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Colorado Kids Ranch – 105 Access Improvements
Final Drainage Report

October 2026

Prepared For:

JD Chapman

Colorado Pumpkin Patch LLC

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Monument, CO 80132

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Prepared By:

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PCD File No. XXXXXX

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Drainage Engineer's Statement

The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the County for drainage reports and said report is in conformity with the applicable master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing this report.

_____ _____

Richie Lyon, PE
State of Colorado No. 53921
For and on behalf of HR Green Development, LLC

Date

Developer's Statement

I, the developer, have read and will comply with all of the requirements specified in this drainage report and plan.

_____ _____

JD Chapman, Owner
Colorado Pumpkin Patch LLC
18065 Saddlewood Road
Monument, CO 80132

Date

El Paso County:

Filed in accordance with the requirements of the El Paso County Land Development Code, Drainage Criteria Manual, Volumes 1 and 2 and the Engineering Criteria Manual, as amended.

_____ _____

Joshua J. Palmer, P.E.
County Engineer / ECM Administrator

Date

Conditions:

I. General Location and Description

The purpose of this Final Drainage Report (FDR) is to analyze and provide specific solutions to drainage concerns on-site and off-site resulting from the development of the CO-105 improvements for permanent access to the Colorado Kids Ranch property. This FDR describes the on-site and off-site drainage patterns, quantifies storm water runoff, assesses existing and proposed storm infrastructure as it relates to water quality and drainage conveyance, and describes the planned stormwater management.

This FDR will provide design and analysis only for the County Highway 105 improvements associated with the permanent access improvements for the Colorado Kids Ranch. This FDR does not analyze other portions of the Colorado Kids Ranch property, unnamed tributary, or other offsite drainageways.

a. Location

1. City and county, and local streets within and adjacent to the subdivision, township, range, section, ¼ section, major drainageways and existing facilities, names of surrounding platted developments)

The Colorado Kids Ranch property is located 18065 Saddlewood Road in northern El Paso County, Colorado. This report specifically analyzes improvements to County Road 105 along the northern property boundary of the Colorado Kids Ranch that are required for a permanent access permit. The site is described as a tract in the North Half of Section 16 lying east of Canterbury West, North of Saddlewood Road, and West of Canterbury East, Section 16, Township 11 South, Range 66 West of the 6th Principal Meridian, El Paso County, Colorado.

The surrounding developments around the Colorado Kids Ranch property include rural residential lots along the west boundary (Lots 29-35 of Canterbury West Subdivision; Zoned RR-5). The east boundary of the site adjoins developed rural residential lots (Tracts 106-112 Canterbury East Subdivision; Zoned RR-5). The south boundary of the property is Saddlewood Road, an improved gravel-paved local public roadway. The north boundary of the property is County Road 105, an improved asphalt-paved arterial public roadway.

This project is located in the West Cherry Creek Drainage Basin, and drainage from the site is tributary to an existing unnamed tributary drainage channel in the West Cherry Creek Drainage Basin. The unnamed tributary channel generally flows northeast from the project site to its convergence with West Cherry Creek.

b. Description of Property

1. Area in acres, ground cover, general topography, general soil conditions, major drainageways, irrigation facilities, utilities and other encumbrances

The Colorado Kids Ranch is a developed agritainment center on an unplatted 40.5 acre property. In September of 2023, El Paso County conditionally approved a Special Use (El Paso County Project No. AL217) allowing agritainment activities on the property with up to 325 vehicles on site, with one of the conditions being approval of the Site Development Plan in El Paso County Project Number PPR2235. In 2024, a temporary access permit was granted to the development under El Paso County Project Number AP24480. El Paso County and the TIS have identified that improvements will now be required to County Road 105 to grant permanent access to the property. A deviation request and traffic memo have been

submitted to El Paso County under PCD File No. DEV261 which outlines the necessary improvements to County Road 105. This report will analyze the drainage impacts and design only for the necessary infrastructure for the County Road 105 improvements.

Ground cover within the project area consists of paved roadway and gravel shoulders for County Road 105, and existing native grasses and weeds outside of the roadway area. The existing vegetative cover is 90 percent, based on field observations and aerial imagery. According to the Natural Resources Conservation Service (NRCS) website, the site consists of type B soils. See Appendix A for the NRCS Soil Map.

Drainage generally flows from the southwest to the northeast across the site. Slopes range from 1% to 33% with a maximum elevation of 7375' and a minimum elevation of 7310'.

No major drainageways exist within the development; however, near the eastern limits of this project is an unnamed tributary with FEMA flood zone A associated with it. The unnamed tributary drains northeast from the project site until its convergence with West Cherry Creek. This development will not negatively impact this drainageway.

No irrigation facilities exist on-site.

There is an existing public quad 36" CMP storm sewer culvert underneath County Road 105 near the eastern limits of this project. This culvert flows for the unnamed tributary which has a FEMA flood zone A association to it. There are also existing overhead electric lines, fiber optic, and gas lines along the north side of County Road 105. There are no other existing utilities on the site.

II. Drainage Basins and Sub-Basins

a. Major Drainage Basin Descriptions

1. Reference should be made to major drainage-way planning studies; such as drainage basin planning studies, flood hazard delineation reports, and flood insurance studies or maps available

The Colorado Kids Ranch is in the West Cherry Creek Drainage Basin, and drainage from the site is tributary to an existing unnamed tributary drainage channel in the West Cherry Creek Drainage Basin. The unnamed tributary channel generally flows northeast from the project site to its convergence with West Cherry Creek.

There is not an El Paso County major drainage basin planning study (DBPS) for the West Cherry Creek Drainage Basin. However, there is a *2025 Watershed plan* by the *Cherry Creek Basin Water Quality Authority*. This report did not have any specific recommendation to the site but does support the "Four Step Process" in MHFD's Urban Storm Drainage Criteria Manual. This report addresses the Four Step process in a following section.

Flood Insurance Rate Maps (FIRMS) covering the site include:

- FEMA Flood Insurance Rate Map Number 08041C0285G effective date December 7, 2018.

2. A floodplain statement shall be provided indication whether any portion of the development is in a designated floodplain as delineated on the current FEMA mapping.

Per FEMA FIRM 08041C0285G (eff. 12/7/2018), there is a FEMA flood zone A at the eastern end of this project for an unnamed tributary. This project will have disturbance within the FEMA flood zone A. A "less than 6" rise" analysis and certification as required by the El Paso County floodplain administrator has been completed as part of this report. A floodplain development permit is also required for disturbance within the zone A floodplain.

3. Major Drainage Basin Description

The Cherry Creek watershed originates at the Palmer Divide, approximately 40 miles south of Cherry Creek Reservoir. The watershed is about 386 square miles (250,000 acres). It is located primarily in Douglas County, with the northern portion of the drainage located in Arapahoe County and small areas located in Elbert and El Paso Counties on the eastern and southern portions of the watershed. The basin includes approximately 600 miles of creeks and streams and the mainstem of Cherry Creek is approximately 50 miles long. Cherry Creek and Cottonwood Creek are the primary inflows into Cherry Creek Reservoir.

4. Identification of all nearby irrigation facilities and other obstruction which could influence or be influence by the local drainage

There are no nearby irrigation facilities or other obstructions that could influence or be influenced by local drainage.

b. Sub-basin Description

1. Discussion of historic drainage patterns on of the property in question

Existing Subbasin Description

Basins with a prefix of "ROW" refer to subbasins within development area within the County Road 105 right of way, and basins with a prefix of "OS" referred to offsite basins tributary to this improvement project. Existing condition subbasins within the development area have been analyzed in this report and are described below.

Existing Basin ROW-1: 3.68 acres, roadway (Q_5 = 2.67 cfs, Q_{100} = 8.92 cfs)

Basin ROW-1 consists primarily of the north half of County Road 105 and roadside ditch area from Roller Coaster Road to Peaceful Pines. Runoff generated in this basin generally drains from the west to the east and is concentrated within a roadside ditch that discharges into an existing public 24" CMP culvert at design point 3. Concentrated flow at design point 3 discharges into subbasin ROW-2. Slopes in this basin average between 2% and 33% with a maximum elevation of 7442' and a minimum elevation of 7355'.

Existing Basin ROW-2: 1.45 acres, roadway (Q_5 = 1.40 cfs, Q_{100} = 4.68 cfs)

Basin ROW-2 consists primarily of the north half of County Road 105 and roadside ditch area from Peaceful Pines to Cherry Springs Ranch Drive. Runoff generated in this basin generally drains from the west to the east and is concentrated within a roadside ditch that discharges into existing public dual 36" CMP culverts at design point 6. Concentrated flow at design point 6 discharges offsite. Slopes in this

basin average between 2% and 33% with a maximum elevation of 7350' and a minimum elevation of 7320'.

Existing Basin ROW-3: 0.98 acres, roadway (Q_5 = 1.13 cfs, Q_{100} = 3.26 cfs)

Basin ROW-3 consists primarily of the south half of County Road 105 from Peaceful Pines to the Colorado Kids Ranch access from County Road 105. Runoff generated in this basin generally drains from the west to the southeast and sheet flows outside the right-of-way into natural drainage swales that drain through the Colorado Kids Ranch property to the existing public quad 36" CMP culverts underneath County Road 105. Concentrated flow at design point 7 discharges to the existing public quad 36" CMP culverts. Slopes in this basin average between 2% and 33% with a maximum elevation of 7368' and a minimum elevation of 7310'.

Existing Basin ROW-4: 0.61 acres, roadway (Q_5 = 0.58 cfs, Q_{100} = 1.91 cfs)

Basin ROW-4 consists primarily of the north half of County Road 105 from Cherry Springs Ranch Drive to the unnamed tributary of West Cherry Creek. Runoff generated in this basin generally drains from the west to the northeast and sheet flows offsite at design point 8. Slopes in this basin average between 2% and 33% with a maximum elevation of 7316' and a minimum elevation of 7310'.

Existing Basin ROW-5: 0.34 acres, roadway (Q_5 = 0.40 cfs, Q_{100} = 1.21 cfs)

Basin ROW-5 consists primarily of the north half of County Road 105 from the unnamed tributary of West Cherry Creek to the limits of disturbance to the east. Runoff generated in this basin generally drains from south to north and sheet flows offsite at design point 8. Slopes in this basin average between 2% and 33% with a maximum elevation of 7342' and a minimum elevation of 7310'.

Existing Basin OS-1: 12.75 acres, residential / roadway (Q_5 = 8.68 cfs, Q_{100} = 32.04 cfs)

Basin OS-1 consists of primarily rural 5-acre residential lots from the Peaceful Pines Subdivision, and Rogers Pine Grove roadway area. For rational calculations, this area was conservatively assumed as 1-acre lots with an impervious percentage of 20% per the DCM. Runoff generated in this basin generally drains from the west to the east and is concentrated within a natural drainage swale that discharges into the County Road 105 roadside ditch at design point 1. Concentrated flow at design point 1 discharges into subbasin ROW-1. Slopes in this basin average between 4% and 6% with a maximum elevation of 7742' and a minimum elevation of 7390'.

Existing Basin OS-2: 3.30 acres, residential / roadway (Q_5 = 2.52 cfs, Q_{100} = 9.32 cfs)

Basin OS-2 consists of primarily rural 5-acre residential lots from the Peaceful Pines Subdivision, and Peaceful Pines roadway area. For rational calculations, this area was conservatively assumed as 1-acre lots with an impervious percentage of 20% per the DCM. Runoff generated in this basin generally drains from the west to the southeast and sheet flows into the County Road 105 roadside ditch at design point 2. Flow at design point 2 discharges into subbasin ROW-1 near the existing public 24" CMP culvert at design point 3. Slopes in this basin average between 2% and 6% with a maximum elevation of 7400' and a minimum elevation of 7360'.

Existing Basin OS-3: 1.53 acres, residential / roadway (Q_5 = 1.20 cfs, Q_{100} = 4.44 cfs)

Basin OS-3 consists of primarily rural 5-acre residential lots from the Peaceful Pines Subdivision, and Peaceful Pines roadway area. For rational calculations, this area was conservatively assumed as 1-acre lots with an impervious percentage of 20% per the DCM. Runoff generated in this basin generally drains

from the west to the southeast and sheet flows into the County Road 105 roadside ditch at design point 4. Flow at design point 4 discharges into subbasin ROW-2. Slopes in this basin average between 4% and 8% with a maximum elevation of 7368' and a minimum elevation of 7340'.

Existing Basin OS-4: 9.25 acres, residential / roadway (Q_5 = 6.72 cfs, Q_{100} = 24.81 cfs)

Basin OS-4 consists of primarily rural 5-acre residential lots from the Peaceful Pines Subdivision, and Peaceful Pines roadway area. For rational calculations, this area was conservatively assumed as 1-acre lots with an impervious percentage of 20% per the DCM. Runoff generated in this basin generally drains from the west to the east and is concentrated within a natural drainage swale that drains to an existing culvert (size/material/ownership unknown) at design point 5. Concentrated flow at design point 5 discharges into subbasin OS-5. Slopes in this basin average between 4% and 10% with a maximum elevation of 7410' and a minimum elevation of 7364'.

Existing Basin OS-5: 22.41 acres, residential / roadway (Q_5 = 14.92 cfs, Q_{100} = 55.09 cfs)

Basin OS-5 consists of primarily rural 5-acre residential lots from the Peaceful Pines Subdivision, Cherry Springs Ranch Subdivision, Cherry Springs Ranch Drive and Peaceful Pines roadway area. For rational calculations, this area was conservatively assumed as 1-acre lots with an impervious percentage of 20% per the DCM. Runoff generated in this basin generally drains from the west to the southeast and is concentrated within natural drainage swales that drain to an existing roadside ditch on Cherry Springs Ranch Drive, which drains south to an existing public dual 36" CMP culvert at design point 6. Concentrated flow at design point 6 discharges offsite at design point 10. Slopes in this basin average between 2% and 33% with a maximum elevation of 7364' and a minimum elevation of 7320'.

Proposed Subbasin Description

Basins with a prefix of "ROW" refer to subbasins within development area within the County Road 105 right of way, and basins with a prefix of "OS" referred to offsite basins tributary to this improvement project. Proposed condition subbasins within the development area have been analyzed in this report and are described below.

Proposed Basin ROW-1: 3.68 acres, roadway (Q_5 = 2.67 cfs, Q_{100} = 8.92 cfs)

The proposed improvements in Basin ROW-1 include roadway striping. No change in runoff is anticipated within this basin. Basin ROW-1 consists primarily of the north half of County Road 105 and roadside ditch area from Roller Coaster Road to Peaceful Pines. Runoff generated in this basin generally drains from the west to the east and is concentrated within a natural drainage swale that discharges into an existing public 24" CMP culvert at design point 3. Concentrated flow at design point 3 discharges into subbasin ROW-2. Slopes in this basin average between 4% and 33% with a maximum elevation of 7742' and a minimum elevation of 7355'.

Proposed Basin ROW-2: 1.45 acres, roadway (Q_5 = 2.04 cfs, Q_{100} = 5.55 cfs)

The proposed improvements with basin ROW-2 include striping, asphalt pavement widening, and road side ditch grading improvements. The existing public dual 36" CMP culverts at design point 6 are analyzed and found to have sufficient capacity for the increase in runoff resulting from the proposed improvements. The re-graded roadside ditch is re-analyzed in this report and has capacity for the increase in runoff resulting from the proposed improvements. Basin ROW-2 consists primarily of the north half of County Road 105 and roadside ditch area from Peaceful Pines to Cherry Springs Ranch Drive.

Runoff generated in this basin generally drains from the west to the east and is concentrated within a roadside ditch that discharges into existing public dual 36" CMP culverts at design point 6. Concentrated flow at design point 6 discharges offsite. Slopes in this basin average between 2% and 33% with a maximum elevation of 7350' and a minimum elevation of 7320'.

Proposed Basin ROW-3: 0.98 acres, roadway (Q_5 = 1.91 cfs, Q_{100} = 4.28 cfs)

The proposed improvements with basin ROW-3 include striping and asphalt pavement widening. There is no roadside ditch on the south side of County Road 105, and runoff drains outside the ROW to existing natural drainage swales which drain east to the unnamed tributary of West Cherry Creek. The existing public quad 36" CMP culverts are not analyzed in this report. The increase in flows from this design point will be captured in an extended detention basin that is part of a separate development on the Colorado Kids Ranch Property. The future extended detention basin will detain tributary flows, including from design point 7 per this report, and reduce flow draining offsite to the quad 36" public CMP culverts to historic rates or less. Basin ROW-3 consists primarily of the south half of County Road 105 from Peaceful Pines to the Colorado Kids Ranch access from County Road 105. Runoff generated in this basin generally drains from the west to the southeast and sheet flows outside the right of way into natural drainage swales that drain through the Colorado Kids Ranch property to the existing public quad 36" CMP culverts underneath County Roady 105. Concentrated flow at design point 7 discharges to the existing public quad 36" CMP culverts. Slopes in this basin average between 2% and 33% with a maximum elevation of 7368' and a minimum elevation of 7310'.

Proposed Basin ROW-4: 0.61 acres, roadway (Q_5 = 0.79 cfs, Q_{100} = 2.18 cfs)

The proposed improvements with basin ROW-4 include striping and asphalt pavement widening, and minor grading improvements. The increase in runoff offsite at design point 8 will not have a negative effect on downstream drainageways or infrastructure. Basin ROW-4 consists primarily of the north half of County Road 105 from Cherry Springs Ranch Drive to the unnamed tributary of West Cherry Creek. Runoff generated in this basin generally drains from the west to the northeast and sheet flows offsite at design point 8. Slopes in this basin average between 2% and 33% with a maximum elevation of 7316' and a minimum elevation of 7310'.

Proposed Basin ROW-5: 0.34 acres, roadway (Q_5 = 0.48 cfs, Q_{100} = 1.31 cfs)

The proposed improvements with basin ROW-5 include striping, asphalt pavement widening, and minor grading improvements. The increase in runoff offsite at design point 8 will not have a negative effect on downstream drainageways or infrastructure. Basin ROW-5 consists primarily of the north half of County Road 105 from the unnamed tributary of West Cherry Creek to the limits of disturbance to the east. Runoff generated in this basin generally drains from south to north and sheet flows offsite at design point 8. Slopes in this basin average between 2% and 33% with a maximum elevation of 7342' and a minimum elevation of 7310'.

Basins OS-1 through OS-5 altered from the existing conditions described above and basin flows and patterns are not altered from the existing description. Refer to the existing subbasin descriptions.

A comparison of existing and proposed flows at major design points and discharging from the site is provided below. The downstream infrastructure at each offsite design point has capacity for the proposed improvements. There will be no negative impact on downstream drainageways and/or properties.

Colorado Kids Ranch - 105 Improvement Offsite Flows						
	Existing		Proposed		Delta	
	Q_5 (cfs)	Q_{100} (cfs)	Q_5 (cfs)	Q_{100} (cfs)	Q_5 (cfs)	Q_{100} (cfs)
6	29.43	107.54	29.81	108.02	0.38	0.48
7	1.13	3.26	1.91	4.28	0.78	1.02
8	1.61	3.05	2.07	3.39	0.46	0.34
Total:	32.17	113.85	33.79	115.69	1.62	1.84

Design Point 6:

The total flow offsite at design point 6 in the developed condition (Q_5 = 29.81 cfs, Q_{100} = 108.02 cfs) is more than the existing flows in the minor and major storms (Q_5 = 29.43 cfs, Q_{100} = 107.54 cfs) due to asphalt roadway widening required for the access improvements proposed to County Road 105. The existing public dual 36" CMP culverts at design point 6 are analyzed in this report to have capacity for the increase in runoff resulting from the proposed improvements. The existing downstream drainage infrastructure has capacity for the proposed improvements and there are no negative impacts on downstream drainageways anticipated by these improvements.

Design Point 7:

The total flow offsite at design point 7 in the developed condition (Q_5 = 1.91 cfs, Q_{100} = 4.28 cfs) is more than the existing flows in the minor and major storms (Q_5 = 1.13 cfs, Q_{100} = 3.26 cfs) due to asphalt roadway widening required for the access improvements proposed to County Road 105. The increase in flows from this design point will be offset by a future extended detention basin that will reduce flows below historic rates under EPC file no. PPR2235. The future extended detention basin will detain tributary flows and reduce flow draining offsite to the quad 36" public CMP culverts to historic rates or less. The existing downstream drainage infrastructure has capacity for the proposed improvements and there are no negative impacts on downstream drainageways anticipated by these improvements.

Design Point 8:

The total flow offsite at design point 8 in the developed condition (Q_5 = 2.07 cfs, Q_{100} = 3.39 cfs) is more than the existing flows in the minor and major storms (Q_5 = 1.61 cfs, Q_{100} = 3.05 cfs) due to asphalt roadway widening required for the access improvements proposed to County Road 105. The existing downstream drainage infrastructure has capacity for the proposed improvements and there are no negative impacts on downstream drainageways anticipated by these improvements.

2. Discussion of off-site drainage flow patterns and their impact on the development

Off-site drainage flows onto the project area. Offsite flow drains through existing public culverts within the County Road 105 area. Culverts that may be impacted by the improvements proposed by this report have been re-analyzed to verify capacity for increases in runoff. The existing public quad 36" CMP culverts underneath County Road 105 are not analyzed in this report. This project does propose an extension of the existing quad 36" CMP culverts to the new toe of slope resulting from the required roadway widening improvements. No additional improvements are anticipated to be made.

III. Drainage Design Criteria

a. Development Criteria Reference

1. Reference all criteria, master plans, and technical information used for report preparation and design; any deviation from such material must be discussed and justified

Listed Below are the technical resources reviewed in the preparation of this FDR amendment:

- El Paso County Drainage Criteria Manual (DCM)
- City of Colorado Springs Drainage Criteria Manual
- Mile High Flood District
- NOAA Atlas 14
- NRCS Soil Survey for El Paso County Area, Colorado
- El Paso County Assessor Property Records

2. Discussion of previous drainage studies for the site in question that influence or are influenced by the drainage design and how the studies affect drainage design for the site.

The Colorado Kids Ranch is in the West Cherry Creek Drainage Basin, and drainage from the site is tributary to an existing unnamed tributary drainage channel in the West Cherry Creek Drainage Basin. The unnamed tributary channel generally flows northeast from the project site to its convergence with West Cherry Creek.

There is a *2025 Watershed plan* by the *Cherry Creek Basin Water Quality Authority*. This report did not have any specific recommendation to the site but does support the “Four Step Process” in MHFD’s Urban Storm Drainage Criteria Manual. This report addresses the Four Step process in a following section.

b. Hydrologic Criteria

1. Identify design rainfall

One-hour design point rainfall values from the NOAA Atlas will be used for development of Intensity-Duration-Frequency (IDF) curves. The one-hour point rainfall values are 1.22 in for the 5-year event and 2.54 in for the 100-year event.

2. Identify runoff calculation method

The chosen method for most hydrologic computations included with this report is the Rational Method to ensure sound design of the storm infrastructure including swales, channels, storm pipes, inlets, and roadway capacities and peak flows at stormwater discharge locations from the property. Composite coefficients, rainfall intensities, and runoff flow rates are calculated using the Rational Method and provided within Appendix B.

3. Identify design storm recurrence intervals

The 5-year storm has been utilized as the minor storm event and the 100-year as the major storm event.

4. Identify detention discharge and storage calculation method

There are no detention ponds required with this development. All disturbance from this project has an applicable water quality and detention exclusion.

a. General Concept

1. Discussion of compliance with off-site runoff considerations

There is off site drainage tributary to this development. Off site drainage is considered and described further in the floodplain analysis section of this report.

2. Discussion of anticipated and proposed drainage patterns

Drainage on-site will be conveyed through existing roadside ditches and release downstream at existing design points.

b. Specific Details

2. Presentation of approach to accommodate drainage impacts on existing and proposed improvements and facilities

Some disturbance from this project has an applicable water quality and detention exclusion. The remaining disturbance from this project has <1 ac of non-excluded soil disturbance and will not require WQ treatment per ECM I.6.1.A. However, drainage from impervious surfaces is proposed to drain into natural ditches and swales to promote infiltration and additional water quality enhancements.

3. Presentation of proposed facilities with respect to alignment, material and structure type

Basin ROW-2 Roadside Ditch

The existing roadside ditch on the north side of County Road 105 from Peaceful Pines to Cherry Springs Ranch Drive is re-analyzed in this report due to widening improvements to County Road 105. The improvements require re-grading a portion of the existing ditch approximately 300’ downstream of the intersection with Peaceful Pines. The regraded ditch section has a depth of 2.33 feet outside the roadway. a foreslope of 4:1, and maximum backslope of 3:1 due to existing utility and private property grading constraints. The proposed ditch section has capacity for the anticipated 100-year storm flows in the ditch within Basin ROW-2. Due to the calculated Froude number and resulting shear stress in the re-graded roadside ditch, TMAX channel lining is specified to stabilize the roadside ditch in the major storm. There will be no negative impacts to downstream drainageways or properties resulting from this development. The specific design data information is provided in Appendix C.

Design Point 6 Public Dual 36” Culverts

The public dual 36” CMP culverts at design point 6 have been re-analyzed in this report due to an increase in runoff to design point 6 from the required roadway widening. The result of the calculations for this culvert show that it has capacity for the proposed improvements to County Road 105. There will be no negative impacts to downstream drainageways or properties resulting from this development. The specific design data information is provided in Appendix C.

4. discussion of drainage impact of site constraints such as streets, utilities, existing and proposed structures

The existing drainage swales and culvert have capacity for the proposed improvements to County Road 105. The existing roadside ditch has been re-analyzed in this report for capacity. This FDR does not re-analyze the public quad 36” CMP culverts that convey the flood flows from the unnamed tributary drainageway.

5. environmental features and issues shall be presented if applicable

This project is not anticipated to be within the vicinity of a jurisdictional stream or any anticipated wetland area. There are no improvements proposed for the unnamed tributary at the east end of this development. This project will not negatively impact the existing unnamed drainageway.

c. Permitting Requirements

When work infringes upon wetlands associated with a Water of the United States (WOTUS), per Section 404 of the Clean Water Act (CWA), additional permitting will be required. If the work within the waterways is minimal, it will likely be covered under a Nationwide Permit; it is however possible that an individual permit will be required. If a waterway is not determined to be a WOTUS and is determined to be a state water, dredge/fill in wetland areas will be required to adhere to State Regulation 87 and additional permitting may be required. If disturbance is minimal, the State General Authorization would likely provide coverage for dredge and fill activity; it is possible that an Individual Authorization may be required. This project does not anticipate infringement upon any wetlands.

The Colorado Department of Public Health and Environment will require permits for any disturbance that exceeds 1 acre of land. Should groundwater be encountered, a dewatering permit will also be required.

El Paso County will require an Erosion and Stormwater Quality Control Permit, and any other construction permits required to complete the construction of the site.

There is development that affects the floodplain. El Paso County will require a permit for work withing the floodplain prior to the commencement of any construction or development within any special flood hazard area (SFHA). This project results in less than a 6” rise in the zone A floodplain as required by the El Paso County floodplain administrator. A description of this analysis is provided in the Floodplain Analysis section of this report. A less than 6” rise certification and floodplain development permit will also be submitted to El Paso County for review and approval. Currently this project does not require any additional coordination with FEMA.

d. 4-Step Process

In accordance with the Engineering Criteria Manual I.7.2.A and DCM V2, this site has implemented the four-step process to minimize adverse impacts of urbanization. The four-step process includes reducing runoff volumes, stabilizing drainageways, treating the water quality capture volume, and considering the need for Industrial Commercial BMPs.

Step 1 – Reducing Runoff Volumes: Impervious areas are routed overland through grass swales and buffers to promote infiltration and water quality.

Step 2 – Stabilize Drainageways: The existing roadside swales impacted by these improvements are analyzed in this FDR for stormwater runoff capacity, velocity, and shear stress. Any altered drainageway is designed in a manner that provides water quality benefits through infiltration and the removal of pollutants via phytoremediation. Vegetation and matting is selected to stabilize the drainageways by reducing the velocity of flows and decreasing any scour. These improvements help stabilize drainageways and minimize erosion and sediment runoff.

Step 3 – Provide WQCV: This project has an applicable water quality exclusion per the ECM I.6.1.B.2 – Excluded Roadway Redevelopment. This exclusion is defined as “Redevelopment sites including existing

roadways, when one of the following criteria is met: The site adds less than 1 acre of paved area per mile of roadway to an existing roadway". This project adds 0.69 acres of paved area, including gravel shoulders to the existing roadway. The remaining disturbance from this project has <1 ac of non-excluded soil disturbance and will not require WQ treatment per ECM I.6.1.A.

Step 4 – Consider the need for Industrial and Commercial BMP's: A site specific storm water quality and erosion control plan and narrative will be prepared with subsequent land use approvals prepared in conjunction with the report prior to any construction. Site specific temporary source control BMPs as well as permanent BMPs are detailed in this plan and narrative. Guidelines detailed in the El Paso DCM V2 4.2 pertaining to the covering and storage handline and spill containment and control shall be followed as necessary. This filing does not contain any commercial or industrial land use.

WATER QUALITY TREATMENT SUMMARY			
COLORADO KIDS RANCH - 105 IMPROVEMENTS			
Subbasin ID	Disturbed Area [AC]	Treatment CM	Notes:
ROW-2	0.27	EXCLUSION	EXCLUSION I.6.1.B.2 - ROADWAY REDEVELOPMENT
ROW-2	0.40	SPA	SPA AREA
ROW-3	0.28	EXCLUSION	EXCLUSION I.6.1.B.2 - ROADWAY REDEVELOPMENT
ROW-3	0.27	SPA	SPA AREA
ROW-3	0.08	UNTREATED	DRAINS OFFSITE UNTREATED
ROW-4	0.10	EXCLUSION	EXCLUSION I.6.1.B.2 - ROADWAY REDEVELOPMENT
ROW-4	0.11	SPA	SPA AREA
ROW-5	0.04	EXCLUSION	EXCLUSION I.6.1.B.2 - ROADWAY REDEVELOPMENT
ROW-5	0.10	SPA	SPA AREA

Min Required Area to Receive WQ	Total Disturbed Area	Total Proposed Treated Area	Total Proposed Disturbed Area Excluded from WQ	Total Treated %
0.96	1.65	0.00	0.69	0%

*Project has <1 ac of non-excluded soil disturbance and will not require WQ treatment per ECM I.6.1.A.

IV. Floodplain Analysis

Required improvements associated with the Colorado Kids Ranch 105 Improvements project are located within a Special Flood Hazard Area (SFHA) Zone A as shown on the FEMA Flood Insurance Rate Map (FIRM) Number 08041C0285G, effective December 7, 2018. Zone A floodplains are areas subject to inundation by the 1-percent-annual-chance flood (100-year flood) for which no Base Flood Elevations (BFEs) or regulatory floodway have been established by FEMA. In accordance with El Paso County floodplain requirements, the proposed improvements have been evaluated to demonstrate that the project will not result in a rise in the modeled 100-year water surface elevation (WSE) of greater than 6 inches. The 100-year storm event is the applicable regulatory event for evaluating compliance with the El Paso

County 6-inch rise criterion. Additional information regarding the hydraulic analysis, modeling assumptions, and results is provided below.

No existing hydraulic model was identified for the FEMA-designated floodplain or the El Paso County floodplain in the vicinity of the project. The unnamed tributary is located within an area that has not been hydraulically studied by El Paso County. Therefore, a new pre-project conditions hydraulic model was developed using the available topographic survey, LiDAR, and FEMA data. The hydraulic analysis was performed using HEC-RAS Version 6.7 as a one-dimensional (1D), steady-state hydraulic model.

The FEMA National Flood Hazard Layer (NFHL) data for El Paso County was downloaded from FEMA and geospatially aligned with the project mapping. The project is located within the Colorado State Plane Central Zone coordinate system, and the vertical datum for the analysis is North American Vertical Datum of 1988 (NAVD 88). Topographic survey information completed by Alessi and Associates, Inc. on August 20, 2026, was utilized to develop cross sections and represent existing topographic conditions within and immediately adjacent to the project limits of disturbance. LiDAR data published January 18, 2019, and downloaded from the Colorado Hazard Mapping LiDAR download for East CO El Paso, was utilized to develop cross sections and represent existing topographic conditions outside of the project limits of disturbance.

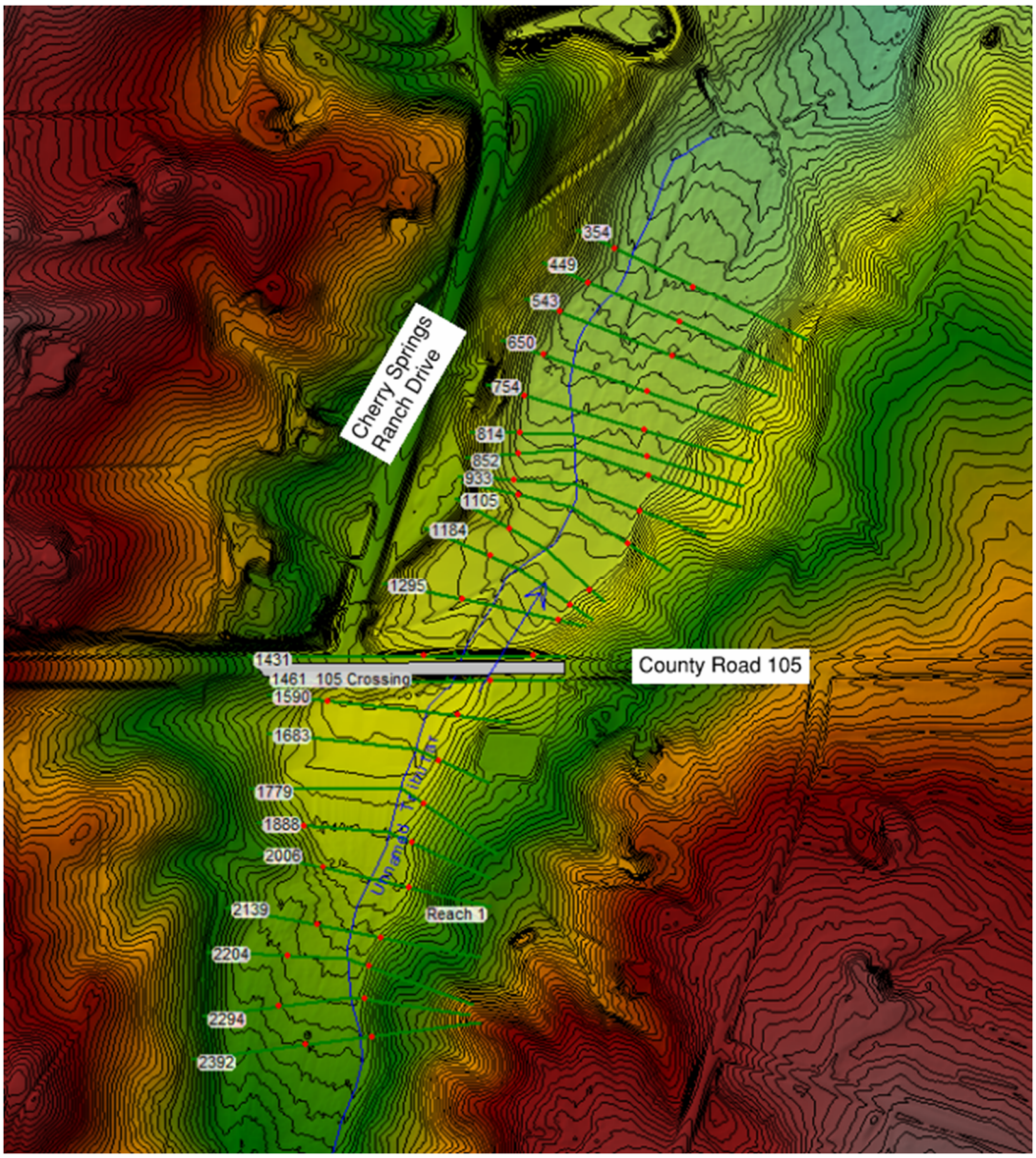
The FEMA Zone A floodplain does not have FEMA-published hydraulic cross sections in the vicinity of the project. Therefore, this analysis evaluates the change in WSE between engineer-defined cross sections representing pre-project and post-project conditions. The downstream bounding cross section for the County Road 105 crossing is not included in the pre-project/post-project WSE comparison because the cross section location must be adjusted to accurately represent the proposed post-project condition following the widening of County Road 105. As a result, the pre-project and post-project conditions at this cross section do not represent the same location and are not directly comparable.

Steady-state flow rates for the analysis were obtained from the United States Geological Survey (USGS) StreamStats program. StreamStats provides spatial analytical tools for estimating streamflow statistics and basin characteristics for water-resources planning, engineering, and design purposes. StreamStats was used to estimate peak flow rates for the 10-year, 100-year, and 500-year storm events and to determine tributary basin characteristics at two locations: 1) immediately upstream of the County Road 105 crossing and 2) immediately downstream of the County Road 105 crossing. StreamStats results and basin characteristics are provided in Appendix B of this report.

The hydraulic analysis was performed using mixed-flow calculations to account for the steep terrain and the potential for both subcritical and supercritical flow conditions within the modeled reach. At the upstream end of the modeled reach, critical depth was used as the boundary condition due to the steep terrain and anticipated mixed-flow conditions. At the downstream end of the modeled reach, normal depth was used as the boundary condition with an assumed energy grade line slope of 1 percent.

Manning's roughness coefficients were selected based on field observations, aerial imagery, and the guidance provided in Table 3-1 of the HEC-RAS Hydraulic Reference Manual. The modeled floodplain section has a generally consistent land cover consisting of a mixture of short and high grasses throughout the channel and overbank areas. Based on the observed site conditions, a Manning's roughness coefficient (n) of 0.035 was selected for the modeled floodplain section. The same Manning's n value of 0.035 was applied to the channel and both overbanks to represent the consistent land cover throughout the modeled section.

The pre-project model represents the existing topographic and hydraulic conditions within the project area and serves as the basis for comparison with the proposed post-project conditions.

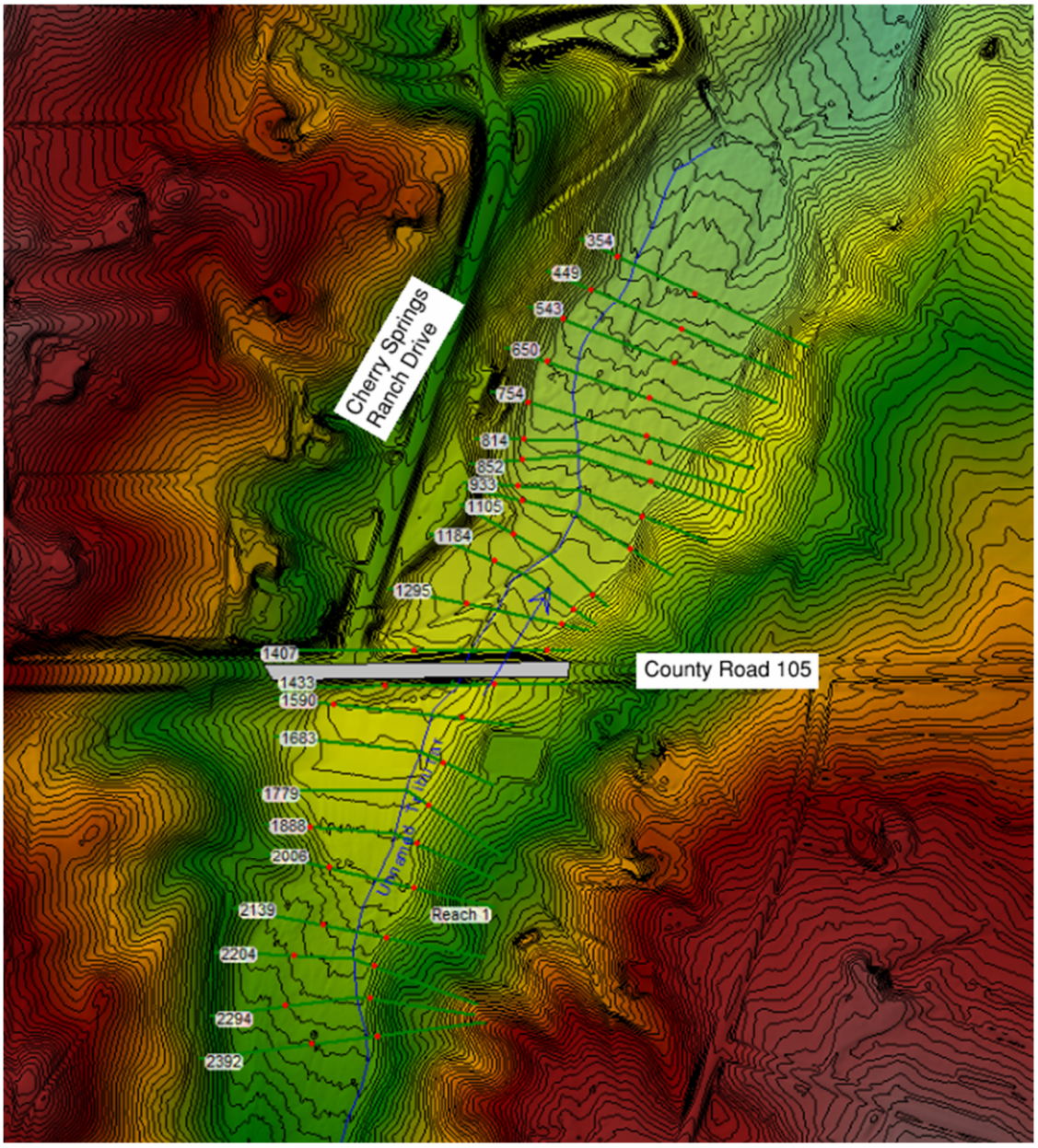


Pre-Project Conditions Model Schematic

The post-project hydraulic model was developed by modifying the pre-project model to represent the proposed improvements. Model modifications primarily include adjustment to the County Road 105 crossing width, downstream embankment slope, and downstream bounding cross section to represent the proposed toe of slope.

The proposed widening of County Road 105 through the floodplain occurs on a taper. The County Road 105 crossing is represented in HEC-RAS as a bridge structure with culvert geometry/opening information based on the topographic survey. HEC-RAS does not provide the capability to directly model a tapered bridge width in the manner proposed. Therefore, a conservative modeling assumption was made to

represent the crossing using a consistent width through the floodplain. The maximum proposed roadway width was used throughout the modeled crossing. This assumption conservatively represents the proposed improvements and is expected to result in a greater modeled impact on WSE than would occur with the actual tapered roadway configuration.



Post-Project Conditions Model Schematic

The modeled pre-project and post-project WSEs were compared at the analyzed cross sections. The results of this comparison are provided in the table below.

Colorado Kids Ranch - 105 Improvments				
Cross-Section		WSE [ft]		Difference [ft]
Pre-Project	Post-Project	Pre-Project	Post-Project	Post-Pre
2392	2392	7320.11	7320.11	0.00
2294	2294	7318.56	7318.56	0.00
2204	2204	7317.16	7317.16	0.00
2139	2139	7315.91	7315.91	0.00
2006	2006	7313.8	7313.77	-0.03
1888	1888	7312.42	7312.46	0.04
1779	1779	7312.53	7312.55	0.02
1683	1683	7312.53	7312.55	0.02
1590	1590	7312.53	7312.55	0.02
1494	1494	7312.53	7312.55	0.02
1461 (105 Crossing)	1461 (105 Crossing)	7312.53	7312.55	0.02
1431	-	7308.39	-	-
-	1407	-	7306.92	-
1295	1295	7303.37	7303.43	0.06
1184	1184	7302.72	7302.72	0.00
1105	1105	7302.15	7302.15	0.00
988	988	7300.22	7300.22	0.00
933	933	7299.35	7299.35	0.00
852	852	7297.97	7297.97	0.00
814	814	7297.09	7297.09	0.00
754	754	7296.53	7296.53	0.00
650	650	7295.17	7295.17	0.00
543	543	7293.73	7293.73	0.00
449	449	7292.39	7292.39	0.00
354	354	7291.14	7291.14	0.00
			Max [ft]:	0.06
			Max [in]:	0.72

WSE Comparison (Pre-Project and Post-Project Conditions)

Based on the post-project hydraulic analysis, the proposed improvements do not result in a rise of greater than 6 inches in the modeled 100-year WSE at the analyzed cross sections. Therefore, the proposed project demonstrates a “Less than 6-Inch Rise” in the 100-year WSE under post-project conditions.

A Less than 6-Inch Rise certification and Floodplain Development Permit will be provided to El Paso County as required. Based on the proposed improvements and the results of this analysis, a Conditional Letter of Map Revision (CLOMR) or Letter of Map Revision (LOMR) is not anticipated to be required for the proposed improvements.

V. Drawings

Refer to the appendices for the Vicinity Map, FEMA Floodplain Map, NRCS Soils Map, hydrology and hydraulic calculations, and drainage basin maps.

VI. Summary

The drainage design contained within this report for the Colorado Kids Ranch County Road 105 improvements remain consistent with pre-development drainage patterns, and anticipated drainage conditions of the previously approved reports that studied the development area. This report and its findings are in general conformance with all pertinent studies. The proposed development will not adversely affect downstream stormwater infrastructure or the surrounding developments. Downstream infrastructure has been described in this report as having capacity for stormwater peak flows discharged from the site. This report meets the latest El Paso County Drainage Criteria.

VII. References

1. City of Colorado Springs. *Drainage Criteria Manual Volumes 1 and 2*, May 2014.
2. El Paso County. *Drainage Criteria Manual Volumes 1 and 2,* September 1991. Revised October 2018.
3. Mile High Flood District. *Urban Storm Drainage Criteria Manual Volumes 1 and 2*, January 2016. Revised March 2024 (Volume 1).
4. Mile High Flood District. *Urban Storm Drainage Criteria Manual Volumes 3,* November 2010. Revised March 2024
5. U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS). *NRCS Web Soil Survey*. Accessed August 2026.
6. U.S. Department of Homeland Security, FEMA. *Flood Insurance Rate Map 08041C0285G*. Effective Date December 7, 2018.
7. U.S. Department of the Interior, USGS. *StreamStats Application*. Accessed September 2026.

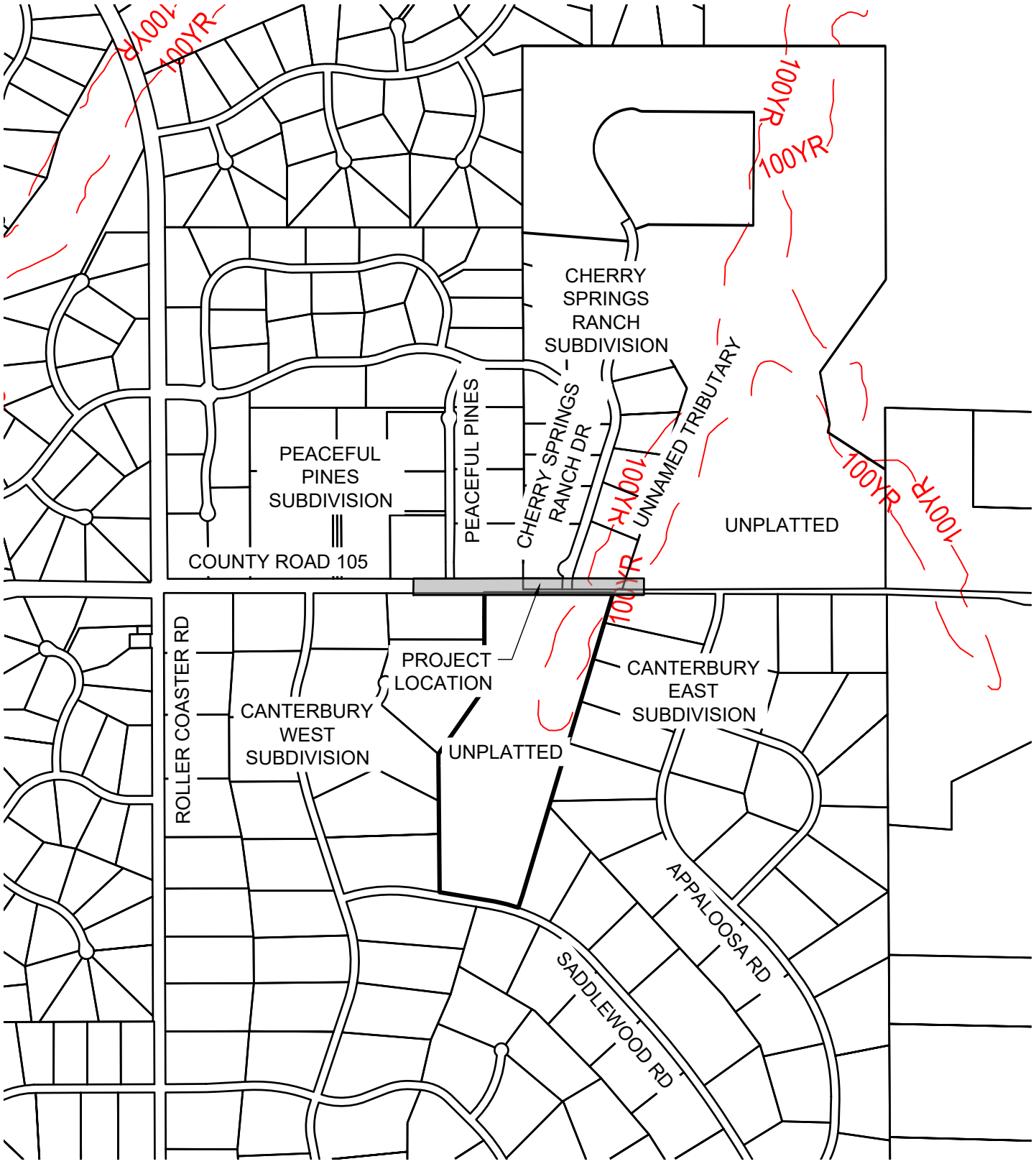
APPENDIX A

VICINITY MAP

NRCS SOILS MAP

FEMA FLOODPLAIN MAP

NOAA ATLAS 14 PRECIPITATION DATA



HRGreen

HRGreen.com

COLORADO KIDS RANCH 105 IMPROVEMENTS

VICINITY MAP

NORTH

SHEET

V–1

SCALE: 1"=1000'

DATE: 10/12/26

Xrefs: 8.5x11_Titleblock; xv–flood–3197; xv–row–3197; xc–dsgn–3197

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 13. The **horizontal datum** was NAD83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the **North American Vertical Datum of 1988 (NAVD88)**. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242 or visit its website at http://www.ngs.noaa.gov/.

Base Map information shown on this FIRM was provided in digital format by El Paso County, Colorado Springs Utilities, City of Fountain, Bureau of Land Management, National Oceanic and Atmospheric Administration, United States Geological Survey, and Anderson Consulting Engineers, Inc. These data are current as of 2006.

This map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map. The profile baselines depicted on this map represent the hydraulic modeling baselines that match the flood profiles and Floodway Data Tables if applicable, in the FIS report. As a result, the profile baselines may deviate significantly from the new base map channel representation and may appear outside of the floodplain.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

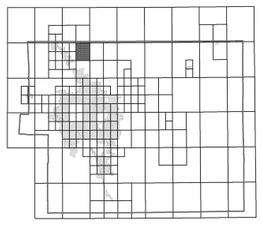
Contact **FEMA Map Service Center** (MSC) via the FEMA Map Information eXchange (FMIX) 1-877-336-2627 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The MSC may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

El Paso County Vertical Datum Offset Table

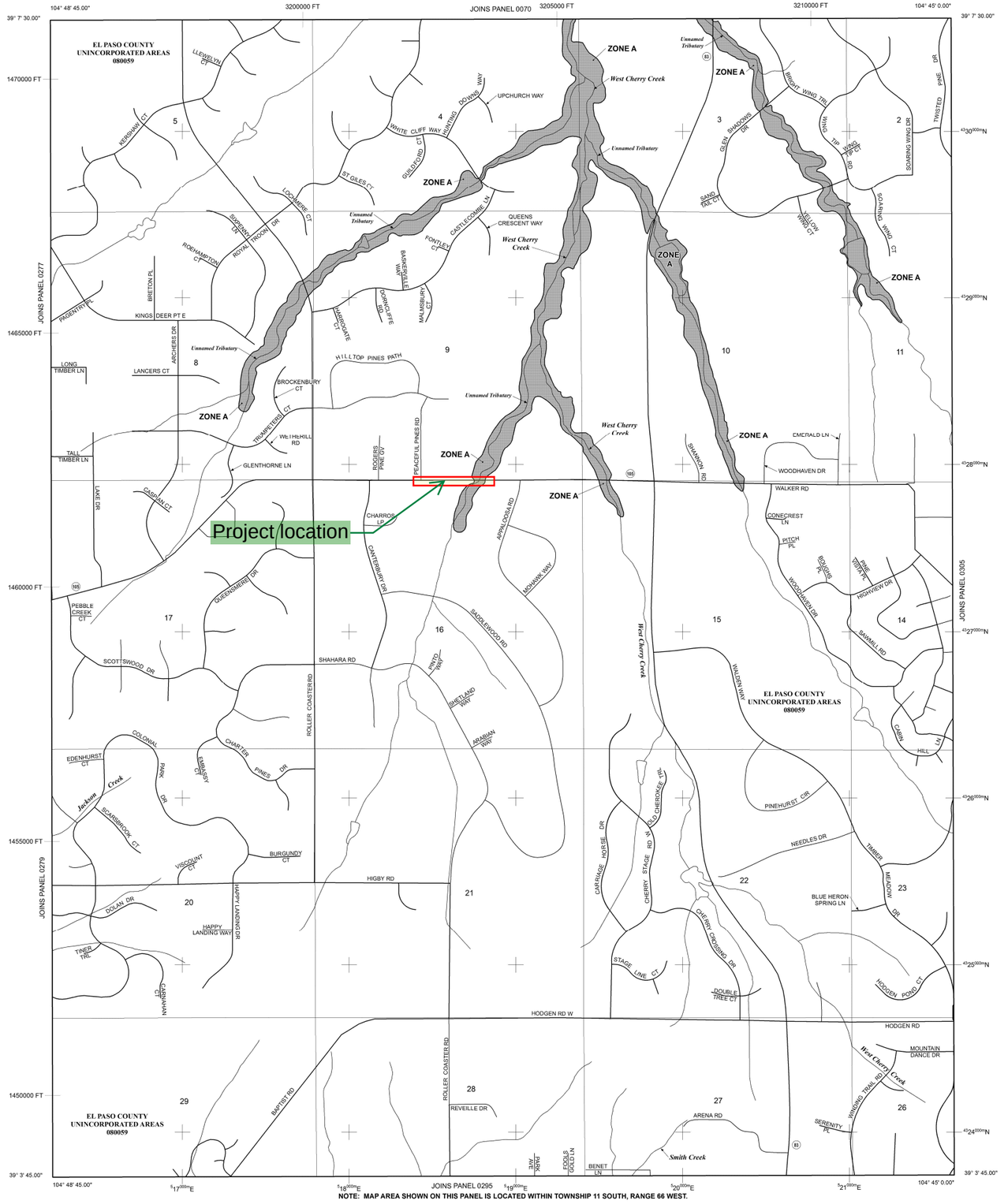
Flooding Source	Vertical Datum Offset (ft)
REFER TO SECTION 3.3 OF THE EL PASO COUNTY FLOOD INSURANCE STUDY FOR STREAM BY STREAM VERTICAL DATUM CONVERSION INFORMATION	

Panel Location Map



This Digital Flood Insurance Rate Map (DFIRM) was produced through a Cooperating Technical Partner (CTP) agreement between the State of Colorado Water Conservation Board (CWCB) and the Federal Emergency Management Agency (FEMA).

Additional Flood Hazard information and resources are available from local communities and the Colorado Water Conservation Board.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAS) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.
ZONE AE Base Flood Elevations determined.
ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR Special Flood Hazard Area Formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

Floodplain boundary
Floodway boundary
Zone D Boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513 — Base Flood Elevation line and value; elevation in feet*
(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

A — A Cross section line
23 — 23 Transect line
97° 07' 30.00" / 32° 22' 30.00" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
4275000mN 1000-meter Universal Transverse Mercator grid ticks, zone 13
6000000 FT 5000-foot grid ticks: Colorado State Plane coordinate system, central zone (FIPSZONE 0502), Lambert Conformal Conic Projection
DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
MARCH 17, 1997

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
DECEMBER 7, 2018 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to update map format, to add roads and road names, and to incorporate previously issued Letters of Map Revision.

For community map revision history prior to countywide mapping, refer to the Community Map History Table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP

PANEL 0285G

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

EL PASO COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 285 OF 1300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

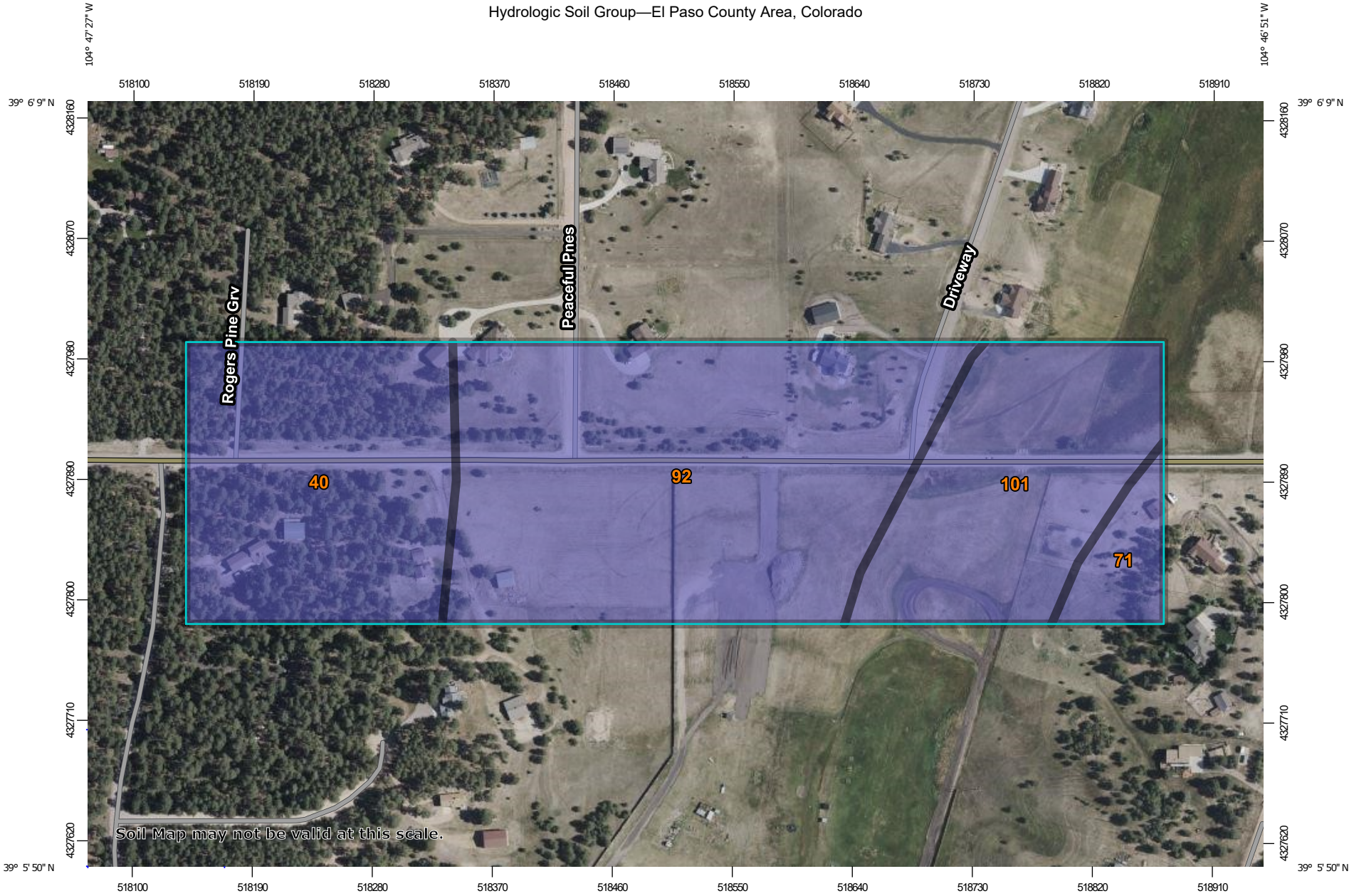
COMMUNITY	NUMBER	PANEL	SUFFIX
EL PASO COUNTY	080059	0285	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER 08041C0285G

MAP REVISED DECEMBER 7, 2018

Federal Emergency Management Agency



Map Scale: 1:4,030 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

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

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

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

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

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

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 23, Aug 29, 2025

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

Date(s) aerial images were photographed: Jul 23, 2024—Aug 4, 2024

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
40	Kettle gravelly loamy sand, 3 to 8 percent slopes	B	10.4	27.2%
71	Pring coarse sandy loam, 3 to 8 percent slopes	B	1.6	4.2%
92	Tomah-Crowfoot loamy sands, 3 to 8 percent slopes	B	17.9	46.6%
101	Ustic Torrifluvents, loamy	B	8.4	22.0%
Totals for Area of Interest			**38.3**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

NOAA Atlas 14, Volume 8, Version 2
Location name: Monument, Colorado, USA*
Latitude: 39.0995°, Longitude: -104.7851°
Elevation: 7324 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.235** (0.194-0.287)	**0.290** (0.239-0.354)	**0.385** (0.315-0.470)	**0.467** (0.380-0.573)	**0.586** (0.463-0.747)	**0.683** (0.525-0.879)	**0.784** (0.581-1.03)	**0.891** (0.632-1.20)	**1.04** (0.707-1.43)	**1.16** (0.763-1.60)
10-min	**0.345** (0.284-0.420)	**0.425** (0.350-0.519)	**0.563** (0.461-0.688)	**0.684** (0.557-0.839)	**0.858** (0.677-1.09)	**1.00** (0.769-1.29)	**1.15** (0.851-1.51)	**1.30** (0.925-1.75)	**1.52** (1.04-2.09)	**1.69** (1.12-2.35)
15-min	**0.420** (0.346-0.512)	**0.519** (0.426-0.632)	**0.687** (0.563-0.840)	**0.834** (0.679-1.02)	**1.05** (0.826-1.33)	**1.22** (0.937-1.57)	**1.40** (1.04-1.84)	**1.59** (1.13-2.14)	**1.86** (1.26-2.55)	**2.06** (1.36-2.86)
30-min	**0.602** (0.495-0.734)	**0.741** (0.609-0.904)	**0.980** (0.803-1.20)	**1.19** (0.968-1.46)	**1.49** (1.18-1.90)	**1.74** (1.34-2.23)	**1.99** (1.48-2.62)	**2.26** (1.61-3.04)	**2.64** (1.80-3.63)	**2.94** (1.94-4.08)
60-min	**0.766** (0.630-0.934)	**0.928** (0.763-1.13)	**1.22** (0.996-1.49)	**1.48** (1.20-1.81)	**1.86** (1.48-2.39)	**2.19** (1.69-2.83)	**2.54** (1.88-3.34)	**2.91** (2.07-3.92)	**3.44** (2.34-4.74)	**3.86** (2.55-5.36)
2-hr	**0.930** (0.770-1.12)	**1.12** (0.922-1.35)	**1.45** (1.20-1.76)	**1.76** (1.44-2.15)	**2.24** (1.79-2.86)	**2.64** (2.05-3.40)	**3.08** (2.30-4.04)	**3.55** (2.54-4.77)	**4.23** (2.91-5.81)	**4.78** (3.18-6.60)
3-hr	**1.02** (0.846-1.23)	**1.21** (1.00-1.45)	**1.56** (1.28-1.88)	**1.89** (1.55-2.29)	**2.41** (1.94-3.08)	**2.86** (2.24-3.68)	**3.36** (2.53-4.41)	**3.91** (2.81-5.24)	**4.70** (3.24-6.44)	**5.35** (3.57-7.35)
6-hr	**1.20** (1.00-1.43)	**1.39** (1.16-1.67)	**1.78** (1.48-2.13)	**2.15** (1.78-2.59)	**2.75** (2.24-3.51)	**3.28** (2.58-4.20)	**3.87** (2.94-5.06)	**4.53** (3.29-6.05)	**5.49** (3.82-7.49)	**6.29** (4.22-8.58)
12-hr	**1.42** (1.20-1.69)	**1.65** (1.38-1.96)	**2.09** (1.75-2.49)	**2.52** (2.09-3.01)	**3.20** (2.61-4.04)	**3.79** (3.00-4.82)	**4.45** (3.39-5.77)	**5.18** (3.78-6.87)	**6.26** (4.38-8.47)	**7.14** (4.83-9.69)
24-hr	**1.69** (1.42-1.99)	**1.97** (1.66-2.33)	**2.50** (2.10-2.96)	**2.99** (2.50-3.55)	**3.75** (3.06-4.67)	**4.40** (3.49-5.52)	**5.10** (3.90-6.54)	**5.87** (4.30-7.70)	**6.98** (4.91-9.36)	**7.88** (5.37-10.6)
2-day	**1.97** (1.67-2.31)	**2.34** (1.98-2.74)	**2.98** (2.51-3.49)	**3.54** (2.98-4.17)	**4.38** (3.58-5.38)	**5.08** (4.04-6.29)	**5.81** (4.46-7.35)	**6.60** (4.85-8.55)	**7.70** (5.44-10.2)	**8.58** (5.88-11.5)
3-day	**2.16** (1.84-2.51)	**2.56** (2.17-2.98)	**3.25** (2.75-3.79)	**3.86** (3.25-4.52)	**4.75** (3.88-5.79)	**5.48** (4.37-6.74)	**6.24** (4.80-7.86)	**7.06** (5.20-9.10)	**8.19** (5.80-10.8)	**9.10** (6.26-12.1)
4-day	**2.31** (1.97-2.68)	**2.73** (2.32-3.17)	**3.45** (2.93-4.01)	**4.08** (3.44-4.77)	**5.00** (4.10-6.08)	**5.76** (4.60-7.07)	**6.56** (5.06-8.22)	**7.40** (5.47-9.51)	**8.57** (6.09-11.3)	**9.50** (6.56-12.6)
7-day	**2.72** (2.32-3.13)	**3.15** (2.70-3.64)	**3.91** (3.33-4.52)	**4.58** (3.88-5.32)	**5.57** (4.59-6.72)	**6.37** (5.12-7.78)	**7.22** (5.60-9.01)	**8.13** (6.04-10.4)	**9.39** (6.71-12.3)	**10.4** (7.22-13.8)
10-day	**3.07** (2.64-3.52)	**3.53** (3.03-4.06)	**4.33** (3.71-5.00)	**5.04** (4.29-5.83)	**6.08** (5.03-7.31)	**6.93** (5.59-8.42)	**7.83** (6.09-9.72)	**8.78** (6.55-11.2)	**10.1** (7.24-13.2)	**11.2** (7.77-14.7)
20-day	**4.06** (3.51-4.63)	**4.65** (4.01-5.30)	**5.64** (4.85-6.45)	**6.50** (5.55-7.46)	**7.72** (6.40-9.16)	**8.70** (7.04-10.4)	**9.71** (7.59-11.9)	**10.8** (8.07-13.6)	**12.2** (8.80-15.8)	**13.3** (9.35-17.5)
30-day	**4.88** (4.23-5.54)	**5.59** (4.84-6.35)	**6.76** (5.83-7.70)	**7.75** (6.64-8.86)	**9.12** (7.57-10.7)	**10.2** (8.26-12.2)	**11.3** (8.84-13.8)	**12.4** (9.31-15.5)	**13.9** (10.0-17.8)	**15.0** (10.6-19.6)
45-day	**5.92** (5.14-6.68)	**6.79** (5.89-7.67)	**8.19** (7.09-9.28)	**9.34** (8.03-10.6)	**10.9** (9.04-12.7)	**12.1** (9.79-14.3)	**13.2** (10.4-16.0)	**14.4** (10.8-17.9)	**15.9** (11.5-20.3)	**17.0** (12.0-22.1)
60-day	**6.81** (5.93-7.66)	**7.81** (6.80-8.80)	**9.40** (8.16-10.6)	**10.7** (9.22-12.1)	**12.4** (10.3-14.3)	**13.6** (11.1-16.0)	**14.8** (11.7-17.9)	**16.0** (12.1-19.8)	**17.5** (12.7-22.2)	**18.6** (13.1-24.0)

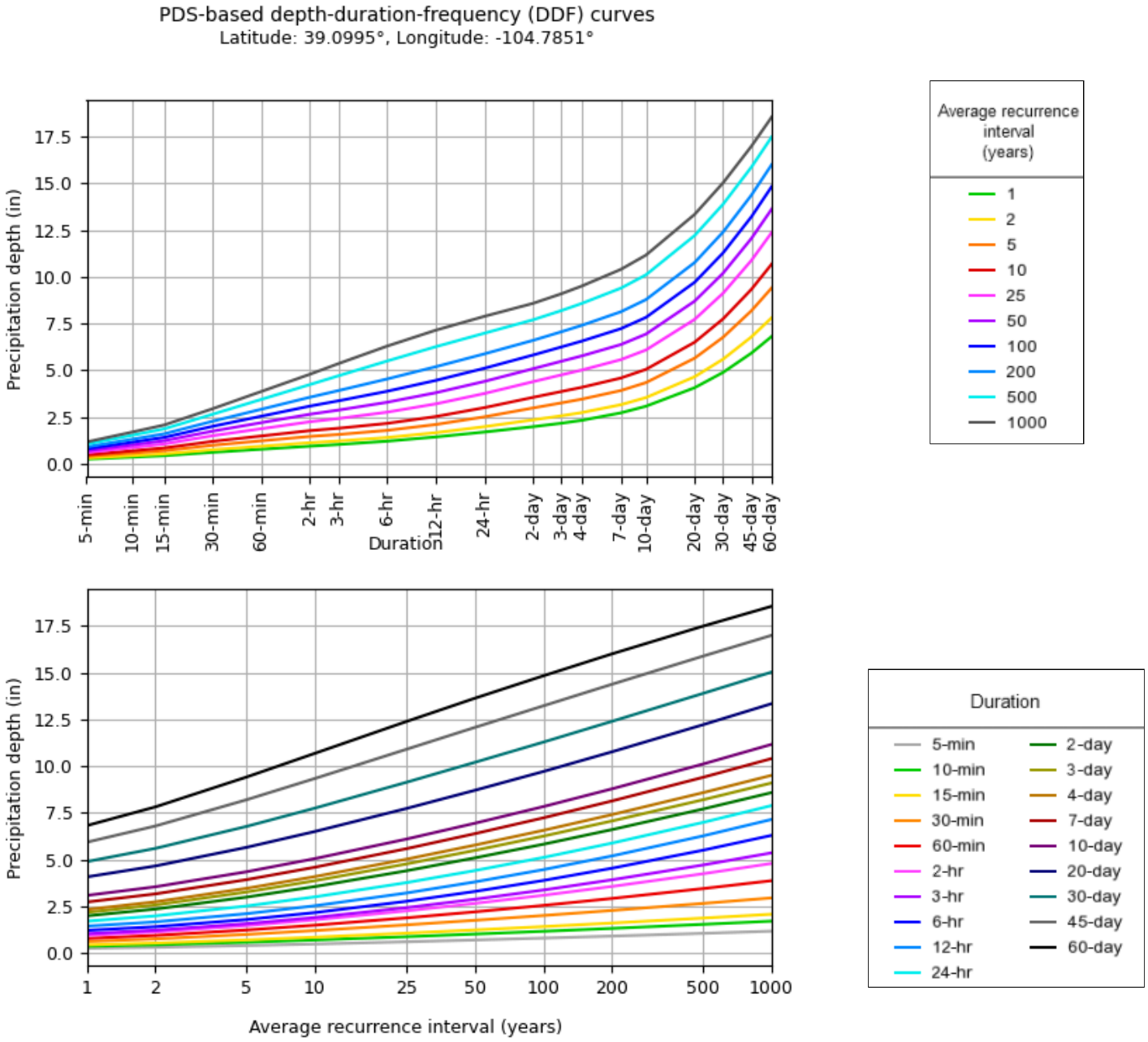
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical



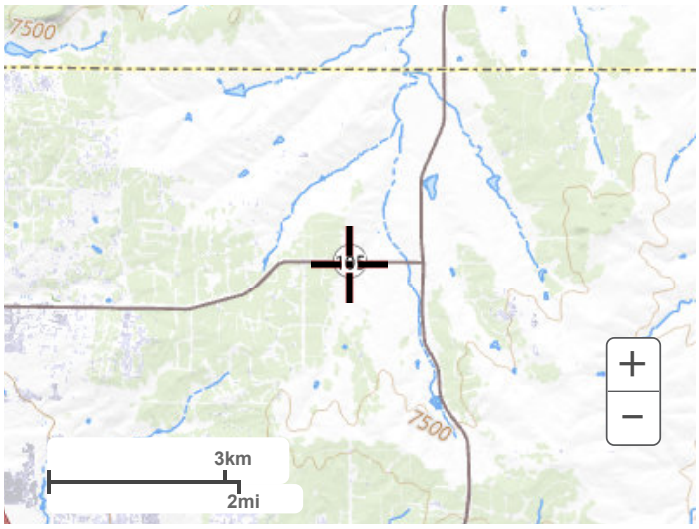
NOAA Atlas 14, Volume 8, Version 2

Created (GMT): Thu Aug 20 16:56:31 2026

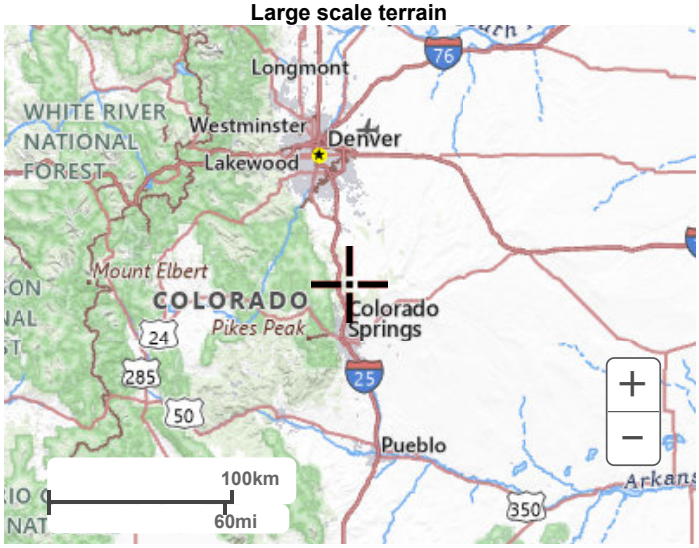
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Maps & aerials

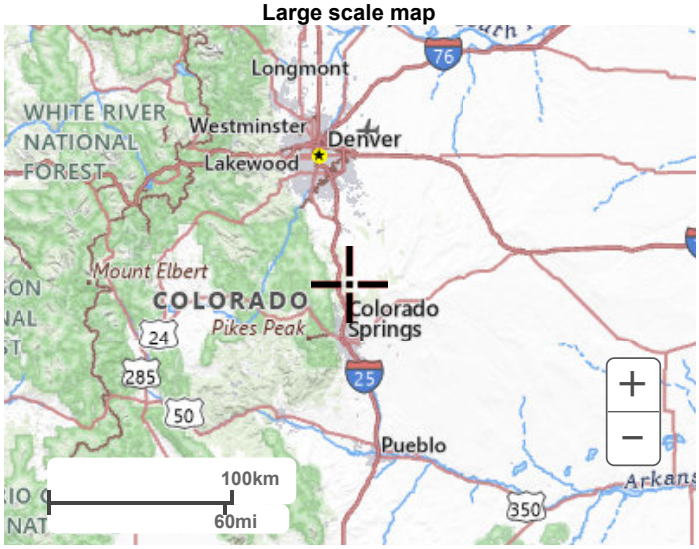
Small scale terrain



Large scale terrain



Large scale map



Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

APPENDIX B

HYDROLOGY CALCULATIONS

COLORADO KIDS RANCH - 105 IMPROVEMENTS	**Calc'd by:**	**SPC**	
EXISTING CONDITIONS	**Checked by:**	**RDL**	
EL PASO COUNTY, CO	**Date:**	**10/9/2026**	

SUMMARY RUNOFF TABLE

BASIN	AREA (ac)	% IMPERVIOUS	Q_5 (cfs)	Q_{100} (cfs)
ROW-1	3.68	20	2.67	8.92
ROW-2	1.45	20	1.40	4.68
ROW-3	0.98	28	1.13	3.26
ROW-4	0.61	21	0.58	1.91
ROW-5	0.34	26	0.40	1.21
OS-1	12.75	20	8.68	32.04
OS-2	3.30	20	2.52	9.32
OS-3	1.53	20	1.20	4.44
OS-4	9.25	20	6.72	24.81
OS-5	22.41	20	14.92	55.09

DESIGN POINT SUMMARY TABLE

DESIGN POINT	CONTRIBUTING BASINS	ΣQ_5 (cfs)	ΣQ_{100} (cfs)
1	OS-1	8.68	19.09
2	OS-2	2.52	9.32
3	ROW-1, DP [1,2]	12.62	45.66
4	OS-3	1.20	4.44
5	OS-4	6.72	24.81
6a	OS-5, DP [5]	16.87	62.28
6b	ROW-2, DP [3,4]	13.25	47.75
6	DP [6a,6b]	29.43	107.54
7	ROW-3	1.13	3.26
8a	ROW-4	0.58	1.91
8b	ROW-5	0.40	1.21
8	DP [8a,8b]	1.61	3.05

HRGreen

COLORADO KIDS RANCH - 105
IMPROVEMENTS
EXISTING CONDITIONS
EL PASO COUNTY, CO

Calc'd by: SPC

Checked by: RDL

Date: 10/9/2026

SOIL TYPE: HSG A&B

COMPOSITE 'C' FACTORS

BASIN	LAND USE TYPE: Paved			Gravel			1 Acre			Historic Flow Analysis--Greenbelts,			Land Use Undefined			Land Use Undefined			TOTAL	COMPOSITE IMPERVIOUSNESS & C FACTOR		
	%I	C_5	C_{100}	%I	C_5	C_{100}	%I	C_5	C_{100}	%I	C_5	C_{100}	%I	C_5	C_{100}	%I	C_5	C_{100}				
	100	0.90	0.96	80	0.59	0.70	20	0.20	0.44	2	0.09	0.36	0	0.00	0.00	0	0.00	0.00				
	ACRES			ACRES			ACRES			ACRES			ACRES			ACRES			ACRES	%I	C_5	C_{100}
ROW-1	0.57			0.14						2.97									3.68	20	0.23	0.47
ROW-2	0.22			0.06						1.17									1.45	20	0.23	0.46
ROW-3	0.22			0.06						0.70									0.98	28	0.30	0.51
ROW-4	0.10			0.02						0.49									0.61	21	0.24	0.47
ROW-5	0.07			0.02						0.25									0.34	26	0.28	0.50
OS-1							12.75												12.75	20	0.20	0.44
OS-2							3.30												3.30	20	0.20	0.44
OS-3							1.53												1.53	20	0.20	0.44
OS-4							9.25												9.25	20	0.20	0.44
OS-5							22.41												22.41	20	0.20	0.44
																			0.00	0		
																			0.00	0		
TOTAL	1.17			0.29			49.24			5.59			0.00			0.00			56.30	20		

HRGreen	**COLORADO KIDS RANCH - 105 IMPROVEMENTS**	**Calc'd by:**	**SPC**
	EXISTING CONDITIONS	**Checked by:**	**RDL**
	EL PASO COUNTY, CO	**Date:**	**10/9/2026**

TIME OF CONCENTRATION

BASIN DATA			OVERLAND TIME (T_i)			TRAVEL TIME (T_t)					TOTAL	tc=(L/180)+10	Design tc
DESIGNATION	C_5	AREA (ac)	LENGTH (ft)	SLOPE %	t_i (min)	C_V	LENGTH (ft)	SLOPE %	V (ft/s)	t_t (min)	t_c (min)	*tc max*	*tc design (min)*
ROW-1	0.23	3.68	83	3.6	9.4	15	1969	4.4	3.1	10.4	19.9	21.4	19.9
ROW-2	0.23	1.45	60	10.0	5.7	15	806	4.5	3.2	4.2	9.9	14.8	9.9
ROW-3	0.30	0.98	33	11.0	3.8	7	771	5.0	1.6	8.2	12.0	14.5	12.0
ROW-4	0.24	0.61	175	5.0	12.2	7	0	0.0	0.0	0.0	12.2	11.0	11.0
ROW-5	0.28	0.34	151	8.0	9.2	7	0	0.0	0.0	0.0	9.2	10.8	9.2
OS-1	0.20	12.75	300	4.5	17.3	7	822	3.8	1.4	10.0	27.4	16.2	16.2
OS-2	0.20	3.30	300	5.0	16.7	7	106	9.0	2.1	0.8	17.6	12.3	12.3
OS-3	0.20	1.53	262	8.0	13.4	7	0	0.0	0.0	0.0	13.4	11.5	11.5
OS-4	0.20	9.25	300	7.0	14.9	7	409	5.4	1.6	4.2	19.1	13.9	13.9
OS-5	0.20	22.41	300	6.8	15.1	7	970	4.7	1.5	10.7	25.7	17.1	17.1

$$t_i = \frac{0.395(1.1 - C_5)\sqrt{L}}{S^{0.33}} \qquad V = C_v S_w^{0.5}$$

Table 6-7. Conveyance Coefficient, C_v

Type of Land Surface	C_v
Heavy meadow	2.5
Tillage/field	5
Riprap (not buried)*	6.5
Short pasture and lawns	7
Nearly bare ground	10
Grassed waterway	15
Paved areas and shallow paved swales	20

*For buried riprap, select C_v value based on type of vegetative cover.

HRGreen

COLORADO KIDS RANCH - 105 IMPROVEMENTS

EXISTING CONDITIONS

DESIGN STORM: 5-YEAR

Calc'd by:	SPC
Checked by:	RDL
Date:	10/9/2026

			DIRECT RUNOFF						TOTAL RUNOFF				STREET			PIPE				TRAVEL TIME			REMARKS
	DESIGN POINT	BASIN ID	AREA (ac)	C_5	t_c (min)	C_5*A (ac)	I (in./ hr.)	Q (cfs)	t_c (min)	C_5*A (ac)	I (in./ hr.)	Q (cfs)	Q_{street} (cfs)	C_5*A (ac)	SLOPE %	Q_{PIPE} (cfs)	C_5*A (ac)	SLOPE %	PIPE SIZE (ft)	LENGTH (FT)	VEL. (FPS)	TRAVEL TIME (mi	
	1	OS-1	12.75	0.20	16.2	2.55	3.40	8.68	16.2	2.55	3.40	**8.68**	8.7	2.55	5.4					620	3.49	2.96	
	2	OS-2	3.30	0.20	12.3	0.66	3.82	2.52	12.3	0.66	3.82	**2.52**	2.5	0.66	5.0					50	3.35	0.25	
	3	ROW-1	3.68	0.23	19.9	0.86	3.10	2.67	19.9	4.07	3.10	**12.62**	12.6	4.07	4.5					806	3.18	4.22	
	4	OS-3	1.53	0.20	11.5	0.31	3.93	1.20	11.5	0.31	3.93	**1.20**	1.2	0.31	4.0					508	3.00	2.82	
	5	OS-4	9.25	0.20	13.9	1.85	3.63	6.72	13.9	1.85	3.63	**6.72**	6.7	1.85	4.3					1099	1.45	12.62	
	6a	OS-5	22.41	0.20	17.1	4.48	3.33	14.92	26.6	6.33	2.66	**16.87**											
	6b	ROW-2	1.45	0.23	9.9	0.34	4.14	1.40	24.1	4.72	2.81	**13.25**											
	6	ROW-2 OS-5	1.45 22.41	0.23 0.20	9.9 17.1	0.34 4.48	4.14 3.33	1.40 14.92	26.6	11.05	2.66	**29.43**											
	7	ROW-3	0.98	0.30	12.0	0.29	3.86	1.13	12.0	0.29	3.86	**1.13**											
	8a	ROW-4	0.61	0.24	11.0	0.15	3.99	0.58	11.0	0.15	3.99	**0.58**											
	8b	ROW-5	0.34	0.28	9.2	0.09	4.25	0.40	9.2	0.09	4.25	**0.40**											
	8	ROW-4 ROW-5	0.61 0.34	0.24 0.28	11.0 9.2	0.15 0.09	3.99 4.25	0.58 0.40	11.0	0.24	6.70	**1.61**											

HRGreen

COLORADO KIDS RANCH - 105 IMPROVEMENTS

EXISTING CONDITIONS

DESIGN STORM: 100-YEAR

Calc'd by:	SPC
Checked by:	RDL
Date:	10/9/2026

			DIRECT RUNOFF						TOTAL RUNOFF				STREET			PIPE				TRAVEL TIME			REMARKS
	DESIGN POINT	BASIN ID	AREA (ac)	C_{100}	t_c (min)	C_{100}*A (ac)	I (in./ hr.)	Q (cfs)	t_c (min)	C_{100}*A (ac)	I (in./ hr.)	Q (cfs)	Q_{street} (cfs)	C_{100}*A (ac)	SLOPE %	Q_{PIPE} (cfs)	C_{100}*A (ac)	SLOPE %	PIPE SIZE (ft)	LENGTH (ft)	VEL. (ft/s)	TRAVEL TIME (min	
	1	OS-1	12.75	0.44	16.2	5.61	5.71	32.04	16.2	5.61	3.40	**19.09**	19.1	5.61	5.4					620	3.49	2.96	
	2	OS-2	3.30	0.44	12.3	1.45	6.42	9.32	12.3	1.45	6.42	**9.32**	9.3	1.45	5.0					50	3.35	0.25	
	3	ROW-1	3.68	0.47	19.9	1.71	5.20	8.92	19.9	8.78	5.20	**45.66**	45.7	8.78	4.5					806	3.18	4.22	
	4	OS-3	1.53	0.44	11.5	0.67	6.59	4.44	11.5	0.67	6.59	**4.44**	4.4	0.67	4.0					508	3.00	2.82	
	5	OS-4	9.25	0.44	13.9	4.07	6.10	24.81	13.9	4.07	6.10	**24.81**	24.8	4.07	4.3					1099	1.45	12.62	
	6a	OS-5	22.41	0.44	17.1	9.86	5.59	55.09	26.6	13.93	4.47	**62.28**											
	6b	ROW-2	1.45	0.46	9.9	0.67	6.95	4.68	24.1	10.12	4.72	**47.75**											
	6	ROW-2 OS-5	1.45 22.41	0.46 0.44	9.9 17.1	0.67 9.86	6.95 5.59	4.68 55.09	26.6	24.05	4.47	**107.54**											
	7	ROW-3	0.98	0.51	12.0	0.50	6.47	3.26	12.0	0.50	6.47	**3.26**											
	8a	ROW-4	0.61	0.47	11.0	0.29	6.70	1.91	11.0	0.29	6.70	**1.91**											
	8b	ROW-5	0.34	0.50	9.2	0.17	7.13	1.21	9.2	0.17	7.13	**1.21**											
	8	ROW-4 ROW-5	0.61 0.34	0.47 0.50	11.0 9.2	0.29 0.17	6.70 7.13	1.91 1.21	11.0	0.46	6.70	**3.05**											

HRGreen	**COLORADO KIDS RANCH - 105 IMPROVEMENTS**	**Calc'd by:**	**SPC**
	PROPOSED CONDITIONS	**Checked by:**	**RDL**
	EL PASO COUNTY, CO	**Date:**	**10/9/2026**

SUMMARY RUNOFF TABLE

BASIN	AREA (ac)	% IMPERVIOUS	Q_5 (cfs)	Q_{100} (cfs)
ROW-1	3.68	20	2.67	8.92
ROW-2	1.45	32	2.04	5.55
ROW-3	0.98	51	1.91	4.28
ROW-4	0.61	31	0.79	2.18
ROW-5	0.34	31	0.48	1.31
OS-1	12.75	20	8.68	32.04
OS-2	3.30	20	2.52	9.32
OS-3	1.53	20	1.20	4.44
OS-4	9.25	20	6.72	24.81
OS-5	22.41	20	14.92	55.09

DESIGN POINT SUMMARY TABLE

DESIGN POINT	CONTRIBUTING BASINS	ΣQ_5 (cfs)	ΣQ_{100} (cfs)
1	OS-1	8.68	19.09
2	OS-2	2.52	9.32
3	ROW-1, DP [1,2]	12.62	45.66
4	OS-3	1.20	4.44
5	OS-4	6.72	24.81
6a	OS-5, DP [5]	16.87	62.28
6b	ROW-2, DP [3,4]	13.66	48.25
6	DP [6a,6b]	29.81	108.02
7	ROW-3	1.91	4.28
8a	ROW-4	0.79	2.18
8b	ROW-5	0.48	1.31
8	DP [8a,8b]	2.07	3.39

COLORADO KIDS RANCH - 105
IMPROVEMENTS
PROPOSED CONDITIONS
EL PASO COUNTY, CO

Calc'd by: SPC

Checked by: RDL

Date: 10/9/2026

SOIL TYPE: HSG A&B

COMPOSITE 'C' FACTORS

BASIN	LAND USE TYPE: Paved			Gravel			1 Acre			Historic Flow Analysis--Greenbelts,			Land Use Undefined			Land Use Undefined			TOTAL	COMPOSITE IMPERVIOUSNESS & C FACTOR		
	%I	C_5	C_{100}	%I	C_5	C_{100}	%I	C_5	C_{100}	%I	C_5	C_{100}	%I	C_5	C_{100}	%I	C_5	C_{100}				
	100	0.90	0.96	80	0.59	0.70	20	0.20	0.44	2	0.09	0.36	0	0.00	0.00	0	0.00	0.00				
	ACRES			ACRES			ACRES			ACRES			ACRES			ACRES			ACRES	%I	C_5	C_{100}
ROW-1	0.57			0.14						2.97									3.68	20	0.23	0.47
ROW-2	0.40			0.06						1.00									1.45	32	0.33	0.54
ROW-3	0.45			0.06						0.47									0.98	51	0.49	0.65
ROW-4	0.16			0.02						0.42									0.61	31	0.33	0.53
ROW-5	0.09			0.02						0.24									0.34	31	0.32	0.53
OS-1							12.75												12.75	20	0.20	0.44
OS-2							3.30												3.30	20	0.20	0.44
OS-3							1.53												1.53	20	0.20	0.44
OS-4							9.25												9.25	20	0.20	0.44
OS-5							22.41												22.41	20	0.20	0.44
																			0.00	0		
																			0.00	0		
TOTAL	1.67			0.29			49.24			5.10			0.00			0.00			56.30	21		

HRGreen	**COLORADO KIDS RANCH - 105 IMPROVEMENTS**	**Calc'd by:**	**SPC**
	PROPOSED CONDITIONS	**Checked by:**	**RDL**
	EL PASO COUNTY, CO	**Date:**	**10/9/2026**

TIME OF CONCENTRATION

BASIN DATA			OVERLAND TIME (T_i)			TRAVEL TIME (T_t)					TOTAL	tc=(L/180)+10	Design tc
DESIGNATION	C_5	AREA (ac)	LENGTH (ft)	SLOPE %	t_i (min)	C_V	LENGTH (ft)	SLOPE %	V (ft/s)	t_t (min)	t_c (min)	*tc max*	*tc design (min)*
ROW-1	0.23	3.68	83	3.6	9.4	15	1969	4.4	3.1	10.4	19.9	21.4	19.9
ROW-2	0.33	1.45	60	10.0	5.1	15	806	4.5	3.2	4.2	9.3	14.8	9.3
ROW-3	0.49	0.98	33	11.0	2.9	7	771	5.0	1.6	8.2	11.1	14.5	11.1
ROW-4	0.33	0.61	175	5.0	11.0	7	0	0.0	0.0	0.0	11.0	11.0	11.0
ROW-5	0.32	0.34	151	8.0	8.8	7	0	0.0	0.0	0.0	8.8	10.8	8.8
OS-1	0.20	12.75	300	4.5	17.3	7	822	3.8	1.4	10.0	27.4	16.2	16.2
OS-2	0.20	3.30	300	5.0	16.7	7	106	9.0	2.1	0.8	17.6	12.3	12.3
OS-3	0.20	1.53	262	8.0	13.4	7	0	0.0	0.0	0.0	13.4	11.5	11.5
OS-4	0.20	9.25	300	7.0	14.9	7	409	5.4	1.6	4.2	19.1	13.9	13.9
OS-5	0.20	22.41	300	6.8	15.1	7	970	4.7	1.5	10.7	25.7	17.1	17.1

$$t_i = \frac{0.395(1.1 - C_5)\sqrt{L}}{S^{0.33}} \qquad V = C_v S_w^{0.5}$$

Table 6-7. Conveyance Coefficient, C_v

Type of Land Surface	C_v
Heavy meadow	2.5
Tillage/field	5
Riprap (not buried)*	6.5
Short pasture and lawns	7
Nearly bare ground	10
Grassed waterway	15
Paved areas and shallow paved swales	20

*For buried riprap, select C_v value based on type of vegetative cover.

HRGreen

COLORADO KIDS RANCH - 105 IMPROVEMENTS

PROPOSED CONDITIONS

DESIGN STORM: 5-YEAR

Calc'd by:	SPC
Checked by:	RDL
Date:	10/9/2026

			DIRECT RUNOFF						TOTAL RUNOFF				STREET			PIPE				TRAVEL TIME			REMARKS
	DESIGN POINT	BASIN ID	AREA (ac)	C_5	t_c (min)	C_5*A (ac)	I (in./ hr.)	Q (cfs)	t_c (min)	C_5*A (ac)	I (in./ hr.)	Q (cfs)	Q_{street} (cfs)	C_5*A (ac)	SLOPE %	Q_{PIPE} (cfs)	C_5*A (ac)	SLOPE %	PIPE SIZE (ft)	LENGTH (FT)	VEL. (FPS)	TRAVEL TIME (mi	
	1	OS-1	12.75	0.20	16.2	2.55	3.40	8.68	16.2	2.55	3.40	**8.68**	8.7	2.55	5.4					620	3.49	2.96	
	2	OS-2	3.30	0.20	12.3	0.66	3.82	2.52	12.3	0.66	3.82	**2.52**	2.5	0.66	5.0					50	3.35	0.25	
	3	ROW-1	3.68	0.23	19.9	0.86	3.10	2.67	19.9	4.07	3.10	**12.62**	12.6	4.07	4.5					806	3.18	4.22	
	4	OS-3	1.53	0.20	11.5	0.31	3.93	1.20	11.5	0.31	3.93	**1.20**	1.2	0.31	4.0					508	3.00	2.82	
	5	OS-4	9.25	0.20	13.9	1.85	3.63	6.72	13.9	1.85	3.63	**6.72**	6.7	1.85	4.3					1099	1.45	12.62	
	6a	OS-5	22.41	0.20	17.1	4.48	3.33	14.92	26.6	6.33	2.66	**16.87**											
	6b	ROW-2	1.45	0.33	9.3	0.48	4.24	2.04	24.1	4.86	2.81	**13.66**											
	6	ROW-2 OS-5	1.45 22.41	0.33 0.20	9.3 17.1	0.48 4.48	4.24 3.33	2.04 14.92	26.6	11.19	2.66	**29.81**											
	7	ROW-3	0.98	0.49	11.1	0.48	3.97	1.91	11.1	0.48	3.97	**1.91**											
	8a	ROW-4	0.61	0.33	11.0	0.20	3.99	0.79	11.0	0.20	3.99	**0.79**											
	8b	ROW-5	0.34	0.32	8.8	0.11	4.33	0.48	8.8	0.11	4.33	**0.48**											
	8	ROW-4 ROW-5	0.61 0.34	0.33 0.32	11.0 8.8	0.20 0.11	3.99 4.33	0.79 0.48	11.0	0.31	6.70	**2.07**											

HRGreen

COLORADO KIDS RANCH - 105 IMPROVEMENTS

PROPOSED CONDITIONS

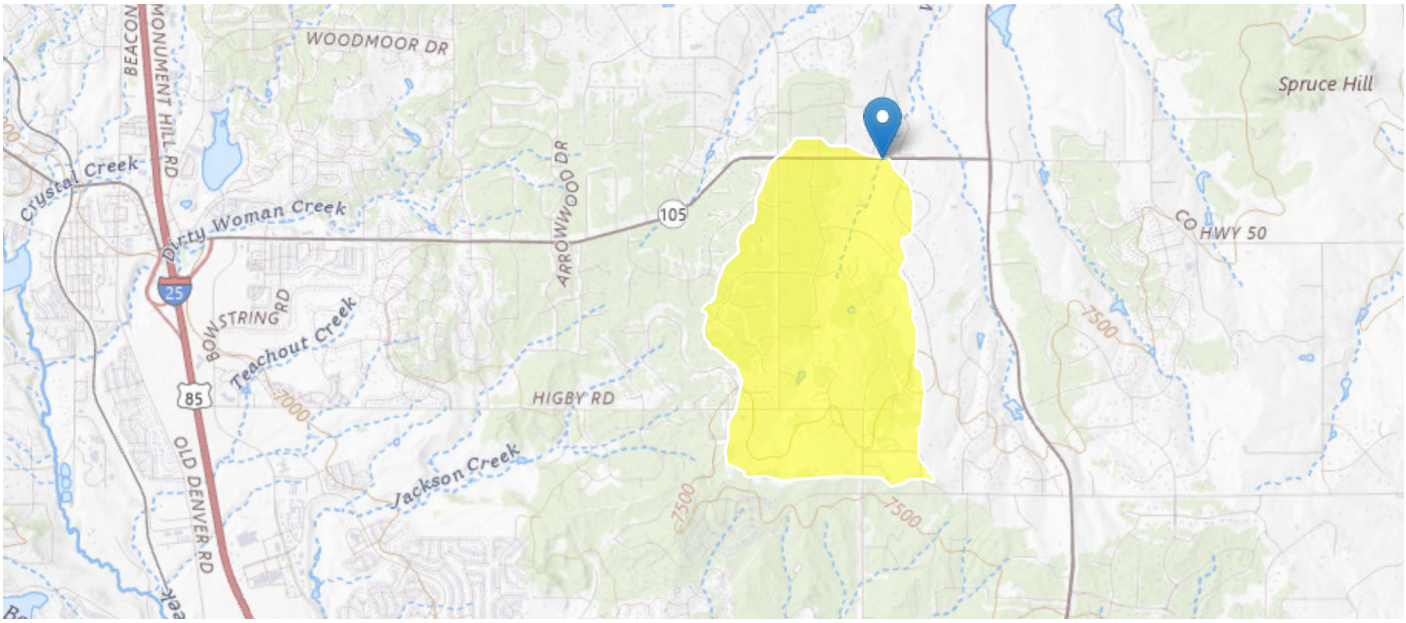
DESIGN STORM: 100-YEAR

Calc'd by:	SPC
Checked by:	RDL
Date:	10/9/2026

			DIRECT RUNOFF						TOTAL RUNOFF				STREET			PIPE				TRAVEL TIME			REMARKS
	DESIGN POINT	BASIN ID	AREA (ac)	C_{100}	t_c (min)	C_{100}*A (ac)	I (in./ hr.)	Q (cfs)	t_c (min)	C_{100}*A (ac)	I (in./ hr.)	Q (cfs)	Q_{street} (cfs)	C_{100}*A (ac)	SLOPE %	Q_{PIPE} (cfs)	C_{100}*A (ac)	SLOPE %	PIPE SIZE (ft)	LENGTH (ft)	VEL. (ft/s)	TRAVEL TIME (min	
	1	OS-1	12.75	0.44	16.2	5.61	5.71	32.04	16.2	5.61	3.40	**19.09**	19.1	5.61	5.4					620	3.49	2.96	
	2	OS-2	3.30	0.44	12.3	1.45	6.42	9.32	12.3	1.45	6.42	**9.32**	9.3	1.45	5.0					50	3.35	0.25	
	3	ROW-1	3.68	0.47	19.9	1.71	5.20	8.92	19.9	8.78	5.20	**45.66**	45.7	8.78	4.5					806	3.18	4.22	
	4	OS-3	1.53	0.44	11.5	0.67	6.59	4.44	11.5	0.67	6.59	**4.44**	4.4	0.67	4.0					508	3.00	2.82	
	5	OS-4	9.25	0.44	13.9	4.07	6.10	24.81	13.9	4.07	6.10	**24.81**	24.8	4.07	4.3					1099	1.45	12.62	
	6a	OS-5	22.41	0.44	17.1	9.86	5.59	55.09	26.6	13.93	4.47	**62.28**											
	6b	ROW-2	1.45	0.54	9.3	0.78	7.12	5.55	24.1	10.23	4.72	**48.25**											
	6	ROW-2 OS-5	1.45 22.41	0.54 0.44	9.3 17.1	0.78 9.86	7.12 5.59	5.55 55.09	26.6	24.16	4.47	**108.02**											
	7	ROW-3	0.98	0.65	11.1	0.64	6.67	4.28	11.1	0.64	6.67	**4.28**											
	8a	ROW-4	0.61	0.53	11.0	0.33	6.70	2.18	11.0	0.33	6.70	**2.18**											
	8b	ROW-5	0.34	0.53	8.8	0.18	7.27	1.31	8.8	0.18	7.27	**1.31**											
	8	ROW-4 ROW-5	0.61 0.34	0.53 0.53	11.0 8.8	0.33 0.18	6.70 7.27	2.18 1.31	11.0	0.51	6.70	**3.39**											

StreamStats Report

Region ID: CO
Delineation Point (Latitude, Longitude): 39.09999, -104.78287
Time: 2026-09-08 10:06:11 -0600



StreamStats Update

Starting with version 4.30.0, the StreamStats application uses services that were redeveloped with open-source software components. Users may observe minor variations in computed results when compared to those from previous versions. These differences are expected and do not reflect errors in the underlying data or analytical methods. Users are advised to consider these potential variations when interpreting or comparing results generated across different versions of StreamStats. Please email streamstats@usgs.gov with any questions or concerns. A full list of changes can be found at **https://www.usgs.gov/streamstats/news/streamstats-data-updates-open-source-code-release (https://www.usgs.gov/streamstats/news/streamstats-data-updates-open-source-code-release)** .

Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	2.12	square miles
I6H100Y	6-hour precipitation that is expected to occur on average once in 100 years	3.869	inches
OUTLETELEV	Elevation of the stream outlet in feet above NAVD88	7309.01	feet
STATSCLAY	Percentage of clay soils from STATSGO	16.3	percent

Peak-Flow Statistics

Peak-Flow Statistics Parameters [Foothills Region Peak Flow 2016 5099]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	2.12	square miles	0.6	2850
I6H100Y	6 Hour 100 Year Precipitation	3.869	inches	2.38	4.89
OUTLETELEV	Elevation of Gage	7309.01	feet	4290	8270
STATSCLAY	STATSGO Percentage of Clay Soils	16.3	percent	9.87	37.5

Peak-Flow Statistics Flow Report [Foothills Region Peak Flow 2016 5099]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	ASEp
50-percent AEP flood	18.8	ft^3/s	117
20-percent AEP flood	53.9	ft^3/s	87
10-percent AEP flood	91.8	ft^3/s	80
4-percent AEP flood	160	ft^3/s	80
2-percent AEP flood	229	ft^3/s	83
1-percent AEP flood	319	ft^3/s	88
0.5-percent AEP flood	424	ft^3/s	94
0.2-percent AEP flood	594	ft^3/s	104

Peak-Flow Statistics Citations

Kohn, M.S., Stevens, M.R., Harden, T.M., Godaire, J.E., Klinger, R.E., and Mommandi, A.,2016, Paleoflood investigations to improve peak-streamflow regional-regression equations for natural streamflow in eastern Colorado, 2015: U.S. Geological Survey Scientific Investigations Report 2016–5099, 58 p. (http://dx.doi.org/10.3133/sir20165099)

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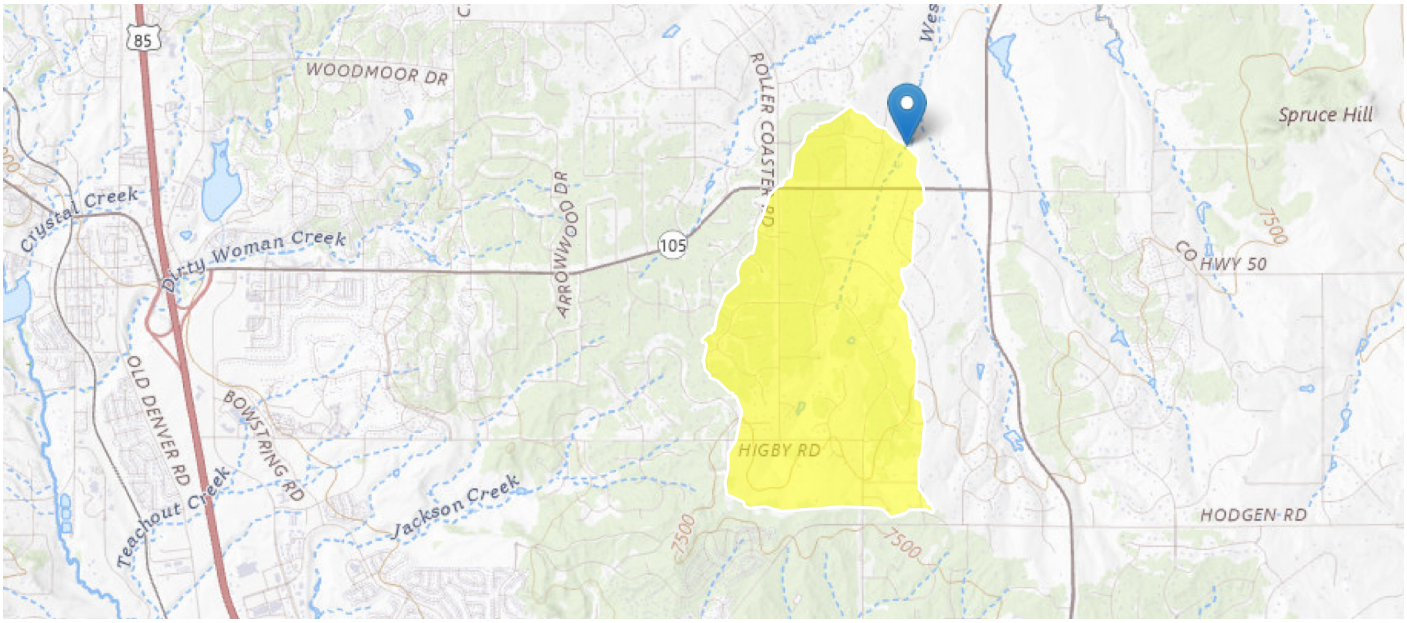
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Application Version: 4.37.1
SSHydro Services Version: 1.4.0
SSDelineate Services Version: 1.2.0
NSS Services Version: 2.5.0
GageStats Services Version: 1.2.1
Pourpoint Services Version: 1.2.2
Batch Processor Version: 1.6.2

StreamStats Report

Region ID: CO
Delineation Point (Latitude, Longitude): 39.10386, -104.77997
Time: 2026-09-16 12:21:24 -0600



StreamStats Update

Starting with version 4.30.0, the StreamStats application uses services that were redeveloped with open-source software components. Users may observe minor variations in computed results when compared to those from previous versions. These differences are expected and do not reflect errors in the underlying data or analytical methods. Users are advised to consider these potential variations when interpreting or comparing results generated across different versions of StreamStats. Please email streamstats@usgs.gov with any questions or concerns. A full list of changes can be found at **https://www.usgs.gov/streamstats/news/streamstats-data-updates-open-source-code-release (https://www.usgs.gov/streamstats/news/streamstats-data-updates-open-source-code-release)** .

Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	2.38	square miles
I6H100Y	6-hour precipitation that is expected to occur on average once in 100 years	3.869	inches
OUTLETELEV	Elevation of the stream outlet in feet above NAVD88	7281.88	feet
STATSCLAY	Percentage of clay soils from STATSGO	16.3	percent

Peak-Flow Statistics

Peak-Flow Statistics Parameters [Foothills Region Peak Flow 2016 5099]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	2.38	square miles	0.6	2850
I6H100Y	6 Hour 100 Year Precipitation	3.869	inches	2.38	4.89
OUTLETELEV	Elevation of Gage	7281.88	feet	4290	8270
STATSCLAY	STATSGO Percentage of Clay Soils	16.3	percent	9.87	37.5

Peak-Flow Statistics Flow Report [Foothills Region Peak Flow 2016 5099]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	ASEp
50-percent AEP flood	20.4	ft^3/s	117
20-percent AEP flood	58.4	ft^3/s	87
10-percent AEP flood	99.5	ft^3/s	80
4-percent AEP flood	174	ft^3/s	80
2-percent AEP flood	248	ft^3/s	83
1-percent AEP flood	345	ft^3/s	88
0.5-percent AEP flood	459	ft^3/s	94
0.2-percent AEP flood	643	ft^3/s	104

Peak-Flow Statistics Citations

Kohn, M.S., Stevens, M.R., Harden, T.M., Godaire, J.E., Klinger, R.E., and Mommandi, A.,2016, Paleoflood investigations to improve peak-streamflow regional-regression equations for natural streamflow in eastern Colorado, 2015: U.S. Geological Survey Scientific Investigations Report 2016–5099, 58 p. (http://dx.doi.org/10.3133/sir20165099)

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Application Version: 4.38.0
SSHydro Services Version: 1.4.0
SSDelineate Services Version: 1.2.0
NSS Services Version: 2.5.0
GageStats Services Version: 1.2.1
Pourpoint Services Version: 1.2.2
Batch Processor Version: 1.6.2

APPENDIX C

HYDRAULIC CALCULATIONS

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Wednesday, Oct 7 2026

ROW-2 DITCH SECTION - 100YR STORM

Triangular

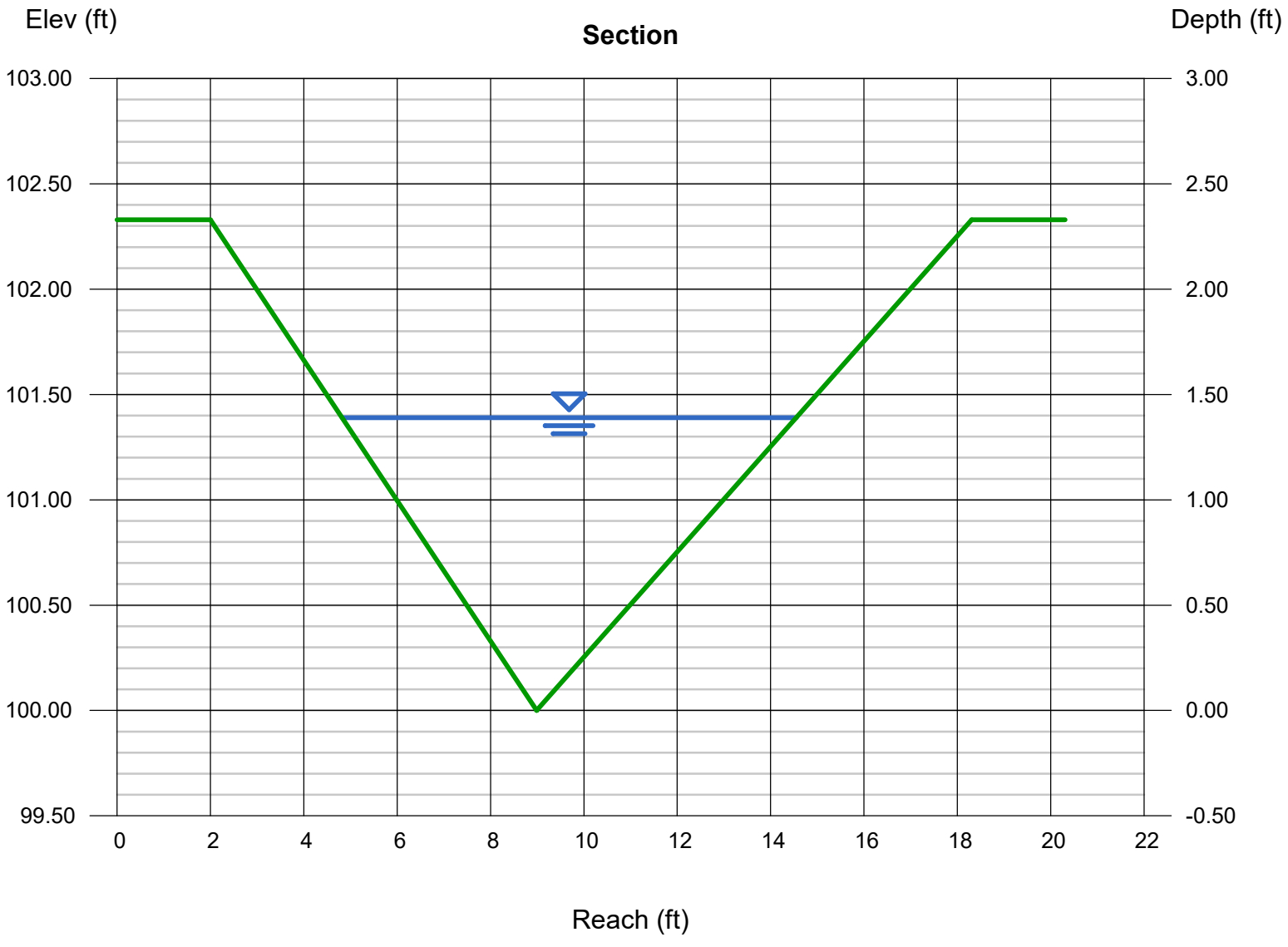
Side Slopes (z:1)	= 3.00, 4.00
Total Depth (ft)	= 2.33
Invert Elev (ft)	= 100.00
Slope (%)	= 5.00
N-Value	= 0.035

Calculations

Compute by:	Known Q
Known Q (cfs)	= 48.25

Highlighted

Depth (ft)	= 1.39
Q (cfs)	= 48.25
Area (sqft)	= 6.76
Velocity (ft/s)	= 7.14
Wetted Perim (ft)	= 10.13
Crit Depth, Yc (ft)	= 1.64
Top Width (ft)	= 9.73
EGL (ft)	= 2.18



FROUDE NUMBER CALCULATIONS			CALCULATED BY:	SPC	DATE:	10/8/2026
PROJECT:			CHECKED BY:	RDL		
Froude Number Calculations: 100-YR (USING MAXIMUM VELOCITY CALCULATIONS)						
DP	Velocity	Gravitational Constant	Hydraulic depth	Xsectional Area	Top Width	Froude #
-	ft/s	ft/s^2	ft	ft^2	ft	N/A
ROW-2	7.14	32.17	0.69	6.76	9.73	1.51

SHEAR STRESS & CHANNEL LININGS		CALCULATED BY:	SPC	DATE:	10/8/2026
PROJECT:		CHECKED BY:	RDL		

Shear Stress Calculations: 100-YR

DP	unit weight of water	Depth of flow	Slope	Shear Stress
-	lb/ft^3	ft	ft/ft	lb/ft^2
ROW-2	62.43	1.39	0.050	4.34

Channel Lining Determination

	Calculated Values			P300 Max Values		
DP	Shear Stress	Velocity	Lining Required	Shear Stress	Velocity	Lining Required
ROW-2	4.34	7.14	LINING RQD	3	9	TMAX

Culvert Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Wednesday, Oct 7 2026

DP 6 CULVERT - 100YR STORM - Proposed Condition

Invert Elev Dn (ft)	=	7308.90
Pipe Length (ft)	=	63.98
Slope (%)	=	1.83
Invert Elev Up (ft)	=	7310.07
Rise (in)	=	36.0
Shape	=	Circular
Span (in)	=	36.0
No. Barrels	=	2
n-Value	=	0.024
Culvert Type	=	Circular Corrugate Metal Pipe
Culvert Entrance	=	Projecting
Coeff. K,M,c,Y,k	=	0.034, 1.5, 0.0553, 0.54, 0.9

Embankment

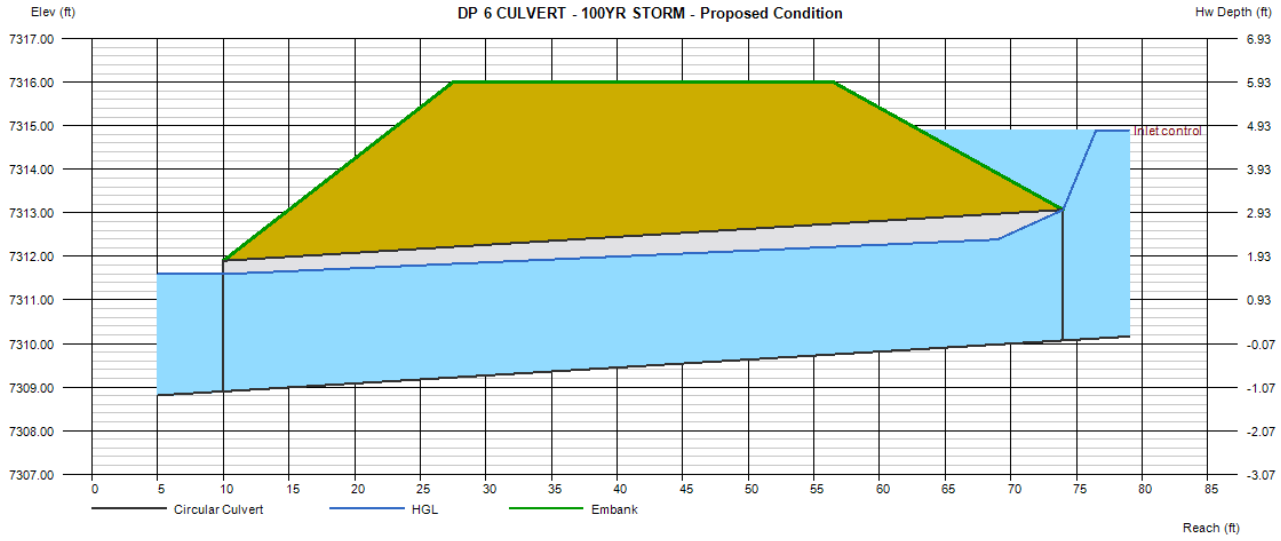
Top Elevation (ft)	=	7316.00
Top Width (ft)	=	29.00
Crest Width (ft)	=	50.00

Calculations

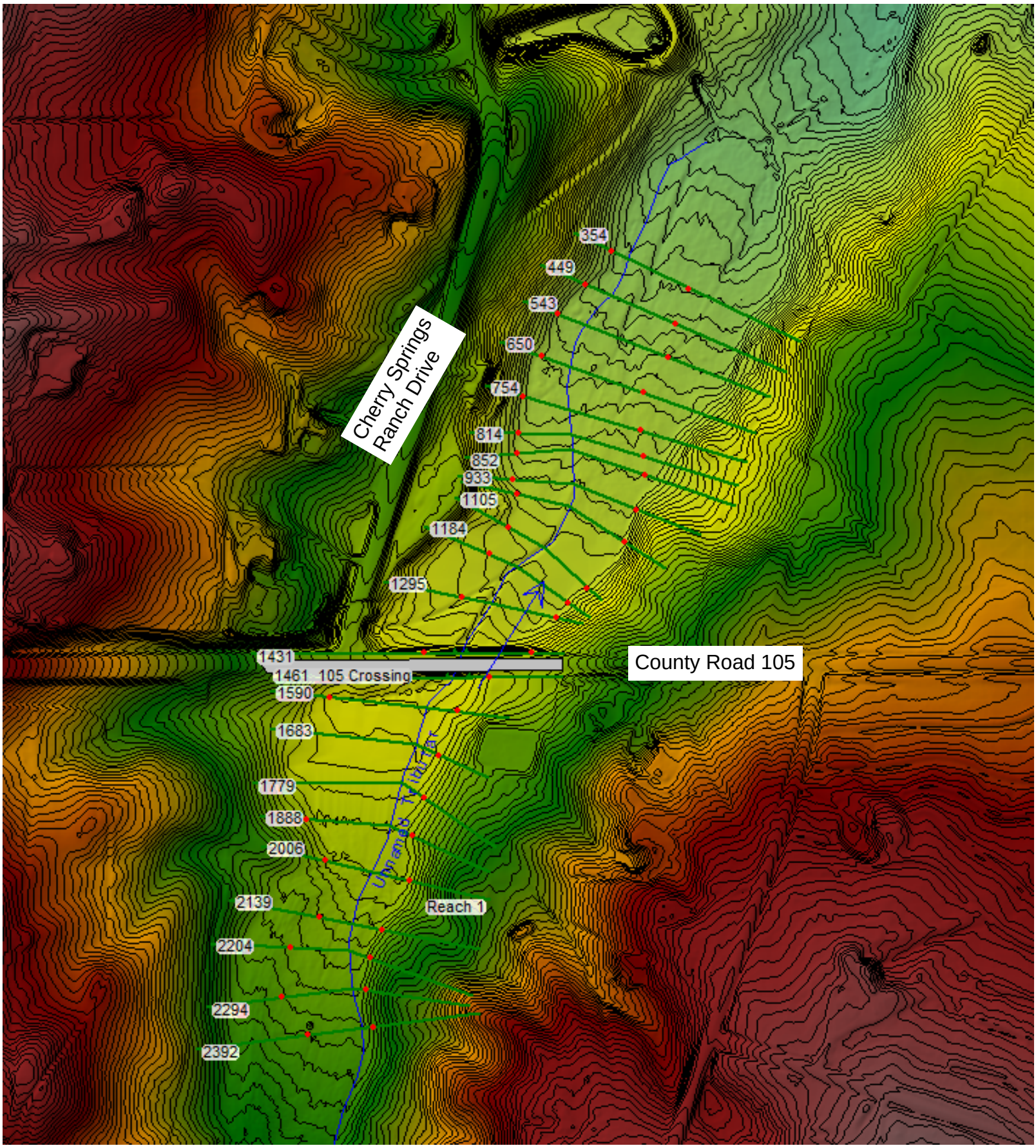
Qmin (cfs)	=	108.02
Qmax (cfs)	=	108.02
Tailwater Elev (ft)	=	(dc+D)/2

Highlighted

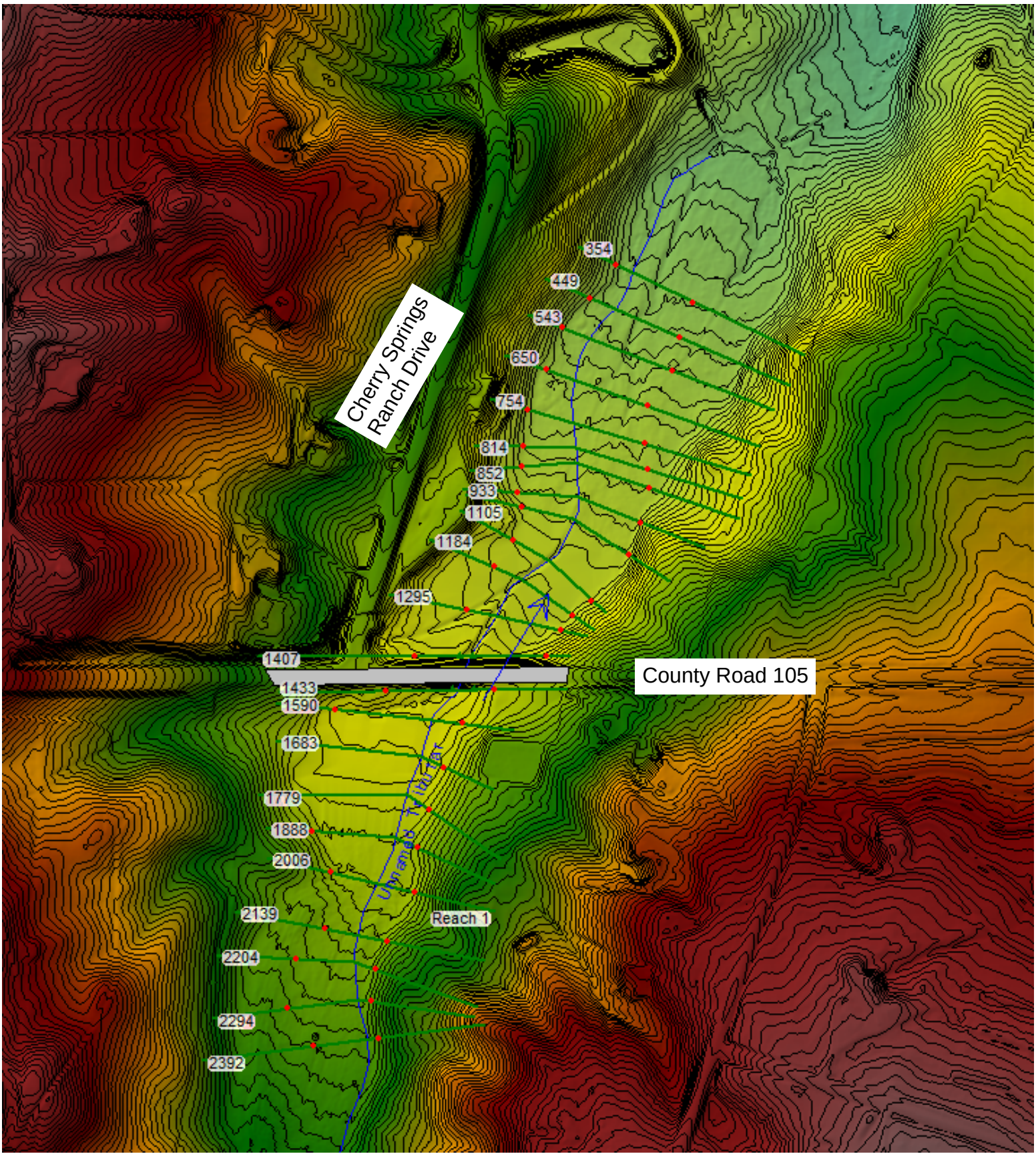
Qtotal (cfs)	=	108.02
Qpipe (cfs)	=	108.02
Qovertop (cfs)	=	0.00
Veloc Dn (ft/s)	=	8.08
Veloc Up (ft/s)	=	8.96
HGL Dn (ft)	=	7311.59
HGL Up (ft)	=	7312.45
Hw Elev (ft)	=	7314.89
Hw/D (ft)	=	1.61
Flow Regime	=	Inlet Control



Pre-Project Conditions Model Schematic - Ex Survey Plan



Post-Project Conditions Model Schematic - Pr Condition Plan



HEC-RAS River: Unnamed Tributar Reach: Reach 1 Profile: 100 YR

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 1	2392	100 YR	Ex Survey	319.00	7318.98	7320.11	7320.04	7320.32	0.015128	3.70	87.07	158.33	0.84
Reach 1	2392	100 YR	Pr Condition	319.00	7318.98	7320.11	7320.04	7320.32	0.015128	3.70	87.07	158.33	0.84
Reach 1	2294	100 YR	Ex Survey	319.00	7317.54	7318.56	7318.50	7318.75	0.016747	3.53	90.34	175.15	0.87
Reach 1	2294	100 YR	Pr Condition	319.00	7317.54	7318.56	7318.50	7318.75	0.016747	3.53	90.34	175.15	0.87
Reach 1	2204	100 YR	Ex Survey	319.00	7315.94	7317.16	7317.08	7317.35	0.014548	3.48	91.77	163.85	0.82
Reach 1	2204	100 YR	Pr Condition	319.00	7315.94	7317.16	7317.08	7317.35	0.014548	3.48	91.77	163.85	0.82
Reach 1	2139	100 YR	Ex Survey	319.00	7314.90	7315.91	7315.91	7316.19	0.022128	4.24	75.31	136.83	1.01
Reach 1	2139	100 YR	Pr Condition	319.00	7314.90	7315.91	7315.91	7316.19	0.022128	4.24	75.31	136.83	1.01
Reach 1	2006	100 YR	Ex Survey	319.00	7312.75	7313.80	7313.57	7313.90	0.005807	2.44	130.94	200.17	0.53
Reach 1	2006	100 YR	Pr Condition	319.00	7312.75	7313.77	7313.57	7313.88	0.006728	2.55	125.09	199.38	0.57
Reach 1	1888	100 YR	Ex Survey	319.00	7311.81	7312.42	7312.42	7312.63	0.025165	3.64	87.56	219.97	1.02
Reach 1	1888	100 YR	Pr Condition	319.00	7311.81	7312.46	7312.42	7312.63	0.018291	3.30	96.61	221.45	0.88
Reach 1	1779	100 YR	Ex Survey	319.00	7310.34	7312.53	7310.92	7312.53	0.000074	0.54	597.69	348.05	0.07
Reach 1	1779	100 YR	Pr Condition	319.00	7310.34	7312.55	7310.92	7312.55	0.000071	0.53	604.50	348.67	0.07
Reach 1	1683	100 YR	Ex Survey	319.00	7308.75	7312.53	7309.49	7312.53	0.000010	0.29	1121.97	397.70	0.03
Reach 1	1683	100 YR	Pr Condition	319.00	7308.75	7312.55	7309.49	7312.55	0.000010	0.29	1129.75	398.30	0.03
Reach 1	1590	100 YR	Ex Survey	319.00	7307.58	7312.53	7308.38	7312.53	0.000004	0.21	1582.87	425.20	0.02
Reach 1	1590	100 YR	Pr Condition	319.00	7307.58	7312.55	7308.37	7312.55	0.000004	0.21	1591.54	425.57	0.02
Reach 1	1494	100 YR	Ex Survey	319.00	7306.84	7312.53	7308.44	7312.53	0.000006	0.28	1288.08	466.09	0.02
Reach 1	1494	100 YR	Pr Condition	319.00	7306.84	7312.55	7308.44	7312.55	0.000006	0.27	1297.20	467.01	0.02
Reach 1	1461 105 Crossing			Culvert									
Reach 1	1431	100 YR	Ex Survey	319.00	7306.15	7308.39	7308.39	7309.18	0.015422	7.13	44.72	216.33	1.00
Reach 1	1407	100 YR	Pr Condition	319.00	7305.05	7306.92	7306.92	7307.65	0.015402	6.84	46.65	261.72	0.99
Reach 1	1295	100 YR	Ex Survey	345.00	7302.44	7303.37	7303.66	7304.37	0.127175	8.04	43.15	113.46	2.28
Reach 1	1295	100 YR	Pr Condition	345.00	7302.44	7303.43	7303.66	7304.17	0.083251	6.94	50.07	119.68	1.87
Reach 1	1184	100 YR	Ex Survey	345.00	7301.20	7302.72	7302.35	7302.80	0.003673	2.16	160.57	212.70	0.43
Reach 1	1184	100 YR	Pr Condition	345.00	7301.20	7302.72	7302.37	7302.79	0.003651	2.15	160.82	212.60	0.43
Reach 1	1105	100 YR	Ex Survey	345.00	7300.82	7302.15	7302.08	7302.29	0.013475	3.01	114.98	244.91	0.77
Reach 1	1105	100 YR	Pr Condition	345.00	7300.82	7302.15	7302.08	7302.29	0.013475	3.01	114.98	244.91	0.77
Reach 1	988	100 YR	Ex Survey	345.00	7299.48	7300.22	7300.20	7300.38	0.019943	3.20	107.78	276.16	0.90
Reach 1	988	100 YR	Pr Condition	345.00	7299.48	7300.22	7300.20	7300.38	0.019943	3.20	107.78	276.16	0.90

HEC-RAS River: Unnamed Tributar Reach: Reach 1 Profile: 100 YR (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 1	933	100 YR	Ex Survey	345.00	7298.59	7299.35	7299.27	7299.47	0.013823	2.77	124.65	303.38	0.76
Reach 1	933	100 YR	Pr Condition	345.00	7298.59	7299.35	7299.27	7299.47	0.013823	2.77	124.65	303.38	0.76
Reach 1	852	100 YR	Ex Survey	345.00	7297.08	7297.97	7297.96	7298.11	0.020858	3.09	112.58	331.73	0.91
Reach 1	852	100 YR	Pr Condition	345.00	7297.08	7297.97	7297.96	7298.11	0.020858	3.09	112.58	331.73	0.91
Reach 1	814	100 YR	Ex Survey	345.00	7296.19	7297.09	7297.07	7297.32	0.019885	3.84	89.83	175.40	0.94
Reach 1	814	100 YR	Pr Condition	345.00	7296.19	7297.09	7297.07	7297.32	0.019885	3.84	89.83	175.40	0.94
Reach 1	754	100 YR	Ex Survey	345.00	7295.22	7296.53	7296.25	7296.62	0.006994	2.50	138.85	252.87	0.57
Reach 1	754	100 YR	Pr Condition	345.00	7295.22	7296.53	7296.25	7296.62	0.006994	2.50	138.85	252.87	0.57
Reach 1	650	100 YR	Ex Survey	345.00	7294.36	7295.17	7295.17	7295.38	0.024205	3.67	94.10	227.35	1.00
Reach 1	650	100 YR	Pr Condition	345.00	7294.36	7295.17	7295.17	7295.38	0.024205	3.67	94.10	227.35	1.00
Reach 1	543	100 YR	Ex Survey	345.00	7291.22	7293.73	7293.56	7293.84	0.009175	2.70	127.98	236.64	0.65
Reach 1	543	100 YR	Pr Condition	345.00	7291.22	7293.73	7293.56	7293.84	0.009175	2.70	127.98	236.64	0.65
Reach 1	449	100 YR	Ex Survey	345.00	7291.28	7292.39	7292.37	7292.61	0.019919	3.71	92.97	193.34	0.94
Reach 1	449	100 YR	Pr Condition	345.00	7291.28	7292.39	7292.37	7292.61	0.019919	3.71	92.97	193.34	0.94
Reach 1	354	100 YR	Ex Survey	345.00	7289.87	7291.14	7291.05	7291.27	0.010013	2.88	128.96	299.47	0.68
Reach 1	354	100 YR	Pr Condition	345.00	7289.87	7291.14	7291.05	7291.27	0.010013	2.88	128.96	299.47	0.68

HEC-RAS River: Unnamed Tributar Reach: Reach 1 Profile: 100 YR

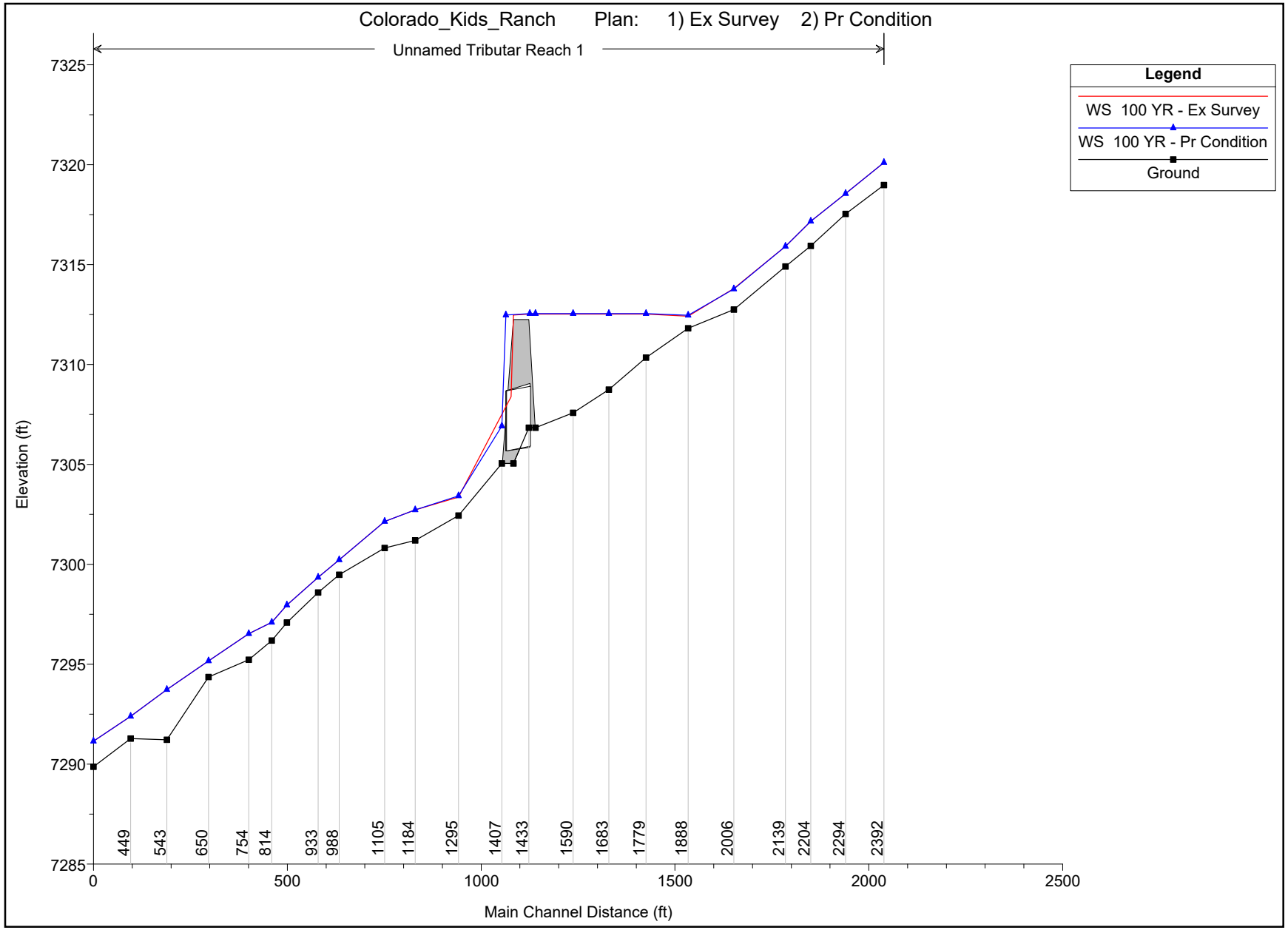
Reach	River Sta	Profile	Plan	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
				(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Reach 1	2392	100 YR	Ex Survey	7320.32	7320.11	0.21	1.57	0.01	1.93	317.07		158.33
Reach 1	2392	100 YR	Pr Condition	7320.32	7320.11	0.21	1.57	0.01	1.93	317.07		158.33
Reach 1	2294	100 YR	Ex Survey	7318.75	7318.56	0.19	1.40	0.00		319.00		175.15
Reach 1	2294	100 YR	Pr Condition	7318.75	7318.56	0.19	1.40	0.00		319.00		175.15
Reach 1	2204	100 YR	Ex Survey	7317.35	7317.16	0.19	1.16	0.01		319.00		163.85
Reach 1	2204	100 YR	Pr Condition	7317.35	7317.16	0.19	1.16	0.01		319.00		163.85
Reach 1	2139	100 YR	Ex Survey	7316.19	7315.91	0.28	1.35	0.06		319.00		136.83
Reach 1	2139	100 YR	Pr Condition	7316.19	7315.91	0.28	1.49	0.05		319.00		136.83
Reach 1	2006	100 YR	Ex Survey	7313.90	7313.80	0.09	1.25	0.01		319.00		200.17
Reach 1	2006	100 YR	Pr Condition	7313.88	7313.77	0.10	1.23	0.01		319.00		199.38
Reach 1	1888	100 YR	Ex Survey	7312.63	7312.42	0.21	0.03	0.06		319.00		219.97
Reach 1	1888	100 YR	Pr Condition	7312.63	7312.46	0.17	0.03	0.05		319.00		221.45
Reach 1	1779	100 YR	Ex Survey	7312.53	7312.53	0.00	0.00	0.00	0.23	318.69	0.09	348.05
Reach 1	1779	100 YR	Pr Condition	7312.55	7312.55	0.00	0.00	0.00	0.25	318.65	0.10	348.67
Reach 1	1683	100 YR	Ex Survey	7312.53	7312.53	0.00	0.00	0.00	4.77	309.70	4.53	397.70
Reach 1	1683	100 YR	Pr Condition	7312.55	7312.55	0.00	0.00	0.00	4.87	309.55	4.58	398.30
Reach 1	1590	100 YR	Ex Survey	7312.53	7312.53	0.00	0.00	0.00	16.96	287.28	14.76	425.20
Reach 1	1590	100 YR	Pr Condition	7312.55	7312.55	0.00	0.00	0.00	17.02	287.07	14.90	425.57
Reach 1	1494	100 YR	Ex Survey	7312.53	7312.53	0.00			18.41	292.58	8.00	466.09
Reach 1	1494	100 YR	Pr Condition	7312.55	7312.55	0.00			18.71	292.13	8.16	467.01
Reach 1	1461 105 Crossing			Culvert								
Reach 1	1431	100 YR	Ex Survey	7309.18	7308.39	0.79	4.78	0.02		319.00		216.33
Reach 1	1407	100 YR	Pr Condition	7307.65	7306.92	0.73	3.48	0.00		319.00		261.72
Reach 1	1295	100 YR	Ex Survey	7304.37	7303.37	1.00	0.83	0.06		342.34	2.66	113.46
Reach 1	1295	100 YR	Pr Condition	7304.17	7303.43	0.74	0.83	0.06		341.42	3.58	119.68
Reach 1	1184	100 YR	Ex Survey	7302.80	7302.72	0.07	0.50	0.01		344.02	0.98	212.70
Reach 1	1184	100 YR	Pr Condition	7302.79	7302.72	0.07	0.50	0.01		344.05	0.95	212.60

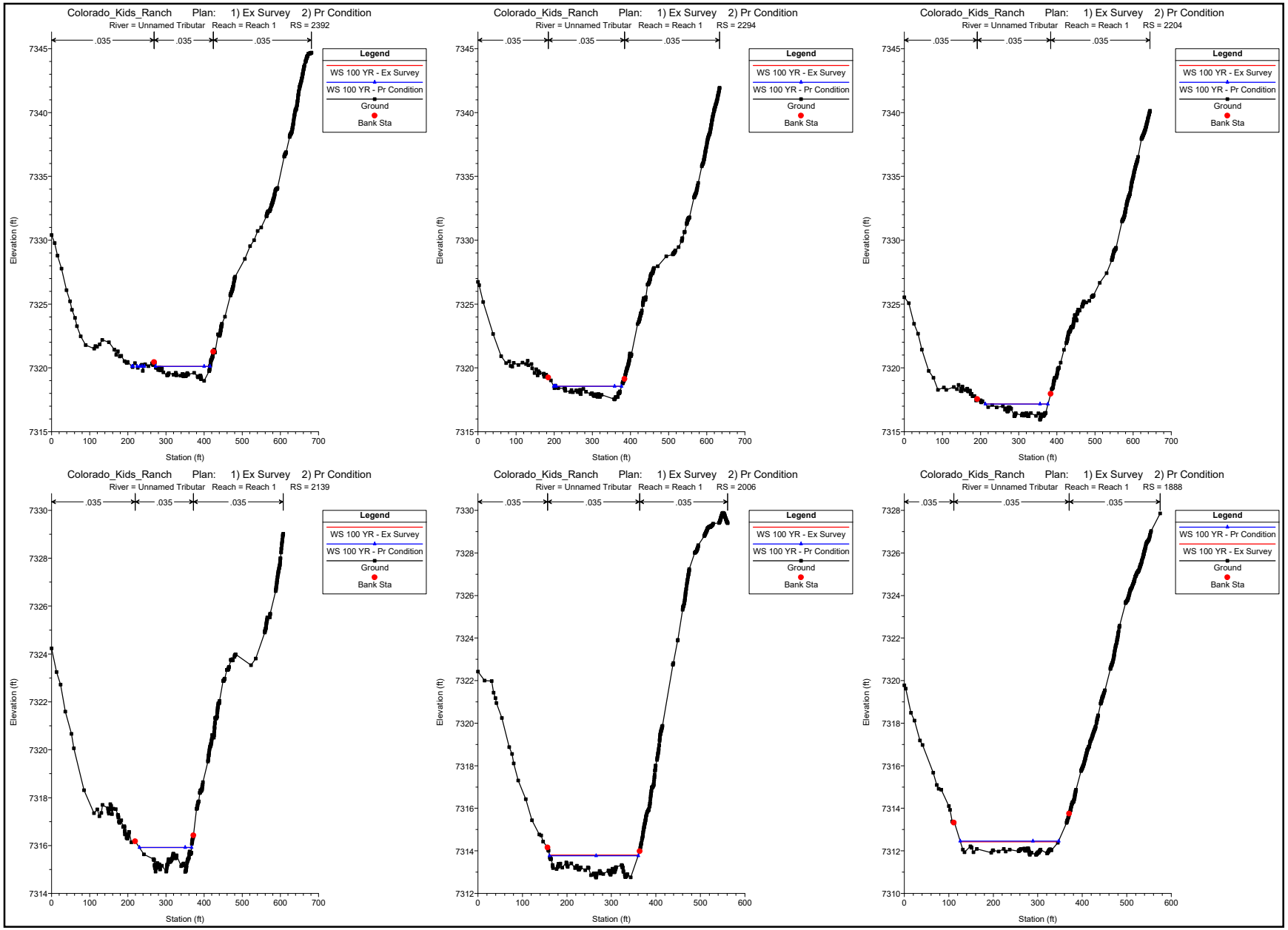
HEC-RAS River: Unnamed Tributar Reach: Reach 1 Profile: 100 YR (Continued)

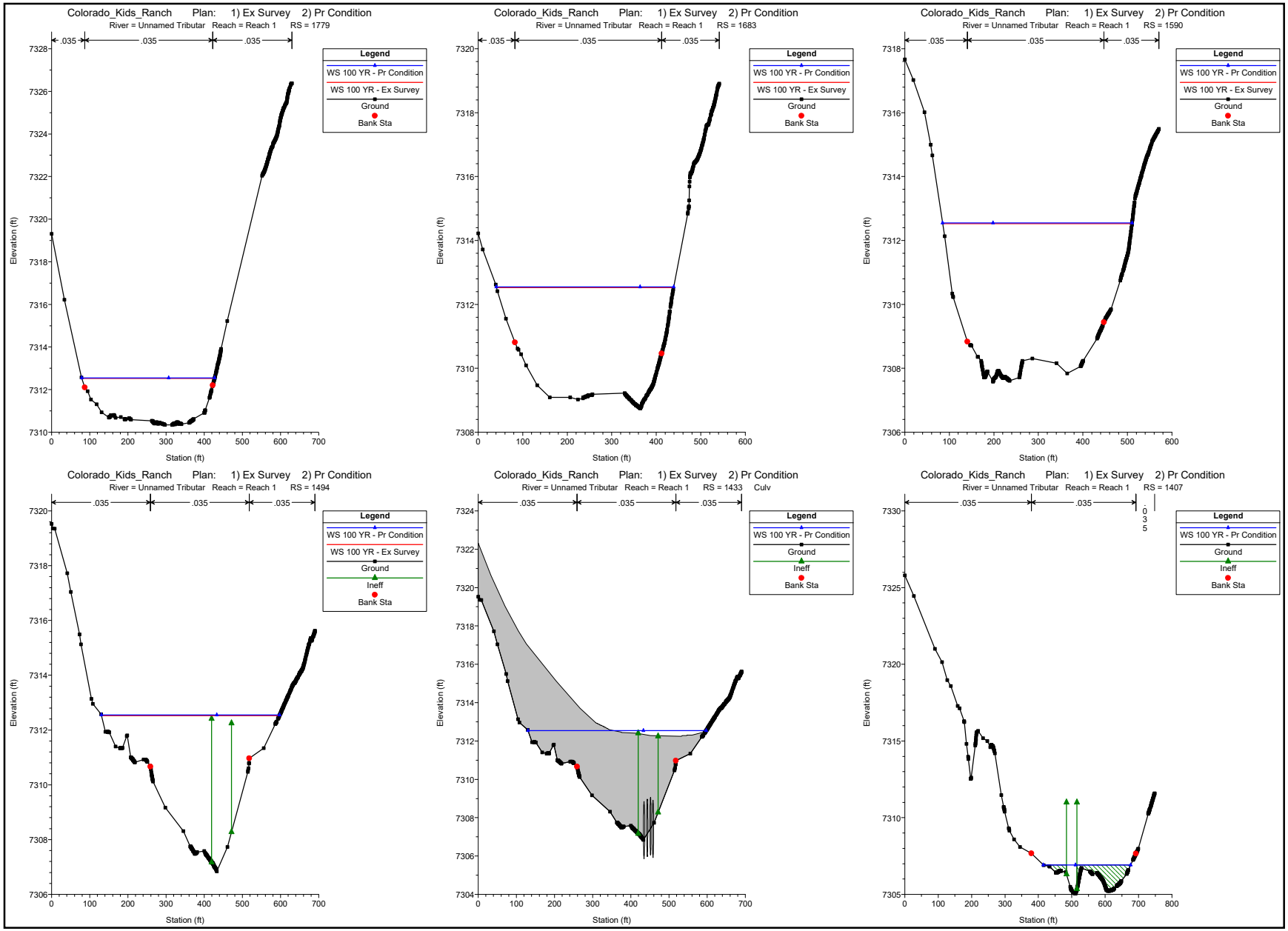
Reach	River Sta	Profile	Plan	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
				(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Reach 1	1105	100 YR	Ex Survey	7302.29	7302.15	0.14	1.90	0.00	0.90	344.10	0.00	244.91
Reach 1	1105	100 YR	Pr Condition	7302.29	7302.15	0.14	1.90	0.00	0.90	344.10	0.00	244.91
Reach 1	988	100 YR	Ex Survey	7300.38	7300.22	0.16	0.90	0.01		345.00		276.16
Reach 1	988	100 YR	Pr Condition	7300.38	7300.22	0.16	0.90	0.01		345.00		276.16
Reach 1	933	100 YR	Ex Survey	7299.47	7299.35	0.12	1.35	0.00	0.04	344.96		303.38
Reach 1	933	100 YR	Pr Condition	7299.47	7299.35	0.12	1.35	0.00	0.04	344.96		303.38
Reach 1	852	100 YR	Ex Survey	7298.11	7297.97	0.15	0.79	0.01	0.04	343.47	1.49	331.73
Reach 1	852	100 YR	Pr Condition	7298.11	7297.97	0.15	0.79	0.01	0.04	343.47	1.49	331.73
Reach 1	814	100 YR	Ex Survey	7297.32	7297.09	0.23	0.66	0.04	0.01	344.99		175.40
Reach 1	814	100 YR	Pr Condition	7297.32	7297.09	0.23	0.66	0.04	0.01	344.99		175.40
Reach 1	754	100 YR	Ex Survey	7296.62	7296.53	0.10	1.23	0.01		344.25	0.75	252.87
Reach 1	754	100 YR	Pr Condition	7296.62	7296.53	0.10	1.23	0.01		344.25	0.75	252.87
Reach 1	650	100 YR	Ex Survey	7295.38	7295.17	0.21	1.51	0.03		345.00		227.35
Reach 1	650	100 YR	Pr Condition	7295.38	7295.17	0.21	1.51	0.03		345.00		227.35
Reach 1	543	100 YR	Ex Survey	7293.84	7293.73	0.11	1.22	0.01		345.00		236.64
Reach 1	543	100 YR	Pr Condition	7293.84	7293.73	0.11	1.22	0.01		345.00		236.64
Reach 1	449	100 YR	Ex Survey	7292.61	7292.39	0.21	1.31	0.03		344.97	0.03	193.34
Reach 1	449	100 YR	Pr Condition	7292.61	7292.39	0.21	1.31	0.03		344.97	0.03	193.34
Reach 1	354	100 YR	Ex Survey	7291.27	7291.14	0.12				319.71	25.29	299.47
Reach 1	354	100 YR	Pr Condition	7291.27	7291.14	0.12				319.71	25.29	299.47

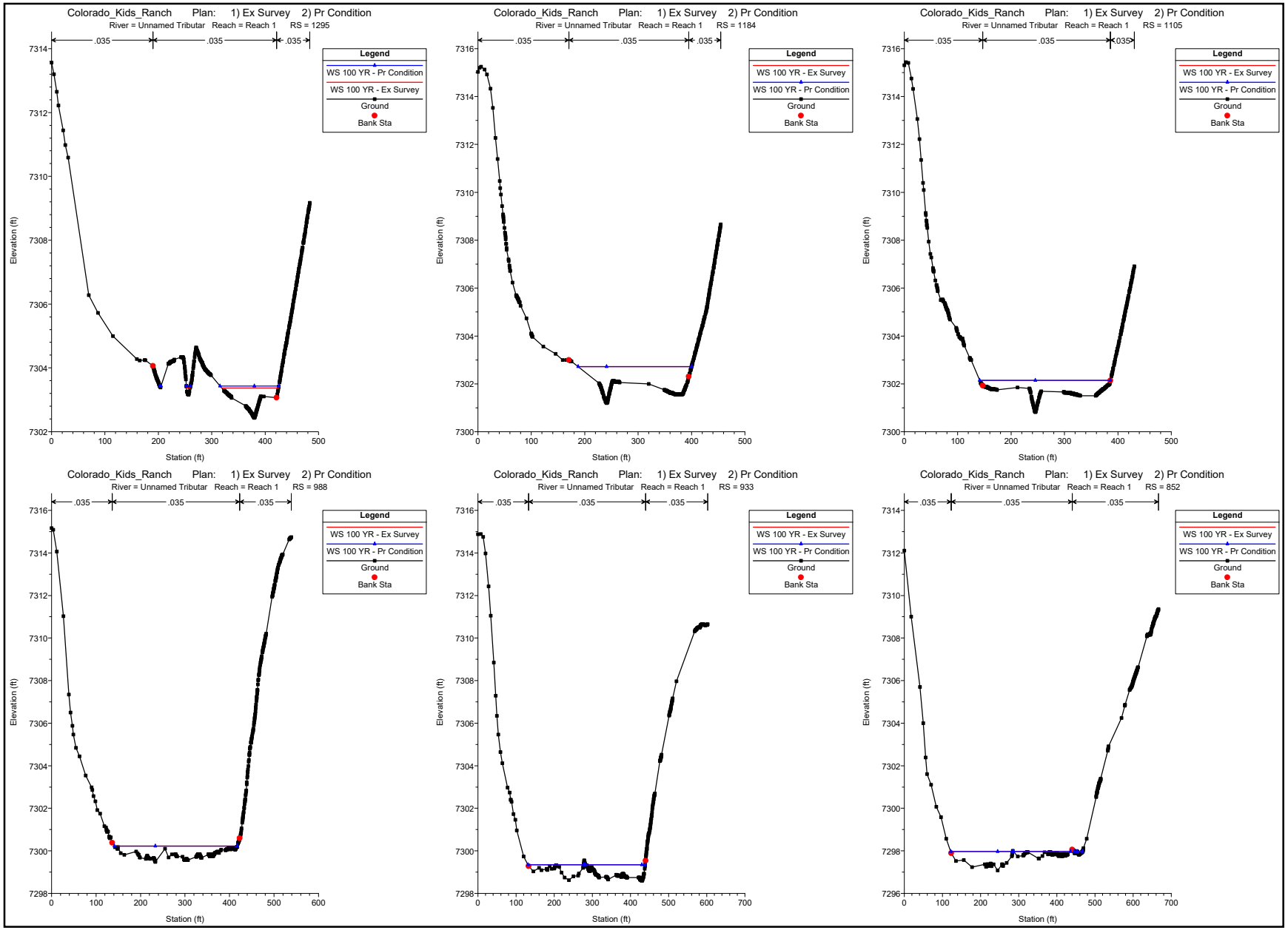
HEC-RAS River: Unnamed Tributar Reach: Reach 1 Profile: 100 YR

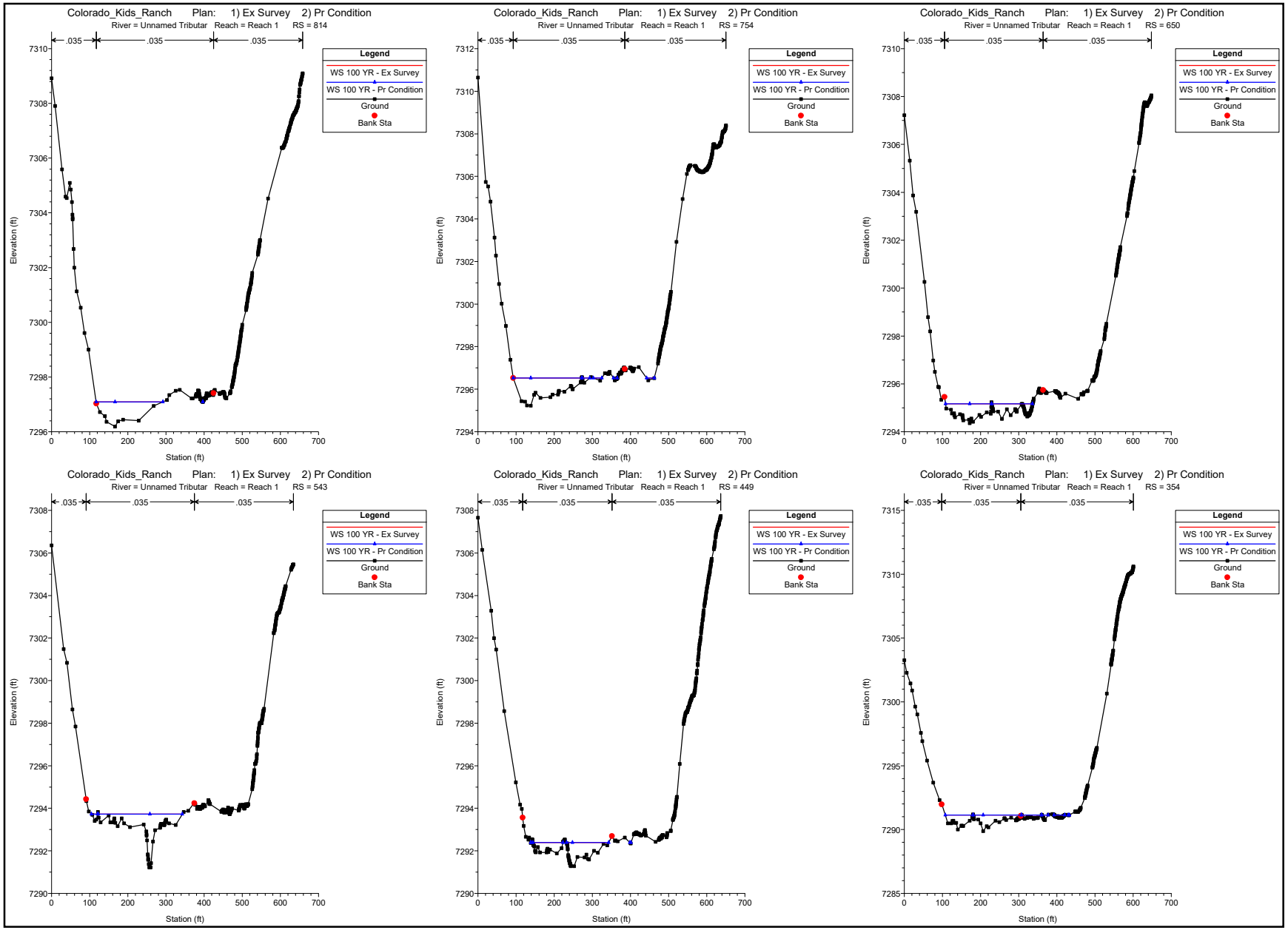
Reach	River Sta	Profile	Plan	E.G. US.	W.S. US.	E.G. IC	E.G. OC	Min El Weir Flow	Q Culv Group	Q Weir	Delta WS	Culv Vel US	Culv Vel DS
				(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(ft)	(ft/s)	(ft/s)
Reach 1	1461 105 Crossing Culvert #1	100 YR	Ex Survey	7312.53	7312.53	7311.90	7312.54	7312.26	63.20	64.34	4.14	8.94	9.85
Reach 1	1461 105 Crossing Culvert #2	100 YR	Ex Survey	7312.53	7312.53	7311.97	7312.53	7312.26	62.88	64.34	4.14	8.90	9.81
Reach 1	1461 105 Crossing Culvert #3	100 YR	Ex Survey	7312.53	7312.53	7312.06	7312.51	7312.26	63.01	64.34	4.14	8.91	9.83
Reach 1	1461 105 Crossing Culvert #4	100 YR	Ex Survey	7312.53	7312.53	7312.29	7312.53	7312.26	65.58	64.34	4.14	9.28	10.09
Reach 1	1433 Culvert #1	100 YR	Pr Condition	7312.55	7312.55	7311.71	7312.55	7312.26	61.95	71.13	5.62	8.76	9.72
Reach 1	1433 Culvert #2	100 YR	Pr Condition	7312.55	7312.55	7311.84	7312.55	7312.26	62.00	71.13	5.62	8.77	9.73
Reach 1	1433 Culvert #3	100 YR	Pr Condition	7312.55	7312.55	7311.91	7312.54	7312.26	61.96	71.13	5.62	8.77	9.72
Reach 1	1433 Culvert #4	100 YR	Pr Condition	7312.55	7312.55	7311.77	7312.55	7312.26	61.96	71.13	5.62	8.77	9.72


Colorado_Kids_Ranch Plan: 1) Ex Survey 2) Pr Condition
Unnamed Tributar Reach 1
Legend
WS 100 YR - Ex Survey
WS 100 YR - Pr Condition
Ground
Elevation (ft)
7325
7320
7315
7310
7305
7300
7295
7290
7285
449
543
650
754
814
933
988
1105
1184
1295
1407
1433
1590
1683
1779
1888
2006
2139
2204
2294
2392
0
500
1000
1500
2000
2500
Main Channel Distance (ft)


Colorado_Kids_Ranch Plan: 1) Ex Survey 2) Pr Condition
River = Unnamed Tributar Reach = Reach 1 RS = 2392
.035 .035 .035
Legend
WS 100 YR - Ex Survey
WS 100 YR - Pr Condition
Ground
Bank Sta
Elevation (ft)
Station (ft)
Colorado_Kids_Ranch Plan: 1) Ex Survey 2) Pr Condition
River = Unnamed Tributar Reach = Reach 1 RS = 2294
.035 .035 .035
Legend
WS 100 YR - Ex Survey
WS 100 YR - Pr Condition
Ground
Bank Sta
Elevation (ft)
Station (ft)
Colorado_Kids_Ranch Plan: 1) Ex Survey 2) Pr Condition
River = Unnamed Tributar Reach = Reach 1 RS = 2204
.035 .035 .035
Legend
WS 100 YR - Ex Survey
WS 100 YR - Pr Condition
Ground
Bank Sta
Elevation (ft)
Station (ft)
Colorado_Kids_Ranch Plan: 1) Ex Survey 2) Pr Condition
River = Unnamed Tributar Reach = Reach 1 RS = 2139
.035 .035 .035
Legend
WS 100 YR - Ex Survey
WS 100 YR - Pr Condition
Ground
Bank Sta
Elevation (ft)
Station (ft)
Colorado_Kids_Ranch Plan: 1) Ex Survey 2) Pr Condition
River = Unnamed Tributar Reach = Reach 1 RS = 2006
.035 .035 .035
Legend
WS 100 YR - Ex Survey
WS 100 YR - Pr Condition
Ground
Bank Sta
Elevation (ft)
Station (ft)
Colorado_Kids_Ranch Plan: 1) Ex Survey 2) Pr Condition
River = Unnamed Tributar Reach = Reach 1 RS = 1888
.035 .035 .035
Legend
WS 100 YR - Pr Condition
WS 100 YR - Ex Survey
Ground
Bank Sta
Elevation (ft)
Station (ft)


Colorado_Kids_Ranch Plan: 1) Ex Survey 2) Pr Condition
River = Unnamed Tributar Reach = Reach 1 RS = 1779
.035 .035 .035
Legend
WS 100 YR - Pr Condition
WS 100 YR - Ex Survey
Ground
Bank Sta
Elevation (ft)
Station (ft)
Colorado_Kids_Ranch Plan: 1) Ex Survey 2) Pr Condition
River = Unnamed Tributar Reach = Reach 1 RS = 1683
.035 .035 .035
Legend
WS 100 YR - Pr Condition
WS 100 YR - Ex Survey
Ground
Bank Sta
Elevation (ft)
Station (ft)
Colorado_Kids_Ranch Plan: 1) Ex Survey 2) Pr Condition
River = Unnamed Tributar Reach = Reach 1 RS = 1590
.035 .035 .035
Legend
WS 100 YR - Pr Condition
WS 100 YR - Ex Survey
Ground
Bank Sta
Elevation (ft)
Station (ft)
Colorado_Kids_Ranch Plan: 1) Ex Survey 2) Pr Condition
River = Unnamed Tributar Reach = Reach 1 RS = 1494
.035 .035 .035
Legend
WS 100 YR - Pr Condition
WS 100 YR - Ex Survey
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Colorado_Kids_Ranch Plan: 1) Ex Survey 2) Pr Condition
River = Unnamed Tributar Reach = Reach 1 RS = 1433 Culv
.035 .035 .035
Legend
WS 100 YR - Pr Condition
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Colorado_Kids_Ranch Plan: 1) Ex Survey 2) Pr Condition
River = Unnamed Tributar Reach = Reach 1 RS = 1407
.035 .035
Legend
WS 100 YR - Pr Condition
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


Colorado_Kids_Ranch Plan: 1) Ex Survey 2) Pr Condition
River = Unnamed Tributar Reach = Reach 1 RS = 1295
.035 .035 .035
Legend
WS 100 YR - Pr Condition
WS 100 YR - Ex Survey
Ground
Bank Sta
Elevation (ft)
Station (ft)
Colorado_Kids_Ranch Plan: 1) Ex Survey 2) Pr Condition
River = Unnamed Tributar Reach = Reach 1 RS = 1184
.035 .035 .035
Legend
WS 100 YR - Ex Survey
WS 100 YR - Pr Condition
Ground
Bank Sta
Elevation (ft)
Station (ft)
Colorado_Kids_Ranch Plan: 1) Ex Survey 2) Pr Condition
River = Unnamed Tributar Reach = Reach 1 RS = 1105
.035 .035 .035
Legend
WS 100 YR - Ex Survey
WS 100 YR - Pr Condition
Ground
Bank Sta
Elevation (ft)
Station (ft)
Colorado_Kids_Ranch Plan: 1) Ex Survey 2) Pr Condition
River = Unnamed Tributar Reach = Reach 1 RS = 988
.035 .035 .035
Legend
WS 100 YR - Ex Survey
WS 100 YR - Pr Condition
Ground
Bank Sta
Elevation (ft)
Station (ft)
Colorado_Kids_Ranch Plan: 1) Ex Survey 2) Pr Condition
River = Unnamed Tributar Reach = Reach 1 RS = 933
.035 .035 .035
Legend
WS 100 YR - Ex Survey
WS 100 YR - Pr Condition
Ground
Bank Sta
Elevation (ft)
Station (ft)
Colorado_Kids_Ranch Plan: 1) Ex Survey 2) Pr Condition
River = Unnamed Tributar Reach = Reach 1 RS = 852
.035 .035 .035
Legend
WS 100 YR - Ex Survey
WS 100 YR - Pr Condition
Ground
Bank Sta
Elevation (ft)
Station (ft)


Colorado_Kids_Ranch Plan: 1) Ex Survey 2) Pr Condition
River = Unnamed Tributar Reach = Reach 1 RS = 814
.035 .035 .035
Legend
WS 100 YR - Ex Survey
WS 100 YR - Pr Condition
Ground
Bank Sta
Elevation (ft)
Station (ft)
Colorado_Kids_Ranch Plan: 1) Ex Survey 2) Pr Condition
River = Unnamed Tributar Reach = Reach 1 RS = 754
.035 .035 .035
Legend
WS 100 YR - Ex Survey
WS 100 YR - Pr Condition
Ground
Bank Sta
Elevation (ft)
Station (ft)
Colorado_Kids_Ranch Plan: 1) Ex Survey 2) Pr Condition
River = Unnamed Tributar Reach = Reach 1 RS = 650
.035 .035 .035
Legend
WS 100 YR - Ex Survey
WS 100 YR - Pr Condition
Ground
Bank Sta
Elevation (ft)
Station (ft)
Colorado_Kids_Ranch Plan: 1) Ex Survey 2) Pr Condition
River = Unnamed Tributar Reach = Reach 1 RS = 543
.035 .035 .035
Legend
WS 100 YR - Ex Survey
WS 100 YR - Pr Condition
Ground
Bank Sta
Elevation (ft)
Station (ft)
Colorado_Kids_Ranch Plan: 1) Ex Survey 2) Pr Condition
River = Unnamed Tributar Reach = Reach 1 RS = 449
.035 .035 .035
Legend
WS 100 YR - Ex Survey
WS 100 YR - Pr Condition
Ground
Bank Sta
Elevation (ft)
Station (ft)
Colorado_Kids_Ranch Plan: 1) Ex Survey 2) Pr Condition
River = Unnamed Tributar Reach = Reach 1 RS = 354
.035 .035 .035
Legend
WS 100 YR - Ex Survey
WS 100 YR - Pr Condition
Ground
Bank Sta
Elevation (ft)
Station (ft)

APPENDIX D

WATER QUALITY CALCULATIONS

WATER QUALITY TREATMENT SUMMARY			
COLORADO KIDS RANCH - 105 IMPROVEMENTS			
Subbasin ID	Disturbed Area [AC]	Treatment CM	Notes:
ROW-2	0.27	EXCLUSION	EXCLUSION I.6.1.B.2 - ROADWAY REDEVELOPMENT
ROW-2	0.40	SPA	SPA AREA
ROW-3	0.28	EXCLUSION	EXCLUSION I.6.1.B.2 - ROADWAY REDEVELOPMENT
ROW-3	0.27	SPA	SPA AREA
ROW-3	0.08	UNTREATED	DRAINS OFFSITE UNTREATED
ROW-4	0.10	EXCLUSION	EXCLUSION I.6.1.B.2 - ROADWAY REDEVELOPMENT
ROW-4	0.11	SPA	SPA AREA
ROW-5	0.04	EXCLUSION	EXCLUSION I.6.1.B.2 - ROADWAY REDEVELOPMENT
ROW-5	0.10	SPA	SPA AREA

TOTAL WATER QUALITY SUMMARY		
Treatment CM	Area [AC]	% of total
TOTAL DIST. AREA	1.65	
WQ EXCLUSION	0.69	42%
TOTAL NON-EXCLUDED AREA	0.96	
UNTREATED	0.96	100%
TOTAL:	0.96	100%

*Project has <1 ac of non-excluded soil disturbance and will not require WQ treatment per ECM I.6.1.A.

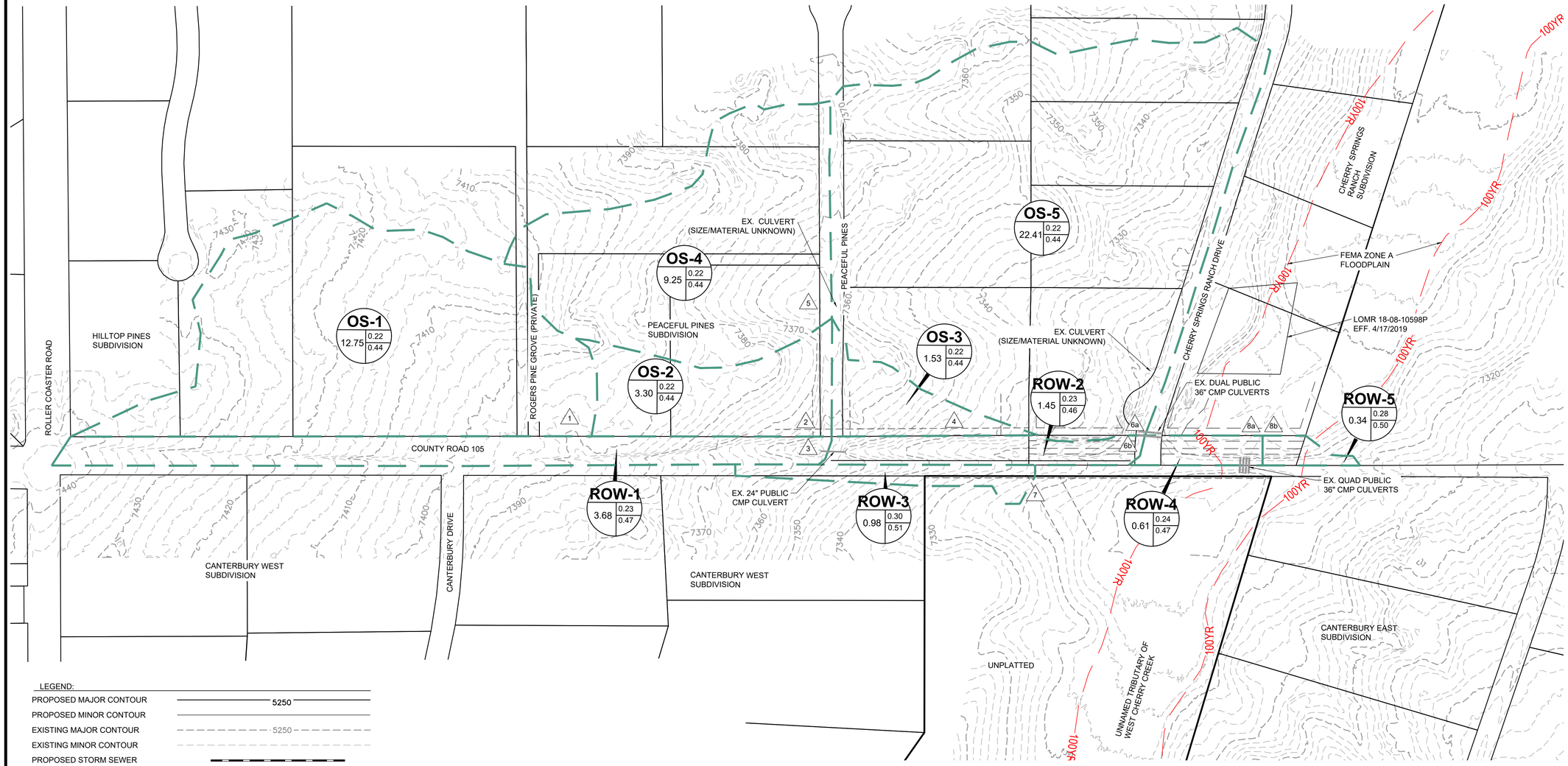
Min Required Area to Receive WQ	Total Disturbed Area	Total Proposed Treated Area	Total Proposed Disturbed Area Excluded from WQ	Total Treated %
0.96	1.65	0.00	0.69	0%

*Project has <1 ac of non-excluded soil disturbance and will not require WQ treatment per ECM I.6.1.A.

APPENDIX E

DRAINAGE MAPS

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LEGEND:

- PROPOSED MAJOR CONTOUR (5250)
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR (5250)
- EXISTING MINOR CONTOUR
- PROPOSED STORM SEWER
- EXISTING STORM SEWER
- EXISTING DRAINAGE SWALE
- PROPOSED DRAINAGE SWALE
- EXISTING TERTIARY DRAINAGE WAY
- FILING NO. 4 PARCEL BOUNDARY
- FILING NO. 5 PARCEL BOUNDARY
- FILING NO. 7 PARCEL BOUNDARY
- FLOW DIRECTION
- DRAINAGE BASIN
- MAJOR BASIN BOUNDARY
- DESIGN POINT (X)
- SWALE CROSS SECTION
- BASIN LABEL (A1 | AREA (AC.) 1.00 | MINOR 5-YR RUNOFF COEF. 0.40 | MAJOR 100-YR RUNOFF COEF. 0.60 | BASIN DESIGNATION)

SUMMARY RUNOFF TABLE

BASIN	AREA (ac)	% IMPERVIOUS	Q5 (cfs)	Q100 (cfs)
ROW-1	3.68	20	2.67	8.92
ROW-2	1.45	20	1.40	4.68
ROW-3	0.98	28	1.13	3.26
ROW-4	0.61	21	0.58	1.91
ROW-5	0.34	26	0.40	1.21
OS-1	12.75	20	8.68	32.04
OS-2	3.30	20	2.52	9.32
OS-3	1.53	20	1.20	4.44
OS-4	9.25	20	6.72	24.81
OS-5	22.41	20	14.92	55.09

DESIGN POINT SUMMARY TABLE

DESIGN POINT	CONTRIBUTING BASINS	SQ5 (cfs)	SQ100 (cfs)
1	OS-1	8.68	19.09
2	OS-2	2.52	9.32
3	ROW-1, DP [1,2]	12.62	45.66
4	OS-3	1.20	4.44
5	OS-4	6.72	24.81
6a	OS-5, DP [5]	16.87	62.28
6b	ROW-2, DP [3,4]	13.25	47.75
6	DP [6a,6b]	29.43	107.54
7	ROW-3	1.13	3.26
8a	ROW-4	0.58	1.91
8b	ROW-5	0.40	1.21
8	DP [8a,8b]	1.61	3.05

NORTH

0 150

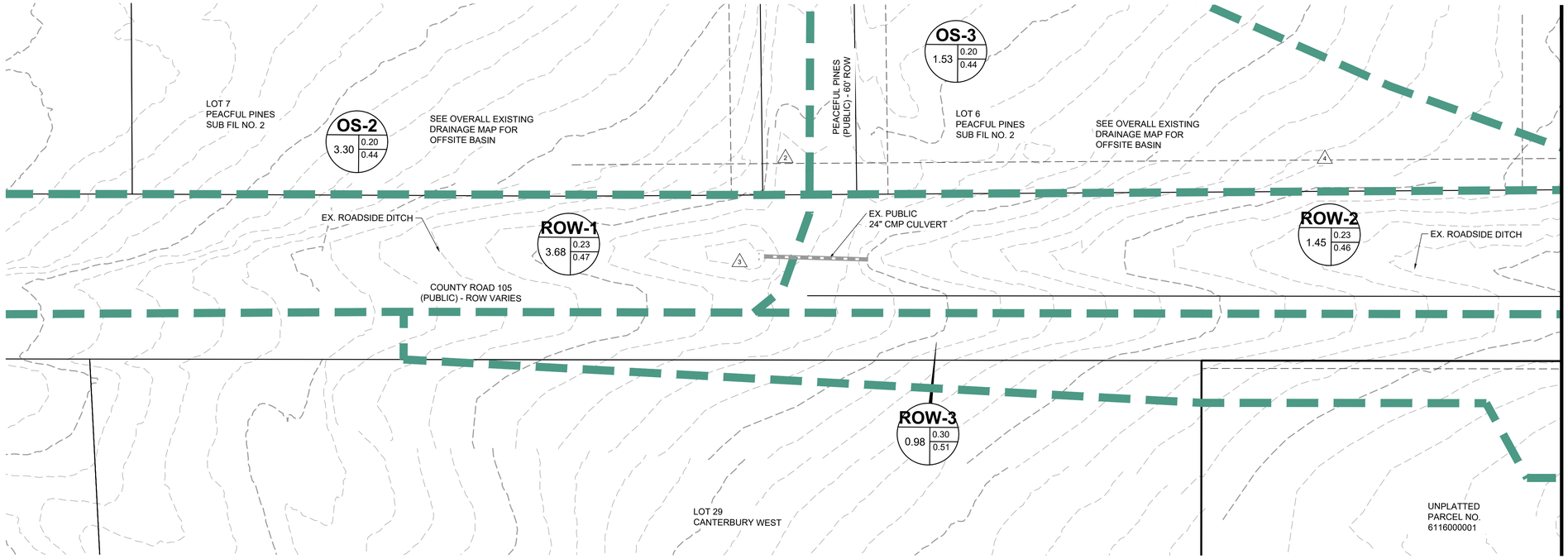
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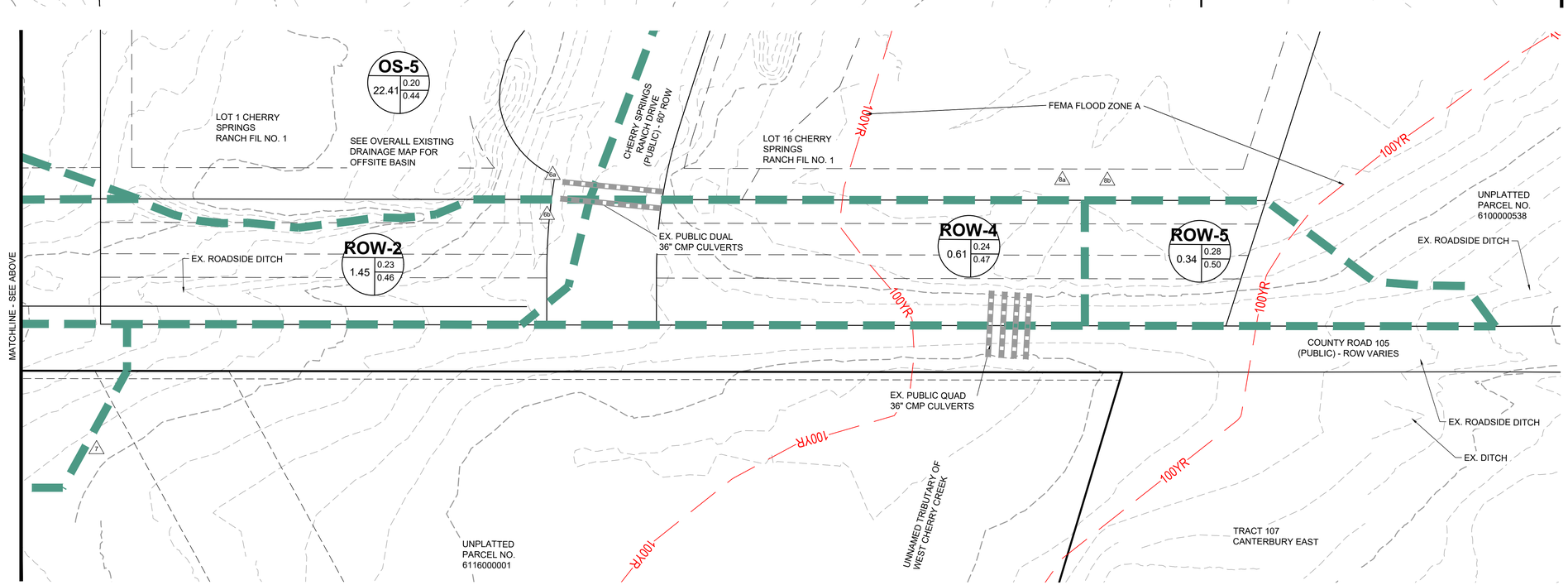
Job No.:	2603197
Prepared By:	SPC
Date:	10/7/2026

OVERALL EXISTING DRAINAGE MAP

FIG.01

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LEGEND:

- PROPOSED MAJOR CONTOUR — 5250
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR — 5250
- EXISTING MINOR CONTOUR
- PROPOSED STORM SEWER
- EXISTING STORM SEWER
- EXISTING DRAINAGE SWALE
- PROPOSED DRAINAGE SWALE
- EXISTING TERTIARY DRAINAGE WAY
- FILING NO. 4 PARCEL BOUNDARY
- FILING NO. 5 PARCEL BOUNDARY
- FILING NO. 7 PARCEL BOUNDARY
- FLOW DIRECTION
- DRAINAGE BASIN
- MAJOR BASIN BOUNDARY
- DESIGN POINT — X
- SWALE CROSS SECTION
- BASIN LABEL — A1 (BASIN DESIGNATION); 1.00 (AREA (AC.)); 0.40 (MINOR 5-YR RUNOFF COEF.); 0.60 (MAJOR 100-YR RUNOFF COEF.)

SUMMARY RUNOFF TABLE

BASIN	AREA (ac)	% IMPERVIOUS	Q5 (cfs)	Q100 (cfs)
ROW-1	3.68	20	2.67	8.92
ROW-2	1.45	20	1.40	4.68
ROW-3	0.98	28	1.13	3.26
ROW-4	0.61	21	0.58	1.91
ROW-5	0.34	26	0.40	1.21
OS-1	12.75	20	8.68	32.04
OS-2	3.30	20	2.52	9.32
OS-3	1.53	20	1.20	4.44
OS-4	9.25	20	6.72	24.81
OS-5	22.41	20	14.92	55.09

DESIGN POINT SUMMARY TABLE

DESIGN POINT	CONTRIBUTING BASINS	SQ5 (cfs)	SQ100 (cfs)
1	OS-1	8.68	19.09
2	OS-2	2.52	9.32
3	ROW-1, DP [1,2]	12.62	45.66
4	OS-3	1.20	4.44
5	OS-4	6.72	24.81
6a	OS-5, DP [5]	16.87	62.28
6b	ROW-2, DP [3,4]	13.25	47.75
6	DP [6a,6b]	29.43	107.54
7	ROW-3	1.13	3.26
8a	ROW-4	0.58	1.91
8b	ROW-5	0.40	1.21
8	DP [8a,8b]	1.61	3.05

NORTH

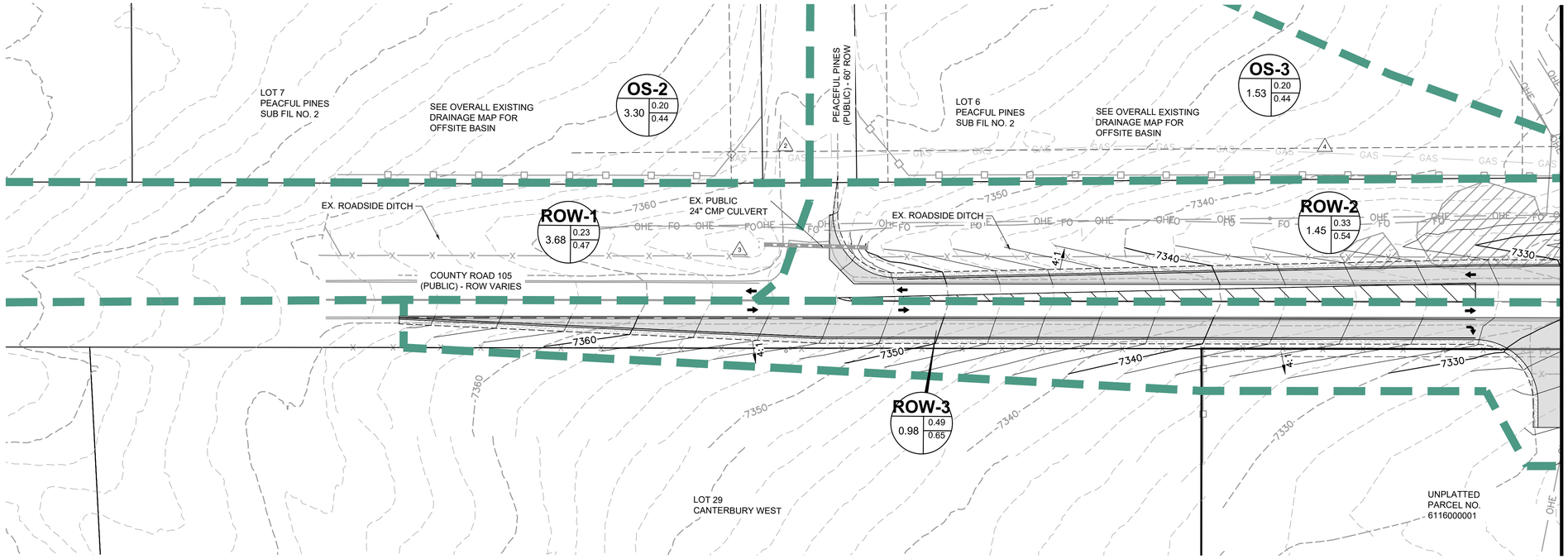
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Job No.:	2603197
Prepared By:	SPC
Date:	10/7/2026

EXISTING DRAINAGE MAP

FIG.02

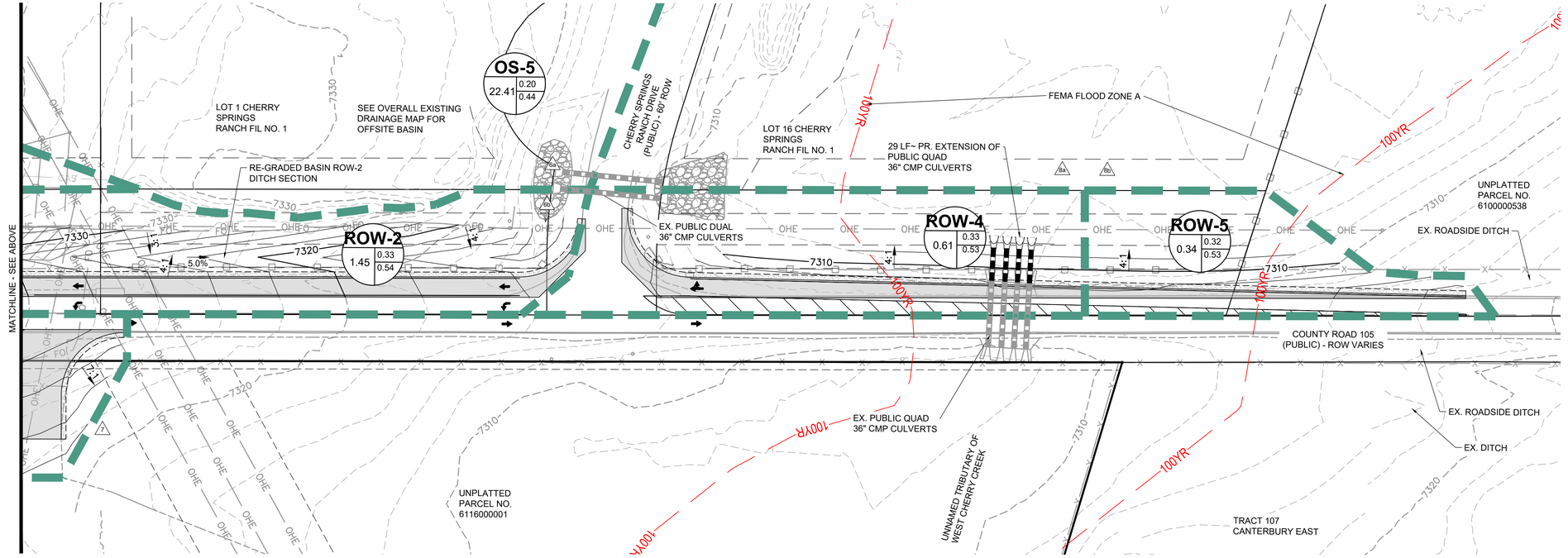
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LEGEND:

- PROPOSED MAJOR CONTOUR — 5250
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR — 5250
- EXISTING MINOR CONTOUR
- PROPOSED STORM SEWER
- EXISTING STORM SEWER
- EXISTING DRAINAGE SWALE
- PROPOSED DRAINAGE SWALE
- EXISTING TERTIARY DRAINAGE WAY
- FILING NO. 4 PARCEL BOUNDARY
- FILING NO. 5 PARCEL BOUNDARY
- FILING NO. 7 PARCEL BOUNDARY
- FLOW DIRECTION
- DRAINAGE BASIN
- MAJOR BASIN BOUNDARY
- DESIGN POINT
- SWALE CROSS SECTION (X)
- BASIN LABEL

BASIN DESIGNATION: A1
AREA (AC.): 1.00
MINOR 5-YR RUNOFF COEF.: 0.40
MAJOR 100-YR RUNOFF COEF.: 0.60



SUMMARY RUNOFF TABLE

BASIN	AREA (ac)	% IMPERVIOUS	Q5 (cfs)	Q100 (cfs)
ROW-1	3.68	20	2.67	8.92
ROW-2	1.45	32	2.04	5.55
ROW-3	0.98	51	1.91	4.28
ROW-4	0.61	31	0.79	2.18
ROW-5	0.34	31	0.48	1.31
OS-1	12.75	20	8.68	32.04
OS-2	3.30	20	2.52	9.32
OS-3	1.53	20	1.20	4.44
OS-4	9.25	20	6.72	24.81
OS-5	22.41	20	14.92	55.09

DESIGN POINT SUMMARY TABLE

DESIGN POINT	CONTRIBUTING BASINS	SQ5 (cfs)	SQ100 (cfs)
1	OS-1	8.68	19.09
2	OS-2	2.52	9.32
3	ROW-1, DP [1,2]	12.62	45.66
4	OS-3	1.20	4.44
5	OS-4	6.72	24.81
6a	OS-5, DP [5]	16.87	62.28
6b	ROW-2, DP [3,4]	13.66	48.25
6	DP [6a,6b]	29.81	108.02
7	ROW-3	1.91	4.28
8a	ROW-4	0.79	2.18
8b	ROW-5	0.48	1.31
8	DP [8a,8b]	2.07	3.39

NORTH

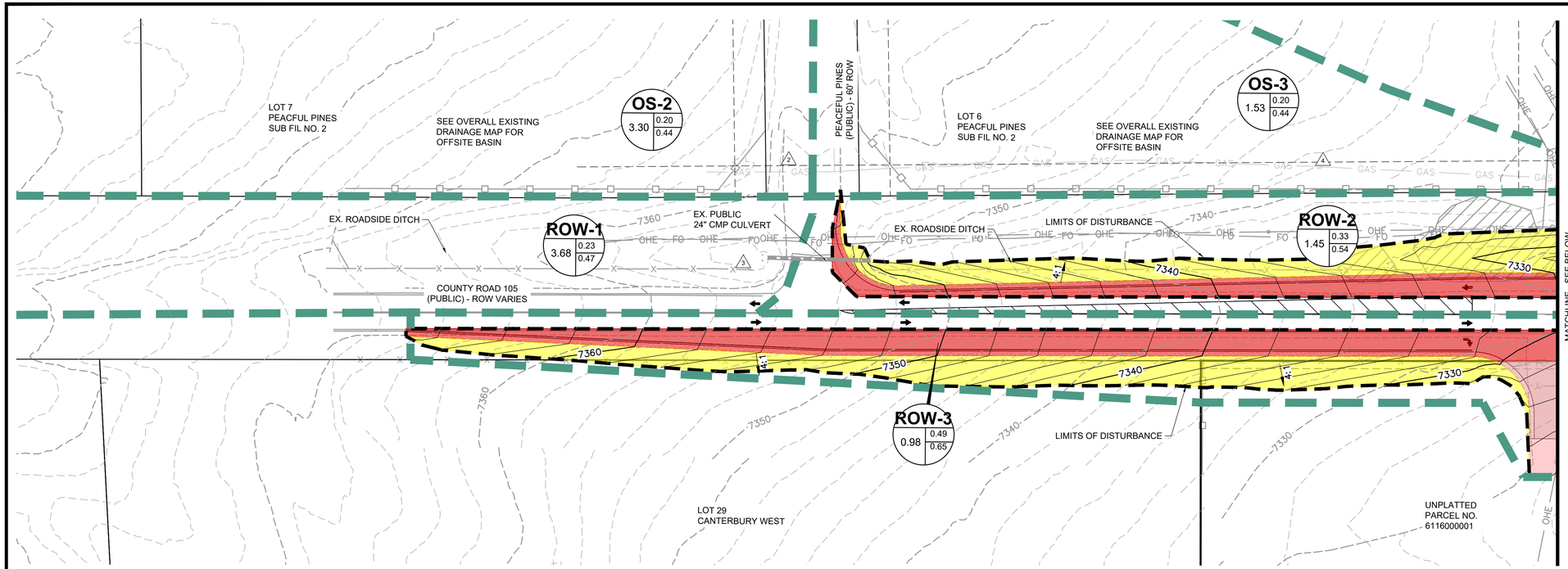
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Job No.:	2603197
Prepared By:	SPC
Date:	10/7/2026

PROPOSED DRAINAGE MAP

FIG.03

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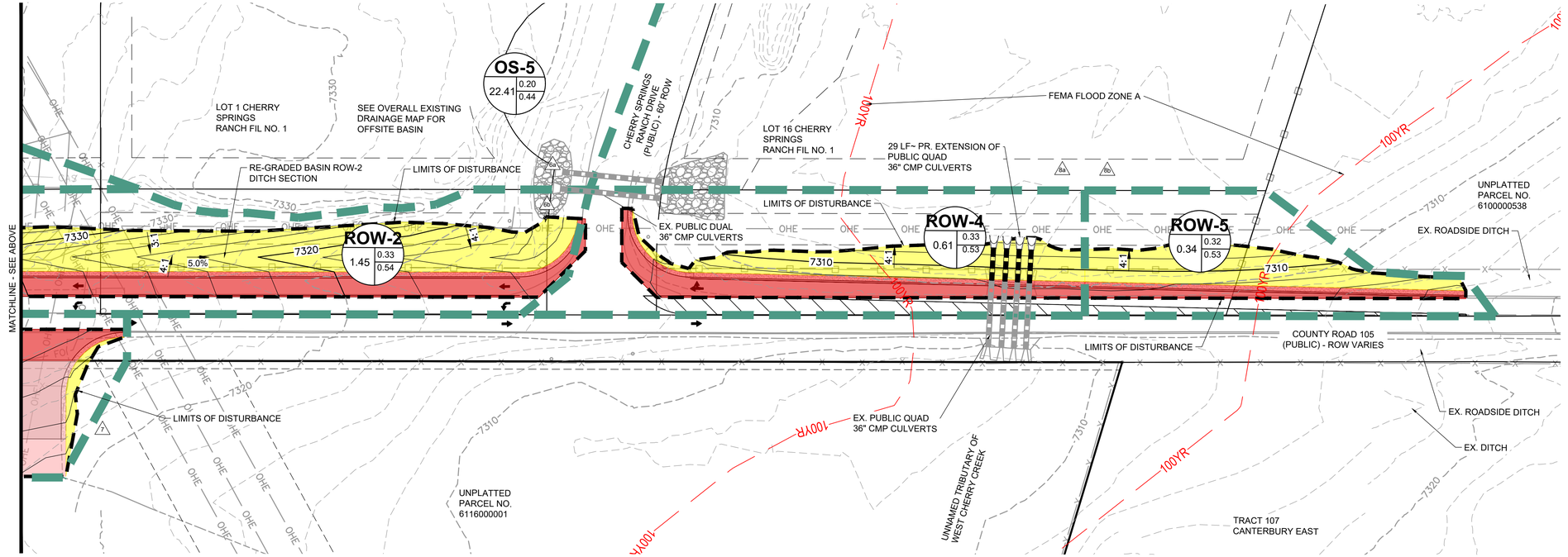


LEGEND:

- PROPOSED MAJOR CONTOUR — 5250
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR — 5250
- EXISTING MINOR CONTOUR
- PROPOSED STORM SEWER
- EXISTING STORM SEWER
- EXISTING DRAINAGE SWALE
- PROPOSED DRAINAGE SWALE
- EXISTING TERTIARY DRAINAGE WAY
- FILING NO. 4 PARCEL BOUNDARY
- FILING NO. 5 PARCEL BOUNDARY
- FILING NO. 7 PARCEL BOUNDARY
- FLOW DIRECTION
- DRAINAGE BASIN
- MAJOR BASIN BOUNDARY
- DESIGN POINT
- SWALE CROSS SECTION — X
- BASIN LABEL — A1 | 1.00 | 0.40 | 0.60
  - BASIN DESIGNATION
  - AREA (AC.)
  - MINOR 5-YR RUNOFF COEF.
  - MAJOR 100-YR RUNOFF COEF.

LEGEND:

- SEPARATE PERVIOUS AREA (SPA)
- UN-TREATED AREA
- WQ EXCLUSION AREA (I.6.1.B.2 - EXCLUDED ROADWAY REDEVELOPMENT) - LESS THAN 1 ACRE OF PAVED AREA (0.69 AC)



WATER QUALITY TREATMENT SUMMARY			
COLORADO KIDS RANCH - 105 IMPROVEMENTS			
Subbasin ID	Disturbed Area [AC]	Treatment CM	Notes:
ROW-2	0.27	EXCLUSION	EXCLUSION I.6.1.B.2 - ROADWAY REDEVELOPMENT
ROW-2	0.40	SPA	SPA AREA
ROW-3	0.28	EXCLUSION	EXCLUSION I.6.1.B.2 - ROADWAY REDEVELOPMENT
ROW-3	0.27	SPA	SPA AREA
ROW-3	0.08	UNTREATED	DRAINS OFFSITE UNTREATED
ROW-4	0.10	EXCLUSION	EXCLUSION I.6.1.B.2 - ROADWAY REDEVELOPMENT
ROW-4	0.11	SPA	SPA AREA
ROW-5	0.04	EXCLUSION	EXCLUSION I.6.1.B.2 - ROADWAY REDEVELOPMENT
ROW-5	0.10	SPA	SPA AREA

TOTAL WATER QUALITY SUMMARY		
Treatment CM	Area [AC]	% of total
TOTAL DIST. AREA	1.65	
WQ EXCLUSION	0.69	42%
TOTAL NON-EXCLUDED AREA	0.96	
UNTREATED	0.96	100%
TOTAL:	0.96	100%

*Project has <1 ac of non-excluded soil disturbance and will not require WQ treatment per ECM I.6.1.A.

NORTH

0 20 40

Job No.:	2603197
Prepared By:	SPC
Date:	10/8/2026

WATER QUALITY MAP

FIG.03