into a roadside ditch along US-89 near the corner of Orchard Drive and Peachtree Lane. Bair Creek is an intermittent stream that only flows during spring runoff and high precipitation events. The stream channel averages 6-foot width through the study area and flows through a 4' wide by 8' high box culvert under US-89. The creek was not flowing on the date of the field visit, however there was evidence of past flows and an ordinary high water mark was present. The portion of Haight Creek located within the study area is entirely piped and it is not intended to be impacted by the project. Bair and Haight Creeks are tributaries to the Great Salt Lake.

The stormwater outlet pipe that drains into the roadside ditch was providing flow on the date of the field visit. A residential retention basin, adjacent to the roadside ditch wetland, also overflows to the roadside ditch producing additional hydrology for the wetland. The roadside ditch was not excavated through existing wetlands. The study area is located in the Great Salt Lake watershed (HUC 16020310).

Existing Field Conditions

The delineation field work was conducted by Terry Johnson and Nathan Clarke on September 26, 2016. The nearby weather station in Farmington, Utah indicates that the area on average receives 21.99 inches of annual precipitation (U.S. climate data). Weather data shows the summer months of June, July, and August had below normal precipitation with 0.61, 0.02, and 0.23 inches respectively. However this trend was reversed in September where the area received a total of 4.11 inches of precipitation leading up to the date of field visit. According to the National Resources Conservation Service, snow pack in the nearby Wasatch Mountains over the previous winter was near normal to slightly above normal. The temperature during the field visit was 74 degrees, which is the normal for this time of September.

Waters of the U.S. Delineation Methodology

Delineation Methodology for Wetlands

The wetland delineation was completed in accordance with the U.S. Army Corps of Engineers' (USACE) *1987 Wetland Delineation Manual* (USACE 1987) and the *Regional Supplement: Arid West Region Version 2.0* (USACE 2008). All potential wetland areas were verified for wetland indicators as established in the above delineation manuals. The following procedures were implemented at each sample point to determine presence of wetland indicators and the collected information was recorded on Arid West Supplement V2 Data Forms. Photographs were also taken to document the sample point (See Appendix B for data forms and photos).

Hydrophytic Vegetation: All plant species within a five-foot radius area of the sample point were recorded. The percent of relative cover for each species was determined by estimating aerial cover. The indicator status of each species was determined by using the 2016 National Wetland Plant List - Arid West (USACE 2016). Vegetation species comprising of at least twenty (20) percent of the total aerial cover in its stratum were considered dominant, following the guidelines of the USACE 50/20 rule. If more than fifty (50) percent of the dominant plant species had an indicator status of obligate wetland species (OBL), facultative wetland species (FACW), or facultative species (FAC), the sample point met the hydrophytic vegetation parameter.

Hydric Soils: At the sample point, a soil pit was dug to a minimum depth of 18 inches to assess soil characteristics and water conditions. A profile of the soil pit was used to determine soil color, texture and moisture at different depths within the soil profile. Colors of the soil profile and any redox features were identified by comparing a moistened soil sample to the Munsell® Soil Color Charts (Munsell® 2000). Soil texture and moisture were determined by feeling the soil samples. If the soil characteristics met one of the primary hydric soil indicators or two or more secondary hydric soil indicators, identified in the Arid West Regional Supplement (USACE 2008) and the Field Indicators of Hydric Soils in the U.S. Version 7 (USDA 2010), the sample point met the hydric soils parameter.

Wetland Hydrology: The soil pits were also examined for the presence or absence of hydrologic indicators. These hydrologic indicators are described in the Arid West Regional Supplement. If it was determined that at least one primary hydrologic indicator or two or more secondary hydrologic indicators were present, the sample point met the hydrologic parameter.

Wetland Boundary Determination Procedure: Sample points that met all three parameters; hydrophytic vegetation, hydric soils, and wetland hydrology, were classified as occurring in a wetland. A second sample point, located in the adjacent upland was then documented for the presence of the three indicators and if the point did not meet all three parameters, the point was classified as occurring in upland. The next step was to define the wetland boundary occurring between the wetland sample point and the upland sample point. The boundary was based on information gathered from the two sample points and observable changes in elevation and plant communities. The wetland boundary and sample points were surveyed using a handheld Trimble GeoExplorer XT global positioning system receiver. The survey data was downloaded into ArcMAP to produce a map that shows delineated wetland boundaries and sample point locations. The acreages for each wetland polygon were included on the map and the Cowardin Classification System (Cowardin et al. 1979) was used to designate the wetland type.

Delineation Methodology for Stream Channels

Stream channels were delineated by using the USACE delineation manual, *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Lichvar and McColley 2008). These stream channels within the project area were identified and the OHWM for these waters was surveyed using a handheld Trimble GeoExplorer XT global positioning system receiver. The survey data was downloaded into a computer-aided drafting and design program to

produce a map that depicts the delineated WOUS. The acreage for each WOUS within the project area was included on the map and the Cowardin Classification System was used to designate the WOUS type.

Delineation Results

One wetland and one water of the U.S. totaling 0.49 acre were identified within the delineation study area. Table 3 summarizes the delineated features (see Appendix A for maps and Appendix B for data forms and photos). The one wetland identified, documented, and mapped is not likely to be jurisdictional due to its location in a roadside ditch with only adjacent uplands and hydrology being stormwater driven. Bair Creek is the non-wetland waters of the U.S. identified, documented, and mapped and it would be classified as jurisdictional because it is a tributary to a navigable WOUS. Greater information about delineated features is provided in the paragraphs below the table.

Table 3: Summary of Waters of the U.S

Feature Name	Cowardin Classification*	Acres	Linear Feet
Wetlands			
Wetland 1	PSS	0.19	NA
Other Waters of The U.S.			
Bair Creek	R4RB	0.24	1278
WOUS TOTAL		0.43	1278

*PSS (Palustrine Scrub/Shrub) R4RB (Riverine Intermittent Rock Bottom)

Wetland Features

During the wetland delineation fieldwork, sample points were established in wetland and upland vegetation communities for sampling of vegetation, soils, and hydrology characteristics. Two sample points were taken throughout the delineation study area to determine the boundaries between wetlands and uplands. One of the sample points meets the three parameters indicative of wetlands. Table 4 summarizes the sample point data. Refer to Table 4 for figures in Appendix A containing data point locations and mapping information. See Appendix B for sample point data forms and photographs.

Table 4: Wetland Indicators for each Sample Point

Sample Point	Hydrophytic Vegetation Present	Hydric Soil Indicators Present	Hydrology Indicators Present	Is the Sample Point in a Wetland	Figure # (Appendix A)
Up 1	N	N	N	N	3
Wet 1	Y	Y	Y	Y	3

Wetland 1

Wetland 1 occurs in the roadside ditch on the north end of the project area and is 0.19 acre in size. The vegetation cover was mainly hydrophytic perennials with a dense coyote willow overstory which met the hydrophytic vegetation indicator. The soil did meet the hydric soil indicator of *depleted matrix (F3)* and

hydrology indicators were also present. The paired upland pit was a foot higher on the roadside slope and did not meet any of the three indicators. Wetland 1 is classified as a palustrine scrub-shrub (PSS) wetland.

Streams

Bair Creek

Bair Creek is an intermittent stream identified within the study area. The stream crosses under US-89 through a concrete culvert. The OHWM was surveyed and the length of the stream channel within the study area is 1582 feet, totaling 0.30 acre. The OHWM was determined by a break in the bank slope, change in vegetation and streambed substrate, water marks, and drift deposits (see OHWM data form in Appendix A).

Haight Creek

Haight Creek is an intermittent stream that is entirely piped under US-89 through the study area and is not intended to be impacted by the project.

Canals and Irrigation Ditches

No canals or irrigation ditches were identified within the study area.

Interstate or Foreign Commerce Connection

The waters of the U.S., including wetlands, within the project area are not likely to have a connection to interstate or foreign commerce.

Contact Information for the Applicant and Owner

The applicant and owner for this project are the same:

Utah Department of Transportation (Region One)
Ryan Halverson, PLA
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rhalverson@utah.gov

Contact Information for Wetland Delineation Consultant

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Horrocks Engineers
Nathan Clarke
2162 West Grove Parkway, Suite 400
Pleasant Grove, UT 84062
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nathanc@horrocks.com

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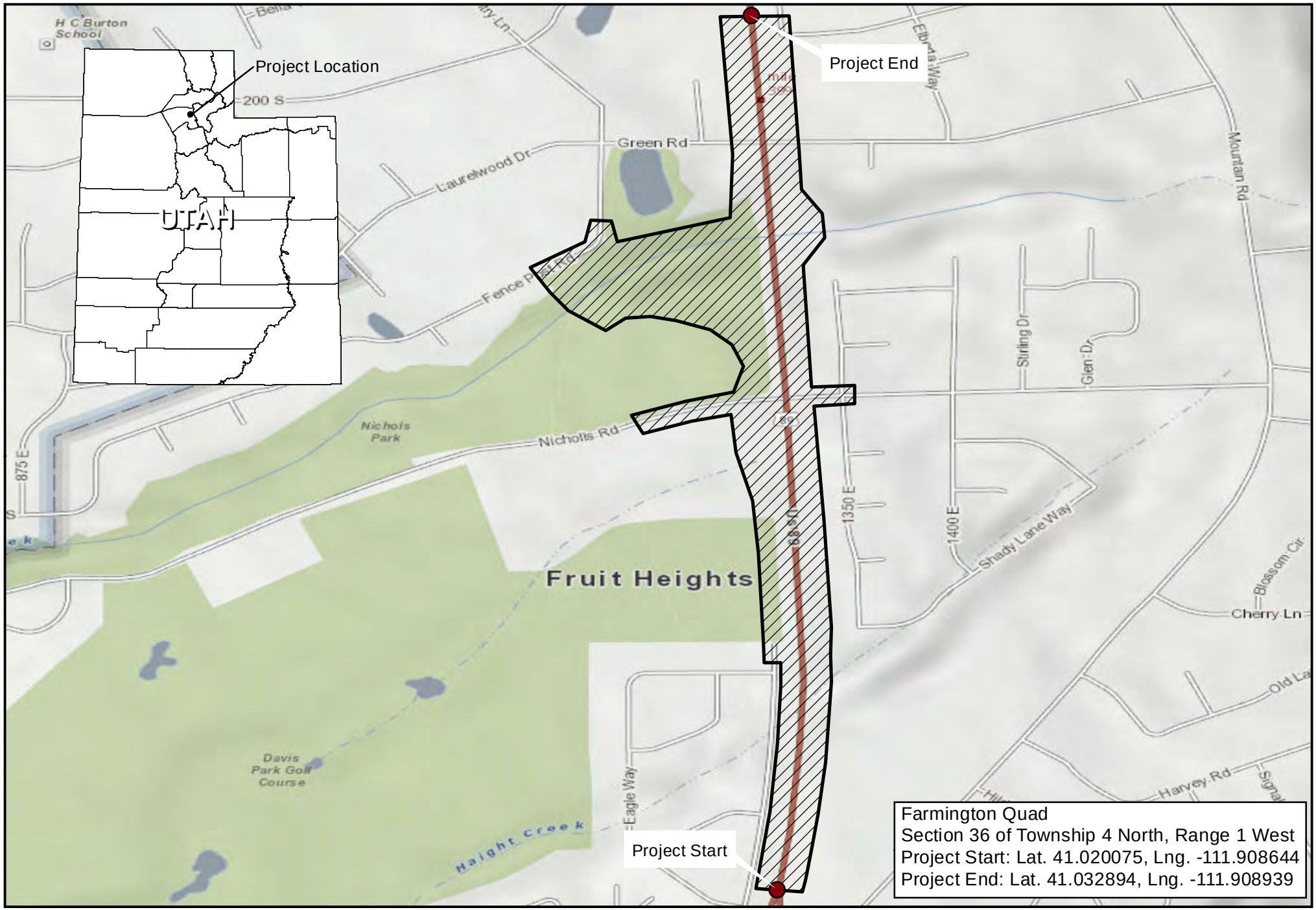
Appendix A:
Maps

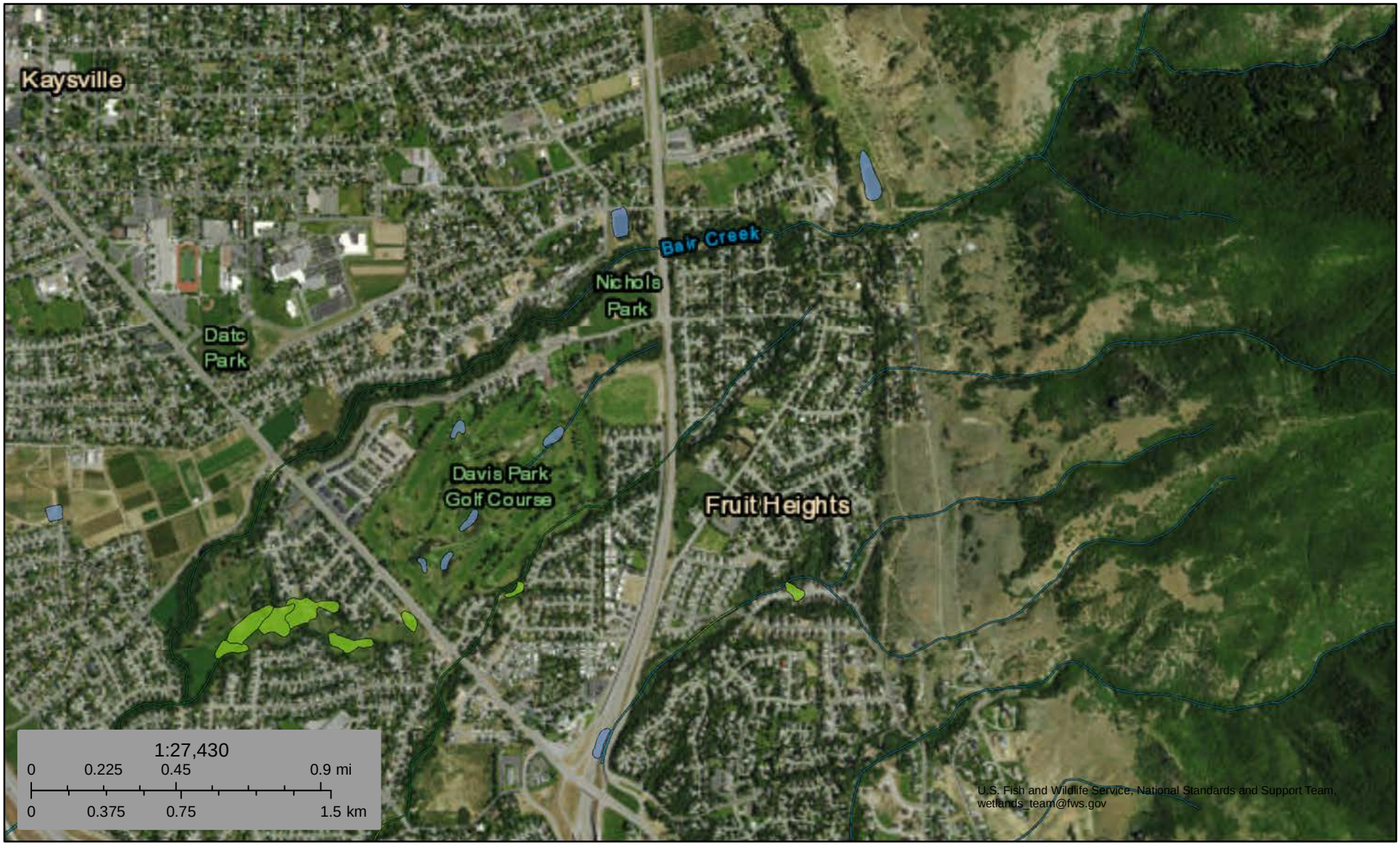


US 89/Nicholls Road

Topgraphic Project Loacation Map

U.S. Fish and Wildlife Service
National Wetlands Inventory

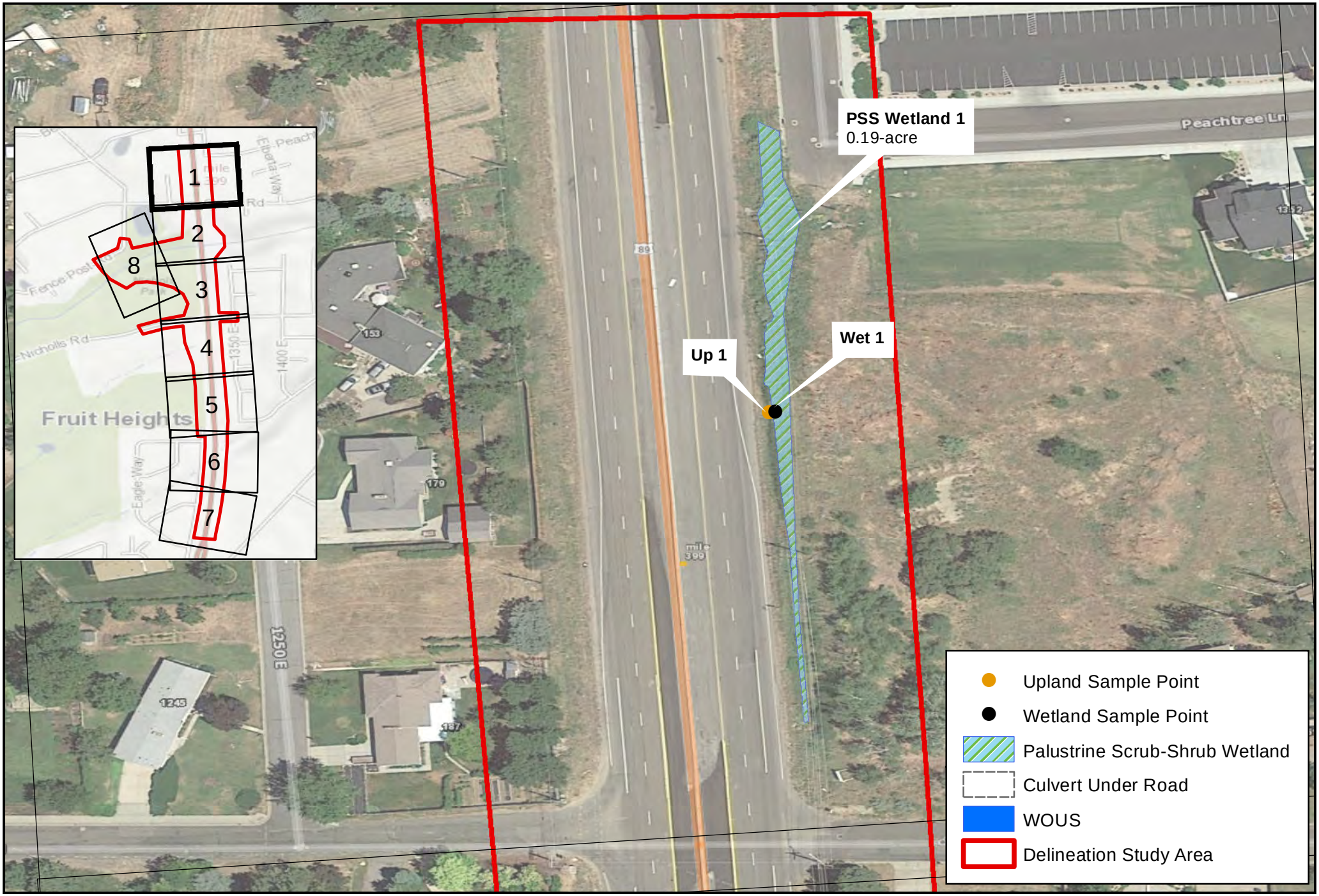
Nichols road



September 26, 2016

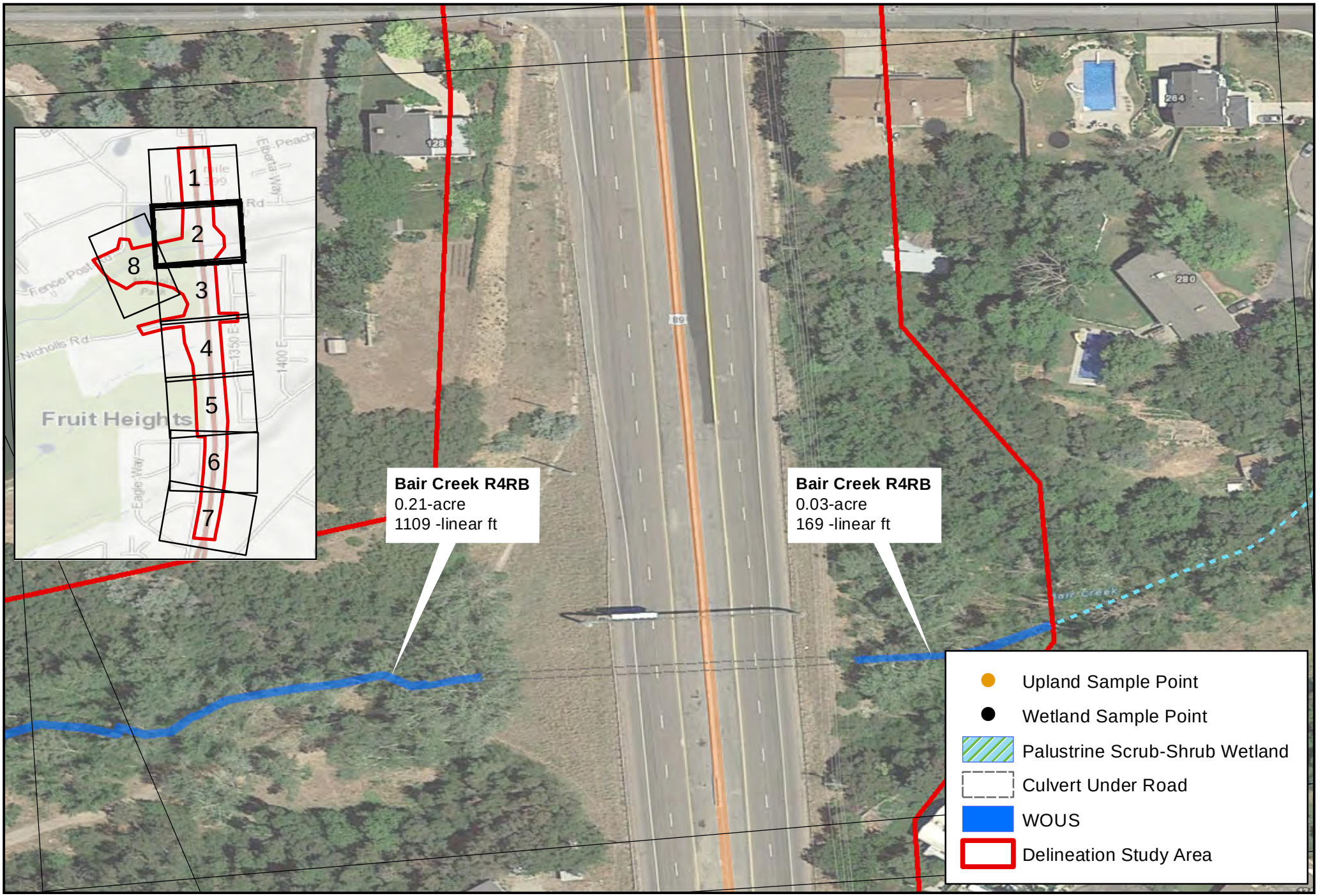
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.



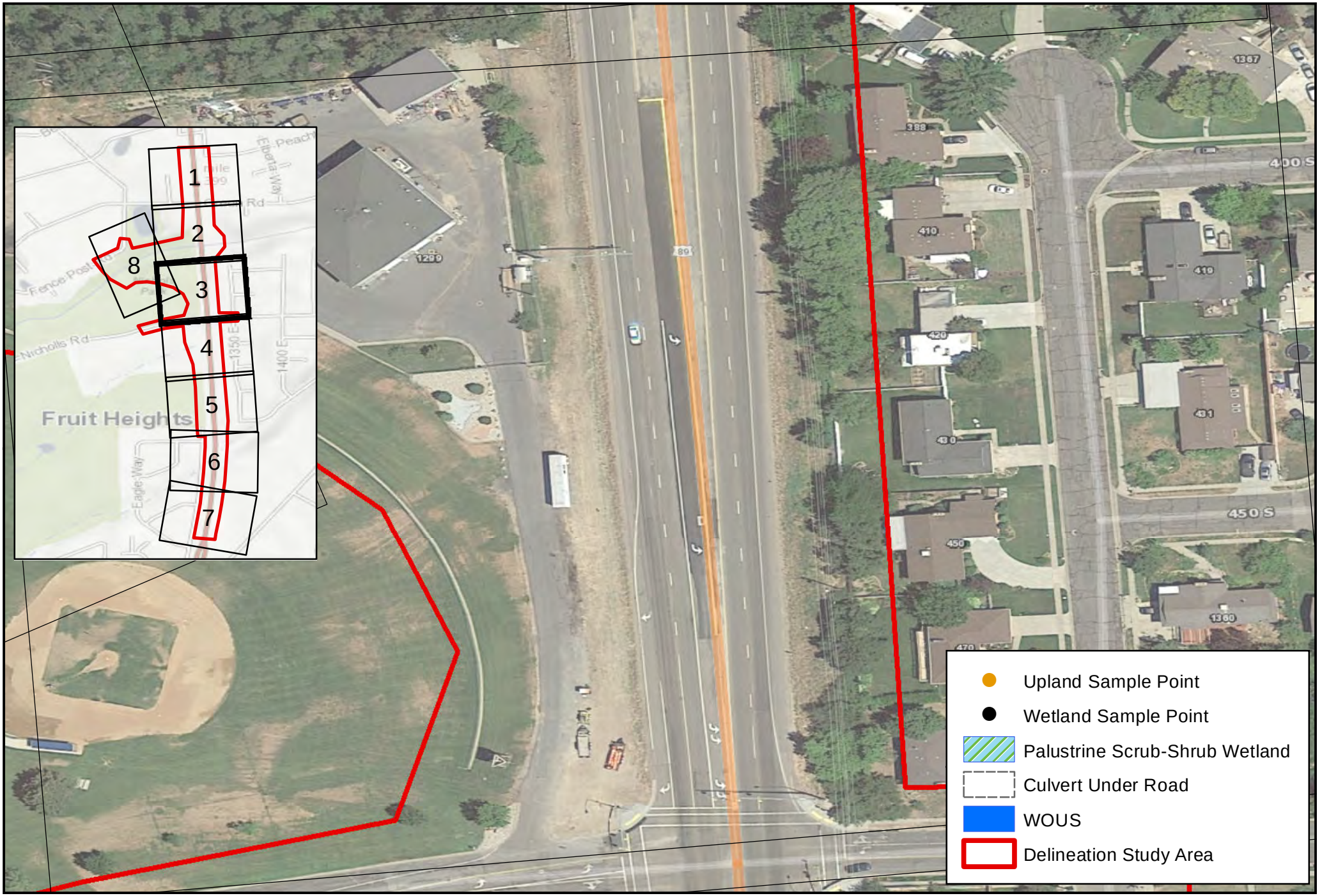
US 89/Nicholls Road

Map 1 of 8



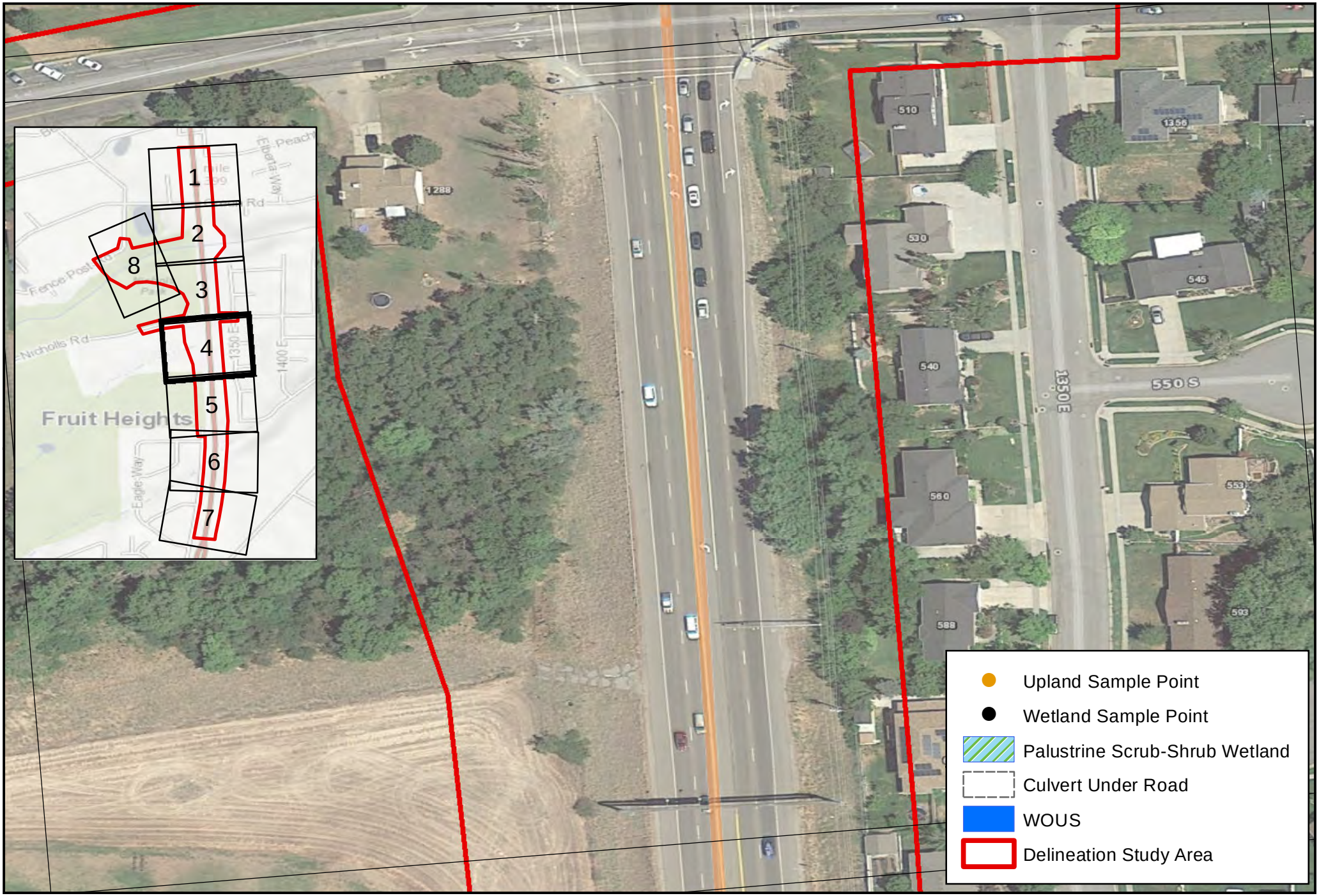
US 89/Nicholls Road

Map 2 of 8



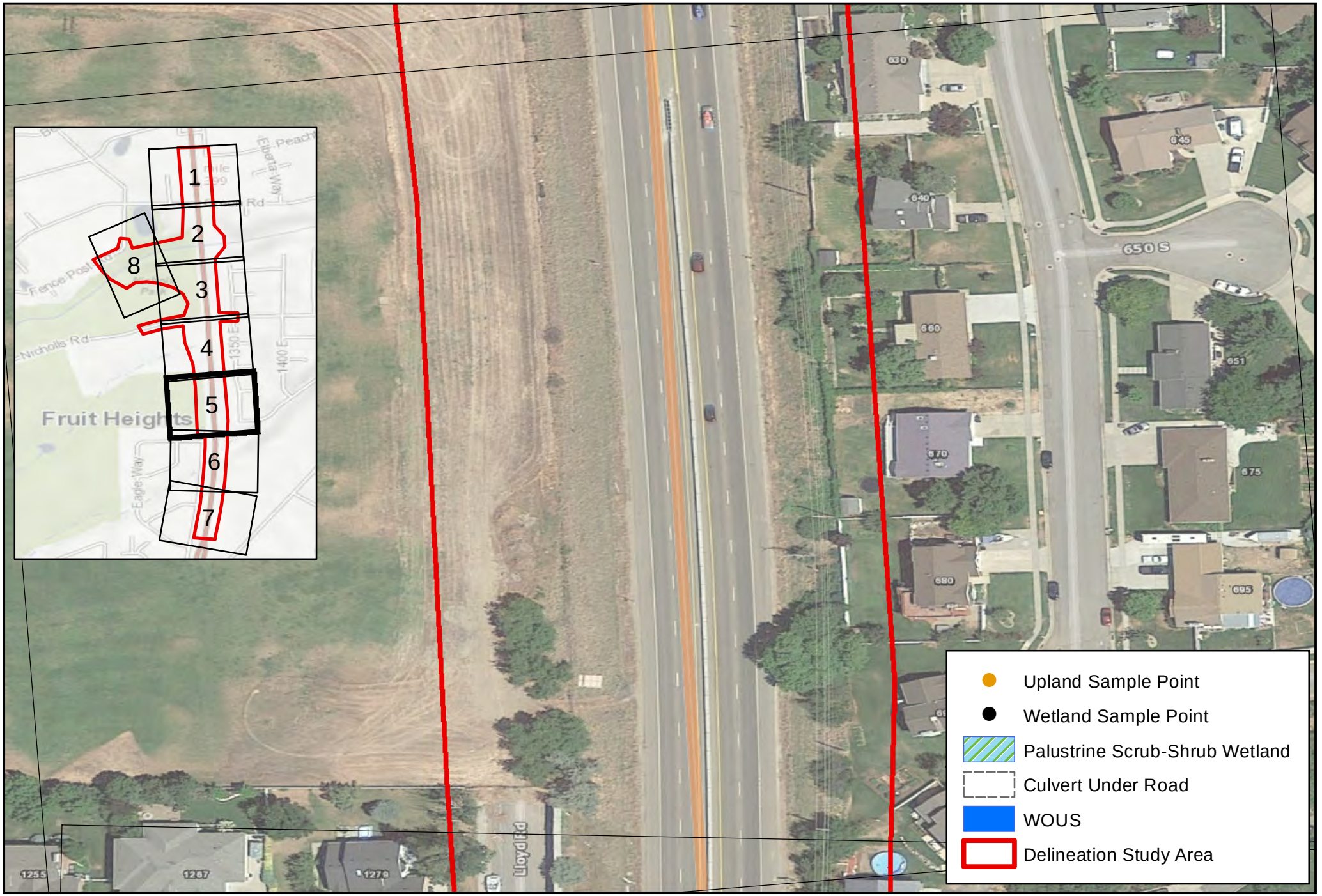
US 89/Nicholls Road

Map 3 of 8



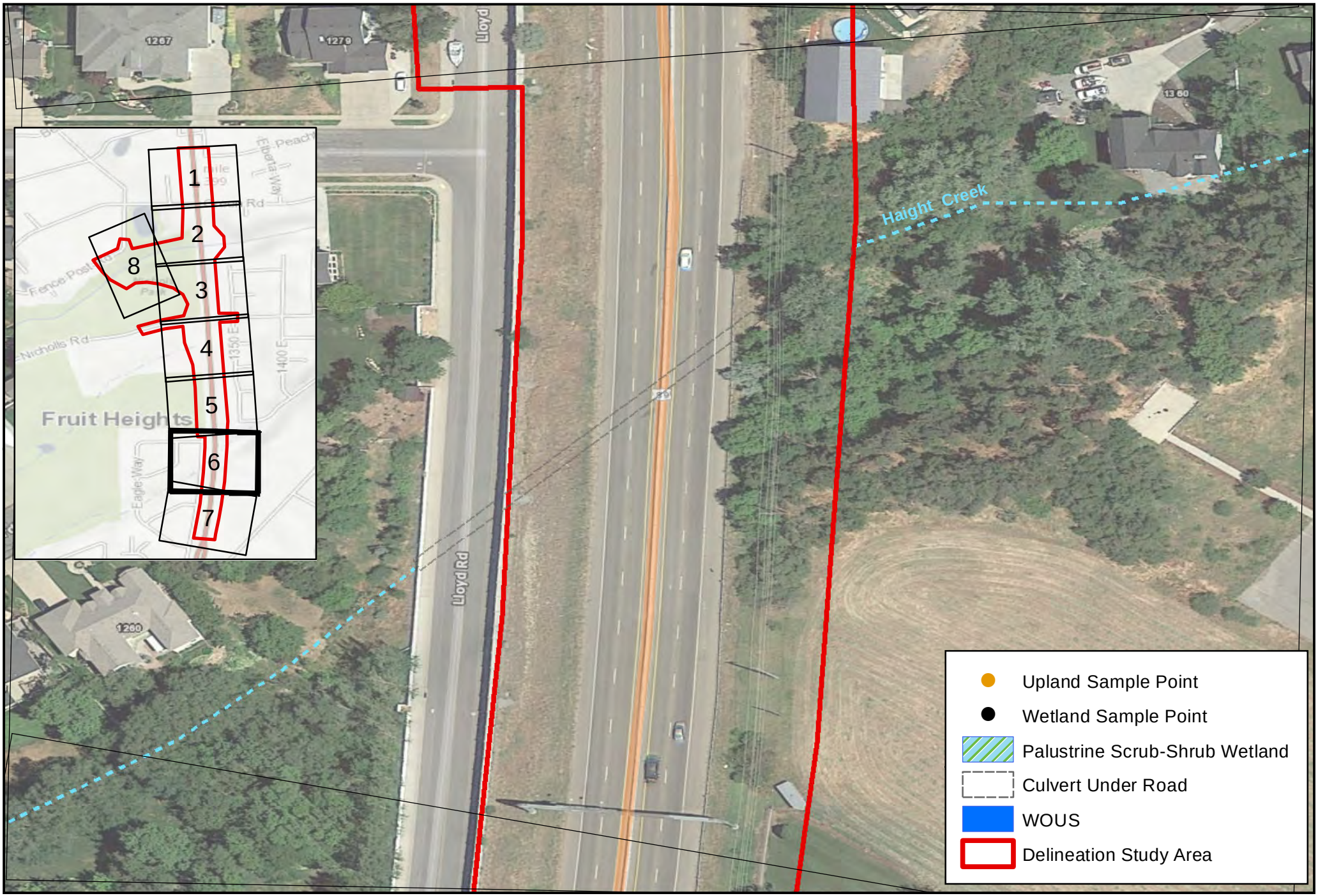
US 89/Nicholls Road

Map 4 of 8



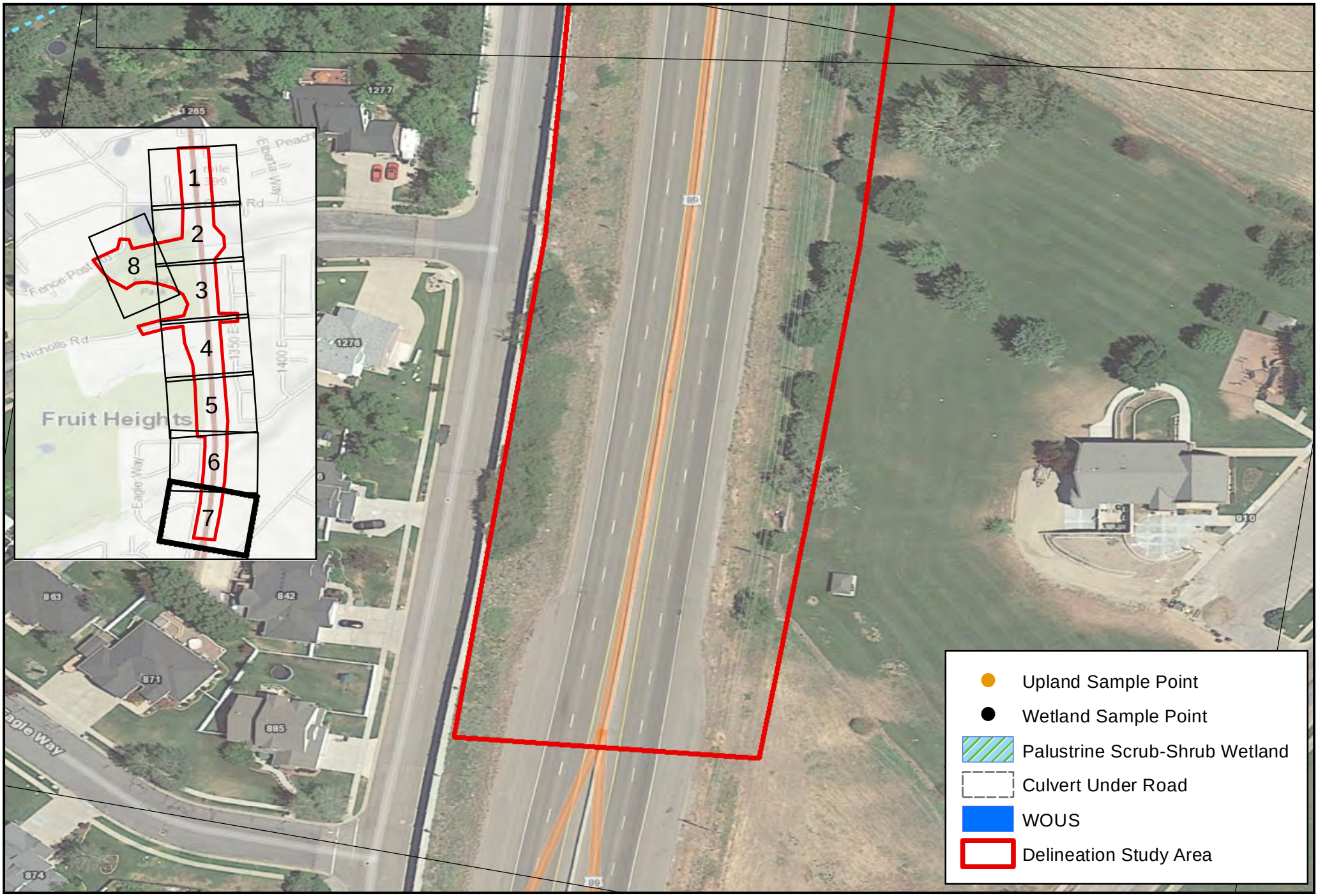
US 89/Nicholls Road

Map 5 of 8



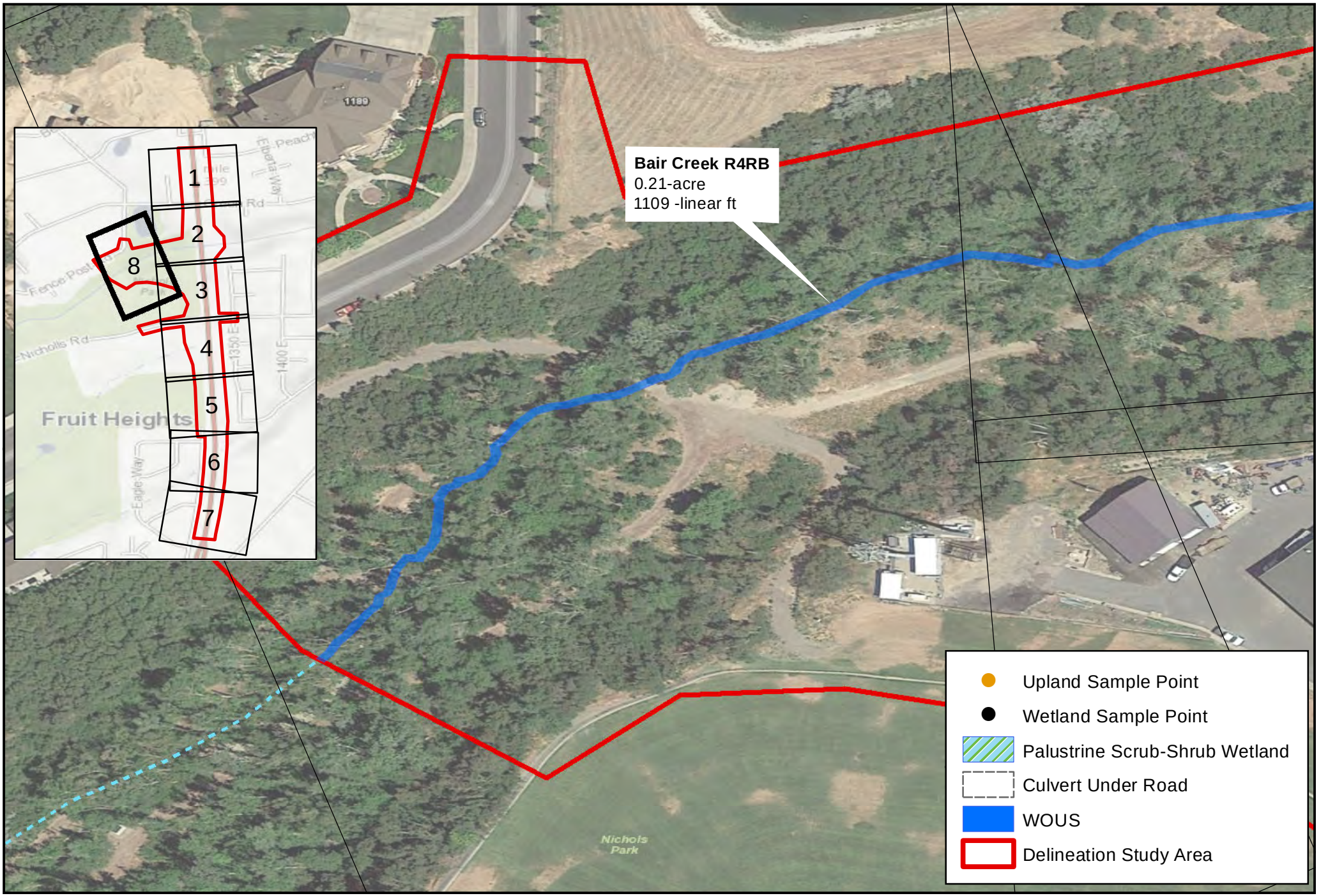
US 89/Nicholls Road

Map 6 of 8



US 89/Nicholls Road

Map 7 of 8



US 89/Nicholls Road

Map 8 of 8

Appendix B:
Data Forms and Photos

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: US 89/Nicholls Road | City/County: Fruit Heights, Davis County | Sampling Date: 9/26/2016

Applicant/Owner: Utah Department of Transportation | State: UT | Sampling Point: Up 1

Investigator(s): Terry Johnson, Nathan Clarke | Section, Township, Range: S 36 T4N R1W

Landform (hillslope, terrace, etc.): Roadside Ditch | Local relief (concave, convex, none): Convex | Slope (%): 20%

Subregion (LRR): D - Interior Deserts | Lat: 41° 1' 55.237" N | Long: -111° 54' 31.180" W | Datum: NAD 86

Soil Map Unit Name: Timpanogos Loam, 1-3 percent slopes | NWI classification: none

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

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

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

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

Hydrophytic Vegetation Present?	Yes ( )	No (●)	
Hydric Soil Present?	Yes ( )	No (●)	**Is the Sampled Area within a Wetland?** Yes ( ) No (●)
Wetland Hydrology Present?	Yes ( )	No (●)	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Salix exigua*	2		FACW
2.			
3.			
4.			
5.			
Total Cover:	2 %		
Herb Stratum			
1. *Festuca arundinacea*	50	Yes	FACU
2. *Agropyron elongatum*	50	Yes	UPL
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	100 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	2	x 2 =	4
FAC species		x 3 =	0
FACU species	50	x 4 =	200
UPL species	50	x 5 =	250
Column Totals:	102 (A)		454 (B)

Prevalence Index = B/A = 4.45

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ( ) No (●)

Remarks:

SOIL

Sampling Point: Up 1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-7	10 YR 2/2	100					Loam	
7-18	7.5 YR 4/3	100					Gravely Sand	Mixed Roadbase

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks: No hydric soils indicators

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks: Sample point was 1' higher than paired wetland sample point

Upland Sample Point 1

Upland Sample Point 1 – Soil Profile

Upland Sample Point 1 – General Conditions

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: US-89/Nicholls Road | City/County: Fruit Heights, Davis County | Sampling Date: 9/26/2016

Applicant/Owner: Utah Department of Transportation | State: UT | Sampling Point: Wet 1

Investigator(s): Terry Johnson, Nathan Clarke | Section, Township, Range: S 36 T4N R1W

Landform (hillslope, terrace, etc.): Roadside Ditch | Local relief (concave, convex, none): Concave | Slope (%): 4%

Subregion (LRR): D - Interior Deserts | Lat: 41° 1' 55.248" N | Long: -111° 54' 31.122" W | Datum: NAD 86

Soil Map Unit Name: Timpanogos Loam, 1-3 percent slopes | NWI classification: none

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

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

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

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

Hydrophytic Vegetation Present?	Yes (●)	No ( )	
Hydric Soil Present?	Yes (●)	No ( )	**Is the Sampled Area within a Wetland?** Yes (●) No ( )
Wetland Hydrology Present?	Yes (●)	No ( )	

Remarks: Wetland occurred within the flow line of roadside ditch

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Salix exigua*	40	Yes	FACW
2.			
3.			
4.			
5.			
Total Cover:	40 %		
Herb Stratum			
1. *Phalaris arundinacea*	50	Yes	FACW
2. *Typha latifolia*	20	Yes	OBL
3. *Schoenoplectus pungens*	15		OBL
4. *Epiloblium ciliatum*	15		FACW
5.			
6.			
7.			
8.			
Total Cover:	100 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 0 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	35	x 1 =	35
FACW species	105	x 2 =	210
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	140 (A)		245 (B)

Prevalence Index = B/A = 1.75

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks:

SOIL

Sampling Point: Wet 1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-9	10 YR 3/1	100					Silty Clay Loam	
9-18	10 YR 4/2	95					Silty Clay Loam	
9-18	10 YR 4/4	5					Silty Clay Loam	Redox starts at 9"

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ◉ No ○ Depth (inches): 1

Water Table Present? Yes ◉ No ○ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ◉ No ○ Depth (inches):

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks: Stormwater runoff from a recent event is likely producing the hydrology in the roadside ditch.

Wetland Point 1

Wetland Sample Point 1 – Soil Profile

Wetland Sample Point 1 – General Conditions

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: US-89/Nicholls Rd
Project Number:
Stream: Bair Creek
Investigator(s): Terry Johnson, Nathan Clarke

Date: 9/26/2016
Town: Fruit Heights
Photo begin file#:

Time: 3:00pm
State: UT
Photo end file#:

Y [X] / N [ ] Do normal circumstances exist on the site?

Y [ ] / N [X] Is the site significantly disturbed?

Location Details:

Projection: **Datum:**
Coordinates:

Potential anthropogenic influences on the channel system:
Pipe culvert under US-89

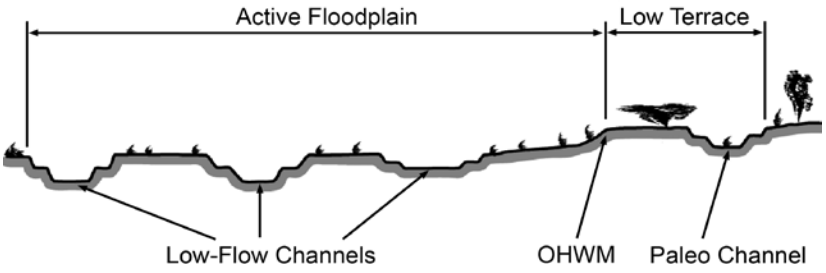
Brief site description:

Checklist of resources (if available):

- [X] Aerial photography
  Dates:
- [X] Topographic maps
- [ ] Geologic maps
- [ ] Vegetation maps
- [ ] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [ ] Global positioning system (GPS)
- [ ] Other studies

- [ ] Stream gage data
  Gage number:
  Period of record:
- [ ] History of recent effective discharges
- [ ] Results of flood frequency analysis
- [ ] Most recent shift-adjusted rating
- [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

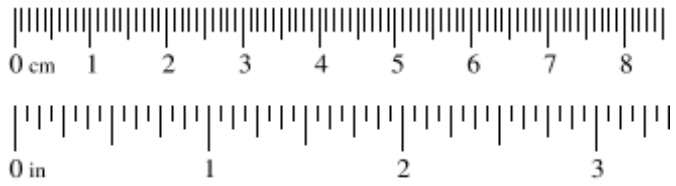


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

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

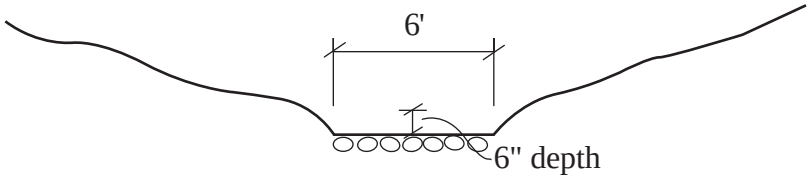
Wentworth Size Classes

Millimeters (mm)		Inches (in)		Wentworth size class	
	10.08		256	Boulder	
	2.56		64	Cobble	Gravel
	0.157		4	Pebble	
	0.079		2.00	Granule	
	0.039		1.00	Very coarse sand	
	0.020		0.50	Coarse sand	
1/2	0.0098		0.25	Medium sand	Sand
1/4	0.005		0.125	Fine sand	
1/8	0.0025		0.0625	Very fine sand	
1/16	0.0012		0.031	Coarse silt	
1/32	0.00061		0.0156	Medium silt	Silt
1/64	0.00031		0.0078	Fine silt	
1/128	0.00015		0.0039	Very fine silt	
				Clay	Mud



Project ID: **Cross section ID:** **Date:**9/26/2016 **Time:**3:00pm

Cross section drawing:



OHWM

GPS point: _____

Indicators:

- [X] Change in average sediment texture
- [X] Change in vegetation species
- [X] Change in vegetation cover
- [X] Break in bank slope
- [ ] Other: _____
- [ ] Other: _____

Comments:

Stream lined with cobble. Beyond OHWM soil and vegetation

Floodplain unit: [ ] Low-Flow Channel [ ] Active Floodplain [X] Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: _____

Total veg cover: 100 % Tree: 40% Shrub: 30% Herb: 30%

Community successional stage:

- [ ] NA
- [ ] Early (herbaceous & seedlings)
- [ ] Mid (herbaceous, shrubs, saplings)
- [X] Late (herbaceous, shrubs, mature trees)

Indicators:

- [ ] Mudcracks
- [ ] Ripples
- [ ] Drift and/or debris
- [ ] Presence of bed and bank
- [X] Benches
- [X] Soil development
- [X] Surface relief
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

Comments:

No active floodplain

No low flow channel - cobble rock

Project ID: **Cross section ID:** **Date:** 9/26/2016 **Time:** 3:00pm

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

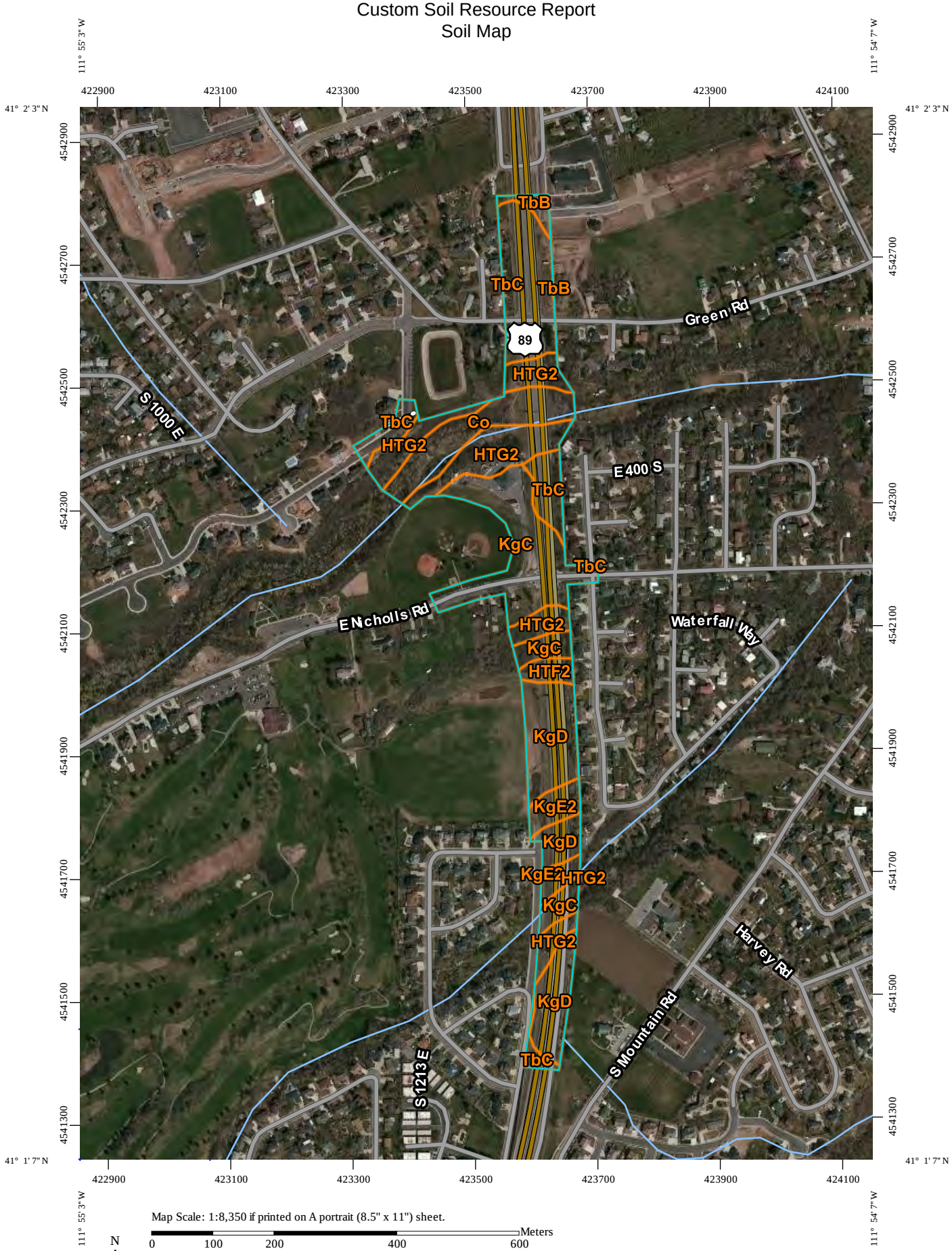
Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

Appendix C:
Soils Map and Legend

Custom Soil Resource Report
Soil Map



Map Scale: 1:8,350 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 100 200 400 600

Feet
0 400 800 1600 2400

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

Map Unit Legend

Davis-Weber Area, Utah (UT607)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
Co	Cobbly alluvial land	4.3	11.1%
HTF2	Hillfield-Timpanogos-Parleys complex, 20 to 30 percent slopes, eroded	0.8	2.0%
HTG2	Hillfield-Timpanogos-Parleys complex, 30 to 60 percent slopes, eroded	8.2	21.2%
KgC	Kilburn gravelly sandy loam, 3 to 6 percent slopes	8.7	22.5%
KgD	Kilburn gravelly sandy loam, 6 to 10 percent slopes	7.2	18.7%
KgE2	Kilburn gravelly sandy loam, 10 to 20 percent slopes, eroded	1.1	3.0%
TbB	Timpanogos loam, 1 to 3 percent slopes	0.5	1.4%
TbC	Timpanogos loam, 3 to 6 percent slopes	7.8	20.1%
Totals for Area of Interest		**38.6**	**100.0%**

Map Unit Descriptions

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

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

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used.

Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

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

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

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

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

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

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

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

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

Appendix D:
Aquatic Resources Excel Spreadsheet

Waters Name	State	Cowardin Code	HGM Code	Meas Type	Amount	Units	Waters Type	Latitude	Longitude	Local Waterway
Wetland 1	Utah	PSS	Depressional	Polygon	0.19	Acres	Wetland	41.032013	-111.908645	Bair Creek

HORROCKS ENGINEERS

To: Project Team

From: Nathan Clarke

Date: November 7, 2016 Memorandum

Subject: Visual Impacts Assessment for Nicholls Road Intersection

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The visual resources of a community or area include the physical features that make up the landscape and include both natural (landforms, waterways, etc.) and other elements (buildings, roads, structures, etc.). The following visual analysis discusses the visual qualities and resources within and nearby the study area and how the Proposed Action will impact those visual resources.

EXISTING VISUAL ENVIRONMENT

Existing development near the intersection of Nicholls Road and U.S. 89 is primarily residential on the east side along the foothills of the Wasatch Range, with some residential development on the west side adjacent to Nicholls Park and Davis Park Golf Course. There are some small areas of undeveloped agricultural land within the study area. Some trees and shrubs are present in the residential neighborhoods with the largest concentration of trees and thicker vegetation present along Bair Creek.

Nicholls Park

Nicholls Park has three baseball fields and some maintenance facilities in the eastern portion of the park, trails and dense vegetation along Bair Creek that cover the northern area, and parking, playgrounds, restrooms, and gathering areas in the southwest.

Davis Park Golf Course

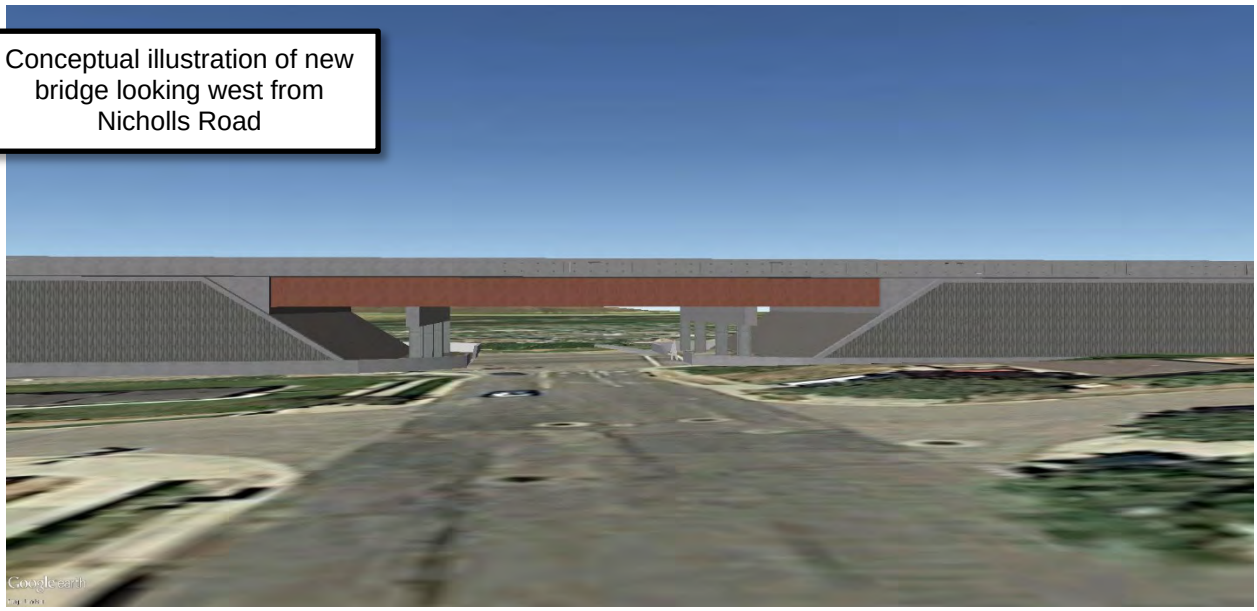
The Davis Park Golf Course covers much of the area southwest of Nicholls road across from Nicholls Park and consists of large open areas with clusters of trees and vegetation. The driving range covers the eastern portion of the golf course and borders the west side of US-89.

Residential Neighborhoods

The residential neighborhoods within the study area have good views of the Wasatch Mountains to the east, and of the valley, Nicholls Park, and Antelope Island to the west.

Direct Impacts

Current Residences – The greatest visual change in the study area would be to those residents near the proposed interchange. As a result of project implementations the viewshed would change from the Wasatch Mountains, Nicholls Park, or Antelope Island to a new roadway and elevated bridge structure on US-89.



Conceptual illustration of new bridge looking west from Nicholls Road

Nicholls Park Users – The new roadway would come close to the eastern part of the park near the ball fields, and would cross Bair Creek. Users would see increased traffic in these areas, with the greatest visual impact being near Bair Creek with the development of the new roadway.

Conceptual illustration of new bridge looking east from Nicholls Park

MITIGATION

Visual impacts to the study area will be mitigated by:

- Designing the bridge with aesthetic elements in mind to minimize visual impacts.
- Adhering to UDOT Aesthetic Guidelines.

Looking northeast Nicholls Road

Looking southwest from Nicholls Road

Looking west from Nicholls Road

Looking east from Nicholls road

Air Quality Memo – US-89; Lloyd Road Extension and Nicholls Road

Project Overview

The Utah Department of Transportation (UDOT) has initiated an environmental study to analyze the need for transportation improvements at the US-89/Nicholls Road intersection in Fruit Heights, Utah. The Proposed Action includes:

- Constructing an overpass at the existing US-89 Nicholls Road at-grade intersection (US-89 over Nicholls Road). The overpass would improve safety by eliminating all crossing conflict points at the US-89/Nicholls Road intersection.
- Eliminating the existing access points to US-89 from Nicholls Road.
- Extending Lloyd Road from Eagle Way to Fence Post Road, to allow for traffic movement on the west side of US-89.
- Constructing a bridge over Bair Creek.
- Re-striping US-89 to include an additional lane, when needed.

Purpose and Need

Purpose

The purpose of the project is to improve safety at the US-89/Nicholls Road intersection and to address mobility and connectivity in Fruit Heights.

Need

The existing US-89/Nicholls Road intersection is an at-grade, signalized intersection that has multiple crossing conflict points. Crossing conflict points pose more dangers to vehicle occupants because crashes in these areas generally involve side impacts. Side impacts have higher rates of fatalities and serious injuries because there is comparatively little vehicle protective structure to safeguard occupants in the struck vehicle.

Based on information obtained from UDOT Traffic and Safety, there were a total of 59 crashes at the US-89/Nicholls Road intersection from Jan 1, 2010 to September 30, 2016. Three of the crashes were classified as severe (incapacitating injury or fatality). Eliminating the existing crossing conflict points at this intersection would improve safety and reduce the number of severe crashes at this location.

Additionally, according to the Wasatch Front Regional Council's (WFRC) Travel Demand Model (TDM) the current (2014) average travel demand for US-89 in the study area is 40,569 vehicles per day (vpd). WFRC's TDM projects that by 2040, the travel demand on US-89 in the study area will be 66,900 vpd. US-89 will operate at Level-of-Service (LOS) F, or failing conditions, if no improvements are constructed.

Study Area Attainment Status

On September 21, 2006, the EPA issued revisions to the National Ambient Air Quality Standards (NAAQS) for particle pollution. The EPA strengthened the 24-hour $PM_{2.5}$ standard from the 1997 level of 65 $\mu g/m^3$ to 35 $\mu g/m^3$, and retained the current annual fine particle standard at 15 $\mu g/m^3$. All or parts of seven Utah counties did not meet this new 24-hour standard, including Davis County in which this project is located. The state had been attaining the old 24-hour standard, and continues to attain the annual $PM_{2.5}$ standard at all locations.

On December 3, 2014, the Utah Air Quality Board approved a $PM_{2.5}$ State Implementation Plan (SIP) meeting the moderate area planning requirements of both Subparts 1 and 4, of Part D, of title 1, of the Clean Air Act. A separate SIP was adopted for each of Utah's three nonattainment areas, which includes the Salt Lake City nonattainment area in which Davis County is included. Also adopted were amendments to SIP Subsections IX.H. 11, 12, and 13, which contain emission limits and operating practices for the large stationary sources specifically addressed by the SIPs for the Salt Lake City and Provo nonattainment areas. There were no such sources identified in the Logan nonattainment area.

Project Assessment

This project is not exempt under either 40 CFR 93.126 or 40 CFR 93.128. This memorandum assesses whether this project qualifies as a project of air quality concern that would require a project level conformity analysis.

Level Conformity Requirements

Projects of air quality concern are certain highway and transit projects that involve a significant level of diesel vehicle traffic or any other project that is identified in the $PM_{2.5}$ or PM_{10} SIP as a localized air quality concern, such as:

i) New or expanded highway projects that have a significant number of or significant increase in diesel vehicles;
ii) Projects affecting intersections that are at LOS D, E, or F with a significant number of diesel vehicles, or those that will change to LOS D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;
iii) New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location;
iv) Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location; and
v) Projects in or affecting locations, areas, or categories of sites which are identified in the PM_{10} or $PM_{2.5}$ applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

If the project qualifies as a project of air quality concern, the hot-spot demonstration must be based on both i) quantitative analysis methods in accordance with 40 CFR 93.116(a) and ii) the consultation requirements of 40 CFR 93.105(c)(1)(i). If the project does not qualify as a project of air quality concern, it must be qualitatively shown that the project will not contribute to any new localized violations, increase the frequency or severity of any existing violations, or delay the timely attainment of the NAAQS or any required emission reductions or milestones in any nonattainment or maintenance area.

Appendix A of the *Transportation Conformity Guidance for Qualitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* provides examples of projects that would be considered projects of air quality concern under 40 CFR 93.123(b)(1)(i) and (ii), which are:

- A project on a new highway or expressway that serves a significant volume of diesel truck traffic, such as facilities with greater than 125,000 annual average daily traffic (AADT) and 8% or more of such AADT is diesel truck traffic;

- New exit ramps and other highway facility improvements to connect a highway or expressway to a major freight, bus, or intermodal terminal;
- Expansion of an existing highway or other facility that affects a congested intersection (operated at Level-of-Service D, E, or F) that has a significant increase in the number of diesel trucks; and,
- Similar highway projects that involve a significant increase in the number of diesel transit busses and/or diesel trucks.

Appendix A also provides examples of projects that would not qualify as projects of air quality concern under 40 CFR 93.123)(b)(1)(i) and (ii). These examples included:

- Any new or expanded highway project that primarily services gasoline traffic (i.e., does not involve a significant number or increase in the number of diesel vehicles), including such projects involving congested intersections operating at LOS D, E or F.
- An intersection channelization project or interchange configuration project that involves either turn lanes or slots, or lanes or movements that are physically separated. These kinds of projects improve freeway operations by smoothing traffic flow and vehicle speeds by improving weave and merge operations, which would not be expected to create or worsen $PM_{2.5}$ or PM_{10} violations; and,
- Intersection channelization projects, traffic circles or roundabouts, intersection signalization projects at individual intersections, and interchange reconfiguration projects that are designed to improve traffic flow and vehicle speeds, and no not involve any increases in idling. Thus, they would be expected to have a neutral or positive influence on $PM_{2.5}$ or PM_{10} emissions.

Project Analysis

New Highway with Significant Volume of Diesel Truck Traffic

Standard: New highway projects that have a significant number of diesel vehicles.

Analysis: This project does not involve a new highway with a significant number of diesel vehicles. This project involves the extension of Lloyd Road along the west side of US-89, which is a new roadway; however, the roadway would be a local roadway intended to act as a frontage road to provide connections between Nicholls Road and other local roads and not a highway. The project would not include changing access points to major commercial, industrial, or other land use activities that typically impact commercial freight traffic and would not serve a significant volume of diesel truck traffic.

Expanded Highway with Significant Increase in Diesel Truck Traffic

Standard: Expanded highway projects that have a significant number of or significant increase in diesel vehicles.

Analysis: This project does involves expanded highway capacity since US-89 would be restriped to include an additional travel lane in each direction; however, US-89 does not currently serve a significant number of diesel vehicles nor is it expected to in the design year (see Table 1). As for Nicholls Road and the planned extension of Lloyd Road, the project does not include changing access points to major commercial, industrial, or other land use activities that typically impact commercial freight traffic. There would be no significant increase in the number of diesel trucks in the project area as a result of this project

Table 1. AADT and Percent Truck Traffic for US-89

Roadway	Existing (2014)			Future (2040)		
	AADT	Diesel Truck AADT	Diesel Truck %	AADT	Diesel Truck AADT	Diesel Truck %
US-89 SB	20,260	2,836	14%	32,800	5,576	17%
US-89 NB	20,309	8,843	14%	34,100	5,797	17%

Source: Wasatch Front Regional Council Travel Demand Model (Version 8)

Further, US-89 would be elevated on a bridge structure over Nicholls Road, with the existing access at the Nicholls Road intersection being eliminated. The elevation of the roadway and the elimination of the access point at Nicholls Road would improve traffic flow on US-89 in the area and decrease idling, thereby decreasing emissions at this location.

Projects Affecting Congested Intersections

Standard: Projects affecting intersections that are at LOS D, E, or F with a significant number of diesel vehicles, or those that will change to LOS D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project.

Analysis: Based upon the percentages of diesel truck traffic in the area under both existing (using 2014 numbers) and future 2040 design conditions, there are not currently a significant number of diesel vehicles that utilize the Nicholls Road/US-89 intersection, nor is there expected to be a significant increase in diesel truck traffic related to the project in the design year that would utilize the new intersection of Nicholls Road and Lloyd Road. The Lloyd Road extension is intended to facilitate local connectivity and would not include changing access points to major commercial, industrial, or other land use activities that typically impact commercial freight traffic.

Further, the project will have the effect of eliminating the intersection of US-89 and Nicholls Road, with US-89 being elevated over Nicholls Road. There would be a new intersection (Nicholls Road/Lloyd Road) as a result of the project, but as indicated above, Lloyd Road would not service a significant number of diesel vehicles as a result of the project.

New Bus and Rail Terminals

Standard: New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location.

Analysis: This project does not involve construction of or connections to a new bus or intermodal terminal that accommodates a significant number of diesel vehicles.

Expanded Bus and Rail Terminals

Standard: Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location

Analysis: This project does not involve construction of or connections to an expanded bus or intermodal terminal that accommodates a significant number of diesel vehicles.

Projects In or Affecting PM_{10} and $PM_{2.5}$ Sites of Violation or Possible Violation

Standard: Projects in or affecting locations, areas, or categories of sites which are identified in the PM_{10} or $PM_{2.5}$ applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

Analysis:
There are two distinct nonattainment areas for the 2006 $PM_{2.5}$ standards residing entirely within the state of Utah. These are the Salt Lake City, UT, and Provo, UT nonattainment areas, which together encompass what is referred to as the Wasatch Front. A third nonattainment area is more or less geographically defined by the Cache Valley which straddles the border between Utah and Idaho (the Logan, UT – ID nonattainment area.) Davis County is included in the Salt Lake City nonattainment area. None of these three areas has violated the annual NAAQS for $PM_{2.5}$.

For the 24-hour $PM_{2.5}$ standard, the standard is met when a three-year average of 98th percentile values is less than or equal to 35 $\mu g/m^3$. According to the $PM_{2.5}$ SIP for the Salt Lake City, UT Nonattainment Area, Section IX. Part A.21, there were noted exceedances of the 24-hour PM2.5 standard at the Bountiful monitoring station, which is the only station located in Davis County, based on data for the 2008-2-10, and 2009-2011 averaging periods. For the 2010-2012 three-year averaging period, the average was less than the 24-hour standard. The Salt Lake City, UT Nonattainment Area SIP stated that, without exception, the exceedances leading to 24-hr NAAQS violations are associated with relatively short-term meteorological occurrences. Further, winter speciation studies conducted to better characterize $PM_{2.5}$ during winter high pollution episodes were conducted, which lead to the conclusion that the exceedances of the $PM_{2.5}$ NAAQS are a result of the increased portion of the secondary $PM_{2.5}$ that was chemically formed in the air and not primary $PM_{2.5}$ emitted directly into the troposphere.

Davis County is not in a nonattainment or maintenance area for PM_{10}. Further, on November 14, 1991, Utah submitted a SIP for the Salt Lake and Utah County nonattainment areas. The SIP demonstrated attainment of the PM_{10} standard for 10 years, 1993 through 2003. EPA published approval of the SIP on July 8, 1994 (59 FR 35036), and Utah achieved attainment of the standard in both areas by 1996. The control measures adopted as part of those plans have proven successful. Both the Salt Lake and the Utah County areas continue to show compliance with the federal health standards for PM_{10}.

Project of Air Quality Concern Determination

Standard: State whether the project is a POAQC and summarize the support that determination. Document the relevant agencies that require interagency consultation on any input for the determination from federal, state, and local transportation and air agencies as necessary for this project per 40 CFR 93.105. This information will be included in any subsequent air quality analysis and project level conformity determination reports.

Answer: This project does not qualify as a project of air quality concern since it would not result in a significant increase in diesel traffic in the project area. The project is not expected to influence the vehicle mix in the project area nor attract a significant number of new diesel vehicles to the area. The proposed improvements address safety concerns at the US-89/Nicholls Road intersection and improve mobility and connectivity in Fruit Heights. The project involves extending Lloyd Road north from its existing terminus south of Nicholls Road to connect to both Nicholls Road and Fence Post Road/Lloyd

Road and eliminate the US-89 connection at Nicholls Road. This would reduce traffic conflicts and the number of vehicle incidents in the area that result in idling. Further, the project would include an additional travel lane in each direction, which would improve traffic flow and speeds on US-89. Neither Nicholls Road nor Lloyd Road are or would be connected to a major freight, bus, or intermodal terminal and all of the roadways in the area, including the proposed new roadway, would primarily service gasoline vehicle traffic. Therefore, this project is not a project of air quality concern.