STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION
Region 3 Environmental

222 South Sixth Street, Rm. 317
Grand Junction, Colorado 81501-2769
(970) 683-6255| Fax (970) 683-6227

DEPARTMENT OF TRANSPORTATION

September 30, 2013

SH 92 Stengel's Hill Reconstruction
Delta County
CDOT Project STA 092A-024, SA 17772
SPK-2013-628

Mr. Nathan J. Green
Colorado West Regulatory Branch
U.S. Army Corps of Engineers
402 Rood Avenue, Room 224
Grand Junction, CO 81501

Dear Nathan:

Please find enclosed for your review the Pre-Construction Notification (PCN) for the Colorado Department of Transportation (CDOT) SH 92 Stengel's Hill reconstruction project, CDOT Project STA 092A-024 (SA 17772), Corps File No SPK-2013-628. CDOT in conjunction with the Federal Highway Administration (FHWA) requests authorization by the US Army Corps of Engineers for the use of Nationwide Permit 23 (NWP 23) for Approved Categorical Exclusions. The project is being prepared as a Categorical Exclusion under 23 CFR 771.117 paragraph (D) (1) and was approved by FHWA on September 17-2012. Previous CDOT construction projects for the corridor were also authorized under a NWP 23 (SPK-2008-898 CW). CDOT proposes to accomplish compensatory mitigation for all permanent impacts to wetlands at WetBank Gunnison, a Corps approved mitigation bank at a 1:1 ratio. Temporary impacts are not anticipated.

The project is located on SH 92 between mileposts 13.80-15.50 in Delta County west of Rogers Mesa. The major feature of the project involves the new construction of a grade separated bridge over the railroad crossing where SH 92 intersects the Union Pacific Railroad (UPRR). This will require a minor shift in the alignment of the highway to the north and full reconstruction of the highway. This is the final construction project that completes the corridor known as Austin to Hotchkiss.

Waters of the US within the project limits were identified in the Wetland Delineation Report, which was previously submitted to your office on April 14, 2013. Electronic copies of the report and this PCN including all relevant attachments are provided on a compact disc (CD). In the report, two types of wetlands were mapped and identified: native riparian wetlands and man-induced irrigated

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wetlands. The riparian wetlands occur along two intermittent tributaries to the North Fork Gunnison River. These are identified as an unnamed tributary and Big Gulch. The man-induced irrigated wetlands are not associated with any tributary and are essentially vegetated swales. Each wetland and their impacts are summarized in Table 1. All wetland impacts are due to embankment fill

Table 1. Wetland Summary Table.

Wetland ID	*Wetland Type*	*Location*			*Existing Area (AC)*	*Impacted Area (AC)*	*Compensatory Mitigation (AC) WetBank Gunnison*
Natural Riparian Wetlands:							
1	PEM	STA 417+00 LT, north of highway	MP 14.7 Unnamed tributary	38.47521 -107.49287	1.04	0.48	0.48
2	PEM	STA 430+50 LT, north of highway	MP 14.9 Big Gulch	38.47571 -107.49099	0.34	0.07	0.07
				Subtotal	**1.38**	**0.55**	**0.55**
Man-Induced Irrigated Wetlands:							
3	PEM	STA 436+00 LT, north of highway	MP 15.0 swale	38.47592 -107.49023	0.26	0.12	0.12
4	PEM	STA 439+00 LT, north of highway	MP 15.0 swale	38.47595 -107.49016	0.66	0.41	0.41
5	PEM	STA 439+00 LT, north of highway	MP 15.0 swale	38.48022 -107.48549	0.01	0.00	0.00
				Subtotal	**0.93**	**0.53**	**0.53**
				TOTAL	**2.31**	**1.08**	**1.08**

In addition to wetland impacts, widening of the highway will require extension of the existing 36" corrugated metal pipe (CMP) at the unnamed tributary by 45 ft. The existing 8 ft cast-in-place arch culvert at Big Gulch will be extended 92 ft and the wingwalls, footers, and toewalls will be replaced.

To aid in the determination of compensatory mitigation ratios, CDOT performed a functional assessment of the wetlands using the Functional Assessment of Colorado Wetlands (FACWet) method (Version 3.0). Three separate assessments were performed for each type of system, natural versus man-induced irrigated wetlands. In general, wetland stressors for each assessment area (AA) were deemed high. A review of the Colorado Wetlands Mapping Inventory website (http://ndismaps.nrel.colostate.edu/wetlands/) categorizes the wetland stressors in this area to be severe. The composite Functional Capacity Index (FCI) scores for each AA are summarized in Table 2. Based on the results of the FACWet functional assessment, CDOT proposes to mitigate for the loss of all of the 1.08 acreage regardless of function or jurisdiction at a 1:1 Ratio.

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Table 2. FACWet Summary Table.

Assessment Area (AA)	*FCI Score/Functional Category*	*Interpretation and Stressors*
Natural Riparian Wetlands (0.55 acres)		
Unnamed Tributary to North Fork Gunnison River	0.82/Highly Functioning	This wetland, while on the lower end of the scale in this category, still retains most of its natural functions. The capacity of the AA has somewhat altered the function of the wetland, but it is still fundamentally sound. Stressors include the location of the adjacent highway and dirt road. Conditions upstream contribute to possible eutrophication and changes to the native wetland plant community by the introduction of cattails to a seasonally flooded saline meadow. Unchecked noxious weed control from surrounding agricultural areas may contribute to the introduction of Canada thistle (*Cirsium arvense*) along the drier wetland/upland fringe.
Big Gulch	0.71/Functioning	This wetland and drainage lies on the lower end of the scale in this category. The capacity of the AA to function properly is impeded by many stressors and is reflected by the dominant plant community (Reed canarygrass (*Phalaris arundinacea*) monotype), which is considered invasive. The dominance of this monoculture in Big Gulch may be due to stressors from nutrient loading and reduced soil structure by compaction associated with the resident horses.
Man-Induced Irrigated Wetlands (0.53 acres)		
Vegetated Swales	0.63/Functioning Impaired	The vegetated swales are situated on the lower end of the Functioning Impaired scale due to the lack of natural hydrology. Long-term irrigation has created wetlands however it is unknown and highly unlikely that these areas would retain their wetland characteristics upon the cessation of water.

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During construction, to prevent sediment-laden water from entering adjacent wetlands or migrating downstream, Best Management Practices (BMPs) will be used as sediment filters. Concrete washouts will be used to capture and contain concrete waste and concrete water. Final stabilization for the entire project will be achieved by re-seeding all slope embankments for an estimated 42 acres with a locally suitable native seed mix.

Standard equipment (i.e., trucks, backhoes, etc.) will be used in construction of this project. All equipment accessing the site will require pre-treatment for aquatic invasives (New Zealand mud snails, zebra mussels, quagga mussels, and whirling disease) before entering any water or wetlands. The method of treatment will be per the standards of the Colorado Parks & Wildlife (CPW) and will be provided to the contractor prior to construction.

As part of the original Categorical Exclusion for this project, CDOT conducted an inventory of cultural resources (Archaeology and History) and threatened and endangered (T&E) species and found that there would be *no adverse effects* on either cultural resources or T&E species. These reports, including SHPO and USFWS concurrence are provided electronically on a CD. CDOT will also provide notification to the CPW for Programmatic Senate Bill (SB) 40 clearance via this transmittal.

If you have any questions or need additional information concerning this project, please feel free to call Paula Durkin at (970) 683-6255, or e-mail at paula.durkin@state.co.us.

Sincerely,

Dave Eller, DIRECTOR
TRANSPORTATION, REGION 3

Michael G Vanderhoof

BY: Mike Vanderhoof, REGION 3
PLANNING AND ENVIRONMENTAL MANAGER

Enclosure
cc: R. Alexander, CDOT, R3 Montrose Residency
J. Fullerton, CDOT, R3 Montrose Residency
P. Durkin, CDOT, R3 Environment
R. Velarde, CPW
M. Siders, BLM
S. Ranney, WETBANK Gunnison
CDOT R3 File, CF

U.S. Army Corps of Engineers

South Pacific Division

Nationwide Permit Pre-Construction Notification (PCN) Form

This form integrates requirements of the U.S. Army Corps of Engineers Nationwide Permit Program within the South Pacific Division (SPD), including General and Regional Conditions. You MUST fill out all boxes related to the work being done. Fillable boxes in this form expand if additional space is needed.

Box 1 Project Name SH 92 Stengel's Hill Reconstruction			
Applicant Name Michael Vanderhoof		**Applicant Title** Region Planning and Environmental Manager (RPEM)	
Applicant Company, Agency, etc. Colorado Department of Transportation - Region 3		Applicant's internal tracking number (if any) STA 092A-024; 17772	
Mailing Address CDOT R3 Environmental, 222 South 6th Street, Rm. 317, Grand Junction, CO 81501			
Work Phone with area code 970-683-6251	Mobile Phone with area code	Home Phone with area code	Fax # with area code 970-683-6227
E-mail Address michael.vanderhoof@state.co.us	Relationship of applicant to property: ☒ Owner ☐ Purchaser ☐ Lessee ☐ Other:		
Application is hereby made for verification that subject regulated activities associated with subject project qualify for authorization under a U.S. Army Corps of Engineers Nationwide Permit or Permits as described herein. I certify that I am familiar with the information contained in this application and, that to the best of my knowledge and belief, such information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities. I hereby grant to the agency to which this application is made the right to enter the above-described location to inspect the proposed, in-progress or completed work. I agree to start work only after all necessary permits have been received and to comply with all terms and conditions of the authorization.			
Signature of applicant Michael E Vanderhoof			Date (mm/dd/yyyy) 09/30/2013

If anyone other than the person named as the Applicant will be in contact with the U.S. Army Corps of Engineers representing the Applicant regarding this project during the permit process, Box 2 MUST be filled out.

Box 2 Authorized Agent/Operator Name Paula Durkin		**Agent/Operator Title**	
Agent/Operator Company, Agency, etc. CDOT, Region 3		E-mail Address paula.durkin@state.co.us	
Mailing Address CDOT Region 3 Environmental, 222 South 6th St., Rm. 317, Grand Junction, CO 81501			
Work Phone with area code 970-683-6255	Mobile Phone with area code	Home Phone with area code	Fax # with area code 970-683-6227
I hereby authorize the above named authorized agent to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application. I understand that I am bound by the actions of my agent and I understand that if a federal or state permit is issued, I, or my agent, must sign the permit.			
Signature of applicant			Date (mm/dd/yyyy)
I certify that I am familiar with the information contained in this application, and that to the best of my knowledge and belief, such information is true, complete, and accurate.			
Signature of authorized agent			Date (mm/dd/yyyy) 09/30/2013

Revised March 21, 2012. For the most recent version of this form, visit your Corps District's Regulatory website.

Box 3 Name of Property Owner(s), if other than Applicant:		
Owner Title	**Owner Company, Agency, etc.**	
Mailing Address		
Work Phone with area code	Mobile Phone with area code	Home Phone with area code

Box 4 Name of Contractor(s) (if known):		
Contractor Title	**Contractor Company, Agency, etc.**	
Mailing Address		
Work Phone with area code	Mobile Phone with area code	Home Phone with area code

Box 5 Site Number 1 of 1. Project location(s), including street address, city, county, state, zip code where proposed activity will occur:

See attached sheets for details of each Water of the US (unnamed tributary to North Fork Gunnison River, Big Gulch, and irrigated wetlands).

Waterbody (if known, otherwise enter "an unnamed tributary to"):

Tributary to what known, downstream waterbody: North Fork Gunnison River

Latitude & Longitude (D/M/S, DD, or UTM with Zone):	Section, Township, Range:
See Table 1, Page 4 of Wetland Delineation Report dated March 21, 2013.	T14S, R93W, Sections 29, 31, 32
County Assessor Parcel Number (Include County name): Delta County	USGS Quadrangle map name: Lazear, COLO 7.5' USGS Topographic Quadrangle
Watershed (HUC and watershed name[1]): 14020005, Lower Gunnison Watershed [1]http://water.usgs.gov/GIS/regions.html	Size of permit area or project boundary: 1.08 acres varies linear feet

Directions to the project location and other location descriptions, if known:

SH92 between MP 13.80 just west of Shamrock Road and extending easterly to MP 15.50 at the top of Stengel's Hill on the west end of Rogers Mesa. From Grand Junction, take US 50 35 miles south to Delta, CO. Take left at the US50/SH92 intersection and travel 13.8 miles east towards Hotchkiss. All wetlands are on the north side of the highway. The first wetland is on BLM land just past the RR tracks and before Hidden Springs Rd.

Nature of Activity (Description of the project, include all features):

The project involves major reconstruction and widening of the highway to the north. Major features include construction of a new grade-separated bridge over the Union Pacific RR tracks, reconstructing and widening SH 92, upgrading the shoulders and improving the geometric layout of horizontal and vertical alignments.

Project Purpose (Description of the reason or purpose of the project):

The purpose of the project is to provide traffic safety improvements by eliminating the bottleneck at the existing at-grade UPRR crossing.

Box 6 Reason(s) for discharge into Waters of the United States (Description of why dredged and/or fill material needs to be placed in Waters of the United States):

All fill is due to embankment fill necessary for highway widening to the north and to replace and extend one 36" culvert. The total discharge of fill into native, natural riparian wetlands is 0.55 acres. The total discharge of fill into irrigation-induced wetlands that developed from seepage from an unlined irrigation ditch or that developed by bordering an artificial stockpond is 0.53 acres.

Proposed discharge of dredge and/or fill material. Indicate total surface area in **acres** and **linear feet** (where appropriate) of the proposed impacts to Waters of the United States, indicate water body type (tidal wetland, non-tidal wetland, riparian wetland, ephemeral stream/river, intermittent stream/river, perennial stream/river, pond/lake, vegetated shallows, bay/harbor, lagoon, ocean, etc.), and identify the impact(s) as permanent and/or temporary for each requested Nationwide Permit[1]:

[1] Enter the intended permit number(s). See Nationwide Permit regulations for permit numbers and qualification information: http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits/NationwidePermits.aspx

Water Body Type	Requested NWP Number: 23				Requested NWP Number:				Requested NWP Number:			
	Permanent		Temporary		Permanent		Temporary		Permanent		Temporary	
	Area	Length	Area	Length	Area	Length	Area	Length	Area	Length	Area	Length
Riparian Wetland	0.48 ac											
Riparian Wetland	0.07 ac											
Non-tidal Wetland	0.12 ac											
Non-tidal Wetland	0.41 ac											
Intermittent Waters		92 ft										
Total:	1.08 ac											

Total volume (in cubic yards) and type(s) of material proposed to be dredged from or discharged into Waters of the United States:

Material Type	Total Volume Dredged	Total Volume Discharged
Rock Slope Protection (RSP)		
Clean spawning gravel		
River rock		
Soil/Dirt/Silt/Sand/Mud	160 CY	15520.47 CY for new embankment
Concrete		192 CY for CBC at Big Gulch
Structure		
Stumps/Root wads		
Other: flowfill		103 CY for pipe at STA 416+05
Total:		

Activity requires a written waiver to exceed specified limits of the Nationwide Permit? ☐ Yes ☒ No
If yes, provide Nationwide Permit number and name, limit to be exceeded, and rationale for each requested waiver:

Activity will result in the loss of greater than ½-acre of Waters of the United States? ☒ Yes ☐ No
If yes, provide an electronic copy (compact disc) or multiple hard copies (7) of the complete PCN for appropriate Federal and State Pre-discharge Notification (See General Condition #31, Pre-construction Notification, Agency Coordination, Section 2 and 4).

Describe direct and indirect effects caused by the activity and how the activity has been designed (or modified) to have minimal adverse effects on the aquatic environment (See General Condition #31, Pre-construction Notification, District Engineer's Decision, Section 1):

Direct effects are due to embankment fill as a result of roadway widening. All culverts are to be extended therefore there will also be some excavation and backfill required. The corrugated steel pipe at Big Gulch will be replaced with a concrete box culvert and new wingwalls and headwall. Indirect effects are not known.

Potential cumulative impacts of proposed activity(if any):
None.

Required drawings and figures (see each U.S. Army Corps of Engineers District's Minimum Standards Guidance):
Vicinity map: ☒ Attached (or mail copy separately if applying electronically)
To-scale Plan view drawing(s): ☒ Attached (or mail copy separately if applying electronically)
To-scale elevation and/or Cross Section drawing(s): ☒ Attached (or mail copy separately if applying electronically)
Numbered and dated pre-project color photographs: ☒ Attached (or mail copy separately if applying electronically)
Sketch drawing(s) or map(s): ☒ Attached (or mail copy separately if applying electronically)

Has a wetlands/waters of the U.S. delineation been completed?
☒ Yes, Attached[2] (or mail copy separately if applying electronically) ☐ No
If a delineation has been completed, has it been verified in writing by the Corps?
☒ Yes, Date of preliminary or approved jurisdictional determination (mm/dd/yyyy): Corps file number: SPK-2013-628 ☐ No
[2]If available, provide ESRI shapefiles (NAD83) for delineated waters

For proposed discharges of dredged material resulting from navigation dredging into inland or near-shore waters of the U.S. (including beach nourishment), please attach[3] a proposed Sampling and Analysis Plan (SAP) prepared according to Inland Testing Manual (ITM) guidelines (including Tier I information, if available), or if disposed offshore, a proposed SAP prepared according to the Ocean Disposal Manual. ☐ Attached (or mail copy separately if applying electronically)
[3]Or mail copy separately if applying electronically

Is any portion of the work already complete? ☐ YES ☒ NO
If yes, describe the work:

Box 7 Authority:
Is Section 10 of the Rivers and Harbors Act applicable?: ☐ YES ☒ NO
Is Section 404 of the Clean Water Act applicable?: ☒ YES ☐ NO

Is the project located on U.S. Army Corps of Engineers property or easement?: ☐ YES ☒ NO
If yes, has Section 408 process been initiated?: ☐ YES ☐ NO
Would the project affect a U.S. Army Corps of Engineers structure?: ☐ YES ☒ NO
If yes, has Section 408 process been initiated?: ☐ YES ☐ NO

Is the project located on other Federal Lands (USFS, BLM, etc.)?: ☒ YES ☐ NO
Is the project located on Tribal Lands?: ☐ YES ☒ NO

Box 8 Is the discharge of fill or dredged material for which Section 10/404 authorization is sought part of a larger plan of development?: ☐ YES ☒ NO

If discharge of fill or dredged material is part of development, name and proposed schedule for that larger development (start-up, duration, and completion dates):

Location of larger development (if discharge of fill or dredged material is part of a plan of development, a map of suitable quality and detail of the entire project site should be included):

Box 9 Measures taken to avoid and minimize impacts to waters of the United States:

One small wetland is entirely avoided while fill to the remaining wetlands was limited to the minimum necessary to stabilize that portion of the new highway.

Box 10 Proposed Compensatory Mitigation related to fill/excavation and dredge activities. Indicate in **acres** and **linear feet** (where appropriate) the total quantity of Waters of the United States proposed to be created, restored, enhanced and/or preserved for purposes of providing compensatory mitigation. Indicate water body type (tidal wetland, non-tidal wetland, riparian wetland, ephemeral stream/river, intermittent stream/river, perennial stream/river, pond/lake, vegetated shallows, bay/harbor, lagoon, ocean, etc.) or non-jurisdictional (uplands[1]). Indicate mitigation type (permittee-responsible on-site/off-site, mitigation bank, or in-lieu fee program). If the mitigation is purchase of credits from a mitigation bank, indicate the bank to be used, if known: WetBank Gunnison

[1] For uplands, please indicate if designed as an upland buffer.

Site Number	Water Body Type	Created		Restored		Enhanced		Preserved		Mitigation Type
		Area	Length	Area	Length	Area	Length	Area	Length	
1	Riparian Wetland					0.56 ac				Mitigation Bank
2	Riparian Wetland					0.27 ac				Mitigation Bank
3	Non-tidal Wetland					0.14 ac				Mitigation Bank
4	Non-tidal Wetland					0.25 ac				Mitigation Bank
	Intermittent Water						92 ft			Pick One
Total:						1.22 ac	92 ft			Pick One

If no mitigation is proposed, provide detailed explanation of why no mitigation would be necessary:

1.22 acres in the above table represents the area of wetlands avoided/preserved and protected by BMPs during construction as shown on the project's Stormwater Management and Erosion Control Plan (attached sheets 150-152). This is not the number of acre-credits to be purchased at WetBank Gunnison. The number of acre-credits to be purchased=1.08 and includes the irrigation-induced acreage.

If permittee-responsible mitigation is proposed, provide justification for not utilizing a Corps-approved mitigation bank or in-lieu fee program:

Has a draft/conceptual mitigation plan been prepared in accordance with the April 10, 2008, Final Mitigation Rule[2] and District Guidelines?

[2]http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits/mitig_info.aspx

[3]**Sacramento and San Francisco Districts**-http://www.spk.usace.army.mil/organizations/cespk-co/regulatory/pdf/Mitigation_Monitoring_Guidelines.pdf

[4]**Los Angeles District**-http://www.spl.usace.army.mil/regulatory/mmg_2004.pdf

[5]**Albuquerque District**-http://www.spa.usace.army.mil/reg/mitigation/SPA%20Final%20Mitigation%20Guidelines_OLD.pdf

☐ Yes, Attached (or mail copy separately if applying electronically) ☒ No

If no, a mitigation plan must be prepared and submitted, if applicable.

Mitigation site(s) Latitude & Longitude (D/M/S, DD, or UTM with Zone):	USGS Quadrangle map name(s):
Assessor Parcel Number(s):	Section(s), Township(s), Range(s):

Other location descriptions, if known:

Directions to the mitigation location(s):

Box 11 Threatened or Endangered Species

Please list any federally-listed (or proposed) threatened or endangered species or critical habitat (or proposed critical habitat) within the project area (include scientific names (e.g., Genus species), if known):

a. See attached. b.
c. d.
e. f.

Have surveys, using U.S. Fish and Wildlife Service/NOAA Fisheries protocols, been conducted?
☒ Yes, Report attached (or mail copy separately if applying electronically) ☐ No

If a federally-listed species would be impacted, please provide a description of the impactand a biological evaluation, if available.
☐ Yes, Report attached (or mail copy separately if applying electronically) ☐ Not attached

Has Section 7 consultation been initiated by another federal agency?
☐ Yes, Initiation letter attached (or mail copy separately if applying electronically) ☒ No

Has Section 10 consultation been initiated for the proposed project?
☐ Yes, Initiation letter attached (or mail copy separately if applying electronically) ☒ No

Has the USFWS/NOAA Fisheries issued a Biological Opinion?
☐ Yes, Attached (or mail copy separately if applying electronically) ☒ No
If yes, list date Opinion was issued (m/d/yyyy):

Box 12 Historic properties and cultural resources:

Are any cultural resources of any type known to exist on-site? ☐ Yes ☒ No

Please list any known historic properties listed, or eligible for listing, on the National Register of Historic Places:

a. See attached. b.
c. d.
e. f.

Has a cultural resource records search been conducted?
☒ Yes, Report attached (or mail copy separately if applying electronically) ☐ No

Has a cultural resource pedestrian survey been conducted for the site?
☒ Yes, Report attached (or mail copy separately if applying electronically) ☐ No

Has another federal agency been designated the lead federal agency for Section 106 consultation?
☐ Yes, Designation letter/email attached (or mail copy separately if applying electronically) ☒ No

Has Section 106 consultation been initiated by another federal agency?
☐ Yes, Initiation letter attached (or mail copy separately if applying electronically) ☒ No

Has a Section 106 MOA or PA been signed by another federal agency and the SHPO?
☐ Yes, Attached (or mail copy separately if applying electronically) ☒ No
If yes, list date MOA or PA was signed (m/d/yyyy):

Box 13 Section 401 Water Quality Certification:
Applying for certification? ☐ Yes, Attached (or mail copy separately if applying electronically) ☒ No

Certification issued? ☐ Yes, Attached (or mail copy separately if applying electronically) ☐ No
Certification waived? ☐ Yes, Attached (or mail copy separately if applying electronically) ☐ No
Certification denied? ☐ Yes, Attached (or mail copy separately if applying electronically) ☐ No

Exempted activity? ☒ Yes ☐ No
Agency concurrence? ☐ Yes, Attached ☐ No
If exempt, state why: Nationwide permits are exempt by State statute in Colorado.

Box 14 Coastal Zone Management Act:
Is the project located within the Coastal Zone? ☐ Yes ☒ No

If yes, applying for a coastal commission-approved Coastal Development Permit?
☐ Yes, Attached (or mail copy separately if applying electronically) ☐ No

If no, applying for separate CZMA-consistency certification?
☐ Yes, Attached (or mail copy separately if applying electronically) ☐ No

Permit/Consistency issued? ☐ Yes, Attached (or mail copy separately if applying electronically) ☐ No

Exempt? ☐ Yes ☐ No
Agency concurrence? ☐ Yes, Attached ☐ No
If exempt, state why:

Box 15 List of other certifications or approvals/denials received from other federal, state, or local agencies for work described in this application:

Agency	Type of Approval[4]	Identification Number	Date Applied	Date Approved	Date Denied
CDPHE	Construction Stormwater Permit	TBD	8/17/2013	TBD	N/A

[4] Would include but is not restricted to zoning, building, and flood plain permits

Nationwide Permit General Conditions (GC) checklist:

(http://www.gpo.gov/fdsys/pkg/FR-2012-02-21/pdf/2012-3687.pdf)

Check	General Condition	Rationale for compliance with General Condition
☒	1. Navigation	There are no navigable waters of the US within the project area.
☒	2. Aquatic Life Movements	Northern leopard frogs were present in the stockpond, but not since irrigation ceased and the pond drained. The frogs were also present in Big Gulch. Construction will be timed to occur after their breeding season (March-June).
☒	3. Spawning Areas	The unnamed tributary and Big Gulch are both intermittent non-fishing waters and do not support fish, however flows to the North Fork Gunnison River will still be diverted during construction to support the spawning season in downstream waters.
☒	4. Migratory Bird Breeding Areas	Per CDOT Standard Specifications, a Wildlife Biologist will be contracted to perform nesting surveys during the migratory bird breeding season between April 1st and August 31st. Measures shall be taken prior to the season to discourage nesting, however should an active migratory nest be discovered during construction, the Contractor must cease working in that area and set up a 50 ft. 'no work area' perimeter until the nest becomes inactive.
☒	5. Shellfish Beds	N/A
☒	6. Suitable Material	All material used for construction shall be per CDOT Standard Specifications and shall be free of toxic pollutants.
☒	7. Water Supply Intakes	N/A
☒	8. Adverse Effects from Impoundments	It is unlikely that the project will require temporary impoundment of water.
☒	9. Management of Water Flows	CDOT's Hydraulics Engineer reviewed and approved all of the watershed analyses and recommended structure plans and capacities for all pipes and for the CBC at Big Gulch.
☒	10. Fills Within 100-Year Floodplains	The project is not located in any 100-year floodplain.
☒	11. Equipment	Operators of heavy equipment will not be allowed to work in wetlands unauthorized by this permit. Wetlands were surveyed and are shown on the plans and shall be demarcated in the field by orange construction fence.
☒	12. Soil Erosion and Sediment Controls	The project has a Stormwater Management and Erosion Control Plan and will be permitted by CDPHE.
☒	13. Removal of Temporary Fills	The project is not expected to generate temporary fills in waters of the US.
☒	14. Proper Maintenance	All authorized structures and fill shall be properly maintained and periodically inspected by the appropriate CDOT Staff or Maintenance Patrol upon completion of the project.

☒	15. Single and Complete Project	This PCN applies to the project as described and for no other activity or project.
☒	16. Wild and Scenic Rivers	N/A
☒	17. Tribal Rights	N/A
☒	18. Endangered Species	See Box 11 above.
☒	19. Migratory Bird and Bald and Golden Eagle Permits	CDOT does not anticipate applying for depredation permits. Preliminary raptor surveys did not located nesting Bald or Golden Eagle nests or other raptors in the project vicinity.
☒	20. Historic Properties	See Box 12 above.
☒	21. Discovery of Previously Unknown Remains and Artifacts	N/A
☒	22. Designated Critical Resource Waters	N/A
☒	23. Mitigation	See Box 10 above.
☒	24. Safety of Impoundment Structures	N/A
☒	25. Water Quality	See Box 13 above.
☒	26. Coastal Zone Management	See Box 14 above.
☒	27. Regional and Case-by-Case Conditions	All applicable Regional Conditions and Case-by-Case Conditions shall be adhered to.
☒	28. Use of Multiple Nationwide Permits	N/A
☒	29. Transfer of Nationwide Permit Verifications	N/A
☒	30. Compliance Certification	CDOT will provide the Corps with a signed Compliance Certification upon completion of the project and will provide the Corps with a copy of the paid invoice for the Wetland Mitigation Bank Certification upon completion of the transaction with CDOT's Business Office. CDOT will also provide a copy of the WetBank Gunnison Certificate upon receipt.
☒	31. Pre-Construction Notification	This form completes the PCN.

Sacramento District

Nationwide Permit Program
Regional Conditions Checklist for Colorado

U.S. ARMY CORPS OF ENGINEERS **BUILDING STRONG ®**

On March 18, 2012, the U.S. Army Corps of Engineers' South Pacific Division approved 26 regional conditions for the 2012 Nationwide Permits (NWP) in Colorado, within the Sacramento District. This checklist is intended to assist applicants with completing the South Pacific Division Pre-Construction Notification Checklist and to ensure compliance with the regional conditions. This checklist does not include the full text of each regional condition.

Please refer to the *2012 Regional Conditions in Colorado* when completing this checklist (http://www.spk.usace.army.mil/Portals/12/documents/regulatory/nwp/2012_nwps/2012-NWP-RC-CO.pdf).

Please check the box to indicate you have read and have/will comply with the regional condition and provide a rationale on how you have/will comply with the condition.

Check	Regional Condition	Compliance Rationale
☒	1. **Nationwide Permit 12.** PCN must be submitted for open trenching in perennial waters or if the utility line is for the purpose of water transmission	The activity does not involve open trenching and is not for the purpose of water transmission. OR The PCN has been submitted with this checklist, and if the project will result in a withdrawal of water from a waterway, includes an evaluation of the effects of the withdrawal.
☒	2. **Nationwide Permits 12 and 14.** PCN must be submitted for projects in the Colorado River Basin.	The activity does not involve utility lines or transportation activities in perennial waters or special aquatic sites in the Colorado River Basin. OR The PCN has been submitted with this checklist.
☒	3. **Nationwide Permit 13.** PCN must be submitted for bank stabilization exceeding 250 feet or in streams with an average width of less than 20 feet. ☒ For streams with a width less than 20 feet, activities are limited to no more than ¼ cubic yard per linear foot.	The activity does not involve bank stabilization activities. OR The activity involves bank stabilization but under the thresholds of the regional condition 3. OR The PCN has been submitted with this checklist. (also address the requirement for no more than ¼ CY in streams < 20 feet wide, if applicable)
☒	4. **Nationwide Permit 23.** PCN must be submitted.	The activity does not involve the use of NWP 23. OR The PCN has been submitted with this checklist.
☒	5. **Nationwide Permit 27.** ☒ Fishery enhancement in perennial streams not authorized. ☒ Channel realignment not authorized. ☒ Structures must allow passage of aquatic organisms. ☒ Structures must not impede navigation. ☒ Concrete/grout not authorized. ☒ Construction of water parks and flood control projects not authorized.	I agree that the activity meets all requirements of regional condition number 5.

Check	Regional Condition	Compliance Rationale
☐	**6. Nationwide Permits 29 and 39.** Floodplain map must be submitted with the PCN.	The activity does not involve the use of NWPs 29 or39 OR A copy of the floodplain map has been submitted with the PCN.
☒	**7. Important Spawning Areas.** ☒ Will not destroy spawning areas or be conducted during trout and Kokanee spawning seasons. ☒ Bio-engineering required for bank protection activities over 50 feet. ☒ PCN required for activities in important spawning areas.	The activity will not be located in identified important spawning areas. OR The PCN has been submitted with this checklist (also explain how the activity will comply with the remaining requirements of this condition).
☒	**8. Removal of Temporary Fills.** Horizontal marker must be used in wetlands.	I agree to use a horizontal marker to delineate the existing ground elevation of wetlands that will be temporarily impacted. OR The activity does not involve temporary fill.
☒	**9. Fens**. NWPS, with the exception of 3, 5, 6, 20, 27, 32, 37 and 38, are revoked in fens and wetlands adjacent to fens. PCN required for these other NWPs.	The activity would not occur in a fen or wetland adjacent to a fen. OR The activity does not involve use of a revoked NWP. OR The PCN has been submitted with this checklist.
☒	**10. Springs.** PCN must be submitted within 100 feet of discharge of a spring.	The activity would not occur within 100 feet of the discharge point of a spring. OR The PCN has been submitted with this checklist.
☒	**11. Suitable Fill.** ☒ PCN must be submitted for the use of broken concrete. ☒ Must demonstrate that soft engineering methods are not practicable. ☒ Concrete with exposed rebar not authorized.	The proposed project would not involve the use of broken concrete or concrete with exposed rebar. OR The PCN has been submitted with this checklist (also explain why soft engineering methods are not practicable, if applicable).

Attachments

- Roadway Sheets (11 pages)
- FACWet Analyses (54 pages)
    - Unnamed Tributary to North Fork Gunnison
    - Big Gulch
    - Man-Induced Irrigated Wetlands
    - CNHP Wetland Stressors Map
- CDOT 128 form CE Number 23 CFR 771.117 paragraph (D)(1)
- Section 7 reports (6 pages)
- Section 106 reports (12 pages)

Oversight / NHS	
FHWA REGION VIII OVERSIGHT?	■ NO □ YES
NATIONAL HIGHWAY SYSTEM?	■ NO □ YES

DEPARTMENT OF TRANSPORTATION
STATE OF COLORADO

HIGHWAY CONSTRUCTION BID PLANS OF PROPOSED
COLORADO PROJECT NO. STA 092A-024
STATE HIGHWAY NO. 92
DELTA COUNTY
CONSTRUCTION PROJECT CODE NO. 17772

Related Projects:	
P. E. UNDER PROJECT:	
Project Number	STA 092A-018
Project Code	14934
R.O.W. Projects:	
R.O.W. Project Description	STA 092A-023
Project Code	17774

FOR
09/19/2013

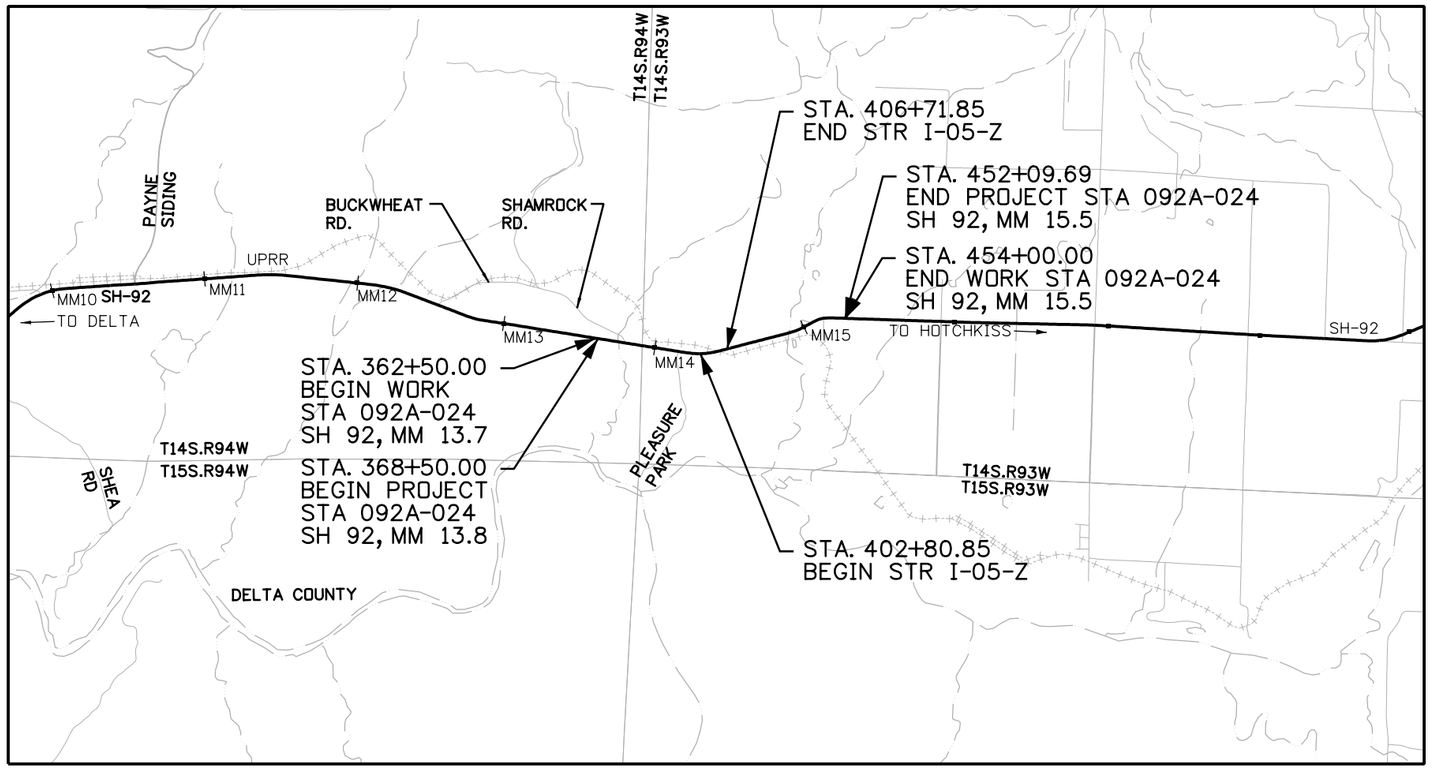
TABULATION OF LENGTH & DESIGN DATA

STATION	FEET ROADWAY SH 92	FEET MAJOR STR.
BEGIN WORK AREA STA. 362+50.00		
BEGIN STA 092A-024 STA. 368+50.00 ON SH92 MM 13.75	3430.85	
STA. 402+80.85 BEGIN STRUCTURE NO. I-05-Z		391.00
STA. 406+71.85 END STRUCTURE NO. I-05-Z		
END STA 092A-024 STA. 452+09.69 ON SH92 MM 15.47	4537.84	
END OF WORK AREA STA. 454+00.00		
TOTAL	7968.69	391.00

SUMMARY OF PROJECT LENGTH	FEET	MILES
ROADWAY	7968.69	1.51
MAJOR STRUCTURE	391.00	.07
PROJECT GROSS LENGTH	8359.69	1.58

DESIGN DATA	S.H. 92
MAXIMUM RADIUS OF CURVE	10,000 ft
MAXIMUM GRADE	6.0%
MINIMUM S.S.D. HORIZONTAL	495 ft
MINIMUM S.S.D. VERTICAL	495 ft
MAXIMUM DESIGN SPEED	55 MPH
2030 DESIGN TRAFFIC	DHV = 873 ADT = 7938
DHV TRUCKS %	6.2%
CLEAR ZONE DISTANCE	30 ft
CONSTRUCTION CLEAR ZONE (MIN 18')	18 ft

* FOR INFORMATION ONLY



PROJECT LOCATION MAP

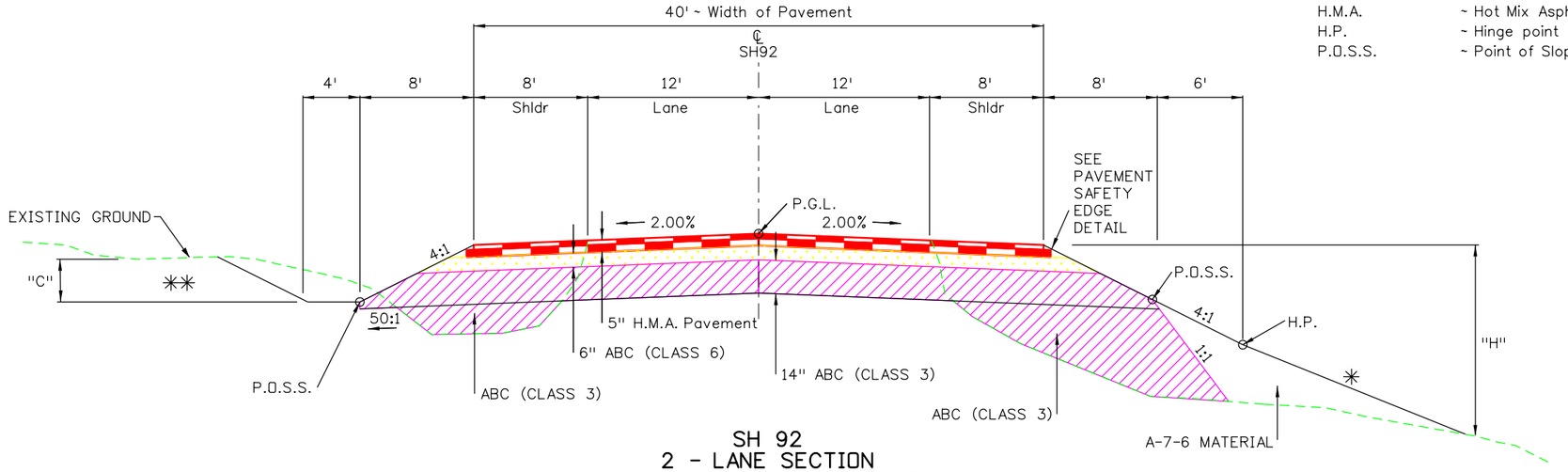
0' 2640' 5280' 10560'

Print Date: 9/17/2013	Sheet Revisions	Colorado Department of Transportation	As Constructed
File Name: 17772DES_TitleSht.dgn	Date: / Comments / Init.	2424 North Townsend Avenue	No Revisions:
Horiz. Scale: 1:1 Vert. Scale: As Noted	FOR PLANS SEPT. 2013	Montrose, CO 81401	Revised:
Unit Information Unit Leader Initials		Phone: 972-249-5285 FAX: 970-249-6018	Void:
URS		Region 3 RA	

Contract Information	Project No./Code
Contractor:	STA 092A-024
Resident Engineer:	17772
Project Engineer:	Sheet Number 1
PROJECT STARTED: / / ACCEPTED: / /	
Comments:	

TYPICAL SECTION NOTES

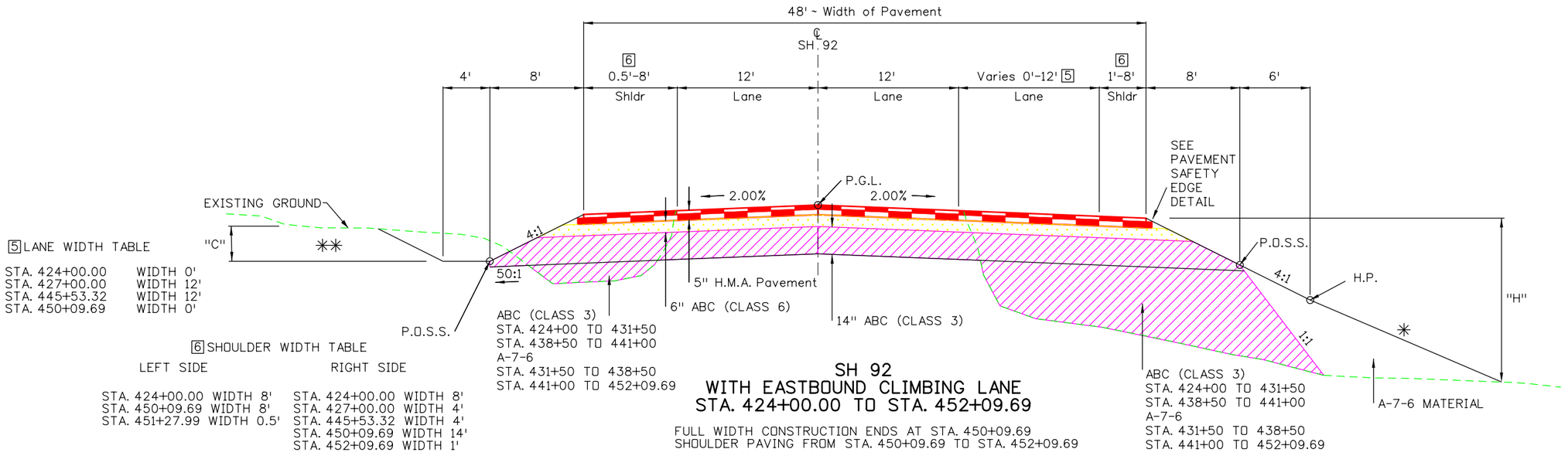
P.G.L.	~ Profile Grade Line & Axis of Rotation
H.M.A.	~ Hot Mix Asphalt
H.P.	~ Hinge point
P.O.S.S.	~ Point of Slope Selection



SH 92
2 - LANE SECTION
STA. 402+41.00 TO STA. 402+80.85
STA. 406+71.85 TO STA. 424+00.00

** CUT SLOPES
SLOPE 4:1 WHEN "C" IS 5' TO 10'
SLOPE 3:1 WHEN "C" IS 10' TO 15'
SLOPE 2:1 WHEN "C" IS OVER 15'

* FILL SLOPES
SLOPE 2:1 WHEN "H" IS OVER 15'
SLOPE 3:1 WHEN "H" IS 10' TO 15'
SLOPE 4:1 WHEN "H" IS 5' TO 10'



[5] LANE WIDTH TABLE

STA. 424+00.00	WIDTH 0'
STA. 427+00.00	WIDTH 12'
STA. 445+53.32	WIDTH 12'
STA. 450+09.69	WIDTH 0'

[6] SHOULDER WIDTH TABLE

LEFT SIDE	RIGHT SIDE
STA. 424+00.00 WIDTH 8'	STA. 424+00.00 WIDTH 8'
STA. 450+09.69 WIDTH 8'	STA. 427+00.00 WIDTH 4'
STA. 451+27.99 WIDTH 0.5'	STA. 445+53.32 WIDTH 4'
	STA. 450+09.69 WIDTH 14'
	STA. 452+09.69 WIDTH 1'

SH 92
WITH EASTBOUND CLIMBING LANE
STA. 424+00.00 TO STA. 452+09.69

FULL WIDTH CONSTRUCTION ENDS AT STA. 450+09.69
SHOULDER PAVING FROM STA. 450+09.69 TO STA. 452+09.69

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Print Date: 9/12/2013	
File Name: 17772DES_TyplSht02.dgn	
Horiz. Scale: 1:10	Vert. Scale:
Unit Information	Unit Leader Initials
URS	

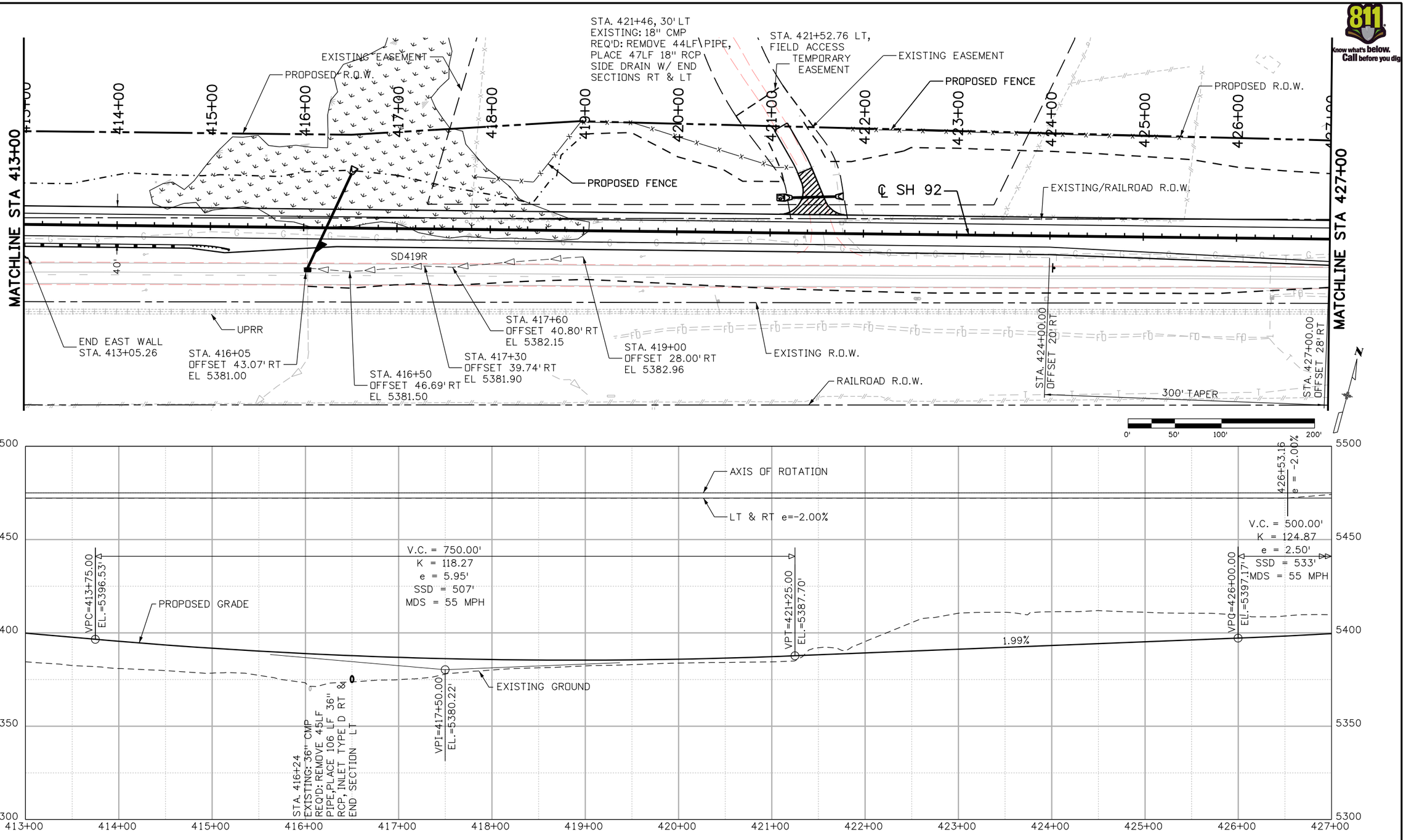
Sheet Revisions		
Date:	Comments	Init.
	FOR PLANS	
	SEPT. 2013	

Colorado Department of Transportation
DEPARTMENT OF TRANSPORTATION
2424 North Townsend Avenue
Montrose, CO 81401
Phone: 972-249-5285 FAX: 970-249-6018
Region 3 RA

As Constructed	
No Revisions:	
Revised:	
Void:	

TYPICAL SECTION			
Designer: P. WELLS		Structure Numbers	
Detailer: B. TENNANT			
Sheet Subset: TYPICAL	Subset Sheets: 02 of 04		

Project No./Code	
STA 092A-024	
17772	
Sheet Number	5



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Horiz. Scale: 1:100	Vert. Scale: 1:50
Unit Information	Unit Leader Initials

URS

Sheet Revisions		
Date:	Comments	Init.
	FOR PLANS	
	SEPT. 2013	

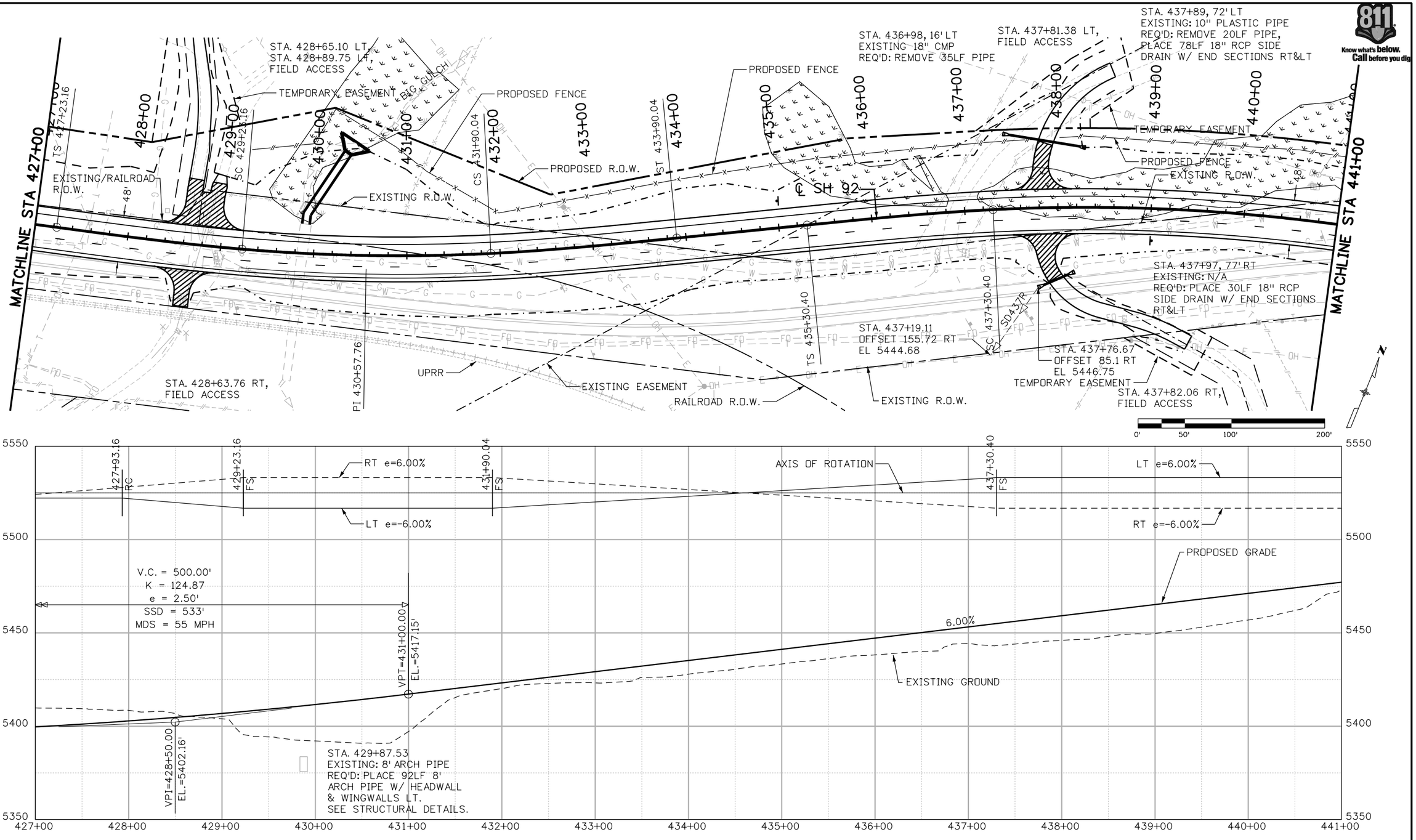
Colorado Department of Transportation
DOT DEPARTMENT OF TRANSPORTATION
2424 North Townsend Avenue
Montrose, CO 81401
Phone: 972-249-5285 FAX: 970-249-6018
Region 3 RA

As Constructed	
No Revisions:	
Revised:	
Void:	

ROADWAY PLAN AND PROFILE

Designer:	P.WELLS	Structure Numbers	
Detailer:	B.TENNANT		
Sheet Subset:	SH92 P&P	Subset Sheets:	05 of 07

Project No./Code	
STA 092A-024	
17772	
Sheet Number	60 .



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Print Date: 9/19/2013	
File Name: 17772DES_PnP06.dgn	
Horiz. Scale: 1:100	Vert. Scale: 1:50
Unit Information	Unit Leader Initials

URS

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Sheet Revisions

Date:	Comments	Init.
	FOR PLANS	
	SEPT. 2013	

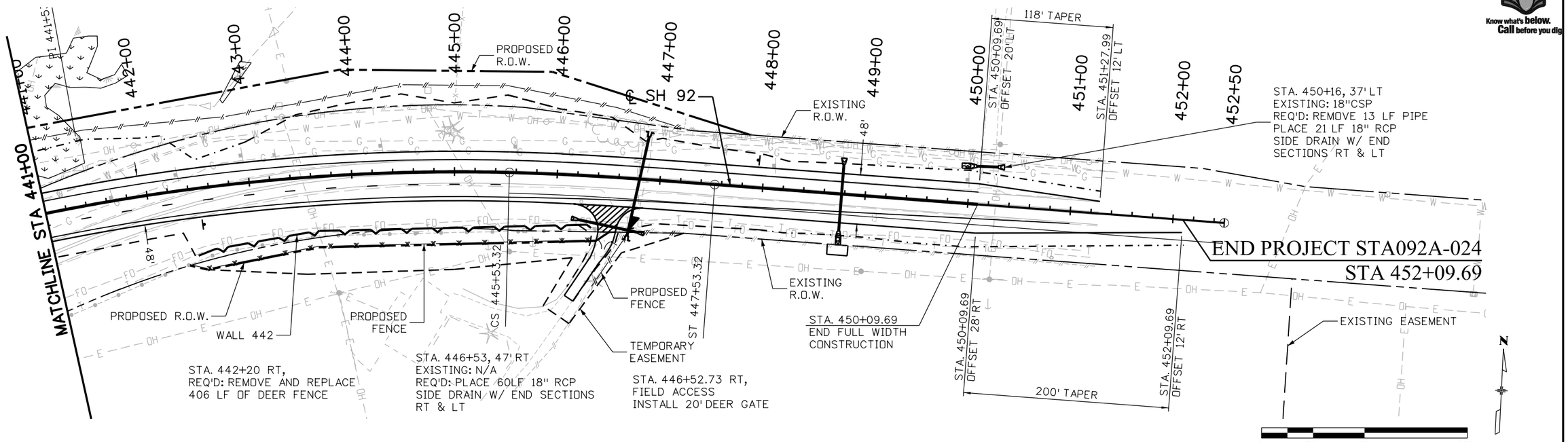
Colorado Department of Transportation
DEPARTMENT OF TRANSPORTATION
2424 North Townsend Avenue
Montrose, CO 81401
Phone: 972-249-5285 FAX: 970-249-6018
Region 3 RA

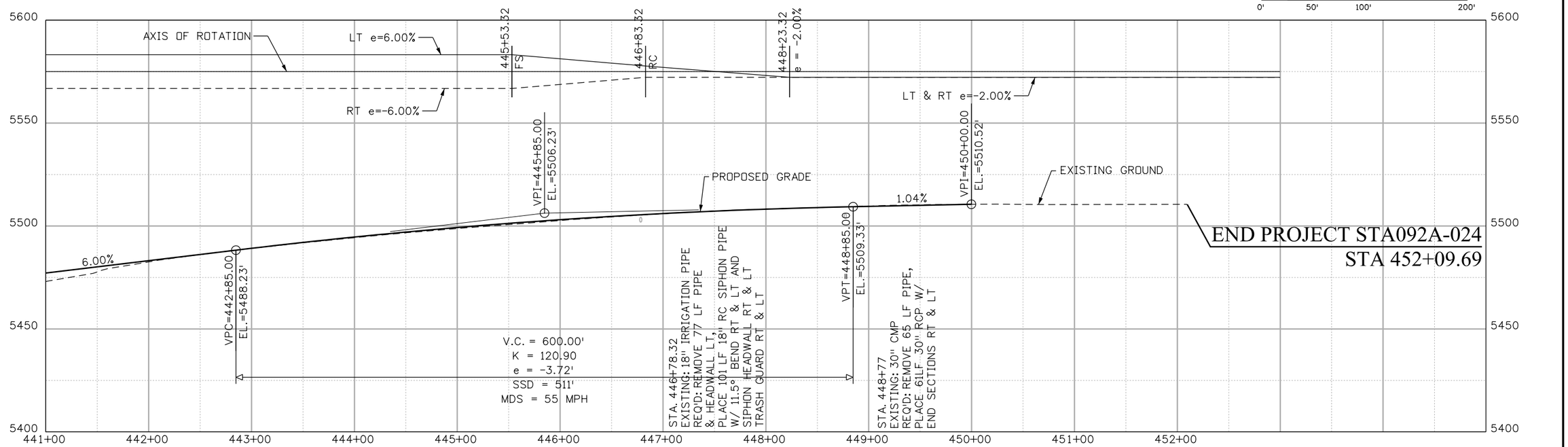
As Constructed
No Revisions:
Revised:
Void:

ROADWAY PLAN AND PROFILE

Designer: P.WELLS
Detailer: B.TENNANT
Sheet Subset: SH92 P&P
Structure Numbers
Subset Sheets: 06 of 07

Project No./Code
STA 092A-024
17772
Sheet Number 61 .





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Horiz. Scale: 1:100	Vert. Scale: 1:50
Unit Information	Unit Leader Initials

URS

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Sheet Revisions

Date:	Comments	Init.
	FOR PLANS	
	SEPT. 2013	

Colorado Department of Transportation
DEPARTMENT OF TRANSPORTATION
2424 North Townsend Avenue
Montrose, CO 81401
Phone: 972-249-5285 FAX: 970-249-6018
Region 3 RA

As Constructed

No Revisions:

Revised:

Void:

ROADWAY PLAN AND PROFILE

Designer: P.WELLS
Detailer: B.TENNANT
Sheet Subset: SH92 P&P
Structure Numbers:
Subset Sheets: 07 of 07

Project No./Code

STA 092A-024

17772

Sheet Number 62 .

GENERAL NOTES

CONSTRUCTION JOINTS NOT SHOWNON THE PLANS SHALL BE APPROVED BY THE ENGINEER.

THE CONTRACTOR IS RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE DURING CONSTRUCTION.

STRUCTURE EXCAVATION AND BACKFILL SHALL BE AS SHOWN ON THE PLANS.

ALL REINFORCING SHALL BE NON-EPOXY COATED.

ALL EXPOSED CONCRETE SURFACES SHALL RECEIVE A CLASS 1 FINAL FINISH TO ONE FOOT BELOW THE GROUND LINE.

GRADE 60 REINFORCING STEEL IS REQUIRED.

THE MINIMUM LAP SPLICE LENGTH FOR BLACK REINFORCING BARS SHALL BE:

BAR SIZE:	#4	#5	#6	#7	#8	#9	#10	#11
SPLICE LENGTH:	1'-0"	1'-4"	1'-7"	1'-10"	2'-5"	3'-1"	3'-11"	4'-10"

ALL DIMENSIONS ARE PERPENDICULAR TO THE CENTERLINE OF THE BOX.

ALL TRANSVERSE REINFORCING SHALL BE NORMAL TO THE CENTERLINE OF THE BOX.

ALL EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED ¾ INCH.

FOR INFORMATION NOT SHOWN, SEE CDOT STANDARDS M-601-1 THROUGH M-601-20.

THE INFORMATION SHOWN ON THESE PLANS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. THE CONTRACTOR SHALL NOTIFY THE UTILITY NOTIFICATION CENTER OF COLORADO AT 1-800-922-1987 AT LEAST 2 DAYS (NOT INCLUDING THE DAY OF NOTIFICATION) PRIOR TO ANY EXCAVATION OR OTHER EARTHWORK.

STATIONS, ELEVATIONS AND DIMENSIONS IN THESE PLANS ARE CALCULATED FROM A RECENT FIELD SURVEY AND EXISTING PLANS. THE CONTRACTOR SHALL VERIFY ALL ELEVATIONS AND DEPENDENT DIMENSIONS IN THE FIELD BEFORE ORDERING OR FABRICATING ANY MATERIAL.

THE POTENTIAL FOR SULFATE ATTACK ON PORTLAND CEMENT CONCRETE IS CLASSIFIED AS A CLASS 3 EXPOSURE. CEMENT SHOULD MEET CLASS 3 CEMENTITIOUS MATERIAL REQUIREMENTS.

LOADING DATA:

LIVE LOAD = HL-93 (DESIGN TRUCK AND DESIGN LAND LOAD)

ALLOWABLE NOMINAL BEARING CAPACITY = 12 KSF

BEARING RESISTANCE FACTOR = 0.55

DESIGN DATA

FIFTH EDITION OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS WITH CURRENT INTERIMS

DESIGN METHOD: LOAD AND RESISTANCE FACTOR DESIGN

CLASS D CONCRETE: f'c = 4,500 psi

REINFORCING STEEL: fy = 60,000 psi

SUMMARY OF QUANTITIES

Item No.	Description	Unit	Arch Culvert
202	Removal of Portions of Present Structure	LS	1
206	Structure Excavation	CY	199
206	Structure Backfill (Class 1)	CY	372
601	Concrete Class D (Box Culvert)	CY	192
602	Reinforcing Steel	LB	14,268

ABBREVIATIONS:

℄	CENTERLINE
CFS	CUBIC FEET PER SECOND
DA	DRAINAGE AREA
DHW	DESIGN HIGH WATER
EOP	EDGE OF PAVEMENT
EL.	ELEVATION
HCL	HORIZONTAL CONTROL LINE
KSF	KIPS PER SQUARE FOOT
LBS	POUNDS
MAX.	MAXIMUM
MIN.	MINIMUM
PSI	POUNDS PER SQUARE INCH
STA.	STATION
SQ. IN.	SQUARE INCH
TYP.	TYPICAL

INDEX OF DRAWINGS

CULVERT DESCRIPTION

Big Gulch Culvert Extension

92'-8⅝" Culvert Extension
SH 92 Over Big Gulch
Skew 90.00'00"

CROSS REFERENCE DRAWING NUMBER
(IF BLANK, REFERENCE IS TO SAME SHEET)

BXX
XX

SECTION OR DETAIL IDENTIFICATION

File Path: P:\URS\SH92_Phase2\17772\Hydraulics\Drawings\Reference_Files\17772HYDR_General Information, SOQ.dgn

Print Date: 7/12/2013
File Name: 17772HYDR_General Information, SOQ.dgn
Horiz. Scale: 1:30 Vert. Scale:
Unit Information Unit Leader Initials

URS | HARTWIG & Associates, Inc.

Sheet Revisions		
Date:	Comments	Init.

FOR PLANS JULY 2013

Colorado Department of Transportation
2424 North Townsend Avenue
Montrose, CO 81401
Phone: 972-249-5285 FAX: 970-249-6018
Region 3 RA

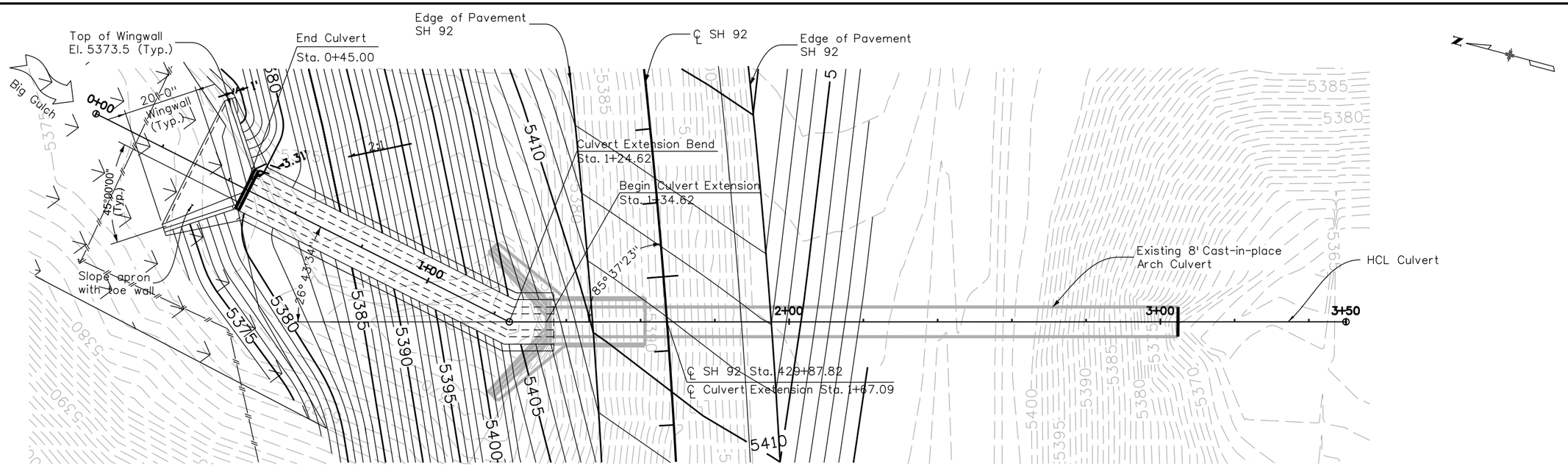
As Constructed	
No Revisions:	
Revised:	
Void:	

BIG GULCH
GENERAL INFORMATION, SUMMARY OF QUANTITIES

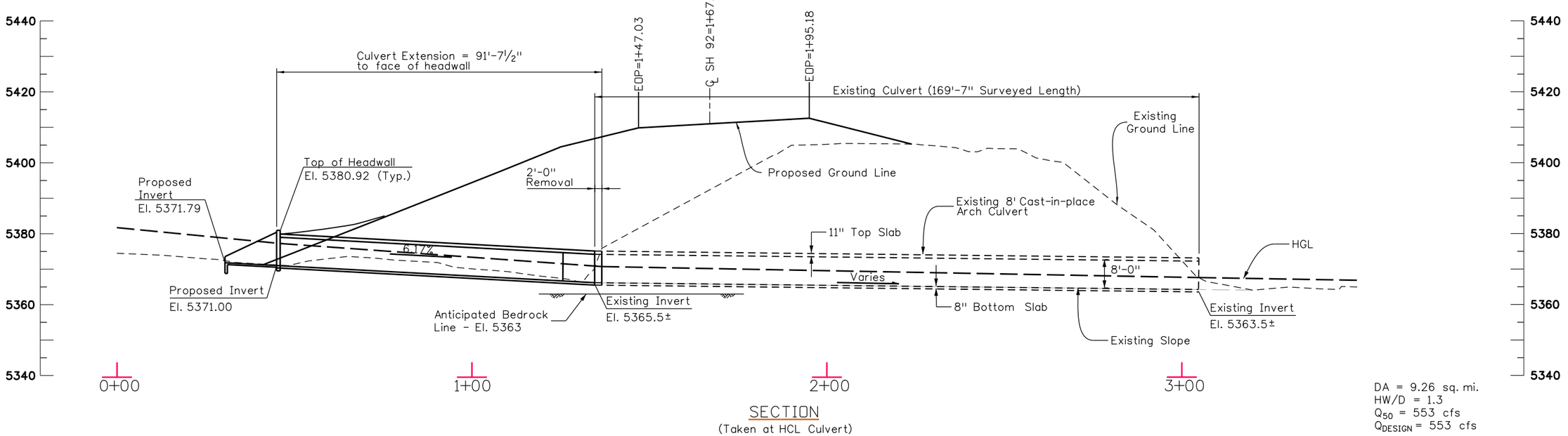
Designer: H. REED
Detailer: H. REED
Sheet Subset: Arch Culvert
Structure Numbers:
Subset Sheets: AC01 of AC06

Project No./Code	
STA 092A-024	
17772	
Sheet Number	126

811 Know what's below. Call before you dig.



PLAN



SECTION
(Taken at HCL Culvert)

DA = 9.26 sq. mi.
HW/D = 1.3
Q_{50} = 553 cfs
Q_{DESIGN} = 553 cfs

File Path: P:\URS\SH92_Phase2\17772\Hydraulics\Drawings\Reference_Files\17772HYDR_GeneralLayout.dgn

Print Date: 7/12/2013	
File Name: 17772HYDR_GeneralLayout.dgn	
Horiz. Scale: 1:30	Vert. Scale:
Unit Information	Unit Leader Initials
URS	

Sheet Revisions		
Date:	Comments	Init.
	FOR PLANS JULY 2013	

Colorado Department of Transportation
DEPARTMENT OF TRANSPORTATION
2424 North Townsend Avenue
Montrose, CO 81401
Phone: 972-249-5285 FAX: 970-249-6018
Region 3 RA

As Constructed
No Revisions:
Revised:
Void:

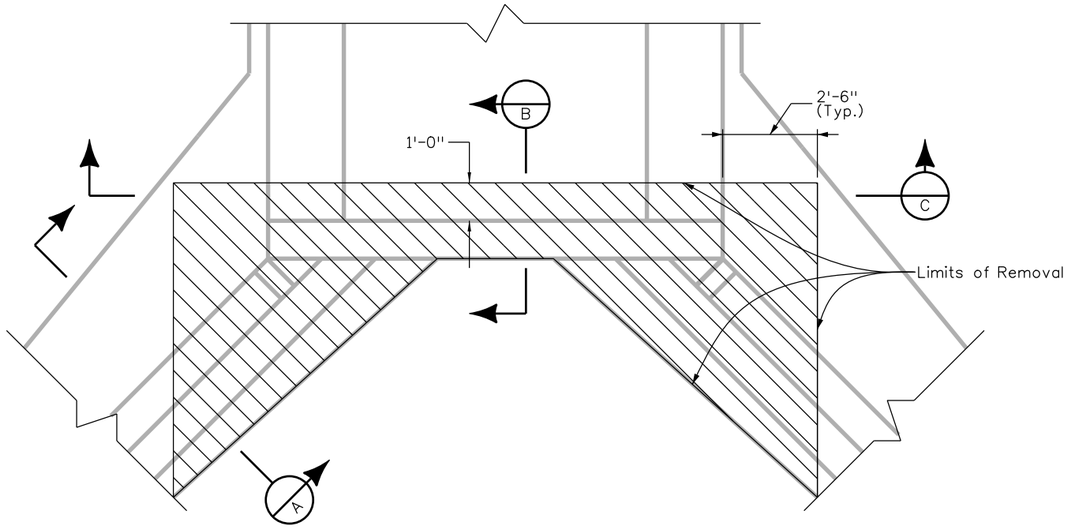
BIG GULCH
GENERAL LAYOUT

Designer: H. REED		Structure Numbers	
Detailer: H. REED			
Sheet Subset: Arch Culvert		Subset Sheets: AC02 of AC06	

Project No./Code
STA 092A-024
17772
Sheet Number 127

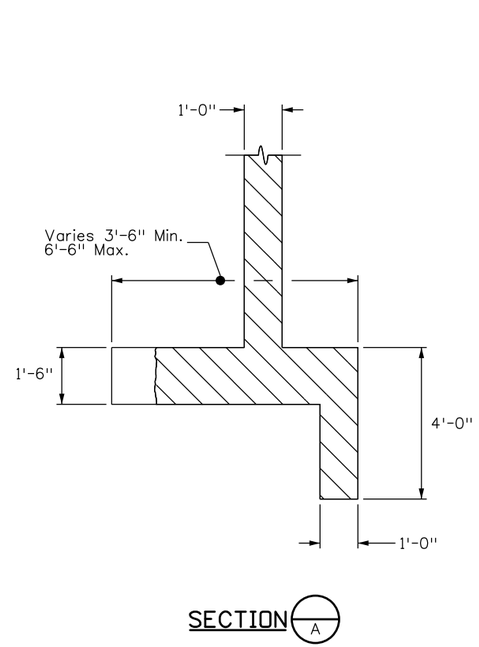
NOTES:

1. REMOVE PORTIONS OF CULVERT TO THE LIMITS SHOWN.
2. REMOVE PORTIONS OF WINGWALLS, FOOTINGS, AND TOEWALLS TO AT LEAST THE LIMITS SHOWN. ADDITIONAL REMOVAL IS ALLOWED AS NEEDED TO AVOID INTERFERENCE WITH NEW CONSTRUCTION.
3. A 1" MINIMUM DEEP SAWCUT SHALL BE MADE AT ALL REMOVAL LINES.
4. ALL EXISTING REINFORCING PROJECTING FROM CULVERT WALLS AND BOTTOM SLAB SHALL BE PRESERVED.
5. ALL SAW CUTTING, REMOVALS, AND PRESERVATION OF REINFORCING SHALL BE INCLUDED IN THE COST OF ITEM 202: REMOVAL OF PORTIONS OF PRESENT STRUCTURE.

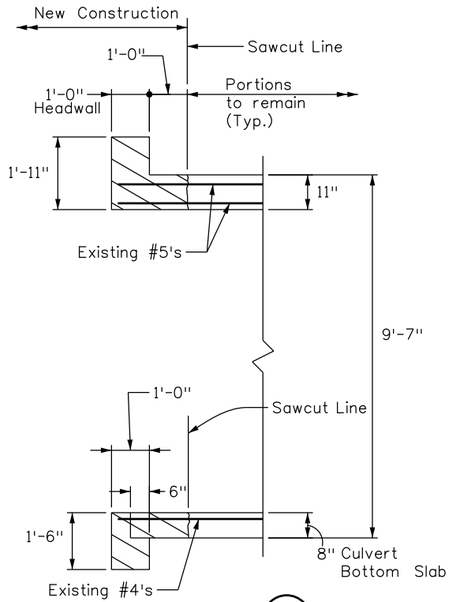


Area to be removed

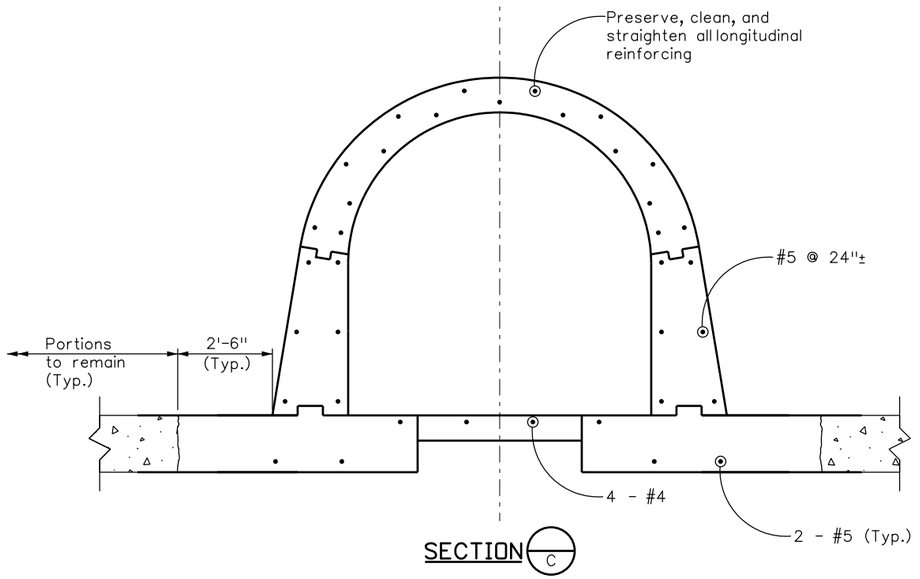
PLAN



SECTION A



SECTION B



SECTION C

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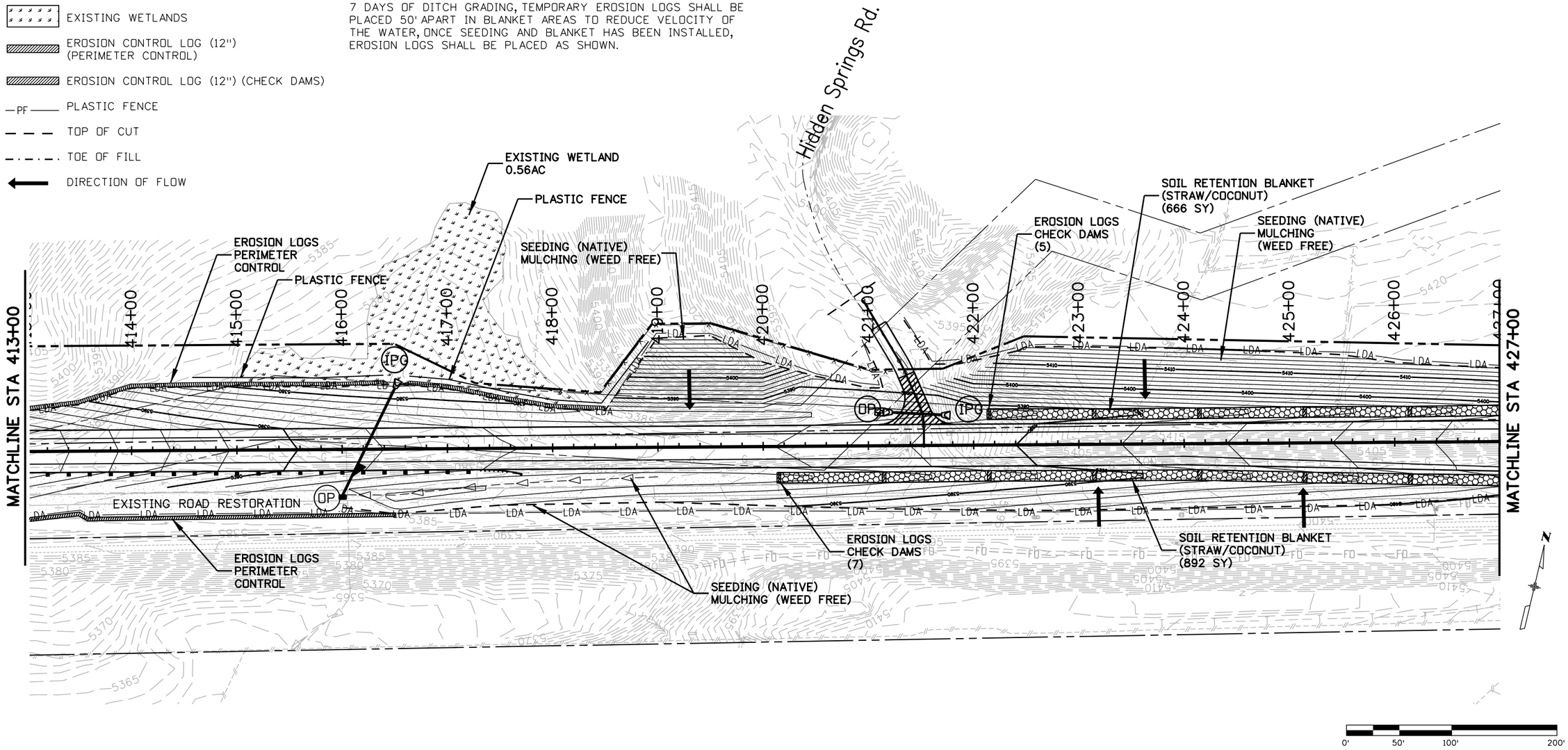
Print Date: 7/12/2013	Sheet Revisions	Colorado Department of Transportation	As Constructed
File Name: 17772HYDR_RemovalDetails.dgn	Date: / Comments / Init.	2424 North Townsend Avenue	No Revisions:
Horiz. Scale: 1:4 Vert. Scale:		Montrose, CO 81401	Revised:
Unit Information Unit Leader Initials	FOR PLANS JULY 2013	Phone: 972-249-5285 FAX: 970-249-6018	Void:
URS HARTWIG & Associates, Inc.		Region 3 RA	

BIG GULCH REMOVAL DETAILS			Project No./Code
Designer: H. REED	Structure Numbers		STA 092A-024
Detailer: H. REED			17772
Sheet Subset: Arch Culvert	Subset Sheets: AC03 of AC06		Sheet Number 128

EROSION CONTROL LEGEND

- IPG — STORM DRAIN INLET PROTECTION
- OP — OUTLET PROTECTION
- SEEDING (NATIVE) MULCHING (WEED FREE)
- SOIL RETENTION BLANKET (STRAW/COCONUT) >2% DITCHES
- EXISTING WETLANDS
- EROSION CONTROL LOG (12") (PERIMETER CONTROL)
- EROSION CONTROL LOG (12") (CHECK DAMS)
- —PF— PLASTIC FENCE
- TOP OF CUT
- TOE OF FILL
- DIRECTION OF FLOW
- CWO — CONCRETE WASHOUT (TBD)
- VTC — VEHICLE TRACKING CONTROL (TBD)
- STABILIZED CONSTRUCTION ENTRANCE (TBD)
- —LDA— LIMITS OF DISTURBANCE

NOTE:
IF SEEDING AND BLANKET PLACEMENT DOES NOT OCCUR WITHIN 7 DAYS OF DITCH GRADING, TEMPORARY EROSION LOGS SHALL BE PLACED 50' APART IN BLANKET AREAS TO REDUCE VELOCITY OF THE WATER, ONCE SEEDING AND BLANKET HAS BEEN INSTALLED, EROSION LOGS SHALL BE PLACED AS SHOWN.



File Path: Z:\Projects\URS\SH 92 PHASE TWO\LANDSCAPE_ENVIRONMENTAL\17772ErosionControlPLAN05.dgn

Print Date: 6/9/2013	Sheet Revisions		
File Name: 17772ErosionControlPLAN05.dgn	Date:	Comments	Init.
Horiz. Scale: 1:100 Vert. Scale:			
Unit Information Unit Leader Initials			
URS PKM DESIGN GROUP, INC.			

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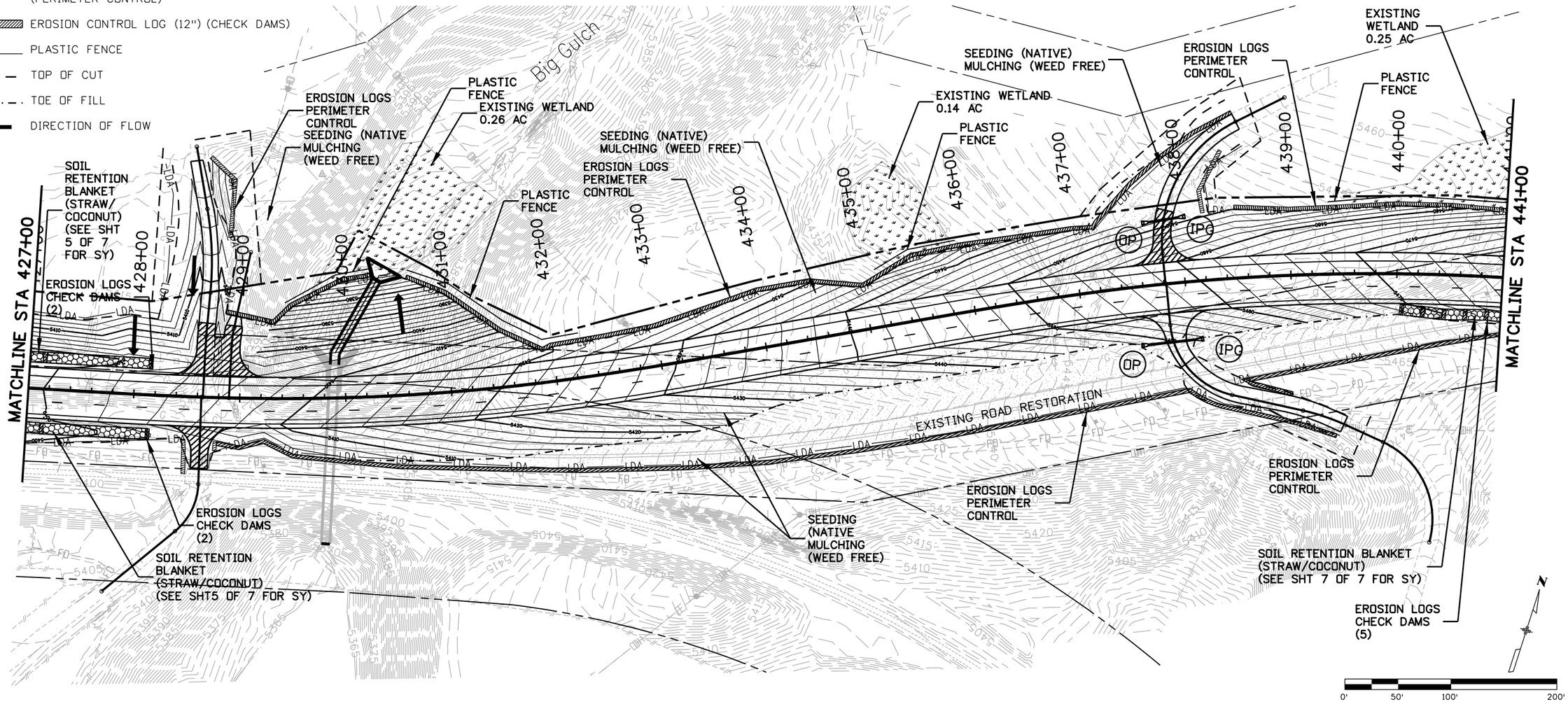
Colorado Department of Transportation
DEPARTMENT OF TRANSPORTATION
2424 North Townsend Avenue
Montrose, CO 81401
Phone: 972-249-5285 FAX: 970-249-6018
Region 3 RA

As Constructed	GRADING AND EROSION CONTROL PLANS			Project No./Code
No Revisions:	Designer: C. SCHRADER	Structure Numbers		STA 092A-024
Revised:	Detailer: C. FISHER			17772
Void:	Sheet Subset: EROSION	Subset Sheets: 05 of 07		Sheet Number 150

EROSION CONTROL LEGEND

- STORM DRAIN INLET PROTECTION (IPG)
- OUTLET PROTECTION (OP)
- SEEDING (NATIVE) MULCHING (WEED FREE)
- SOIL RETENTION BLANKET (STRAW/COCONUT) >2% DITCHES
- EXISTING WETLANDS
- EROSION CONTROL LOG (12") (PERIMETER CONTROL)
- EROSION CONTROL LOG (12") (CHECK DAMS)
- —PF— PLASTIC FENCE
- — — — TOP OF CUT
- — · — · — TOE OF FILL
- DIRECTION OF FLOW
- CWO CONCRETE WASHOUT (TBD)
- VTC VEHICLE TRACKING CONTROL (TBD)
- STABILIZED CONSTRUCTION ENTRANCE (TBD)
- —LDA— LIMITS OF DISTURBANCE

NOTE:
IF SEEDING AND BLANKET PLACEMENT DOES NOT OCCUR WITHIN 7 DAYS OF DITCH GRADING, TEMPORARY EROSION LOGS SHALL BE PLACED 50' APART IN BLANKET AREAS TO REDUCE VELOCITY OF THE WATER, ONCE SEEDING AND BLANKET HAS BEEN INSTALLED, EROSION LOGS SHALL BE PLACED AS SHOWN.



File Path: Z:\Projects\URS\SH 92 PHASE TWO\LANDSCAPE_ENVIRONMENTAL\17772ErosionControlPLAN06.dgn

Print Date: 6/9/2013			
File Name: 17772ErosionControlPLAN06.dgn			
Horiz. Scale: 1:100	Vert. Scale:		
Unit Information	Unit Leader Initials		
URS PKM DESIGN GROUP, INC.			

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
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2424 North Townsend Avenue
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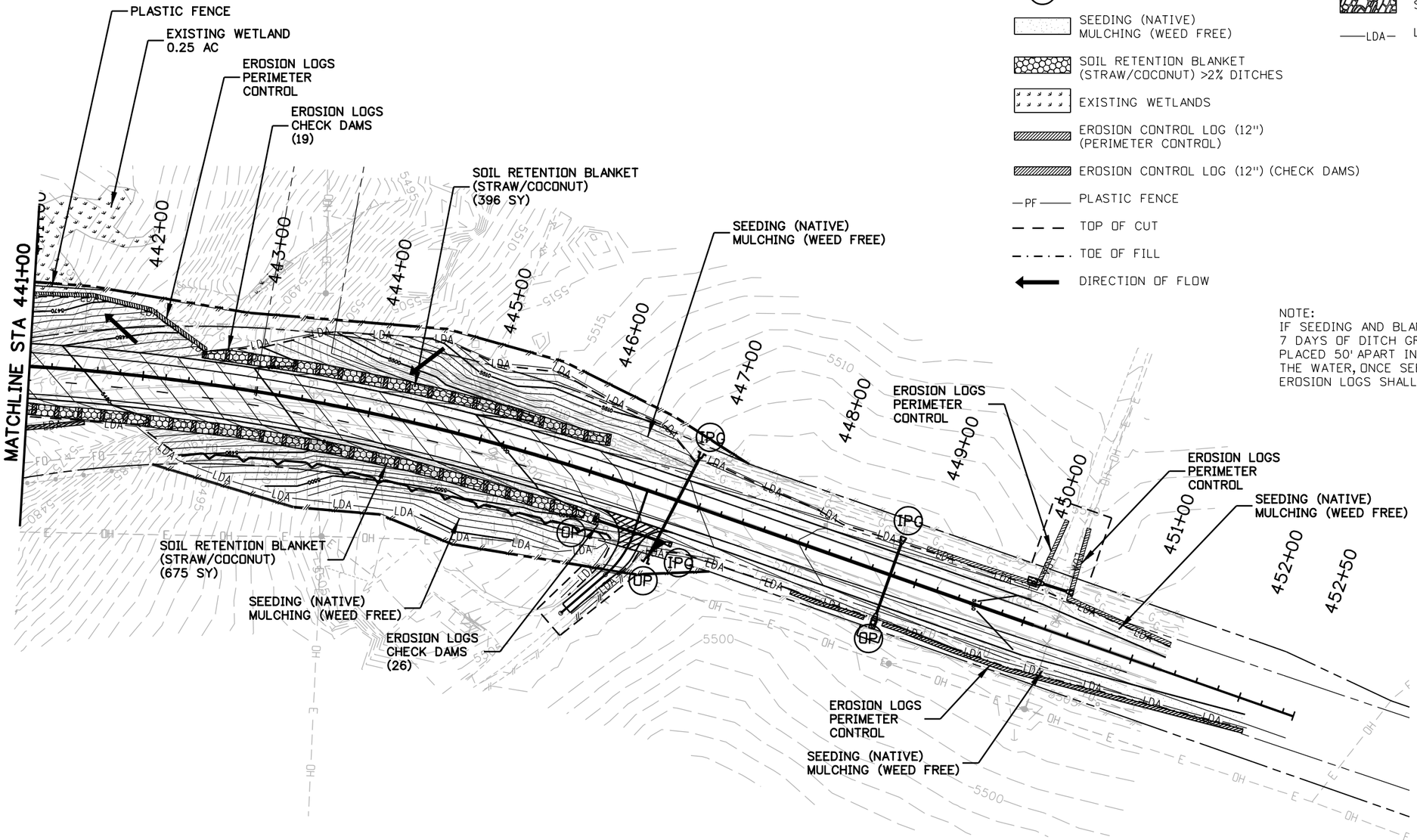
Region 3 RA

As Constructed				
No Revisions:	EROSION CONTROL PLANS			Project No./Code
Revised:	Designer: C. SCHRADER	Structure Numbers		STA 092A-024
Void:	Detailer: C. FISHER			17772
	Sheet Subset: EROSION	Subset Sheets:	06 of 07	Sheet Number 151

EROSION CONTROL LEGEND

- IPG — STORM DRAIN INLET PROTECTION
- OP — OUTLET PROTECTION
- SEEDING (NATIVE) MULCHING (WEED FREE)
- SOIL RETENTION BLANKET (STRAW/COCONUT) >2% DITCHES
- EXISTING WETLANDS
- EROSION CONTROL LOG (12") (PERIMETER CONTROL)
- EROSION CONTROL LOG (12") (CHECK DAMS)
- —PF— PLASTIC FENCE
- TOP OF CUT
- TOE OF FILL
- DIRECTION OF FLOW
- CWO — CONCRETE WASHOUT (TBD)
- VTC — VEHICLE TRACKING CONTROL (TBD)
- STABILIZED CONSTRUCTION ENTRANCE (TBD)
- —LDA— LIMITS OF DISTURBANCE

NOTE:
IF SEEDING AND BLANKET PLACEMENT DOES NOT OCCUR WITHIN 7 DAYS OF DITCH GRADING, TEMPORARY EROSION LOGS SHALL BE PLACED 50' APART IN BLANKET AREAS TO REDUCE VELOCITY OF THE WATER, ONCE SEEDING AND BLANKET HAS BEEN INSTALLED, EROSION LOGS SHALL BE PLACED AS SHOWN.



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Print Date: 6/10/2013	Sheet Revisions	Colorado Department of Transportation	As Constructed
File Name: 17772ErosionControlPLAN07.dgn	Date: / Comments / Init.	2424 North Townsend Avenue	No Revisions:
Horiz. Scale: 1:100 Vert. Scale:		Montrose, CO 81401	Revised:
Unit Information Unit Leader Initials		Phone: 972-249-5285 FAX: 970-249-6018	Void:
URS PKM DESIGN GROUP, INC.		Region 3 RA	

GRADING AND EROSION CONTROL PLANS			Project No./Code
			STA 092A-024
Designer: C. SCHRADER	Structure Numbers		17772
Detailer: C. FISHER			
Sheet Subset: EROSION	Subset Sheets: 07 of 07		Sheet Number 152

ADMINISTRATIVE CHARACTERIZATION

General Information

		Date of Evaluation:	7/25/2013
Site Name or ID:	STA 092A-024; 17772	Project Name:	SH 92 Stengel's Hill Reconstruction
404 or Other Permit Application #:	SPK-2013-628	Applicant Name:	CDOT R3
Evaluator Name(s):	Paula Durkin	Evaluator's professional position and organization:	CDOT Wetland Specialist, PWS #1225

Location Information:

Site Coordinates (Decimal Degrees, e.g., 38.85, -104.96):	38.47521, -107.49287	Geographic Datum Used (NAD 83):	NAD 83
		Elevation:	5376'-5380'
Location Information:	SH 92 at MP 14.7 in Delta County (Wetland #1)		
Associated stream/water body name:	Unnamed Creek	Stream Order:	1
USGS Quadrangle Map:	Lazear 7.5' topo	Map Scale: (Circle one)	✓ 1:24,000 1:100,000 Other
Sub basin Name (8 digit HUC):	North Fork Gunnison Watershed (14020004)	Wetland Ownership:	BLM and CDOT

Project Information:

This evaluation is being performed at: *(Check applicable box)*
- [✓] *Project Wetland*
- [ ] *Mitigation Site*

Purpose of Evaluation (check all applicable):
- [✓] *Potentially Impacted Wetlands*
- [ ] *Mitigation; Pre-construction*
- [ ] *Mitigation; Post-construction*
- [ ] *Monitoring*
- [ ] *Other (Describe)*

Intent of Project: *(Check all applicable)* [ ] Restoration [ ] Enhancement [ ] Creation

Total Size of Wetland Involved: (Record Area, Check and Describe Measurement Method Used)	ac.	[✓] Measured: 1.04 ac		
		[ ] Estimated:		
Assessment Area (AA) Size (Record Area, check appropriate box. Additional spaces are used to record acreage when more than one AA is included in a single assessment)	ac.	[✓] Measured:	5.47 ac.	0.41 mi perimeter
		[ ] Estimated:		
Characteristics or Method used for AA boundary determination:	Combined analysis of NAIP (2011) aerial imagery available on CDOT's GIS system, Google Earth imagery with scanned NWI raster data, plus review of USGS 7.5' topo map for the area, driving the adjacent road to observe conditions upstream, and ground-truthing/walking the site, and observing conditions immediately downstream.			

Notes:	This wetland site and AA, except for the impounded area south of SH 92, is not identified on the NWI maps or the CPW/CNHP Colorado Wetlands Mapping Inventory.

ECOLOGICAL DESCRIPTION 1

Special Concerns

Check all that apply

- ☐ Organic soils including Histosols or Histic Epipedons are present in the AA (i.e., AA includes core fen habitat).
- ☐ Project will directly impact organic soil portions of the AA including areas possessing either Histosol soils or histic epipedons.
- ☐ Organic soils are known to occur anywhere within the contiguous wetland of which the AA is part.
- ☐ The wetland is a habitat oasis in an otherwise dry or urbanized landscape?
- ☐ Federally threatened or endangered species are **KNOWN** to occur in the AA? List Below.
- ☐ Federally threatened or endangered species are **SUSPECTED** to occur in the AA?
- ☐ Species of concern according to the Colorado Natural Heritage (CNHP) are known to occur in the AA?
- ☐ The site is located within a potential conservation area or element occurrence buffer area as determined by CNHP?
- ☐ Other special concerns (please describe)

No Special Concerns have been identified. T&E foot surveys were completed for several ESA species that yielded negative results. There will be no depletions to CO River fish.

HYDROGEOMORPHIC SETTING

- ☐ AA wetland maintains its fundamental natural hydrogeomorphic characteristics
- ☑ AA wetland has been subject to change in HGM classes as a result of anthropogenic modification

If the above is checked, please describe the original wetland type if discernable using the table below.

- ☐ AA wetland was created from an upland setting.

Current Conditions

Describe the hydrogeomorphic setting of the wetland by circling all conditions that apply.

HGM Setting

Water source	(Surface flow) (Groundwater) Precipitation Unknown
Hydrodynamics	(Unidirectional) Vertical Bi-directional
Wetland Gradient	(0 - 2%) 2-4% 4-10% >10%
# Surface Inlets	Over-bank 0 (1) 2 3 >3
# Surface Outlets	0 (1) 2 3 >3
Geomorphic Setting (Narrative Description. Include approx. stream order for riverine)	This small unnamed creek originates from a groundwater source north of SH 92 at 5500' elevation on sparsely vegetated BLM land within the Shale Deserts and Sedimentary Basins Ecoregion of the Colorado Plateau. It is a small basin (stream order 1) within the North Fork Gunnison Watershed and is a direct tributary to the North Fork of the Gunnison River. Total stream length of the creek is 1.32 miles.
HGM class	Riverine (Slope) Depressional Lacustrine

Historical Conditions

Previous Wetland Typology

Water source	Surface flow (Groundwater) Precipitation Unknown
Hydrodynamics	(Unidirectional) Vertical
Geomorphic Setting (Narrative Description)	Historic aerial photography from Google Earth dates back to 1993 and the USGS topo dates back to 1955. Since 1955 Hidden Springs Rd and another dirt road was constructed across the creek north of the AA. Sometime between 1993 and 2005 this area began populating and the creek likely receives runoff from those properties contributing to possible eutrophication of the waters as indicated by cattails and the excavation of a stockpond just above Hidden Springs Rd where it crosses the creek.
Previous HGM Class	Riverine (Slope) Depressional Lacustrine

Notes (include information on the AA's HGM subclass and regional subclass):

ECOLOGICAL DESCRIPTION 2

Vegetation Habitat Description

US FWS habitat classification according as reported in Cowardin et al. (1979).

System	Subsystem	Class	Subclass	Water Regime	Other Modifiers	% AA
Palustrine	Palustrine	Emergent (EM)	Rooted vascular	Seasonally flooded - C	alkaline (i); diked/impounded (h); excavated (x)	90% (estimate)
Lacustrine	Littoral; Limnoral	Rock Bot. (RB) Uncon Bottom(UB) Aquatic Bed(AB) Rocky Shore(RS) Uncon Shore(US) Emergent(EM) Shrub-scrub(SS) Forested (FO)	Floating vascular; Rooted vascular; Algal; Persistent; Non-Persistent; Broad-leaved deciduous; Needle-leaved evergreen; Cobble - gravel; Sand; Mud; Organic	**Examples** Temporarily flooded(A); Saturated(B); Seasonally flooded(C); Seas.-flood./sat.(E); Semi-Perm. flooded(F); Intermittently exposed(G); Artificially flooded(K); Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)	Hypersaline(7) ; Eusaline(8); Mixosaline(9); Fresh(0); Acid(a); Circumneutral(c); Alkaline/calcareous(i); Organic(g); Mineral(n); Beaver(b); Partially Drained/ditched(d); Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)	
Palustrine	Palustrine					
Riverine	Lower perennial; Upper perennial; Intermittent					

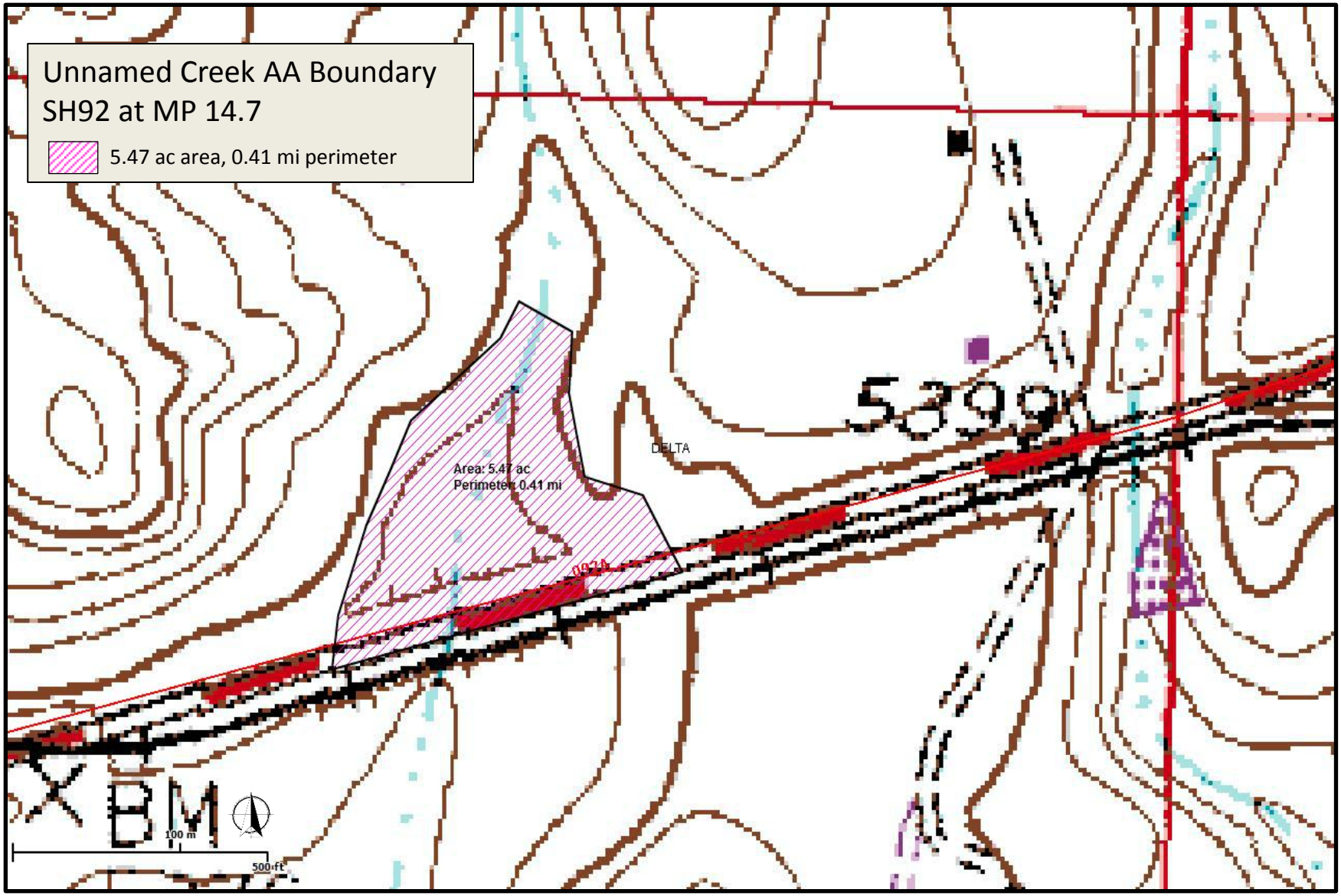
Site Map

Scale: 1 sq. =

Draw a sketch map of the site including relevant portions of the wetland, AA boundary, structures, habitat classes, and other significant features.

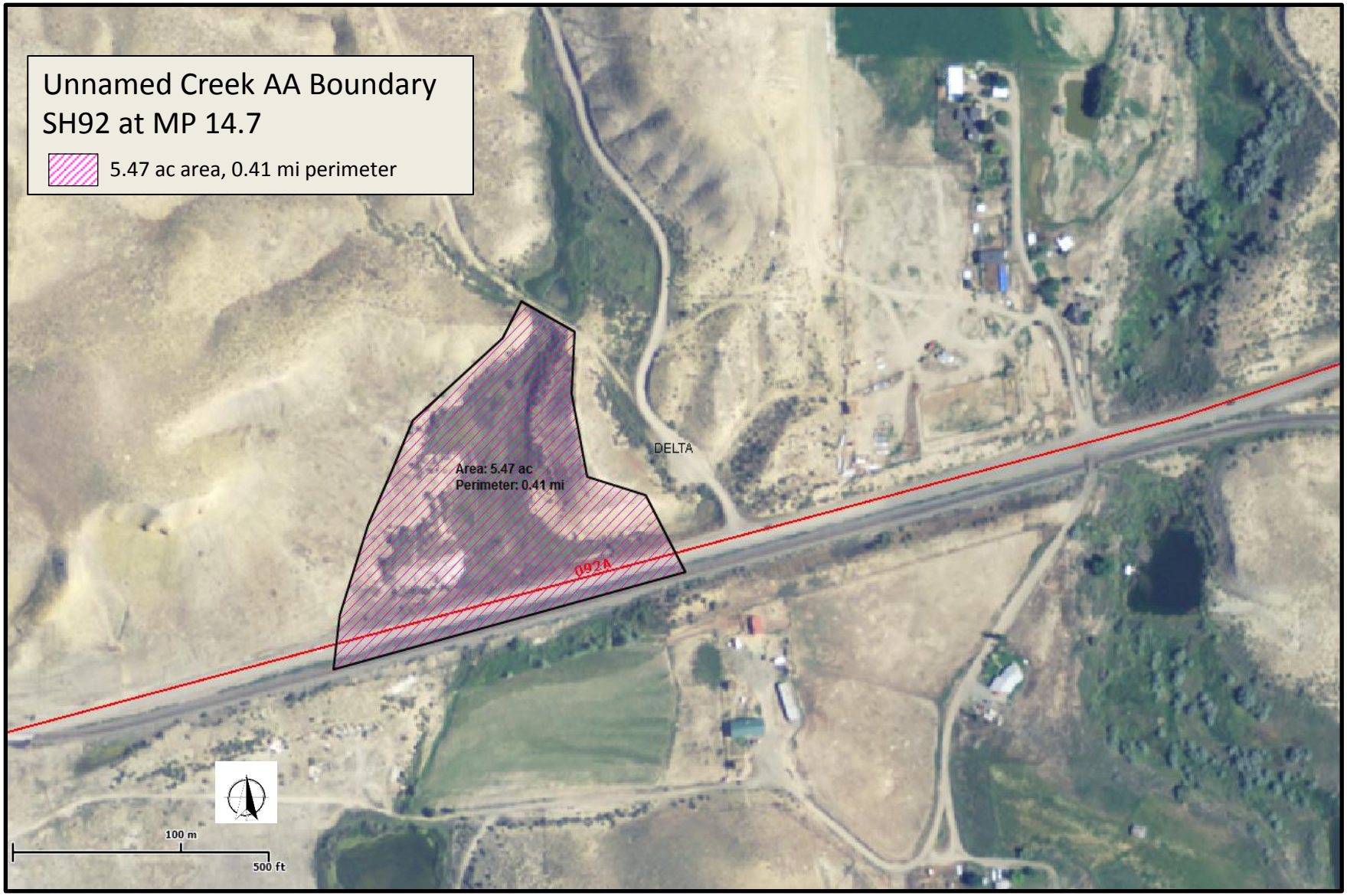
See attached.

Unnamed Creek Ecological Description 2 Site Map



Lazear 7.5' Topographic Quadrangle (1955)

Unnamed Creek Ecological Description 2 Aerial Photo



Variable 1: Habitat Connectivity

The Habitat Connectivity Variable is described by two sub-variables – Neighboring Wetland and Riparian Habitat Loss and Barriers to Migration and Dispersal. These sub-variables were treated as independent variables in FACWet Version 2.0. The merging of these variables makes their structure more consistent with that of other composite variables in FACWet. The new variable configuration also makes this landscape variable more accurately reflect the interactions amongst aquatic habitats in Colorado's agricultural and urbanized landscapes, which have a naturally low density of wetlands. The two Habitat Connectivity Sub-variables are scored in exactly the same manner as their FACWet 2.0 counterparts, as described below. The Habitat Connectivity Variable score is simply the arithmetic average of the two sub-variable scores which is entered on the second page of the Variable 1 data form. If there is little or no wetland or riparian habitat in the Habitat Connectivity Envelope (defined below), then Sub-variable 1.1 is not scored.

SV 1.1 - Neighboring Wetland and Riparian Habitat Loss

(Do not score if few or no wetlands naturally exist in the HCE)

This sub-variable is a measure of how isolated from other naturally-occurring wetlands or riparian habitat the AA has become as the result of habitat destruction. To score this sub-variable, estimate the percent of naturally-occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within the 500-meter-wide belt surrounding the AA. This zone is called the Habitat Connectivity Envelope (HCE). In most cases the evaluator must use best professional judgment to estimate the amount of natural wetland loss. Historical photographs, National Wetland Inventory (NWI) maps, hydric soil maps can be helpful in making these determinations. Floodplain maps are especially valuable in river-dominated regions, such as the Front Range urban corridor. Evaluation of landforms and habitat patterns in the context of perceivable land use change is used to steer estimates of the amount of wetland loss within the HCE.

Rules for Scoring:

1. On the aerial photo, create a 500 m perimeter around the AA.
2. The area within this perimeter is the **Habitat Connectivity Envelope (HCE)**.
3. Within the HCE, outline the current extent of naturally occurring wetland and riparian habitat. Do not include habitats such as excavated ponds or reservoir induced fringe wetlands.
4. Outline the historical extent of wetland and riparian habitats (i.e., existing natural wetlands plus those that have been destroyed).

- Use your knowledge of the history of the area and evident land use change to identify where habitat losses have occurred. Additional research can be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, soil maps, etc.

5. Calculate the area of existing and historical wetlands. Divide the area of existing wetland by the total amount of existing and historical wetland and riparian habitat, and determine the variable score using the guidelines below. Enter sub-variable score at the bottom of p.2 of the Habitat Connectivity data form.

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	***A*** *Reference Standard*	Wetland losses are absent or negligible or there is no evidence to suggest the native landscape within the HCE historically contained other wetland habitats
<0.9 - 0.8	***B*** *Highly Functioning*	More than 80% of historical wetland habitat area within the HCE is still present (less than 20% of habitat area lost).
<0.8 - 0.7	***C*** *Functioning*	80 to 60% of historical wetland habitat area within the HCE is still present (20% to 40% of habitat area lost).
<0.7 - 0.6	***D*** *Functioning Impaired*	Less than 60 to 25% of historical wetland habitat area within the HCE is still present (more than 40 to 75% of habitat area lost).
<0.6	***F*** *Non-functioning*	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).

Notes: Losses in the HCE aren't apparent, however, the character has probably changed. Area of historical wetlands in HCE=1.19 ac/1.04=0.87 ac

Variable 1: Habitat Connectivity p. 2

SV 1.2: Migration/Dispersal Barriers

This sub-variable is intended to rate the degree to which the AA has become isolated from existing neighboring wetland and riparian habitat by artificial barriers that inhibit migration or dispersal of organisms. On the aerial photograph, identify the man-made barriers within the HCE that intercede between the AA and surrounding wetlands and riparian areas, and identify them by type on the stressor list. Score this variable based on the barriers' impermeability to migration and dispersal and the amount of surrounding wetland/riparian habitat they affect.

Rules for Scoring:

1. On the aerial photo, outline **all** existing wetland and riparian habitat areas within the HCE. This includes naturally occurring habitats, as well as those purposefully created or induced by land use change.

2. Identify artificial barriers to dispersal and migration of organisms within the HCE that intercede between the AA and surrounding habitats. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.

3. Considering the composite effect of all of identified barriers to migration and dispersal (i.e., stressors), assign an overall variable score using the scoring guidelines.

Stressors = artificial barriers

✔	Stressors	Comments/description
✔	Major Highway	SH 92 bisects wetland on the south side.
	Secondary Highway	
✔	Tertiary Roadway	Hidden Springs Road crosses the wetland on the north side.
✔	Railroad	UPRR bisects AA immediately south of SH 92.
	Bike Path	
	Urban Development	
	Agricultural Development	
	Artificial Water Body	
✔	Fence	
	Ditch or Aqueduct	
✔	Aquatic Organism Barriers	Inlets and outlets are culverted.

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	***A*** *Reference Standard*	No appreciable barriers exist between the AA and other wetland and riparian habitats in the HCE; or there are no other wetland and riparian areas in the HCE.
<0.9 - 0.8	***B*** *Highly Functioning*	Barriers impeding migration/dispersal between the AA and up to 33% of surrounding wetland/riparian habitat highly permeable and easily passed by most organisms. Examples could include gravel roads, minor levees, ditches or barbed-wire fences. More significant barriers (see "functioning category below) could affect migration to up to 10% of surrounding wetland/riparian habitat.
<0.8 - 0.7	***C*** *Functioning*	Barriers to migration and dispersal retard the ability of many organisms/propagules to pass between the AA and up to 66% of wetland/riparian habitat. Passage of organisms and propagules through such barriers is still possible, but it may be constrained to certain times of day, be slow, dangerous or require additional travel. Busy two-lane roads, culverted areas, small to medium artificial water bodies or small earthen dams would commonly rate a score in this range. More significant barriers (see "functioning impaired" category below) could affect migration to up to 10% of surrounding wetland/riparian habitat.
<0.7 - 0.6	***D*** *Functioning Impaired*	Barriers to migration and dispersal preclude the passage of some types of organisms/propagules between the AA and up to 66% of surrounding wetland/riparian habitat. Travel of those animals which can potentially negotiate the barrier are strongly restricted and may include a high chance of mortality. Up to 33% of surrounding wetland/riparian habitat could be functionally isolated from the AA.
<0.6	***F*** *Non-functioning*	AA is essentially isolated from surrounding wetland/riparian habitat by impermeable migration and dispersal barriers. An interstate highway or concrete-lined water conveyance canal are examples of barriers which would generally create functional isolation between the AA and wetland/riparian habitat in the HCE.

SV 1.1 Score	0.80
SV 1.2 Score	0.80

Add SV 1.1 and 1.2 scores and divide by two to calculate variable score

Variable 1 Score 0.80

Variable 2: Contributing Area (p. 2)

SV 2.3 - Average Buffer Width

Record measured buffer widths in the spaces below and average.

Line #	1	2	3	4	5	6	7	8	Avg. Buffer Width (m)
Buffer Width (m)	29.2	42.3	31.5	21.5	42.9	49.9	52.8	64.2	42

0.75

SV 2.3 - Average Buffer Width Score

Subvariable Score	Condition Grade	Buffer Width Scoring Guidelines
1.0 - 0.9	*Reference Standard*	Average Buffer width is 190-250m
<0.9 - 0.8	*Highly Functioning*	Average Buffer width is 101-189m
<0.8 - 0.7	*Functioning*	Average Buffer width is 31-100m
<0.7 - 0.6	*Functioning Impaired*	Average Buffer width is 6-30m
<0.6	*Non-functioning*	Average Buffer width is 0-5m

SV 2.4 - Surrounding Land Use

SV 2.4 - Surrounding Land Use Score

Catalog and characterize land use changes in the surrounding landscape and score.

Stressors = Land Use Changes

✓	Stressors	Comments/description
	Industrial/commercial	
	Urban	
✓	Residential	light
✓	Rural	BLM land
	Dryland Farming	
	Intensive Agriculture	
	Orchards or Nurseries	
	Livestock Grazing	
✓	Transportation Corridor	highway
	Urban Parklands	
✓	Dams/impoundments	highway and railroad essentially act as a dam
	Artificial Water body	
	Physical Resource Extraction	
	Biological Resource Extraction	
✓	Other	railroad

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	***A*** *Reference Standard*	No appreciable land use change has been imposed Surrounding Landscape.
<0.9 - 0.8	***B*** *Highly Functioning*	Some land use change has occurred in the Surrounding Landscape, but changes have minimal effect on the the landscape's capacity to support characteristic aquatic functioning, either because land use is not intensive, for example haying, light grazing, or low intensity silviculture, or more substantial changes occur in approximately less than 10% of the area.
<0.8 - 0.7	***C*** *Functioning*	Surrounding Landscape has been subjected to a marked shift in land use, however, the land retains much of its capacity to support natural wetland function and it is not an overt source of pollutants or sediment. Moderate-intensity land uses such as dry-land farming, urban "green" corridors, or moderate cattle grazing would commonly be placed within this scoring range.
<0.7 - 0.6	***D*** *Functioning Impaired*	Land use changes within the Surrounding Landscape has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surfaces; considerable in-flow urban runoff or fertilizer-rich waters common. Supportive capacity of the land has been greatly diminished but not totally extinguished. Intensively logged areas, low-density urban developments, some urban parklands and many cropping
<0.6	***F*** *Non-functioning*	The Surrounding Landscape is essentially comletely developed or is otherwise a cause of severe ecological stress on wetland habitats. Commercial developments or highly urban landscapes generally rate a score of less than 0.6.

	Buffer Score (Lowest score)		Surrounding Land Use				
(	0.7	+	0.75	) ÷	2	= **Variable 2 Score**	0.73

Variable 2: Contributing Area (p. 2)

SV 2.3 - Average Buffer Width

Record measured buffer widths in the spaces below and average.

Line #	1	2	3	4	5	6	7	8	Avg. Buffer Width (m)
Buffer Width (m)	29.2	42.3	31.5	21.5	42.9	49.9	52.8	64.2	42

0.75

SV 2.3 - Average Buffer Width Score

Subvariable Score	Condition Grade	Buffer Width Scoring Guidelines
1.0 - 0.9	*Reference Standard*	Average Buffer width is 190-250m
<0.9 - 0.8	*Highly Functioning*	Average Buffer width is 101-189m
<0.8 - 0.7	*Functioning*	Average Buffer width is 31-100m
<0.7 - 0.6	*Functioning Impaired*	Average Buffer width is 6-30m
<0.6	*Non-functioning*	Average Buffer width is 0-5m

SV 2.4 - Surrounding Land Use

SV 2.4 - Surrounding Land Use Score

Catalog and characterize land use changes in the surrounding landscape and score.

Stressors = Land Use Changes

✓	Stressors	Comments/description
	Industrial/commercial	
	Urban	
✓	Residential	light
✓	Rural	BLM land
	Dryland Farming	
	Intensive Agriculture	
	Orchards or Nurseries	
	Livestock Grazing	
✓	Transportation Corridor	highway
	Urban Parklands	
✓	Dams/impoundments	highway and railroad essentially act as a dam
	Artificial Water body	
	Physical Resource Extraction	
	Biological Resource Extraction	
✓	Other	railroad

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	***A*** *Reference Standard*	No appreciable land use change has been imposed Surrounding Landscape.
<0.9 - 0.8	***B*** *Highly Functioning*	Some land use change has occurred in the Surrounding Landscape, but changes have minimal effect on the the landscape's capacity to support characteristic aquatic functioning, either because land use is not intensive, for example haying, light grazing, or low intensity silviculture, or more substantial changes occur in approximately less than 10% of the area.
<0.8 - 0.7	***C*** *Functioning*	Surrounding Landscape has been subjected to a marked shift in land use, however, the land retains much of its capacity to support natural wetland function and it is not an overt source of pollutants or sediment. Moderate-intensity land uses such as dry-land farming, urban "green" corridors, or moderate cattle grazing would commonly be placed within this scoring range.
<0.7 - 0.6	***D*** *Functioning Impaired*	Land use changes within the Surrounding Landscape has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surfaces; considerable in-flow urban runoff or fertilizer-rich waters common. Supportive capacity of the land has been greatly diminished but not totally extinguished. Intensively logged areas, low-density urban developments, some urban parklands and many cropping
<0.6	***F*** *Non-functioning*	The Surrounding Landscape is essentially comletely developed or is otherwise a cause of severe ecological stress on wetland habitats. Commercial developments or highly urban landscapes generally rate a score of less than 0.6.

	Buffer Score (Lowest score)		Surrounding Land Use				
(	0.7	+	0.75	) ÷	2	= **Variable 2 Score**	0.73

Variable 3: Water Source

This variable is concerned with ***up-gradient*** *hydrologic connectivity. It is a measure of impacts to the AA's water source, including the quantity and timing of water delivery, and the ability of source water to perform work such as sediment transport, erosion, soil pore flushing, etc. To score this variable, identify stressors that alter the source of water to the AA, and record their presence on the stressor list. Stressors can impact water source by depletion, augmentation, or alteration of inflow timing or hydrodynamics. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 7.*

Scoring rules:

1. Use the stressor list and knowledge of the watershed to catalog type-specific impairments of the AA's water source. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.

2. Considering the composite effect of stressors on the water source, rate the condition of this variable with the aid of the scoring guidelines.

✔	Stressors	Comments/description
	Ditches or Drains (tile, etc.)	
	Dams	
	Diversions	
	Groundwater pumping	
	Draw-downs	
✔	Culverts or Constrictions	two
	Point Source (urban, ind., ag.)	
✔	Non-point Source	suspected leaching field
	Increased Drainage Area	
	Storm Drain/Urban Runoff	
	Impermeable Surface Runoff	
	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
	Transbasin Diversion	
	Actively Managed Hydrology	

Variable Score	Condition Grade	Depletion	Augmentation
1.0 - 0.9	***A*** *Reference Standard*	Unnatural drawdown events minor, rare or non-existent, very slight uniform depletion, or trivial alteration of hydrodynamics.	Unnatural high-water events minor, rare or non-existent, slight uniform increase in amount of inflow, or trivial alteration of hydrodynamics.
<0.9 - 0.8	***B*** *Highly Functioning*	Unnatural drawdown events occasional, short duration and/or mild; or uniform depletion up to 20%; or mild to moderate reduction of peak flows or capacity of water to perform work.	Occasional unnatural high-water events, short in duration and/or mild in intensity; or uniform augmentation up to 20%; or mild to moderate increase of peak flows or capacity of water to perform work.
<0.8 - 0.7	***C*** *Functioning*	Unnatural drawdown events common and of mild to moderate intensity and/or duration; or uniform depletion up to 50%; or moderate to substantial reduction of peak flows or capacity of water to perform work.	Common occurrence of unnatural high-water events, of a mild to moderate intensity and/or duration; or uniform augmentation up to 50%; or moderate to substantial increase of peak flows or capacity of water to perform work.
<0.7 - 0.6	***D*** *Functioning Impaired*	Unnatural drawdown events occur frequently with a moderate to high intensity and/or duration; or uniform depletion up to 75%; or substantial reduction of peak flows or capacity of water to perform work. **Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.**	Common occurrence of unnatural high-water events, some of which may be severe in nature or exist for a substantial portion of the growing season; or uniform augmentation more than 50% or capacity of water to perform work. **Wetlands with actively managed or wholly artificial hydrology will usually score in this range or**
<0.6	***F*** *Non-functioning*	Water source diminished enough to threaten or extinguish wetland hydrology in the AA.	Frequency, duration or magnitude of unnaturally high-water great enough to change the fundamental characteristics of the wetland.

Variable 3 Score 0.9

Variable 4: Water Distribution

This variable is concerned with hydrologic connectivity ***within*** *the AA. It is a measure of alteration to the spatial distribution of surface and groundwater within the AA. These alterations are manifested as local changes to the hydrograph and generally result from geomorphic modifications within the AA. To score this variable, identify stressors within the AA that alter flow patterns and impact the hydrograph of the AA, including localized increases or decreases to the depth or duration of the water table or surface water.*

Because the wetland's ability to distribute water in a characteristic fashion is fundamentally dependent on the condition of its water source, ***in most cases the Water Source variable score will define the upper limit Water Distribution score****. For example, if the Water Source variable is rated at 0.85, the Water Distribution score will usually have the potential to attain a maximum score of 0.85. Additional stressors within or outside the lower end of the AA effecting water distribution (e.g., ditches and levees) will reduce the score from the maximum value.*

Scoring rules:

1. Identify impacts to the natural distribution of water throughout the AA and catalog them in the stressor table.

2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. In most cases, the Water Source variable score will set the upper limit for the Water Distribution score.

✔	Stressors	Comments/description
	Alteration of Water Source	
	Ditches	
	Ponding/Impoundment	
✔	Culverts	
✔	Road Grades	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Enlarged Channel	
	Artificial Banks/Shoreline	
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
	Sediment/Fill Accumulation	

Variable Score	Condition Grade	Non-riverine	Riverine
1.0 - 0.9	***A*** *Reference Standard*	Little or no alteration has been made to the way in which water is distributed throughout the wetland. AA maintains a natural hydrologic regime.	Natural active floodplain areas flood on a normal recurrence interval. No evidence of alteration of flooding and subirrigation duration and intensity.
<0.9 - 0.8	***B*** *Highly Functioning*	Less than 10% of the AA is affected by *in situ* hydrologic alteration; or more widespread impacts result in less than a 2 in. (5 cm) change in mean growing season water table elevation.	Channel-adjacent areas have occasional unnatural periods of drying or flooding; or uniform shift in the hydrograph less than typical root depth.
<0.8 - 0.7	***C*** *Functioning*	Between 10 and 33% of the AA is affected by *in situ* hydrologic alteration; or more widespread impacts result in a 4 in. (5 cm) or less change in mean growing season water table elevation.	In channel-adjacent area, periods of drying or flooding are common; or uniform shift in the hydrograph near root depth.
<0.7 - 0.6	***D*** *Functioning Impaired*	33 to 66% of the AA is affected by *in situ* hydrologic alteration; or more widespread impacts result in a 6 in. (15 cm) or less change in mean growing season water table elevation. Water table behavior must still meet jurisdictional criteria to merit this rating.	Adjacent to the channel, unnatural periods of drying or flooding are the norm; or uniform shift in the hydrograph greater than root depth.
<0.6	***F*** *Non-functioning*	More than 66% of the AA is affected by hydrologic alteration which changes the fundamental functioning of the wetland system, generally exhibited as a conversion to upland or deep water habitat.	Historical active floodplain areas are almost never wetted from overbank flooding, and/or groundwater infiltration is effectively cut off.

Variable 4 Score 0.8

Variable 5: Water Outflow

This variable is concerned with ***down-gradient*** *hydrologic connectivity and the flow of water and water-borne materials and energy out of the AA. In particular it illustrates the degree to which the AA can support the functioning of down-gradient habitats. It is a measure of impacts that affect the hydrologic outflow of water including the passage of water through its normal low- and high-flow surface outlets, infiltration/groundwater recharge, and the energetic characteristics of water delivered to dependent habitats. In some cases, alteration of evapotranspiration rates may be significant enough of a factor to consider in scoring. Score this variable by identifying stressors that impact the means by which water is exported from the AA. To evaluate this variable focus on how water, energy and associated materials are exported out of the AA and their ability it support down-gradient habitats in a manner consistent with their HGM (regional) subclass.*

Because the wetland's ability to export water and materials in a characteristic fashion is to a very large degree dependent the condition of its water source, as with the Water Distribution variable, ***in most cases the Water Source variable score will define the upper limit Water Outflow score****.*

Scoring rules:

1. Identify impacts to the natural outflow of water from the AA and catalog them in the stressor table.

2.Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. Take in to account the cumulative effect of stressors on the wetland's ability to export water and water-borne materials. In most cases the Water Source variable will set the upper limit for the Water Outflow score.

✔	Stressors	Comments/description
	Alteration of Water Source	
	Ditches	
	Dikes/Levees	
✔	Road Grades	
	Culverts	
	Diversions	
✔	Constrictions.75	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Artificial Stream Banks	
	Weirs	
	Confined Bridge Openings	

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	***A*** *Reference Standard*	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.
<0.9 - 0.8	***B*** *Highly Functioning*	High- or low-water outflows are mildly to moderately affected, but at intermediate ("normal") levels flow continues essentially unaltered in quantity or character.
<0.8 - 0.7	***C*** *Functioning*	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics moderately affected.
<0.7 - 0.6	***D*** *Functioning Impaired*	Outflow at all stages is moderately to highly impaired resulting in persistent flooding of portions of the AA or unnatural drainage; or outflow hydrodynamics severely disrupted.
<0.6	***F*** *Non-functioning*	The natural outflow regime is profoundly impaired. Down-gradient hydrologic connection severed or nearly so. Alterations may cause widespread unnatural persistent flooding or dewatering of the wetland system.

Variable 5 Score 0.75

Variable 6: Geomorphology

This variable is a measure of the degree to which the geomorphic setting has been altered within the AA. Changes to the surface configuration and natural topography constitute stressors. Such stressors may be observed in the form of fill, excavation, dikes, sedimentation due to absence of flushing floods, etc. In riverine systems, geomorphic changes to the stream channel should be considered if the channel is within the AA (i.e, small is size). Alterations may involve the bed and bank (substrate embeddedness or morphological changes), stream instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland surface hydrology and water relations with vegetation. Geomorphic alterations can also directly affect soil properties, such as near-surface texture, and the wetland chemical environment such as the redox state or nutrient composition in the rooting zone. In rating this variable, ***do not*** *include these resultant effects of geomorphic change; rather focus on the physical impacts* ***within the footprint*** *of the alteration* ***within the AA*** *– For example, the width and depth of a ditch or the size of a levee* ***within the AA*** *would describe the extent of the stressors. The secondary effects of geomorphic change are addressed by other variables. All alterations to geomorphology should be evaluated including small-scale impacts such as pugging, hoof sheer, and sedimentation which can be significant but not immediately obvious.*

Scoring Rules:

1. Identify impacts to geomorphological setting and topography within the AA and record them on the stressor checklist.
2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines.

✔		Stressors	Comments
	General	Dredging/Excavation/Mining	
✔		Fill, including dikes, road grades, etc	
		Grading	
		Compaction	
		Plowing/Disking	
		Excessive Sedimentation	
		Dumping	
		Hoof Shear/Pugging	
		Aggregate or Mineral Mining	
		Sand Accumulation	
	Channels Only	Channel Instability/Over Widening	
		Excessive Bank Erosion	
		Channelization	
		Reconfigured Stream Channels	
		Artificial Banks/Shoreline	
		Beaver Dam Removal	
		Substrate Embeddedness	
		Lack or Excess of Woody Debris	

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	***A*** *Reference Standard*	Topography essentially unaltered from the natural state, or alterations appear to have a minimal effect on wetland functioning and condition. Patch or microtopographic complexity may be slightly altered, but native plant communities are still supported.
<0.9 - 0.8	***B*** *Highly Functioning*	Alterations to topography result in small but detectable changes to habitat conditions in some or all of the AA; or more severe impacts exist but affect less than 10% of the AA.
<0.8 - 0.7	***C*** *Functioning*	Changes to AA topography may be pervasive but generally mild to moderate in severity. May include patches of more significant habitat alteration; or more severe alterations affect up to 20 % of the AA.
<0.7 - 0.6	***D*** *Functioning Impaired*	At least one important surface type or landform has been eliminated or created; microtopography has been strongly impacted throughout most or all of the AA; or more severe alterations affect up to 50% of the AA. Evidence that widespread diminishment or alteration of native plant community exist due to physical habitat alterations. Most incidentally created wetland habitat such as that created by roadside ditches and the like would score in this range or lower.
<0.6	***F*** *Non-functioning*	Pervasive geomorphic alterations have caused a fundamental change in site character and functioning, commonly resulting in a conversion to upland or deepwater habitat.

Variable 6 Score 0.8

Variable 7: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants, water and soil characteristics. The origin of pollutants may be within or outside the AA. Score this variable by listing indicators of chemical stress in the AA. Consider point source and non-point sources of pollution, as well as mechanical or hydrologic changes that alter the chemical environment. Because water quality frequently cannot be inferred directly, the presence of stressors is often identified by the presence of indirect indicators. Five sub-variables are used to describe the Water and Soil Chemical Environment: Nutrient Enrichment/Eutrophication/Oxygen; Sedimentation/Turbidity; Toxic Contamination/pH; Temperature; and Soil Chemistry and Redox Potential. Utilization of web-based data mining tools is highly recommended to help inform and support variable scores.

Scoring rules:

1. Stressors are grouped into sub-variables which have a similar signature or set of causes.
2. Use the indicator list to identify each stressor impacting the chemical environment of the AA.
3. For each sub-variable, determine its score using the scoring guideline table provided on the second page of the scoring sheet. Scoring sub-variables is carried out in exactly the same way as normal variable scoring.
   -If the AA is part of a water body that is recognized as impaired or recommended for TMDL development for one of the factors, then score that sub-variable 0.65 or lower.
4. Transcribe sub-variable scores to the following variable scoring page and compute the sum.
5. The lowest sub-variable score sets the letter grade range. The composite of sub-variables influences the score within that range.

Sub-variable	Stressor Indicator	✓	Comments	Sub-variable Score
SV 7.1 Nutrient Enrichment/ Eutrophication/ Oxygen (D.O.)	Livestock			0.80
	Agricultural Runoff			
	Septic/Sewage	✓	some suspected	
	Excessive Algae or Aquatic Veg.			
	Cumulative Watershed NPS			
	CDPHE Impairment/TMDL List			
SV 7.2 Sedimentation/ Turbidity	Excessive Erosion			0.95
	Excessive Deposition			
	Fine Sediment Plumes			
	Agricultural Runoff			
	Excessive Turbidity			
	Nearby Construction Site			
	Cumulative Watershed NPS			
	CDPHE Impairment/TMDL List			
SV 7.3 Toxic contamination/ pH	Recent Chemical Spills			0.85
	Nearby Industrial Sites			
	Road Drainage/Runoff	✓		
	Livestock			
	Agricultural Runoff			
	Storm Water Runoff	✓		
	Fish/Wildlife Impacts			
	Vegetation Impacts			
	Cumulative Watershed NPS			
	Acid Mine Drainage			
	Point Source Discharge			
	CDPHE Impairment/TMDL List			
	Metal staining on rocks and veg.			
SV 7.4 Temperature	Excessive Temperature Regime			0.95
	Lack of Shading			
	Reservoir/Power Plant Discharge			
	Industrial Discharge			
	Cumulative Watershed NPS			
	CDPHE Impairment/TMDL List			
SV 7.5 Soil chemistry/ Redox potential	Unnatural Saturation/Desaturation			0.95
	Mechanical Soil Disturbance			
	Dumping/introduced Soil			
	CDPHE Impairment/TMDL List			

Variable 7: Water and Soil Chemical Environment p.2

Sub-variable Scoring Guidelines

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	***A*** *Reference Standard*	Stress indicators not present or trivial.
<0.9 - 0.8	***B*** *Highly Functioning*	Stress indicators scarcely present and mild, or otherwise not occurring in more than 10% of the AA.
<0.8 - 0.7	***C*** *Functioning*	Stress indicators present at mild to moderate levels, or otherwise not occurring in more than 33% of the AA.
<0.7 - 0.6	***D*** *Functioning Impaired*	Stress indicators present at moderate to high levels, or otherwise not occurring in more than 66% of the AA
<0.6	***F*** *Non-functioning*	Stress indicators strongly evident throughout the AA at levels which apparently alter the fundamental chemical environment of the wetland system

Input each sub-variable score from p. 1 of the V7 data form and calculate the sum.

Nutrient enrichment/ Eutrophication/ Oxygen (D.O.)		Sedimentation/ Turbidity		Toxic contamination/ pH		Temperature		Soil chemistry/ Redox potential		Sum of Sub-variable Scores
0.80	+	0.95	+	0.85	+	0.95	+	0.95	=	4.50

Use the table to score the Chemical Environment Variable circling the applicable scoring rules.

Variable Score	Condition Grade	Scoring Rules		
		Single Factor		**Composite Score**
1.0 - 0.9	***A*** *Reference Standard*	No single factor scores < 0.9		The factor scores sum > 4.5
<0.9 - 0.8	***B*** *Highly Functioning*	Any single factor scores ≥ 0.8 but < 0.9		The factor scores sum >4.0 but ≤4.5
<0.8 - 0.7	***C*** *Functioning*	Any single factor scores ≥ 7.0 but < 0.8		The factor scores sum >3.5 but ≤ 4.0
<0.7 - 0.6	***D*** *Functioning Impaired*	Any single factor scores ≥ 0.6 but <0.7		The factor scores sum >3.0 but ≤3.5
< 0.6	***F*** *Non-functioning*	Any single factor scores < 0.6		The factor scores sum < 3.0

Variable 7 Score 0.85

Variable 8: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It particularly focuses on the wetland's ability to perform higher-order functions such as support of wildlife populations, and influence primary functions such as flood-flow attenuation, channel stabilization and sediment retention. Score this variable by listing stressors that have affected the structure, diversity, composition and cover of each vegetation stratum that would normally be present in the HGM (regional) subclass being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition or from the natural range of variability exhibited the HGM subclass or regional subclass. This variable has four sub-variables, each corresponding to a stratum of vegetation: Tree Canopy; Shrub Layer; Herbaceous Layer; and Aquatics.

Rules for Scoring:

1. Determine the number and types of vegetation layers present within the AA. Make a judgment as to whether additional layers were historically present using direct evidence such as stumps, root wads or historical photographs. Indirect evidence such as local knowledge and expert opinion can also be used in this determination.

2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.

3. Estimate and record the current coverage of each vegetation layer at the top of the table.

4. Record the Reference Standard or expected percent coverage of each vegetation layer to create the sub-variable weighting factor. The condition of predominant vegetation layers has a greater influence on the variable score than do minor components.

5. Enter the percent cover values as decimals in the row of the stressor table labeled " Reference/expected Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).

6. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table. The difference between the expected and observed stratum coverages is one measure of stratum alteration.

7. Determine the sub-variable score for each valid vegetation layer using the scoring guidelines on the second page of the scoring sheet. Enter each sub-variable score in the appropriate cell of the row labeled "Veg. Layer Sub-variable Score". If a stratum has been wholly removed score it as 0.5.

8. Multiply each layer's *Reference Percent Cover of Layer* score by its Veg. Layer Sub-variable scores and enter the products in the labled cells. These are the weighted sub-variable scores. Individually sum the *Reference Percent Cover of Layer* and *Weighted Sub-variables scores.*

9. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 8 score. Enter this number in the labeled box at the bottom of this page.

	Vegetation Layers				
Current % Coverage of Layer	0	20	80	0	
Stressor	**Tree**	**Shrub**	**Herb**	**Aquatic**	**Comments**
Noxious Weeds			✓		Canada thistle present along the edges (10%).
Exotic/Invasive spp.					
Tree Harvest					
Brush Cutting/Shrub Removal					
Livestock Grazing					
Excessive Herbivory					
Mowing/Haying					
Herbicide					
Loss of Zonation/Homogenization					
Dewatering					
Over Saturation					
DIFFERENCE BETWEEN CURRENT COVERAGE AND REFERENCE/EXPECTED					

Reference/Expected % Cover of Layer	0.00	+ 0.20	+ 0.80	+ 0.00	=	1	
	x	x	x	x			
Veg. Layer Sub-variable Score	1	1	0.9	1		÷	**See sub-variable scoring guidelines on following page**
	=	=	=	=			
Weighted Sub-variable Score	0.00	+ 0.20	+ 0.72	+ 0.00	=	0.92	

Variable 8 Score 0.92

Variable 8: Vegetation Structure and Complexity p. 2

Sub-variable 8 Scoring Guidelines:

Based on the list of stressors identified above, rate the severity of their cumulative effect on vegetation structure and complexity for each vegetation layer.

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	***A*** *Reference Standard*	Stressors not present or with an intensity low enough as to not detectably affect the structure, diversity or composition of the vegetation layer.
<0.9 - 0.8	***B*** *Highly Functioning*	Stressors present at intensity levels sufficient to cause detectable, but minor, changes in layer composition. Stress related change should generally be less than 10% for any given attribute (e.g., 10% cover of invasive, 10% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as high as 33% for a given attribute if stressors are confined to patches comprising less than 10% of the wetland.
<0.8 - 0.7	***C*** *Functioning*	Stressors present with enough intensity to cause significant changes in the character of vegetation, including alteration of layer coverage, structural complexity and species composition. The vegetation layer retains its essential character though. AA's with a high proportion of non-native grasses will commonly fall in this class. Stress related change should generally be less than 33% for any given attribute (e.g., 33% cover of invasive, 33% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as much as 66% for a given attribute if stressors are confined to patches comprising less than 25% of the wetland.
<0.7 - 0.6	***D*** *Functioning Impaired*	Stressor intensity severe enough to cause profound changes to the fundamental character of the vegetation layer. Stress-related change should generally be less than 66% for any given attribute (e.g., 66% cover of invasive, 66% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as much as 80% of a given attribute if stressors are confined to patches comprising less than 50% of the wetland.
<0.6	***F*** *Non-functioning*	Vegetation layer has been completely removed or altered to the extent that is no longer comparable to the natural structure, diversity and composition.

FACWet Score Card

Scoring Procedure:

1. Transcribe variable scores from each variable data sheet to the corresponding cell in the variable score table.
2. In each Functional Capacity Index (FCI) equation, enter the corresponding variable scores in the equation cells. Do not enter values in the crossed cells lacking labels.
3. Add the variable scores to calculate the total functional points achieved for each function.
4. Divide the total functional points achieved by the functional points possible. The typical number of total points possible is provided, however, if a variable is added or subtracted to FCI equation the total possible points must be adjusted
5. Calculate the Composite FCI, by adding the FCI scores and dividing by the total number of functions scored (usually 7).
6. If scoring is done directly in the Excel spreadsheet, all values will be transferred and calculated automatically.

VARIABLE SCORE TABLE

Buffer & Landscape Context	**Variable 1:**	**Habitat Connectivity (Connect)**	0.80
	Variable 2:	**Contributing Area (CA)**	0.73
Hydrology	**Variable 3:**	**Water Source (Source)**	0.90
	Variable 4:	**Water Distribution (Dist)**	0.80
	Variable 5:	**Water Outflow (Outflow)**	0.75
Abiotic and Biotic Habitat	**Variable 6:**	**Geomorphology (Geom)**	0.80
	Variable 7:	**Chemical Environment (Chem)**	0.85
	Variable 8:	**Vegetation Structure and Complexity (Veg)**	0.92

Functional Capacity Indices

Function 1 -- Support of Characteristic Wildlife Habitat

$V1_{connect}$	+ $V2_{CA}$	+ (2 x $V8_{veg}$)					Total Functional Points		FCI
0.80	+ 0.73	+ 1.84	+	+	+	=	3.37	÷ **4**	= 0.84

Function 2 -- Support of Characteristic Fish/aquatic Habitat

(3 x $V3_{source}$)	+ (2 x $V4_{dist}$)	+ (2 x $V5_{outflow}$)	+ $V6_{geom}$	+ $V7_{chem}$				
2.70	+ 1.60	+ 1.50	+ 0.80	+ 0.85	+	=	7.45	÷ **9** = 0.83

Function 3 -- Flood Attenuation

$V2_{CA}$	+ (2 x $V3_{source}$)	+ (2 x $V4_{dist}$)	+ (2 x $V5_{outflow}$)	+ $V6_{geom}$	+ $V8_{veg}$			
0.73	+ 1.80	+ 1.60	+ 1.50	+ 0.80	+ 0.92	=	7.35	÷ **9** = 0.82

Function 4 -- Short- and Long-term Water Storage

$V3_{source}$	+ (2 x $V4_{dist}$)	+ (2 x $V5_{outflow}$)	$V6_{geom}$					
0.90	+ 1.60	+ 1.50	+ 0.80	+	+	=	4.80	÷ **6** = 0.80

Function 5 -- Nutrient/Toxicant Removal

(2 x $V2_{CA}$)	+ (2 x $V4_{dist}$)	+ $V6_{geom}$	$V7_{chem}$					
1.45	+ 1.60	+ 0.80	+ 0.85	+	+	=	4.70	÷ **6** = 0.78

Function 6 -- Sediment Retention/Shoreline Stabilization

$V2_{CA}$	+ (2 x $V6_{geom}$)	+ (2 x $V8_{veg}$)						
0.73	+ 1.60	+ 1.84	+	+	+	=	4.17	÷ **5** = 0.83

Function 7 -- Production Export/Food Chain Support

$V1_{connect}$	+ (2 x $V5_{outflow}$)	+ $V6_{geom}$	+ $V7_{chem}$	+ (2 x $V8_{veg}$)				
0.80	+ 1.50	+ 0.80	+ 0.85	+ 1.84	+	=	5.79	÷ **7** = 0.83

Sum of Individual FCI Scores **5.73**

Divide by the Number of Functions Scored **÷ 7**

Composite FCI Score **0.82**

ADMINISTRATIVE CHARACTERIZATION

General Information

		Date of Evaluation:	7/25/2013
Site Name or ID:	STA 092A-024; 17772	Project Name:	SH 92 Stengel's Hill Reconstruction
404 or Other Permit Application #:	SPK-2013-628	Applicant Name:	CDOT R3
Evaluator Name(s):	Paula Durkin	Evaluator's professional position and organization:	CDOT Wetland Specialist, PWS #1225

Location Information:

Site Coordinates (Decimal Degrees, e.g., 38.85, -104.96):	38.47571, -107.49099	Geographic Datum Used (NAD 83):	NAD 83
		Elevation:	5376'-5382'
Location Information:	SH 92 at MP 14.9 in Delta County (Wetland #2)		
Associated stream/water body name:	Big Gulch	Stream Order:	1
USGS Quadrangle Map:	Lazear 7.5' topo	Map Scale: (Circle one)	✓ 1:24,000 1:100,000 Other
Sub basin Name (8 digit HUC):	North Fork Gunnison Watershed (14020004)	Wetland Ownership:	Private and CDOT

Project Information:

This evaluation is being performed at: *(Check applicable box)*
- [✓] *Project Wetland*
- [ ] *Mitigation Site*

Purpose of Evaluation (check all applicable):
- [✓] *Potentially Impacted Wetlands*
- [ ] *Mitigation; Pre-construction*
- [ ] *Mitigation; Post-construction*
- [ ] *Monitoring*
- [ ] *Other (Describe)*

Intent of Project: *(Check all applicable)* [ ] Restoration [ ] Enhancement [ ] Creation

Total Size of Wetland Involved: (Record Area, Check and Describe Measurement Method Used)	ac.	[✓]	Measured: 0.34 ac		
		[ ]	Estimated:		
Assessment Area (AA) Size (Record Area, check appropriate box. Additional spaces are used to record acreage when more than one AA is included in a single assessment)	ac.	[✓]	Measured:	2.21 ac	0.26 mi perimeter
		[ ]	Estimated:		
Characteristics or Method used for AA boundary determination:	Combined analysis of NAIP (2011) aerial imagery available on CDOT's GIS system, Google Earth imagery with scanned NWI raster data, plus review of USGS 7.5' topo map for the area, along with ground-truthing/walking the site, and observing conditions immediately downstream.				

Notes:	This wetland site and AA, is identified on the NWI maps or the CPW/CNHP Colorado Wetlands Mapping Inventory as PEMC.

ECOLOGICAL DESCRIPTION 1

Special Concerns

Check all that apply

- ☐ Organic soils including Histosols or Histic Epipedons are present in the AA (i.e., AA includes core fen habitat).
- ☐ Project will directly impact organic soil portions of the AA including areas possessing either Histosol soils or histic epipedons.
- ☐ Organic soils are known to occur anywhere within the contiguous wetland of which the AA is part.
- ☐ The wetland is a habitat oasis in an otherwise dry or urbanized landscape?
- ☐ Federally threatened or endangered species are **KNOWN** to occur in the AA? List Below.
- ☐ Federally threatened or endangered species are **SUSPECTED** to occur in the AA?
- ☐ Species of concern according to the Colorado Natural Heritage (CNHP) are known to occur in the AA?
- ☐ The site is located within a potential conservation area or element occurrence buffer area as determined by CNHP?
- ☐ Other special concerns (please describe)

No Special Concerns have been identified. T&E foot surveys were completed for several ESA species that yielded negative results. There will be no depletions to CO River fish.

HYDROGEOMORPHIC SETTING

- ☐ AA wetland maintains its fundamental natural hydrogeomorphic characteristics
- ☑ AA wetland has been subject to change in HGM classes as a result of anthropogenic modification

If the above is checked, please describe the original wetland type if discernable using the table below.

- ☐ AA wetland was created from an upland setting.

Current Conditions

Describe the hydrogeomorphic setting of the wetland by circling all conditions that apply.

HGM Setting

Water source	(Surface flow)	Groundwater	Precipitation	Unknown		
Hydrodynamics	(Unidirectional)	Vertical	Bi-directional			
Wetland Gradient	(0 - 2%)	2-4%	4-10%	>10%		
# Surface Inlets	Over-bank	(0)	1	2	3	>3
# Surface Outlets		0	(1)	2	3	>3
Geomorphic Setting (Narrative Description. Include approx. stream order for riverine)	Big Gulch originates from a groundwater source north of SH 92 at 6610' elevation on Redlands Mesa within the Semiarid Benchlands and Canyonlands Ecoregion of the Colorado Plateau. It is a small basin (stream order 1) within the North Fork Gunnison Watershed and is a direct tributary to the North Fork of the Gunnison River. Total stream length of the creek is approximately 5 miles.					
HGM class	(Riverine)	Slope	Depressional	Lacustrine		

Historical Conditions

Previous Wetland Typology

Water source	Surface flow	(Groundwater)	Precipitation	Unknown
Hydrodynamics	(Unidirectional)	Vertical		
Geomorphic Setting (Narrative Description)	Historic aerial photography from Google Earth dates back to 1993 and the USGS topo dates back to 1955. While still rural, since 1955 there appears to be a few more excavated stockponds upgradient and probably more irrigation withdrawals as the area populated.			
Previous HGM Class	Riverine	(Slope)	Depressional	Lacustrine

Notes (include information on the AA's HGM subclass and regional subclass): CNHP reports of severe wetland stressors in this corridor.

ECOLOGICAL DESCRIPTION 2

Vegetation Habitat Description

US FWS habitat classification according as reported in Cowardin et al. (1979).

System	Subsystem	Class	Subclass	Water Regime	Other Modifiers	% AA
Palustrine	Palustrine	Emergent (EM)	Rooted vascular	Seasonally flooded - C	alkaline (i); diked/impounded (h); excavated (x)	90% (estimate)
Lacustrine	Littoral; Limnoral	Rock Bot. (RB) Uncon Bottom(UB) Aquatic Bed(AB) Rocky Shore(RS) Uncon Shore(US) Emergent(EM) Shrub-scrub(SS) Forested (FO)	Floating vascular; Rooted vascular; Algal; Persistent; Non-Persistent; Broad-leaved deciduous; Needle-leaved evergreen; Cobble - gravel; Sand; Mud; Organic	**Examples** Temporarily flooded(A); Saturated(B); Seasonally flooded(C); Seas.-flood./sat.(E); Semi-Perm. flooded(F); Intermittently exposed(G); Artificially flooded(K); Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)	Hypersaline(7) ; Eusaline(8); Mixosaline(9); Fresh(0); Acid(a); Circumneutral(c); Alkaline/calcareous(i); Organic(g); Mineral(n); Beaver(b); Partially Drained/ditched(d); Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)	
Palustrine	Palustrine					
Riverine	Lower perennial; Upper perennial; Intermittent					

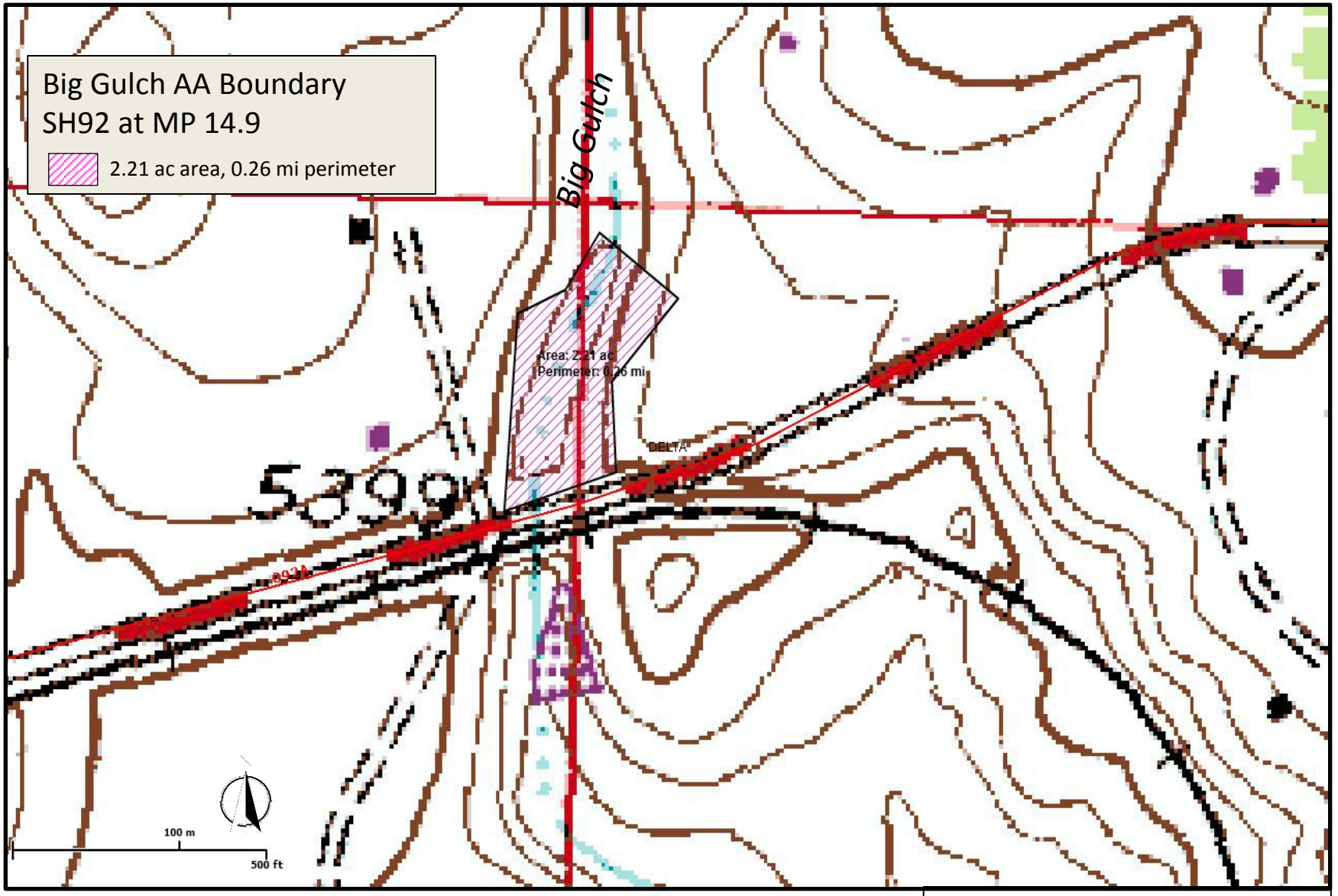
Site Map

Scale: 1 sq. =

Draw a sketch map of the site including relevant portions of the wetland, AA boundary, structures, habitat classes, and other significant features.

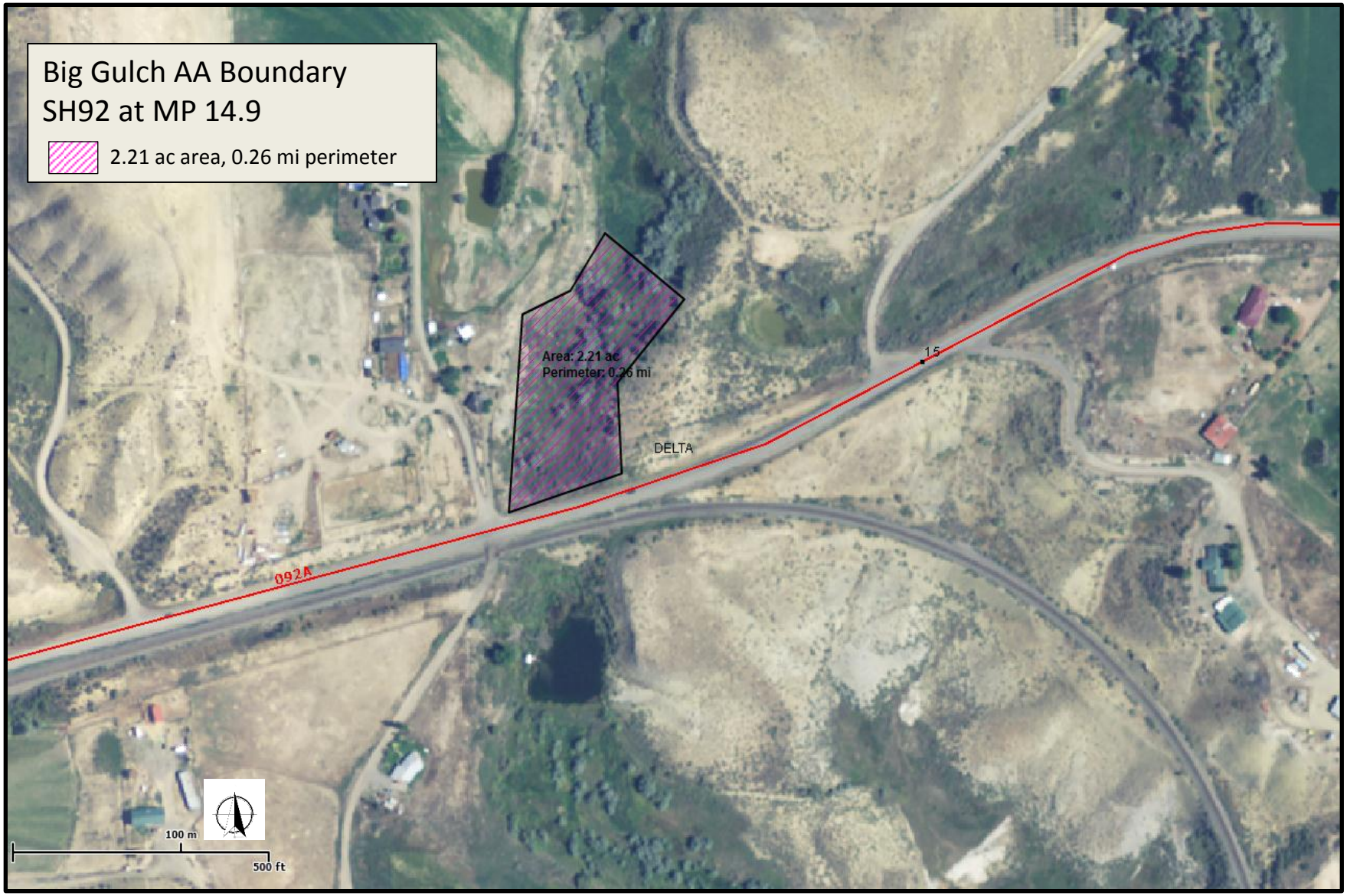
See attached.

Big Gulch Ecological Description 2 Site Map



Lazear 7.5' Topographic Quadrangle (1955)

Big Gulch Ecological Description 2 Aerial Photo



Variable 1: Habitat Connectivity

The Habitat Connectivity Variable is described by two sub-variables – Neighboring Wetland and Riparian Habitat Loss and Barriers to Migration and Dispersal. These sub-variables were treated as independent variables in FACWet Version 2.0. The merging of these variables makes their structure more consistent with that of other composite variables in FACWet. The new variable configuration also makes this landscape variable more accurately reflect the interactions amongst aquatic habitats in Colorado's agricultural and urbanized landscapes, which have a naturally low density of wetlands. The two Habitat Connectivity Sub-variables are scored in exactly the same manner as their FACWet 2.0 counterparts, as described below. The Habitat Connectivity Variable score is simply the arithmetic average of the two sub-variable scores which is entered on the second page of the Variable 1 data form. If there is little or no wetland or riparian habitat in the Habitat Connectivity Envelope (defined below), then Sub-variable 1.1 is not scored.

SV 1.1 - Neighboring Wetland and Riparian Habitat Loss

(Do not score if few or no wetlands naturally exist in the HCE)

This sub-variable is a measure of how isolated from other naturally-occurring wetlands or riparian habitat the AA has become as the result of habitat destruction. To score this sub-variable, estimate the percent of naturally-occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within the 500-meter-wide belt surrounding the AA. This zone is called the Habitat Connectivity Envelope (HCE). In most cases the evaluator must use best professional judgment to estimate the amount of natural wetland loss. Historical photographs, National Wetland Inventory (NWI) maps, hydric soil maps can be helpful in making these determinations. Floodplain maps are especially valuable in river-dominated regions, such as the Front Range urban corridor. Evaluation of landforms and habitat patterns in the context of perceivable land use change is used to steer estimates of the amount of wetland loss within the HCE.

Rules for Scoring:

1. On the aerial photo, create a 500 m perimeter around the AA.
2. The area within this perimeter is the **Habitat Connectivity Envelope (HCE)**.
3. Within the HCE, outline the current extent of naturally occurring wetland and riparian habitat. Do not include habitats such as excavated ponds or reservoir induced fringe wetlands.
4. Outline the historical extent of wetland and riparian habitats (i.e., existing natural wetlands plus those that have been destroyed).

- Use your knowledge of the history of the area and evident land use change to identify where habitat losses have occurred. Additional research can be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, soil maps, etc.

5. Calculate the area of existing and historical wetlands. Divide the area of existing wetland by the total amount of existing and historical wetland and riparian habitat, and determine the variable score using the guidelines below. Enter sub-variable score at the bottom of p.2 of the Habitat Connectivity data form.

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	***A*** *Reference Standard*	Wetland losses are absent or negligible or there is no evidence to suggest the native landscape within the HCE historically contained other wetland habitats
<0.9 - 0.8	***B*** *Highly Functioning*	More than 80% of historical wetland habitat area within the HCE is still present (less than 20% of habitat area lost).
<0.8 - 0.7	***C*** *Functioning*	80 to 60% of historical wetland habitat area within the HCE is still present (20% to 40% of habitat area lost).
<0.7 - 0.6	***D*** *Functioning Impaired*	Less than 60 to 25% of historical wetland habitat area within the HCE is still present (more than 40 to 75% of habitat area lost).
<0.6	***F*** *Non-functioning*	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).

Notes: Losses in the HCE are due to excavated ponds up and downstream, historic uses have likely changed the character of the original wetlands.

Variable 1: Habitat Connectivity p. 2

SV 1.2: Migration/Dispersal Barriers

This sub-variable is intended to rate the degree to which the AA has become isolated from existing neighboring wetland and riparian habitat by artificial barriers that inhibit migration or dispersal of organisms. On the aerial photograph, identify the man-made barriers within the HCE that intercede between the AA and surrounding wetlands and riparian areas, and identify them by type on the stressor list. Score this variable based on the barriers' impermeability to migration and dispersal and the amount of surrounding wetland/riparian habitat they affect.

Rules for Scoring:

1. On the aerial photo, outline **all** existing wetland and riparian habitat areas within the HCE. This includes naturally occurring habitats, as well as those purposefully created or induced by land use change.

2. Identify artificial barriers to dispersal and migration of organisms within the HCE that intercede between the AA and surrounding habitats. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.

3. Considering the composite effect of all of identified barriers to migration and dispersal (i.e., stressors), assign an overall variable score using the scoring guidelines.

Stressors = artificial barriers	✓	Stressors	Comments/description
	✓	Major Highway	SH 92 bisects wetland on the south side.
		Secondary Highway	
		Tertiary Roadway	
	✓	Railroad	UPRR bisects AA immediately south of SH 92.
		Bike Path	
		Urban Development	
	✓	Agricultural Development	Horse and cattle usage was evident.
		Artificial Water Body	
	✓	Fence	Fenced all around the perimeter.
		Ditch or Aqueduct	
	✓	Aquatic Organism Barriers	Lower part is culverted, but northern leopard frogs were present.

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	***A*** *Reference Standard*	No appreciable barriers exist between the AA and other wetland and riparian habitats in the HCE; or there are no other wetland and riparian areas in the HCE.
<0.9 - 0.8	***B*** *Highly Functioning*	Barriers impeding migration/dispersal between the AA and up to 33% of surrounding wetland/riparian habitat highly permeable and easily passed by most organisms. Examples could include gravel roads, minor levees, ditches or barbed-wire fences. More significant barriers (see "functioning category below) could affect migration to up to 10% of surrounding wetland/riparian habitat.
<0.8 - 0.7	***C*** *Functioning*	Barriers to migration and dispersal retard the ability of many organisms/propagules to pass between the AA and up to 66% of wetland/riparian habitat. Passage of organisms and propagules through such barriers is still possible, but it may be constrained to certain times of day, be slow, dangerous or require additional travel. Busy two-lane roads, culverted areas, small to medium artificial water bodies or small earthen dams would commonly rate a score in this range. More significant barriers (see "functioning impaired" category below) could affect migration to up to 10% of surrounding wetland/riparian habitat.
<0.7 - 0.6	***D*** *Functioning Impaired*	Barriers to migration and dispersal preclude the passage of some types of organisms/propagules between the AA and up to 66% of surrounding wetland/riparian habitat. Travel of those animals which can potentially negotiate the barrier are strongly restricted and may include a high chance of mortality. Up to 33% of surrounding wetland/riparian habitat could be functionally isolated from the AA.
<0.6	***F*** *Non-functioning*	AA is essentially isolated from surrounding wetland/riparian habitat by impermeable migration and dispersal barriers. An interstate highway or concrete-lined water conveyance canal are examples of barriers which would generally create functional isolation between the AA and wetland/riparian habitat in the HCE.

SV 1.1 Score	0.70
SV 1.2 Score	0.60

Add SV 1.1 and 1.2 scores and divide by two to calculate variable score

Variable 1 Score 0.65

Variable 2: Contributing Area

The AA's Contributing Area is defined as the 250-meter-wide zone surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to support characteristic functions of high quality wetland habitat. Depending on its condition, the contributing area can help maintain wetland condition or it can degrade it. Contributing Area condition is evaluated by considering the AA's Buffer and its Surrounding Land Use. Buffers are strips or patches of more-or-less natural upland and/or wetland habitat more than 5m wide. Buffers are contiguous with the AA boundary and they intercede between it and more intensively used lands. The AA Buffer is characterized with three sub-variables: Buffer Condition, Buffer Extent, and Average Buffer Width. The Surrounding Land Use Sub-variable considers changes within the Contributing Area that limit its capacity to support characteristic wetland functions. Many of the acute, on-site effects of land use change in the Contributing Area are specifically captured by Variables 3 - 8.

Rules for Scoring:

1. Delimit the Contributing Area on an aerial photograph as the zone within 250 meters of the outer boundary of the AA.
2. Evaluate and then rate the Buffer Condition sub-variable using the scoring guidelines. Record the score in the cell provided on the datasheet.
3. Indicate on the aerial photograph zones surrounding the AA which have ≥5m of buffer vegetation and those which do not.
4. Calculate the percentage of the AA which has a Buffer and record the value where indicated on the data sheet.
5. Rate the *Buffer Extent* Sub-variable using the scoring guidelines.
6.Determine the average Buffer width by drawing a line perpendicularly from the AA boundary to the outer extent of the buffer habitat. Measure line length and record its value on the data sheet. Repeat this process until a total of 8 lines have been sampled.
7. Calculate the average buffer width and record value on the data form. Then determine the sub-variable score using the scoring guidelines.
8.Score the Surrounding Land Use sub-variable by recording land use changes on the stressor list that affect the capacity of the landscape to support characteristic wetland functioning.
9. Enter the **lowest** of the three Buffer sub-variable scores along with the Surrounding Land Use Sub-variable score in the Contributing Area Variable scoring formula at the bottom of p. 2 of the data form. The Contributing Area Variable is the average of the two sub-variable scores.

SV 2.1 - Buffer Condition

0.6 ***SV 2.1 - Buffer Condition Score***

Subvariable Score	Condition Grade	Buffer Condition Scoring Guidelines
1.0 - 0.9	*Reference Standard*	Buffer vegetation is predominately native vegetation, human-caused disturbance of the substrate is not evident, and human visitation is minimal. Common examples: Wilderness areas, undeveloped forest and range lands.
<0.9 - 0.8	*Highly Functioning*	Buffer vegetation may have a mixed native-nonnative composition, but characteristic structure and complexity remain. Soils are mostly undisturbed or have recovered from past human disturbance. Little or only low-impact human visitation. Buffers with higher levels of substrate disturbance may be included here if the buffer is still able to maintain predominately native vegetation. Common examples: Dispursed camping areas in national forests, common in wildland parks (e.g. State Parks) and open spaces.
<0.8 - 0.7	*Functioning*	Buffer vegetation is substantially composed of non-native species. Vegetation structure may be somewhat altered, such as by brush clearing. Moderate substrate disturbance and compaction occurs, and small pockets of greater disturbance may exist. Common examples: City natural areas, mountain hay meadows.
<0.7 - 0.6	*Functioning Impaired*	Buffer vegetation is substantially composed of non-native species and vegetation structure has been strongly altered by the complete removal of one or more strata. Soil disturbance and the intensity of human visitation are generally high. Common examples: Open lands around resource extraction sites (e.g., gravel mines), clear cut logging areas, ski slopes.
<0.6	*Non-functioning*	Buffer is nearly or entirely absent.

SV 2.2 - Buffer Extent

0.60 Precent of AA with Buffer

0.65 ***SV 2.2 - Buffer Extent***

Subvariable Score	Condition Class	% Buffer Scoring Guidelines
1.0 - 0.9	*Reference Standard*	90 - 100% of AA with Buffer
<0.9 - 0.8	*Highly Functioning*	70-90% of AA with Buffer
<0.8 - 0.7	*Functioning*	51-69% of AA with Buffer
<0.7 - 0.6	*Functioning Impaired*	26-50% of AA with Buffer
<0.6	*Non-functioning*	0-25% of AA with Buffer

Variable 2: Contributing Area (p. 2)

SV 2.3 - Average Buffer Width

Record measured buffer widths in the spaces below and average.

Buffer Width (m)	*13.1*	*16.9*	*17*	*39.4*	*36.7*	*30.9*	*20.2*	*13.5*	23
Line #	1	2	3	4	5	6	7	8	**Avg. Buffer Width (m)**

0.6

SV 2.3 - Average Buffer Width Score

Subvariable Score	Condition Grade	Buffer Width Scoring Guidelines
1.0 - 0.9	*Reference Standard*	Average Buffer width is 190-250m
<0.9 - 0.8	*Highly Functioning*	Average Buffer width is 101-189m
<0.8 - 0.7	*Functioning*	Average Buffer width is 31-100m
<0.7 - 0.6	*Functioning Impaired*	Average Buffer width is 6-30m
<0.6	*Non-functioning*	Average Buffer width is 0-5m

SV 2.4 - Surrounding Land Use

0.7

SV 2.4 - Surrounding Land Use Score

Catalog and characterize land use changes in the surrounding landscape and score.

Stressors = Land Use Changes

✓	Stressors	Comments/description
	Industrial/commercial	
	Urban	
✓	Residential	medium
✓	Rural	
	Dryland Farming	
	Intensive Agriculture	
✓	Orchards or Nurseries	
	Livestock Grazing	
✓	Transportation Corridor	highway
	Urban Parklands	
✓	Dams/impoundments	highway and railroad essentially act as a dam
	Artificial Water body	
	Physical Resource Extraction	
	Biological Resource Extraction	
✓	Other	railroad

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	***A*** *Reference Standard*	No appreciable land use change has been imposed Surrounding Landscape.
<0.9 - 0.8	***B*** *Highly Functioning*	Some land use change has occurred in the Surrounding Landscape, but changes have minimal effect on the the landscape's capacity to support characteristic aquatic functioning, either because land use is not intensive, for example haying, light grazing, or low intensity silviculture, or more substantial changes occur in approximately less than 10% of the area.
<0.8 - 0.7	***C*** *Functioning*	Surrounding Landscape has been subjected to a marked shift in land use, however, the land retains much of its capacity to support natural wetland function and it is not an overt source of pollutants or sediment. Moderate-intensity land uses such as dry-land farming, urban "green" corridors, or moderate cattle grazing would commonly be placed within this scoring range.
<0.7 - 0.6	***D*** *Functioning Impaired*	Land use changes within the Surrounding Landscape has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surfaces; considerable in-flow urban runoff or fertilizer-rich waters common. Supportive capacity of the land has been greatly diminished but not totally extinguished. Intensively logged areas, low-density urban developments, some urban parklands and many cropping
<0.6	***F*** *Non-functioning*	The Surrounding Landscape is essentially comletely developed or is otherwise a cause of severe ecological stress on wetland habitats. Commercial developments or highly urban landscapes generally rate a score of less than 0.6.

Buffer Score (Lowest score)		**Surrounding Land Use**				
(0.6	+	0.7	) ÷	2	=	**Variable 2 Score** 0.65

Variable 3: Water Source

This variable is concerned with ***up-gradient*** *hydrologic connectivity. It is a measure of impacts to the AA's water source, including the quantity and timing of water delivery, and the ability of source water to perform work such as sediment transport, erosion, soil pore flushing, etc. To score this variable, identify stressors that alter the source of water to the AA, and record their presence on the stressor list. Stressors can impact water source by depletion, augmentation, or alteration of inflow timing or hydrodynamics. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 7.*

Scoring rules:

1. Use the stressor list and knowledge of the watershed to catalog type-specific impairments of the AA's water source. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.

2. Considering the composite effect of stressors on the water source, rate the condition of this variable with the aid of the scoring guidelines.

✔	Stressors	Comments/description
✔	Ditches or Drains (tile, etc.)	irrigation ditches
✔	Dams	
	Diversions	
	Groundwater pumping	
	Draw-downs	
✔	Culverts or Constrictions	one
	Point Source (urban, ind., ag.)	
✔	Non-point Source	suspected leaching field
	Increased Drainage Area	
	Storm Drain/Urban Runoff	
	Impermeable Surface Runoff	
✔	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
	Transbasin Diversion	
	Actively Managed Hydrology	

Variable Score	Condition Grade	Depletion	Augmentation
1.0 - 0.9	***A*** *Reference Standard*	Unnatural drawdown events minor, rare or non-existent, very slight uniform depletion, or trivial alteration of hydrodynamics.	Unnatural high-water events minor, rare or non-existent, slight uniform increase in amount of inflow, or trivial alteration of hydrodynamics.
<0.9 - 0.8	***B*** *Highly Functioning*	Unnatural drawdown events occasional, short duration and/or mild; or uniform depletion up to 20%; or mild to moderate reduction of peak flows or capacity of water to perform work.	Occasional unnatural high-water events, short in duration and/or mild in intensity; or uniform augmentation up to 20%; or mild to moderate increase of peak flows or capacity of water to perform work.
<0.8 - 0.7	***C*** *Functioning*	Unnatural drawdown events common and of mild to moderate intensity and/or duration; or uniform depletion up to 50%; or moderate to substantial reduction of peak flows or capacity of water to perform work.	Common occurrence of unnatural high-water events, of a mild to moderate intensity and/or duration; or uniform augmentation up to 50%; or moderate to substantial increase of peak flows or capacity of water to perform work.
<0.7 - 0.6	***D*** *Functioning Impaired*	Unnatural drawdown events occur frequently with a moderate to high intensity and/or duration; or uniform depletion up to 75%; or substantial reduction of peak flows or capacity of water to perform work. **Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.**	Common occurrence of unnatural high-water events, some of which may be severe in nature or exist for a substantial portion of the growing season; or uniform augmentation more than 50% or capacity of water to perform work. **Wetlands with actively managed or wholly artificial hydrology will usually score in this range or**
<0.6	***F*** *Non-functioning*	Water source diminished enough to threaten or extinguish wetland hydrology in the AA.	Frequency, duration or magnitude of unnaturally high-water great enough to change the fundamental characteristics of the wetland.

Variable 3 Score 0.8

Variable 4: Water Distribution

This variable is concerned with hydrologic connectivity ***within*** *the AA. It is a measure of alteration to the spatial distribution of surface and groundwater within the AA. These alterations are manifested as local changes to the hydrograph and generally result from geomorphic modifications within the AA. To score this variable, identify stressors within the AA that alter flow patterns and impact the hydrograph of the AA, including localized increases or decreases to the depth or duration of the water table or surface water.*

Because the wetland's ability to distribute water in a characteristic fashion is fundamentally dependent on the condition of its water source, ***in most cases the Water Source variable score will define the upper limit Water Distribution score****. For example, if the Water Source variable is rated at 0.85, the Water Distribution score will usually have the potential to attain a maximum score of 0.85. Additional stressors within or outside the lower end of the AA effecting water distribution (e.g., ditches and levees) will reduce the score from the maximum value.*

Scoring rules:

1. Identify impacts to the natural distribution of water throughout the AA and catalog them in the stressor table.

2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. In most cases, the Water Source variable score will set the upper limit for the Water Distribution score.

✔	Stressors	Comments/description
	Alteration of Water Source	
	Ditches	
	Ponding/Impoundment	
✔	Culverts	
	Road Grades	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Enlarged Channel	
	Artificial Banks/Shoreline	
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
	Sediment/Fill Accumulation	

Variable Score	Condition Grade	Non-riverine	Riverine
1.0 - 0.9	***A*** *Reference Standard*	Little or no alteration has been made to the way in which water is distributed throughout the wetland. AA maintains a natural hydrologic regime.	Natural active floodplain areas flood on a normal recurrence interval. No evidence of alteration of flooding and subirrigation duration and intensity.
<0.9 - 0.8	***B*** *Highly Functioning*	Less than 10% of the AA is affected by *in situ* hydrologic alteration; or more widespread impacts result in less than a 2 in. (5 cm) change in mean growing season water table elevation.	Channel-adjacent areas have occasional unnatural periods of drying or flooding; or uniform shift in the hydrograph less than typical root depth.
<0.8 - 0.7	***C*** *Functioning*	Between 10 and 33% of the AA is affected by *in situ* hydrologic alteration; or more widespread impacts result in a 4 in. (5 cm) or less change in mean growing season water table elevation.	In channel-adjacent area, periods of drying or flooding are common; or uniform shift in the hydrograph near root depth.
<0.7 - 0.6	***D*** *Functioning Impaired*	33 to 66% of the AA is affected by *in situ* hydrologic alteration; or more widespread impacts result in a 6 in. (15 cm) or less change in mean growing season water table elevation. Water table behavior must still meet jurisdictional criteria to merit this rating.	Adjacent to the channel, unnatural periods of drying or flooding are the norm; or uniform shift in the hydrograph greater than root depth.
<0.6	***F*** *Non-functioning*	More than 66% of the AA is affected by hydrologic alteration which changes the fundamental functioning of the wetland system, generally exhibited as a conversion to upland or deep water habitat.	Historical active floodplain areas are almost never wetted from overbank flooding, and/or groundwater infiltration is effectively cut off.

Variable 4 Score 0.8

Variable 5: Water Outflow

This variable is concerned with ***down-gradient*** *hydrologic connectivity and the flow of water and water-borne materials and energy out of the AA. In particular it illustrates the degree to which the AA can support the functioning of down-gradient habitats. It is a measure of impacts that affect the hydrologic outflow of water including the passage of water through its normal low- and high-flow surface outlets, infiltration/groundwater recharge, and the energetic characteristics of water delivered to dependent habitats. In some cases, alteration of evapotranspiration rates may be significant enough of a factor to consider in scoring. Score this variable by identifying stressors that impact the means by which water is exported from the AA. To evaluate this variable focus on how water, energy and associated materials are exported out of the AA and their ability it support down-gradient habitats in a manner consistent with their HGM (regional) subclass.*

Because the wetland's ability to export water and materials in a characteristic fashion is to a very large degree dependent the condition of its water source, as with the Water Distribution variable, ***in most cases the Water Source variable score will define the upper limit Water Outflow score****.*

Scoring rules:

1. Identify impacts to the natural outflow of water from the AA and catalog them in the stressor table.

2.Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. Take in to account the cumulative effect of stressors on the wetland's ability to export water and water-borne materials. In most cases the Water Source variable will set the upper limit for the Water Outflow score.

✓	Stressors	Comments/description
	Alteration of Water Source	
	Ditches	
	Dikes/Levees	
✓	Road Grades	
	Culverts	
	Diversions	
✓	Constrictions	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Artificial Stream Banks	
	Weirs	
	Confined Bridge Openings	

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	***A*** *Reference Standard*	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.
<0.9 - 0.8	***B*** *Highly Functioning*	High- or low-water outflows are mildly to moderately affected, but at intermediate ("normal") levels flow continues essentially unaltered in quantity or character.
<0.8 - 0.7	***C*** *Functioning*	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics moderately affected.
<0.7 - 0.6	***D*** *Functioning Impaired*	Outflow at all stages is moderately to highly impaired resulting in persistent flooding of portions of the AA or unnatural drainage; or outflow hydrodynamics severely disrupted.
<0.6	***F*** *Non-functioning*	The natural outflow regime is profoundly impaired. Down-gradient hydrologic connection severed or nearly so. Alterations may cause widespread unnatural persistent flooding or dewatering of the wetland system.

Variable 5 Score 0.75

Variable 6: Geomorphology

This variable is a measure of the degree to which the geomorphic setting has been altered within the AA. Changes to the surface configuration and natural topography constitute stressors. Such stressors may be observed in the form of fill, excavation, dikes, sedimentation due to absence of flushing floods, etc. In riverine systems, geomorphic changes to the stream channel should be considered if the channel is within the AA (i.e, small is size). Alterations may involve the bed and bank (substrate embeddedness or morphological changes), stream instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland surface hydrology and water relations with vegetation. Geomorphic alterations can also directly affect soil properties, such as near-surface texture, and the wetland chemical environment such as the redox state or nutrient composition in the rooting zone. In rating this variable, ***do not*** *include these resultant effects of geomorphic change; rather focus on the physical impacts* ***within the footprint*** *of the alteration* ***within the AA*** *– For example, the width and depth of a ditch or the size of a levee* ***within the AA*** *would describe the extent of the stressors. The secondary effects of geomorphic change are addressed by other variables. All alterations to geomorphology should be evaluated including small-scale impacts such as pugging, hoof sheer, and sedimentation which can be significant but not immediately obvious.*

Scoring Rules:

1. Identify impacts to geomorphological setting and topography within the AA and record them on the stressor checklist.
2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines.

✔		Stressors	Comments
	General	Dredging/Excavation/Mining	
✔		Fill, including dikes, road grades, etc	
		Grading	
		Compaction	
		Plowing/Disking	
		Excessive Sedimentation	
		Dumping	
✔		Hoof Shear/Plugging	horses and cattle
		Aggregate or Mineral Mining	
		Sand Accumulation	
	Channels Only	Channel Instability/Over Widening	
		Excessive Bank Erosion	
		Channelization	
		Reconfigured Stream Channels	
		Artificial Banks/Shoreline	
		Beaver Dam Removal	
		Substrate Embeddedness	
		Lack or Excess of Woody Debris	

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	***A*** *Reference Standard*	Topography essentially unaltered from the natural state, or alterations appear to have a minimal effect on wetland functioning and condition. Patch or microtopographic complexity may be slightly altered, but native plant communities are still supported.
<0.9 - 0.8	***B*** *Highly Functioning*	Alterations to topography result in small but detectable changes to habitat conditions in some or all of the AA; or more severe impacts exist but affect less than 10% of the AA.
<0.8 - 0.7	***C*** *Functioning*	Changes to AA topography may be pervasive but generally mild to moderate in severity. May include patches of more significant habitat alteration; or more severe alterations affect up to 20 % of the AA.
<0.7 - 0.6	***D*** *Functioning Impaired*	At least one important surface type or landform has been eliminated or created; microtopography has been strongly impacted throughout most or all of the AA; or more severe alterations affect up to 50% of the AA. Evidence that widespread diminishment or alteration of native plant community exist due to physical habitat alterations. Most incidentally created wetland habitat such as that created by roadside ditches and the like would score in this range or lower.
<0.6	***F*** *Non-functioning*	Pervasive geomorphic alterations have caused a fundamental change in site character and functioning, commonly resulting in a conversion to upland or deepwater habitat.

Variable 6 Score 0.7

Variable 7: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants, water and soil characteristics. The origin of pollutants may be within or outside the AA. Score this variable by listing indicators of chemical stress in the AA. Consider point source and non-point sources of pollution, as well as mechanical or hydrologic changes that alter the chemical environment. Because water quality frequently cannot be inferred directly, the presence of stressors is often identified by the presence of indirect indicators. Five sub-variables are used to describe the Water and Soil Chemical Environment: Nutrient Enrichment/Eutrophication/Oxygen; Sedimentation/Turbidity; Toxic Contamination/pH; Temperature; and Soil Chemistry and Redox Potential. Utilization of web-based data mining tools is highly recommended to help inform and support variable scores.

Scoring rules:

1. Stressors are grouped into sub-variables which have a similar signature or set of causes.
2. Use the indicator list to identify each stressor impacting the chemical environment of the AA.
3. For each sub-variable, determine its score using the scoring guideline table provided on the second page of the scoring sheet. Scoring sub-variables is carried out in exactly the same way as normal variable scoring.
   -If the AA is part of a water body that is recognized as impaired or recommended for TMDL development for one of the factors, then score that sub-variable 0.65 or lower.
4. Transcribe sub-variable scores to the following variable scoring page and compute the sum.
5. The lowest sub-variable score sets the letter grade range. The composite of sub-variables influences the score within that range.

Sub-variable	Stressor Indicator	✓	Comments	Sub-variable Score
SV 7.1 Nutrient Enrichment/ Eutrophication/ Oxygen (D.O.)	Livestock	✓		0.70
	Agricultural Runoff	✓		
	Septic/Sewage	✓	some suspected	
	Excessive Algae or Aquatic Veg.			
	Cumulative Watershed NPS			
	CDPHE Impairment/TMDL List			
SV 7.2 Sedimentation/ Turbidity	Excessive Erosion			0.80
	Excessive Deposition			
	Fine Sediment Plumes			
	Agricultural Runoff			
	Excessive Turbidity			
	Nearby Construction Site			
	Cumulative Watershed NPS			
	CDPHE Impairment/TMDL List			
SV 7.3 Toxic contamination/ pH	Recent Chemical Spills			0.80
	Nearby Industrial Sites			
	Road Drainage/Runoff	✓		
	Livestock	✓		
	Agricultural Runoff			
	Storm Water Runoff	✓		
	Fish/Wildlife Impacts			
	Vegetation Impacts			
	Cumulative Watershed NPS			
	Acid Mine Drainage			
	Point Source Discharge			
	CDPHE Impairment/TMDL List			
	Metal staining on rocks and veg.			
SV 7.4 Temperature	Excessive Temperature Regime			0.80
	Lack of Shading			
	Reservoir/Power Plant Discharge			
	Industrial Discharge			
	Cumulative Watershed NPS			
	CDPHE Impairment/TMDL List			
SV 7.5 Soil chemistry/ Redox potential	Unnatural Saturation/Desaturation			0.80
	Mechanical Soil Disturbance			
	Dumping/introduced Soil			
	CDPHE Impairment/TMDL List			

Variable 7: Water and Soil Chemical Environment p.2

Sub-variable Scoring Guidelines

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	***A*** *Reference Standard*	Stress indicators not present or trivial.
<0.9 - 0.8	***B*** *Highly Functioning*	Stress indicators scarcely present and mild, or otherwise not occurring in more than 10% of the AA.
<0.8 - 0.7	***C*** *Functioning*	Stress indicators present at mild to moderate levels, or otherwise not occurring in more than 33% of the AA.
<0.7 - 0.6	***D*** *Functioning Impaired*	Stress indicators present at moderate to high levels, or otherwise not occurring in more than 66% of the AA
<0.6	***F*** *Non-functioning*	Stress indicators strongly evident throughout the AA at levels which apparently alter the fundamental chemical environment of the wetland system

Input each sub-variable score from p. 1 of the V7 data form and calculate the sum.

Nutrient enrichment/ Eutrophication/ Oxygen (D.O.)		Sedimentation/ Turbidity		Toxic contamination/ pH		Temperature		Soil chemistry/ Redox potential		Sum of Sub-variable Scores
0.80	+	0.80	+	0.80	+	0.80	+	0.80	=	4.00

Use the table to score the Chemical Environment Variable circling the applicable scoring rules.

Variable Score	Condition Grade	Scoring Rules		
		Single Factor		**Composite Score**
1.0 - 0.9	***A*** *Reference Standard*	No single factor scores < 0.9		The factor scores sum > 4.5
<0.9 - 0.8	***B*** *Highly Functioning*	Any single factor scores ≥ 0.8 but < 0.9		The factor scores sum >4.0 but ≤4.5
<0.8 - 0.7	***C*** *Functioning*	Any single factor scores ≥ 7.0 but < 0.8		The factor scores sum >3.5 but ≤ 4.0
<0.7 - 0.6	***D*** *Functioning Impaired*	Any single factor scores ≥ 0.6 but <0.7		The factor scores sum >3.0 but ≤3.5
< 0.6	***F*** *Non-functioning*	Any single factor scores < 0.6		The factor scores sum < 3.0

Variable 7 Score 0.7

Variable 8: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It particularly focuses on the wetland's ability to perform higher-order functions such as support of wildlife populations, and influence primary functions such as flood-flow attenuation, channel stabilization and sediment retention. Score this variable by listing stressors that have affected the structure, diversity, composition and cover of each vegetation stratum that would normally be present in the HGM (regional) subclass being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition or from the natural range of variability exhibited the HGM subclass or regional subclass. This variable has four sub-variables, each corresponding to a stratum of vegetation: Tree Canopy; Shrub Layer; Herbaceous Layer; and Aquatics.

Rules for Scoring:

1. Determine the number and types of vegetation layers present within the AA. Make a judgment as to whether additional layers were historically present using direct evidence such as stumps, root wads or historical photographs. Indirect evidence such as local knowledge and expert opinion can also be used in this determination.

2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.

3. Estimate and record the current coverage of each vegetation layer at the top of the table.

4. Record the Reference Standard or expected percent coverage of each vegetation layer to create the sub-variable weighting factor. The condition of predominant vegetation layers has a greater influence on the variable score than do minor components.

5. Enter the percent cover values as decimals in the row of the stressor table labeled " Reference/expected Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).

6. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table. The difference between the expected and observed stratum coverages is one measure of stratum alteration.

7. Determine the sub-variable score for each valid vegetation layer using the scoring guidelines on the second page of the scoring sheet. Enter each sub-variable score in the appropriate cell of the row labeled "Veg. Layer Sub-variable Score". If a stratum has been wholly removed score it as 0.5.

8. Multiply each layer's *Reference Percent Cover of Layer* score by its Veg. Layer Sub-variable scores and enter the products in the labled cells. These are the weighted sub-variable scores. Individually sum the *Reference Percent Cover of Layer* and *Weighted Sub-variables scores.*

9. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 8 score. Enter this number in the labeled box at the bottom of this page.

	Vegetation Layers				
Current % Coverage of Layer	25	30	80	0	
Stressor	**Tree**	**Shrub**	**Herb**	**Aquatic**	**Comments**
Noxious Weeds	✓		✓		Russian olive, knapweed, Canada thistle common.
Exotic/Invasive spp.	✓		✓		Main wetland type is Typha/Phalaris.
Tree Harvest					
Brush Cutting/Shrub Removal					
Livestock Grazing			✓		Lots of trampling in muck, manure, etc.
Excessive Herbivory					
Mowing/Haying					
Herbicide					
Loss of Zonation/Homogenization					
Dewatering					
Over Saturation					
DIFFERENCE BETWEEN CURRENT COVERAGE AND REFERENCE/EXPECTED					

Reference/Expected % Cover of Layer	0.00	+ 30.00	+ 0.80	+ 0.00	=	30.8	
	x	x	x	x			
Veg. Layer Sub-variable Score	0.6	0.6	0.6	1	÷		**See sub-variable scoring guidelines on following page**
	=	=	=	=			
Weighted Sub-variable Score	0.00	+ 18.00	+ 0.48	+ 0.00	=	18.48	

Variable 8 Score 0.60

Variable 8: Vegetation Structure and Complexity p. 2

Sub-variable 8 Scoring Guidelines:

Based on the list of stressors identified above, rate the severity of their cumulative effect on vegetation structure and complexity for each vegetation layer.

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	***A*** *Reference Standard*	Stressors not present or with an intensity low enough as to not detectably affect the structure, diversity or composition of the vegetation layer.
<0.9 - 0.8	***B*** *Highly Functioning*	Stressors present at intensity levels sufficient to cause detectable, but minor, changes in layer composition. Stress related change should generally be less than 10% for any given attribute (e.g., 10% cover of invasive, 10% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as high as 33% for a given attribute if stressors are confined to patches comprising less than 10% of the wetland.
<0.8 - 0.7	***C*** *Functioning*	Stressors present with enough intensity to cause significant changes in the character of vegetation, including alteration of layer coverage, structural complexity and species composition. The vegetation layer retains its essential character though. AA's with a high proportion of non-native grasses will commonly fall in this class. Stress related change should generally be less than 33% for any given attribute (e.g., 33% cover of invasive, 33% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as much as 66% for a given attribute if stressors are confined to patches comprising less than 25% of the wetland.
<0.7 - 0.6	***D*** *Functioning Impaired*	Stressor intensity severe enough to cause profound changes to the fundamental character of the vegetation layer. Stress-related change should generally be less than 66% for any given attribute (e.g., 66% cover of invasive, 66% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as much as 80% of a given attribute if stressors are confined to patches comprising less than 50% of the wetland.
<0.6	***F*** *Non-functioning*	Vegetation layer has been completely removed or altered to the extent that is no longer comparable to the natural structure, diversity and composition.

FACWet Score Card

Scoring Procedure:

1. Transcribe variable scores from each variable data sheet to the corresponding cell in the variable score table.
2. In each Functional Capacity Index (FCI) equation, enter the corresponding variable scores in the equation cells. Do not enter values in the crossed cells lacking labels.
3. Add the variable scores to calculate the total functional points achieved for each function.
4. Divide the total functional points achieved by the functional points possible. The typical number of total points possible is provided, however, if a variable is added or subtracted to FCI equation the total possible points must be adjusted
5. Calculate the Composite FCI, by adding the FCI scores and dividing by the total number of functions scored (usually 7).
6. If scoring is done directly in the Excel spreadsheet, all values will be transferred and calculated automatically.

VARIABLE SCORE TABLE

Buffer & Landscape Context	**Variable 1:**	**Habitat Connectivity (Connect)**	0.65
	Variable 2:	**Contributing Area (CA)**	0.65
Hydrology	**Variable 3:**	**Water Source (Source)**	0.80
	Variable 4:	**Water Distribution (Dist)**	0.80
	Variable 5:	**Water Outflow (Outflow)**	0.75
Abiotic and Biotic Habitat	**Variable 6:**	**Geomorphology (Geom)**	0.70
	Variable 7:	**Chemical Environment (Chem)**	0.70
	Variable 8:	**Vegetation Structure and Complexity (Veg)**	0.60

Functional Capacity Indices

Function 1 -- Support of Characteristic Wildlife Habitat

$V1_{connect}$	+ $V2_{CA}$	+ (2 x $V8_{veg}$)				= Total Functional Points	÷	FCI
0.65	+ 0.65	+ 1.20	+	+	+	= 2.50	÷ 4	= 0.63

Function 2 -- Support of Characteristic Fish/aquatic Habitat

(3 x $V3_{source}$)	+ (2 x $V4_{dist}$)	+ (2 x $V5_{outflow}$)	+ $V6_{geom}$	+ $V7_{chem}$				
2.40	+ 1.60	+ 1.50	+ 0.70	+ 0.70	+	= 6.90	÷ 9	= 0.77

Function 3 -- Flood Attenuation

$V2_{CA}$	+ (2 x $V3_{source}$)	+ (2 x $V4_{dist}$)	+ (2 x $V5_{outflow}$)	+ $V6_{geom}$	+ $V8_{veg}$			
0.65	+ 1.60	+ 1.60	+ 1.50	+ 0.70	+ 0.60	= 6.65	÷ 9	= 0.74

Function 4 -- Short- and Long-term Water Storage

$V3_{source}$	+ (2 x $V4_{dist}$)	+ (2 x $V5_{outflow}$)	$V6_{geom}$					
0.80	+ 1.60	+ 1.50	+ 0.70	+	+	= 4.60	÷ 6	= 0.77

Function 5 -- Nutrient/Toxicant Removal

(2 x $V2_{CA}$)	+ (2 x $V4_{dist}$)	+ $V6_{geom}$	$V7_{chem}$					
1.30	+ 1.60	+ 0.70	+ 0.70	+	+	= 4.30	÷ 6	= 0.72

Function 6 -- Sediment Retention/Shoreline Stabilization

$V2_{CA}$	+ (2 x $V6_{geom}$)	+ (2 x $V8_{veg}$)						
0.65	+ 1.40	+ 1.20	+	+	+	= 3.25	÷ 5	= 0.65

Function 7 -- Production Export/Food Chain Support

$V1_{connect}$	+ (2 x $V5_{outflow}$)	+ $V6_{geom}$	+ $V7_{chem}$	+ (2 x $V8_{veg}$)				
0.65	+ 1.50	+ 0.70	+ 0.70	+ 1.20	+	= 4.75	÷ 7	= 0.68

Sum of Individual FCI Scores 4.94

Divide by the Number of Functions Scored ÷ 7

Composite FCI Score 0.71

ADMINISTRATIVE CHARACTERIZATION

General Information

		Date of Evaluation:	7/25/2013
Site Name or ID:	STA 092A-024; 17772	Project Name:	SH 92 Stengel's Hill Reconstruction
404 or Other Permit Application #:	SPK-2013-628	Applicant Name:	CDOT R3
Evaluator Name(s):	Paula Durkin	Evaluator's professional position and organization:	CDOT Wetland Specialist, PWS #1225

Location Information:

Site Coordinates (Decimal Degrees, e.g., 38.85, -104.96):	Wetland #3: 38.47592, -107.49023 Wetland #4: 38.47595, -107.49016	Geographic Datum Used (NAD 83):	NAD 83
		Elevation:	5440'-5484'
Location Information:	SH 92 at MP 15.0 in Delta County (Wetlands #3 and #4)		
Associated stream/water body name:	irrigated wetlands	Stream Order:	1
USGS Quadrangle Map:	Lazear 7.5' topo	Map Scale: (Circle one)	✓ *1:24,000* 1:100,000 Other
Sub basin Name (8 digit HUC):	North Fork Gunnison Watershed (14020004)	Wetland Ownership:	Private and CDOT

Project Information:

This evaluation is being performed at: *(Check applicable box)*
- [x] *Project Wetland*
- [ ] *Mitigation Site*

Purpose of Evaluation (check all applicable):
- [x] *Potentially Impacted Wetlands*
- [ ] *Mitigation; Pre-construction*
- [ ] *Mitigation; Post-construction*
- [ ] *Monitoring*
- [ ] *Other (Describe)*

Intent of Project: *(Check all applicable)* ☐ Restoration ☐ Enhancement ☐ Creation

Total Size of Wetland Involved: (Record Area, Check and Describe Measurement Method Used)	ac.	✓ Measured: #3: 0.26 ac + #4: 0.66 ac = 0.92 ac		
		☐ Estimated:		
Assessment Area (AA) Size (Record Area, check appropriate box. Additional spaces are used to record acreage when more than one AA is included in a single assessment)	ac.	✓ Measured:	8.38 ac	0.62 mi perimeter
		☐ Estimated:		
Characteristics or Method used for AA boundary determination:	Combined analysis of NAIP (2011) aerial imagery available on CDOT's GIS system, Google Earth imagery with scanned NWI raster data, plus review of USGS 7.5' topo map for the area, along with ground-truthing/walking the site, and observing conditions immediately downstream.			

Notes:	Wetland #3 is identified on the NWI maps or the CPW/CNHP Colorado Wetlands Mapping Inventory as PABFh, however the landowners are no longer flooding the stockpond and it is drying out. Wetland #4 is classified as PEMA.

ECOLOGICAL DESCRIPTION 1

Special Concerns

Check all that apply

- ☐ Organic soils including Histosols or Histic Epipedons are present in the AA (i.e., AA includes core fen habitat).
- ☐ Project will directly impact organic soil portions of the AA including areas possessing either Histosol soils or histic epipedons.
- ☐ Organic soils are known to occur anywhere within the contiguous wetland of which the AA is part.
- ☐ The wetland is a habitat oasis in an otherwise dry or urbanized landscape?
- ☐ Federally threatened or endangered species are **KNOWN** to occur in the AA? List Below.
- ☐ Federally threatened or endangered species are **SUSPECTED** to occur in the AA?
- ☐ Species of concern according to the Colorado Natural Heritage (CNHP) are known to occur in the AA?
- ☐ The site is located within a potential conservation area or element occurrence buffer area as determined by CNHP?
- ☐ Other special concerns (please describe)

No Special Concerns have been identified. T&E foot surveys were completed for several ESA species that yielded negative results. There will be no depletions to CO River fish.

HYDROGEOMORPHIC SETTING

- ☐ AA wetland maintains its fundamental natural hydrogeomorphic characteristics
- ☐ AA wetland has been subject to change in HGM classes as a result of anthropogenic modification

If the above is checked, please describe the original wetland type if discernable using the table below.

- ☑ AA wetland was created from an upland setting.

Current Conditions

Describe the hydrogeomorphic setting of the wetland by circling all conditions that apply.

HGM Setting

Water source	Surface flow	(Groundwater)	Precipitation	Unknown		
Hydrodynamics	(Unidirectional)	Vertical	Bi-directional			
Wetland Gradient	(0 - 2%)	2-4%	4-10%	>10%		
# Surface Inlets	Over-bank	0	(1)	2	3	>3
# Surface Outlets		0	(1)	2	3	>3
Geomorphic Setting (Narrative Description. Include approx. stream order for riverine)	Existing wetlands appear to originate from seepage from an unlined irrigation ditch and via a culvert under Stengel's driveway to Wetland #3. Flows are entirely controlled.					
HGM class	Riverine	(Slope)	Depressional	Lacustrine		

Historical Conditions

Previous Wetland Typology

Water source	Surface flow	Groundwater	Precipitation	(Unknown)	
Hydrodynamics	(Unidirectional)	Vertical			
Geomorphic Setting (Narrative Description)	The irrigation ditch shows up on the 1993 aerial photography and follows the 5500' contour on the topo map and then appears to intercept another irrigation ditch at Stingley Gulch to the NE at 5700' elevation.				
Previous HGM Class	Riverine	(Slope)	Depressional	Lacustrine	

Notes (include information on the AA's HGM subclass and regional subclass): CNHP reports of severe wetland stressors in this corridor.

ECOLOGICAL DESCRIPTION 2

Vegetation Habitat Description

US FWS habitat classification according as reported in Cowardin et al. (1979).

System	Subsystem	Class	Subclass	Water Regime	Other Modifiers	% AA
Palustrine	Palustrine	Emergent (EM)	Rooted vascular	Seasonally flooded - C Temporarily flooded - A	alkaline (i); diked/impounded (h); excavated (x)	90% (estimate)
Lacustrine	Littoral; Limnoral	Rock Bot. (RB) Uncon Bottom(UB) Aquatic Bed(AB) Rocky Shore(RS) Uncon Shore(US) Emergent(EM) Shrub-scrub(SS) Forested (FO)	Floating vascular; Rooted vascular; Algal; Persistent; Non-Persistent; Broad-leaved deciduous; Needle-leaved evergreen; Cobble - gravel; Sand; Mud; Organic	**Examples** Temporarily flooded(A); Saturated(B); Seasonally flooded(C); Seas.-flood./sat.(E); Semi-Perm. flooded(F); Intermittently exposed(G); Artificially flooded(K); Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)	Hypersaline(7) ; Eusaline(8); Mixosaline(9); Fresh(0); Acid(a); Circumneutral(c); Alkaline/calcareous(i); Organic(g); Mineral(n); Beaver(b); Partially Drained/ditched(d); Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)	
Palustrine	Palustrine					
Riverine	Lower perennial; Upper perennial; Intermittent					

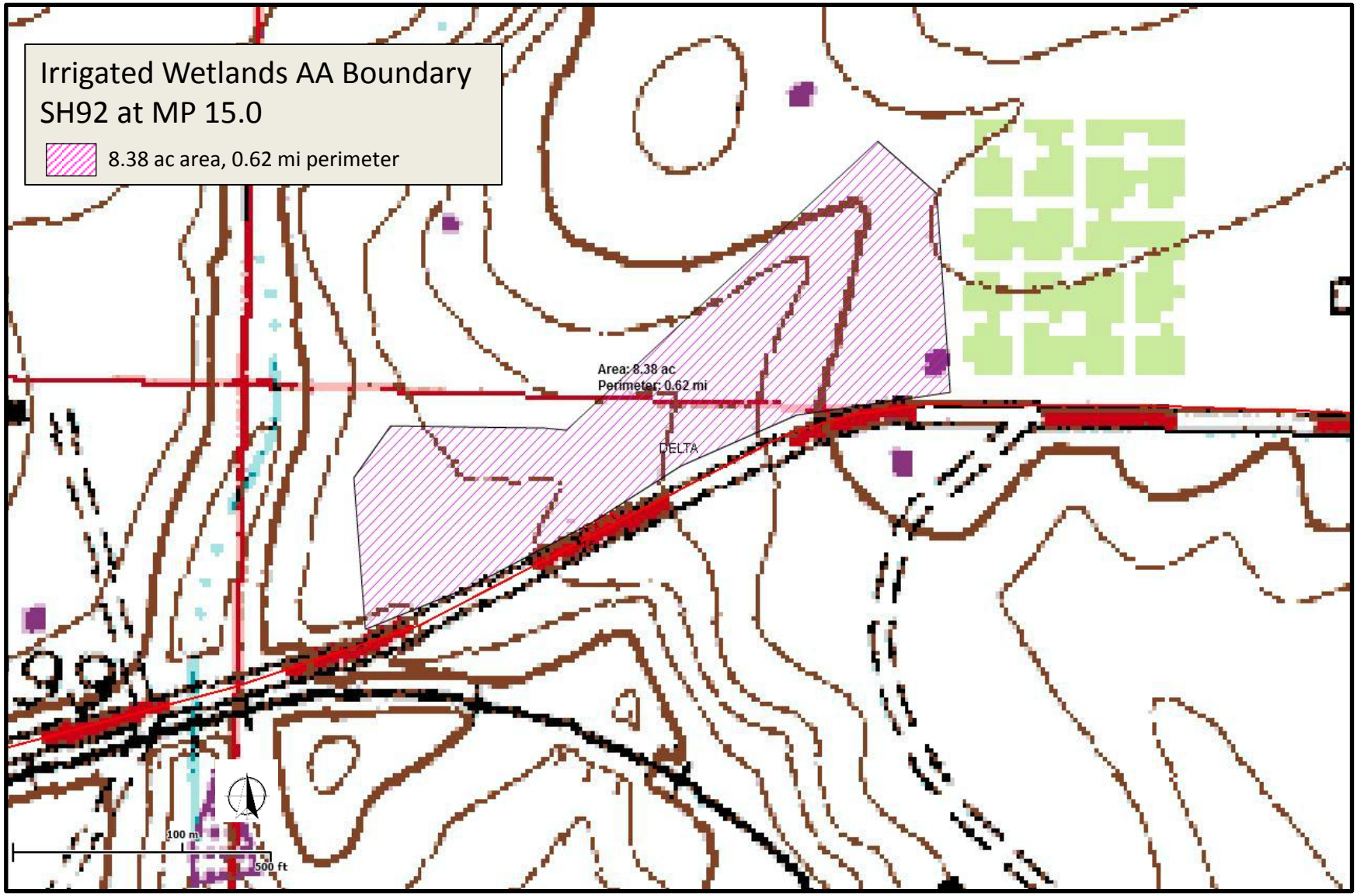
Site Map

Scale: 1 sq. =

Draw a sketch map of the site including relevant portions of the wetland, AA boundary, structures, habitat classes, and other significant features.

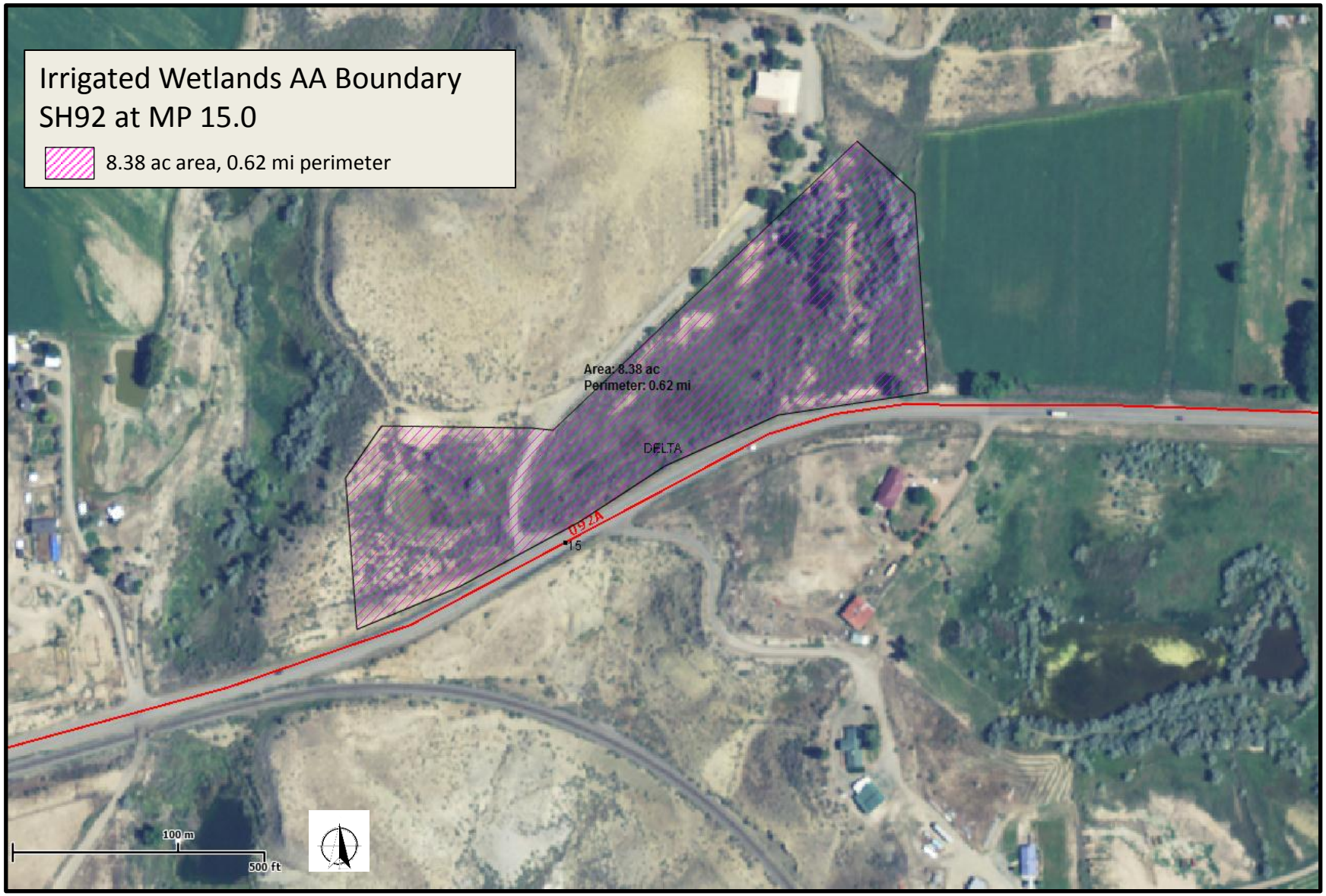
See attached.

Irrigated Wetlands Ecological Description 2 Site Map



Lazear 7.5' Topographic Quadrangle (1955)

Irrigated Wetlands Ecological Description 2 Aerial Photo



Variable 1: Habitat Connectivity

The Habitat Connectivity Variable is described by two sub-variables – Neighboring Wetland and Riparian Habitat Loss and Barriers to Migration and Dispersal. These sub-variables were treated as independent variables in FACWet Version 2.0. The merging of these variables makes their structure more consistent with that of other composite variables in FACWet. The new variable configuration also makes this landscape variable more accurately reflect the interactions amongst aquatic habitats in Colorado's agricultural and urbanized landscapes, which have a naturally low density of wetlands. The two Habitat Connectivity Sub-variables are scored in exactly the same manner as their FACWet 2.0 counterparts, as described below. The Habitat Connectivity Variable score is simply the arithmetic average of the two sub-variable scores which is entered on the second page of the Variable 1 data form. If there is little or no wetland or riparian habitat in the Habitat Connectivity Envelope (defined below), then Sub-variable 1.1 is not scored.

SV 1.1 - Neighboring Wetland and Riparian Habitat Loss

(Do not score if few or no wetlands naturally exist in the HCE)

This sub-variable is a measure of how isolated from other naturally-occurring wetlands or riparian habitat the AA has become as the result of habitat destruction. To score this sub-variable, estimate the percent of naturally-occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within the 500-meter-wide belt surrounding the AA. This zone is called the Habitat Connectivity Envelope (HCE). In most cases the evaluator must use best professional judgment to estimate the amount of natural wetland loss. Historical photographs, National Wetland Inventory (NWI) maps, hydric soil maps can be helpful in making these determinations. Floodplain maps are especially valuable in river-dominated regions, such as the Front Range urban corridor. Evaluation of landforms and habitat patterns in the context of perceivable land use change is used to steer estimates of the amount of wetland loss within the HCE.

Rules for Scoring:

1. On the aerial photo, create a 500 m perimeter around the AA.
2. The area within this perimeter is the **Habitat Connectivity Envelope (HCE)**.
3. Within the HCE, outline the current extent of naturally occurring wetland and riparian habitat. Do not include habitats such as excavated ponds or reservoir induced fringe wetlands.
4. Outline the historical extent of wetland and riparian habitats (i.e., existing natural wetlands plus those that have been destroyed).

- Use your knowledge of the history of the area and evident land use change to identify where habitat losses have occurred. Additional research can be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, soil maps, etc.

5. Calculate the area of existing and historical wetlands. Divide the area of existing wetland by the total amount of existing and historical wetland and riparian habitat, and determine the variable score using the guidelines below. Enter sub-variable score at the bottom of p.2 of the Habitat Connectivity data form.

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	***A*** *Reference Standard*	Wetland losses are absent or negligible or there is no evidence to suggest the native landscape within the HCE historically contained other wetland habitats
<0.9 - 0.8	***B*** *Highly Functioning*	More than 80% of historical wetland habitat area within the HCE is still present (less than 20% of habitat area lost).
<0.8 - 0.7	***C*** *Functioning*	80 to 60% of historical wetland habitat area within the HCE is still present (20% to 40% of habitat area lost).
<0.7 - 0.6	***D*** *Functioning Impaired*	Less than 60 to 25% of historical wetland habitat area within the HCE is still present (more than 40 to 75% of habitat area lost).
<0.6	***F*** *Non-functioning*	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).

Note: Unscored

Variable 1: Habitat Connectivity p. 2

SV 1.2: Migration/Dispersal Barriers

This sub-variable is intended to rate the degree to which the AA has become isolated from existing neighboring wetland and riparian habitat by artificial barriers that inhibit migration or dispersal of organisms. On the aerial photograph, identify the man-made barriers within the HCE that intercede between the AA and surrounding wetlands and riparian areas, and identify them by type on the stressor list. Score this variable based on the barriers' impermeability to migration and dispersal and the amount of surrounding wetland/riparian habitat they affect.

Rules for Scoring:

1. On the aerial photo, outline **all** existing wetland and riparian habitat areas within the HCE. This includes naturally occurring habitats, as well as those purposefully created or induced by land use change.

2. Identify artificial barriers to dispersal and migration of organisms within the HCE that intercede between the AA and surrounding habitats. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.

3. Considering the composite effect of all of identified barriers to migration and dispersal (i.e., stressors), assign an overall variable score using the scoring guidelines.

Stressors = artificial barriers	✓	Stressors	Comments/description
	✓	Major Highway	SH 92 on the south side.
		Secondary Highway	
	✓	Tertiary Roadway	Dirt road to Stengel's gunshop bisects wetlands.
		Railroad	
		Bike Path	
		Urban Development	
	✓	Agricultural Development	Some cattle usage was evident.
	✓	Artificial Water Body	Stockpond excavated out of Wetland #3.
	✓	Fence	Fenced all around the perimeter.
		Ditch or Aqueduct	
	✓	Aquatic Organism Barriers	Lower part is culverted. Leopard frogs were present when ponded.

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	***A*** *Reference Standard*	No appreciable barriers exist between the AA and other wetland and riparian habitats in the HCE; or there are no other wetland and riparian areas in the HCE.
<0.9 - 0.8	***B*** *Highly Functioning*	Barriers impeding migration/dispersal between the AA and up to 33% of surrounding wetland/riparian habitat highly permeable and easily passed by most organisms. Examples could include gravel roads, minor levees, ditches or barbed-wire fences. More significant barriers (see "functioning category below) could affect migration to up to 10% of surrounding wetland/riparian habitat.
<0.8 - 0.7	***C*** *Functioning*	Barriers to migration and dispersal retard the ability of many organisms/propagules to pass between the AA and up to 66% of wetland/riparian habitat. Passage of organisms and propagules through such barriers is still possible, but it may be constrained to certain times of day, be slow, dangerous or require additional travel. Busy two-lane roads, culverted areas, small to medium artificial water bodies or small earthen dams would commonly rate a score in this range. More significant barriers (see "functioning impaired" category below) could affect migration to up to 10% of surrounding wetland/riparian habitat.
<0.7 - 0.6	***D*** *Functioning Impaired*	Barriers to migration and dispersal preclude the passage of some types of organisms/propagules between the AA and up to 66% of surrounding wetland/riparian habitat. Travel of those animals which can potentially negotiate the barrier are strongly restricted and may include a high chance of mortality. Up to 33% of surrounding wetland/riparian habitat could be functionally isolated from the AA.
<0.6	***F*** *Non-functioning*	AA is essentially isolated from surrounding wetland/riparian habitat by impermeable migration and dispersal barriers. An interstate highway or concrete-lined water conveyance canal are examples of barriers which would generally create functional isolation between the AA and wetland/riparian habitat in the HCE.

SV 1.1 Score	
SV 1.2 Score	0.60

Add SV 1.1 and 1.2 scores and divide by two to calculate variable score

Variable 1 Score 0.60

Variable 2: Contributing Area

The AA's Contributing Area is defined as the 250-meter-wide zone surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to support characteristic functions of high quality wetland habitat. Depending on its condition, the contributing area can help maintain wetland condition or it can degrade it. Contributing Area condition is evaluated by considering the AA's Buffer and its Surrounding Land Use. Buffers are strips or patches of more-or-less natural upland and/or wetland habitat more than 5m wide. Buffers are contiguous with the AA boundary and they intercede between it and more intensively used lands. The AA Buffer is characterized with three sub-variables: Buffer Condition, Buffer Extent, and Average Buffer Width. The Surrounding Land Use Sub-variable considers changes within the Contributing Area that limit its capacity to support characteristic wetland functions. Many of the acute, on-site effects of land use change in the Contributing Area are specifically captured by Variables 3 - 8.

Rules for Scoring:

1. Delimit the Contributing Area on an aerial photograph as the zone within 250 meters of the outer boundary of the AA.
2. Evaluate and then rate the Buffer Condition sub-variable using the scoring guidelines. Record the score in the cell provided on the datasheet.
3. Indicate on the aerial photograph zones surrounding the AA which have ≥5m of buffer vegetation and those which do not.
4. Calculate the percentage of the AA which has a Buffer and record the value where indicated on the data sheet.
5. Rate the *Buffer Extent* Sub-variable using the scoring guidelines.
6.Determine the average Buffer width by drawing a line perpendicularly from the AA boundary to the outer extent of the buffer habitat. Measure line length and record its value on the data sheet. Repeat this process until a total of 8 lines have been sampled.
7. Calculate the average buffer width and record value on the data form. Then determine the sub-variable score using the scoring guidelines.
8.Score the Surrounding Land Use sub-variable by recording land use changes on the stressor list that affect the capacity of the landscape to support characteristic wetland functioning.
9. Enter the **lowest** of the three Buffer sub-variable scores along with the Surrounding Land Use Sub-variable score in the Contributing Area Variable scoring formula at the bottom of p. 2 of the data form. The Contributing Area Variable is the average of the two sub-variable scores.

SV 2.1 - Buffer Condition

0.6 ***SV 2.1 - Buffer Condition Score***

Subvariable Score	Condition Grade	Buffer Condition Scoring Guidelines
1.0 - 0.9	*Reference Standard*	Buffer vegetation is predominately native vegetation, human-caused disturbance of the substrate is not evident, and human visitation is minimal. Common examples: Wilderness areas, undeveloped forest and range lands.
<0.9 - 0.8	*Highly Functioning*	Buffer vegetation may have a mixed native-nonnative composition, but characteristic structure and complexity remain. Soils are mostly undisturbed or have recovered from past human disturbance. Little or only low-impact human visitation. Buffers with higher levels of substrate disturbance may be included here if the buffer is still able to maintain predominately native vegetation. Common examples: Dispursed camping areas in national forests, common in wildland parks (e.g. State Parks) and open spaces.
<0.8 - 0.7	*Functioning*	Buffer vegetation is substantially composed of non-native species. Vegetation structure may be somewhat altered, such as by brush clearing. Moderate substrate disturbance and compaction occurs, and small pockets of greater disturbance may exist. Common examples: City natural areas, mountain hay meadows.
<0.7 - 0.6	*Functioning Impaired*	Buffer vegetation is substantially composed of non-native species and vegetation structure has been strongly altered by the complete removal of one or more strata. Soil disturbance and the intensity of human visitation are generally high. Common examples: Open lands around resource extraction sites (e.g., gravel mines), clear cut logging areas, ski slopes.
<0.6	*Non-functioning*	Buffer is nearly or entirely absent.

SV 2.2 - Buffer Extent

0.60 Precent of AA with Buffer

0.60 ***SV 2.2 - Buffer Extent***

Subvariable Score	Condition Class	% Buffer Scoring Guidelines
1.0 - 0.9	*Reference Standard*	90 - 100% of AA with Buffer
<0.9 - 0.8	*Highly Functioning*	70-90% of AA with Buffer
<0.8 - 0.7	*Functioning*	51-69% of AA with Buffer
<0.7 - 0.6	*Functioning Impaired*	26-50% of AA with Buffer
<0.6	*Non-functioning*	0-25% of AA with Buffer

Variable 2: Contributing Area (p. 2)

SV 2.3 - Average Buffer Width

Record measured buffer widths in the spaces below and average.

Line #	1	2	3	4	5	6	7	8	Avg. Buffer Width (m)
Buffer Width (m)	102.2	28.6	9.1	12.3	5.3	6.1	5.7	13.1	23

0.65

SV 2.3 - Average Buffer Width Score

Subvariable Score	Condition Grade	Buffer Width Scoring Guidelines
1.0 - 0.9	*Reference Standard*	Average Buffer width is 190-250m
<0.9 - 0.8	*Highly Functioning*	Average Buffer width is 101-189m
<0.8 - 0.7	*Functioning*	Average Buffer width is 31-100m
<0.7 - 0.6	*Functioning Impaired*	Average Buffer width is 6-30m
<0.6	*Non-functioning*	Average Buffer width is 0-5m

SV 2.4 - Surrounding Land Use

0.65

SV 2.4 - Surrounding Land Use Score

Catalog and characterize land use changes in the surrounding landscape and score.

Stressors = Land Use Changes

✓	Stressors	Comments/description
	Industrial/commercial	
	Urban	
✓	Residential	medium-high
✓	Rural	
	Dryland Farming	
✓	Intensive Agriculture	
	Orchards or Nurseries	
	Livestock Grazing	
✓	Transportation Corridor	highway
	Urban Parklands	
✓	Dams/impoundments	several stockponds
	Artificial Water body	
	Physical Resource Extraction	
	Biological Resource Extraction	
✓	Other	

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	***A*** *Reference Standard*	No appreciable land use change has been imposed Surrounding Landscape.
<0.9 - 0.8	***B*** *Highly Functioning*	Some land use change has occurred in the Surrounding Landscape, but changes have minimal effect on the the landscape's capacity to support characteristic aquatic functioning, either because land use is not intensive, for example haying, light grazing, or low intensity silviculture, or more substantial changes occur in approximately less than 10% of the area.
<0.8 - 0.7	***C*** *Functioning*	Surrounding Landscape has been subjected to a marked shift in land use, however, the land retains much of its capacity to support natural wetland function and it is not an overt source of pollutants or sediment. Moderate-intensity land uses such as dry-land farming, urban "green" corridors, or moderate cattle grazing would commonly be placed within this scoring range.
<0.7 - 0.6	***D*** *Functioning Impaired*	Land use changes within the Surrounding Landscape has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surfaces; considerable in-flow urban runoff or fertilizer-rich waters common. Supportive capacity of the land has been greatly diminished but not totally extinguished. Intensively logged areas, low-density urban developments, some urban parklands and many cropping
<0.6	***F*** *Non-functioning*	The Surrounding Landscape is essentially comletely developed or is otherwise a cause of severe ecological stress on wetland habitats. Commercial developments or highly urban landscapes generally rate a score of less than 0.6.

(	Buffer Score (Lowest score)	+	Surrounding Land Use	) ÷	2	=	Variable 2 Score
	0.6		0.65				0.63

Variable 3: Water Source

This variable is concerned with ***up-gradient*** *hydrologic connectivity. It is a measure of impacts to the AA's water source, including the quantity and timing of water delivery, and the ability of source water to perform work such as sediment transport, erosion, soil pore flushing, etc. To score this variable, identify stressors that alter the source of water to the AA, and record their presence on the stressor list. Stressors can impact water source by depletion, augmentation, or alteration of inflow timing or hydrodynamics. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 7.*

Scoring rules:

1. Use the stressor list and knowledge of the watershed to catalog type-specific impairments of the AA's water source. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.

2. Considering the composite effect of stressors on the water source, rate the condition of this variable with the aid of the scoring guidelines.

✔	Stressors	Comments/description
✔	Ditches or Drains (tile, etc.)	irrigation ditches
✔	Dams	
	Diversions	
	Groundwater pumping	
	Draw-downs	
✔	Culverts or Constrictions	one
	Point Source (urban, ind., ag.)	
✔	Non-point Source	suspected leaching field
	Increased Drainage Area	
	Storm Drain/Urban Runoff	
	Impermeable Surface Runoff	
✔	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
	Transbasin Diversion	
	Actively Managed Hydrology	

Variable Score	Condition Grade	Depletion	Augmentation
1.0 - 0.9	***A*** *Reference Standard*	Unnatural drawdown events minor, rare or non-existent, very slight uniform depletion, or trivial alteration of hydrodynamics.	Unnatural high-water events minor, rare or non-existent, slight uniform increase in amount of inflow, or trivial alteration of hydrodynamics.
<0.9 - 0.8	***B*** *Highly Functioning*	Unnatural drawdown events occasional, short duration and/or mild; or uniform depletion up to 20%; or mild to moderate reduction of peak flows or capacity of water to perform work.	Occasional unnatural high-water events, short in duration and/or mild in intensity; or uniform augmentation up to 20%; or mild to moderate increase of peak flows or capacity of water to perform work.
<0.8 - 0.7	***C*** *Functioning*	Unnatural drawdown events common and of mild to moderate intensity and/or duration; or uniform depletion up to 50%; or moderate to substantial reduction of peak flows or capacity of water to perform work.	Common occurrence of unnatural high-water events, of a mild to moderate intensity and/or duration; or uniform augmentation up to 50%; or moderate to substantial increase of peak flows or capacity of water to perform work.
<0.7 - 0.6	***D*** *Functioning Impaired*	Unnatural drawdown events occur frequently with a moderate to high intensity and/or duration; or uniform depletion up to 75%; or substantial reduction of peak flows or capacity of water to perform work. **Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.**	Common occurrence of unnatural high-water events, some of which may be severe in nature or exist for a substantial portion of the growing season; or uniform augmentation more than 50% or capacity of water to perform work. **Wetlands with actively managed or wholly artificial hydrology will usually score in this range or**
<0.6	***F*** *Non-functioning*	Water source diminished enough to threaten or extinguish wetland hydrology in the AA.	Frequency, duration or magnitude of unnaturally high-water great enough to change the fundamental characteristics of the wetland.

Variable 3 Score 0.65

Variable 4: Water Distribution

This variable is concerned with hydrologic connectivity ***within*** *the AA. It is a measure of alteration to the spatial distribution of surface and groundwater within the AA. These alterations are manifested as local changes to the hydrograph and generally result from geomorphic modifications within the AA. To score this variable, identify stressors within the AA that alter flow patterns and impact the hydrograph of the AA, including localized increases or decreases to the depth or duration of the water table or surface water.*

Because the wetland's ability to distribute water in a characteristic fashion is fundamentally dependent on the condition of its water source, ***in most cases the Water Source variable score will define the upper limit Water Distribution score****. For example, if the Water Source variable is rated at 0.85, the Water Distribution score will usually have the potential to attain a maximum score of 0.85. Additional stressors within or outside the lower end of the AA effecting water distribution (e.g., ditches and levees) will reduce the score from the maximum value.*

Scoring rules:

1. Identify impacts to the natural distribution of water throughout the AA and catalog them in the stressor table.

2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. In most cases, the Water Source variable score will set the upper limit for the Water Distribution score.

✔	Stressors	Comments/description
✔	Alteration of Water Source	controlled
✔	Ditches	
✔	Ponding/Impoundment	
✔	Culverts	
	Road Grades	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Enlarged Channel	
	Artificial Banks/Shoreline	
	Weirs	
✔	Dikes/Levees/Berms	Berms due to tertiary roads.
	Diversions	
	Sediment/Fill Accumulation	

Variable Score	Condition Grade	Non-riverine	Riverine
1.0 - 0.9	***A*** *Reference Standard*	Little or no alteration has been made to the way in which water is distributed throughout the wetland. AA maintains a natural hydrologic regime.	Natural active floodplain areas flood on a normal recurrence interval. No evidence of alteration of flooding and subirrigation duration and intensity.
<0.9 - 0.8	***B*** *Highly Functioning*	Less than 10% of the AA is affected by *in situ* hydrologic alteration; or more widespread impacts result in less than a 2 in. (5 cm) change in mean growing season water table elevation.	Channel-adjacent areas have occasional unnatural periods of drying or flooding; or uniform shift in the hydrograph less than typical root depth.
<0.8 - 0.7	***C*** *Functioning*	Between 10 and 33% of the AA is affected by *in situ* hydrologic alteration; or more widespread impacts result in a 4 in. (5 cm) or less change in mean growing season water table elevation.	In channel-adjacent area, periods of drying or flooding are common; or uniform shift in the hydrograph near root depth.
<0.7 - 0.6	***D*** *Functioning Impaired*	33 to 66% of the AA is affected by *in situ* hydrologic alteration; or more widespread impacts result in a 6 in. (15 cm) or less change in mean growing season water table elevation. Water table behavior must still meet jurisdictional criteria to merit this rating.	Adjacent to the channel, unnatural periods of drying or flooding are the norm; or uniform shift in the hydrograph greater than root depth.
<0.6	***F*** *Non-functioning*	More than 66% of the AA is affected by hydrologic alteration which changes the fundamental functioning of the wetland system, generally exhibited as a conversion to upland or deep water habitat.	Historical active floodplain areas are almost never wetted from overbank flooding, and/or groundwater infiltration is effectively cut off.

Variable 4 Score 0.6

Variable 5: Water Outflow

This variable is concerned with ***down-gradient*** *hydrologic connectivity and the flow of water and water-borne materials and energy out of the AA. In particular it illustrates the degree to which the AA can support the functioning of down-gradient habitats. It is a measure of impacts that affect the hydrologic outflow of water including the passage of water through its normal low- and high-flow surface outlets, infiltration/groundwater recharge, and the energetic characteristics of water delivered to dependent habitats. In some cases, alteration of evapotranspiration rates may be significant enough of a factor to consider in scoring. Score this variable by identifying stressors that impact the means by which water is exported from the AA. To evaluate this variable focus on how water, energy and associated materials are exported out of the AA and their ability it support down-gradient habitats in a manner consistent with their HGM (regional) subclass.*

Because the wetland's ability to export water and materials in a characteristic fashion is to a very large degree dependent the condition of its water source, as with the Water Distribution variable, ***in most cases the Water Source variable score will define the upper limit Water Outflow score****.*

Scoring rules:

1. Identify impacts to the natural outflow of water from the AA and catalog them in the stressor table.

2.Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. Take in to account the cumulative effect of stressors on the wetland's ability to export water and water-borne materials. In most cases the Water Source variable will set the upper limit for the Water Outflow score.

✔	Stressors	Comments/description
✔	Alteration of Water Source	Controlled water source. ET rates are high.
	Ditches	
	Dikes/Levees	
✔	Road Grades	
	Culverts	
	Diversions	
✔	Constrictions	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Artificial Stream Banks	
	Weirs	
	Confined Bridge Openings	

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	***A*** *Reference Standard*	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.
<0.9 - 0.8	***B*** *Highly Functioning*	High- or low-water outflows are mildly to moderately affected, but at intermediate ("normal") levels flow continues essentially unaltered in quantity or character.
<0.8 - 0.7	***C*** *Functioning*	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics moderately affected.
<0.7 - 0.6	***D*** *Functioning Impaired*	Outflow at all stages is moderately to highly impaired resulting in persistent flooding of portions of the AA or unnatural drainage; or outflow hydrodynamics severely disrupted.
<0.6	***F*** *Non-functioning*	The natural outflow regime is profoundly impaired. Down-gradient hydrologic connection severed or nearly so. Alterations may cause widespread unnatural persistent flooding or dewatering of the wetland system.

Variable 5 Score 0.6

Variable 6: Geomorphology

This variable is a measure of the degree to which the geomorphic setting has been altered within the AA. Changes to the surface configuration and natural topography constitute stressors. Such stressors may be observed in the form of fill, excavation, dikes, sedimentation due to absence of flushing floods, etc. In riverine systems, geomorphic changes to the stream channel should be considered if the channel is within the AA (i.e, small is size). Alterations may involve the bed and bank (substrate embeddedness or morphological changes), stream instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland surface hydrology and water relations with vegetation. Geomorphic alterations can also directly affect soil properties, such as near-surface texture, and the wetland chemical environment such as the redox state or nutrient composition in the rooting zone. In rating this variable, ***do not*** *include these resultant effects of geomorphic change; rather focus on the physical impacts* ***within the footprint*** *of the alteration* ***within the AA*** *– For example, the width and depth of a ditch or the size of a levee* ***within the AA*** *would describe the extent of the stressors. The secondary effects of geomorphic change are addressed by other variables. All alterations to geomorphology should be evaluated including small-scale impacts such as pugging, hoof sheer, and sedimentation which can be significant but not immediately obvious.*

Scoring Rules:

1. Identify impacts to geomorphological setting and topography within the AA and record them on the stressor checklist.
2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines.

✔		Stressors	Comments
	General	Dredging/Excavation/Mining	
✔		Fill, including dikes, road grades, etc	
		Grading	
		Compaction	
		Plowing/Disking	
		Excessive Sedimentation	
		Dumping	
✔		Hoof Shear/Plugging	very minor.
		Aggregate or Mineral Mining	
		Sand Accumulation	
	Channels Only	Channel Instability/Over Widening	
		Excessive Bank Erosion	
		Channelization	
		Reconfigured Stream Channels	
		Artificial Banks/Shoreline	
		Beaver Dam Removal	
		Substrate Embeddedness	
		Lack or Excess of Woody Debris	

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	***A*** *Reference Standard*	Topography essentially unaltered from the natural state, or alterations appear to have a minimal effect on wetland functioning and condition. Patch or microtopographic complexity may be slightly altered, but native plant communities are still supported.
<0.9 - 0.8	***B*** *Highly Functioning*	Alterations to topography result in small but detectable changes to habitat conditions in some or all of the AA; or more severe impacts exist but affect less than 10% of the AA.
<0.8 - 0.7	***C*** *Functioning*	Changes to AA topography may be pervasive but generally mild to moderate in severity. May include patches of more significant habitat alteration; or more severe alterations affect up to 20 % of the AA.
<0.7 - 0.6	***D*** *Functioning Impaired*	At least one important surface type or landform has been eliminated or created; microtopography has been strongly impacted throughout most or all of the AA; or more severe alterations affect up to 50% of the AA. Evidence that widespread diminishment or alteration of native plant community exist due to physical habitat alterations. Most incidentally created wetland habitat such as that created by roadside ditches and the like would score in this range or lower.
<0.6	***F*** *Non-functioning*	Pervasive geomorphic alterations have caused a fundamental change in site character and functioning, commonly resulting in a conversion to upland or deepwater habitat.

Variable 6 Score 0.65

Variable 7: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants, water and soil characteristics. The origin of pollutants may be within or outside the AA. Score this variable by listing indicators of chemical stress in the AA. Consider point source and non-point sources of pollution, as well as mechanical or hydrologic changes that alter the chemical environment. Because water quality frequently cannot be inferred directly, the presence of stressors is often identified by the presence of indirect indicators. Five sub-variables are used to describe the Water and Soil Chemical Environment: Nutrient Enrichment/Eutrophication/Oxygen; Sedimentation/Turbidity; Toxic Contamination/pH; Temperature; and Soil Chemistry and Redox Potential. Utilization of web-based data mining tools is highly recommended to help inform and support variable scores.

Scoring rules:

1. Stressors are grouped into sub-variables which have a similar signature or set of causes.
2. Use the indicator list to identify each stressor impacting the chemical environment of the AA.
3. For each sub-variable, determine its score using the scoring guideline table provided on the second page of the scoring sheet. Scoring sub-variables is carried out in exactly the same way as normal variable scoring.
   -If the AA is part of a water body that is recognized as impaired or recommended for TMDL development for one of the factors, then score that sub-variable 0.65 or lower.
4. Transcribe sub-variable scores to the following variable scoring page and compute the sum.
5. The lowest sub-variable score sets the letter grade range. The composite of sub-variables influences the score within that range.

Sub-variable	Stressor Indicator	✓	Comments	Sub-variable Score
SV 7.1 Nutrient Enrichment/ Eutrophication/ Oxygen (D.O.)	Livestock	✓		0.80
	Agricultural Runoff	✓		
	Septic/Sewage	✓	unknown	
	Excessive Algae or Aquatic Veg.			
	Cumulative Watershed NPS			
	CDPHE Impairment/TMDL List			
SV 7.2 Sedimentation/ Turbidity	Excessive Erosion			0.80
	Excessive Deposition			
	Fine Sediment Plumes			
	Agricultural Runoff			
	Excessive Turbidity			
	Nearby Construction Site			
	Cumulative Watershed NPS			
	CDPHE Impairment/TMDL List			
SV 7.3 Toxic contamination/ pH	Recent Chemical Spills			0.80
	Nearby Industrial Sites			
	Road Drainage/Runoff	✓		
	Livestock	✓		
	Agricultural Runoff			
	Storm Water Runoff	✓		
	Fish/Wildlife Impacts			
	Vegetation Impacts			
	Cumulative Watershed NPS			
	Acid Mine Drainage			
	Point Source Discharge			
	CDPHE Impairment/TMDL List			
	Metal staining on rocks and veg.			
SV 7.4 Temperature	Excessive Temperature Regime			0.80
	Lack of Shading			
	Reservoir/Power Plant Discharge			
	Industrial Discharge			
	Cumulative Watershed NPS			
	CDPHE Impairment/TMDL List			
SV 7.5 Soil chemistry/ Redox potential	Unnatural Saturation/Desaturation			0.80
	Mechanical Soil Disturbance			
	Dumping/introduced Soil			
	CDPHE Impairment/TMDL List			

Variable 7: Water and Soil Chemical Environment p.2

Sub-variable Scoring Guidelines

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	***A*** *Reference Standard*	Stress indicators not present or trivial.
<0.9 - 0.8	***B*** *Highly Functioning*	Stress indicators scarcely present and mild, or otherwise not occurring in more than 10% of the AA.
<0.8 - 0.7	***C*** *Functioning*	Stress indicators present at mild to moderate levels, or otherwise not occurring in more than 33% of the AA.
<0.7 - 0.6	***D*** *Functioning Impaired*	Stress indicators present at moderate to high levels, or otherwise not occurring in more than 66% of the AA
<0.6	***F*** *Non-functioning*	Stress indicators strongly evident throughout the AA at levels which apparently alter the fundamental chemical environment of the wetland system

Input each sub-variable score from p. 1 of the V7 data form and calculate the sum.

Nutrient enrichment/ Eutrophication/ Oxygen (D.O.)		Sedimentation/ Turbidity		Toxic contamination/ pH		Temperature		Soil chemistry/ Redox potential		Sum of Sub-variable Scores
0.80	+	0.80	+	0.80	+	0.80	+	0.80	=	4.00

Use the table to score the Chemical Environment Variable circling the applicable scoring rules.

Variable Score	Condition Grade	Scoring Rules		
		Single Factor		**Composite Score**
1.0 - 0.9	***A*** *Reference Standard*	No single factor scores < 0.9		The factor scores sum > 4.5
<0.9 - 0.8	***B*** *Highly Functioning*	Any single factor scores ≥ 0.8 but < 0.9		The factor scores sum >4.0 but ≤4.5
<0.8 - 0.7	***C*** *Functioning*	Any single factor scores ≥ 7.0 but < 0.8		The factor scores sum >3.5 but ≤ 4.0
<0.7 - 0.6	***D*** *Functioning Impaired*	Any single factor scores ≥ 0.6 but <0.7		The factor scores sum >3.0 but ≤3.5
< 0.6	***F*** *Non-functioning*	Any single factor scores < 0.6		The factor scores sum < 3.0

Variable 7 Score 0.75

Variable 8: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It particularly focuses on the wetland's ability to perform higher-order functions such as support of wildlife populations, and influence primary functions such as flood-flow attenuation, channel stabilization and sediment retention. Score this variable by listing stressors that have affected the structure, diversity, composition and cover of each vegetation stratum that would normally be present in the HGM (regional) subclass being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition or from the natural range of variability exhibited the HGM subclass or regional subclass. This variable has four sub-variables, each corresponding to a stratum of vegetation: Tree Canopy; Shrub Layer; Herbaceous Layer; and Aquatics.

Rules for Scoring:

1. Determine the number and types of vegetation layers present within the AA. Make a judgment as to whether additional layers were historically present using direct evidence such as stumps, root wads or historical photographs. Indirect evidence such as local knowledge and expert opinion can also be used in this determination.

2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.

3. Estimate and record the current coverage of each vegetation layer at the top of the table.

4. Record the Reference Standard or expected percent coverage of each vegetation layer to create the sub-variable weighting factor. The condition of predominant vegetation layers has a greater influence on the variable score than do minor components.

5. Enter the percent cover values as decimals in the row of the stressor table labeled " Reference/expected Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).

6. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table. The difference between the expected and observed stratum coverages is one measure of stratum alteration.

7. Determine the sub-variable score for each valid vegetation layer using the scoring guidelines on the second page of the scoring sheet. Enter each sub-variable score in the appropriate cell of the row labeled "Veg. Layer Sub-variable Score". If a stratum has been wholly removed score it as 0.5.

8. Multiply each layer's *Reference Percent Cover of Layer* score by its Veg. Layer Sub-variable scores and enter the products in the labled cells. These are the weighted sub-variable scores. Individually sum the *Reference Percent Cover of Layer* and *Weighted Sub-variables scores.*

9. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 8 score. Enter this number in the labeled box at the bottom of this page.

	Vegetation Layers				
Current % Coverage of Layer	40	40	90	0	
Stressor	**Tree**	**Shrub**	**Herb**	**Aquatic**	**Comments**
Noxious Weeds	✓		✓		Russian olive, knapweed, Canada thistle common.
Exotic/Invasive spp.	✓		✓		
Tree Harvest					
Brush Cutting/Shrub Removal					
Livestock Grazing			✓		
Excessive Herbivory					
Mowing/Haying					
Herbicide					
Loss of Zonation/Homogenization					
Dewatering					
Over Saturation					
DIFFERENCE BETWEEN CURRENT COVERAGE AND REFERENCE/EXPECTED					

Reference/Expected % Cover of Layer	0.00	+	30.00	+	0.80	+	0.00	= 30.8
	x		x		x		x	
Veg. Layer Sub-variable Score	0.6		0.6		0.6		1	÷
	=		=		=		=	
Weighted Sub-variable Score	0.00	+	18.00	+	0.48	+	0.00	= 18.48

See sub-variable scoring guidelines on following page

Variable 8 Score 0.60

Variable 8: Vegetation Structure and Complexity p. 2

Sub-variable 8 Scoring Guidelines:

Based on the list of stressors identified above, rate the severity of their cumulative effect on vegetation structure and complexity for each vegetation layer.

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	***A*** *Reference Standard*	Stressors not present or with an intensity low enough as to not detectably affect the structure, diversity or composition of the vegetation layer.
<0.9 - 0.8	***B*** *Highly Functioning*	Stressors present at intensity levels sufficient to cause detectable, but minor, changes in layer composition. Stress related change should generally be less than 10% for any given attribute (e.g., 10% cover of invasive, 10% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as high as 33% for a given attribute if stressors are confined to patches comprising less than 10% of the wetland.
<0.8 - 0.7	***C*** *Functioning*	Stressors present with enough intensity to cause significant changes in the character of vegetation, including alteration of layer coverage, structural complexity and species composition. The vegetation layer retains its essential character though. AA's with a high proportion of non-native grasses will commonly fall in this class. Stress related change should generally be less than 33% for any given attribute (e.g., 33% cover of invasive, 33% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as much as 66% for a given attribute if stressors are confined to patches comprising less than 25% of the wetland.
<0.7 - 0.6	***D*** *Functioning Impaired*	Stressor intensity severe enough to cause profound changes to the fundamental character of the vegetation layer. Stress-related change should generally be less than 66% for any given attribute (e.g., 66% cover of invasive, 66% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as much as 80% of a given attribute if stressors are confined to patches comprising less than 50% of the wetland.
<0.6	***F*** *Non-functioning*	Vegetation layer has been completely removed or altered to the extent that is no longer comparable to the natural structure, diversity and composition.

FACWet Score Card

Scoring Procedure:

1. Transcribe variable scores from each variable data sheet to the corresponding cell in the variable score table.
2. In each Functional Capacity Index (FCI) equation, enter the corresponding variable scores in the equation cells. Do not enter values in the crossed cells lacking labels.
3. Add the variable scores to calculate the total functional points achieved for each function.
4. Divide the total functional points achieved by the functional points possible. The typical number of total points possible is provided, however, if a variable is added or subtracted to FCI equation the total possible points must be adjusted
5. Calculate the Composite FCI, by adding the FCI scores and dividing by the total number of functions scored (usually 7).
6. If scoring is done directly in the Excel spreadsheet, all values will be transferred and calculated automatically.

VARIABLE SCORE TABLE

Buffer & Landscape Context	**Variable 1:**	**Habitat Connectivity (Connect)**	0.60
	Variable 2:	**Contributing Area (CA)**	0.63
Hydrology	**Variable 3:**	**Water Source (Source)**	0.65
	Variable 4:	**Water Distribution (Dist)**	0.60
	Variable 5:	**Water Outflow (Outflow)**	0.60
Abiotic and Biotic Habitat	**Variable 6:**	**Geomorphology (Geom)**	0.65
	Variable 7:	**Chemical Environment (Chem)**	0.75
	Variable 8:	**Vegetation Structure and Complexity (Veg)**	0.60

Functional Capacity Indices

Function 1 -- Support of Characteristic Wildlife Habitat

$V1_{connect}$	+	$V2_{CA}$	+	$(2 \times V8_{veg})$				Total Functional Points		FCI
0.60	+	0.63	+	1.20	+		+	= 2.43	÷ 4	= 0.61

Function 2 -- Support of Characteristic Fish/aquatic Habitat

$(3 \times V3_{source})$	+	$(2 \times V4_{dist})$	+	$(2 \times V5_{outflow})$	+	$V6_{geom}$	+	$V7_{chem}$				
1.95	+	1.20	+	1.20	+	0.65	+	0.75	+		= 5.75	÷ 9 = 0.64

Function 3 -- Flood Attenuation

$V2_{CA}$	+	$(2 \times V3_{source})$	+	$(2 \times V4_{dist})$	+	$(2 \times V5_{outflow})$	+	$V6_{geom}$	+	$V8_{veg}$		
0.63	+	1.30	+	1.20	+	1.20	+	0.65	+	0.60	= 5.58	÷ 9 = 0.62

Function 4 -- Short- and Long-term Water Storage

$V3_{source}$	+	$(2 \times V4_{dist})$	+	$(2 \times V5_{outflow})$	+	$V6_{geom}$					
0.65	+	1.20	+	1.20	+	0.65	+		+	= 3.70	÷ 6 = 0.62

Function 5 -- Nutrient/Toxicant Removal

$(2 \times V2_{CA})$	+	$(2 \times V4_{dist})$	+	$V6_{geom}$	+	$V7_{chem}$				
1.25	+	1.20	+	0.65	+	0.75	+		= 3.85	÷ 6 = 0.64

Function 6 -- Sediment Retention/Shoreline Stabilization

$V2_{CA}$	+	$(2 \times V6_{geom})$	+	$(2 \times V8_{veg})$					
0.63	+	1.30	+	1.20	+		+	= 3.13	÷ 5 = 0.63

Function 7 -- Production Export/Food Chain Support

$V1_{connect}$	+	$(2 \times V5_{outflow})$	+	$V6_{geom}$	+	$V7_{chem}$	+	$(2 \times V8_{veg})$			
0.60	+	1.20	+	0.65	+	0.75	+	1.20	+	= 4.40	÷ 7 = 0.63

Sum of Individual FCI Scores 4.38

Divide by the Number of Functions Scored ÷ 7

Composite FCI Score 0.63

SH 92 Wetland Stressors

Colorado Wetlands Mapping Inventory

August 02, 2013


Watershed & Reference Data
Major River Basins
Major River Basins
River Subbasins (8-digit HUCs)
River Subbasins (8-digit HUCs)
Counties
Counties
Land Management (COMaP v8)
Private
Tribe
Federal/NPS/FWS
BLM
USFS
State
Local
Land Trust/NGO
Status Data
NWI Status
Digital Data
Scanned Images
Planned for 2011
Non-Digital Data
No Data
NWI Image Year
2009
2001
1990s
1980s
1970s
No Image
CDOW Riparian Status
Digital Data
No Data
Potential Fens Status
Digital Data
No Data
RMBO Potential Playas Status
Digital Data
No Data
Wetland Data
NWI Digital Data
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Lake
Riverine
Other
CDOW Riparian
Forested Deciduous
Forested Evergreen
Shrub
Herbaceous
Irrigated Agriculture
Open Water
Upland Vegetation
Potential Fens
Confirmed Fen
Modified Fen
Potential Fen
Peat Accumulating Wetland
Non-Fen Wetland
Potential Playas
Confirmed Playa
Potential Playa - Highly Probable
Potential Playa - Probable
Potential Playa - Possible
Potential Playa - Low Potential
CNHP Potential Wetland Conservation Areas
B1: Outstanding Biodiversity Significance
B2: Very High Biodiversity Significance
B3: High Biodiversity Significance
B4: Moderate Biodiversity Significance
B5: General Biodiversity Interest
CNHP Wetland Stressors
None
Low
Moderate
High
Severe
Ecoregion Data
EPA Ecoregion Level3
19a Rolling Sagebrush Steppe
19d Foothill Shrublands and Low Mountains
19e Salt Desert Shrub Basins
19f Laramie Basin
20a Montezuma-Cortez Uplands
20b Shale Deserts and Sedimentary Basins
20c Semiarid Benchlands and Canyonlands
20d Arid Canyonlands
20e Escarpments
20f Uinta Basin Rim
21a Alpine Zone
21b Crystalline Subalpine Forests
21c Crystalline Mid-Elevation Forests
21d Foothill Shrublands
21e Sedimentary Subalpine Forests
21f Sedimentary Mid-Elevation Forests
21g Volcanic Subalpine Forests
21h Volcanic Mid-Elevation Forests
21i Sagebrush Parks
21j Grassland Parks
22a San Luis Shrublands and Hills
22b San Luis Alluvial Flats and Wetlands
22c Salt Flats
22e Sand Dunes and Sand Sheets
25b Rolling Sand Plains
25c Moderate Relief Plains
25d Flat to Rolling Plains
25f Front Range Fans
25e Piedmont Plains and Tablelands
25f Mesa de Maya/Black Mesa
25g Purgatoire Hills and Canyons
25h Pinyon-Juniper Woodlands and Savannas
25i Pine-Oak Woodlands
25j Foothill Grasslands
25k Sandsheets
EPA Ecoregion Level2
19 Wyoming Basin
20 Colorado Plateaus
21 Southern Rockies
22 Arizona/New Mexico Plateau
25 High Plains
26 Southwestern Tablelands

COLORADO DEPARTMENT OF TRANSPORTATION **CATEGORICAL EXCLUSION DETERMINATION**	Date: 03/04/2010	Revision Date:	Project Code #: 17772 + 17774
	Project #: STA 092A-024 + STA 092A-23		
Project Name:	**SH 92 Stengel's Hill**		
Project Description:	**RECONSTRUCTION - RAILROAD UNDERPASS**		

A. Categorical Exclusion Project Determination

1. This project fits Categorical Exclusion or Programmatic CE number 23 CFR 771.117 PARAGRAPH (D) (1)
2. All required Clearance Actions indicated in Part B below have been completed. All Permits and Additional Requirements indicated in Part C below will be obtained before project ad.
3. No significant environmental impacts will result from this project. The Region Planning and Environmental manager (RPEM) will ensure implementation of required mitigation commitments.
4. CDOT Form #463 dated (Revised) is attached.

B. Clearance Actions

REQUIRED		DATE COMPLETED	REQUIRED		DATE COMPLETED
☐	Air Quality (hot spot analysis)		☐	Paleontology	09/10/2012
☐	Noise		☐	Archaeology	06/09/2012
	Hazardous Waste		☒	History	08/22/2012
	☐ ISA Checklist	07/31/2012	☐	Historic Bridge	
	☐ MESA (or Phase 1)		☒	4(f) De Minimis	08/21/2012
☐	Threatened or Endangered Species	09/07/2012	☐	6(f) Agreements	
☒	Wetland Delineation (survey)	08/15/2012	☐	Other	

All clearance requirements have been completed for the work indicated in the CDOT Form #463 referenced above.

RPEM Signature Michael E VanDeCoy | Date 09/11/2012 | Region # 03

I concur in the above category designation and the scope of environmental clearance/permits indicated.

for **FHWA Division Administrator Signature** (when required) Eva LaDous (Please return form to RPEM) | Date 09-17-2012

C. Permits and Additional Requirements

REQUIRED		DATE COMPLETED	REQUIRED		DATE COMPLETED
☒	404 Permit		☐	Division of Wildlife SB 40	
☐	401 Certification		☒	Wetland Finding	
	402 Certification		☐	APCD Bridge/Structure Demo permit	
	☒ Const Stormwater Permit (CDPS)		☐	Hazardous Material (Phase II)	
	☐ Const Dewatering Permit		☐	6(f) Completion	
☐	Floodplains Development Permit		☐	Other	

D. Comments

E. Environmental Project Certification

All clearance and permit requirements for this project have been completed and mitigation included in the set of plans and specifications dated . The appropriate documentation is on file in the Region office.

RPEM Signature | Date

Note to Project Manager: Any changes to the plans and specifications after the date of the RPEM signature in part B that affect environmental impacts or mitigation must be approved by the RPEM.

Distribution: **Previous editions are obsolete and may not be used** **CDOT Form #128a**

09/11/2012

RPEM (original); copies to: Project Manager, Region Right of Way (if ROW required), Central Files

17772

Project name: Stengel's Hill
Project number: STA 092A-024 County(s): Delta
Sub-acct: 17772 Region 3
Due date: 7/1/2012 Date completed: 9/7/2012
location: SH 92 MM 13.8-16
Description: minor widening and construction of a new grade separated RR crossing

Site visit? y
Photo? y **Contact:** Sherry Dunn
Elevation: 5330'
Habitat: Shale Deserts and Sedimentary Basins
It is sparsely vegetated with mat saltbush, bud sagebrush, galleta grass, and desert trumpet.
SGPI? n

Ownership CDOT, Private

ESA Species	Habitat?	NDIS	Other	Impact?	Rationale
Black-footed ferret	n			n	no p dog towns will be impacted
Canada lynx	n			n	below elevational tolerances
Clay-loving wild buckwheat	y	y	y	n	survey done, none found, FWS concurrence obtained
CO River fish	y	n	n	n	no depl to CO River Basin
Greenback cutthroat trout	n			n	no habitat will be impacted
Colorado hookless cactus	y	n	y	n	survey done, none found, FWS concurrence obtained
Wolverine	n			n	below elevational tolerances
Yellow-billed cuckoo	n			n	no habitat will be impacted

State species	Habitat	NDIS	Other	Impact?	Rationale
Colorado River Cutthroat Trout	n				no habitat will be impacted
Roundtail Chub	n				no habitat will be impacted
Boreal Toad	n				below elevational tolerances
Bald Eagle	n				no nests or roosts w/in 2 miles
Northern Leopard frog	n				no habitat will be impacted

USFS/Other	Habitat	NDIS	Other	Impact?
N/A				

MBTA no
Depl none
SB40 no
Wetland/Water none
Summary: *There are expected to be no T&E impacts as a result of this project.*

This clearance is valid for 1 year from the date of completion

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

4201 East Arkansas Avenue, Shumate Bldg
Denver, Colorado 80222
(303) 757-9011

August 30, 2012

Susan Linner
U.S. Fish and Wildlife Service
Ecological Services, CFO
P.O. Box 25486, DFC (65412)
Denver, Colorado 80225-0486

Attn: Alison Deans Michael

RE: Stengel's Hill (STA 092A-024, SA 17772)

Dear Ms. Linner:

The Colorado Department of Transportation (CDOT) has assessed impacts associated with the safety improvements to State Highway 92 (SH92) from mile marker 13.8 – 15.5 in Delta County, Colorado (See Figure 1). The following federally listed species obtained through IPaC, have been identified as having the potential of being impacted by this project:

Black-footed ferret (*Mustela nigripes*) – No prairie dog towns will be impacted; no effect.

Bonytail (*Gila elegans*) – There will be no depletions or impacts to the Colorado River system; no effect.

Clay-loving wild buckwheat (*Eriogonum pelinophilum*) - May be affected by the project.

Colorado pikeminnow *(Ptychocheilus lucius)* - There will be no depletions or impacts to the Colorado River system; no effect.

Greenback cutthroat trout (*Oncorhynchus clarki stomias)* - No habitat will be impacted; no effect.

Gunnison's Sage Grouse (*Centrocercus minimus)* - No habitat will be impacted; no effect.

Humpback chub (*Gila cypha*) - There will be no depletions or impacts to the Colorado River system; no effect.

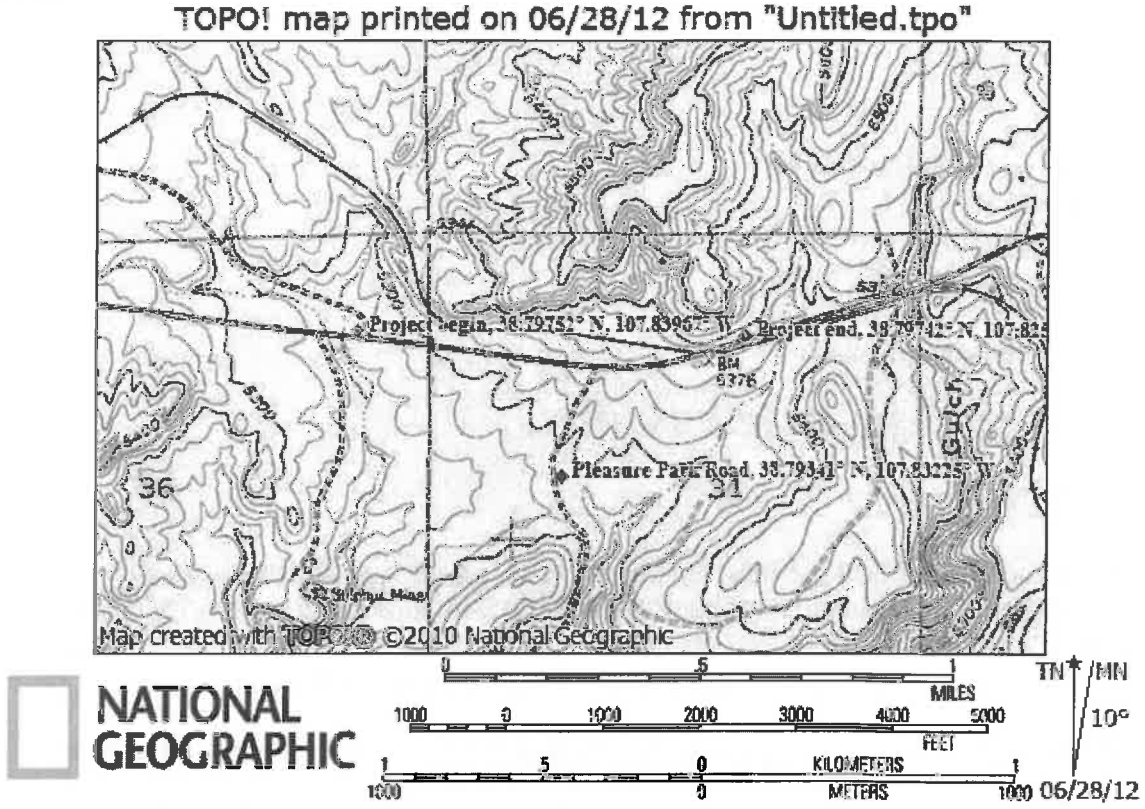
North American wolverine (*Gulo gulo luscus)* – No habitat will be impacted; no effect.

Razorback sucker (*Xyrauchen texanus*) - There will be no depletions or impacts to the Colorado River system; no effect.

Colorado hookless cactus *(Sclerocactus glaucus)* – May be affected by the project.

Yellow-billed Cuckoo (*Coccyzus americanus*) - No habitat will be affected; no effect.

Figure 1. Project Location



This area has been identified as suitable habitat for the clay-loving wild buckwheat and the Colorado hookless cactus (cactus) and has an elevation of about 5290 feet. Critical habitat for the buckwheat is in the area, but will not be affected by this project. None of the other species listed has the possibility of being affected by this project so no further analysis of them is warranted at this time.

The purpose of this project is to reconstruct the highway to extend the shoulders by about 6' to bring the existing 2' shoulders up to 8' wide. A new bridge will be constructed to create a grade separated railroad crossing. In order to get the correct alignment for the bridge the road will have to be moved to the north of its current location and the bridge build over the existing railroad tracks. When the new road and bridge are completed, the existing road will be obliterated and restored with native vegetation. This project will require additional right-of-way to be obtained north of the current ROW fence. In addition, the intersection of SH 92 and Pleasure Park Road on the South side of the highway will be reconfigured. The work will be done with standard heavy equipment. An estimated total of 25.62 acres of disturbance will be incurred by this project. Approximately 17.0 acres of that will be reclaimed with native

vegetation. Construction will start in the spring of 2014. The scheduled completion date is October 24, 2014. Plans are available upon request.

The entire project area was surveyed by CDOT personnel on May 10-11, 2012 to determine the presence of the cactus and again on June 26-27, 2012 to determine the presence to the buckwheat. None of the target cacti were found and the habitat was only marginal. No buckwheat was found either, although the habitat was very good in areas that haven't been disturbed by the Austin to Hotchkiss Safety Improvements Project (STA 092A-018) completed in 2009. As part of the Austin to Hotchkiss project, much of the same area was surveyed in 2007 as was surveyed this year. During the 2007 survey, CDOT and US Fish and Wildlife personnel found no buckwheat plants in this area, although some were found in different locations further to the west. This year, after having no success in finding the buckwheat within the project footprint, CDOT personnel went to locations where the plant was known to be during the 2007 survey. No buckwheat was found at those locations either. One theory to explain this was that the local weather conditions were not conducive to the emergence of this plant. It has been an extraordinarily hot and dry spring and early summer. But nowhere in the literature does it say that this plant will not emerge if the climatological conditions are not correct. This leads to just one of two conclusions; the buckwheat is either not present at these locations, or it is present but not located in one or both locations. Because it cannot be stated with certainty that the buckwheat is not present within the project area, it must be assumed that it may be present and, therefore may be affected by the project. However, because the buckwheat was surveyed for in 2007 and in 2012 and the results of both surveys were negative for its presence, it cannot be assumed that this project will adversely affect it. It is for these reasons that it has been determined that this project *may affect, but is not likely to adversely affect* the buckwheat. No designated Critical Habitat will be affected by this project. No Colorado hookless cacti were observed within the project area and the habitat is marginal at best. It is believed that this project will have *no effect* on this species. No other federally species will be impacted by this project.

We respectfully request your concurrence with these determinations.

Sincerely,

Jeff Peterson
CDOT Wildlife Specialist

Cc: CDOT R3, Sherry Dunn

17772

United States Department of the Interior

FISH AND WILDLIFE SERVICE
COLORADO FIELD OFFICE/LAKEWOOD
P.O. BOX 25486, DENVER FEDERAL CENTER
DENVER, COLORADO 80225-0486

IN REPLY REFER TO:
ES/CO: CDOT
TAILS: 06E24000-2012-I-0711

AUG 3 1 2012

Jeff Peterson
Colorado Department of Transportation
4201 East Arkansas Avenue, Shumate Building
Denver, Colorado 80222

Dear Mr. Peterson:

Based on the authority conferred to the U.S. Fish and Wildlife Service (Service) by the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq.*), the Service reviewed your August 30, 2012, report regarding safety improvements to State Highway 92 (SH92) near Hotchkiss in Delta County, Colorado. The proposed project will occur within habitat for the endangered clay-loving wild-buckwheat (*Eriogonum pelinophilum*) and the threatened Colorado hookless cactus (*Sclerocactus glaucus*). SH92 will be reconstructed between milemarkers 13.8 and 15.5. Shoulders will be widened, a new bridge over the railroad tracks will be constructed, an interchange will be reconfigured, and a portion of the highway will be realigned.

Construction is planned for spring, summer, and fall of 2014. Approximately 25.6 acres will be disturbed, 17 acres of which will be reclaimed with native vegetation.

Surveys conducted for both species in 2007 and 2012 did not locate any individuals of either species within the project footprint. Clay-loving wild-buckwheat was observed in the vicinity of the project disturbance in 2007, but none were seen either within or near the project area in 2012.

Given the findings of your surveys, the Service finds your determination acceptable and agrees that the project will not likely adversely affect the clay-loving wild-buckwheat or the Colorado hookless cactus. Although critical habitat for the clay-loving wild-buckwheat has been designated, none will be affected.

Please note that should project plans change or if additional information regarding listed or proposed species becomes available, this determination may be reconsidered under the ESA. Because the project is not scheduled to occur for almost two years, we request that you contact us prior to project construction to obtain the most recent information regarding listed or proposed species and their critical habitats.

We appreciate your submitting this report to our office for review and comment. If the Service can be of further assistance, please contact Alison Deans Michael of my staff at (303) 236-4758.

Sincerely,

ACTING FOR

Susan C. Linner
Colorado Field Supervisor

ec: CDOT, R3 (Sherry Dunn)
Michael

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MEMORANDUM

DEPARTMENT OF TRANSPORTATION

Environmental Programs Branch
4201 East Arkansas Avenue
Shumate Building
Denver, Colorado 80222
(303) 757-9011

TO: Sherry Dunn, Region 3

FROM: Ashley L. Bushey, Environmental Programs Branch

DATE: July 12, 2012

RE: Section 106 Consultation Materials, CDOT Project STA 092A-023, State Highway 92, Delta County

The following packet includes materials forwarded to SHPO today to initiate Section 106 consultation. Materials were also sent to Delta County to invite comment as a consulting party. As you may know, each of these entities has thirty (30) days from receipt of these materials to comment.

Please feel free to contact me with any questions. 7.12.12

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION
Environmental Programs Branch
Shumate Building
4201 East Arkansas Avenue
Denver, Colorado 80222
(303) 757-9281

July 12, 2012

Mr. Edward C. Nichols
State Historic Preservation Officer
History Colorado
1200 Broadway
Denver, CO 80203

Subject: Determinations of Eligibility and Effects and Notification of Section 4(f) *De Minimis*, CDOT Project STA 092A-023, State Highway 92, Delta County

Dear Mr. Nichols:

This letter and the attached materials constitute a request for concurrence on Determinations of Eligibility and Effects for the project referenced above, which involves road reconstruction and minor widening of State Highway (SH) 92 in Delta County.

DESCRIPTION OF WORK: The project involves reconstruction and minor widening to SH 92 from milepost (MP) 13.8 to MP 16.0 in Delta County; an area referred to as Stengel's Hill. The project also includes construction of a new grade separated railroad crossing where SH 92 intersects the grade of the Union Pacific Railroad (UPRR), which involves a slight shift in the alignment of the highway.

AREA OF POTENTIAL EFFECTS: The Area of Potential Effects (APE) consists of the existing CDOT right-of-way (ROW) and areas where ROW, temporary and permanent easements will be required to accommodate the work. Please refer to the attached APE map for additional detail.

Eligibility Determinations

Surveyed Properties: The project will require ROW, permanent, and/or temporary easements from ten (10) parcels. A review of Delta County Assessor records, a file search of the COMPASS database maintained by History Colorado, a comparison of area topographic and aerial maps, and recent photographs of the project area were used to determine historic and potentially historic properties within the APE. Only two of the properties included in the project were found to contain resources meeting or exceeding 50 years of age. These properties were evaluated for National Register of Historic Places (NRHP) eligibility, and are addressed below.

Denver & Rio Grande Western Railroad Segment (5DT.749.5): There has been no official determination regarding the eligibility of the entire Denver & Rio Grande Western (D&RGW) Railroad (current Union Pacific Railroad) in Delta County. For the purpose of this consultation the entire resource is being treated as eligible under Criterion A in the area of Transportation. The surveyed segment was constructed in 1902 as part of the line between Delta and Somerset, Colorado. The line was constructed with narrow gauge track, the preferred gauge of mountain railroads. The track has been replaced with standard gauge rails. The surveyed segment through the current project area *supports* the overall eligibility of the resource. In keeping with other surveyed segments of the resource, the historic boundary

is 15 meters or approximately fifty feet. This incorporates twenty-five feet to either side of the grade centerline and includes the grade, track, ballast, and a small amount of the railroad ROW.

Allen Homestead, Beard Property (5DT.1877): Frank Allen patented 120 acres in 1919 under the 1862 Homestead Act. These holdings were expanded through a 1935 patent of 520.47 acres under the Stock Raising Act, bringing Allen's Hotchkiss vicinity holdings to 640.47 acres. Allen owned the property until at least 1940, and died in 1959. The property includes a hipped-roof box type house listed by the Delta County Assessor as constructed in 1900 (though more likely constructed closer to 1910), with modifications dating to 1934. Most of the ten or twelve standing structures on the property date to the mid-twentieth century or later and are unlikely associated with the occupation of Allen. Of the 640-acre homestead property, only approximately 56 acres remain legally associated with the building complex. Modern intrusions have negatively impacted integrity of setting, feeling, and association with the homesteading period. Areas of the former homestead just south of the building complex and State Highway 92 include a 1980s residential/agricultural complex and a 1950s/1960s residence. Areas of the former homestead north and west of the complex have been subdivided to form the Hidden Springs Subdivision, containing several residences constructed in the early 2000s. Though significant under Criterion A in the areas of settlement and agriculture, the Frank Allen Homestead lacks sufficient integrity to convey significance. CDOT has determined the property is *not eligible* the NRHP.

Effects Determinations

Denver & Rio Grande Western Railroad Segment (5DT.749.5): The project includes minor realignment of State Highway 92 at the intersection with the Union Pacific Railroad in the northeast quarter of Section 31, Township 14S Range 93W. The realignment will carry the highway approximately 100 feet from the current alignment, measuring from centerline to centerline at the widest point. The realignment will necessitate construction of a new, grade separated railroad crossing slightly north-west of the existing crossing. Location of the new crossing in relation to the existing crossing can be seen on Sheet 7.03 of the enclosed plans. The project will require two permanent easements: PE101 requires 19,707 square feet (0.452 acres) and PE101A requires 93,249 square feet (2.141 acres) to accommodate the shift in highway alignment at the railroad crossing. These easements represent a small portion of the overall linear resource. Graphic representations of the easement locations are included on Sheet s 7.02 and 7.03.

The highway will be carried over the railroad at the new alignment by a bridge measuring approximately 350 feet from abutment to abutment. Two piers located approximately 95 feet from each abutment will offer support and leave a center span of approximately 160 feet. The piers will be 96 inches in diameter and constructed of reinforced concrete caissons with reinforced concrete "I" girders. The bridge will have a 40 foot wide deck accommodating two travel lanes and two 8-foot shoulders. The total width of the bridge will be 43 feet. The railroad crossing is located on land owned by the Bureau of Land Management (BLM); the railroad maintains an easement of 50 feet to either side of the grade centerline. The abutments and piers of the new bridge structure will be located within this BLM easement to the railroad, and may overlap with areas granted by easement to CDOT. Only the piers may overlap the defined historic boundary of the railroad segment. Mechanically Stabilized Earth (MSE) walls will accommodate the entrance and exit of the bridge structure.

The Railroad grade is considered eligible under Criterion A, indicating the resource is more significant for its associations than for its design or construction methods. The project will introduce a new crossing with SH92 within the surveyed segment; however this crossing will be located close to an existing crossing in an area of the railroad grade that already includes setting disturbances. The railroad grade itself will remain at the existing elevation, and the project area represents a very small portion of the overall linear resource. With continual maintenance and the introduction of new materials, including replacement of the

original narrow-gauge track, the grade itself is the dominant feature defining the historic railroad. The project will not impact the essential character defining features of width or alignment, which are identified by the *Railroads in Colorado 1858-1948* Multiple Property Documentation Form as critical defining features when original or historic materials such as track and ties have been removed. The project will not diminish the qualities of the resource qualifying it for inclusion on the NRHP, and the project will result in a finding of *no adverse effect* with regard to the Denver & Rio Grande Western Railroad Segment (5DT.749.5).

Allen Homestead, Beard Property (5DT.1877): The project includes acquisition of ROW and a temporary easement from the Beard Property to accommodate highway widening (ROW 106) and driveway access (TE106). The project requires a 52,728 square foot (1.21 acre) ROW acquisition and a 13,495 square foot (0.31 acre) temporary easement from the 55.9 acre parcel. Locations of these acquisitions are available on Sheet 7.05. As the property has been determined not eligible, the project will result in a finding of *no historic properties affected* with regard to the Allen Homestead/Beard Property (5DT.1877).

Finding of Section 4(f) *De Minimis* Determination

The project has been determined to have *no adverse effect* to the Denver & Rio Grande Western Railroad. Based on this finding, FHWA may make a *de minimis* finding for the Section 4(f) requirements for this property.

We request your concurrence with the Determinations of Eligibility and Effects outlined above. If you have questions or require additional information, please contact CDOT Assistant Staff Historian Ashley L. Bushey at (303) 757-9758.

Very truly yours,

Jane Hann, Manager
Environmental Programs Branch

Enclosures:
APE Map
Site Forms (5DT749.5, 5DT.1877)
Construction Plans

cc: Sherry Dunn, CDOT Region 3

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION
Environmental Programs Branch
Shumate Building
4201 East Arkansas Avenue
Denver, Colorado 80222
(303) 757-9281

July 12, 2012

Susan S. Hansen, County Administrator
Delta County Courthouse
501 Palmer Street, Suite 227
Delta, CO 81416

Subject: Determinations of Eligibility and Effects and Notification of Section 4(f) *De Minimis*, CDOT Project STA 092A-023, State Highway 92, Delta County

Dear Ms. Hansen:

As you may be aware, the Colorado Department of Transportation (CDOT) and Federal Highway Administration (FHWA) propose reconstruction and minor widening of State Highway (SH) 92 in Delta County. As part of FHWA's obligation to consider the effects of the project on historic properties eligible for or listed on the National Register of Historic Places (NRHP), we are providing the County with the opportunity to comment on our eligibility and effects determinations for the project.

DESCRIPTION OF WORK: The project involves reconstruction and minor widening to SH 92 from milepost (MP) 13.8 to MP 16.0 in Delta County; an area referred to as Stengel's Hill. The project also includes construction of a new grade separated railroad crossing where SH 92 intersects the grade of the Union Pacific Railroad (UPRR), which involves a slight shift in the alignment of the highway.

AREA OF POTENTIAL EFFECTS: The Area of Potential Effects (APE) consists of the existing CDOT right-of-way (ROW) and areas where ROW, temporary and permanent easements will be required to accommodate the work. Please refer to the attached APE map for additional detail.

Eligibility Determinations

Surveyed Properties: The project will require ROW, permanent, and/or temporary easements from ten (10) parcels. A review of Delta County Assessor records, a file search of the COMPASS database maintained by History Colorado, a comparison of area topographic and aerial maps, and recent photographs of the project area were used to determine historic and potentially historic properties within the APE. Only two of the properties included in the project were found to contain resources meeting or exceeding 50 years of age. These properties were evaluated for National Register of Historic Places (NRHP) eligibility, and are addressed below.

Denver & Rio Grande Western Railroad Segment (5DT.749.5): There has been no official determination regarding the eligibility of the entire Denver & Rio Grande Western (D&RGW) Railroad (current Union Pacific Railroad) in Delta County. For the purpose of this consultation the entire resource is being treated as eligible under Criterion A in the area of Transportation. The surveyed segment was constructed in 1902 as part of the line between Delta and Somerset, Colorado. The line was constructed with narrow gauge track, the preferred gauge of mountain railroads. The track has been replaced with standard gauge rails. The surveyed segment through the current project area *supports* the overall

eligibility of the resource. In keeping with other surveyed segments of the resource, the historic boundary is 15 meters or approximately fifty feet. This incorporates twenty-five feet to either side of the grade centerline and includes the grade, track, ballast, and a small amount of the railroad ROW.

Allen Homestead, Beard Property (5DT.1877): Frank Allen patented 120 acres in 1919 under the 1862 Homestead Act. These holdings were expanded through a 1935 patent of 520.47 acres under the Stock Raising Act, bringing Allen's Hotchkiss vicinity holdings to 640.47 acres. Allen owned the property until at least 1940, and died in 1959. The property includes a hipped-roof box type house listed by the Delta County Assessor as constructed in 1900 (though more likely constructed closer to 1910), with modifications dating to 1934. Most of the ten or twelve standing structures on the property date to the mid-twentieth century or later and are unlikely associated with the occupation of Allen. Of the 640-acre homestead property, only approximately 56 acres remain legally associated with the building complex. Modern intrusions have negatively impacted integrity of setting, feeling, and association with the homesteading period. Areas of the former homestead just south of the building complex and State Highway 92 include a 1980s residential/agricultural complex and a 1950s/1960s residence. Areas of the former homestead north and west of the complex have been subdivided to form the Hidden Springs Subdivision, containing several residences constructed in the early 2000s. Though significant under Criterion A in the areas of settlement and agriculture, the Frank Allen Homestead lacks sufficient integrity to convey significance. CDOT has determined the property is *not eligible* the NRHP.

Effects Determinations

Denver & Rio Grande Western Railroad Segment (5DT.749.5): The project includes minor realignment of State Highway 92 at the intersection with the Union Pacific Railroad in the northeast quarter of Section 31, Township 14S Range 93W. The realignment will carry the highway approximately 100 feet from the current alignment, measuring from centerline to centerline at the widest point. The realignment will necessitate construction of a new, grade separated railroad crossing slightly north-west of the existing crossing. Location of the new crossing in relation to the existing crossing can be seen on Sheet 7.03 of the enclosed plans. The project will require two permanent easements: PE101 requires 19,707 square feet (0.452 acres) and PE101A requires 93,249 square feet (2.141 acres) to accommodate the shift in highway alignment at the railroad crossing. These easements represent a small portion of the overall linear resource. Graphic representations of the easement locations are included on Sheet s 7.02 and 7.03.

The highway will be carried over the railroad at the new alignment by a bridge measuring approximately 350 feet from abutment to abutment. Two piers located approximately 95 feet from each abutment will offer support and leave a center span of approximately 160 feet. The piers will be 96 inches in diameter and constructed of reinforced concrete caissons with reinforced concrete "I" girders. The bridge will have a 40 foot wide deck accommodating two travel lanes and two 8-foot shoulders. The total width of the bridge will be 43 feet. The railroad crossing is located on land owned by the Bureau of Land Management (BLM); the railroad maintains an easement of 50 feet to either side of the grade centerline. The abutments and piers of the new bridge structure will be located within this BLM easement to the railroad, and may overlap with areas granted by easement to CDOT. Only the piers may overlap the defined historic boundary of the railroad segment. Mechanically Stabilized Earth (MSE) walls will accommodate the entrance and exit of the bridge structure.

The Railroad grade is considered eligible under Criterion A, indicating the resource is more significant for its associations than for its design or construction methods. The project will introduce a new crossing with SH92 within the surveyed segment; however this crossing will be located close to an existing crossing in an area of the railroad grade that already includes setting disturbances. The railroad grade itself will remain at the existing elevation, and the project area represents a very small portion of the overall linear

resource. With continual maintenance and the introduction of new materials, including replacement of the original narrow-gauge track, the grade itself is the dominant feature defining the historic railroad. The project will not impact the essential character defining features of width or alignment, which are identified by the *Railroads in Colorado 1858-1948* Multiple Property Documentation Form as critical defining features when original or historic materials such as track and ties have been removed. The project will not diminish the qualities of the resource qualifying it for inclusion on the NRHP, and the project will result in a finding of *no adverse effect* with regard to the Denver & Rio Grande Western Railroad Segment (5DT.749.5).

Allen Homestead, Beard Property (5DT.1877): The project includes acquisition of ROW and a temporary easement from the Beard Property to accommodate highway widening (ROW 106) and driveway access (TE106). The project requires a 52,728 square foot (1.21 acre) ROW acquisition and a 13,495 square foot (0.31 acre) temporary easement from the 55.9 acre parcel. Locations of these acquisitions are available on Sheet 7.05. As the property has been determined not eligible, the project will result in a finding of *no historic properties affected* with regard to the Allen Homestead/Beard Property (5DT.1877).

SECTION 4(F) AND DE MINIMIS

Background

In addition to Section 106 of the National Historic Preservation Act (NHPA), FHWA must comply with Section 4(f) of the US Department of Transportation Act, which is codified at both 49 U.S.C § 303 and 23 U.S.C. § 138. Congress amended Section 4(f) when it enacted the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (Public Law 109-59, enacted August 10, 2005) ("SAFETEA-LU"). Section 6009 of SAFETEA-LU added a new subsection to Section 4(f), which authorizes FHWA to approve a project that uses Section 4(f) lands that are part of a historic property without preparation of an Avoidance Analysis, if it makes a finding that such uses would have "*de minimis*" impacts upon the Section 4(f) resource, with the concurrence of the SHPO.

On December 12, 2005, the Federal Highway Administration issued its "Guidance for Determining *De Minimis* Impacts to Section 4(f) Resources" which indicates that a finding of *de minimis* can be made when the Section 106 process results in a *no adverse effect* or *no historic properties affected* determination, when the SHPO is informed of the FHWA's intent to make a *de minimis* impact finding based on their written concurrence in the Section 106 determination, and when FHWA has considered the views of any Section 106 consulting parties participating in the Section 106 process. This new provision of Section 4(f) and the associated guidance are in part the basis of this letter, and of FHWA's determination and notification of *de minimis* impacts to Routt County with respect to the proposed project. At this time we are notifying the Section 106 consulting parties per section 6009(b)(2)(C). On March 12, 2008, FHWA issued a Final Rule on Section 4(f), which clarifies and implements the procedures for determining a *de minimis* impact. In addition the Final Rule moves the Section 4(f) regulation to 23 CFR 774.

Finding of Section 4(f) *De Minimis* Determination

The project has been determined to have *no adverse effect* to the Denver & Rio Grande Western Railroad. Based on this finding, FHWA may make a *de minimis* finding for the Section 4(f) requirements for this property.

As a local government with a potential interest in this undertaking, we welcome your comments on these determinations. Should you elect to respond, we request you do so within thirty (30) days of receipt of these materials, as stipulated in the Section 106 regulations. For additional information on the Section

106 process, please visit the website of the Advisory Council on Historic Preservation (ACHP) at www.achp.gov. If you have questions or require additional information, please contact CDOT Assistant Staff Historian Ashley L. Bushey at (303) 757.9758 or ashley.bushey@dot.state.co.us.

Very truly yours,

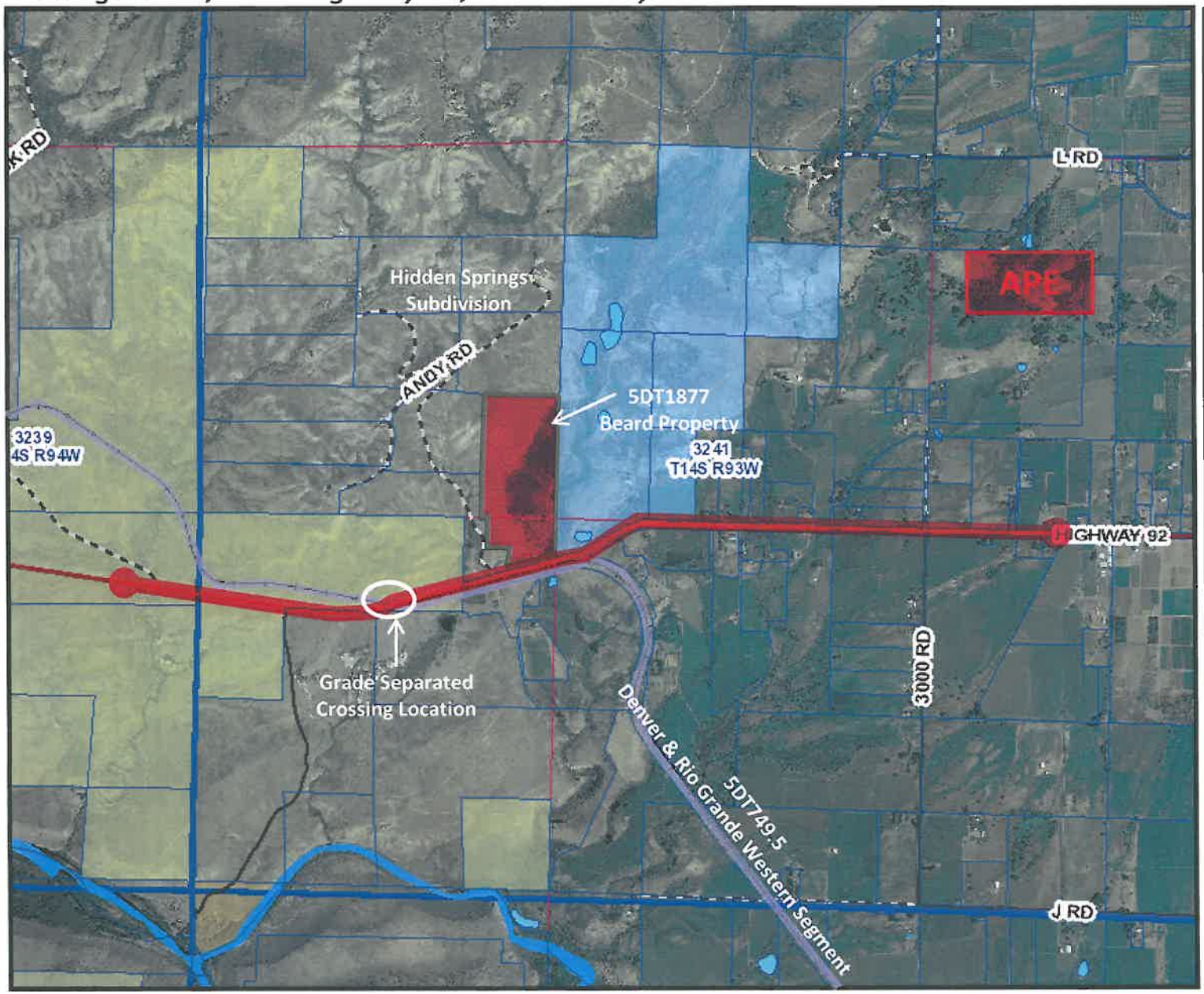
Jane Hann, Manager
Environmental Programs Branch

Enclosures:
APE Map
Site Forms (5DT749.5, 5DT.1877)
Construction Plans

cc: Sherry Dunn, CDOT Region 3

APE Map: STA 092A-024, SA 17772

Stengel's Hill, State Highway 92, Delta County



Project Area Overview

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Created:
Wednesday
June 13, 2012

CDOT
DEPARTMENT OF TRANSPORTATION

The information contained in this map is based on the most currently available data and has been checked for accuracy. CDOT does not guarantee the accuracy of any information presented, is not liable in any respect for any errors or omissions, and is not responsible for determining "fitness for use."

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION
Environmental Programs Branch
Shumate Building
4201 East Arkansas Avenue
Denver, Colorado 80222
(303) 757-9281

DEPARTMENT OF TRANSPORTATION

August 17, 2012

Mr. John M. Cater
Division Administrator
FHWA - Colorado Division
12300 W. Dakota Avenue, Suite 180
Lakewood, CO 80228

SUBJECT: Finding of Section 4(f) *De Minimis,* CDOT Project STA 092A-023, State Highway 92, Delta County

Dear Mr. Cater:

This letter and the attached materials constitute a request for concurrence with a finding of *de minimis* impact for the project referenced above. The undertaking involves road reconstruction and minor widening of State Highway 92 in Delta County from milepost 13.8 to 16.0, an area referred to as Stengel's Hill. The project also includes construction of a new grade separated crossing where SH 92 intersects the Union Pacific Railroad (UPRR), which involves a slight shift in the highway alignment. The project area is located partially on lands administered by the Bureau of Land Management (BLM), Uncompahgre Field Office.

AREA OF POTENTIAL EFFECTS: The Area of Potential Effects (APE) consists of the existing CDOT right-of-way (ROW) and areas where ROW, and temporary and permanent easements will be required to accommodate the work. Please refer to the attached APE map for additional detail.

Resource Descriptions

Surveyed Properties: The project will require ROW, and permanent and/or temporary easements from ten (10) parcels. A review of Delta County Assessor records, the COMPASS database maintained by History Colorado, a comparison of area topographic and aerial maps, and recent photographs of the project area were used to determine historic and potentially historic properties within the APE. Only two properties were found to contain resources exceeding 50 years of age, and consequently an evaluation of National Register of Historic Places (NRHP) eligibility was limited to those properties. One resource met the criteria for NRHP eligibility, as follows:

Denver & Rio Grande Western Railroad Segment (5DT749.5): There has been no official determination regarding the eligibility of the entire Denver & Rio Grande Western (D&RGW) Railroad (current Union Pacific Railroad) in Delta County. For the purpose of this consultation the entire resource is treated as eligible under Criterion A in the area of Transportation. The surveyed segment was constructed in 1902 as part of the line between Delta and Somerset, and originally consisted of narrow gauge track (the track has been replaced with standard gauge rails). The surveyed segment *supports* the overall eligibility of the resource. In keeping with other surveyed segments of the resource, the historic boundary is 15 meters wide, or approximately fifty feet. This incorporates twenty-five feet to either side of the grade centerline and includes the grade, track, ballast, and a small amount of railroad ROW.

***De Minimis* Use**

Denver & Rio Grande Western Railroad Segment (5DT749.5): The project includes minor realignment of State Highway 92 at the intersection with the UPRR. The realignment will carry the highway approximately 100 feet from the current alignment, measuring from centerline to centerline at the widest point. That work will necessitate construction of a new grade separated railroad crossing slightly northwest of the existing crossing. (Location of the new versus crossing can be seen on Sheet 7.03 of the enclosed plans.) The project will require two permanent easements: PE101 requires 19,707 square feet (0.452 acres) and PE101A requires 93,249 square feet (2.141 acres) to accommodate the shift in highway alignment at the crossing. These easements represent a small portion of the overall linear resource. Graphic representations of the easement locations are included on Sheets 7.02 and 7.03.

The highway will be carried over the railroad at the new alignment by a bridge measuring approximately 350 feet from abutment to abutment. Two piers located approximately 95 feet from each abutment will offer support and leave a center span of approximately 160 feet. The piers will be 96 inches in diameter and constructed of reinforced concrete caissons with reinforced "I" girders. The bridge will have a 40 foot wide deck accommodating two travel lanes and two 8-foot shoulders. The total width of the bridge will be 43 feet.

The railroad crossing is located on land owned by the BLM; the railroad maintains an easement of 50 feet to either side of the grade centerline. The abutments and piers of the new bridge structure will be located within this BLM easement to the railroad, and may overlap with areas granted by easement to CDOT. Only the piers may overlap the defined historic boundary of the railroad segment. Mechanically Stabilized Earth (MSE) walls will accommodate the entrance and exit of the bridge structure.

The railroad grade is eligible under Criterion A, indicating the resource is more significant for its associations than for its design or construction methods. The project will introduce a new crossing with SH 92 within the surveyed segment; however this crossing will be located close to an existing crossing in an area of the railroad grade that already includes setting disturbances. The railroad grade itself will remain at the existing elevation, and the project area represents a very small portion of the overall linear resource. With continual maintenance and the introduction of new materials, including replacement of the original narrow-gauge track, the grade itself is the dominant feature defining the historic railroad. The project will not impact the essential character defining features of width or alignment, which are identified by the *Railroads in Colorado 1858-1948* Multiple Property Documentation Form as critical defining features when original or historic materials such as track and ties have been removed. The project will not diminish the qualities of the resource qualifying it for inclusion on the NRHP.

Finding of *De Minimis* Impact

CDOT consulted with SHPO and Delta County, the latter in the capacity of consulting party, in letters dated July 12, 2012. In correspondence dated July 19, 2012, SHPO concurred with the recommended finding of *no adverse effect* for resource 5DT749, including segment 5DT749.5. No comments were received from the consulting party within the 30-day consultation period.

Based on the information presented above and in the attached documentation, the effects of this proposed improvement on the properties described above constitute a *de minimis* impact and the requirements of 23 USC 138, 49 USC 303, and 23 CFR 774 have been satisfied. This finding is considered valid unless new information is obtained or the proposed effects change to the extent that consultation under Section 106 must be reinitiated.

If you concur with this finding, please sign below.

Very truly yours,

for Jane Hann, Manager
Environmental Programs Branch

Enclosures:
Section 106 Correspondence
Site Forms
APE Map
Construction Plans

cc: File/CF

I concur:

John M. Cater, P.E.
Colorado Division Administrator

8/21/12
Date