



Magellan Pipeline Company, L.P., is a subsidiary of ONEOK

Appendix J

Floodplain Delineation Study



Arapahoe County Floodplain Delineation Study for Magellan Denver Expansion Project

Magellan Pipeline Company, L.P.

Denver Expansion Project - Scott City To Denver Pipeline

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Date Submitted:

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REVISION HISTORY

DATE	REVISION	REVISION DESCRIPTION	PREPARED BY:	REVIEWED BY:	APPROVED BY:
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Acronyms and Abbreviations

3DEP	USGS 3D Elevation Program
AEP	annual exceedance probability
ArcGIS	A Geographic Information System computer program
ac	acre
BFE	base flood elevation
CAD	Computer Aided and Design
cfs	cubic feet per second
CL	pipeline centerline alignment
DEM(s)	Digital Elevation Model(s)
ESRI	Environmental Systems Research Institute
EXP	EXP Energy Services, Inc.
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	FEMA Flood Insurance Study
fps	feet per second
ft	feet
GIS	Geographic Information System
HGL	hydraulic gradeline
hrs	hours
in	inch
kip	1000 pound-force
Lat	Latitude
LiDAR	Light Detection and Ranging
Long	Longitude
Magellan	Magellan Pipeline Company, L.P.
mi	mi
MP	milepost
PL	pipeline
RMV	rupture mitigation valves
ROW	Right-of-Way
sq	square
URL	Uniform Resource Locator
U.S.	United States
USGS	United States Geological Survey

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1 Certification Statement

I hereby affirm that this document entitled Arapahoe County Floodplain Delineation Study for the Denver Expansion Project was prepared in accordance with applicable, viable, and pertinent technical data and criteria for the Colorado Water Conservation Board, the Federal Emergency Management Agency, and Arapahoe County, Colorado. The document, report, and all attachments submitted herewith were prepared in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the necessary information and accurately prepared the document. Additionally, I hereby certify that no insurable structures are impacted due to the revisions documented in this Floodplain Delineation Study.

Sincerely,

Jung-Hoe Hopgood

CO PE: 65459

EXP

2 Introduction

Magellan Pipeline Company (Magellan) is proposing the installation of approximately 235 miles of new buried pipeline (PL) of varying diameter (i.e., 10-inch and 16-inch) from Scott City, Kansas to the Denver International Airport (DIA), with the majority following the existing Chase Colorado PL in Kansas and Colorado. Of the 235 miles of pipeline, approximately 33 miles traverse Arapahoe County. The Project also involves the installation of several aboveground rupture mitigation valves (RMVs) and trap facilities along the new pipeline, all of which will be outside any delineated floodplains. EXP has been contracted by Magellan to provide engineering support for the Denver Expansion Project. As a part of this effort, EXP is providing engineering support needed for permitting. For the permit application for Arapahoe County (County), this report provides the floodplain delineations for drainageways crossed by the PL in the County and certifies that there will be no permanent impact within the floodplain from construction of the project. As this is an underground linear utility project, all construction within the floodplain is intended to be temporary and temporary disturbances will be restored to preexisting conditions.

The overall extent of the project and location relative to the County is provided in **Figure 1**.

The drawing shown in Appendix A provides an overview of the project overlain with streams and watershed boundaries. It shows the PL centerline alignment (CL) in orange overlaid on a hill shaded terrain map with the contributing watershed areas shaded in blue and drainage lines in blue. Federal Emergency Management Agency (FEMA) 100-year floodplain delineations are shown in red. Drainage paths in general travel from south to north. The County boundary is shown in black.

Figure 1 –Project Area



3 Scope

For the floodplain analysis, stream location data was downloaded from the U.S. Geological Survey (USGS) StreamStats website. From this stream data, all stream crossing points were identified where the CL crosses streams. Where it was indicated that the CL crosses a stream multiple times within the same floodplain, the point with the highest peak flow rate was used for the floodplain delineations to give the most conservative results. The map book in Appendix B overlays on aerial photography all stream location data from StreamStats, CL, FEMA 100-year floodplain delineations, each stream crossing location identified by milepost (MP), tributary area for each identified stream crossing the CL and indicates which stream crossings require a local floodplain delineation.

Table 1 presents all streams crossed by the proposed CL labeled by their MP, GPS coordinate, Township Section Map Reference, stream name, tributary drainage area, and floodplain delineation category.

Table 1: Arapahoe County Streams Crossed By Project

MP	Latitude	Longitude	Section Map	Tributary Name and FEMA stream	Area (ac)	Floodplain
416.60	39.5681	-104.080	T5S,R60W:35SW	Middle Bijou Creek	88771.7	FEMA
416.77	39.5688	-104.083	T5S,R60W:34SE		73.5	<130ac
416.98	39.5698	-104.087	T5S,R60W:34SE	Unnamed Tributary to Middle Bijou Creek	143.1	Local
417.07	39.5702	-104.089	T5S,R60W:34SE		72.2	<130ac
417.47	39.5720	-104.096	T5S,R60W:34SW		32.4	<130ac
417.97	39.5746	-104.105	T5S,R60W:33NE	Willow Gulch to Middle Bijou Creek	8042.7	Local
418.29	39.5764	-104.110	T5S,R60W:33NW	Unnamed Tributary to Middle Bijou Creek	894.7	Local
419.36	39.5822	-104.129	T5S,R60W:29SW	Unnamed Tributary to Hay Glch to Middle Bijou Creek	253.6	Local
419.48	39.5828	-104.131	T5S,R60W:29SW	Hay Gulch to Middle Bijou Creek	8764.8	Local
419.72	39.5841	-104.135	T5S,R60W:29SW		100.8	<130ac
420.68	39.5893	-104.152	T5S,R60W:30NW		67.3	<130ac
420.85	39.5902	-104.155	T5S,R60W:30NW		48.5	<130ac
421.15	39.5918	-104.160	T5S,R61W:25NE	Unnamed Tributary to Middle Bijou Creek	187.0	Local
421.23	39.5923	-104.161	T5S,R61W:25NE	Unnamed Tributary to Middle Bijou Creek	298.9	Local
421.84	39.5955	-104.172	T5S,R61W:24SW		30.7	<130ac
422.04	39.5966	-104.175	T5S,R61W:23SE		78.1	<130ac
422.66	39.6000	-104.186	T5S,R61W:23SW		40.2	<130ac
423.18	39.6023	-104.195	T5S,R61W:22NE	Rattlesnake Creek to Middle Bijou Creek	7448.8	Local
423.50	39.6040	-104.201	T5S,R61W:22NE	Unnamed Tributary to Middle Bijou Creek	857.9	Local

MP	Latitude	Longitude	Section Map	Tributary Name and FEMA stream	Area (ac)	Floodplain
424.10	39.6073	-104.211	T5S,R61W:22NW		57.1	<130ac
424.59	39.6099	-104.220	T5S,R61W:16SE	Unnamed Tributary to Middle Bijou Creek	879.8	Local
424.88	39.6114	-104.225	T5S,R61W:16SW		64.4	<130ac
425.60	39.6158	-104.237	T5S,R61W:17SE		100.3	<130ac
426.24	39.6195	-104.248	T5S,R61W:17NW	Unnamed Tributary to West Bijou Creek	1201.8	FEMA
426.58	39.6214	-104.254	T5S,R61W:18NE	West Bijou Creek	161364.3	FEMA
427.14	39.6248	-104.263	T5S,R61W:7SW	Unnamed Tributary to West Bijou Creek	359.0	Local
427.16	39.6250	-104.264	T5S,R61W:7SW		122.3	<130ac
427.71	39.6272	-104.273	T5S,R62W:12SE		26.2	<130ac
427.83	39.6276	-104.276	T5S,R62W:12SE		26.3	<130ac
428.42	39.6299	-104.286	T5S,R62W:11SE		61.4	<130ac
428.45	39.6301	-104.287	T5S,R62W:11NE	Unnamed Tributary to West Bijou Creek	2846.4	Local
428.84	39.6328	-104.293	T5S,R62W:11NE	Unnamed Tributary to West Bijou Creek	498.4	Local
429.00	39.6339	-104.296	T5S,R62W:11NW	Unnamed Tributary to West Bijou Creek	351.6	Local
430.09	39.6411	-104.314	T5S,R62W:3SW	Little Comanche Creek to Comanche Creek to Kiowa Creek	3935.5	FEMA
430.45	39.6435	-104.320	T5S,R62W:3SW		92.4	<130ac
430.78	39.6451	-104.326	T5S,R62W:4NE	Unnamed Tributary to Comanche Creek to Kiowa Creek	132.8	Local
431.65	39.6507	-104.340	T5S,R62W:4NW		27.7	<130ac
431.73	39.6512	-104.342	T5S,R62W:5NE	Comanche Creek to Kiowa Creek	48288.8	FEMA
431.81	39.6518	-104.343	T4S,R62W:32SE		107.7	<130ac
432.30	39.6552	-104.351	T4S,R62W:32SW	Unnamed Tributary to Comanche Creek to Kiowa Creek	342.8	Local
432.78	39.6586	-104.359	T4S,R62W:32SW		57.2	<130ac
433.22	39.6606	-104.367	T4S,R62W:31NE		105.6	<130ac
433.42	39.6614	-104.370	T4S,R62W:31NW	Wolf Creek to Kiowa Creek	43545.0	FEMA
435.07	39.6696	-104.399	T4S,R63W:26SE	Unnamed Tributary to Wolf Creek to Kiowa Creek	550.3	Local
435.26	39.6706	-104.403	T4S,R63W:26SE	Unnamed Tributary to Wolf Creek to Kiowa Creek	371.6	Local

MP	Latitude	Longitude	Section Map	Tributary Name and FEMA stream	Area (ac)	Floodplain
435.60	39.6736	-104.407	T4S,R63W:26NW		55.5	<130ac
436.00	39.6779	-104.412	T4S,R63W:26NW		26.9	<130ac
437.18	39.6852	-104.432	T4S,R63W:22SW	Kiowa Creek	149808.9	FEMA
437.48	39.6867	-104.437	T4S,R63W:21SE	Unnamed Tributary to Kiowa Creek	4307.8	FEMA
438.92	39.6949	-104.462	T4S,R63W:17SE		33.2	<130ac
439.29	39.6976	-104.468	T4S,R63W:17SW	Unnamed Tributary to Lost Creek/Cost Creek/West Sand Creek to Middle South Platte-Cherry Creek	464.3	Local
439.85	39.7016	-104.477	T4S,R63W:18SE		108.8	<130ac
440.14	39.7040	-104.480	T4S,R63W:18NE		90.1	<130ac
440.19	39.7040	-104.481	T4S,R63W:18NW	Unnamed Tributary to Lost Creek/Cost Creek/West Sand Creek to Middle South Platte-Cherry Creek	143.3	Local
441.21	39.7097	-104.499	T4S,R64W:12SE		24.7	<130ac
441.32	39.7097	-104.501	T4S,R64W:12SW	Unnamed Tributary to Lost Creek/Cost Creek/West Sand Creek to Middle South Platte-Cherry Creek	399.7	Local
441.88	39.7097	-104.511	T4S,R64W:11SE	Unnamed Tributary to Lost Creek/Cost Creek/West Sand Creek to Middle South Platte-Cherry Creek	207.0	Local
442.09	39.7097	-104.515	T4S,R64W:11SE		27.6	<130ac
442.48	39.7099	-104.523	T4S,R64W:11SW	West Sand Creek to Middle South Platte-Cherry Creek	2315.6	Local
443.16	39.7108	-104.535	T4S,R64W:10SE		92.6	<130ac
443.30	39.7112	-104.538	T4S,R64W:10SW		127.6	<130ac
444.07	39.7131	-104.552	T4S,R64W:9SE	Box Elder Creek to Middle South Platte-Cherry Creek	105450.2	FEMA
444.29	39.7136	-104.556	T4S,R64W:9SW		86.6	<130ac
445.20	39.7181	-104.572	T4S,R64W:8NE	Cardboard Draw to Box Elder Creek to Middle South Platte-Cherry Creek	864.4	Local
445.74	39.7207	-104.582	T4S,R64W:8NW		22.5	<130ac
447.05	39.7276	-104.605	T4S,R65W:1SE		57.9	<130ac
447.25	39.7287	-104.608	T4S,R65W:1SE	Coyote Run to Box Elder Creek to Middle South Platte-Cherry Creek	8011.6	FEMA

MP	Latitude	Longitude	Section Map	Tributary Name and FEMA stream	Area (ac)	Floodplain
447.65	39.7307	-104.615	T4S,R65W:1SW	Unnamed Tributary to Coyote Run to Middle South Platte-Cherry Creek	1296.0	FEMA
448.22	39.7337	-104.625	T4S,R65W:2NE	Unnamed Tributary to Coyote Run to Middle South Platte-Cherry Creek	144.4	Local

A total of 69 StreamStats streams are crossed by the CL. Per County floodplain policy, the local floodplain delineation was performed on all streams with an upstream tributary area greater than 130 acres. 11 streams were within FEMA 100-year floodplain delineations and of the remaining 58, 25 exceed the 130 acre threshold. Therefore, local floodplain analyses was performed on these 25 stream crossing locations as described in the following sections of this report.

4 Local Floodplain Analysis

As discussed above, drainage basins were delineated at each intersection of the stream to the CL, along with their associated flow paths, from StreamStats by USGS. Drainage pathways were verified from several sources including civil topographic survey data collected near the CL, USGS 3D Elevation Program (3DEP) digital elevation model, aerial imagery within ArcGIS Pro and ArcHydro. These were used to determine attributes in the hydrologic analysis of the contributing drainage catchments.

4.1 Hydrologic Analysis

Each stream crossing location was analyzed on the StreamStat's website to determine the basin characteristics. The basin properties are included on each stream crossing drawing in Appendix C. Definitions for the basin properties are described here:

DRNAREA - Area that drains to a point on a stream

OUTLETELEV - Elevation of the stream outlet in feet above NAVD88

STATSCLAY - Percentage of clay soils from STATSGO

I6H100Y - 6-hour precipitation that is expected to occur on average once in 100-years

PRECIP - Mean Annual Precipitation

ELEV - Mean Basin Elevation

BSLDEM10M - Mean basin slope computed from 10m DEM

CSL1085LFP - Change in elevation divided by length between points 10 and 85 percent of distance along the longest flow path to the basin divide, LFP from 2D grid

RCN - Runoff-curve number as defined by NRCS

(<http://policy.nrcs.usda.gov/OpenNonWebContent.aspx?content=17758.wba>)

TOC - Time of concentration in hours

The peak design flow for the 100-year return frequency was calculated using USGS Colorado's Foothills Region Peak Flow 2016 5099 regional regression equation of the form

$$PK1AEP=10^{13.244} \times DRNAREA^{0.572} \times I6H100Y^{3.190} \times STATSCLAY^{1.013} \times OUTLETELEV^{-3.631}.$$

The result of the hydrologic analysis is summarized in **Table 2**.

Table 2: Local Floodplain Basin Characteristics and 100-Year Design Flows

MP mi	DRNAREA sq mi	OUTLETELEV ft	STATSCLAY %	I6H100Y in	PK1AEP cfs
416.98	0.22	5317	18.27	4.00	346
417.97	12.60	5306	22.45	4.00	4350
418.29	1.40	5325	22.00	4.01	1210
419.36	0.40	5322	20.30	4.01	544
419.48	13.70	5311	21.81	3.98	4340
421.15	0.29	5431	21.76	3.99	444
421.23	0.47	5429	24.04	3.99	648
423.18	11.60	5383	24.36	3.95	4110
423.50	1.34	5395	25.74	3.95	1250
424.59	1.37	5421	20.37	3.95	984
427.14	0.56	5431	30.71	3.92	867
428.45	4.44	5506	21.67	3.89	1850
428.84	0.78	5557	19.47	3.00	259
429.00	0.55	5590	18.30	3.90	450
430.78	0.21	5580	18.30	3.87	255
432.30	0.54	5551	18.30	3.85	438
435.07	0.86	5581	18.30	3.00	253
435.26	0.58	5585	18.30	3.81	432
439.29	0.72	5667	25.77	3.77	634
440.19	0.22	5689	18.30	3.77	224
441.32	0.62	5690	25.62	3.76	565
441.88	0.32	5680	36.49	3.00	271
442.48	3.62	5661	28.03	3.75	1720
445.20	1.35	5593	25.19	3.73	900
448.22	0.23	5560	25.30	3.00	167

4.2 Hydraulic Analysis

The local floodplain analysis uses a digital terrain model to represent the current condition at the crossing location. This terrain model was developed from surveyed topographic data collected in July and August of 2024 within 100 ft of the CL. Where survey data had an insufficient level of detail, it was supplemented with high resolution USGS 3DEP LiDAR data. For the channel configuration, a cross-sectional profile at each stream crossing location normal to the direction of flow was cut. Some stream crossing identified by the StreamStats stream locations when compared to existing conditions data indicate that the stream has migrated significantly from the stream location, hydraulic conditions have changed due to development or the basis for the original dataset had a poor level of resolution. In the hydraulic analysis for each crossing location, the cross section for the nearest conveyance channel

was used and all elevation points for the entire cross-section are utilized in the cross-sectional area calculation, including the lowest point near the identified crossing location and the left and right banks far beyond the possible floodplain extent.

The composite Manning's roughness coefficient was estimated from aerial photography and take into account effects from stream sinuosity, contracting or expanding section, vegetation density, channel depth and width and relative location to any nearby confluences.

A hydraulic model was developed for each crossing location to determine the normal flow depth using the cross-sectional area, Manning's n , peak design flow with a 1% annual exceedance probability (AEP) and slope from the tributary basin properties as determined by the StreamStats website. The normal flow depth was used to calculate the flood elevation for the design condition at the crossing location as the construction activity will be temporary, there are no potential at-risk structures nearby and simple hydraulic representation is appropriate. The values used in the calculation of the hydraulic gradeline (HGL) for the 100-year return frequency condition are included on each stream crossing drawing in Appendix C.

A HGL flood elevation at each crossing location was determined from the hydraulic calculations performed under the design condition and are summarized in **Table 3**.

Table 3: 100-Year HGL Flood Elevations

MP mi	DRNAREA sq mi	Flow cfs	Velocity fps	Area sq ft	Width ft	Depth ft	HGL ft
416.98	0.22	350	4.64	75.4	82.9	2.93	5324.08
417.97	12.60	4370	5.56	785.3	406.8	5.09	5311.94
418.29	1.40	1221	5.58	219.0	138.5	2.29	5328.85
419.36	0.40	547	6.25	87.5	76.3	2.03	5327.48
419.48	13.70	4360	7.54	578.0	170.8	7.46	5324.36
421.15	0.29	447	4.86	92.0	101.4	1.27	5442.54
421.23	0.47	651	6.04	107.7	97.8	2.16	5442.37
423.18	11.60	4123	3.56	1157.3	602.2	5.81	5389.25
423.50	1.34	1256	4.76	263.9	152.9	3.55	5396.89
424.59	1.37	995	2.34	425.5	766.1	1.35	5427.12
427.14	0.56	872	4.34	201.1	216.6	1.96	5427.01
428.45	4.44	1851	4.67	396.3	191.5	6.45	5505.41
428.84	0.78	261	3.01	86.5	76.2	1.79	5556.94
429.00	0.55	554	1.69	327.5	629.7	1.07	5592.14
430.78	0.21	258	2.11	122.5	214.4	1.29	5570.90
432.30	0.54	440	2.77	158.8	170.5	1.49	5546.75
435.07	0.86	254	5.58	45.6	46.3	2.09	5576.69
435.26	0.58	435	5.62	77.5	91.0	2.28	5583.96
439.29	0.72	643	6.98	92.2	76.9	2.38	5671.99
440.19	0.22	227	3.62	62.6	136.5	0.79	5690.52

MP mi	DRNAREA sq mi	Flow cfs	Velocity fps	Area sq ft	Width ft	Depth ft	HGL ft
441.32	0.62	573	4.03	142.1	206.4	1.68	5691.45
441.88	0.32	276	5.63	49.0	44.5	1.92	5677.60
442.48	3.62	1727	3.91	442.1	393.4	2.22	5661.19
445.20	1.35	909	3.87	234.6	327.1	1.77	5597.44
448.22	0.23	169	6.56	25.8	18.4	2.39	5550.16

4.3 Local Floodplain Delineation

Local floodplain delineations were developed from the design HGL flood elevation determined for each stream crossing location. This elevation was extended upstream and downstream along the drainage path using the main channel slope from the basin properties for the width of the project area and is shown for each stream crossing drawing in Appendix C.

5 FEMA Floodplain Analysis

11 locations were identified along the CL alignment with FEMA 100-year floodplain delineations.

Similar to the local floodplain analysis above, drainage basins were delineated at the intersection of the FEMA stream to the CL, along with their associated flow paths, from StreamStats by USGS. Drainage pathways were verified from several sources including civil topographic survey data collected near the CL, 3DEP digital elevation model, aerial imagery within ArcGIS Pro and ArcHydro. These were used to determine attributes in the hydrologic analysis of the contributing drainage catchments.

5.1 Hydrologic Analysis

Each stream crossing location was analyzed on the StreamStat's website to determine the basin characteristics. The basin properties are included on each stream crossing drawing in Appendix D. Definitions for the basin properties are the same as described in the local floodplain delineations section. For the analysis at the stream crossings at MP 444.07 and MP 447.25, the FEMA Flood Insurance Study (FIS) was referenced for peak flows. The remaining stream crossings do not have peak flows developed, therefore the peak design flow for the 100-year return frequency was calculated using USGS Colorado's Foothills Region Peak Flow 2016 5099 regional regression equation of the form $PK1AEP = 10^{13.244} \times DRNAREA^{0.572} \times I6H100Y^{3.190} \times STATSCLAY^{1.013} \times OUTLETELEV^{-3.631}$.

The result of the hydrologic analysis is summarized in **Table 4**.

Table 4: FEMA Floodplain Basin Characteristics and 100-Year Design Flows

MP mi	DRNAREA sq mi	OUTLETELEV ft	STATSCLAY %	I6H100Y in	PK1AEP cfs
416.60	139.00	5293	20.42	4.03	16100
426.24	1.88	5340	19.42	3.94	1180
426.58	252.00	5333	25.14	3.90	24500
430.09	6.15	5566	17.61	3.87	1710
431.73	75.40	5552	15.18	3.82	5960
433.42	68.00	5518	17.63	3.79	6520

MP mi	DRNAREA sq mi	OUTLETELEV ft	STATSCLAY %	I6H100Y in	PK1AEP cfs
437.18	234.00	5556	15.72	3.76	11200
437.48	6.73	5566	28.50	3.77	2690
444.07	165.00	5606	16.96	3.71	11138*
447.25	12.50	5528	25.55	3.00	5804*
447.65	2.02	5538	25.30	3.00	589

5.2 FEMA Floodplain HGL and Delineation Analysis

Similar to the local floodplain delineations, the FEMA floodplain channel representation uses a digital terrain model to represent the current condition at the crossing location. This terrain model was developed with high resolution USGS 3DEP LiDAR data. For the floodplain delineations at MP 444.07 and MP 447.25, the FIS was referenced for the regulatory base flood elevation (BFE) HGL. For FEMA floodplains where the BFE HGL has not been determined, the FEMA floodplain analysis uses the current delineated boundary for displaying the delineation extent on the cross-section profile in the drawings in Appendix D. It was noted that the main channel at the stream crossing at MP 437.48 has migrated and the floodplain boundary should extend another 93 feet to the east to account for the shift. This additional floodplain area has been included as FEMA Floodplain Analysis Delineation on the plans. No potential at-risk structures are nearby and all construction activity in the floodplains will be temporary, and natural ground will be restored to existing conditions.

6 Floodplain Delineation Results and Summary

25 locations were identified along the CL alignment where the upstream contributing area exceeds 130 acres. At these locations, the flood elevation expected for the peak design flow for the 100-year return frequency was determined. An estimate of the floodplain extent was drawn based on the calculated HGL surface and compared against the digital terrain model. In addition to the local floodplain delineations, 11 locations were identified with FEMA 100-year floodplain delineations. The Computer Aided and Design (CAD) drawings in Appendix C and D present the result of the floodplain delineation for each stream crossing. Open trenching to the PL depth of at minimum of 4 feet of cover will be used at all locations but the local floodplain at MP 417.97. 9 floodplains will be entirely bored, 4 local floodplains will be bored for most of the length near MPs 418.29, 419.48, 430.78, and 440.19, and 5 FEMA floodplains will be bored the width of the main channels at MPs 431.73, 433.42, 437.48, 447.25, and 447.65.

All construction that will occur within the floodplain is expected to be temporary. Surveys showing the before and as-built condition will be conducted to ensure restoration of natural ground elevations have been achieved. As noted on the plans, no hazardous material will be stored in the floodplain. Storage of spoil from excavation will be put back in place within 30 days. Any temporary disturbances will be restored to preexisting conditions at the end of the construction. Therefore, there is not expected to be any impact from construction within the identified floodplains on this project.

7 References

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<https://streamstats.usgs.gov/ss>

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<https://gis.arapahoegov.com/ArapaMAP/>

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<https://streamstats.usgs.gov/nss/>

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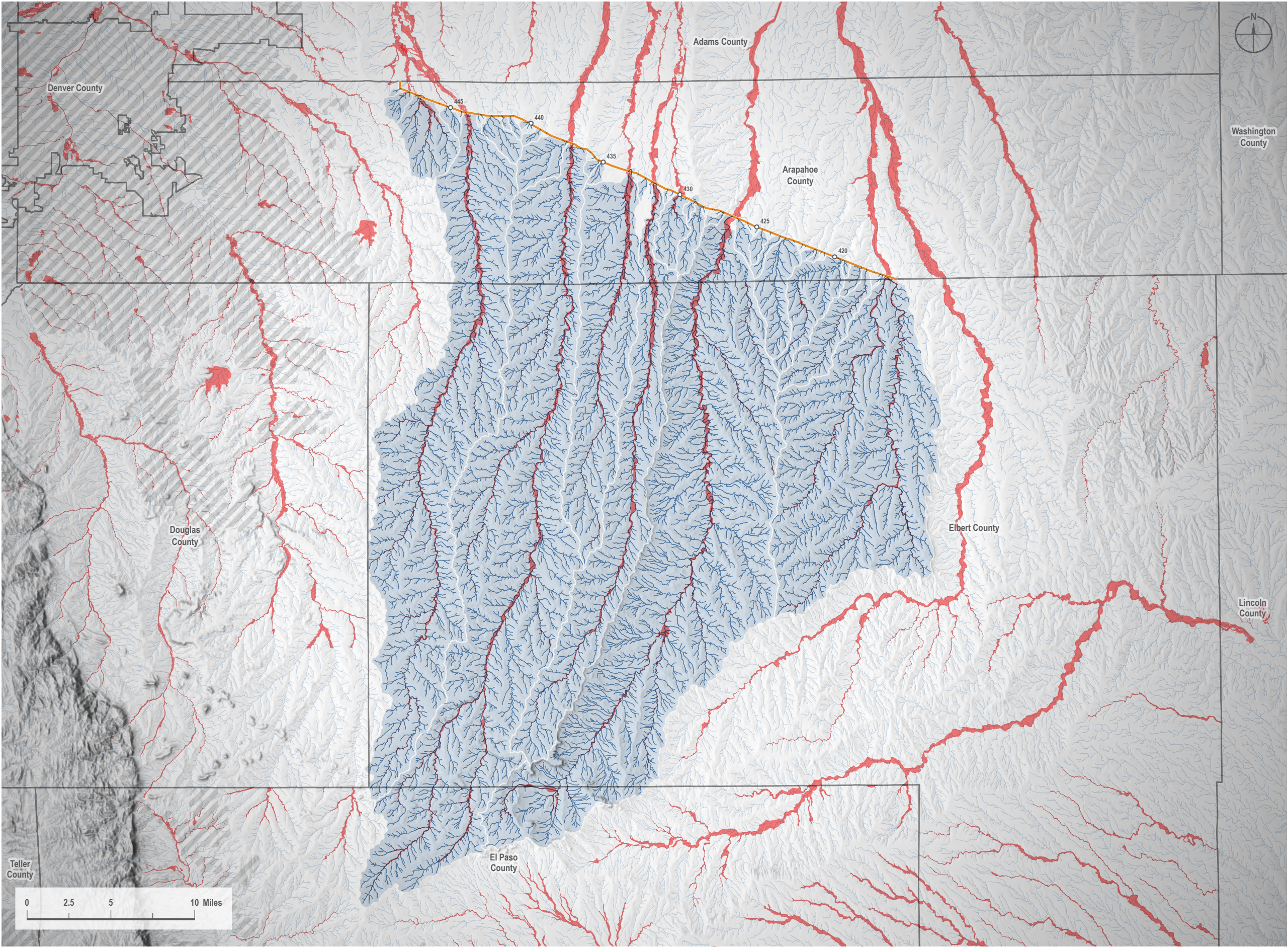
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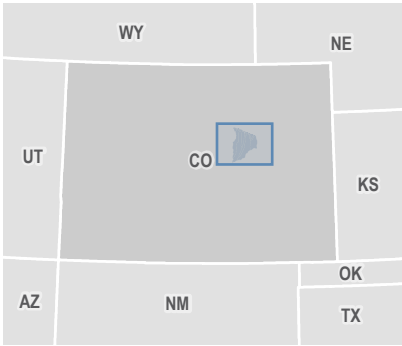
Appendix A – Arapahoe County Overview with Watersheds



P:\G\Projects\TA_2403394-00_Magellan_Scott City to Denver Pipeline\0500_CEO\10_Mapping\01 Map Books\02 Engineering\1001-02-003 Floodplain Delineation Analysis\1001-02-0031001-02-003.aprx

Disclaimer:

VICINITY MAP



LEGEND

- Milepost
- Scott City to Denver Pipeline (Arapahoe Co.)
- Tributary
- Local Floodplain Delineation (Drainage Area >130 ac.)
- Excluded from Delineation (Drainage Area <130 ac.)
- FEMA Floodplain
- County Boundary
- Urban Area

REVISIONS

Date: 2024-11-11 Revised by: PD Checked by: JHH

A - Issued for Review
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Date: Revised by: Checked by:

Date: Revised by: Checked by:

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Client:
MAGELLAN
MIDSTREAM PARTNERS, L.P.

Figure Title:
**Scott City to Denver Pipeline
Floodplain Delineation Overview - Arapahoe Co.**

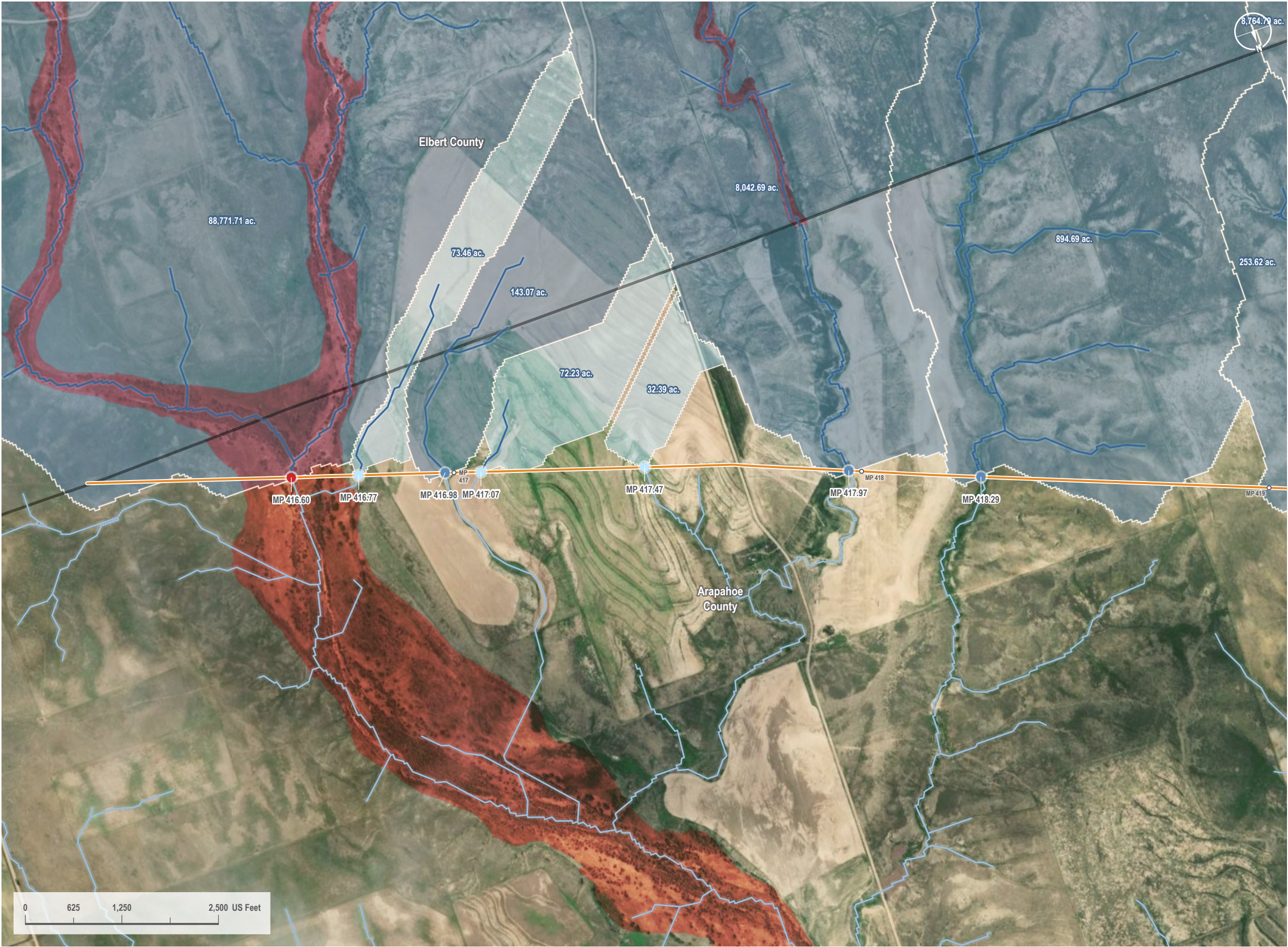
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1 inch equals 5.76 miles

Projection:
Transverse Mercator
NAD 1983 BLM Zone 13N

Sheet:
1
1 of 1

Drawing Number:
1001-02-003
Revision A

Appendix B – Stream Crossings Map Book



VICINITY MAP

LEGEND

- Milepost
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- Tributary Crossing (Drainage Area >130 ac.)
- Within FEMA Floodplain
- Tributary Crossing (Drainage Area <130 ac.)
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DENVER EXPANSION PROJECT

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Figure Title:

Scott City to Denver Pipeline
Floodplain Delineation - Arapahoe Co.

Scale: 1 : 15,000 1 inch equals 1,250 feet	Projection: Transverse Mercator NAD 1983 BLM Zone 13N
Sheet: 1 1 of 12	Drawing Number: 1001-02-004 Revision A



VICINITY MAP

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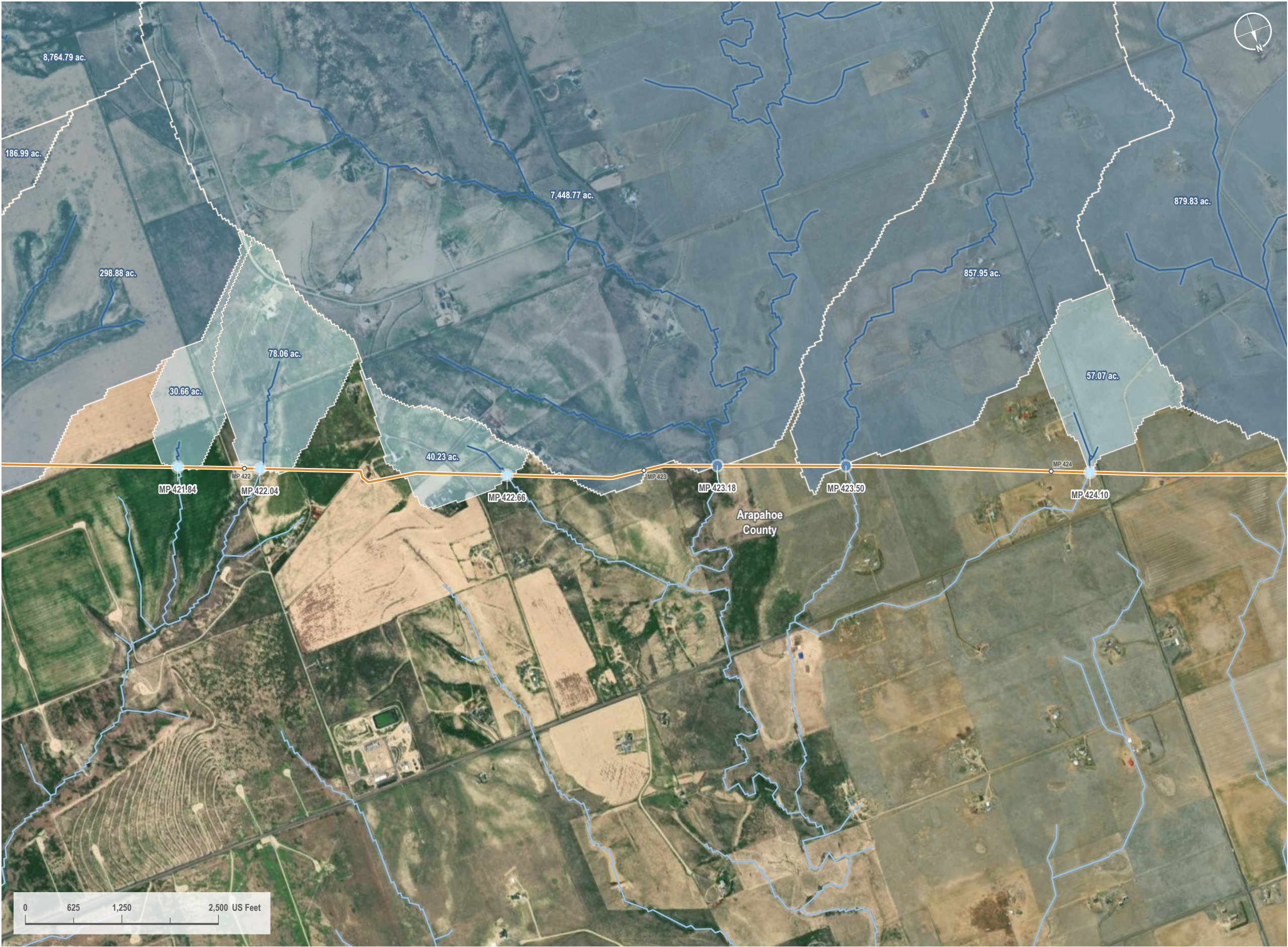
DENVER EXPANSION PROJECT

Client:

Figure Title:

Scott City to Denver Pipeline
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Scale: 1 : 15,000 1 inch equals 1,250 feet	Projection: Transverse Mercator NAD 1983 BLM Zone 13N
Sheet: 2 2 of 12	Drawing Number: 1001-02-004 Revision A



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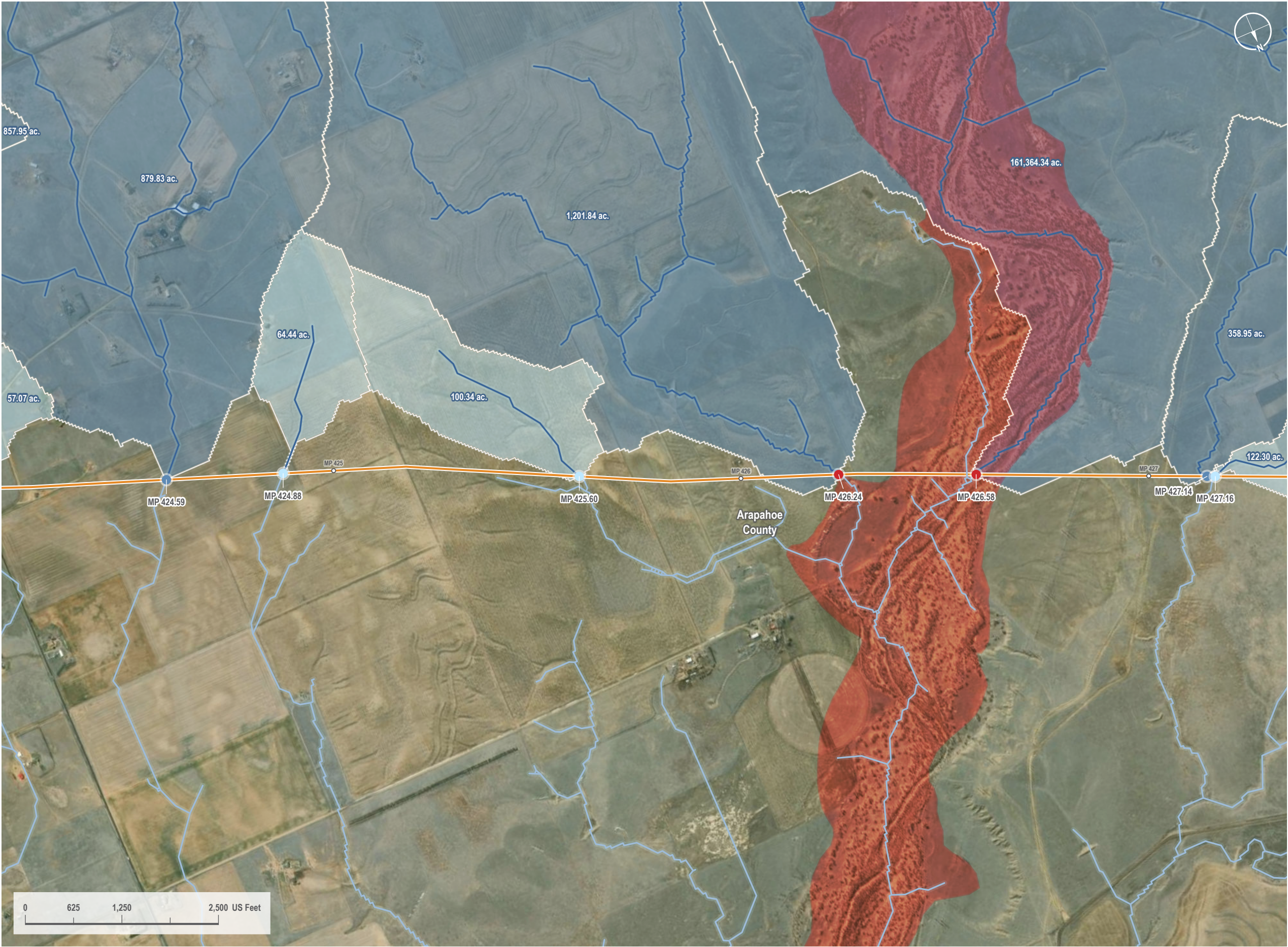
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Client:

Figure Title:

Scott City to Denver Pipeline
Floodplain Delineation - Arapahoe Co.

Scale: 1 : 15,000 1 inch equals 1,250 feet	Projection: Transverse Mercator NAD 1983 BLM Zone 13N
Sheet: 3 3 of 12	Drawing Number: 1001-02-004 Revision A



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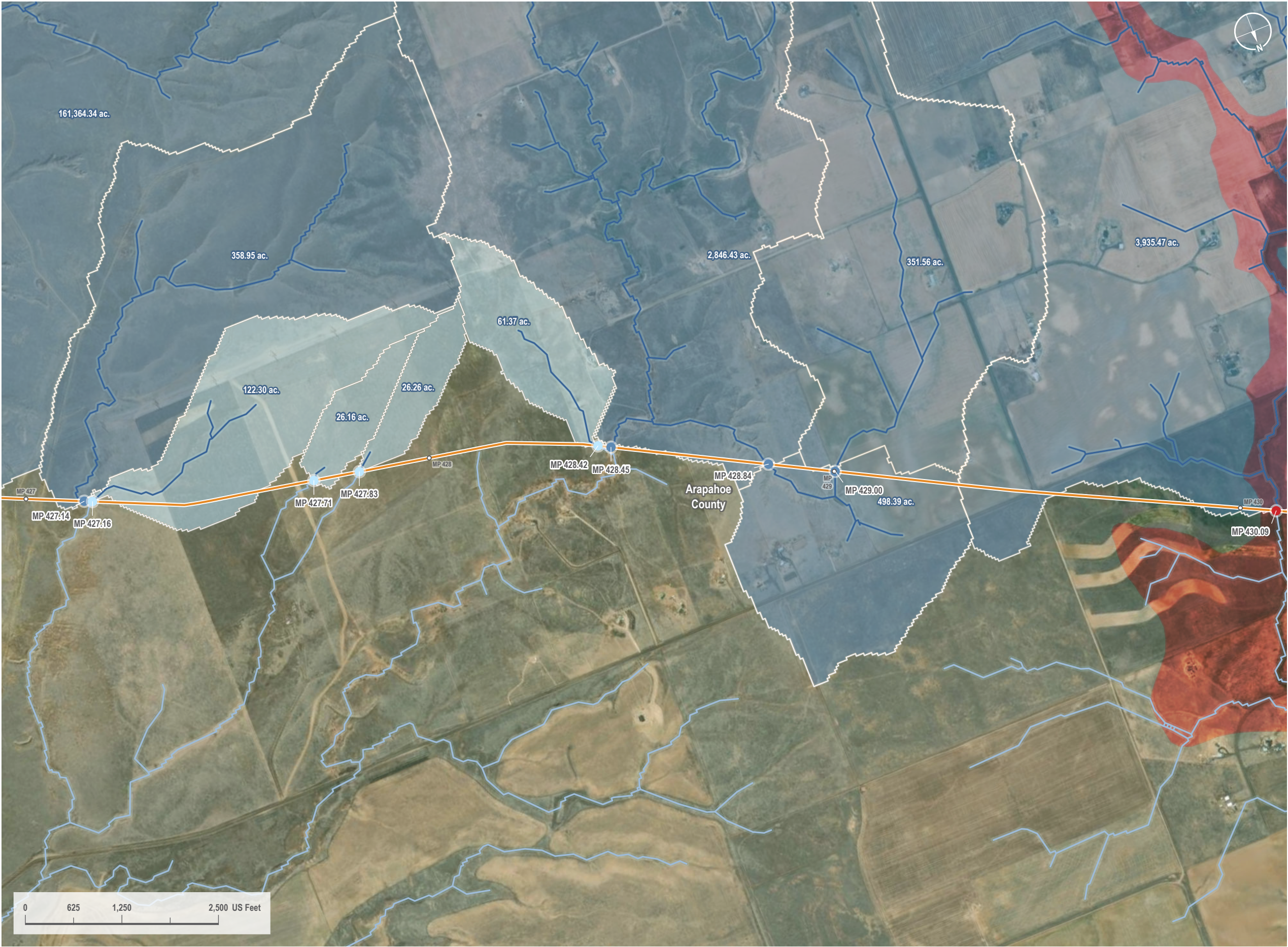
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Figure Title:

Scott City to Denver Pipeline
Floodplain Delineation - Arapahoe Co.

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1 : 15,000	Transverse Mercator
1 inch equals 1,250 feet	NAD 1983 BLM Zone 13N
Sheet:	Drawing Number:
4	1001-02-004
4 of 12	Revision A



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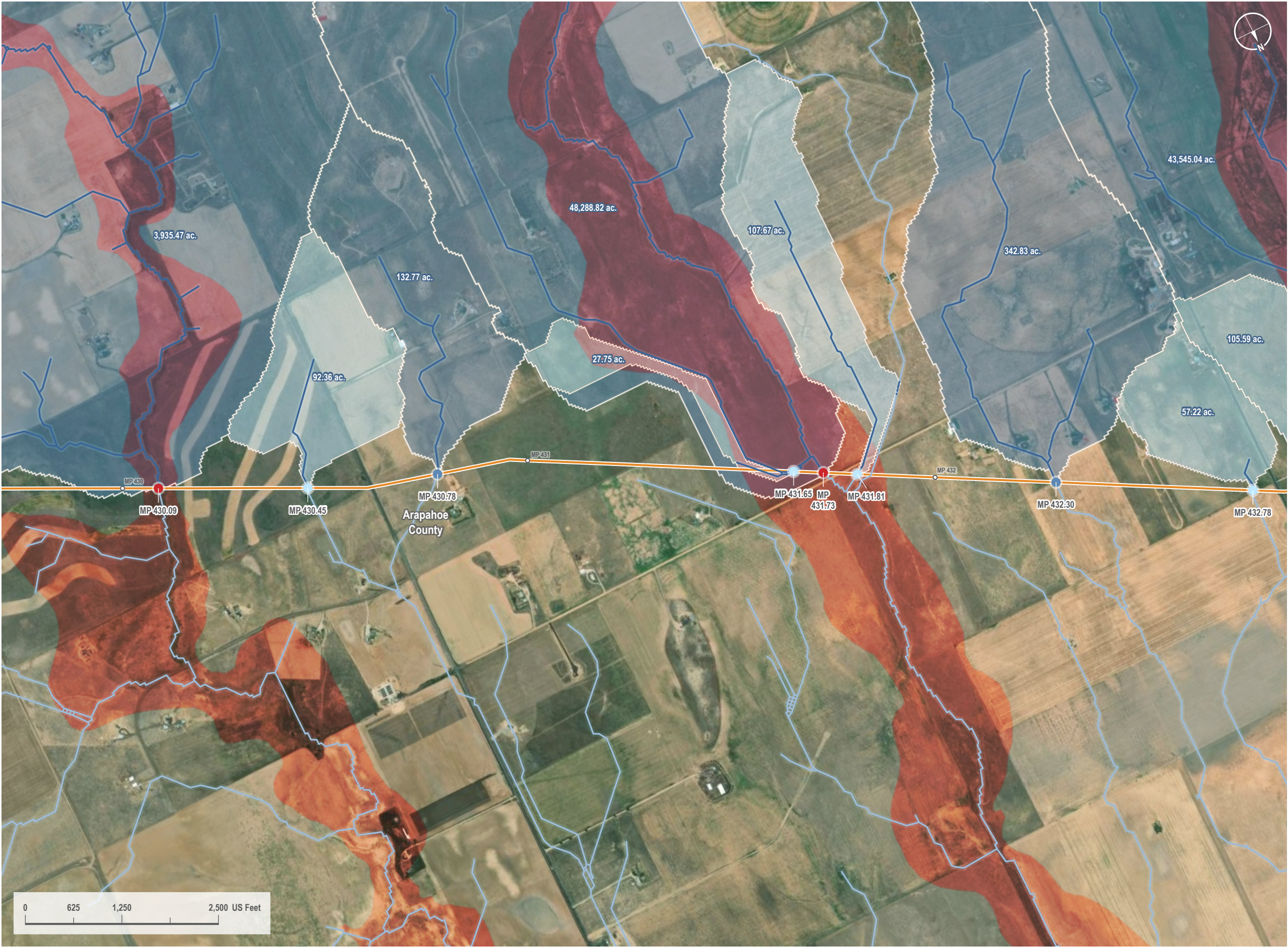
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Figure Title:

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Sheet: 5 5 of 12	Drawing Number: 1001-02-004 Revision A



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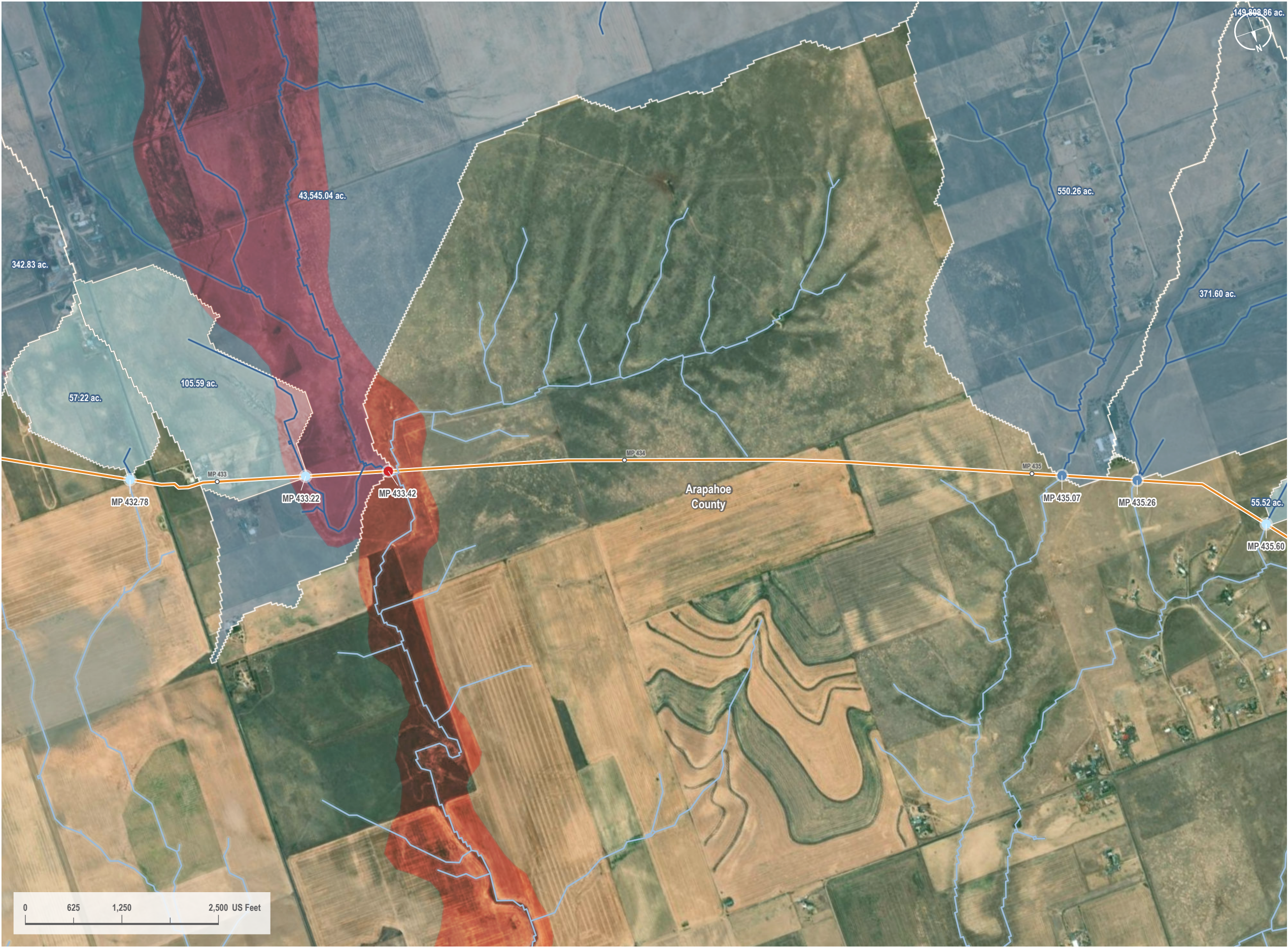
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Figure Title:

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Sheet: 6 6 of 12	Drawing Number: 1001-02-004 Revision A



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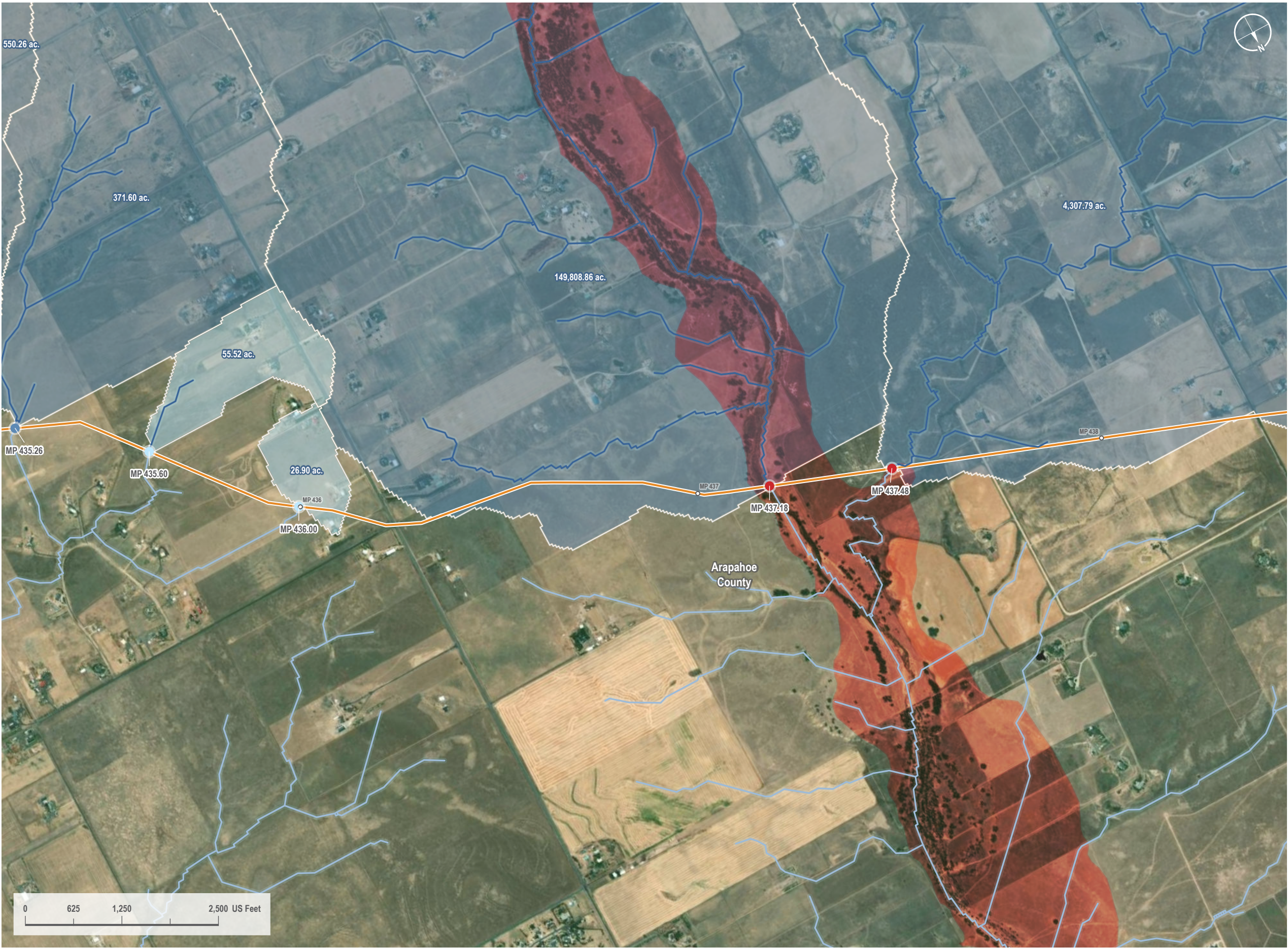
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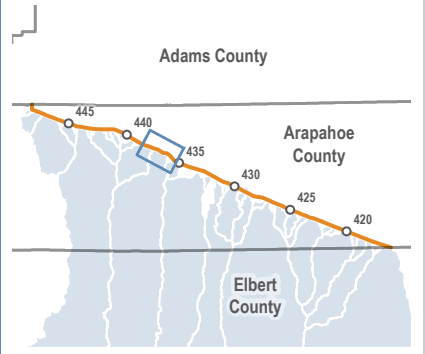
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Floodplain Delineation - Arapahoe Co.

Scale: 1 : 15,000 1 inch equals 1,250 feet	Projection: Transverse Mercator NAD 1983 BLM Zone 13N
Sheet: 7 7 of 12	Drawing Number: 1001-02-004 Revision A



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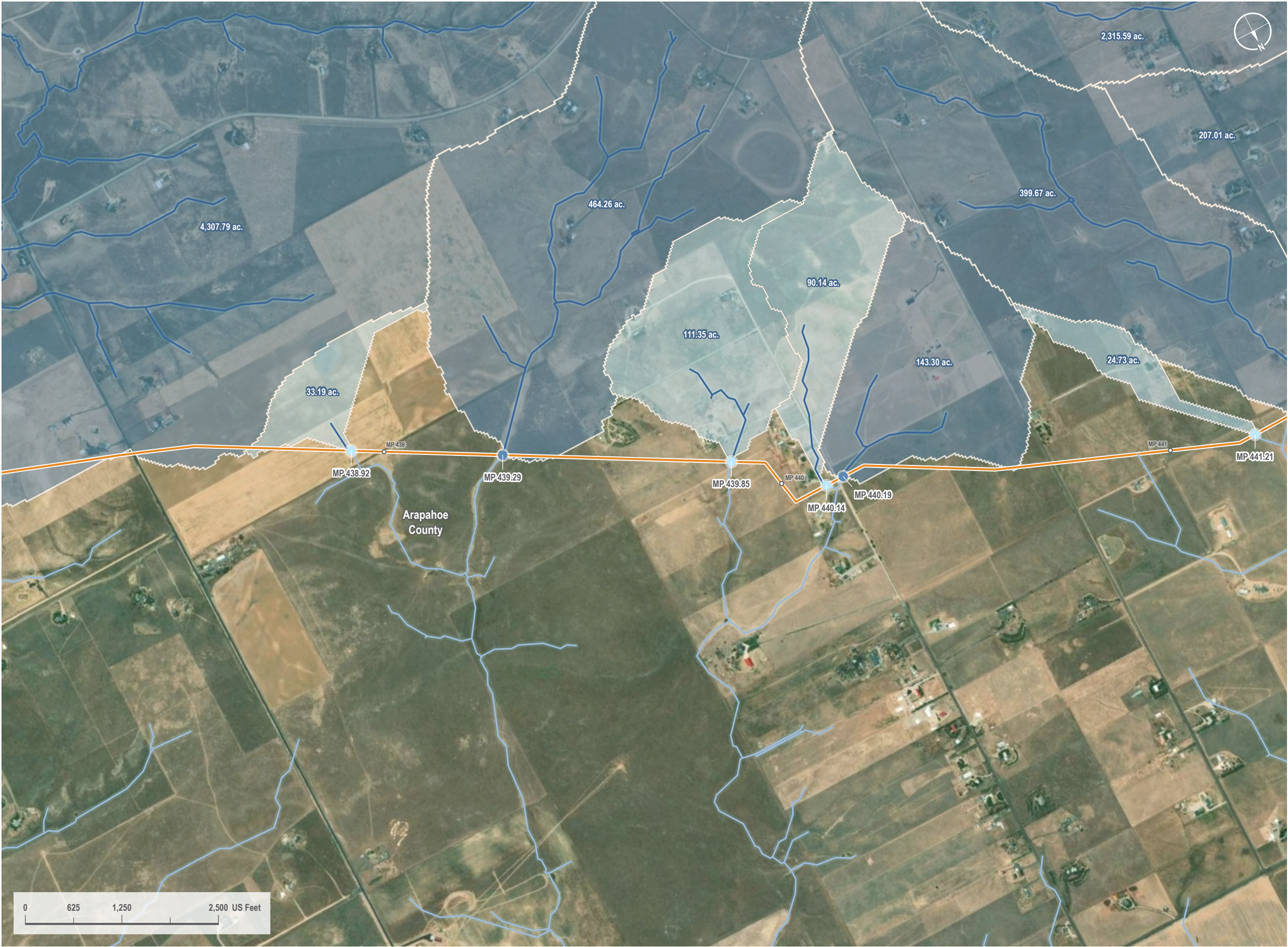
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Figure Title: Scott City to Denver Pipeline
Floodplain Delineation - Arapahoe Co.

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Sheet: 8 8 of 12	Drawing Number: 1001-02-004 Revision A



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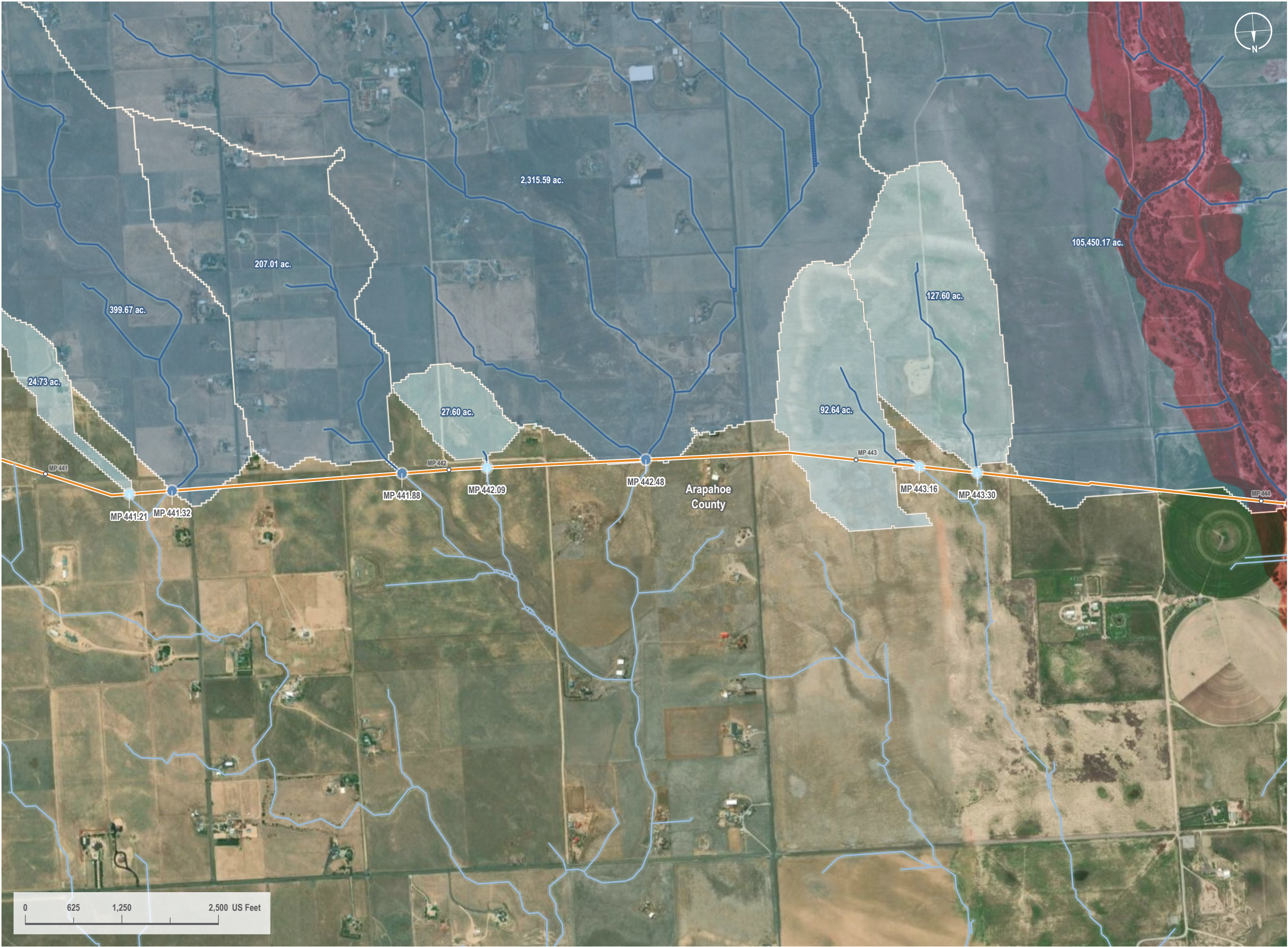
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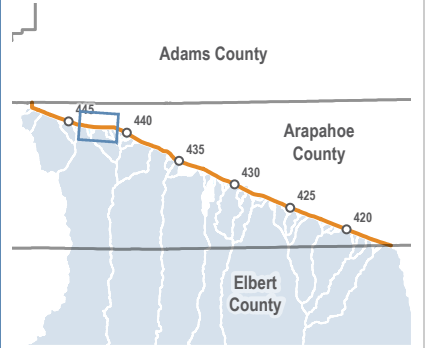
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Scott City to Denver Pipeline
Floodplain Delineation - Arapahoe Co.

Scale: 1 : 15,000 1 inch equals 1,250 feet	Projection: Transverse Mercator NAD 1983 BLM Zone 13N
Sheet: 9 9 of 12	Drawing Number: 1001-02-004 Revision A



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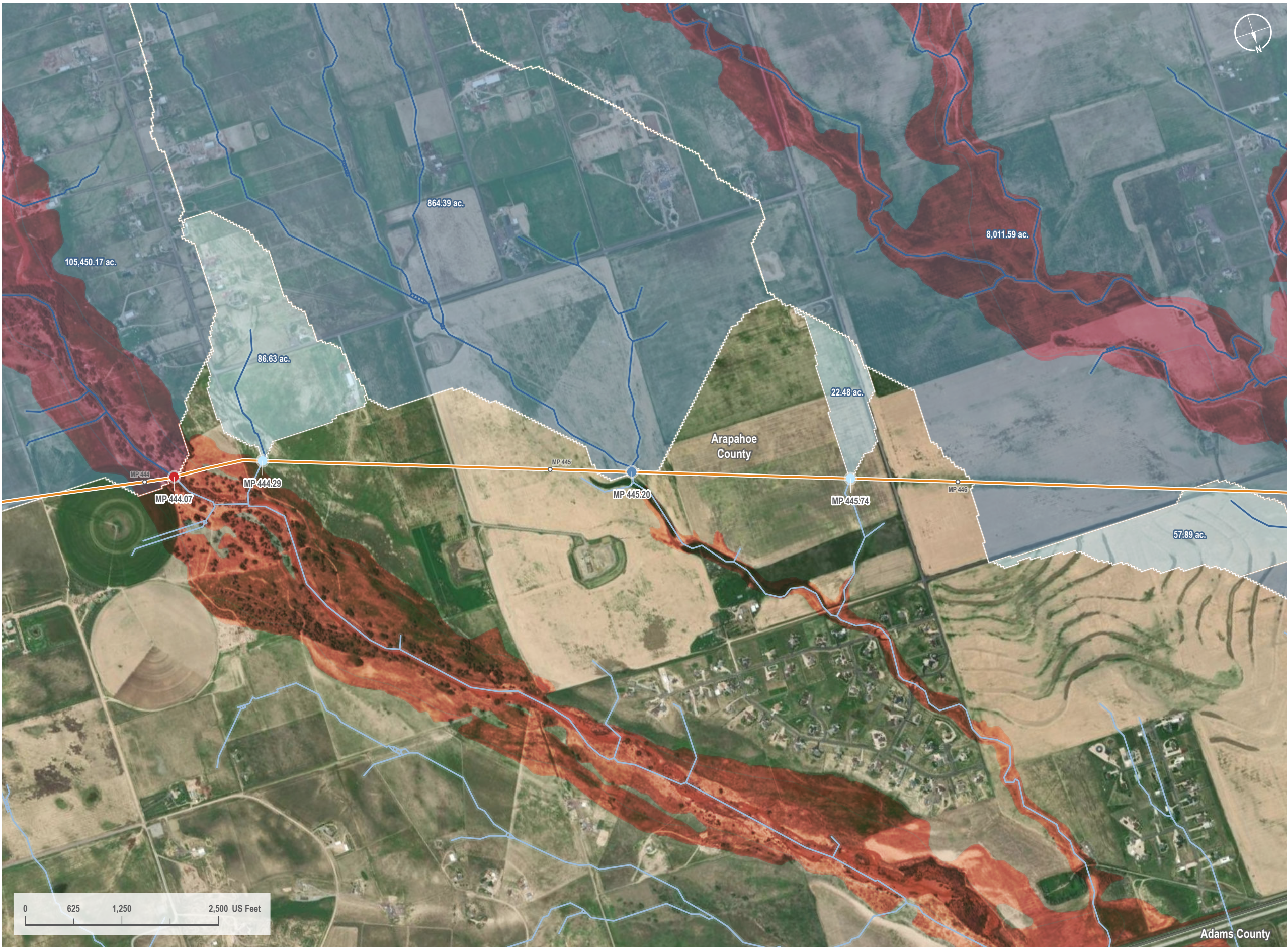


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Client:
MAGELLAN
MIDSTREAM PARTNERS, L.P.

Figure Title:
**Scott City to Denver Pipeline
Floodplain Delineation - Arapahoe Co.**

Scale: 1 : 15,000 1 inch equals 1,250 feet	Projection: Transverse Mercator NAD 1983 BLM Zone 13N
Sheet: 10 10 of 12	Drawing Number: 1001-02-004 Revision A



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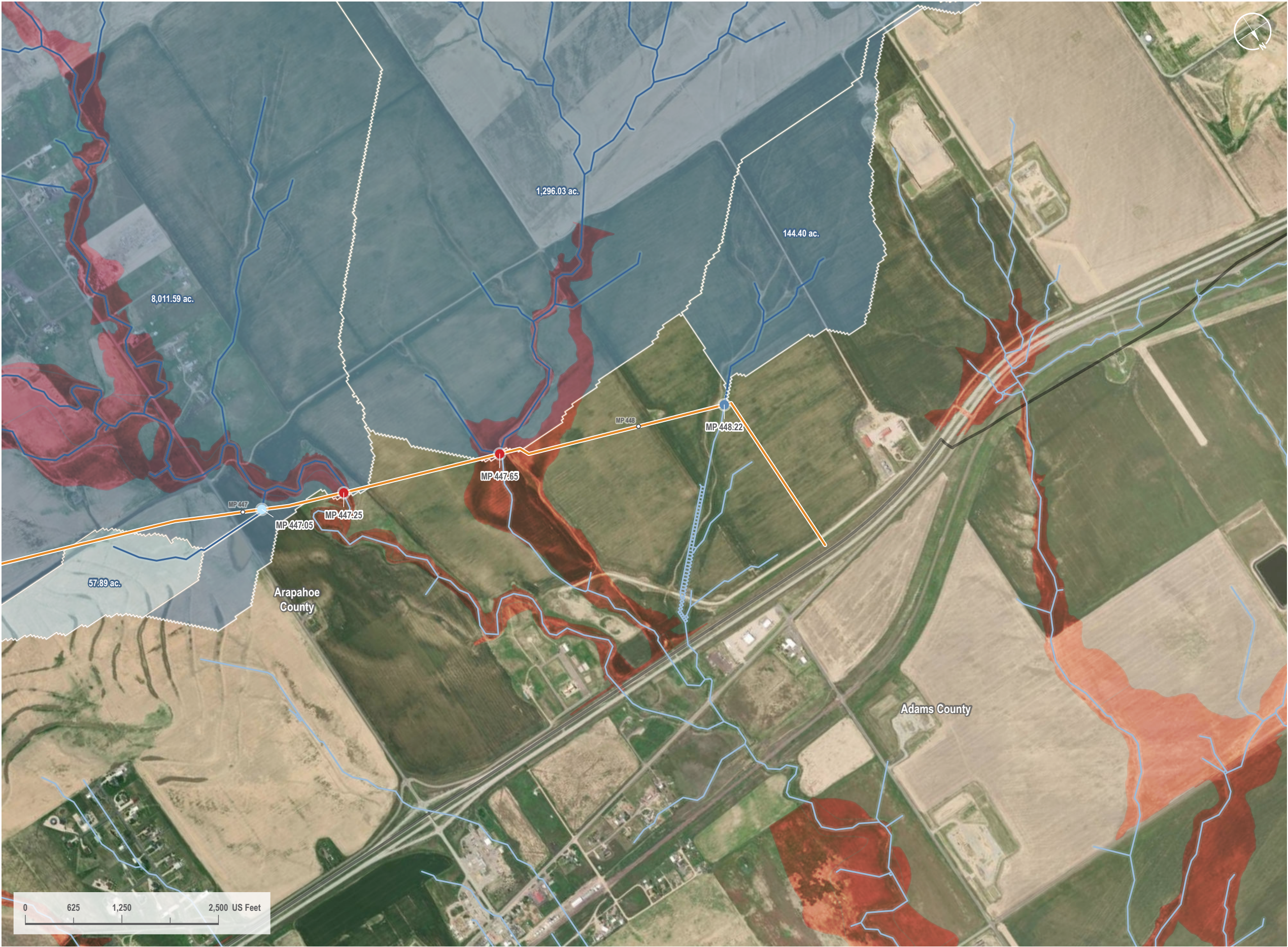
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Client:

Figure Title:

Scott City to Denver Pipeline
Floodplain Delineation - Arapahoe Co.

Scale: 1 : 15,000 1 inch equals 1,250 feet	Projection: Transverse Mercator NAD 1983 BLM Zone 13N
Sheet: 11 11 of 12	Drawing Number: 1001-02-004 Revision A



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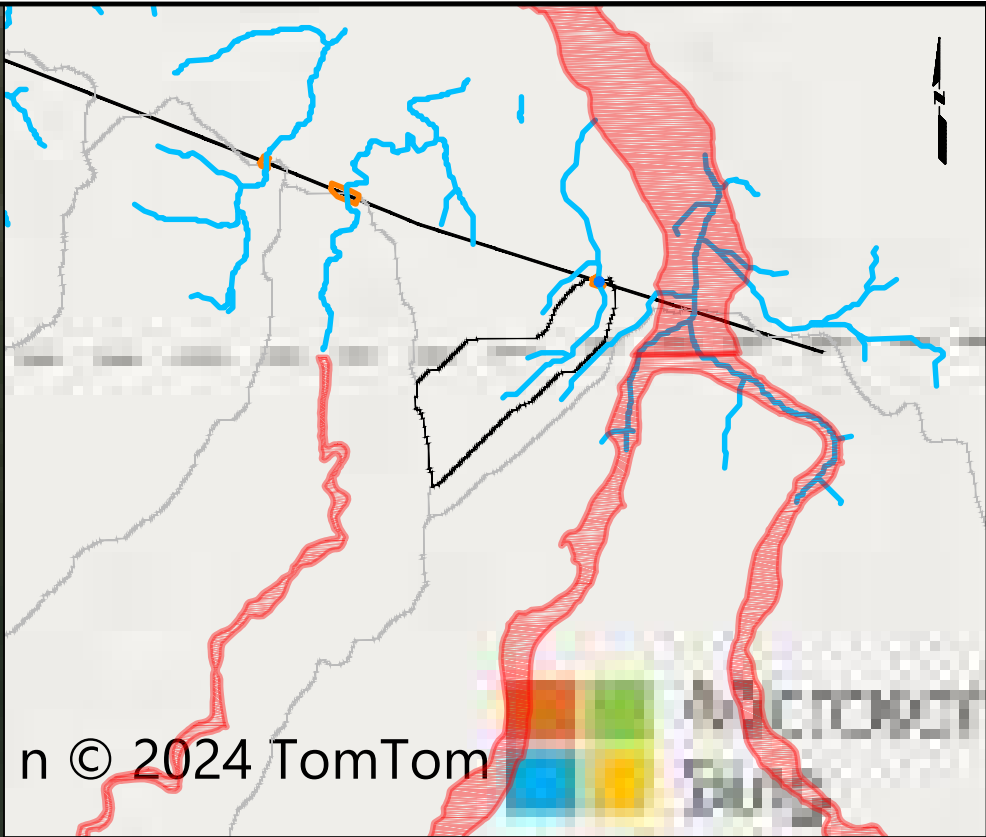
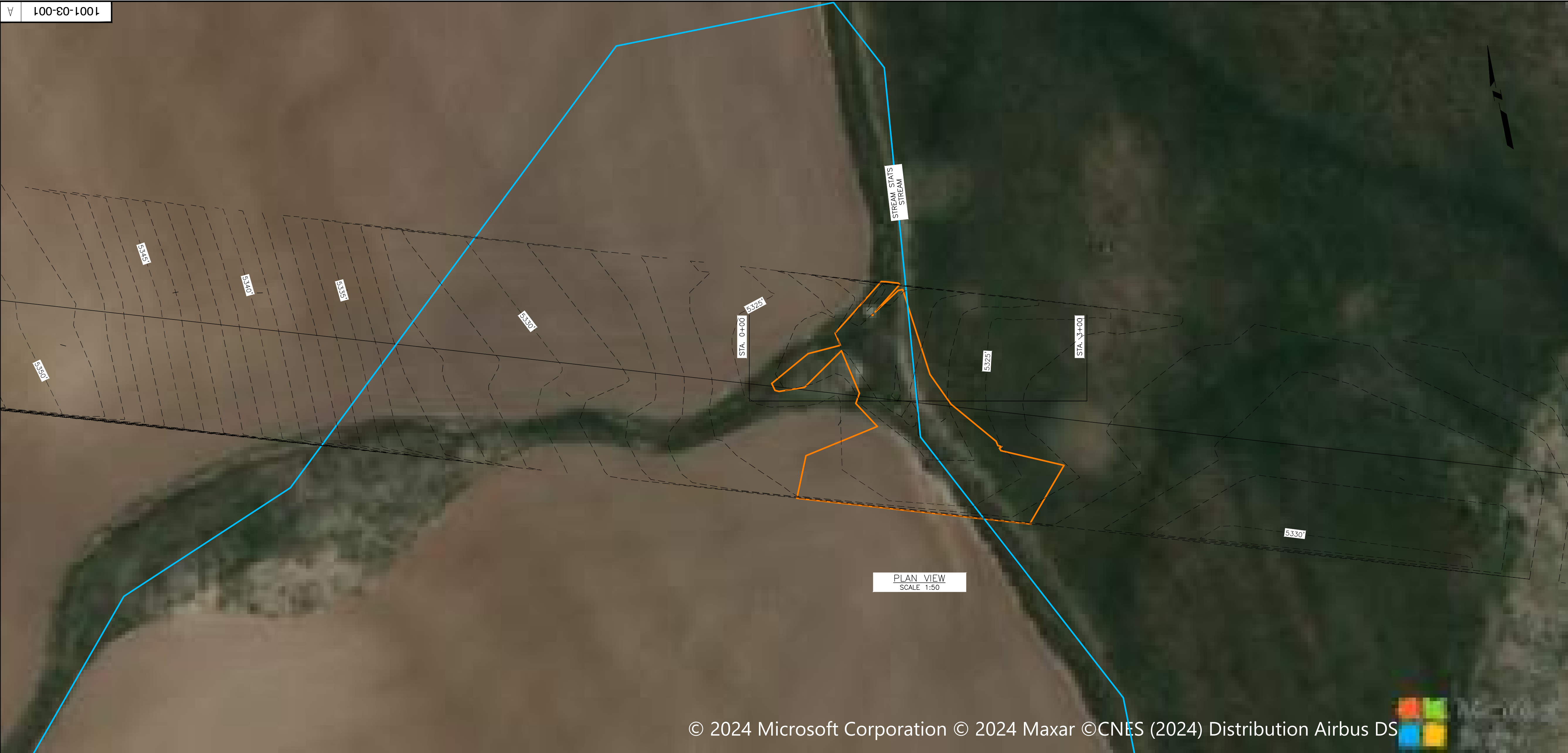
DENVER EXPANSION PROJECT

Client:

Figure Title: **Scott City to Denver Pipeline
Floodplain Delineation - Arapahoe Co.**

Scale: 1 : 15,000 1 inch equals 1,250 feet	Projection: Transverse Mercator NAD 1983 BLM Zone 13N
Sheet: 12 12 of 12	Drawing Number: 1001-02-004 Revision A

Appendix C – Local Floodplain Delineation Drawings

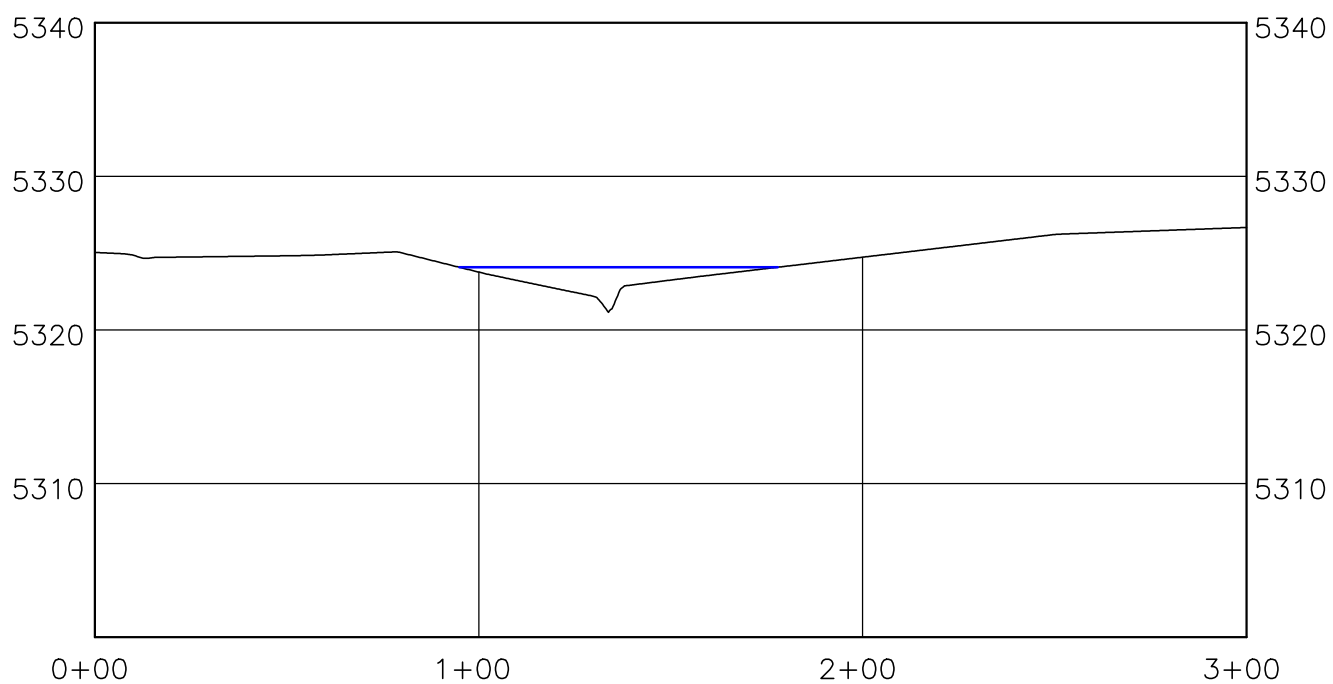


BASIN PROPERTIES:

MP	416.98	mi
Station	2201645.34	ft
Lat	39.5698	degrees
Long	-104.0870	degrees
Stream Name	Unnamed Tributary to Middle Bijou Creek	
FEMA FIRM Panel	08005C0650K	
Region Name	Foothills Region Peak Flow 2016 5099	
Area SqM	0.22	mi ²
IGH100Y	4.00	in
OUTLET ELEV	5317	ft
STATSCLAY	18.27	%
100YrFlow	346	cfs
PRECIP	16.01	in
BSLDEM10M	2	%
CSL108SLFP	119.1	ft/mi
ELEV	5381	ft
RCN	83.56	
TOC	1.34	hrs

PLAN VIEW
SCALE 1:50

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SECTION VIEW
HORIZ. SCALE: SCALE 1:100
VERT. SCALE: 1:25

HYDRAULIC CALCULATIONS:

Channel Invert Slope	Roughness Coefficient	Channel Invert Elevation	Design Water Depth	Discharge	Froude Number	Flow Velocity	Flow Area	Top Width	Wetted Perimeter	Hydraulic Radius	Hydraulic Depth	Specific Energy	Centroid of Flow Area	Specific Force	BFEHGL	Low Point on CL	at Station	Predicted CL depth
ft/ft		ft	ft	cfs		fps	ft ²	ft	ft	ft	ft	ft	ft	kip	ft	ft	ft	ft
0.023	0.045	5321.15	2.93	350.1	0.86	4.64	75.4	82.9	83.5	0.90	0.91	3.26	2.25	13.7	5324.08	5321.18	2201660.9	2.90

NOTES:

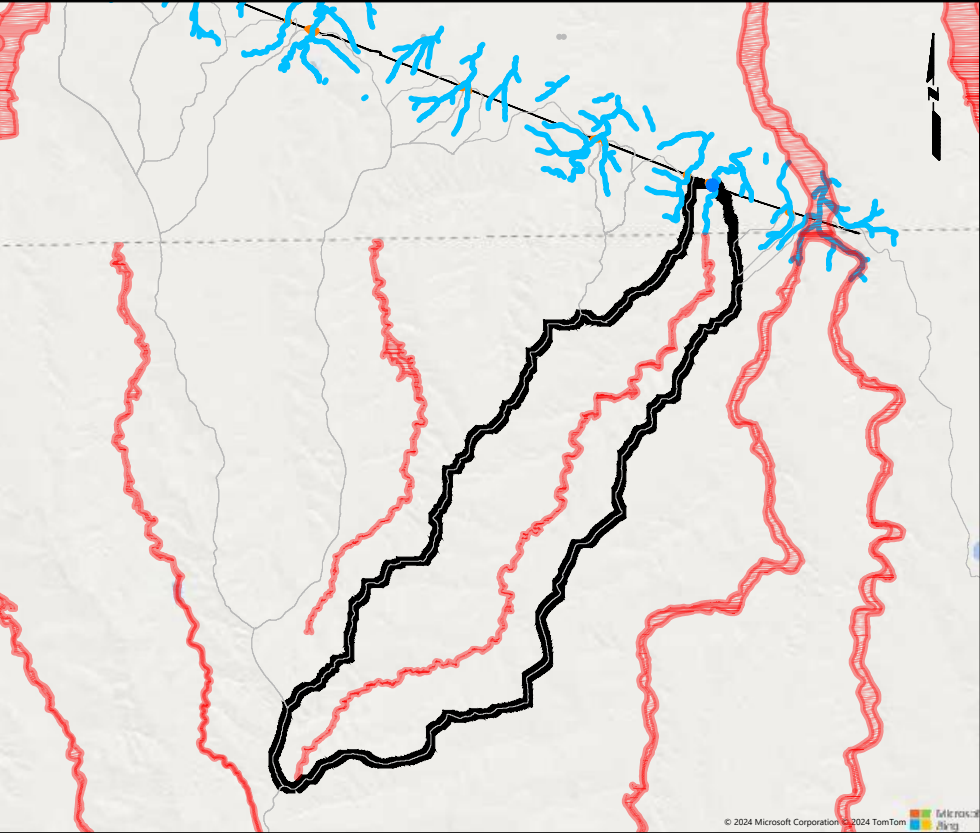
- Hydraulic gradeline based on cross section from civil survey from July-August 2024.

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MIDSTREAM PARTNERS, L.P.

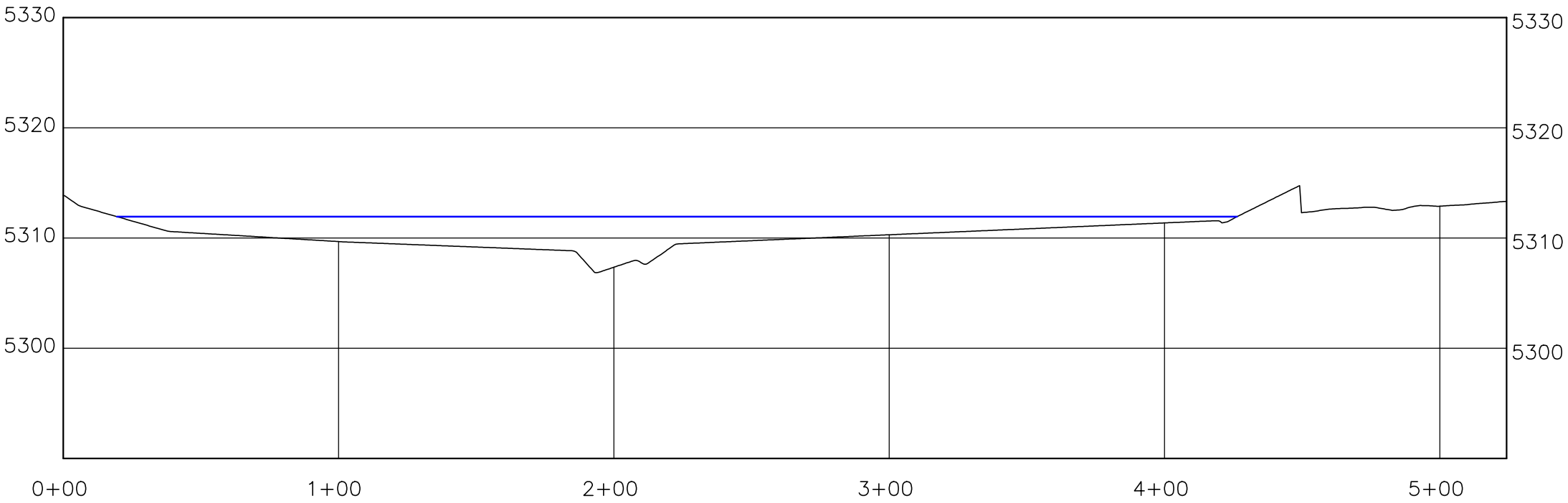
DENVER EXPANSION PROJECT
SCOTT CITY TO DENVER PIPELINE
FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 416.98
ARAPAHOE COUNTY COLORADO

DRAWN BY	ADH	SCALE: AS NOTED	A.F.E.	—
DATE DRAWN	11-22-24	DRAWING NO.	1001-03-001	
CHECKED BY	JHH			
PROJECT ENGINEER	JHH			
APPROVED BY	SAS			



BASIN PROPERTIES:

MP	417.97	mi
Station	2206875.37	ft
Lat	39.5746	degrees
Long	-104.1050	degrees
Stream Name	Willow Gulch to Middle Bijou Creek	
FEMA FIRM Panel	08005C0650K	
RegionName	Foothills_Region_Peak_Flow_2016_5099	
AreaSqMi	12.57	mi ²
16H100Y	4.00	in
OUTLEIELEV	5306	ft
STATSCLAY	22.45	%
100YFlow	4350	cfs
PRECIP	16.78	in
BSLDEM10M	7	%
CSL108SLFP	37.6	ft/mi
ELEV	5633	ft
RCN	65.13	
TOC	10.15	hrs



SECTION VIEW
HORIZ. SCALE: SCALE 1:100
VERT. SCALE: 1:25

HYDRAULIC CALCULATIONS:

Channel Invert Slope	Roughness Coefficient	Channel Invert Elevation	Design Water Depth	Discharge	Froude Number	Flow Velocity	Flow Area	Top Width	Wetted Perimeter	Hydraulic Radius	Hydraulic Depth	Specific Energy	Centroid of Flow Area	Specific Force	BFEHGL	Low Point on CL	at Station	Predicted CL depth
ft/ft		ft	ft	cfs		fps	ft ²	ft	ft	ft	ft	ft	ft	kip	ft	ft	ft	ft
0.007	0.035	5306.85	5.09	4370.2	0.71	5.56	785.3	406.8	407.4	1.93	1.93	5.57	3.85	236.1	5311.94	5306.43	2206896.9	5.51

NOTES:

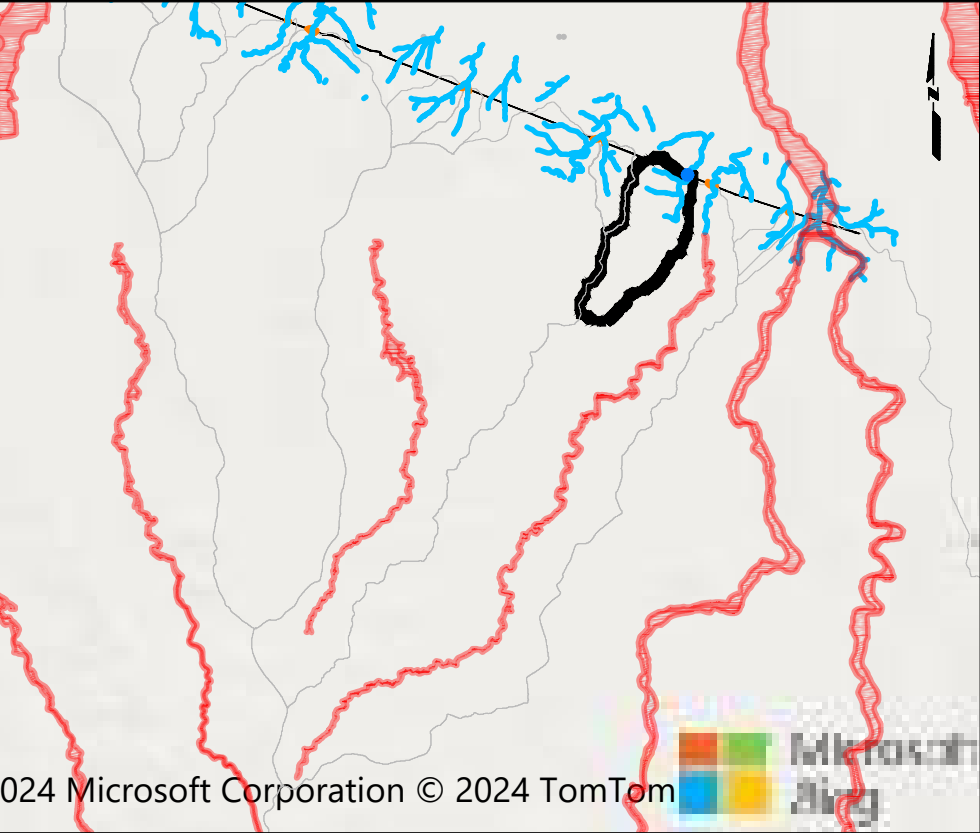
1. Hydraulic gradeline based on cross section from civil survey from July-August 2024.

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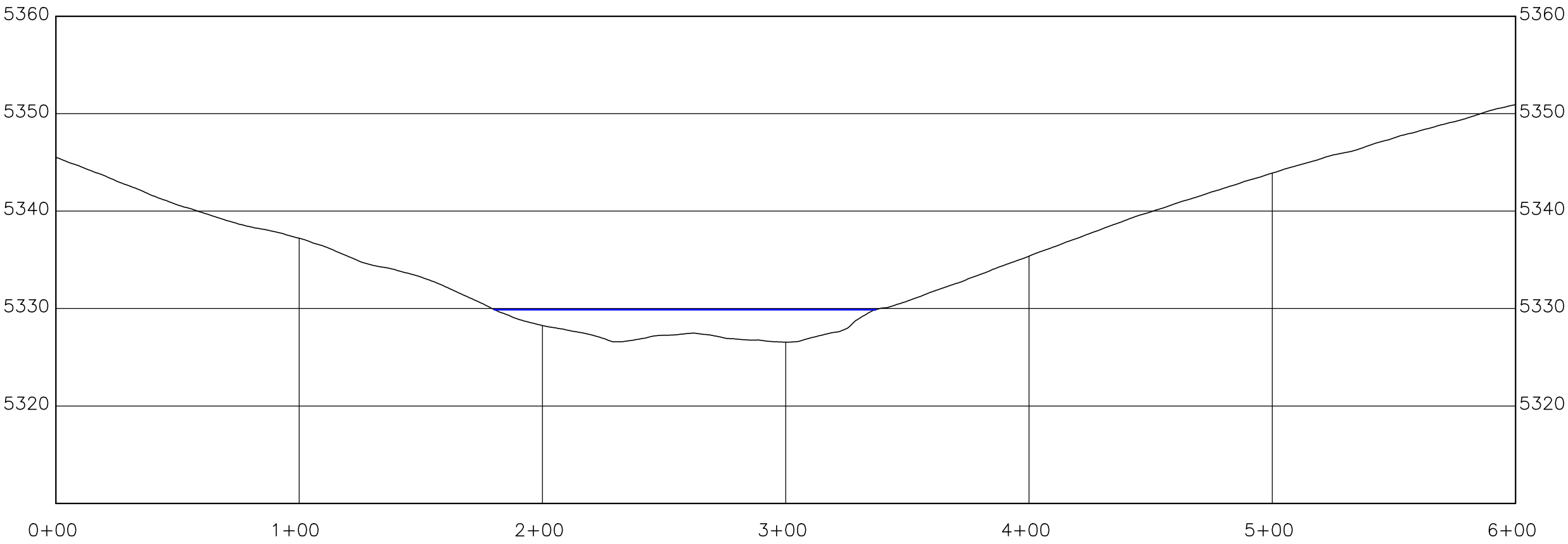
DENVER EXPANSION PROJECT
SCOTT CITY TO DENVER PIPELINE
FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 417.97
ARAPAHOE COUNTY COLORADO

DRAWN BY	ADH	SCALE: AS NOTED	A.F.E.	—
DATE DRAWN	11-22-24	DRAWING NO.	1001-03-002	
CHECKED BY	JHH			
PROJECT ENGINEER	JHH			
APPROVED BY	SAS			



BASIN PROPERTIES:

MP	418.29	mi
Station	2208587.42	ft
Lat	39.5764	degrees
Long	-104.1100	degrees
Stream Name	Unnamed Tributary to Middle Bijou Creek	
FEMA FIRM Panel	08005C0650K	
RegionName	Foothills Region Peak Flow 2016 5099	
AreaSqMi	1.40	mi ²
16H100Y	4.01	in
OUTLET ELEV	5325	ft
STATSCLAY	22	%
100YFlow	1210	cfs
PRECIP	16.14	in
BSLDEM10M	6	%
CSL108SLFP	64.4	ft/mi
ELEV	5438	ft
RCN	75.86	
TOC	2.31	hrs



SECTION VIEW
HORIZ. SCALE: SCALE 1:100
VERT. SCALE: 1:25

HYDRAULIC CALCULATIONS:

Channel Invert Slope	Roughness Coefficient	Channel Invert Elevation	Design Water Depth	Discharge	Froude Number	Flow Velocity	Flow Area	Top Width	Wetted Perimeter	Hydraulic Radius	Hydraulic Depth	Specific Energy	Centroid of Flow Area	Specific Force	BFEHGL	Low Point on CL	at Station	Predicted CL depth
ft/ft		ft	ft	cfs		fps	ft ²	ft	ft	ft	ft	ft	ft	kip	ft	ft	ft	ft
0.012	0.04	5326.56	2.29	1221.5	0.78	5.58	219.0	138.5	138.7	1.58	1.58	2.77	1.38	32.1	5328.85	5326.47	2208655.9	2.38

NOTES:

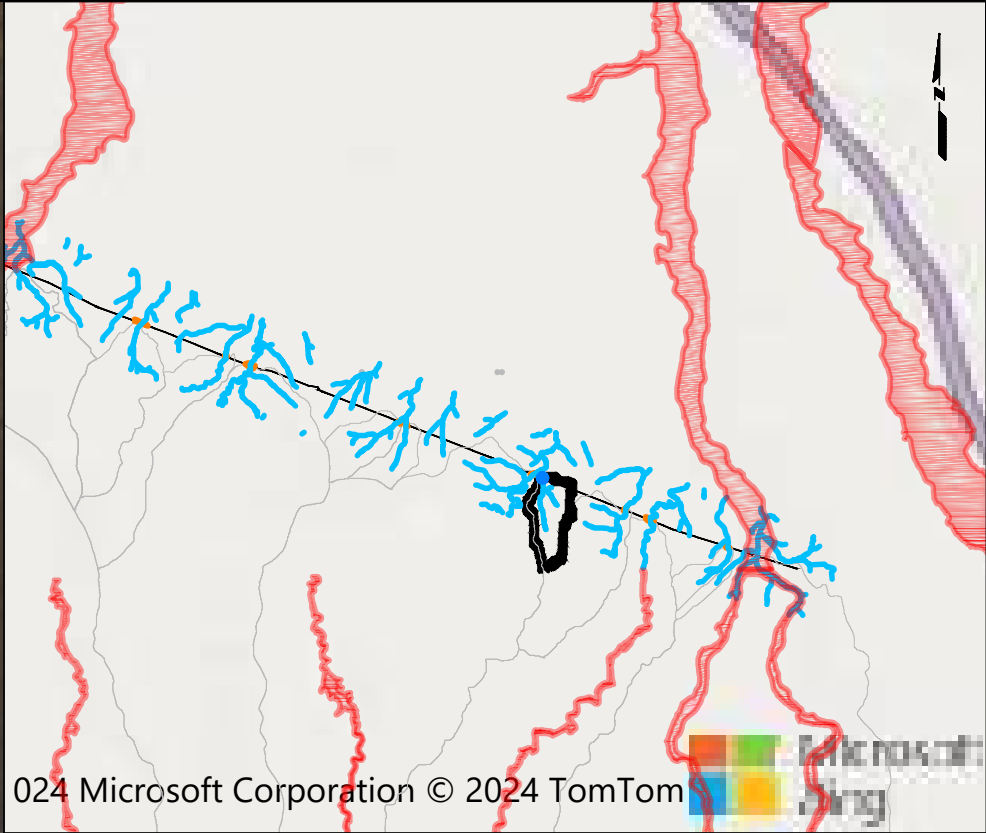
1. Floodplain delineation based on 3DEP LIDAR digital terrain model.

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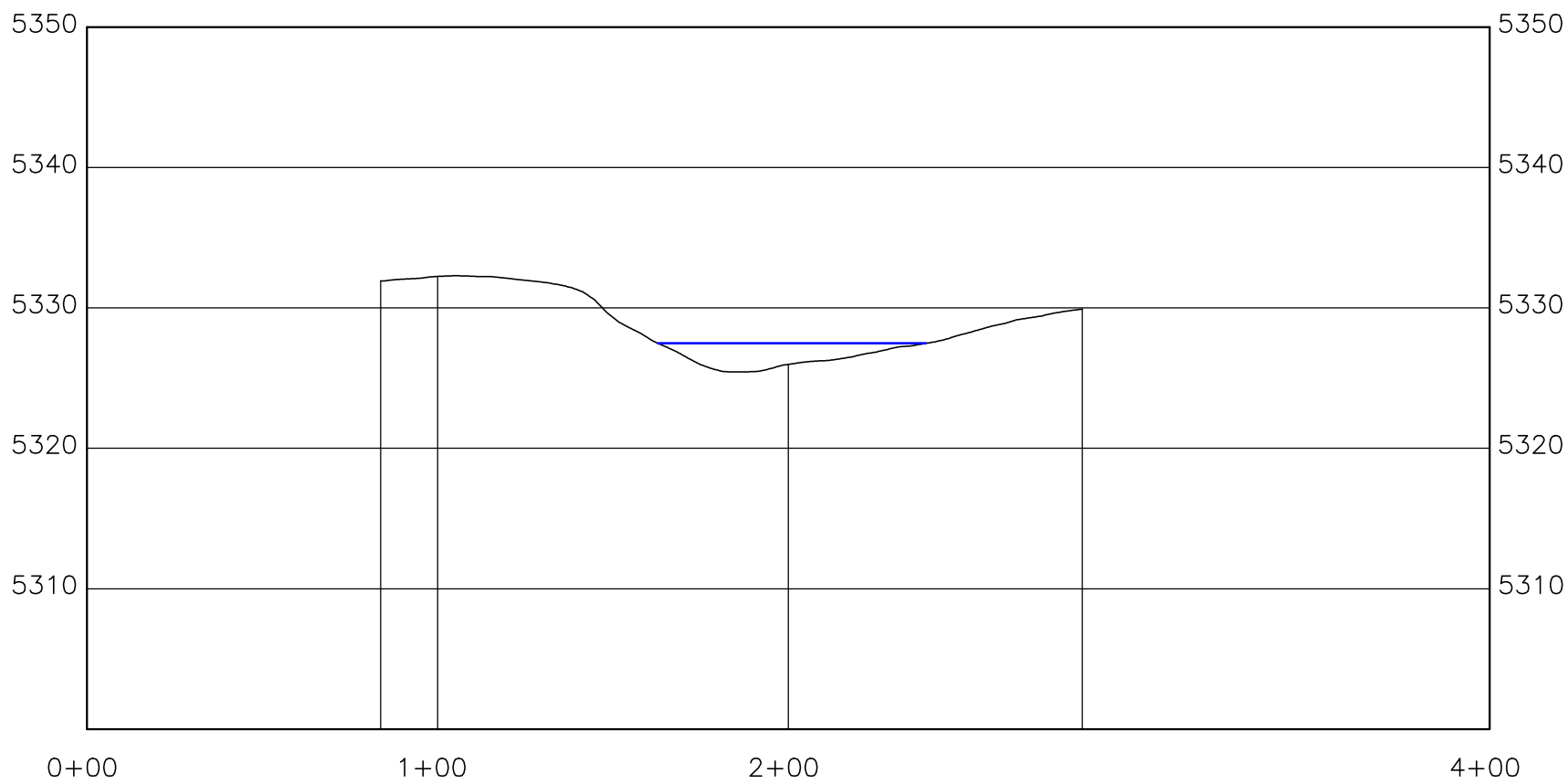
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DENVER EXPANSION PROJECT
SCOTT CITY TO DENVER PIPELINE
FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 418.29
ARAPAHOE COUNTY COLORADO

DRAWN BY	ADH	SCALE: AS NOTED	A.F.E.	—
DATE DRAWN	11-22-24	DRAWING NO.	1001-03-003	
CHECKED BY	JHH			
PROJECT ENGINEER	JHH			
APPROVED BY	SAS			



BASIN PROPERTIES:		
MP	419.36	mi
Station	2214244.15	ft
Lat	39.5822	degrees
Long	-104.1290	degrees
Stream Name	named Tributary to Hay Glch to Middle Bijou Cr	
FEMA FIRM Panel	08005C0625K	
Region Name	Foothills_Region_Peak_Flow_2016_5099	
Area Sq Mi	0.40	mi ²
16H100Y	4.01	in
OUTLET ELEV	5322	ft
STATS CLAY	20.3	%
100Y Flow	544	cfs
PRECIP	16.11	in
BSLDEM10M	7	%
CSL108SLFP	124.4	ft/mi
ELEV	5419	ft
RCN	64.77	
TOC	1.48	hrs



SECTION VIEW
HORIZ. SCALE: SCALE 1:50
VERT. SCALE: 1:12.5

HYDRAULIC CALCULATIONS:

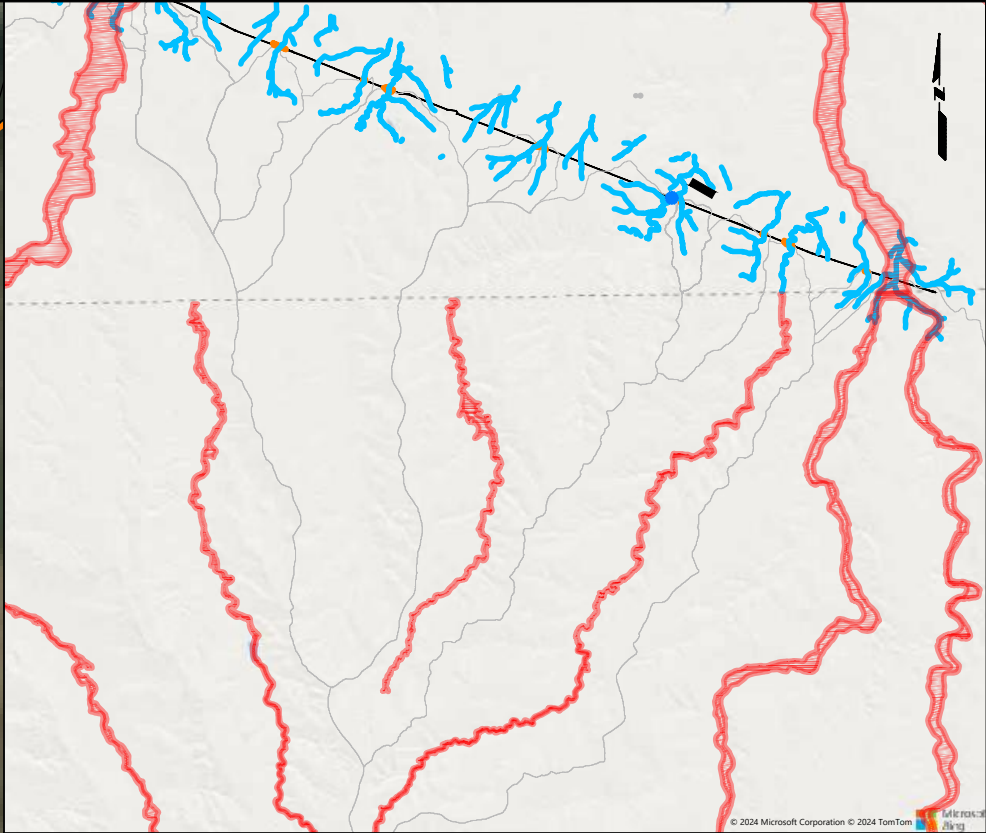
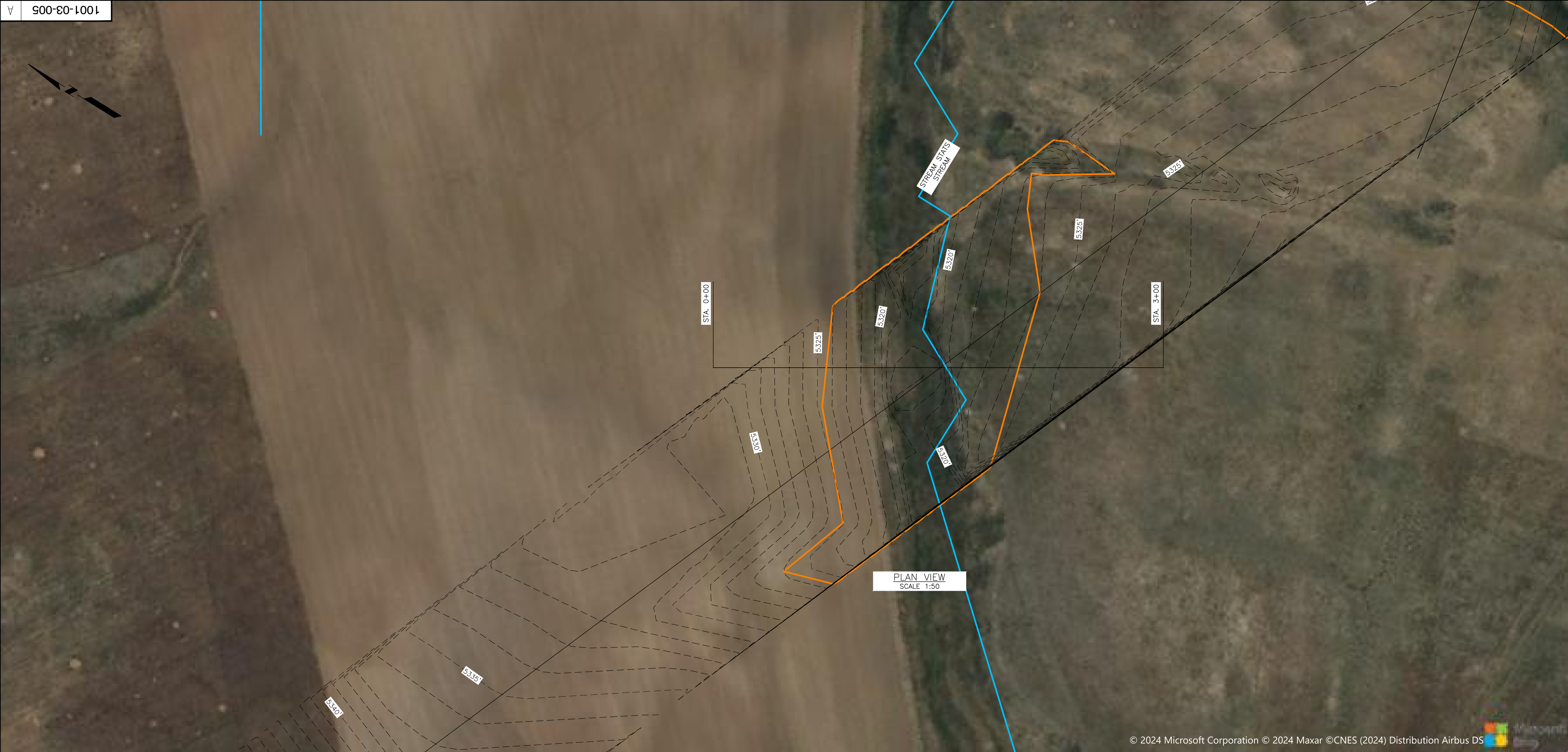
Channel Invert Slope	Roughness Coefficient	Channel Invert Elevation	Design Water Depth	Discharge	Froude Number	Flow Velocity	Flow Area	Top Width	Wetted Perimeter	Hydraulic Radius	Hydraulic Depth	Specific Energy	Centroid of Flow Area	Specific Force	BFE HGL	Low Point on CL	at Station	Predicted CL depth
ft/ft		ft	ft	cfs		fps	ft ²	ft	ft	ft	ft	ft	ft	kip	ft	ft	ft	ft
0.024	0.04	5325.45	2.03	547.3	1.03	6.25	87.5	76.3	76.5	1.14	1.15	2.64	1.28	13.6	5327.48	5325.17	2214286.9	2.31

NOTES:

1. Floodplain delineation based on 3DEP LiDAR digital terrain model.

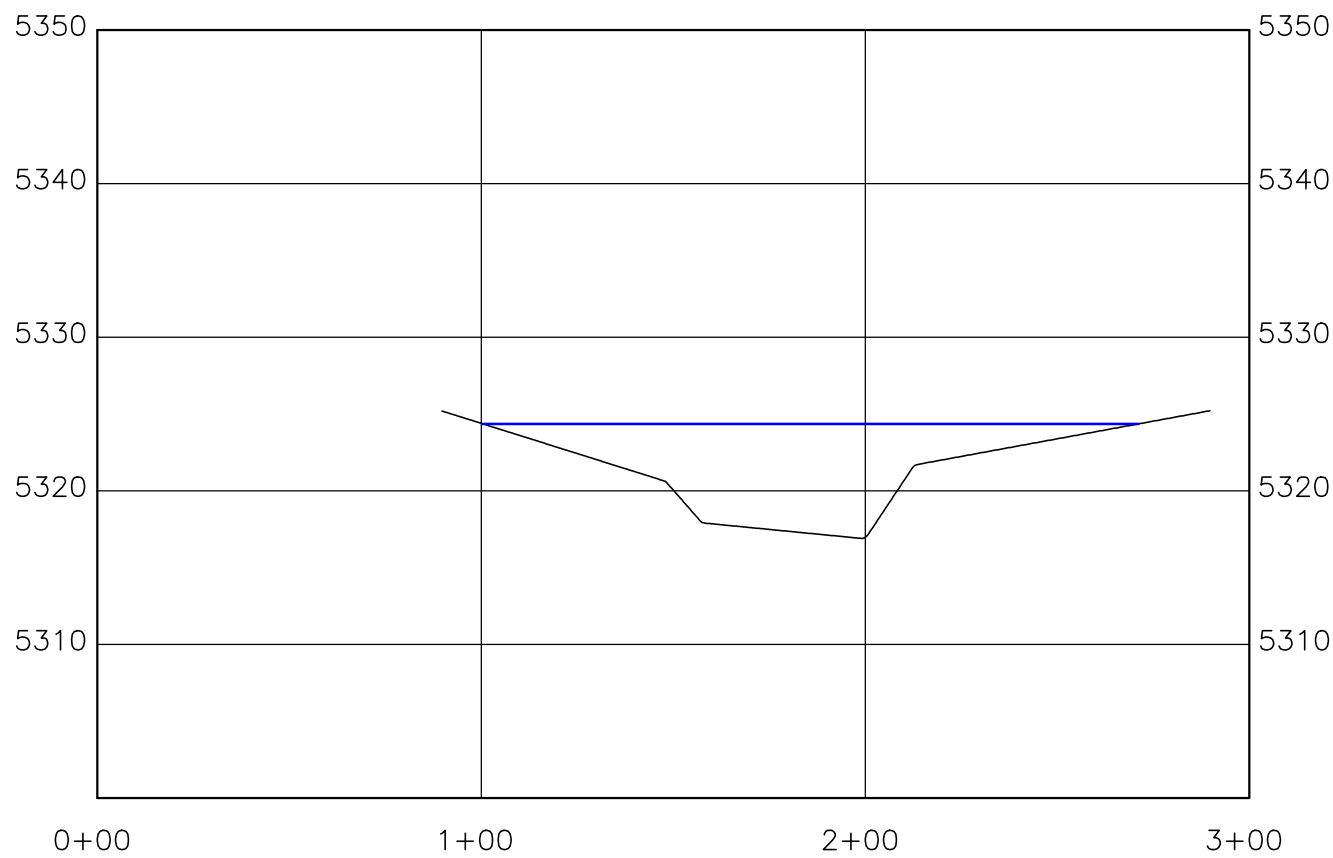
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A	Issued for Review		ADH		11-22-24	JHH	JHH	SAS
REVISION NUMBER	DRAWN BY	DATE REVISED	CHECKED BY	PROJECT ENGINEER		APPROVED BY		
 MAGELLAN MIDSTREAM PARTNERS, L.P.								
DENVER EXPANSION PROJECT SCOTT CITY TO DENVER PIPELINE FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 419.36 ARAPAHOE COUNTY COLORADO								
DRAWN BY	ADH	SCALE: AS NOTED	A.F.E.		—			
DATE DRAWN	11-22-24	DRAWING NO.	1001-03-004					
CHECKED BY	JHH							
PROJECT ENGINEER	JHH							
APPROVED BY	SAS							
A								



BASIN PROPERTIES:

MP	419.48	mi
Station	2214876.23	ft
Lat	39.5828	degrees
Long	-104.1310	degrees
Stream Name	Hay Gulch to Middle Bijou Creek	
FEMA FIRM Panel	08005C0625K	
Region Name	Foothills Region Peak Flow 2016 5099	
Area Sq Mi	13.69	mi ²
16H100Y	3.98	in
OUTLET ELEV	5311	ft
STATSCLAY	21.81	%
100Y Flow	4340	cfs
PRECIP	16.63	in
BSLDEM10M	9	%
CSL108SLFP	33	ft/mi
ELEV	5592	ft
FCN	70.62	
TOC	7.6	hrs



SECTION VIEW
HORIZ. SCALE: SCALE: 1:50
VERT. SCALE: 1:12.5

HYDRAULIC CALCULATIONS:

Channel Invert Slope	Roughness Coefficient	Channel Invert Elevation	Design Water Depth	Discharge	Froude Number	Flow Velocity	Flow Area	Top Width	Wetted Perimeter	Hydraulic Radius	Hydraulic Depth	Specific Energy	Centroid of Flow Area	Specific Force	BFEHGL	Low Point on CL	at Station	Predicted CL depth
ft/ft		ft	ft	cfs		fps	ft ²	ft	ft	ft	ft	ft	ft	kip	ft	ft	ft	ft
0.006	0.035	5316.90	7.46	4359.9	0.72	7.54	578.0	170.8	172.3	3.36	3.38	8.34	4.82	237.7	5324.36	5316.91	2214885.9	7.46

NOTES:

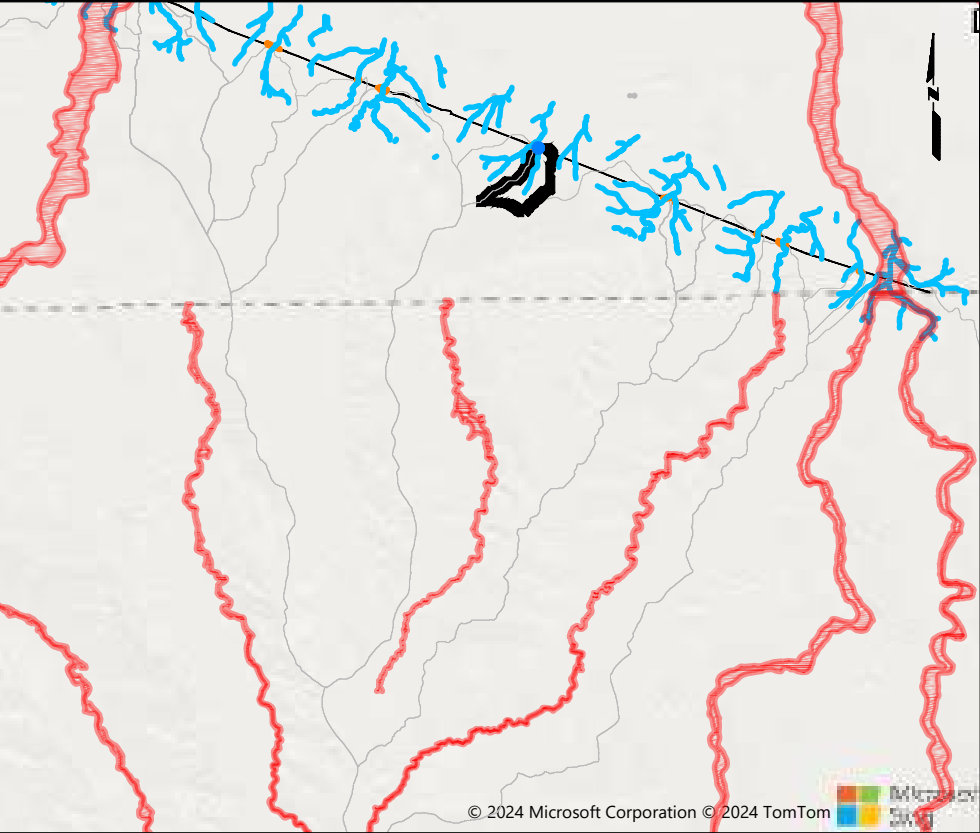
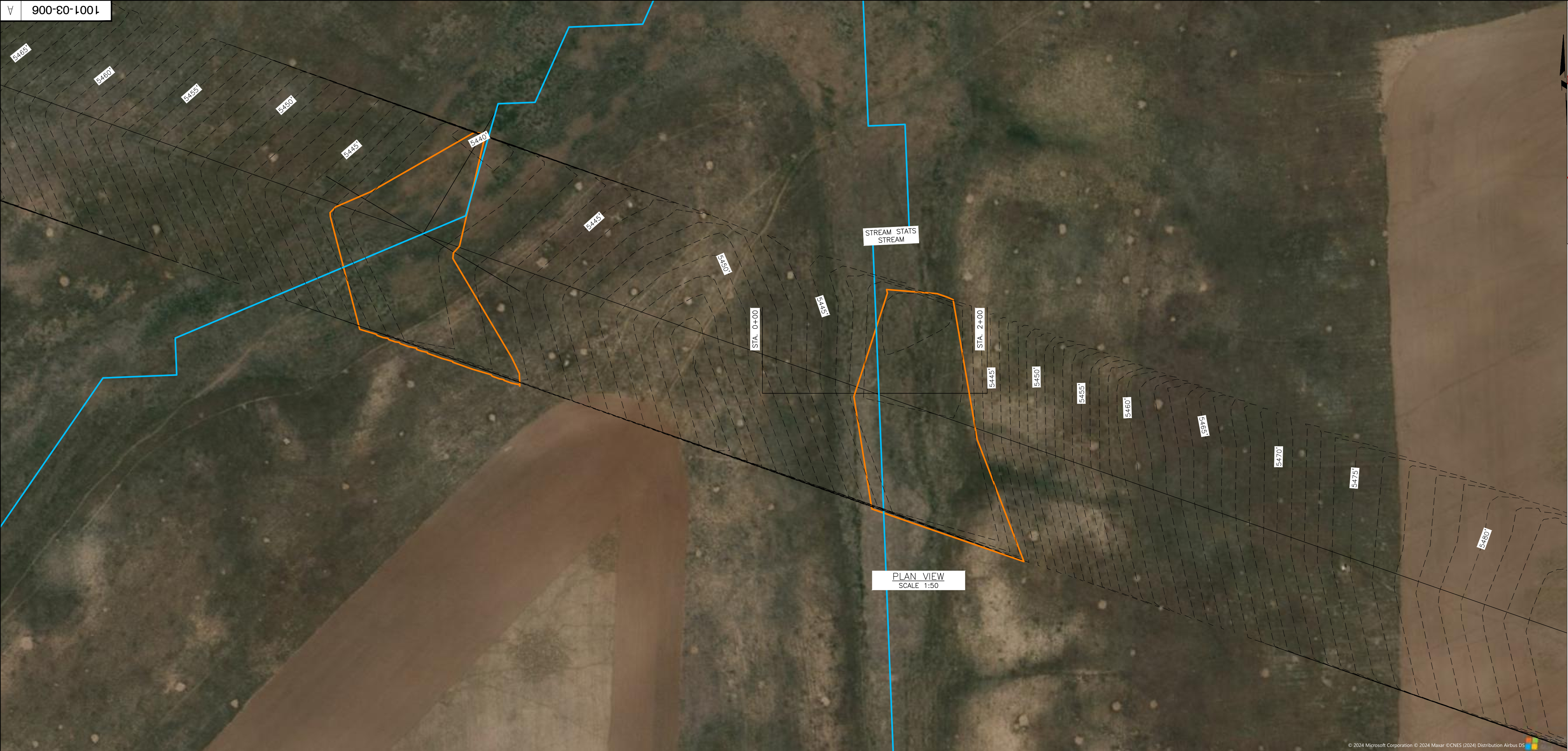
1. Hydraulic gradeline based on cross section from civil survey from July-August 2024.

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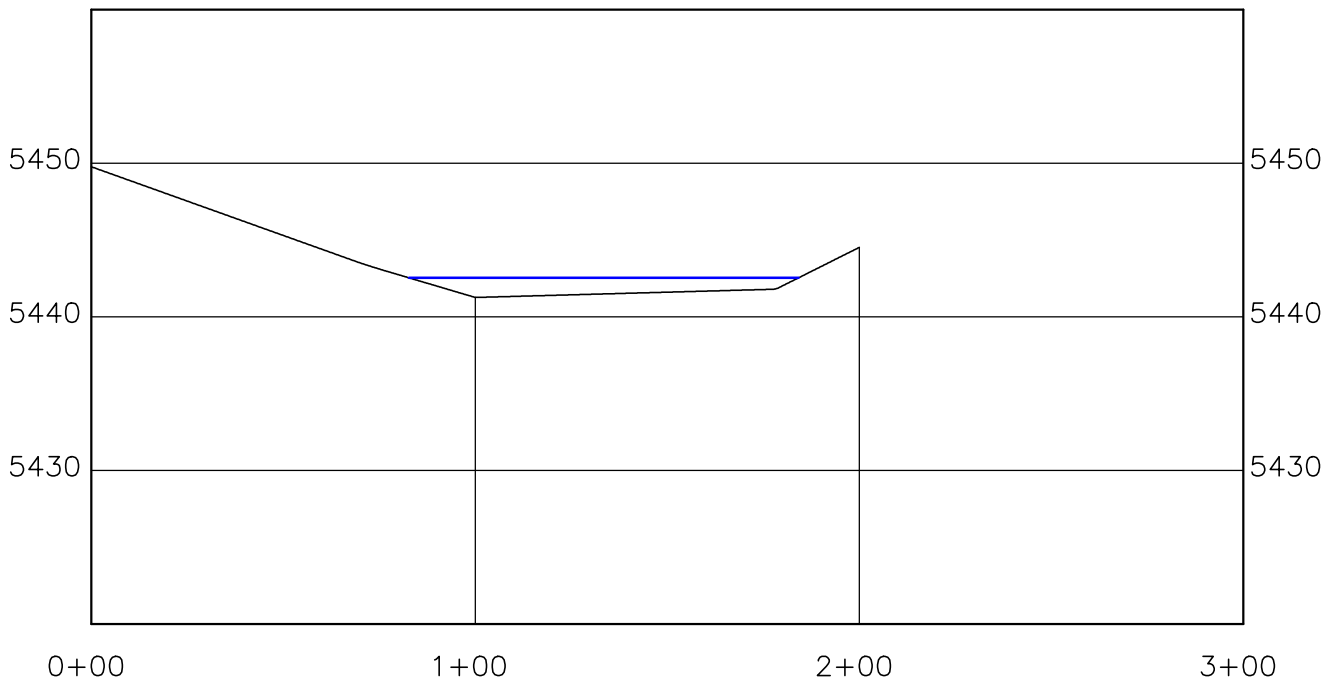
DENVER EXPANSION PROJECT
SCOTT CITY TO DENVER PIPELINE
FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 419.48
ARAPAHOE COUNTY COLORADO

DRAWN BY	ADH	SCALE: AS NOTED	A.F.E.	—
DATE DRAWN	11-22-24	DRAWING NO.	1001-03-005	
CHECKED BY	JHH			
PROJECT ENGINEER	JHH			
APPROVED BY	SAS			



BASIN PROPERTIES:

MP	421.15	mi
Station	2223667.60	ft
Lat	39.5918	degrees
Long	-104.1600	degrees
Stream Name	Unnamed Tributary to Middle Bijou Creek	
FEMA FIRM Panel	08005C0625K	
RegionName	Foothills_Region_Peak_Flow_2016_5099	
AreaSqMi	0.29	mi ²
16H100Y	3.99	in
OUTLEIELEV	5431	ft
STATSCLAY	21.76	%
100YFlow	444	cfs
PRECIP	16.27	in
BSLDEM10M	3	%
CSL108SLFP	102.3	ft/mi
ELEV	5498	ft
RCN	83.82	
TOC	1.26	hrs



SECTION VIEW
HORIZ. SCALE: SCALE 1:50
VERT. SCALE: 1:12.5

HYDRAULIC CALCULATIONS:

Channel Invert Slope	Roughness Coefficient	Channel Invert Elevation	Design Water Depth	Discharge	Froude Number	Flow Velocity	Flow Area	Top Width	Wetted Perimeter	Hydraulic Radius	Hydraulic Depth	Specific Energy	Centroid of Flow Area	Specific Force	BFEHGL	Low Point on CL	at Station	Predicted CL depth
ft/ft		ft	ft	cfs		fps	ft ²	ft	ft	ft	ft	ft	ft	kip	ft	ft	ft	ft
0.019	0.04	5441.27	1.27	447.1	0.90	4.86	92.0	101.4	101.5	0.91	0.91	1.64	0.77	8.6	5442.54	5441.27	2223671.9	1.27

NOTES:

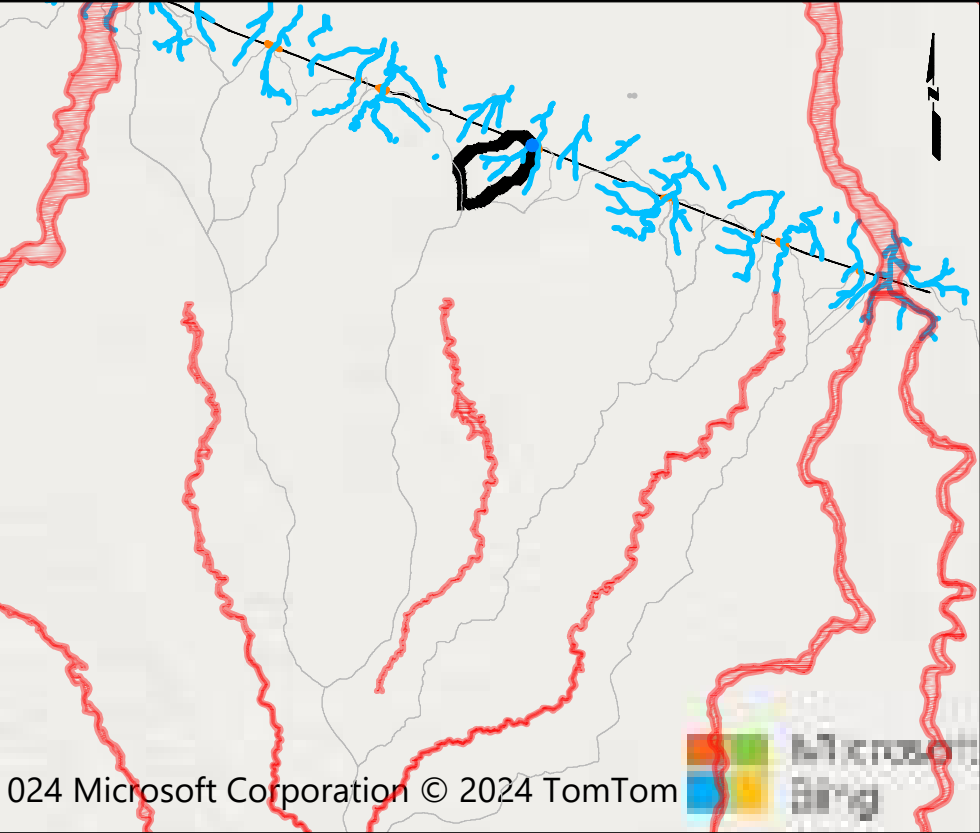
1. Hydraulic gradeline based on cross section from civil survey from July-August 2024.

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REVISION	ADH	DATE	JHH	JHH	SAS	
NUMBER	DRAWN BY	REVISED	CHECKED BY	PROJECT ENGINEER	APPROVED BY	
 MAGELLAN[®] MIDSTREAM PARTNERS, L.P.						
DENVER EXPANSION PROJECT SCOTT CITY TO DENVER PIPELINE FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 421.15 ARAPAHOE COUNTY COLORADO						
DRAWN BY	ADH	SCALE: AS NOTED	A.F.E.	—		
DATE DRAWN	11-22-24	DRAWING NO.	1001-03-006			
CHECKED BY	JHH					
PROJECT ENGINEER	JHH					
APPROVED BY	SAS					
A						

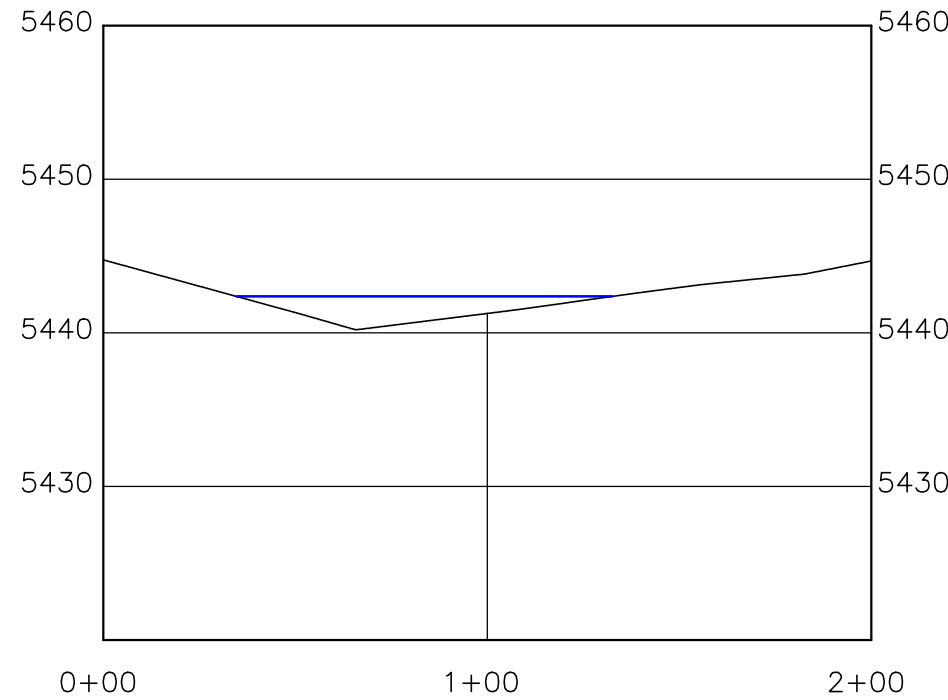
1001-03-006

A



BASIN PROPERTIES:

MP	421.23	mi
Station	2224097.29	ft
Lat	39.5923	degrees
Long	-104.1610	degrees
Stream Name	Unnamed Tributary to Middle Bijou Creek	
FEMA FIRM Panel	08005C0625K	
RegionName	Foothills Region Peak Flow 2016 5099	
AreaSqMi	0.47	mi ²
16H100Y	3.99	in
OUTLET ELEV	5429	ft
STATSCLAY	24.04	%
100YrFlow	648	cfs
PRECIP	16.28	in
BSLDEM10M	5	%
CSL108SLFP	122.2	ft/mi
ELEV	5516	ft
RCN	82.37	
TOC	1.1	hrs



SECTION VIEW
HORIZ. SCALE: SCALE 1:50
VERT. SCALE: 1:12.5

HYDRAULIC CALCULATIONS:

Channel Invert Slope	Roughness Coefficient	Channel Invert Elevation	Design Water Depth	Discharge	Froude Number	Flow Velocity	Flow Area	Top Width	Wetted Perimeter	Hydraulic Radius	Hydraulic Depth	Specific Energy	Centroid of Flow Area	Specific Force	BFEHGL	Low Point on CL at Station	Predicted CL depth
ft/ft		ft	ft	cfs		fps	ft ²	ft	ft	ft	ft	ft	ft	kip	ft	ft	ft
0.023	0.04	5440.21	2.16	650.9	1.01	6.04	107.7	97.8	97.9	1.10	1.10	2.73	1.43	17.2	5442.37	5440.24	2.13

NOTES:

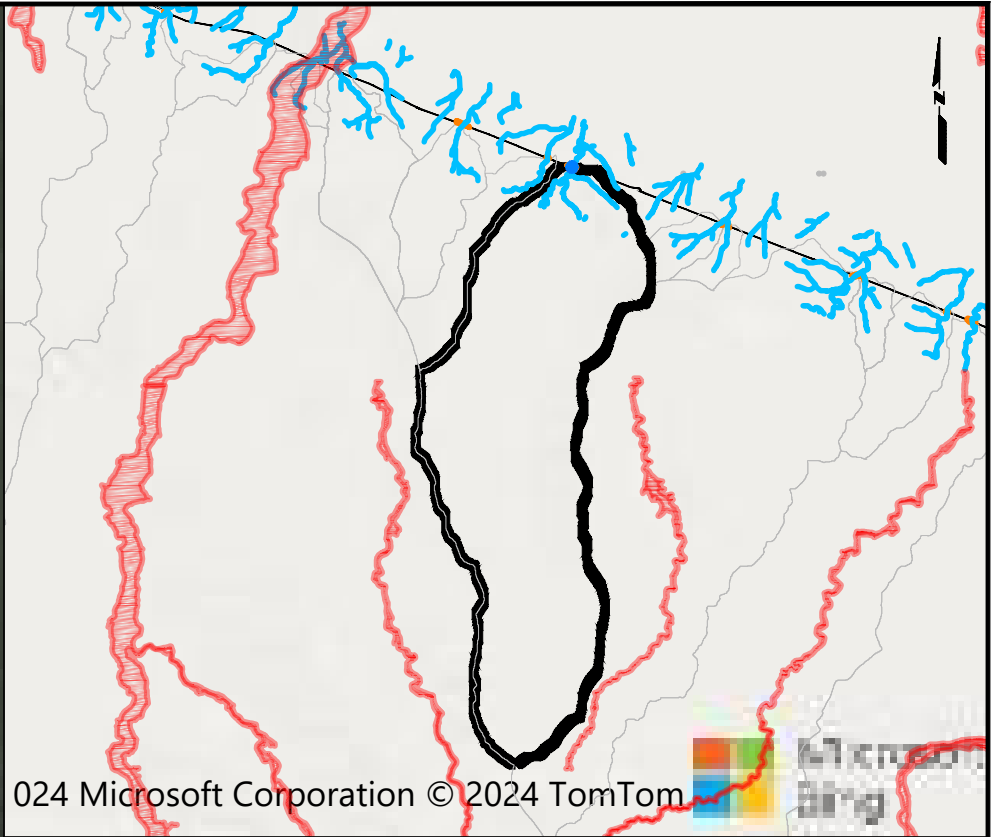
1. Hydraulic gradeline based on cross section from civil survey from July-August 2024.

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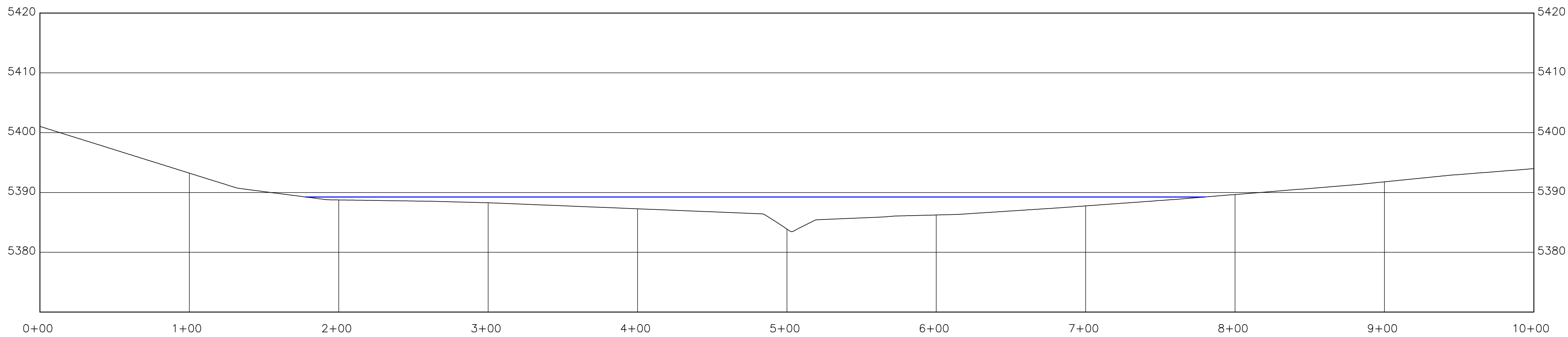


DENVER EXPANSION PROJECT
SCOTT CITY TO DENVER PIPELINE
FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 421.23
ARAPAHOE COUNTY COLORADO

DRAWN BY	ADH	SCALE: AS NOTED	A.F.E.	—
DATE DRAWN	11-22-24	DRAWING NO.	1001-03-007	
CHECKED BY	JHH			
PROJECT ENGINEER	JHH			
APPROVED BY	SAS			



<u>BASIN_PROPERTIES:</u>		
MP	423.18	mi
Station	2234398.81	ft
Lat	39.6023	degrees
Long	-104.1950	degrees
Stream Name	Rattlesnake Creek to Middle Bijou Creek	
FEMA FIRI/Panel	08005C0625K	
RegionName	Foothills_Region_Peak_Flow_2016_5099	
AreaSqMi	11.64	mi ²
16H100Y	3.95	in
OUTLETELEV	5383	ft
STATSLAY	24.36	%
100YrFlow	4110	cfs
PRECIP	16.72	in
BSLDEM10MI	6	%
CSL1085LFP	25.6	ft/mi
ELEV	5591	ft
RON	68.31	
TOC	8.87	hrs



SECTION VIEW
HORIZ. SCALE: SCALE 1:50
VERT. SCALE: 1:12.5

HYDRAULIC CALCULATIONS:

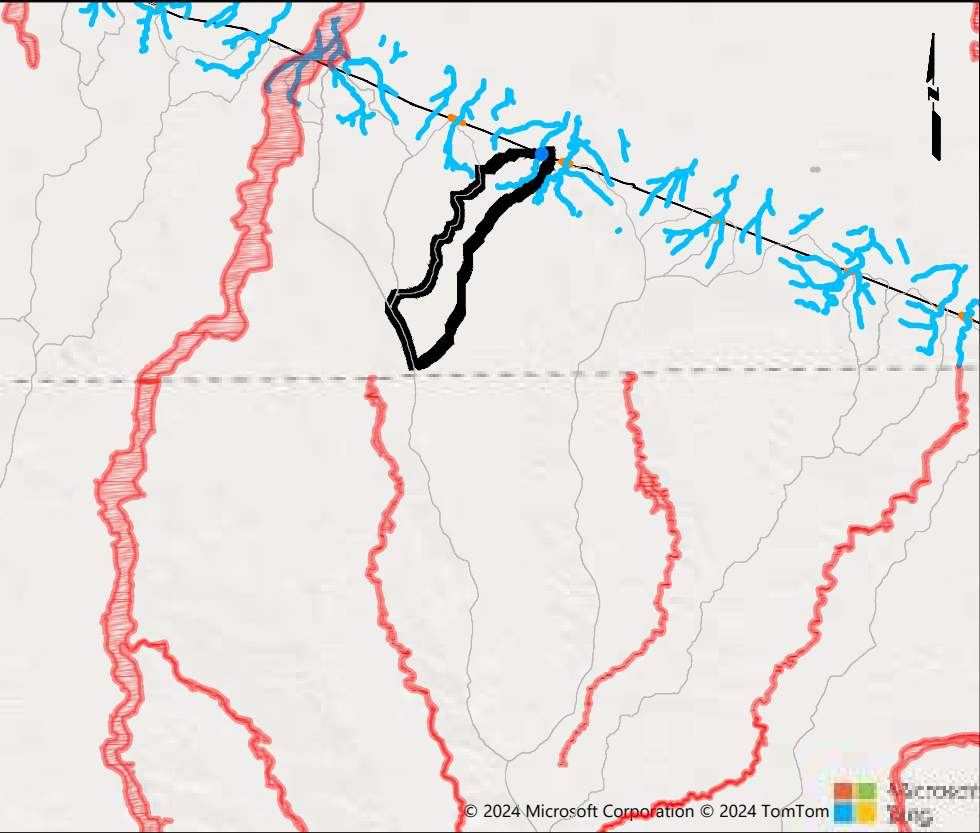
Channel Invert Slope	Roughness Coefficient	Channel Invert Elevation	Design Water Depth	Discharge	Froude Number	Flow Velocity	Flow Area	Top Width	Wetted Perimeter	Hydraulic Radius	Hydraulic Depth	Specific Energy	Centroid of Flow Area	Specific Force	BFE/HGL	Low Point on CL	at Station	Predicted CL depth
ft/ft		ft	ft	cfs		fps	ft ²	ft	ft	ft	ft	ft	ft	kip	ft	ft	ft	ft
0.005	0.045	5383.44	5.81	4122.8	0.45	3.56	1157.3	602.2	602.6	1.92	1.92	6.01	4.47	351.2	5389.25	5383.59	2234394.9	5.66

NOTES:

1. Hydraulic gradeline based on cross section from civil survey from July-August 2024

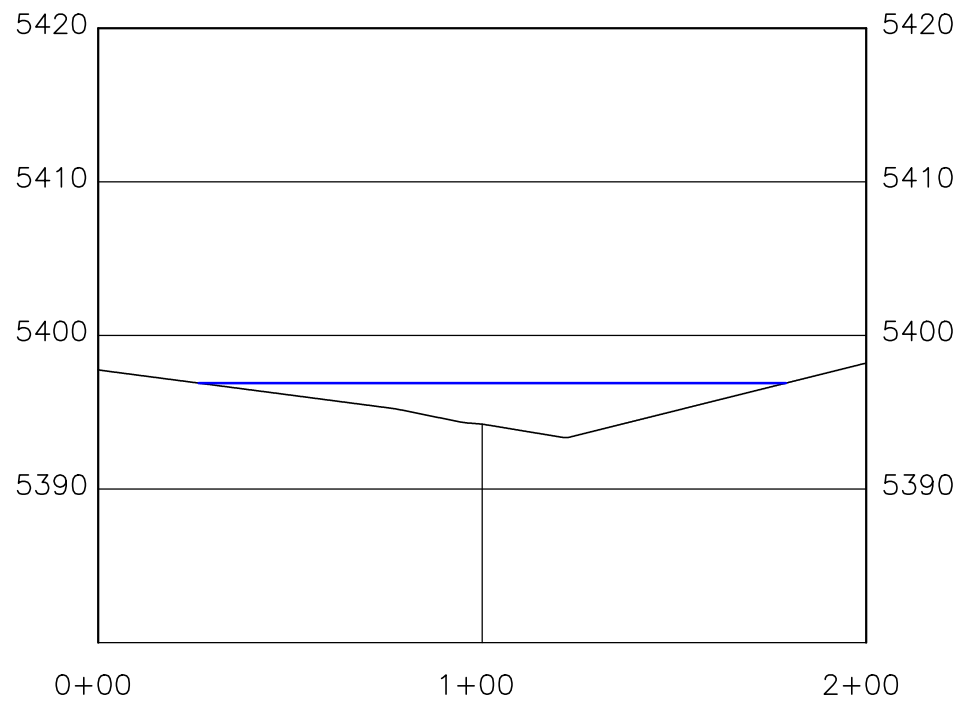
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A	Issued for Review				JHH	JHH	SAS
REVISION NUMBER	ADH DRAWN BY	DATE REVISED	JHH CHECKED BY	JHH PROJECT ENGINEER	SAS APPROVED BY		
 MAGELLAN MIDSTREAM PARTNERS, L.P.							
DENVER EXPANSION PROJECT SCOTT CITY TO DENVER PIPELINE							
FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 423.18 ARAPAHOE COUNTY COLORADO							
DRAWN BY	ADH	SCALE:	AS NOTED				
DATE DRAWN	11-22-24	DRAWING NO.	A.F.E. —				
CHECKED BY	JHH	1001-03-008					
PROJECT ENGINEER	JHH						
APPROVED BY	SAS						



BASIN PROPERTIES:

MP	423.50	mi
Station	2236062.97	ft
Lat	39.6040	degrees
Long	-104.2010	degrees
Stream Name	Unnamed Tributary to Middle Bijou Creek	
FEMA FIRM Panel	08005C0625K	
RegionName	Foothills_Region_Peak_Flow_2016_5099	
AreaSqMi	1.34	mi ²
IBFH100Y	3.95	in
OUTLETELEV	5395	ft
STATSCLAY	25.74	%
100YFlow	1250	cfs
PRECIP	16.38	in
BSLDEM10M	2	%
CSL108SLFP	41.7	ft/mi
ELEV	5494	ft
RCN	75.61	
TOC	5.06	hrs



SECTION VIEW
HORIZ. SCALE: SCALE 1:50
VERT. SCALE: 1:12.5

HYDRAULIC CALCULATIONS:

Channel Invert Slope	Roughness Coefficient	Channel Invert Elevation	Design Water Depth	Discharge	Froude Number	Flow Velocity	Flow Area	Top Width	Wetted Perimeter	Hydraulic Radius	Hydraulic Depth	Specific Energy	Centroid of Flow Area	Specific Force	BFEHGL	Low Point on CL	at Station	Predicted CL depth
ft/ft		ft	ft	cfs		fps	ft ²	ft	ft	ft	ft	ft	ft	kip	ft	ft	ft	ft
0.008	0.04	5393.34	3.55	1255.7	0.64	4.76	263.9	152.9	153.1	1.72	1.73	3.90	2.37	50.7	5396.89	5393.43	2236038.9	3.46

NOTES:

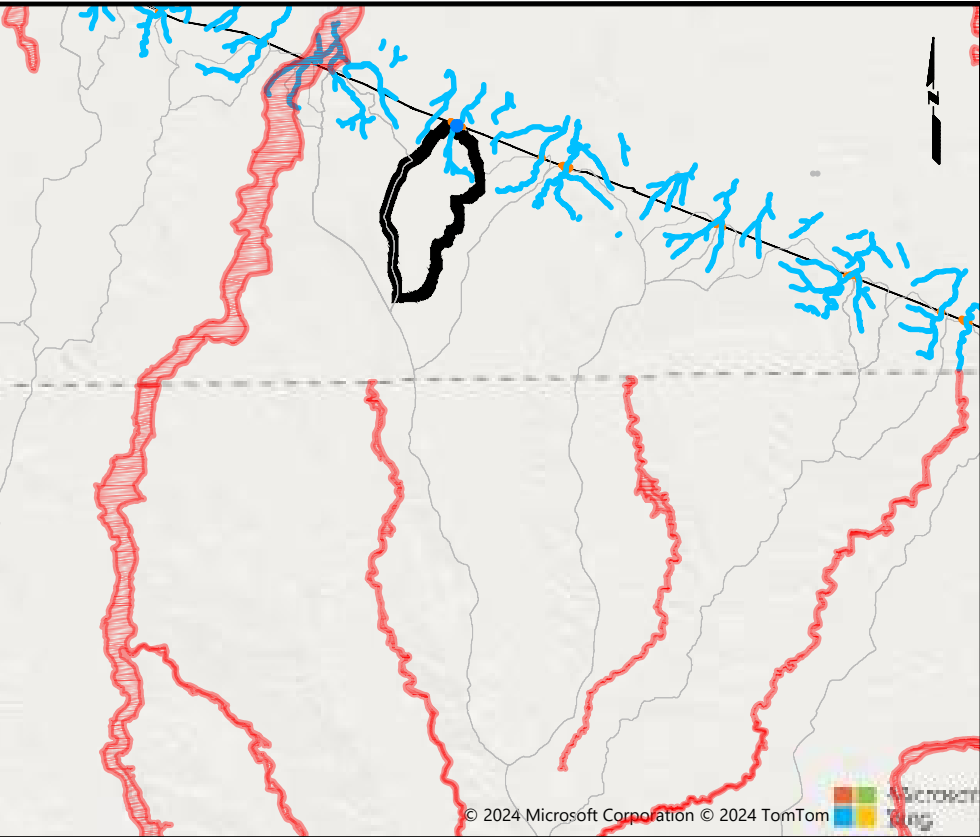
1. Hydraulic gradeline based on cross section from civil survey from July-August 2024.

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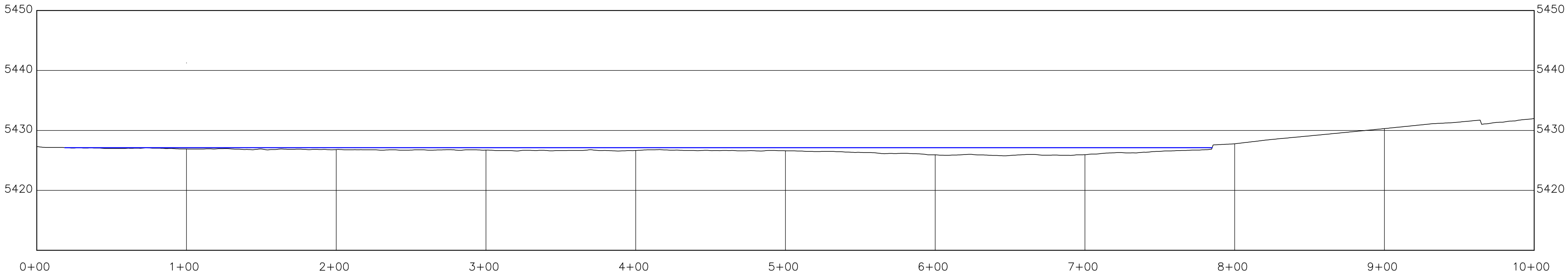
DENVER EXPANSION PROJECT
SCOTT CITY TO DENVER PIPELINE
FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 423.50
ARAPAHOE COUNTY COLORADO

DRAWN BY	ADH	SCALE: AS NOTED	A.F.E.	—
DATE DRAWN	11-22-24	DRAWING NO.		
CHECKED BY	JHH	1001-03-009		
PROJECT ENGINEER	JHH			
APPROVED BY	SAS			



BASIN PROPERTIES:

MP	424.59	mi
Station	2241832.25	ft
Lat	39.6099	degrees
Long	-104.2200	degrees
Stream Name	Unnamed Tributary to Middle Bijou Creek	
FEMA FIRM Panel	08005C0625K	
Region Name	Foothills Region Peak Flow 2016 5099	
Area Sq Mi	1.37	mi ²
16H100Y	3.95	in
OUTLET ELEV	5421	ft
STATSCLAY	20.37	%
100YFlow	984	cfs
PRECIP	16.3	in
BSLDEM10M	2	%
CSL108SLFP	34.9	ft/mi
ELEV	5490	ft
RCN	64.43	
TOC	4.7	hrs



SECTION VIEW
HORIZ. SCALE: SCALE 1:50
VERT. SCALE: 1:12.5

HYDRAULIC CALCULATIONS:

Channel Invert Slope	Roughness Coefficient	Channel Invert Elevation	Design Water Depth	Discharge	Froude Number	Flow Velocity	Flow Area	Top Width	Wetted Perimeter	Hydraulic Radius	Hydraulic Depth	Specific Energy	Centroid of Flow Area	Specific Force	BFEHGL	Low Point on CL at Station	Predicted CL depth
ft/ft		ft	ft	cfs		fps	ft ²	ft	ft	ft	ft	ft	ft	kip	ft	ft	ft
0.007	0.035	5425.77	1.35	995.0	0.55	2.34	425.5	766.1	766.2	0.56	0.56	1.43	0.96	30.0	5427.12	5425.78	2241582.9

NOTES:

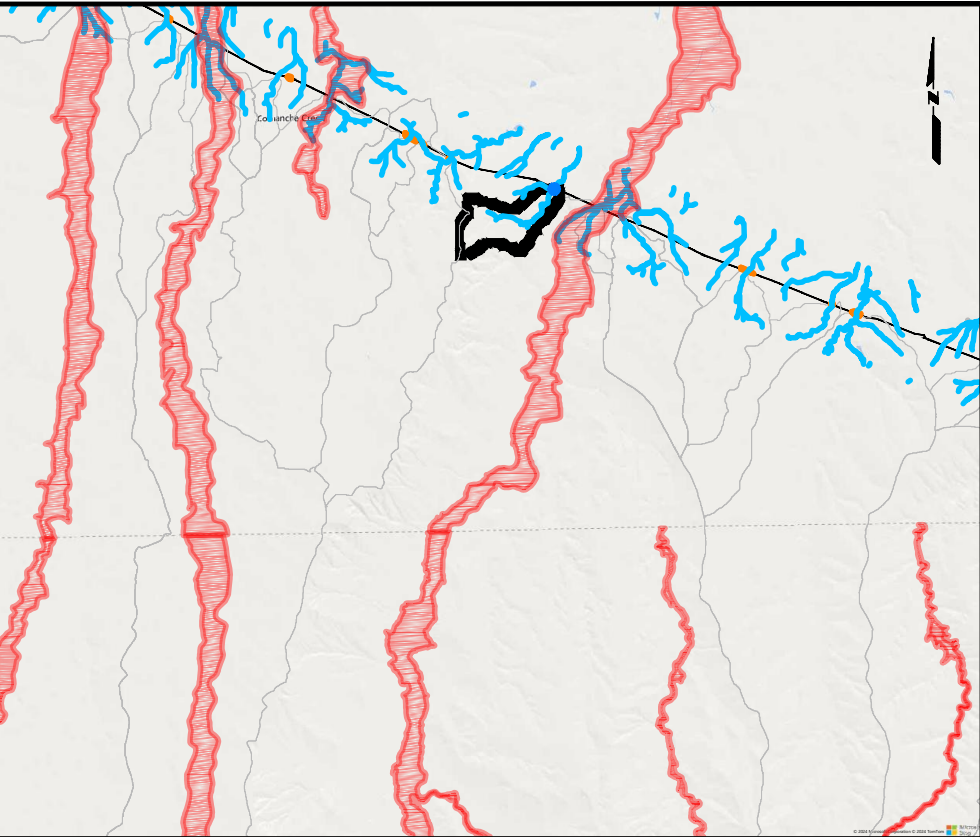
1. Floodplain delineation based on 3DEP LiDAR digital terrain model.

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A	Issued for Review					
REVISION	ADH	DATE	JHH	JHH	SAS	
NUMBER	DRAWN BY	REVISED	CHECKED BY	PROJECT ENGINEER	APPROVED BY	
MAGELLAN MIDSTREAM PARTNERS, L.P.						
DENVER EXPANSION PROJECT SCOTT CITY TO DENVER PIPELINE FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 424.59 ARAPAHOE COUNTY COLORADO						
DRAWN BY	ADH	SCALE: AS NOTED	A.F.E.	—		
DATE DRAWN	11-22-24	DRAWING NO.	1001-03-010 A			
CHECKED BY	JHH					
PROJECT ENGINEER	JHH					
APPROVED BY	SAS					

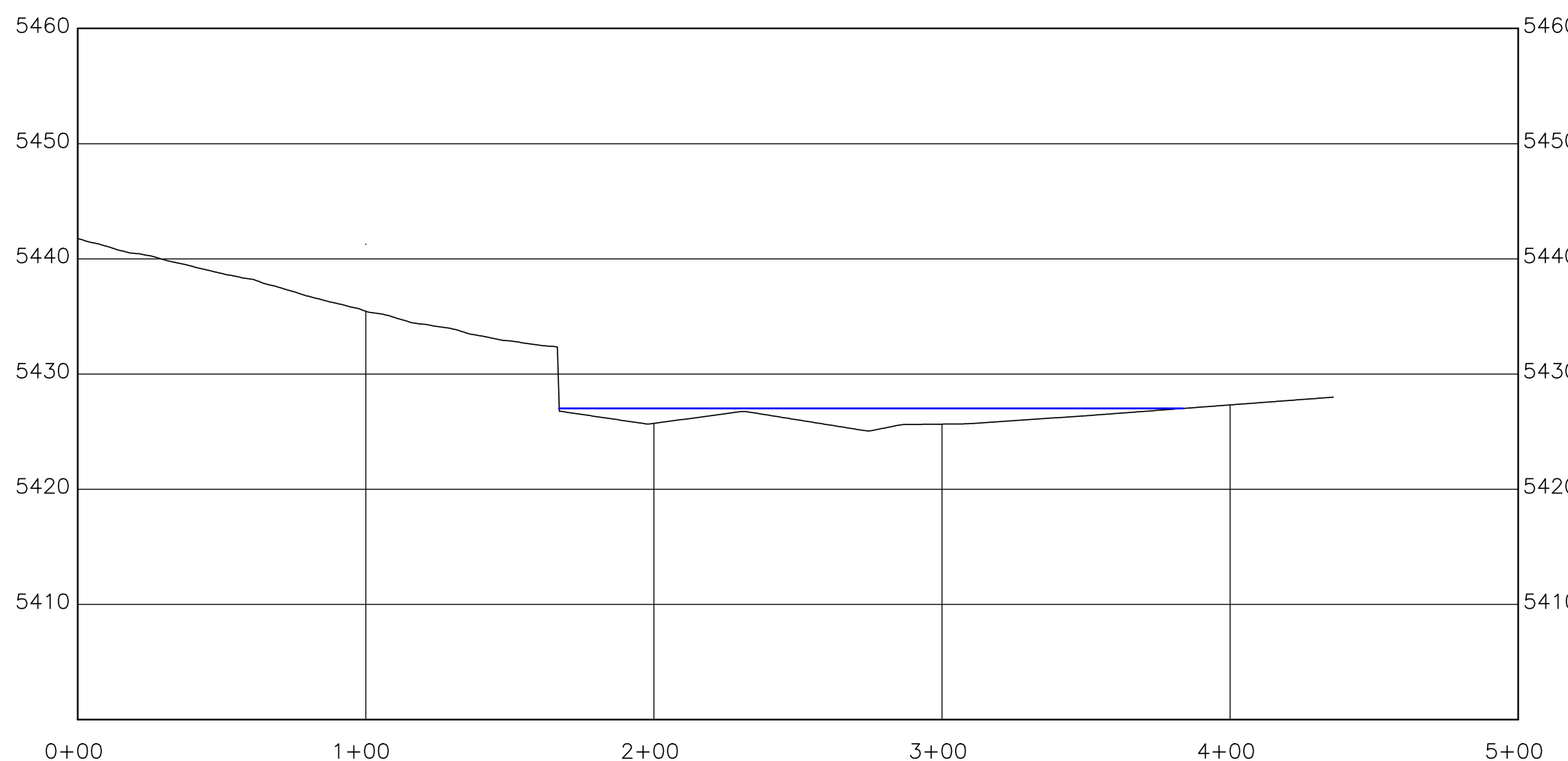
1001-03-010

A



BASIN PROPERTIES:

MP	427.14	mi
Station	2255315.17	ft
Lat	39.6248	degrees
Long	-104.2630	degrees
Stream Name	Unnamed Tributary to West Bljou Creek	
FEMA FIRM Panel	08005C0600K	
RegionName	Foothills_Region_Peak_Flow_2016_5099	
AreaSqMi	0.56	mi ²
I6H100Y	3.92	in
OUTLET ELEV	5431	ft
STATSCLAY	30.71	%
100YFlow	867	cfs
PRECIP	16.43	in
BSLDEM10M	6	%
CSL1085LFP	100.3	ft/mi
ELEV	5538	ft
RCN	67.16	
TOC	2.16	hrs



HYDRAULIC CALCULATIONS:

Channel Invert Slope	Roughness Coefficient	Channel Invert Elevation	Design Water Depth	Discharge	Froude Number	Flow Velocity	Flow Area	Top Width	Wetted Perimeter	Hydraulic Radius	Hydraulic Depth	Specific Energy	Centroid of Flow Area	Specific Force	BFEHGL	Low Point on CL	at Station	Predicted CL depth
ft/ft		ft	ft	cfs		fps	ft ²	ft	ft	ft	ft	ft	ft	kip	ft	ft	ft	ft
0.019	0.045	5425.05	1.96	872.5	0.79	4.34	201.1	216.6	216.9	0.93	0.93	2.25	1.30	23.7	5427.01	5424.81	2255354.9	2.21

NOTES:

1. Hydraulic gradeline based on cross section from civil survey from July-August 2024.

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11-22-24

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REVISION NUMBER

DRAWN BY

DATE REVISED

CHECKED BY

PROJECT ENGINEER

APPROVED BY

MAGELLAN

MIDSTREAM PARTNERS, L.P.

DENVER EXPANSION PROJECT

SCOTT CITY TO DENVER PIPELINE

FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 427.14

ARAPAHOE COUNTY

COLORADO

DRAWN BY

DATE DRAWN

CHECKED BY

PROJECT ENGINEER

APPROVED BY

ADH

11-22-24

JHH

JHH

SAS

SCALE: AS NOTED

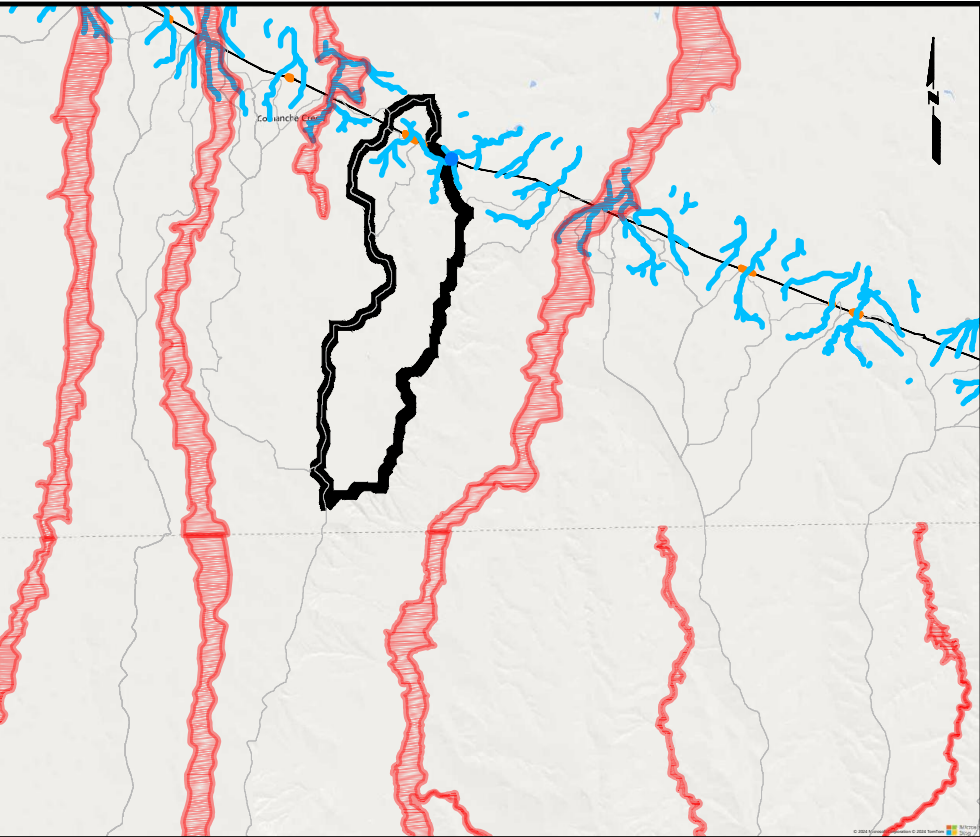
A.F.E.

—

DRAWING NO.

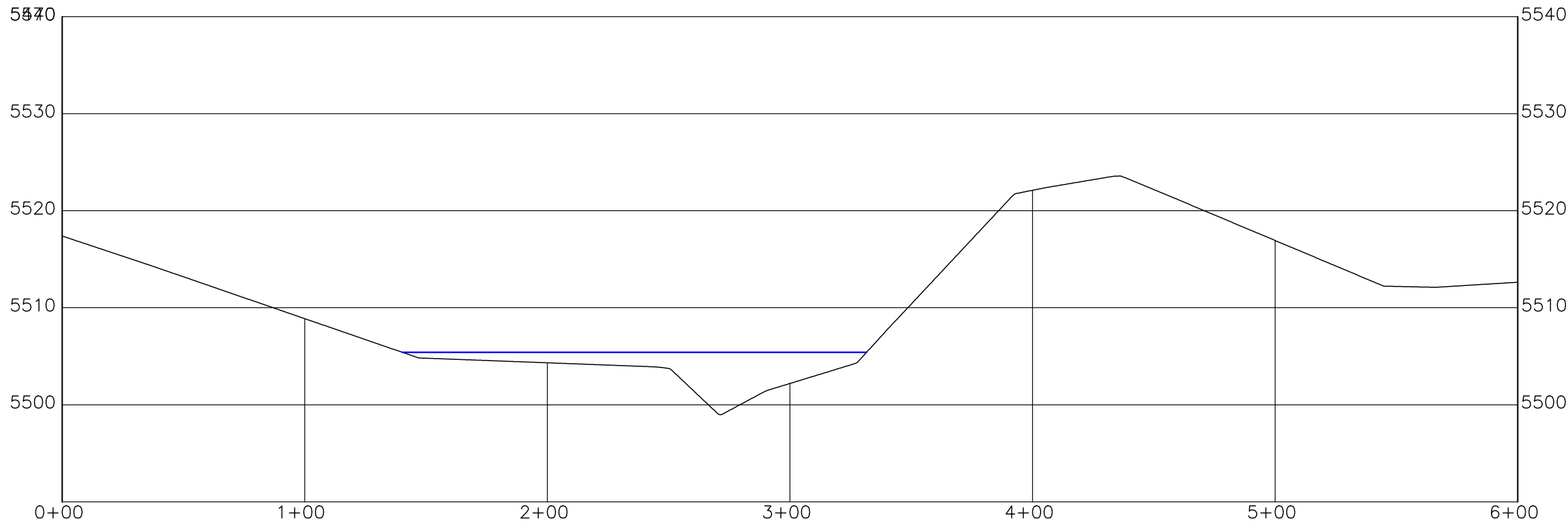
1001-03-011

A



BASIN PROPERTIES:

MP	428.45	mi
Station	2262214.09	ft
Lat	39.6301	degrees
Long	-104.2870	degrees
Stream Name	Unnamed Tributary to West Bijou Creek	
FBMA FIRM Panel	08001C1025H	
RegionName	Foothills_Region_Peak_Flow_2016_5099	
AreaSqMi	4.45	mi ²
10Y100Y	3.89	in
OUTLETELEV	5506	ft
STATSCLAY	21.67	%
100YrFlow	1850	cfs
PRECIP	16.74	in
BSLDEM10M	3	%
CSL108SLFP	31.7	ft/mi
ELEV	5655	ft
RCN	70.69	
TOC	7.22	hrs



SECTION VIEW
HORIZ. SCALE: SCALE 1:50
VERT. SCALE: 1:12.5

HYDRAULIC CALCULATIONS:

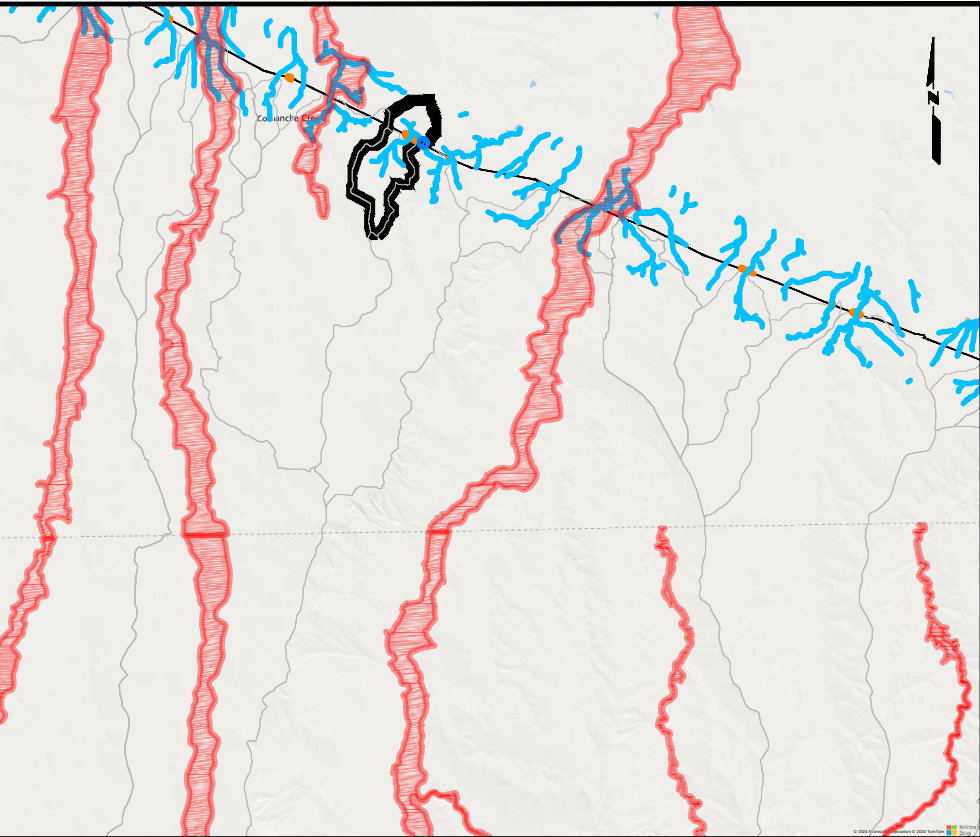
Channel Invert Slope	Roughness Coefficient	Channel Invert Elevation	Design Water Depth	Discharge	Froude Number	Flow Velocity	Flow Area	Top Width	Wetted Perimeter	Hydraulic Radius	Hydraulic Depth	Specific Energy	Centroid of Flow Area	Specific Force	BFEHGL	Low Point on CL	at Station	Predicted CL depth
ft/ft		ft	ft	cfs		fps	ft ²	ft	ft	ft	ft	ft	ft	kip	ft	ft	ft	ft
0.006	0.04	5498.96	6.45	1851.0	0.57	4.67	396.3	191.5	192.5	2.06	2.07	6.79	4.76	134.4	5505.41	5498.99	2262243.9	6.42

NOTES:

1. Hydraulic gradeline based on cross section from civil survey from July-August 2024.

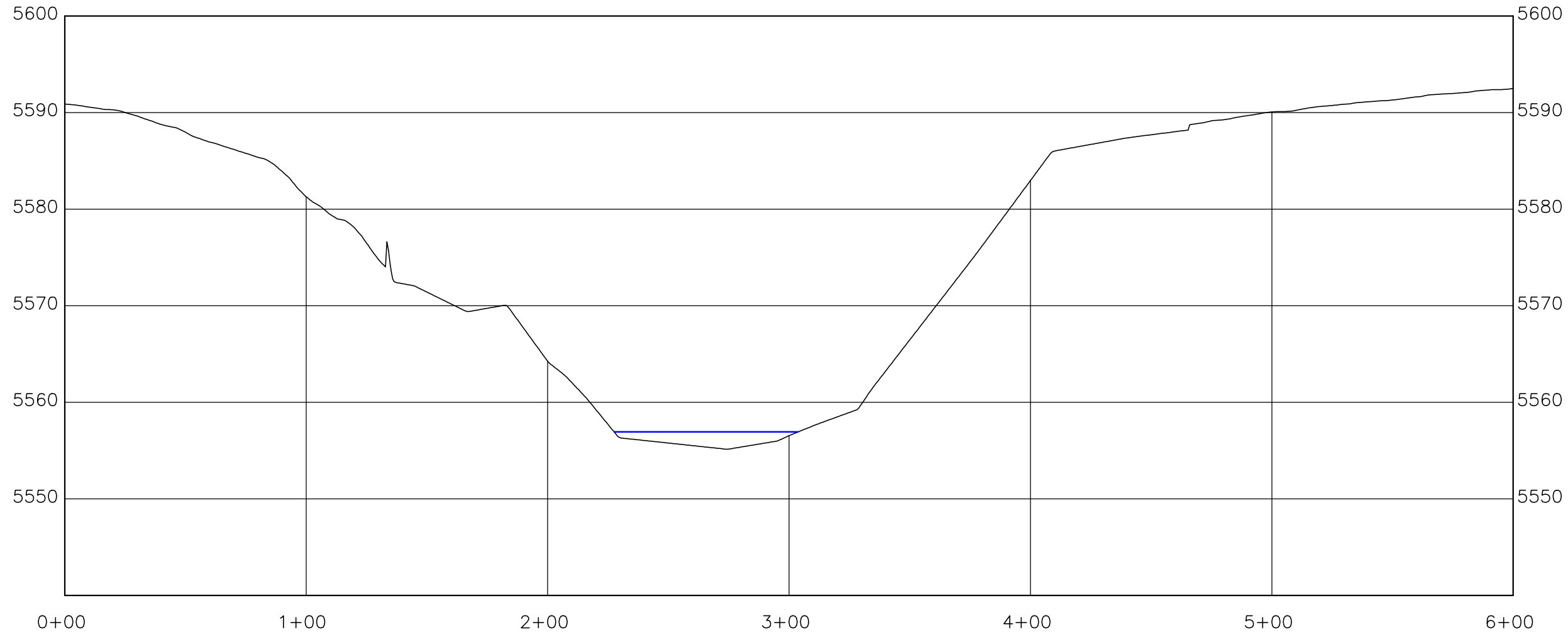
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A	Issued for Review				
REVISION NUMBER	ADH	11-22-24	JHH	JHH	SAS
DRAWN BY	ADH	DATE REVISED	CHECKED BY	PROJECT ENGINEER	APPROVED BY
					
DENVER EXPANSION PROJECT SCOTT CITY TO DENVER PIPELINE					
FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 428.45					
ARAPAHOE COUNTY COLORADO					
DRAWN BY	ADH	SCALE: AS NOTED		A.F.E.	—
DATE DRAWN	11-22-24	DRAWING NO.			
CHECKED BY	JHH	1001-03-012			
PROJECT ENGINEER	JHH				
APPROVED BY	SAS				



BASIN PROPERTIES:

MP	428.84	mi
Station	2264264.19	ft
Lat	39.6328	degrees
Long	-104.2930	degrees
Stream Name	Unnamed Tributary to West Bijou Creek	
FEMA FIRM Panel	08001C1025H	
RegionName	Foothills_Region_Peak_Flow_2016_5099	
AreaSqM	0.78	mi ²
I6H100Y	3.00	in
OUTLETELEV	5557	ft
STATSCLAY	19.47	%
100YFlow	259	cfs
PRECIP	16.6	in
BSLDEM10M	1	%
CSL108SLFP	29.3	ft/mi
ELEV	5611	ft
RCN	78.83	
TOC	3.42	hrs



HYDRAULIC CALCULATIONS:

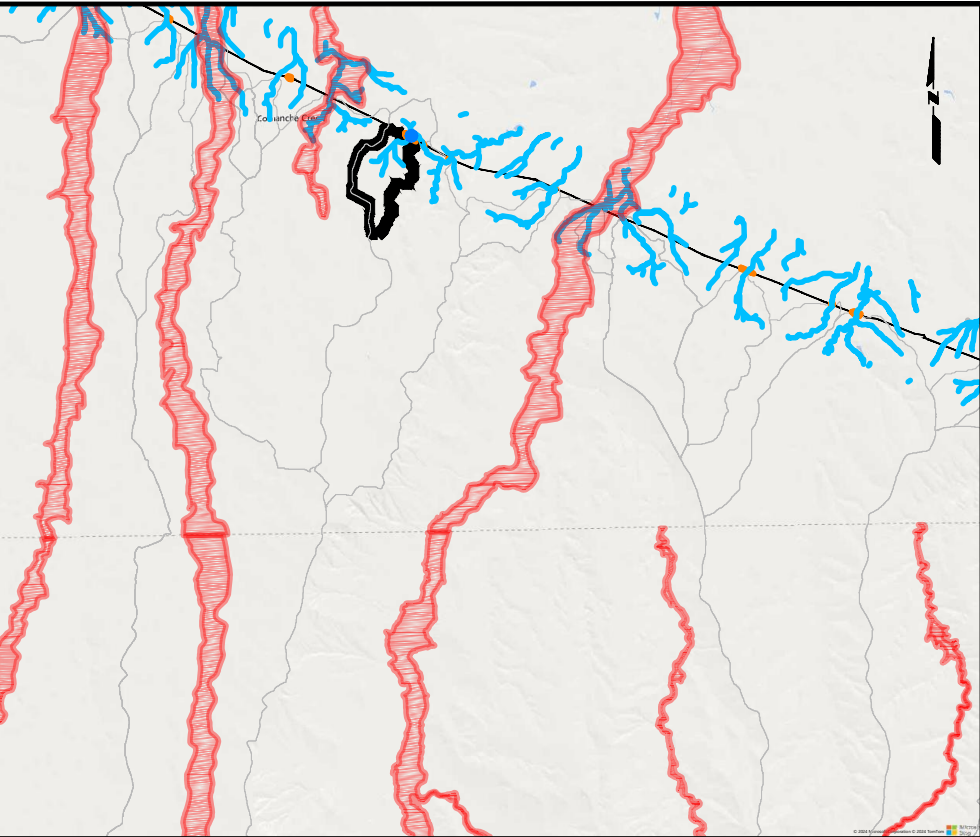
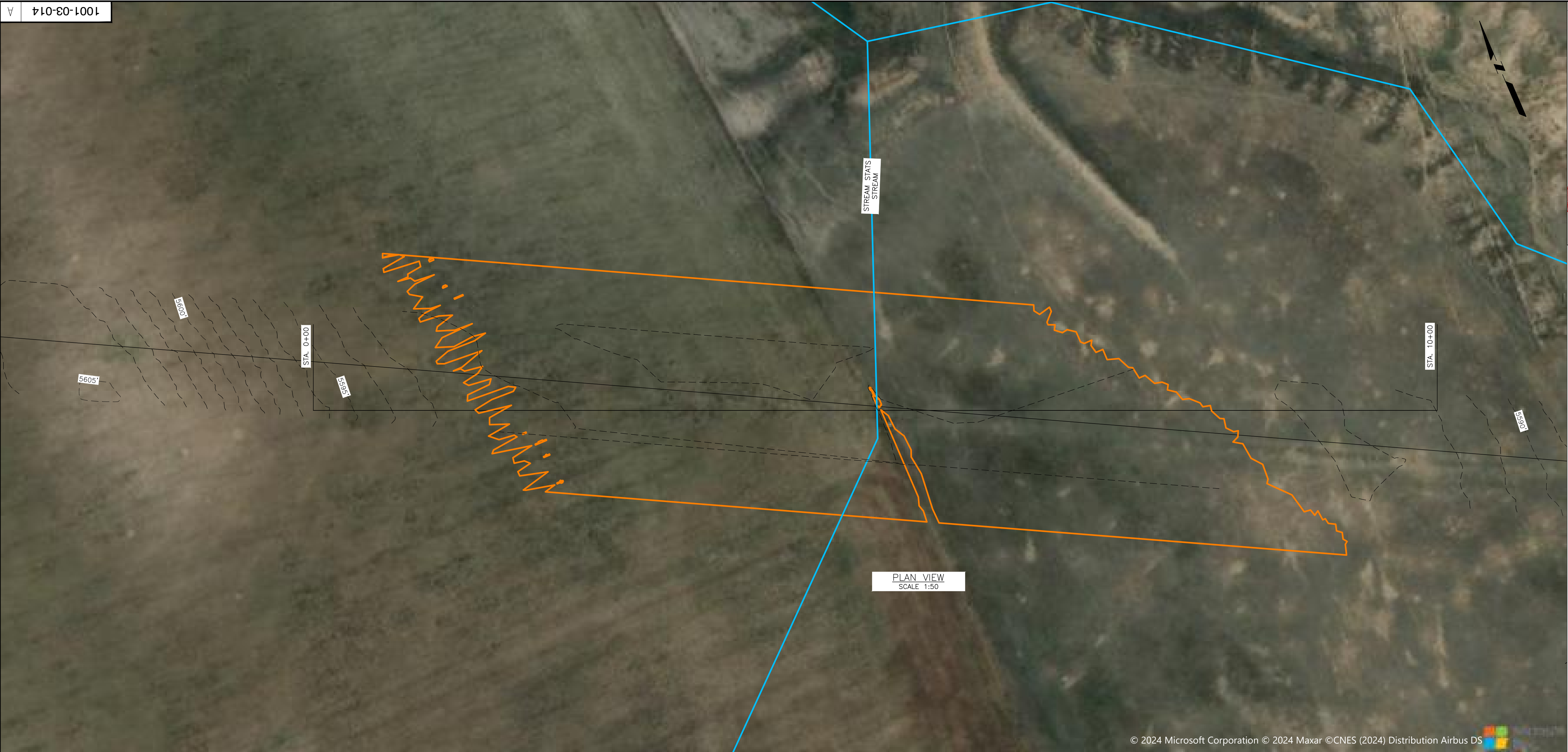
Channel Invert Slope	Roughness Coefficient	Channel Invert Elevation	Design Water Depth	Discharge	Froude Number	Flow Velocity	Flow Area	Top Width	Wetted Perimeter	Hydraulic Radius	Hydraulic Depth	Specific Energy	Centroid of Flow Area	Specific Force	BFEHGL	Low Point on CL	at Station	Predicted CL depth
ft/ft		ft	ft	cfs		fps	ft ²	ft	ft	ft	ft	ft	ft	kip	ft	ft	ft	ft
0.006	0.04	5555.15	1.79	260.7	0.50	3.01	86.5	76.2	76.4	1.13	1.13	1.93	1.13	7.6	5556.94	5552.83	2264205.9	4.11

NOTES:

- Hydraulic gradeline based on cross section from civil survey from July-August 2024.
- Floodplain delineation based on 3DEP LiDAR digital terrain model.

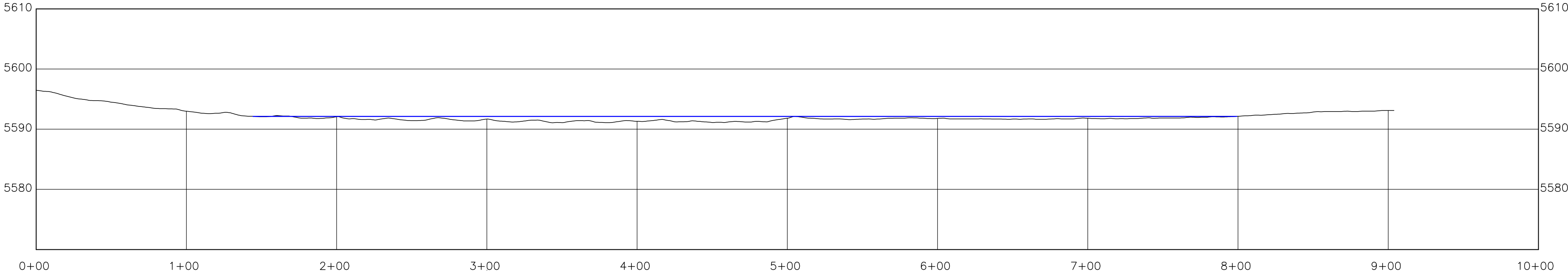
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A	Issued for Review				
	ADH	11-22-24	JHH	JHH	SAS
REVISION NUMBER	DRAWN BY	DATE REVISED	CHECKED BY	PROJECT ENGINEER	APPROVED BY
					
DENVER EXPANSION PROJECT SCOTT CITY TO DENVER PIPELINE FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 428.84 ARAPAHOE COUNTY COLORADO					
DRAWN BY	ADH	SCALE: AS NOTED		A.F.E.	—
DATE DRAWN	11-22-24	DRAWING NO.			
CHECKED BY	JHH	1001-03-013			
PROJECT ENGINEER	JHH				
APPROVED BY	SAS				



BASIN PROPERTIES:

MP	429.00	mi
Station	2265132.49	ft
Lat	39.6339	degrees
Long	-104.2960	degrees
Stream Name	Unnamed Tributary to West Bijou Creek	
FEMA FIRM Panel	08001C1025H	
Region Name	Foothills Region Peak Flow 2016 5099	
Area Sq Mi	0.55	mi ²
16H100Y	3.90	in
OUTLET ELEV	5590	ft
STATSCLAY	18.3	%
100Y Flow	450	cfs
PRECIP	16.63	in
BSLDEM10M	1	%
CSL108SLFP	19.9	ft/mi
ELEV	5615	ft
RCN	81.85	
TOC	2.72	hrs



HYDRAULIC CALCULATIONS:

Channel Invert Slope	Roughness Coefficient	Channel Invert Elevation	Design Water Depth	Discharge	Froude Number	Flow Velocity	Flow Area	Top Width	Wetted Perimeter	Hydraulic Radius	Hydraulic Depth	Specific Energy	Centroid of Flow Area	Specific Force	BFEHGL	Low Point on CL	at Station	Predicted CL depth
ft/ft		ft	ft	cfs		fps	ft ²	ft	ft	ft	ft	ft	ft	kip	ft	ft	ft	ft
0.004	0.035	5591.07	1.07	553.6	0.41	1.69	327.5	629.7	629.7	0.52	0.52	1.11	0.74	16.9	5592.14	5591.01	2265191.9	1.13

NOTES:

1. Floodplain delineation based on 3DEP LiDAR digital terrain model.

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REVISION NUMBER	ADH	11-22-24	JHH	JHH	SAS
DRAWN BY	DATE	REVIS	CHECKED BY	PROJECT ENGINEER	APPROVED BY

MAGELLAN

MIDSTREAM PARTNERS, L.P.

DENVER EXPANSION PROJECT

SCOTT CITY TO DENVER PIPELINE

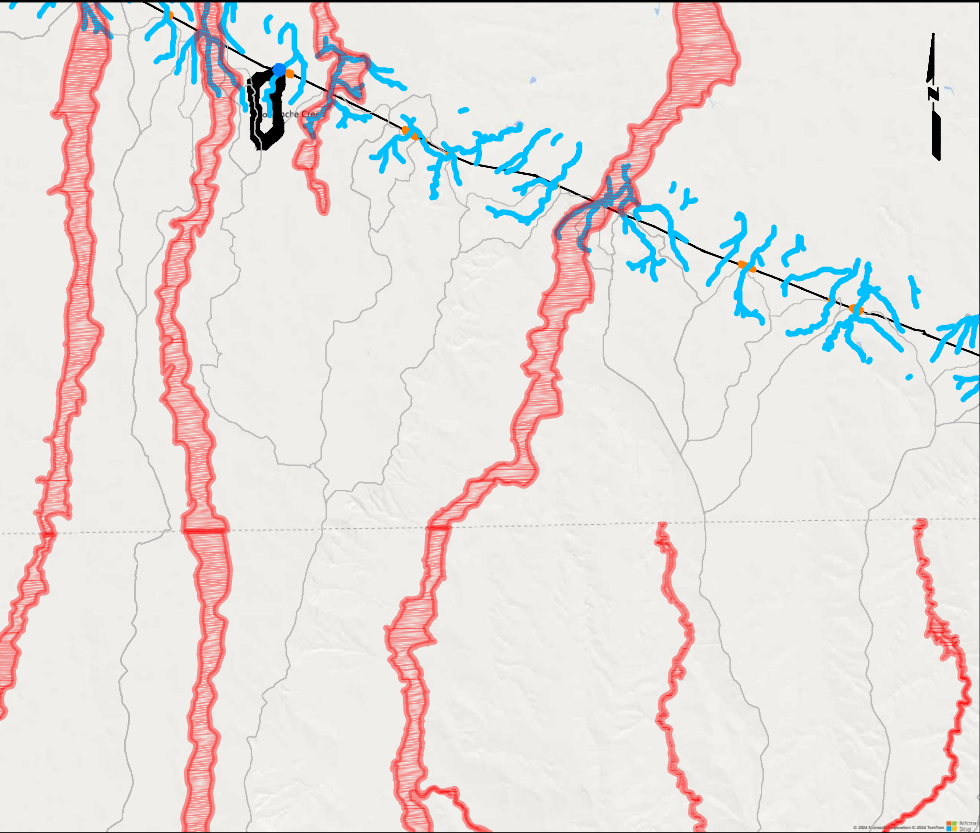
FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 429.00

ARAPAHOE COUNTY

COLORADO

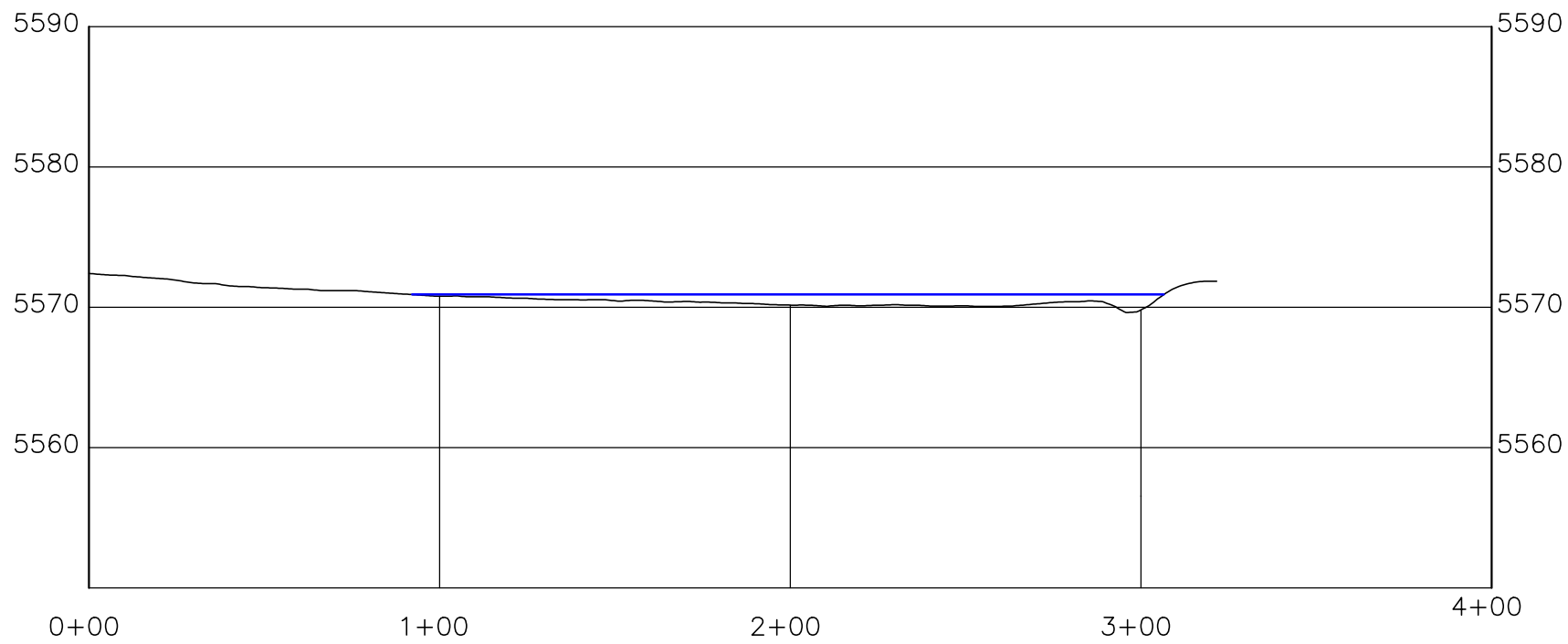
DRAWN BY	ADH	SCALE: AS NOTED	A.F.E.	—
DATE DRAWN	11-22-24	DRAWING NO.		
CHECKED BY	JHH	1001-03-014		
PROJECT ENGINEER	JHH			
APPROVED BY	SAS			

A



BASIN PROPERTIES:

MP	430.78	mi
Station	2274495.45	ft
Lat	39.6451	degrees
Long	-104.3260	degrees
Stream Name	amed Tributary to Comanche Creek to Kiowa C	
FEMA FIRM Panel	08001C1025H	
Region Name	Foothills_Region_Peak_Flow_2016_5099	
Area Sq Mi	0.21	mi ²
16H100Y	3.87	in
OUTLET ELEV	5580	ft
STATS CLAY	18.3	%
100Y Flow	255	cfs
PRECIP	16.62	in
BSLDEM10M	2	%
CSL108SLFP	35.6	ft/mi
ELEV	5595	ft
RCN	69.53	
TOC	2.11	hrs



SECTION VIEW
HORIZ. SCALE: SCALE 1:50
VERT. SCALE: 1:12.5

HYDRAULIC CALCULATIONS:

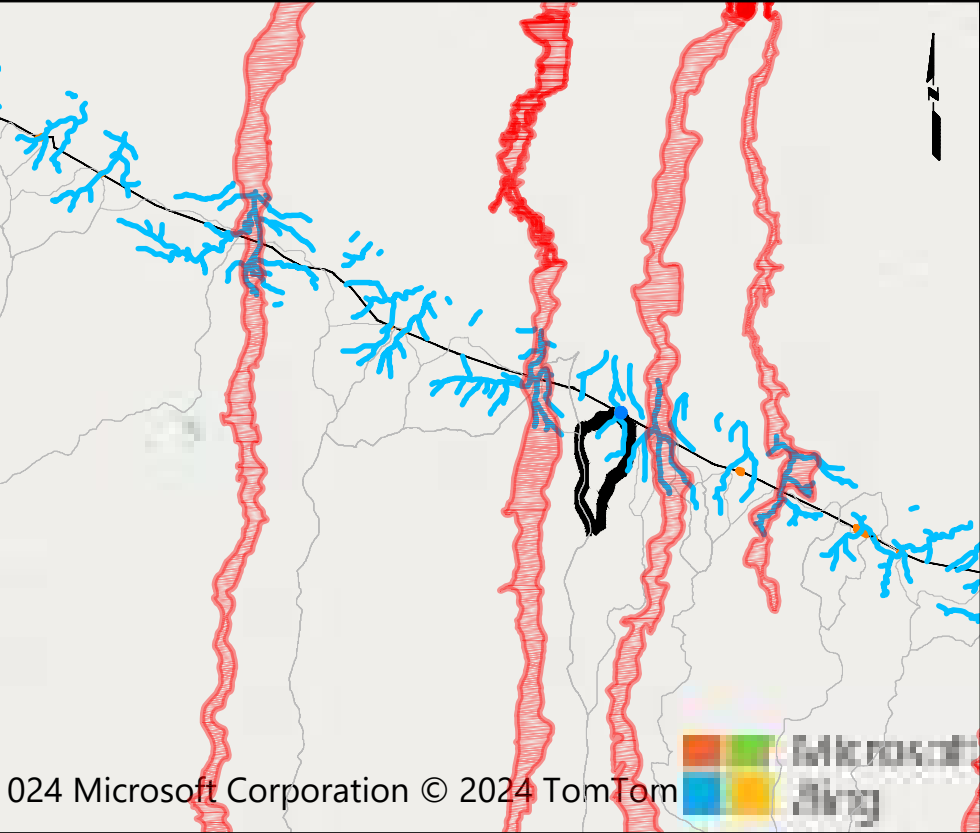
Channel Invert Slope	Roughness Coefficient	Channel Invert Elevation	Design Water Depth	Discharge	Froude Number	Flow Velocity	Flow Area	Top Width	Wetted Perimeter	Hydraulic Radius	Hydraulic Depth	Specific Energy	Centroid of Flow Area	Specific Force	BFEHGL	Low Point on CL	at Station	Predicted CL depth
ft/ft		ft	ft	cfs		fps	ft ²	ft	ft	ft	ft	ft	ft	kip	ft	ft	ft	ft
0.007	0.04	5569.61	1.29	257.9	0.49	2.11	122.5	214.4	214.5	0.57	0.57	1.36	0.94	8.2	5570.90	5569.64	2273651.9	1.27

NOTES:

1. Hydraulic gradeline based on cross section from civil survey from July-August 2024.

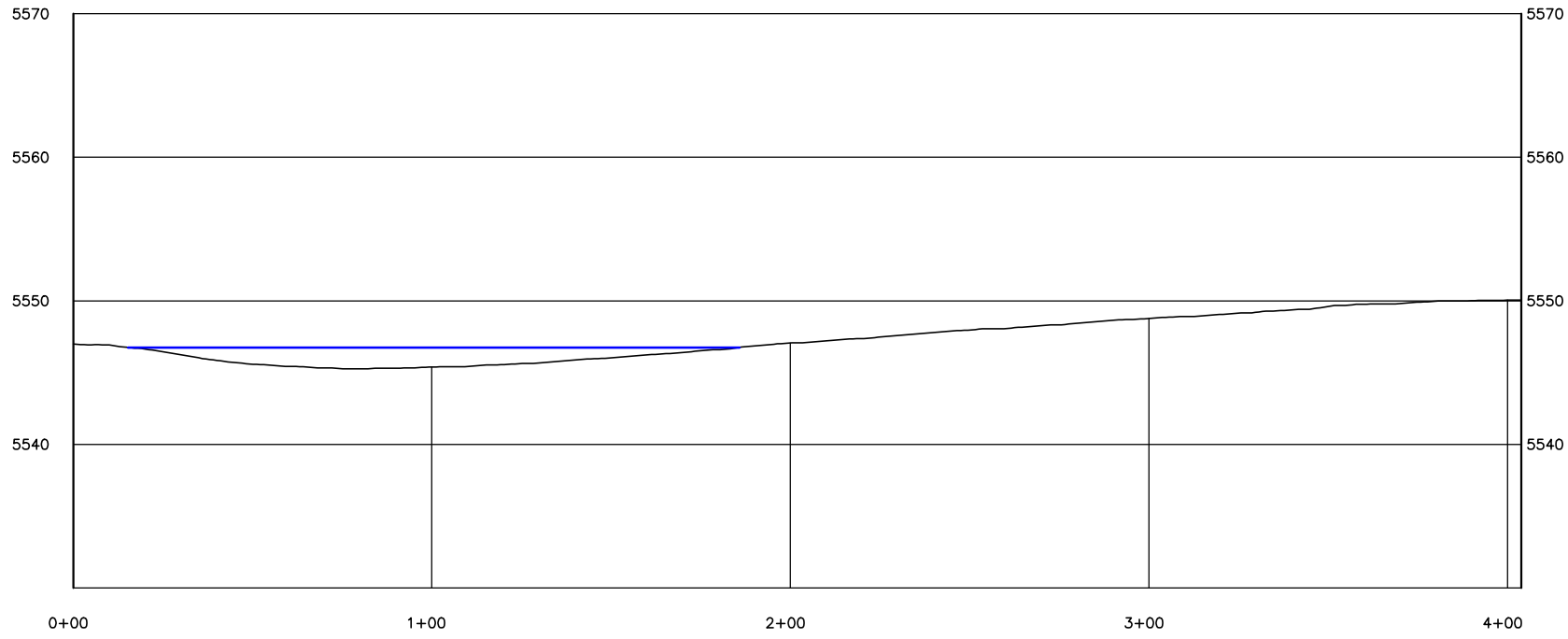
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A		Issued for Review			
REVISION NUMBER	ADH DRAWN BY	11-22-24 DATE REVISED	JHH CHECKED BY	JHH PROJECT ENGINEER	SAS APPROVED BY
 MAGELLAN[®] MIDSTREAM PARTNERS, L.P.					
DENVER EXPANSION PROJECT SCOTT CITY TO DENVER PIPELINE					
FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 430.78 ARAPAHOE COUNTY COLORADO					
DRAWN BY	ADH	SCALE: AS NOTED	A.F.E.	—	
DATE DRAWN	11-22-24	DRAWING NO.			
CHECKED BY	JHH	1001-03-014			
PROJECT ENGINEER	JHH				
APPROVED BY	SAS				
A					



BASIN PROPERTIES:

MP	432.30	mi
Station	2282526.27	ft
Lat	39.6552	degrees
Long	-104.3510	degrees
Stream Name	Imed Tributary to Comanche Creek to Kiowa C	
FEMA FIRM Panel	08001C1025H	
Region Name	Foothills Region Peak Flow 2016 5099	
Area Sq Mi	0.54	mi ²
16H100Y	3.85	in
OUTLET ELEV	5551	ft
STATS CLAY	18.3	%
100Yr Flow	438	cfs
PRECIP	16.61	in
BSLDEM10M	1	%
CSL108SLFP	24.6	ft/mi
ELEV	5572	ft
RCN	73.58	
TOC	3.85	hrs



SECTION VIEW
HORIZ. SCALE: SCALE 1:50
VERT. SCALE: 1:12.5

HYDRAULIC CALCULATIONS:

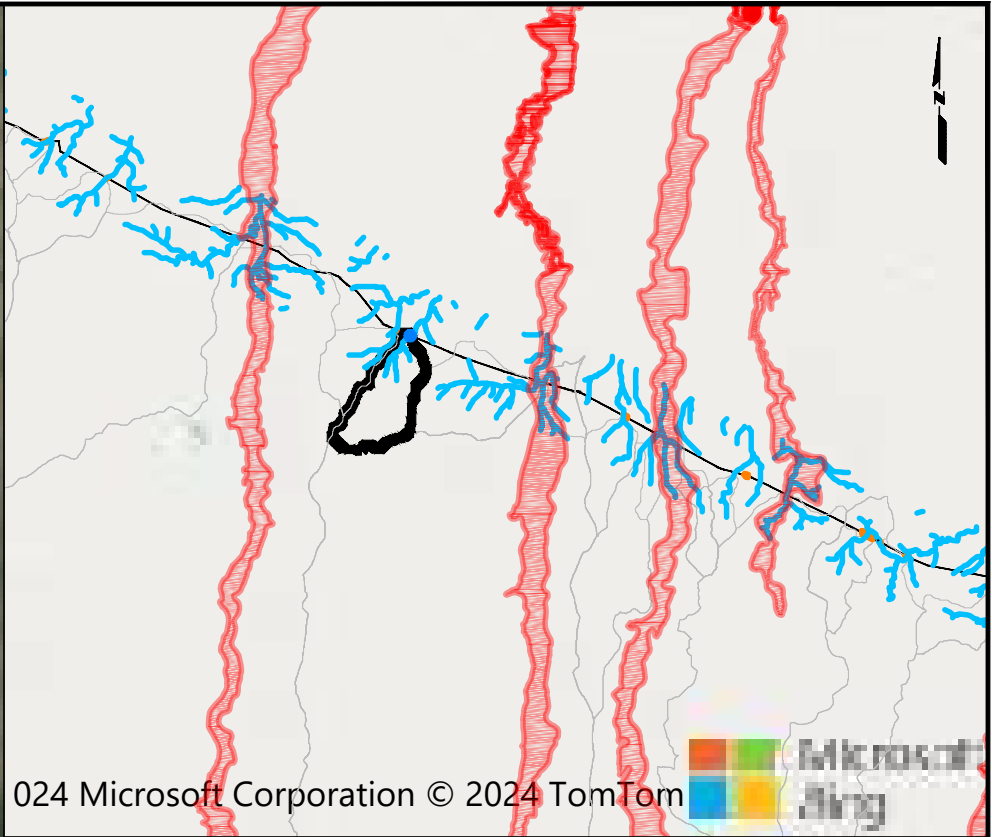
Channel Invert Slope	Roughness Coefficient	Channel Invert Elevation	Design Water Depth	Discharge	Froude Number	Flow Velocity	Flow Area	Top Width	Wetted Perimeter	Hydraulic Radius	Hydraulic Depth	Specific Energy	Centroid of Flow Area	Specific Force	BFEHGL	Low Point on CL	at Station	Predicted CL depth
ft/ft		ft	ft	cfs		fps	ft ²	ft	ft	ft	ft	ft	ft	kip	ft	ft	ft	ft
0.005	0.035	5545.26	1.49	439.8	0.51	2.77	158.8	170.5	170.5	0.93	0.93	1.61	0.91	11.4	5546.75	5546.15	2282354.9	0.60

NOTES:

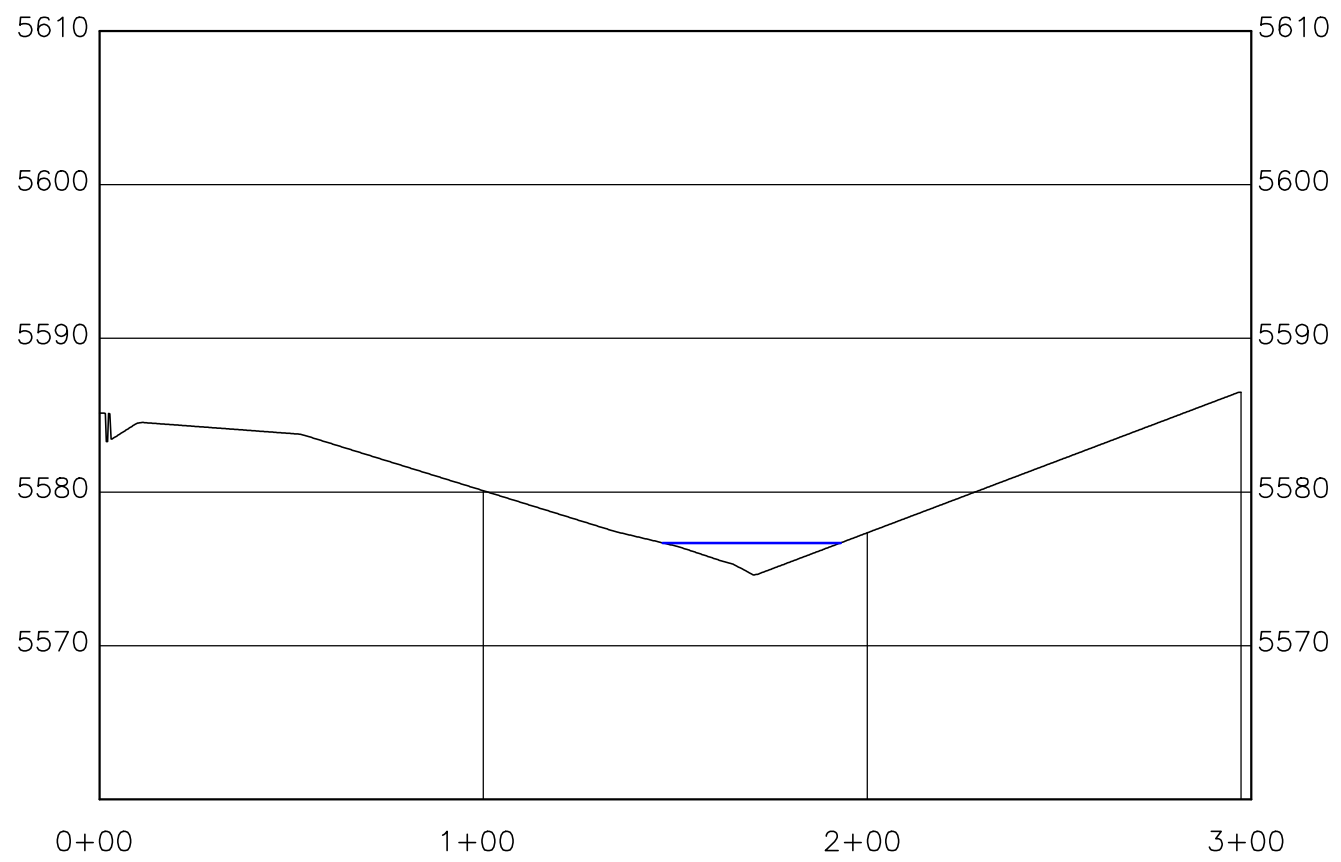
1. Floodplain delineation based on 3DEP LIDAR digital terrain model.

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A		Issued for Review			
REVISION NUMBER	ADH	11-22-24	JHH	JHH	SAS
	DRAWN BY	DATE REVISED	CHECKED BY	PROJECT ENGINEER	APPROVED BY
 MAGELLAN[®] MIDSTREAM PARTNERS, L.P.					
DENVER EXPANSION PROJECT SCOTT CITY TO DENVER PIPELINE					
FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 432.30 ARAPAHOE COUNTY COLORADO					
DRAWN BY	ADH	SCALE: AS NOTED	A.F.E.	—	
DATE DRAWN	11-22-24	DRAWING NO.			
CHECKED BY	JHH	1001-03-016			
PROJECT ENGINEER	JHH				
APPROVED BY	SAS				
A					



BASIN PROPERTIES:		
MP	435.07	mi
Station	2297190.11	ft
Lat	39.8696	degrees
Long	-104.3990	degrees
Stream Name	Imnamed Tributary to Wolf Creek to Kowa Creek	
FEMA FIRM Panel	08001C100H	
Region Name	Foothills_Region_Peak_Flow_2016_5099	
AreaSqMi	0.86	mi ²
16H100Y	3.00	in
OUTLETELEV	5581	ft
STATSLCY	18.3	%
100YFlow	253	cfs
PRECIP	16.86	in
BSLDEM10M	2	%
CSL1085LFP	93.1	ft/mi
ELEV	5672	ft
RON	62.89	
TOC	4.17	hrs



SECTION VIEW
HORIZ. SCALE: SCALE 1:50
VERT. SCALE: 1:12.5

HYDRAULIC CALCULATIONS:

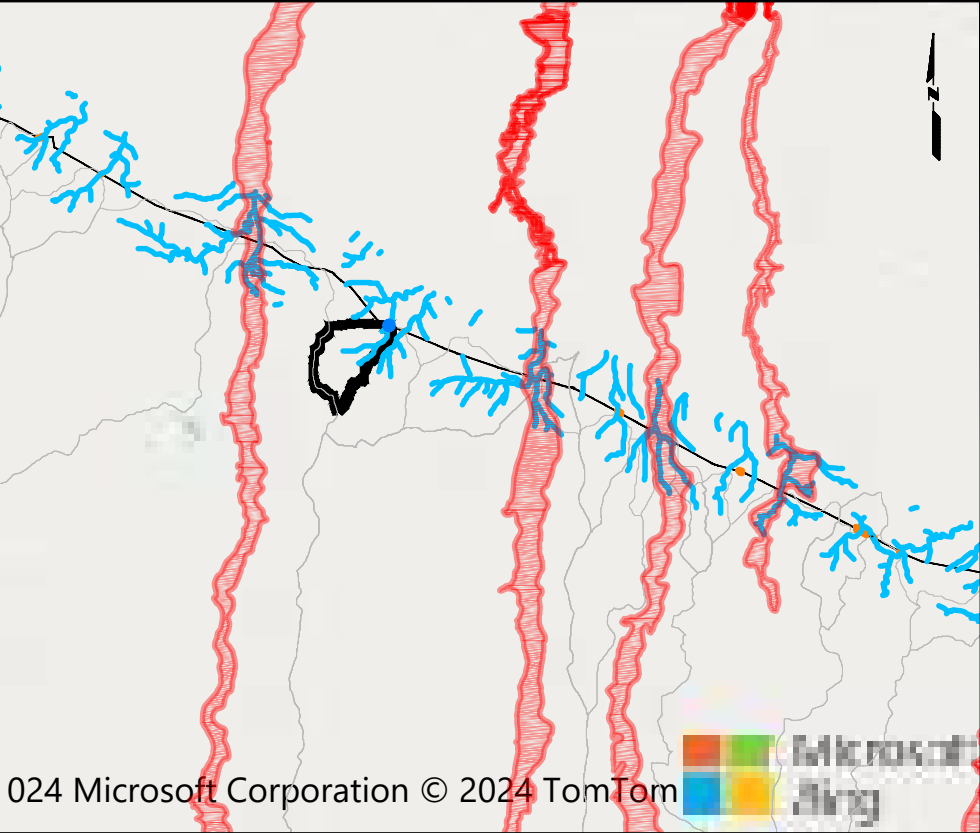
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ft/ft		ft	ft	cfs		fps	ft ²	ft	ft	ft	ft	ft	ft	kip			ft	ft
0.018	0.035	5574.60	2.09	254.1	0.99	5.58	45.6	46.3	46.5	0.98	0.98	2.57	1.40	6.7	5576.69	5573.92	2297160.9	2.77

NOTES:

1. Hydraulic gradeline based on cross section from civil survey from July-August 2024

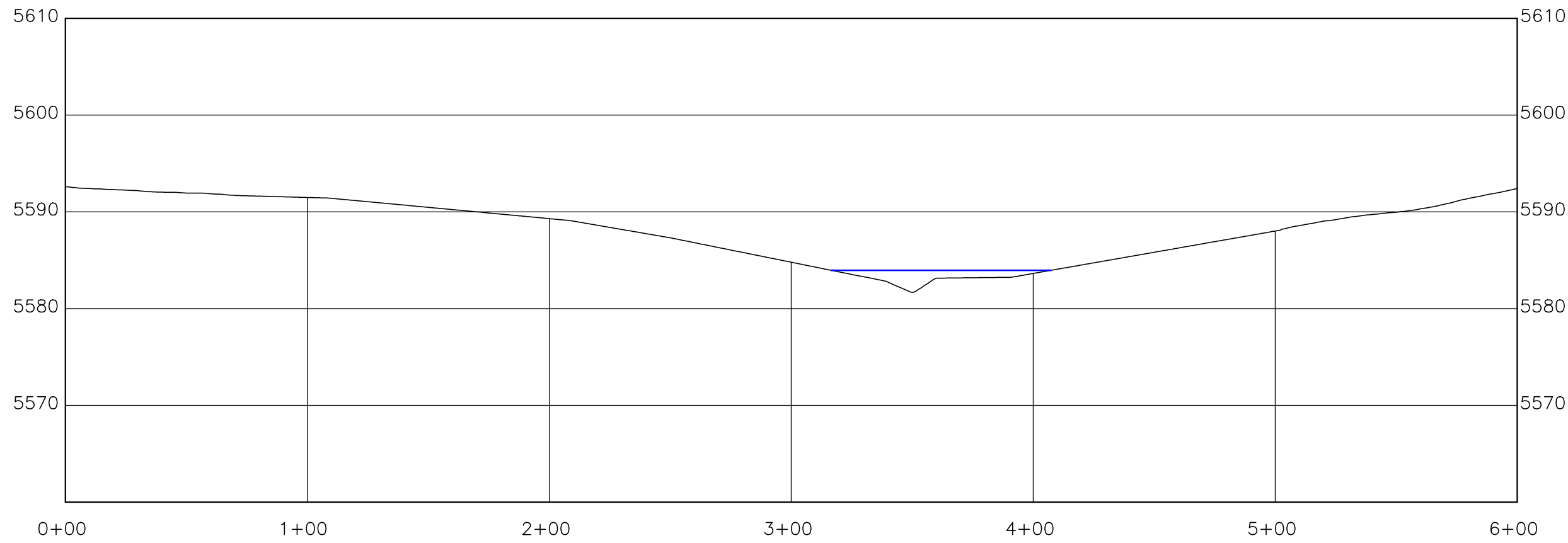
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A	Issued for Review				JHH	JHH	SAS
REVISION NUMBER	ADH DRAWN BY	DATE REVISED	JHH CHECKED BY	JHH PROJECT ENGINEER	SAS APPROVED BY		
 MAGELLAN MIDSTREAM PARTNERS, L.P.							
DENVER EXPANSION PROJECT SCOTT CITY TO DENVER PIPELINE FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 435.07 ARAPAHOE COUNTY COLORADO							
DRAWN BY	ADH	SCALE:	AS NOTED		A.F.E.	—	
DATE DRAWN	11-22-24	DRAWING NO.		1001-03-017			
CHECKED BY	JHH						
PROJECT ENGINEER	JHH						
APPROVED BY	SAS						
		A					



BASIN PROPERTIES:

MP	435.26	mi
Station	2298165.75	ft
Lat	39.6706	degrees
Long	-104.4030	degrees
Stream Name	unnamed Tributary to Wolf Creek to Kiowa Creek	
FEMA FIRM Panel	08001C1000H	
RegionName	Foothills Region Peak Flow 2016 5099	
AreaSqMi	0.58	mi ²
16H100Y	3.81	in
OUTLEIELEV	5585	ft
STATSLAY	18.3	%
100YFlow	432	cfs
PRECIP	16.84	in
BSLDEM10M	3	%
CSL108SLFP	114.3	ft/mi
ELEV	5674	ft
RCN	66.21	
TOC	2.26	hrs



SECTION VIEW
HORIZ. SCALE: SCALE 1:50
VERT. SCALE: 1:12.5

HYDRAULIC CALCULATIONS:

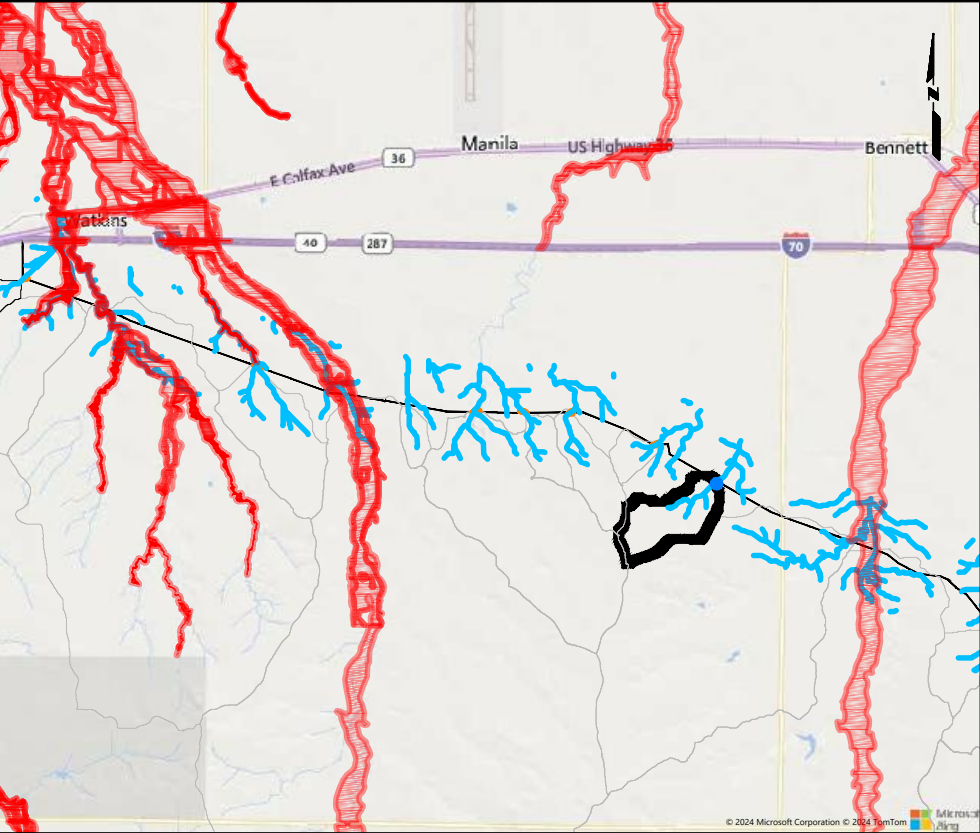
Channel Invert Slope	Roughness Coefficient	Channel Invert Elevation	Design Water Depth	Discharge	Froude Number	Flow Velocity	Flow Area	Top Width	Wetted Perimeter	Hydraulic Radius	Hydraulic Depth	Specific Energy	Centroid of Flow Area	Specific Force	BFEHGL	Low Point on CL	at Station	Predicted CL depth
ft/ft		ft	ft	cfs		fps	ft ²	ft	ft	ft	ft	ft	ft	kip	ft	ft	ft	ft
0.022	0.035	5581.68	2.28	435.0	1.07	5.62	77.5	91.0	91.2	0.85	0.85	2.77	1.68	12.9	5583.96	5582.44	2298117.9	1.52

NOTES:

1. Hydraulic gradeline based on cross section from civil survey from July-August 2024.

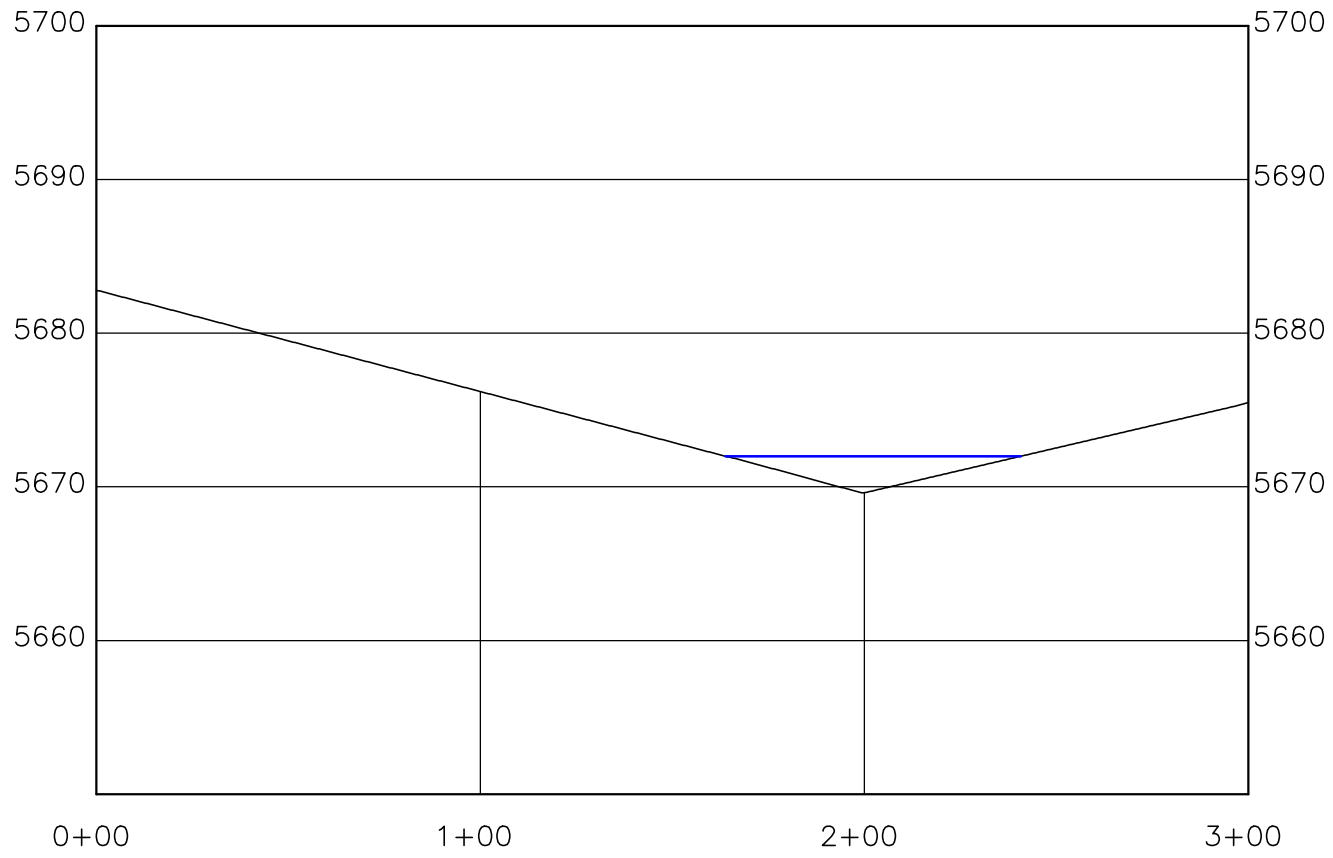
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A	Issued for Review				
REVISION NUMBER	DRAWN BY	DATE	REVISOR	CHECKED BY	APPROVED BY
	ADH	11-22-24	JHH	JHH	SAS
					
DENVER EXPANSION PROJECT SCOTT CITY TO DENVER PIPELINE					
FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 435.26 ARAPAHOE COUNTY COLORADO					
DRAWN BY	ADH	SCALE: AS NOTED		A.F.E.	—
DATE DRAWN	11-22-24	DRAWING NO.			
CHECKED BY	JHH	1001-03-018			
PROJECT ENGINEER	JHH				
APPROVED BY	SAS				



BASIN PROPERTIES:

MP	435.26	mi
Station	2298165.75	ft
Lat	39.6706	degrees
Long	-104.4030	degrees
Stream Name	unnamed Tributary to Wolf Creek to Kiowa Creek	
FEMA FIRM Panel	08001C1000H	
RegionName	Foothills_Region_Peak_Flow_2016_5099	
AreaSqMi	0.58	mi ²
16H100Y	3.81	in
OUTLET ELEV	5585	ft
STATSCLAY	18.3	%
100YrFlow	432	cfs
PRECIP	16.84	in
BSLDEM10M	3	%
CSL108SLFP	114.3	ft/mi
ELEV	5674	ft
RCN	66.21	
TOC	2.26	hrs



SECTION VIEW
HORIZ. SCALE: SCALE 1:50
VERT. SCALE: 1:12.5

HYDRAULIC CALCULATIONS:

Channel Invert Slope	Roughness Coefficient	Channel Invert Elevation	Design Water Depth	Discharge	Froude Number	Flow Velocity	Flow Area	Top Width	Wetted Perimeter	Hydraulic Radius	Hydraulic Depth	Specific Energy	Centroid of Flow Area	Specific Force	BFEHGL	Low Point on CL at Station	Predicted CL depth
ft/ft		ft	ft	cfs		fps	ft ²	ft	ft	ft	ft	ft	ft	kip	ft	ft	ft
0.022	0.035	5581.68	2.28	435.0	1.07	5.62	77.5	91.0	91.2	0.85	0.85	2.77	1.68	12.9	5583.96	5582.44	2298117.9

NOTES:

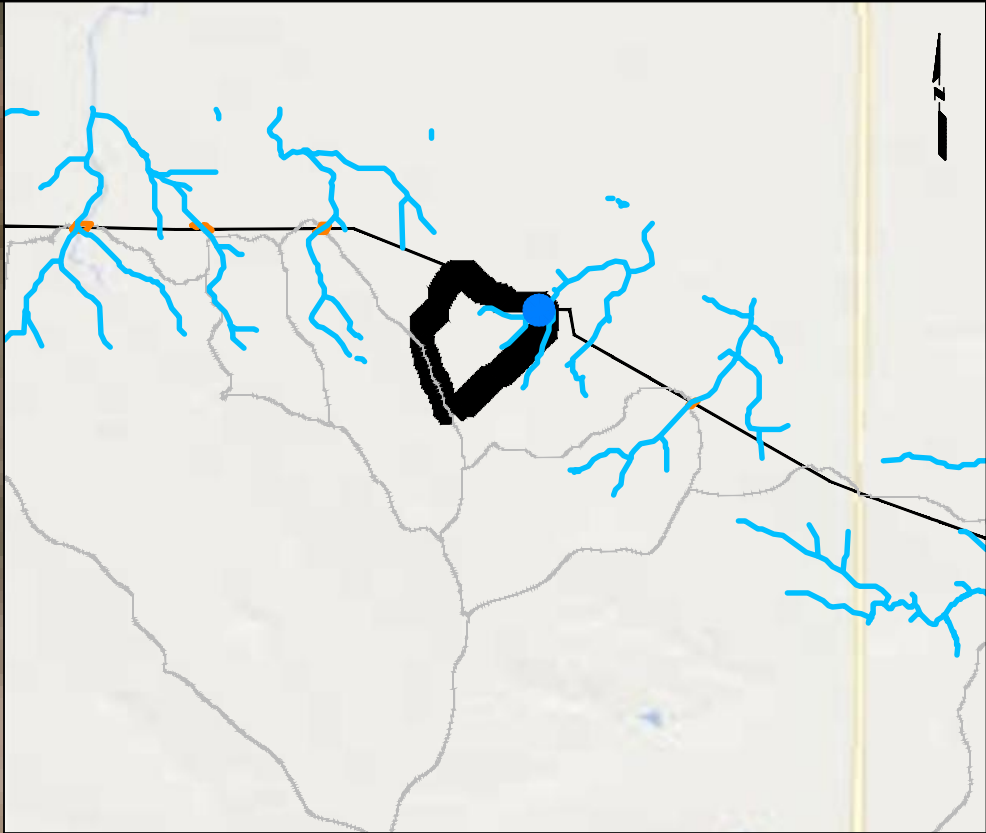
1. Hydraulic gradeline based on cross section from civil survey from July-August 2024.

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PROJECT ENGINEER	JHH						
APPROVED BY	SAS						
1001-03-019							

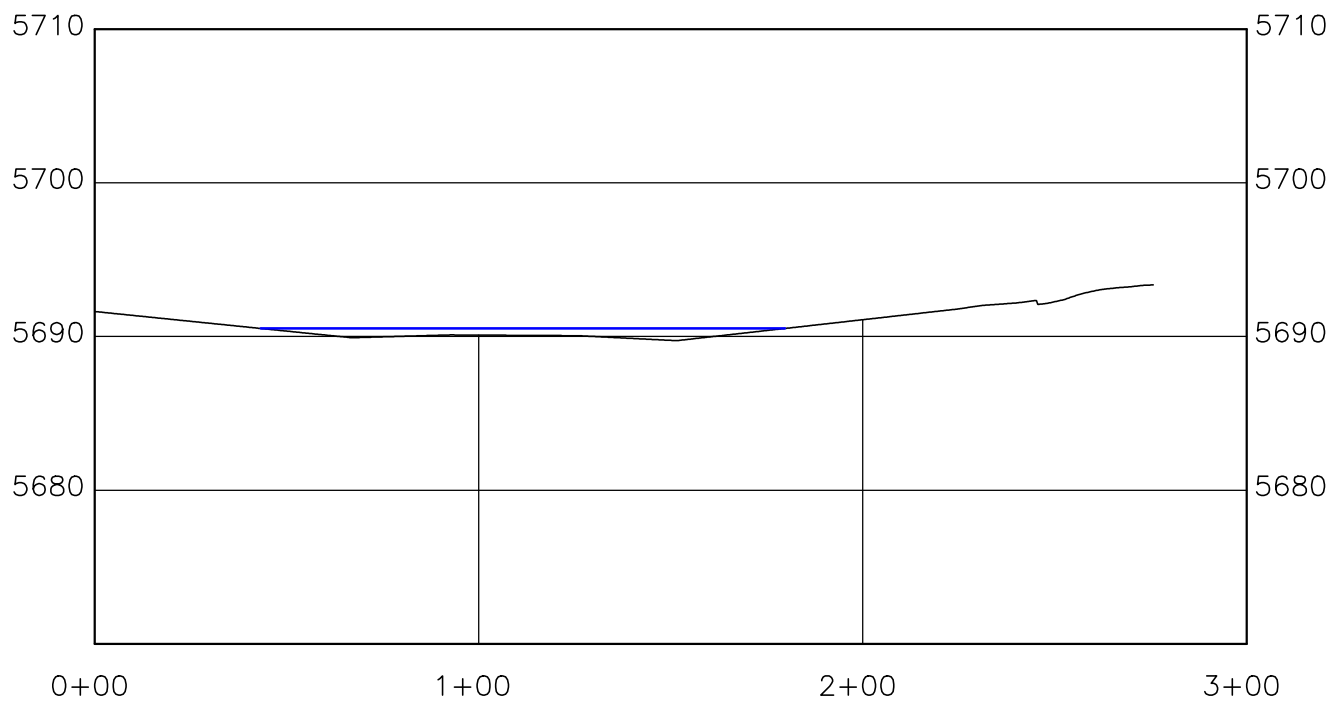
1001-03-019

A



BASIN PROPERTIES:

MP	440.19	mi
Station	2324195.23	ft
Lat	39.7040	degrees
Long	-104.4810	degrees
Stream Name	Creek/Cost Creek/West Sand Creek to Middle	
FEMA FIRM Panel	08001C0980H	
RegionName	Foothills_Region_Peak_Flow_2016_5099	
AreaSqMi	0.22	mi ²
I6H100Y	3.77	in
OUTLETELEV	5689	ft
STATSCLAY	18.3	%
100YFlow	224	cfs
PRECIP	17.33	in
BSLDEM10M	3	%
CSL1085LFP	108	ft/mi
ELEV	5748	ft
RCN	74.25	
TOC	1.15	hrs



HYDRAULIC CALCULATIONS:

Channel Invert Slope	Roughness Coefficient	Channel Invert Elevation	Design Water Depth	Discharge	Froude Number	Flow Velocity	Flow Area	Top Width	Wetted Perimeter	Hydraulic Radius	Hydraulic Depth	Specific Energy	Centroid of Flow Area	Specific Force	BFEHGL	Low Point on CL	at Station	Predicted CL depth
ft/ft		ft	ft	cfs		fps	ft ²	ft	ft	ft	ft	ft	ft	kip	ft	ft	ft	ft
0.020	0.035	5689.73	0.79	226.7	0.94	3.62	62.6	136.5	136.5	0.46	0.46	0.99	0.53	3.7	5690.52	5689.23	2324150.9	1.29

NOTES:

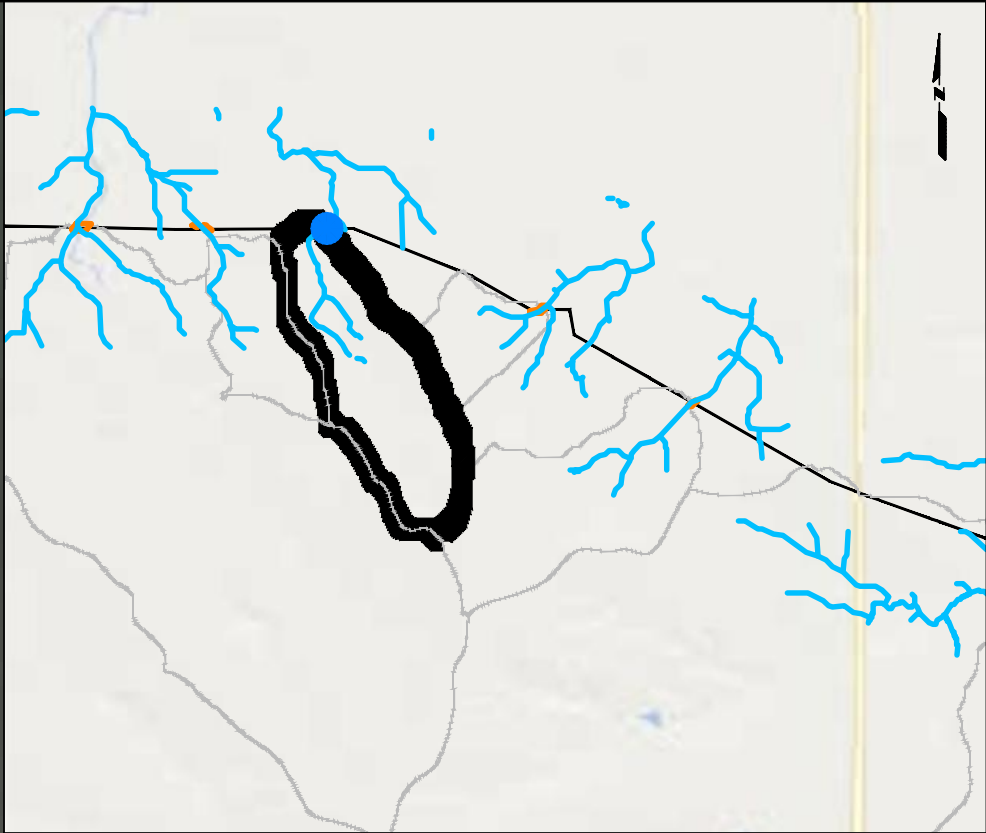
1. Hydraulic gradeline based on cross section from civil survey from July-August 2024.

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DENVER EXPANSION PROJECT SCOTT CITY TO DENVER PIPELINE FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 440.19 ARAPAHOE COUNTY COLORADO					
DRAWN BY	ADH	SCALE: AS NOTED	A.F.E. —		
DATE DRAWN	11-22-24	DRAWING NO.	1001-03-020		
CHECKED BY	JHH				
PROJECT ENGINEER	JHH				
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1001-03-020

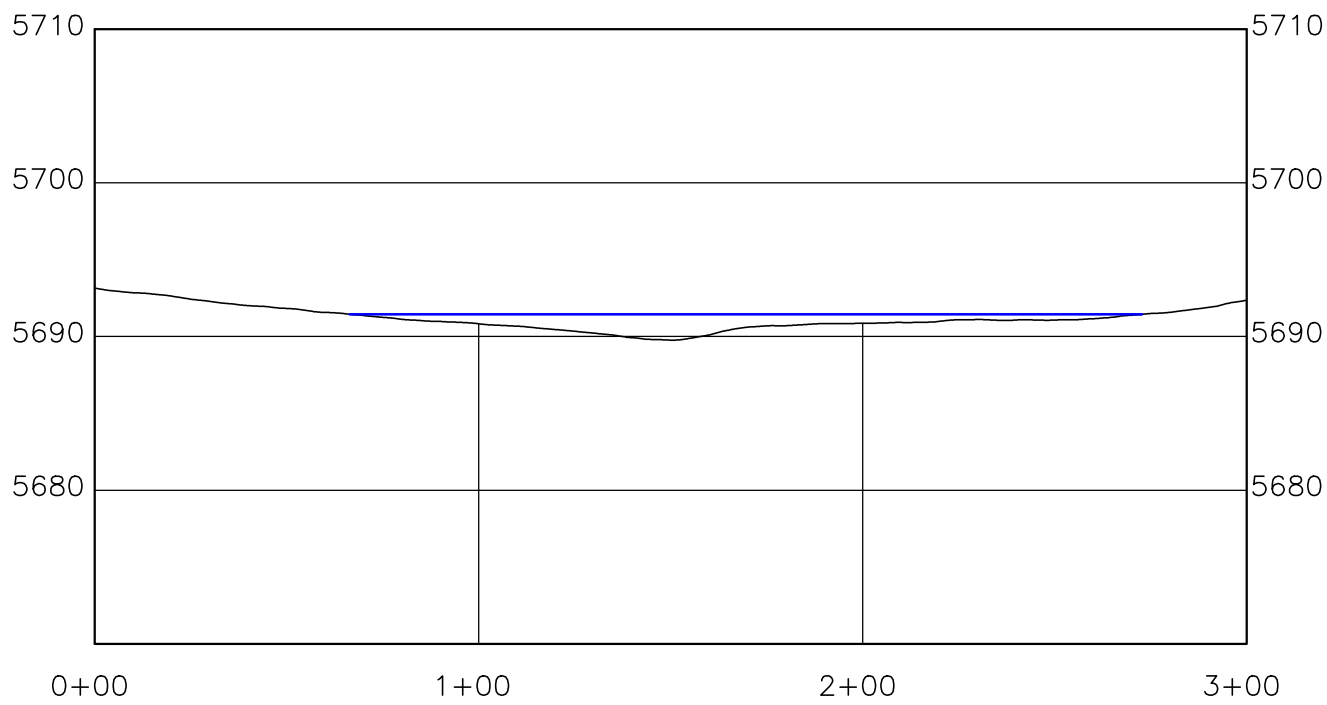
A



BASIN PROPERTIES:

MP	441.32	mi
Station	2330165.64	ft
Lat	39.7097	degrees
Long	-104.5010	degrees
Stream Name	Creek/Cost Creek/Vest Sand Creek to Middle	
FEMA FIRM Panel	08001C0960H	
RegionName	Foothills_Region_Peak_Flow_2016_5099	
AreaSqMi	0.62	mi ²
16H100Y	3.76	in
OUTLEIELEV	5690	ft
STATSCLAY	25.62	%
100YFlow	565	cfs
PRECIP	17.42	in
BSLDEM10M	3	%
CSL108SLFP	78	ft/mi
ELEV	5768	ft
RCN	60.52	
TOC	3.4	hrs

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SECTION VIEW
HORIZ. SCALE: SCALE 1:50
VERT. SCALE: 1:12.5

HYDRAULIC CALCULATIONS:

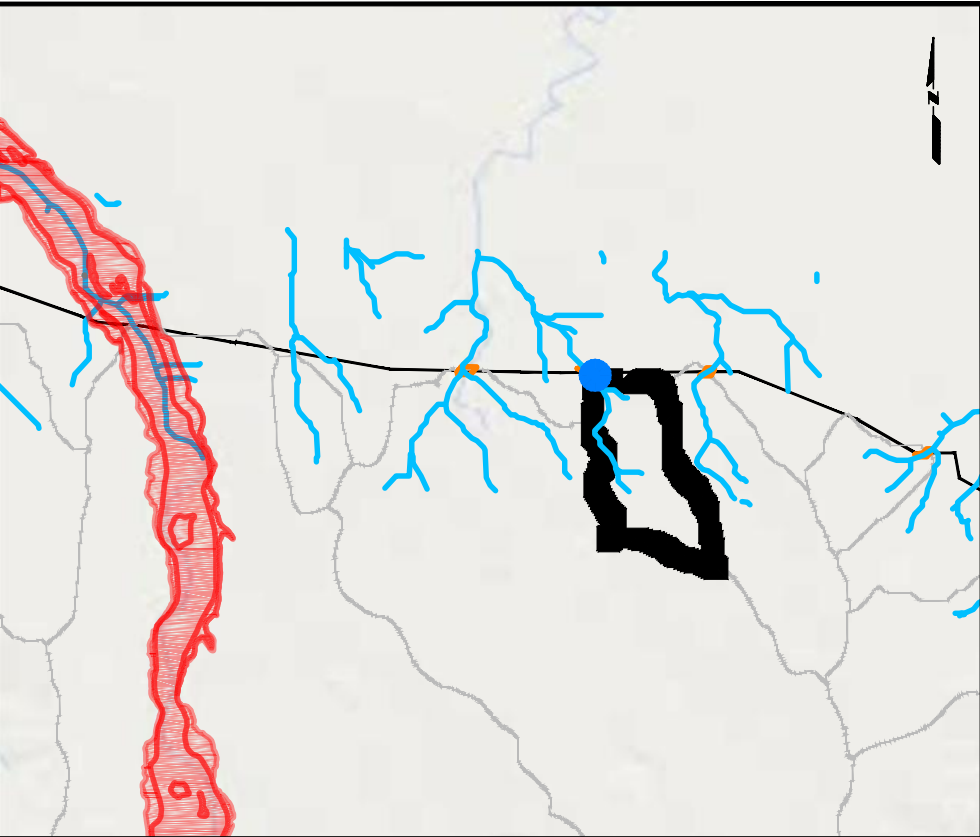
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ft/ft		ft	ft	cfs		fps	ft ²	ft	ft	ft	ft	ft	ft	kip	ft	ft	ft	ft
0.015	0.035	5689.77	1.68	572.9	0.86	4.03	142.1	206.4	206.5	0.69	0.69	1.93	1.20	15.1	5691.45	5689.76	2330164.9	1.69

NOTES:

1. Floodplain delineation based on 3DEP LIDAR digital terrain model.

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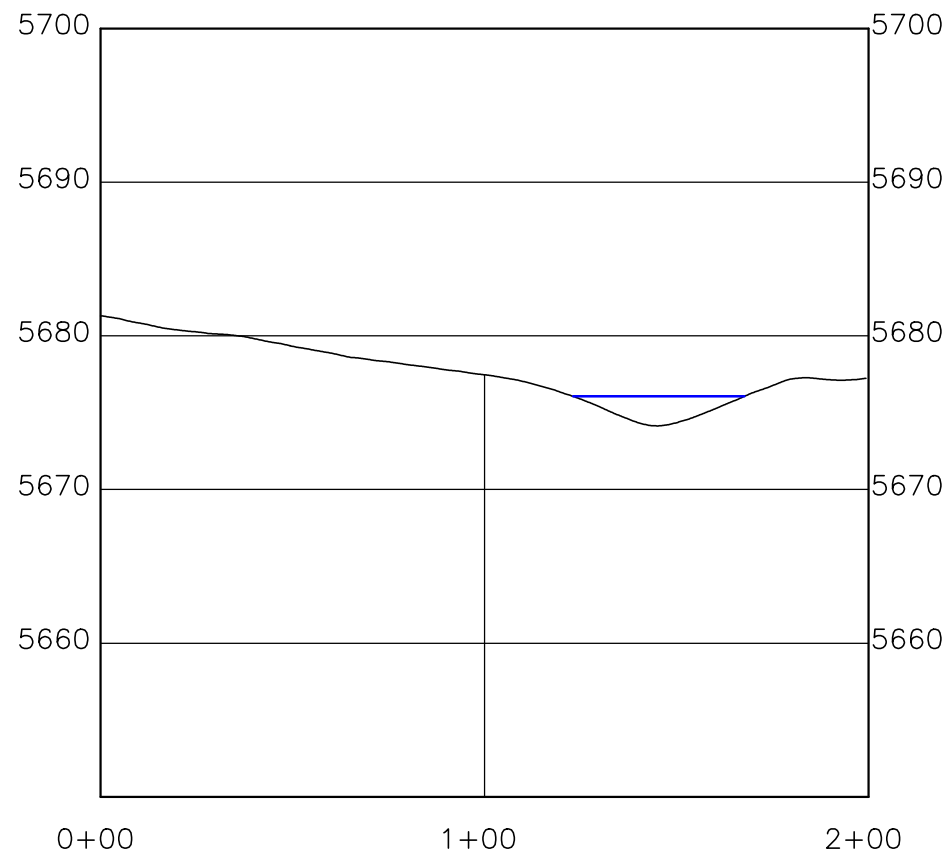
A	Issued for Review		JHH	JHH	SAS
REVISION NUMBER	ADH DRAWN BY	11-22-24 DATE REVISED	JHH CHECKED BY	JHH PROJECT ENGINEER	SAS APPROVED BY
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DENVER EXPANSION PROJECT SCOTT CITY TO DENVER PIPELINE FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 441.32 ARAPAHOE COUNTY COLORADO					
DRAWN BY	ADH	SCALE: AS NOTED	A.F.E. —		
DATE DRAWN	11-22-24	DRAWING NO.	1001-03-021		
CHECKED BY	JHH				
PROJECT ENGINEER	JHH				
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BASIN PROPERTIES:

MP	441.88	mi
Station	2333150.05	ft
Lat	39.7097	degrees
Long	-104.5110	degrees
Stream Name	Creek/Cost Creek/Vest Sand Creek to Middle	
FEMA FIRM Panel	08001C0960H	
Region Name	Foothills Region Peak Flow 2016 5099	
Area Sq Mi	0.32	mi ²
16H100Y	3.00	in
OUTLET ELEV	5680	ft
STATS CLAY	36.49	%
100Yr Flow	271	cfs
PRECIP	17.46	in
BSLDEM10M	2	%
CSL108SLFP	81.8	ft/mi
ELEV	5725	ft
RCN	68.06	
TOC	2.43	hrs

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SECTION VIEW
HORIZ. SCALE: SCALE 1:50
VERT. SCALE: 1:12.5

HYDRAULIC CALCULATIONS:

Channel Invert Slope	Roughness Coefficient	Channel Invert Elevation	Design Water Depth	Discharge	Froude Number	Flow Velocity	Flow Area	Top Width	Wetted Perimeter	Hydraulic Radius	Hydraulic Depth	Specific Energy	Centroid of Flow Area	Specific Force	BFEHGL	Low Point on CL	at Station	Predicted CL depth
ft/ft		ft	ft	cfs		fps	ft ²	ft	ft	ft	ft	ft	ft	kip	ft	ft	ft	ft
0.015	0.035	5674.14	1.92	275.9	0.95	5.63	49.0	44.5	44.7	1.10	1.10	2.41	1.20	6.7	5677.60	5676.16	2333000.9	1.44

NOTES:

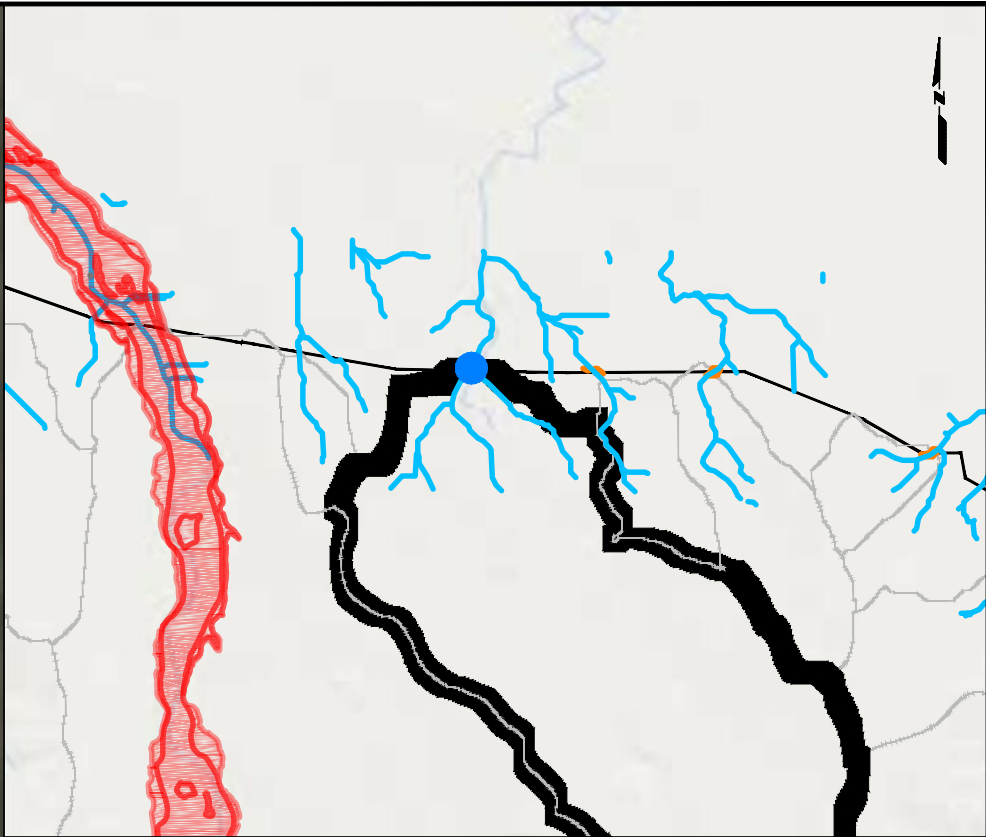
1. Floodplain delineation based on 3DEP LiDAR digital terrain model.

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FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 441.88							
ARAPAHOE COUNTY COLORADO							
DRAWN BY	ADH	SCALE: AS NOTED	A.F.E.	—	1001-03-022 A		
DATE DRAWN	11-22-24	DRAWING NO.					
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PROJECT ENGINEER	JHH						
APPROVED BY	SAS						

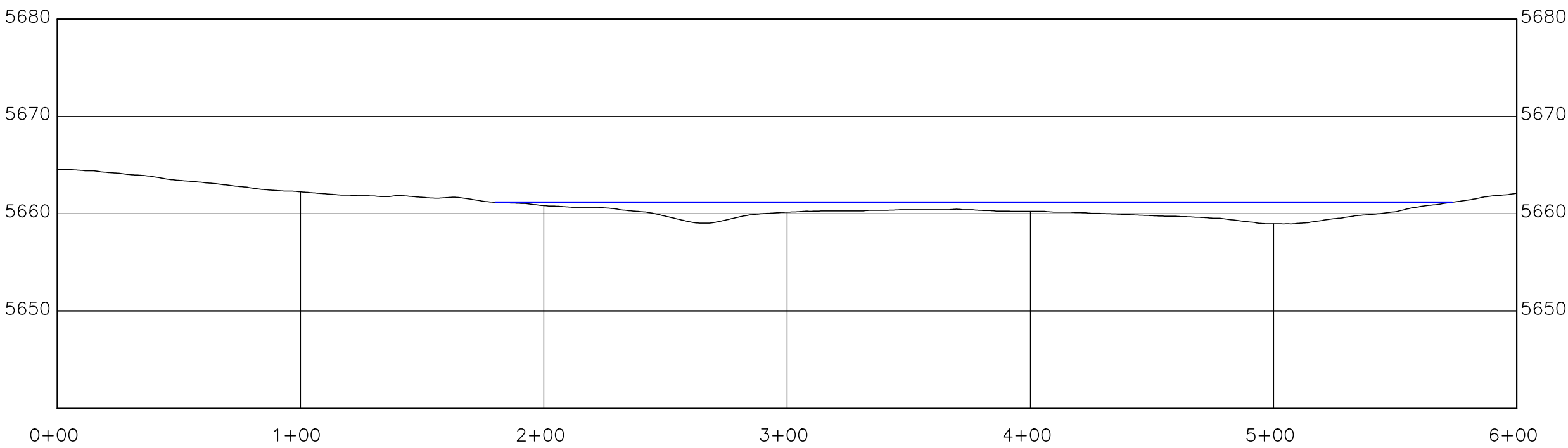
1001-03-022

A



BASIN PROPERTIES:

MP	442.48	mi
Station	2336312.42	ft
Lat	39.7099	degrees
Long	-104.5230	degrees
Stream Name	Sand Creek to Middle South Platte-Cherry Creek	
FEMA FIRM Panel	08001C0960H	
Region Name	Foothills Region Peak Flow 2016 5099	
Area Sq Mi	3.62	mi ²
16H100Y	3.75	in
OUTLET ELEV	5661	ft
STATS CLAY	28.03	%
100Y Flow	1720	cfs
PRECIP	17.64	in
BSLDEM10M	3	%
CSL108SLFP	49.7	ft/mi
ELEV	5764	ft
FCN	68.33	
TOC	4.78	hrs



HYDRAULIC CALCULATIONS:

Channel Invert Slope	Roughness Coefficient	Channel Invert Elevation	Design Water Depth	Discharge	Froude Number	Flow Velocity	Flow Area	Top Width	Wetted Perimeter	Hydraulic Radius	Hydraulic Depth	Specific Energy	Centroid of Flow Area	Specific Force	BFEHGL	Low Point on CL	at Station	Predicted CL depth
ft/ft		ft	ft	cfs		fps	ft ²	ft	ft	ft	ft	ft	ft	kip	ft	ft	ft	ft
0.009	0.04	5658.97	2.22	1726.7	0.65	3.91	442.1	393.4	393.5	1.12	1.12	2.46	1.52	55.1	5661.19	5659.09	2336347.9	2.10

NOTES:

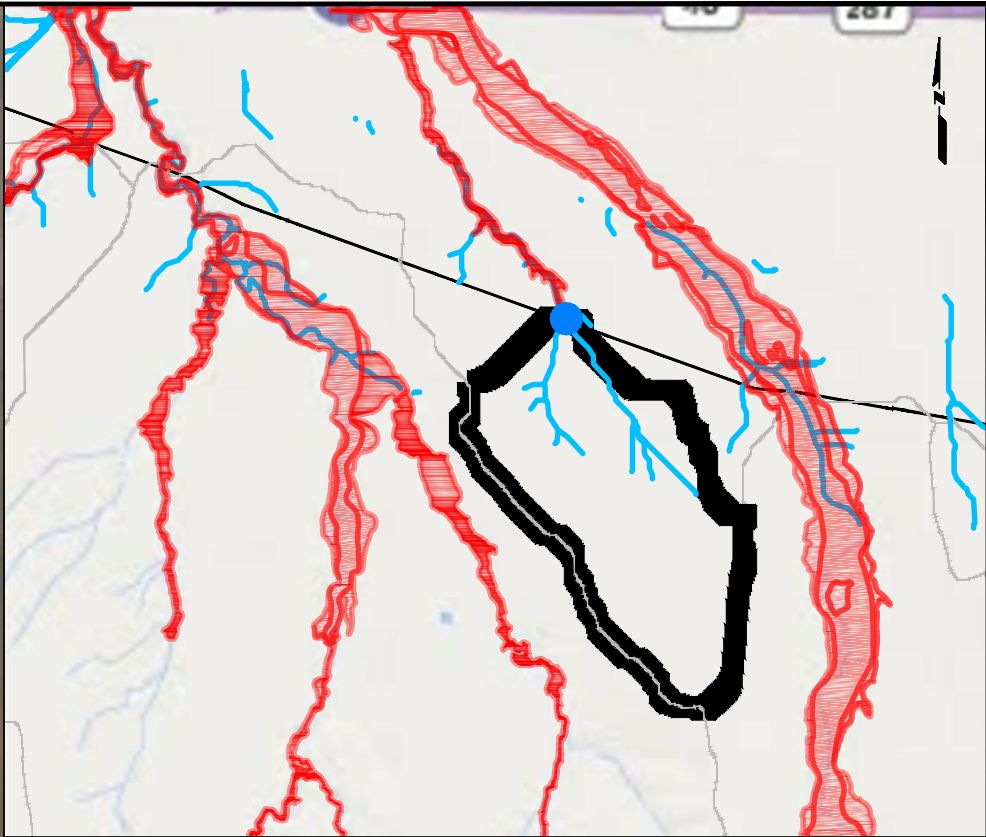
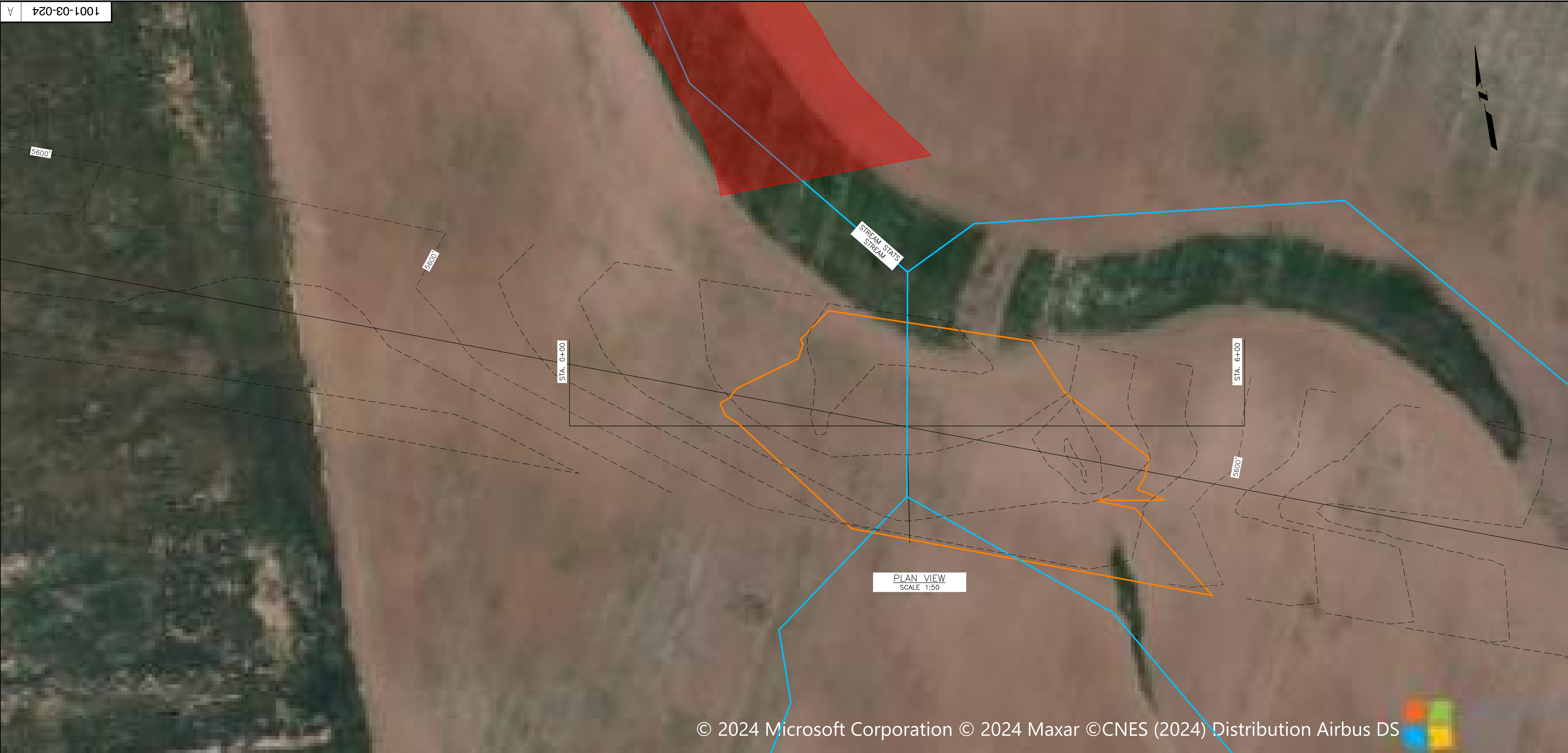
1. Floodplain delineation based on 3DEP LiDAR digital terrain model.

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DENVER EXPANSION PROJECT SCOTT CITY TO DENVER PIPELINE FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 442.48 ARAPAHOE COUNTY COLORADO					
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DATE DRAWN	11-22-24	DRAWING NO.	1001-03-023		
CHECKED BY	JHH				
PROJECT ENGINEER	JHH				
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1001-03-023

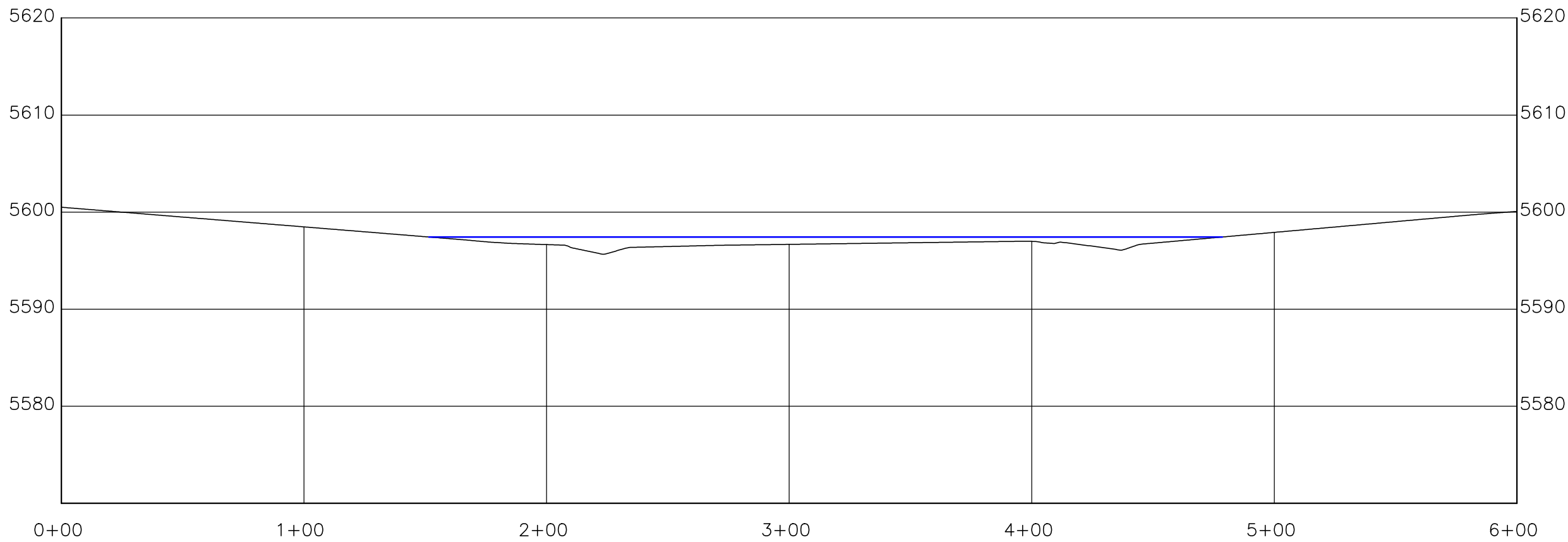
A



BASIN PROPERTIES:

MP	445.20	mi
Station	2350657.75	ft
Lat	39.7181	degrees
Long	-104.5720	degrees
Stream Name	Law to Box Elder Creek to Middle South Platte	
FEMA FIRM Panel	08001C0975H	
Region Name	Foothills Region Peak Flow 2016 5099	
Area Sq Mi	1.35	mi ²
16H100Y	3.73	in
OUTLET ELEV	5593	ft
STATS CLAY	25.19	%
100Y Flow	900	cfs
PRECIP	17.82	in
BSLDEM10M	2	%
CSL108SLFP	89	ft/mi
ELEV	5677	ft
RCN	79.45	
TOC	2.76	hrs

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HYDRAULIC CALCULATIONS:

Channel Invert Slope	Roughness Coefficient	Channel Invert Elevation	Design Water Depth	Discharge	Froude Number	Flow Velocity	Flow Area	Top Width	Wetted Perimeter	Hydraulic Radius	Hydraulic Depth	Specific Energy	Centroid of Flow Area	Specific Force	BFEHGL	Low Point on CL	at Station	Predicted CL depth
ft/ft		ft	ft	cfs		fps	ft ²	ft	ft	ft	ft	ft	ft	kip	ft	ft	ft	ft
0.017	0.04	5595.67	1.77	909.1	0.81	3.87	234.6	327.1	327.1	0.72	0.72	2.00	1.34	26.4	5597.44	5595.61	2350507.9	1.82

NOTES:

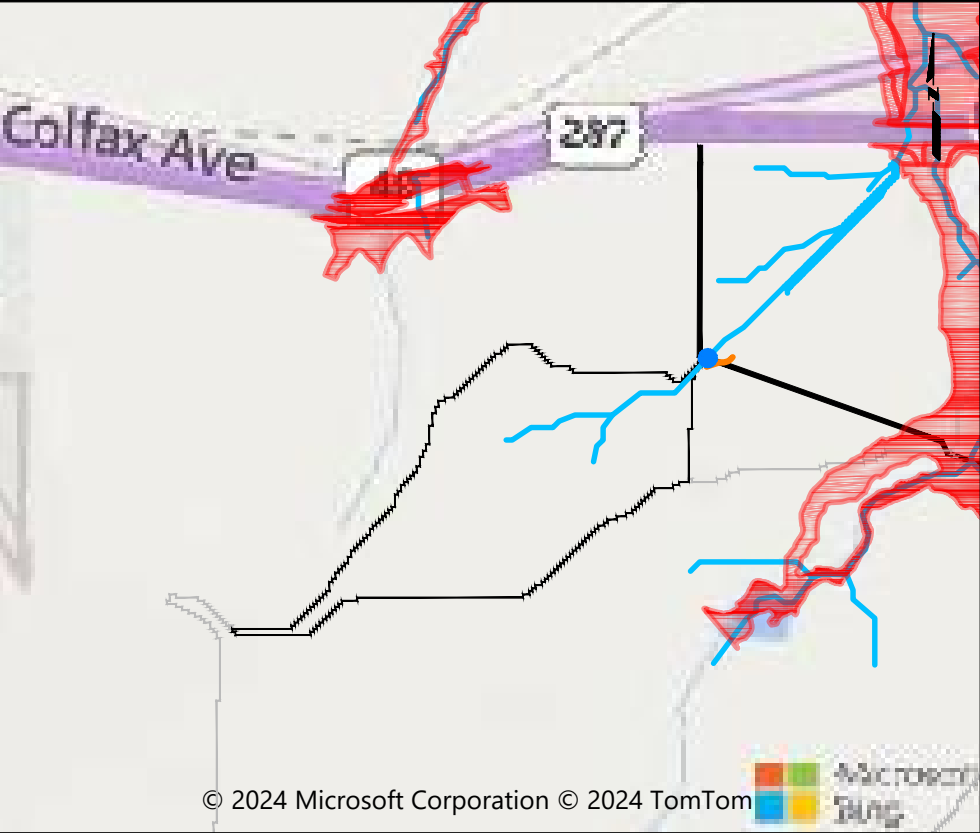
1. Hydraulic gradeline based on cross section from civil survey from July-August 2024.

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DENVER EXPANSION PROJECT SCOTT CITY TO DENVER PIPELINE FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 445.20 ARAPAHOE COUNTY COLORADO					
DRAWN BY	ADH	SCALE: AS NOTED	A.F.E.	—	
DATE DRAWN	11-22-24	DRAWING NO.	1001-03-024		
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PROJECT ENGINEER	JHH				
APPROVED BY	SAS				
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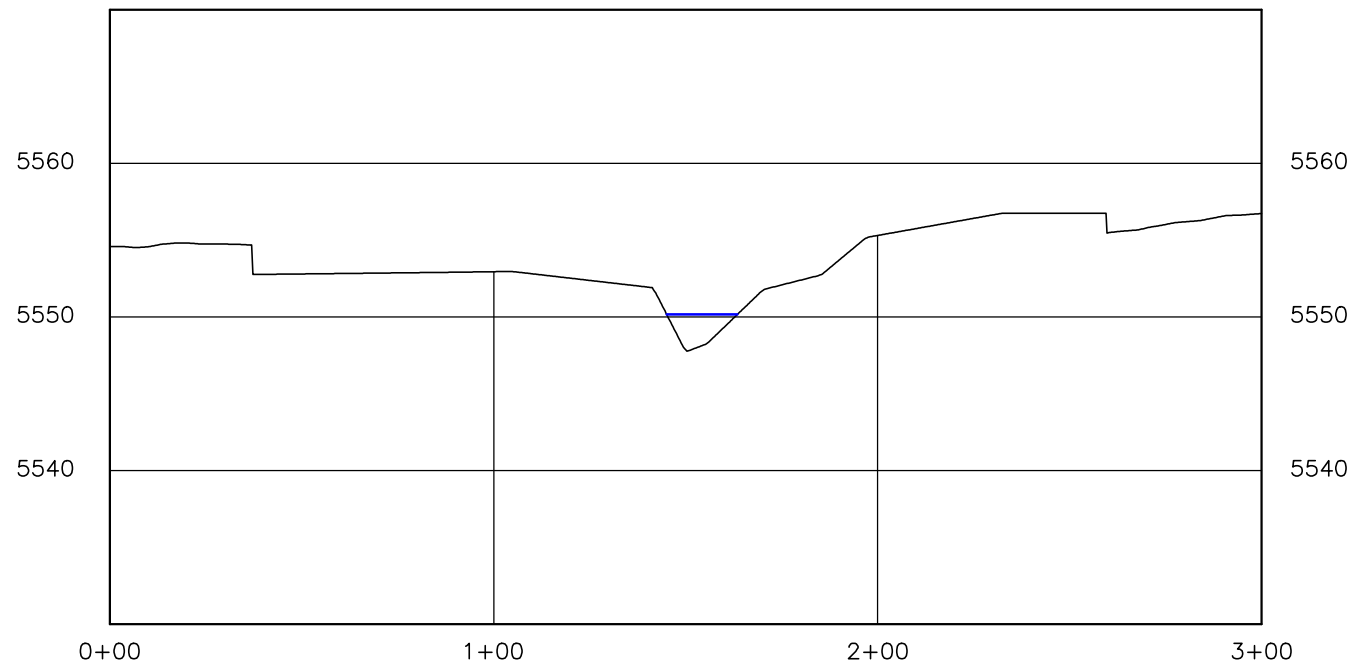
1001-03-024

A



BASIN PROPERTIES:

MP	448.22	mi
Station	2366585.78	ft
Lat	39.7337	degrees
Long	-104.6250	degrees
Stream Name	Unnamed Tributary to Coyote Run to Middle South Platte-Cherry Creek	
FEMA FIRM Panel	08001C0951J	
Region Name	Foothills_Region_Peak_Flow_2016_5099	
Area Sq Mi	0.23	mi ²
I6H100Y	3.00	in
OUTLET ELEV	5560	ft
STATS CLAY	25.3	%
100Yr Flow	167	cfs
PRECIP	17.94	in
BSLDEM10M	2	%
CSL1085LFP	110.4	ft/mi
ELEV	5605	ft
RCN	84.88	
TOC	1.37	hrs



SECTION VIEW
HORIZ. SCALE: SCALE 1:100
VERT. SCALE: 1:25

HYDRAULIC CALCULATIONS:

Channel Invert Slope	Roughness Coefficient	Channel Invert Elevation	Design Water Depth	Discharge	Froude Number	Flow Velocity	Flow Area	Top Width	Wetted Perimeter	Hydraulic Radius	Hydraulic Depth	Specific Energy	Centroid of Flow Area	Specific Force	BFEHGL	Low Point on CL	at Station	Predicted CL depth
ft/ft		ft	ft	cfs		fps	ft ²	ft	ft	ft	ft	ft	ft	kip	ft	ft	ft	ft
0.021	0.04	5547.77	2.39	169.3	0.98	6.56	25.8	18.4	19.2	1.35	1.40	3.06	1.49	4.6	5550.16	5548.90	2366450.9	1.25

NOTES:

- Hydraulic gradeline based on cross section from civil survey from July-August 2024.
- Floodplain delineation based on 3DEP LIDAR digital terrain model.

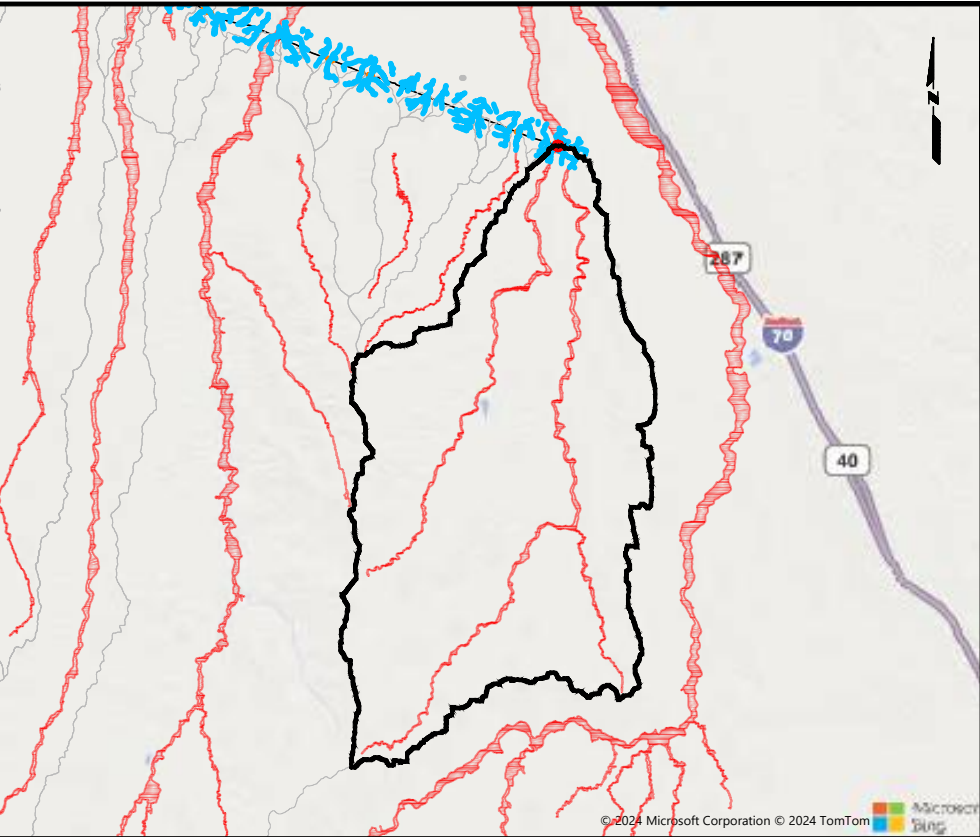
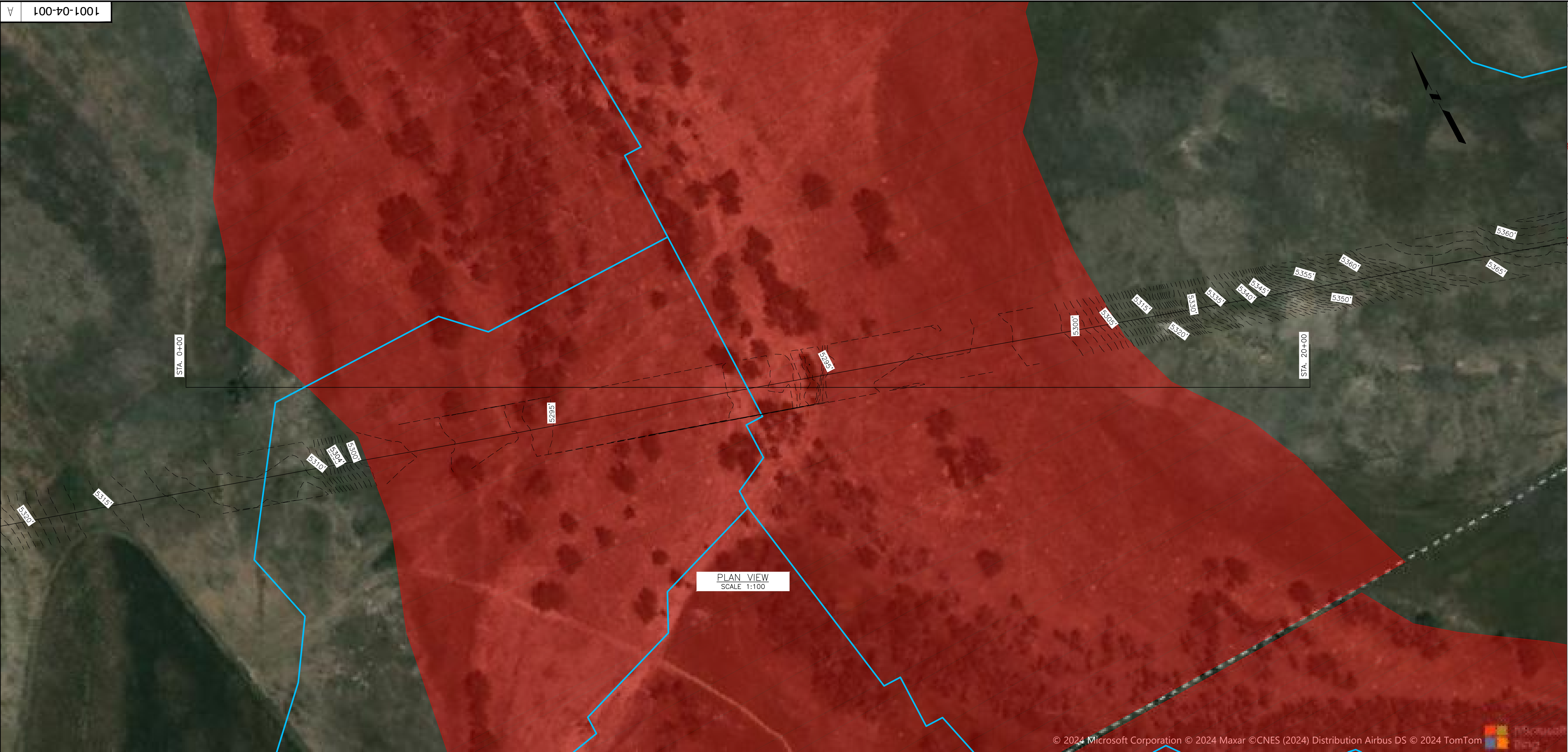
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DRAWN BY	ADH	SCALE: AS NOTED	A.F.E.	280-2024-3720		
DATE DRAWN	11-22-24	DRAWING NO. 1001-03-025				
CHECKED BY	JHH					
PROJECT ENGINEER	JHH					
APPROVED BY	SAS					
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1001-03-025

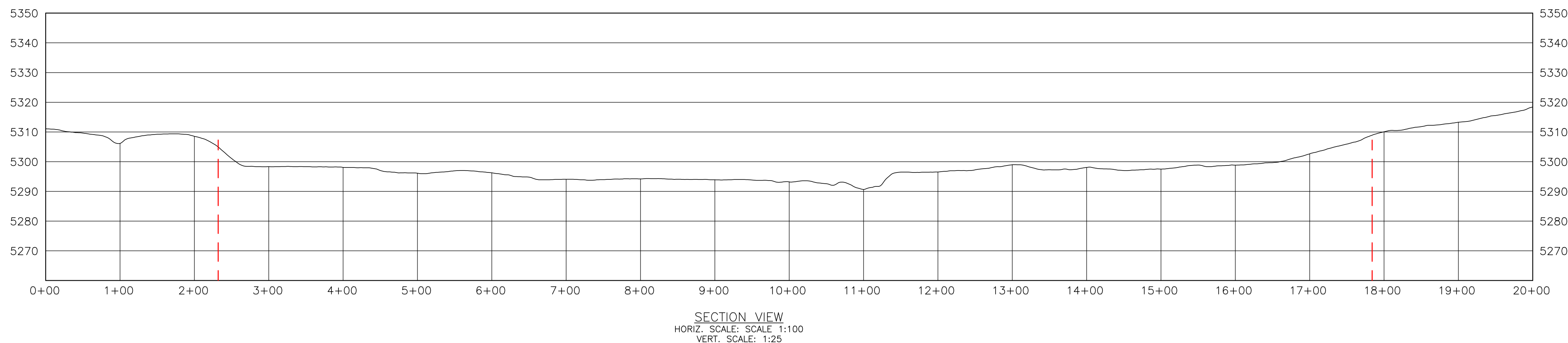
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Appendix D – FEMA Floodplain Delineation Drawings



BASIN PROPERTIES:

MP	416.60	mi
Station	2199653.56	ft
Lat	39.5681	degrees
Long	-104.0800	degrees
Stream Name	Middle Bijou Creek	
FEMA FIRM Panel	08005C0650K	
Region Name	Foothills_Region_Peak_Flow_2016_5099	
Area Sq Mi	138.71	mi ²
16H100Y	4.03	in
OUTLET ELEV	5293	ft
STATS CLAY	20.42	%
100Yr Flow	16100	cfs
PRECIP	17.01	in
BSLDEM10M	6	%
CSL108SLFP	21.5	ft/mi
ELEV	5816	ft
RCN	61.72	
TOC	25.4	hrs



- NOTES:
- Showing extent of FEMA 100 Year Floodplain Delineation boundaries
 - Elevations based on 3DEP LIDAR digital terrain model.

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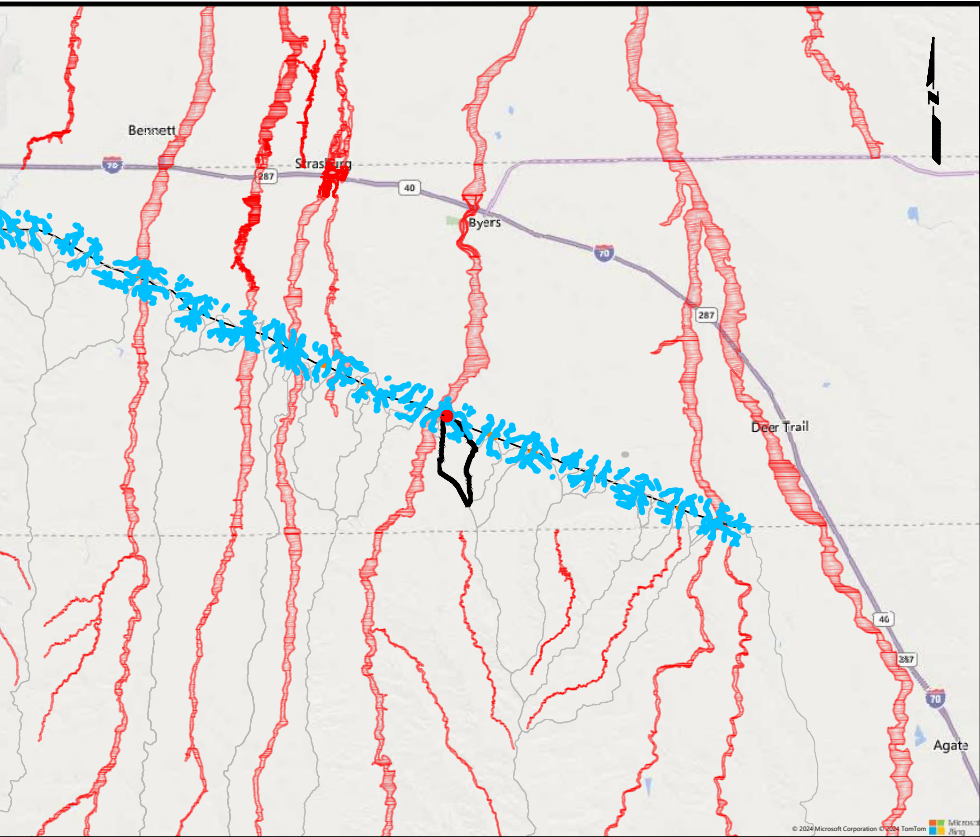
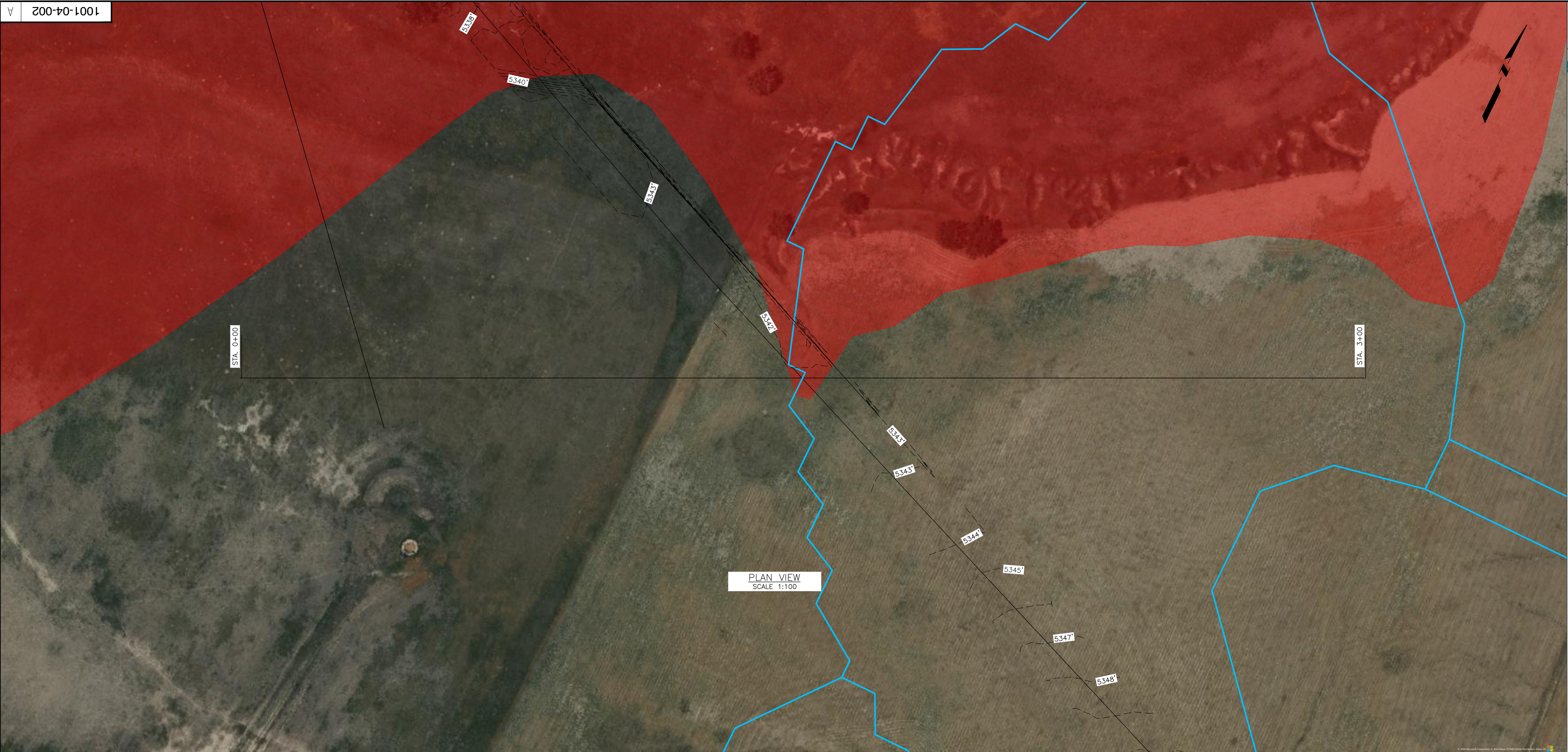
DENVER EXPANSION PROJECT SCOTT CITY TO DENVER PIPELINE FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 416.60 ARAPAHOE COUNTY COLORADO			
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DATE DRAWN	11-22-24	DRAWING NO.		
CHECKED BY	JHH	1001-04-001		
PROJECT ENGINEER	JHH			
APPROVED BY	SAS			

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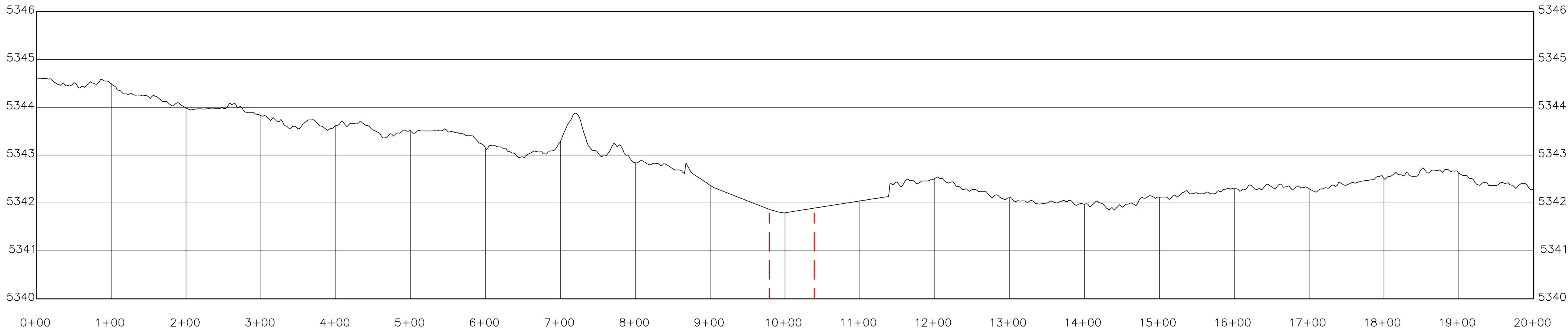
1001-04-001

A



BASIN PROPERTIES:

MP	426.24	mi
Station	2250546.03	ft
Lat	39.6195	degrees
Long	-104.2480	degrees
Stream Name	Unnamed Tributary to West Bijou Creek	
FEMA FIRM Panel	08005C0625K	
RegionName	Foothills Region Peak Flow 2016 5099	
AreaSqMi	1.88	mi ²
16H100Y	3.94	in
OUTLET ELEV	5340	ft
STATSCLAY	19.42	%
100YFlow	1180	cfs
PRECIP	16.27	in
BSLDEM10M	2	%
CSL108SLFP	48.1	ft/mi
ELEV	5460	ft
RCN	76.54	
TOC	5.24	hrs



SECTION VIEW
HORIZ. SCALE: SCALE 1:100
VERT. SCALE: 1:25

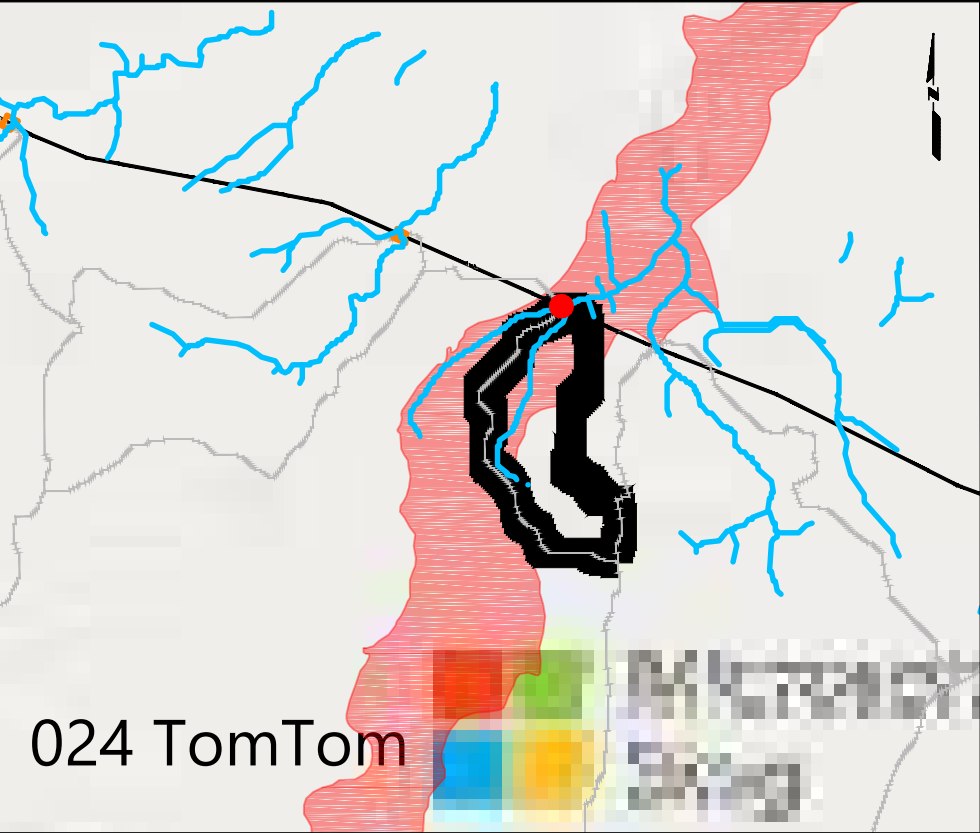
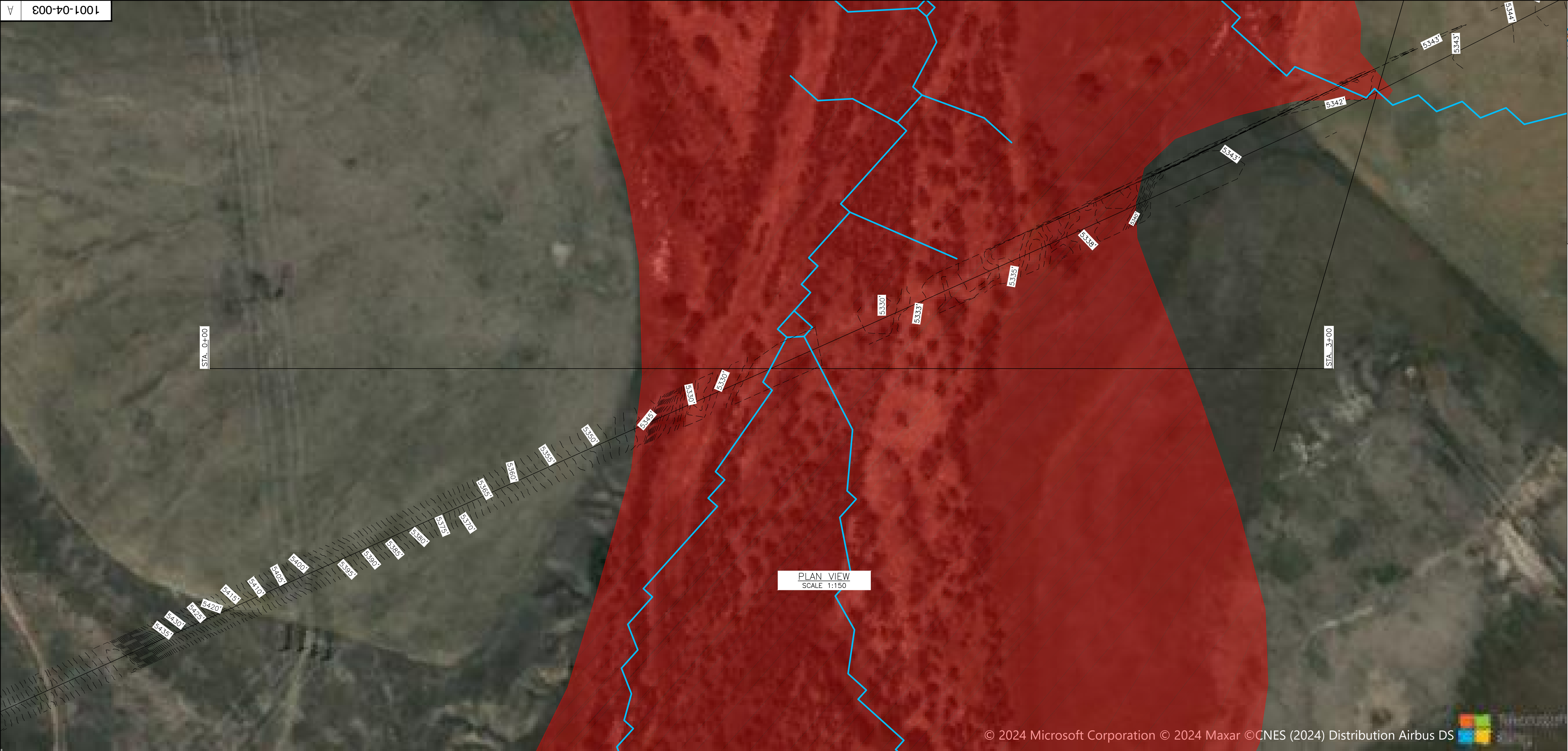
NOTES:

- Showing extent of FEMA 100 Year Floodplain Delineation boundaries
- Elevations based on 3DEP LIDAR digital terrain model.

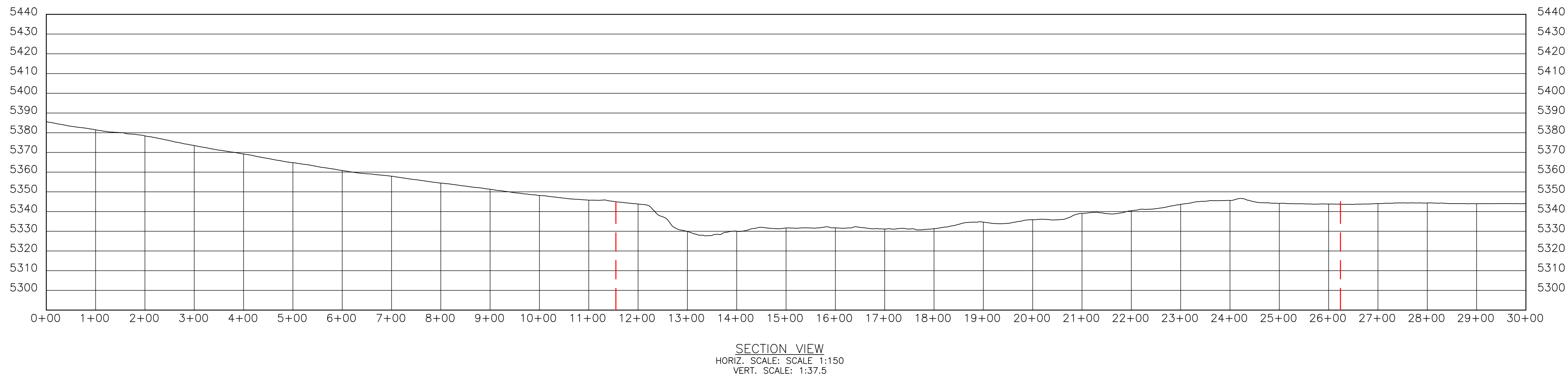
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FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 426.24 ARAPAHOE COUNTY COLORADO					
DRAWN BY	ADH	SCALE: AS NOTED	A.F.E.	—	
DATE DRAWN	11-22-24	DRAWING NO.			
CHECKED BY	JHH	1001-04-002			
PROJECT ENGINEER	JHH				
APPROVED BY	SAS				

A



BASIN PROPERTIES:		
MP	426.58	mi
Station	2252327.22	ft
Lat	39.6214	degrees
Long	-104.2540	degrees
Stream Name	West Bijou Creek	
FBMA FIRM Panel	08005C0600K	
RegionName	Foothills_Region_Peak_Flow_2016_5099	
AreaSqM	252.13	mi ²
IGH100Y	3.90	in
OUTLETELEV	5333	ft
STATSCLAY	25.14	%
100YrFlow	24500	cfs
PRECIP	18	in
BSLDEM10M	7	%
CSL1085LFP	19.2	ft/mi
ELEV	6105	ft
RCN	64.89	
TOC	35.05	hrs

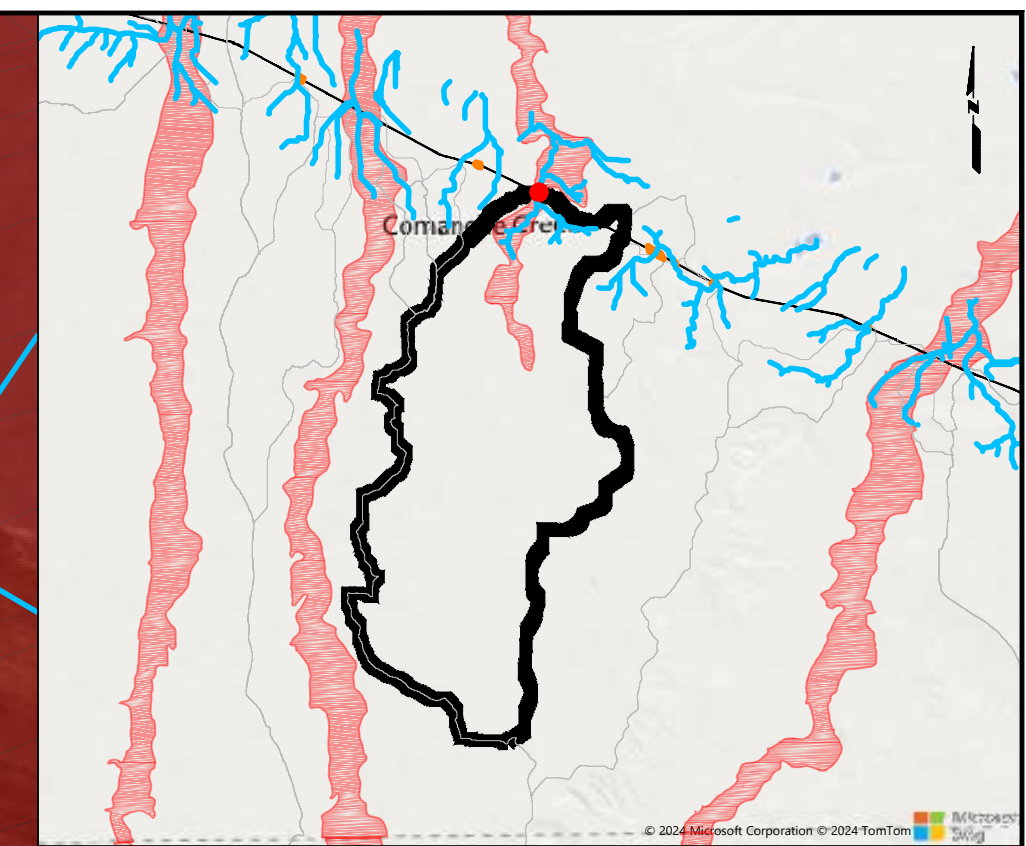
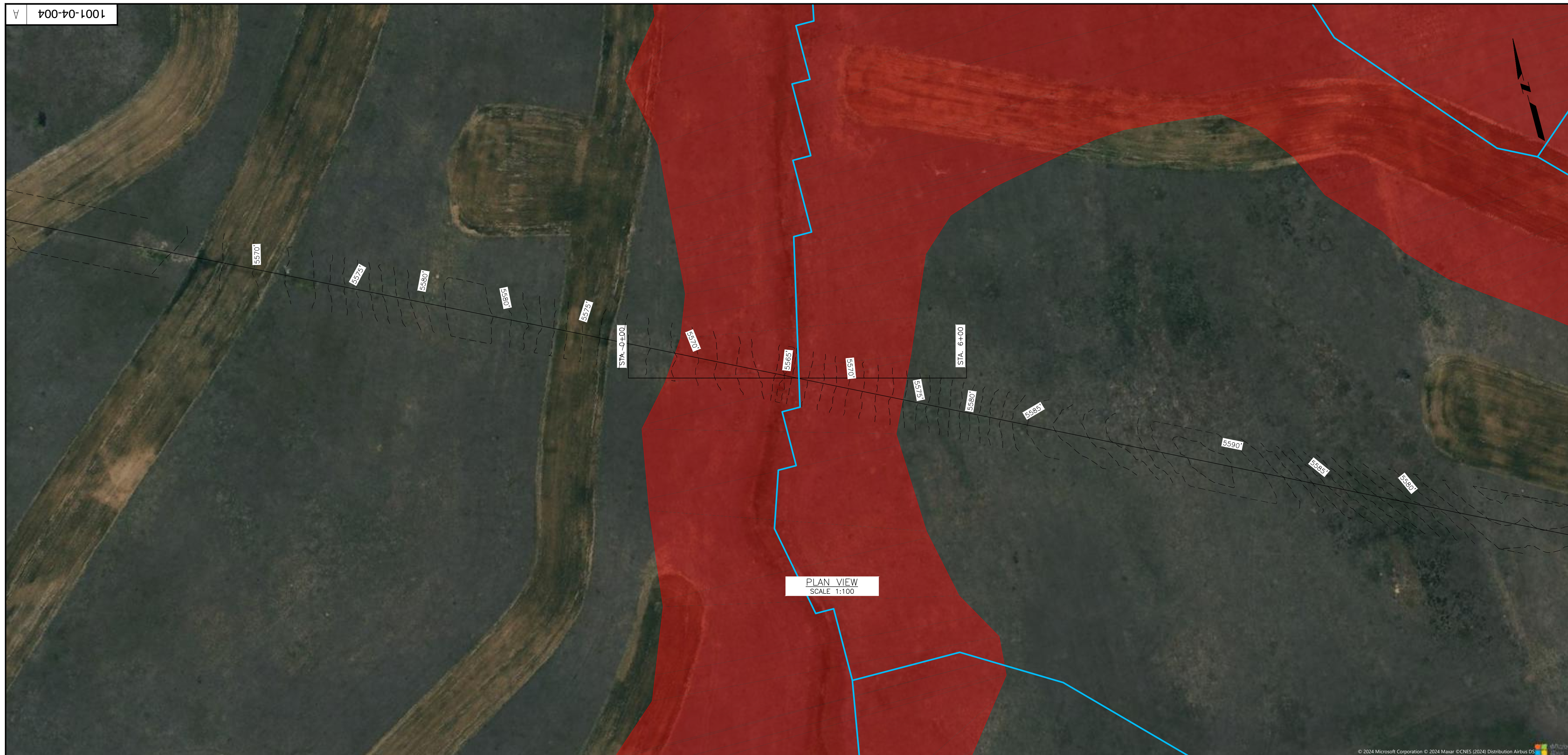


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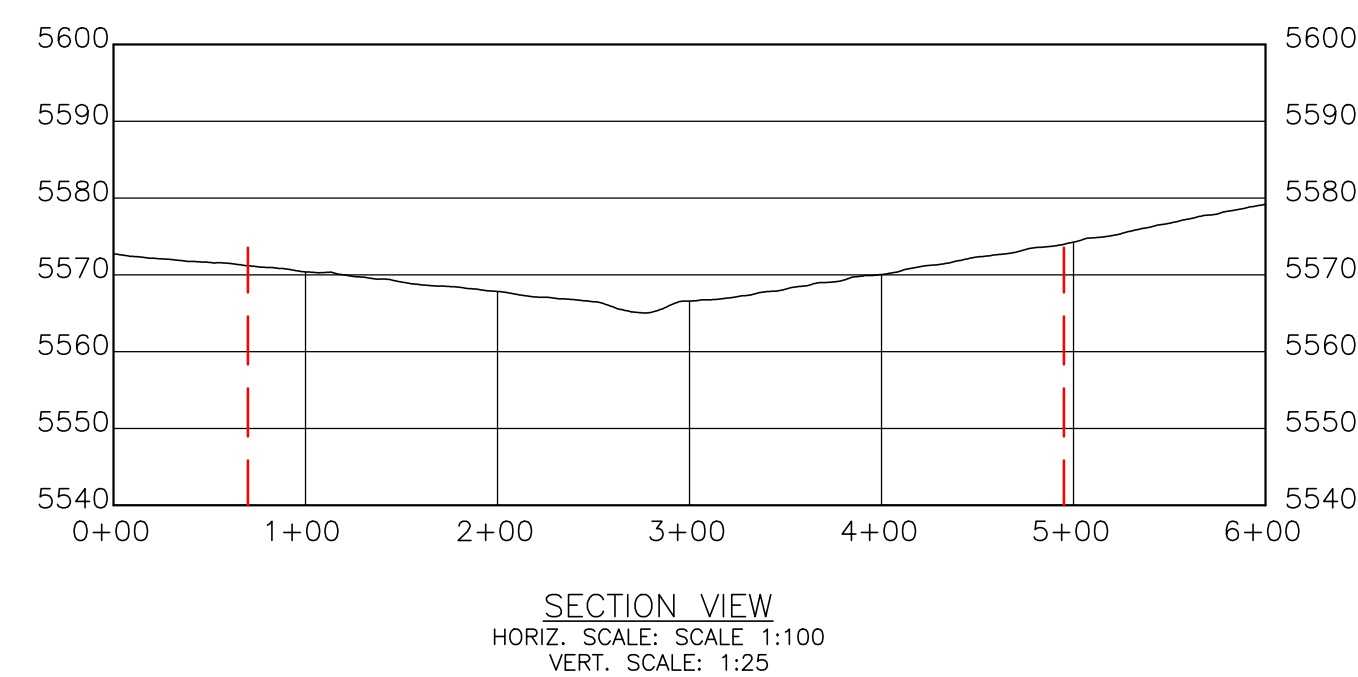
- Showing extent of FEMA 100 Year Floodplain Delineation boundaries
- Elevations based on 3DEP LIDAR digital terrain model.

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REVISION NUMBER	ADH DRAWN BY	11-22-24 DATE REVISED	JHH CHECKED BY	JHH PROJECT ENGINEER	SAS APPROVED BY	
 MAGELLAN[®] MIDSTREAM PARTNERS, L.P.						
DENVER EXPANSION PROJECT SCOTT CITY TO DENVER PIPELINE						
FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 426.58 ARAPAHOE COUNTY COLORADO						
DRAWN BY	ADH	SCALE: AS NOTED	A.F.E.	—		
DATE DRAWN	11-22-24	DRAWING NO.				
CHECKED BY	JHH	1001-04-003				
PROJECT ENGINEER	JHH					
APPROVED BY	SAS					
A						



<u>BASIN PROPERTIES:</u>		
MP	430.09	<i>mi</i>
Station	2270865.45	<i>ft</i>
Lat	39.6411	<i>degrees</i>
Long	-104.3140	<i>degrees</i>
Little Comanche Creek to Comanche Creek to		
Stream Name	Kiowa Creek	
FEMA FIRMPanel	08001C1025H	
RegionName	Foothills_Region_Peak_Flow_2016_5099	
AreaSqMi	6.15	<i>mi</i> ²
I6H100Y	3.87	<i>in</i>
OUTLETLEV	5566	<i>ft</i>
STATSLAY	17.61	<i>ft</i>
100YFlow	1710	<i>cfs</i>
PRECIP	16.85	<i>in</i>
BSLDEM10M	1	<i>%</i>
CSL108SLFP	34.1	<i>ft/mi</i>
ELEV	5654	<i>ft</i>
RCN	71.39	
TOC	10.49	<i>hrs</i>

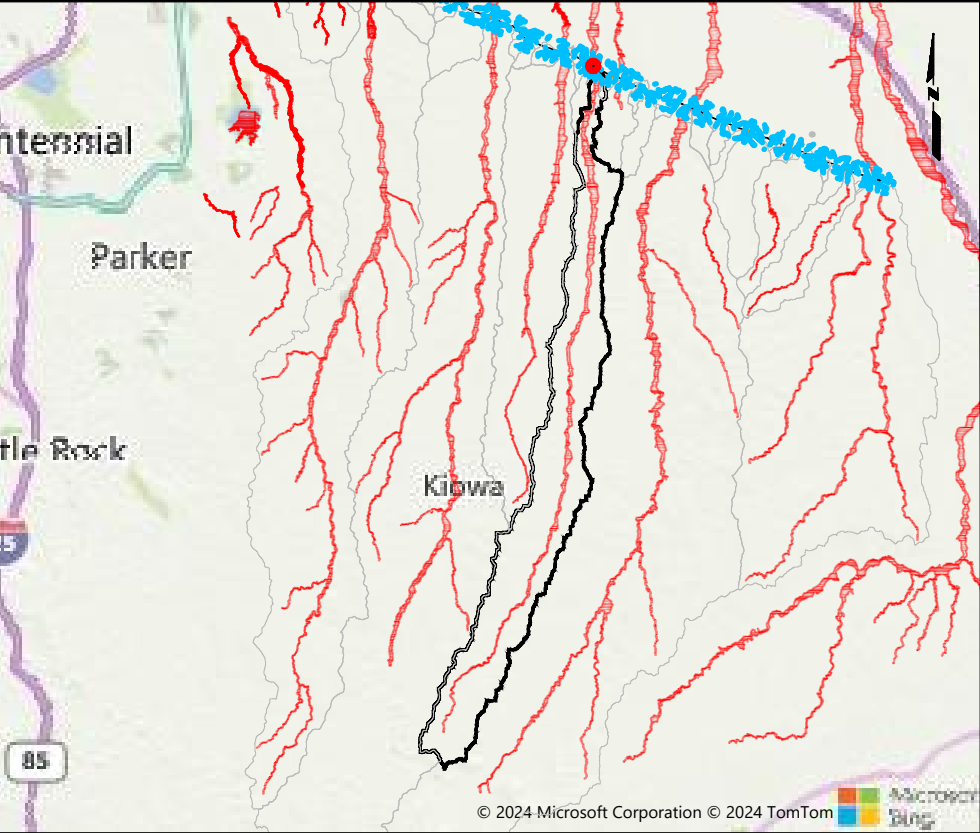
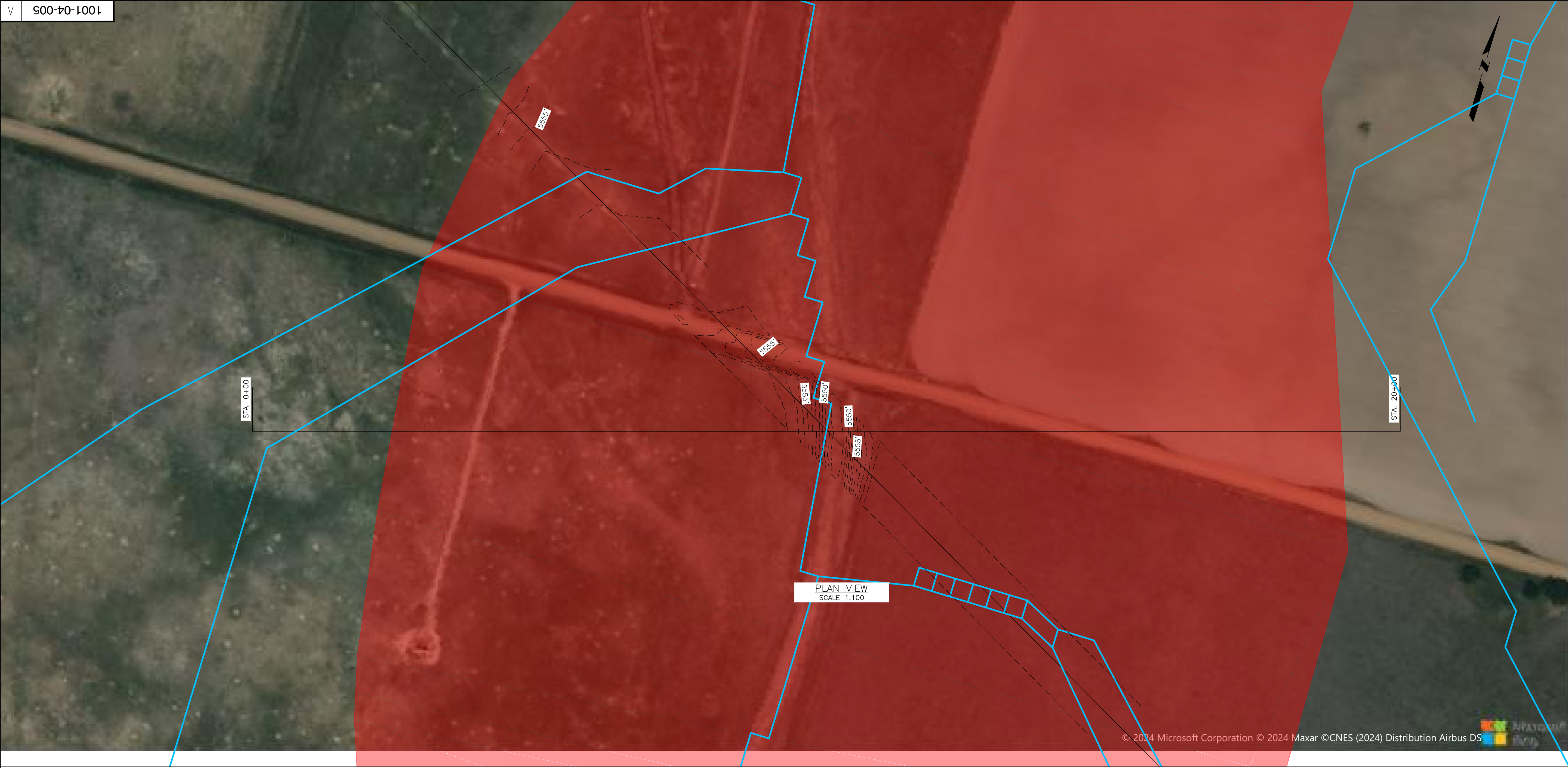


NOTES:

1. Showing extent of FEMA 100 Year Floodplain Delineation boundaries
2. Elevations based on 3DEP LiDAR digital terrain model.

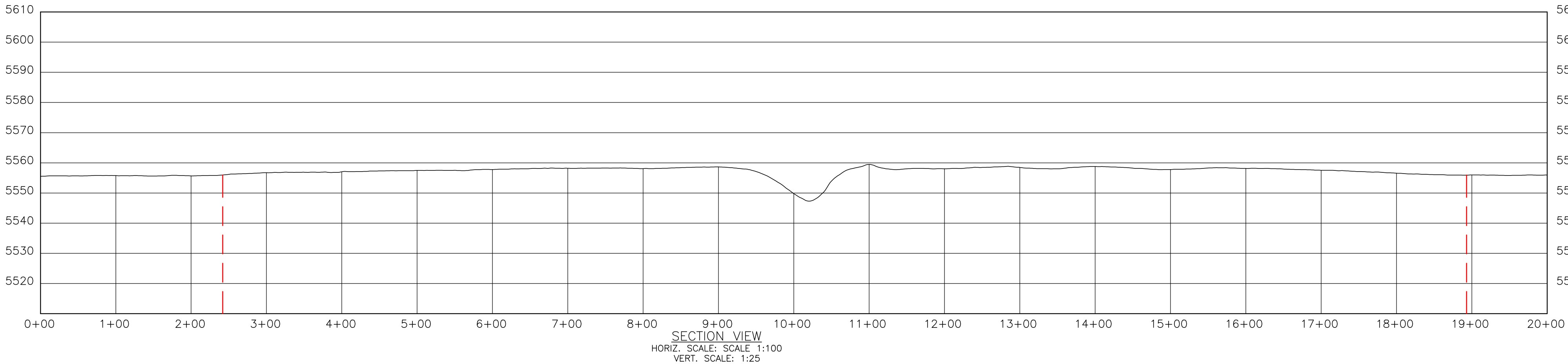
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DENVER EXPANSION PROJECT SCOTT CITY TO DENVER PIPELINE FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 430.09 ARAPAHOE COUNTY COLORADO						
DRAWN BY	ADH	SCALE: AS' NOTED	A.F.E.	—		
DATE DRAWN	11-22-24	DRAWING NO.				
CHECKED BY	JHH	1001-04-004				
PROJECT ENGINEER	JHH					
APPROVED BY	SAS					
A						



BASIN PROPERTIES:

MP	431.73	mi
Station	2279511.26	ft
Lat	39.6512	degrees
Long	-104.3420	degrees
Stream Name	Comanche Creek to Kiowa Creek	
FEMA FIRM Panel	08001C1025H	
RegionName	Foothills_Region_Peak_Flow_2016_5099	
AreaSqM	75.45	mi ²
16H100Y	3.82	in
OUTLET ELEV	5552	ft
STATSCLAY	15.18	%
100YFlow	5960	cfs
PRECIP	18.67	in
BSLDEM10M	5	%
CSL108SLFP	29	ft/mi
ELEV	6342	ft
FCN	59.39	
TOC	35.52	hrs

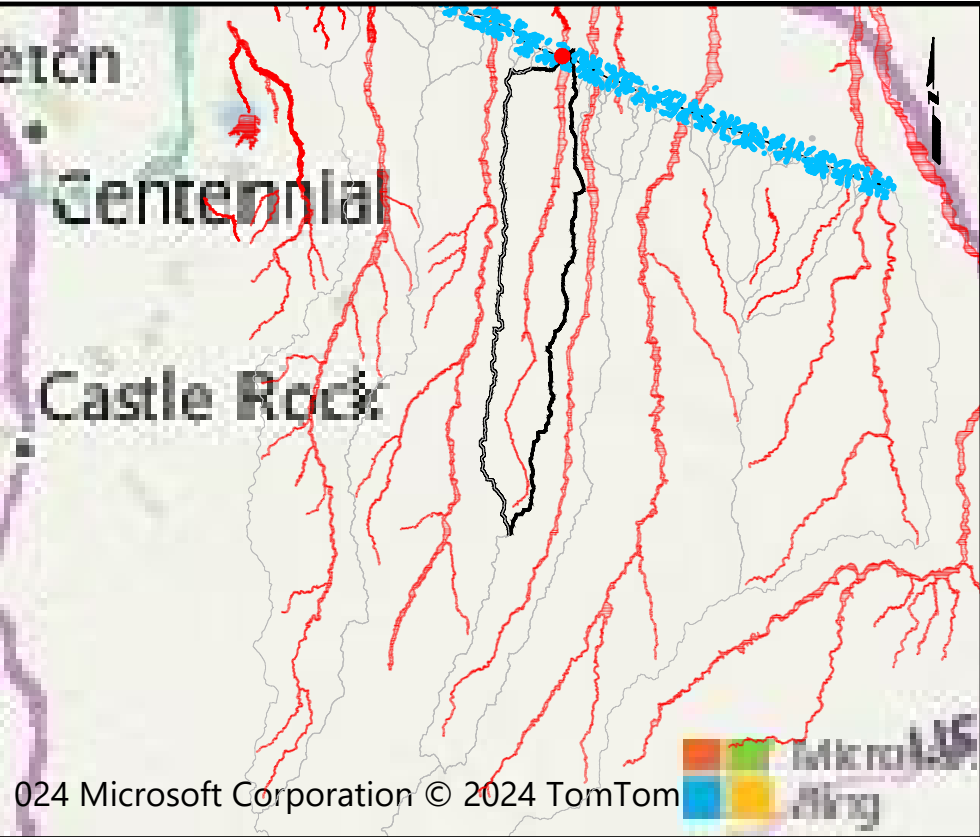
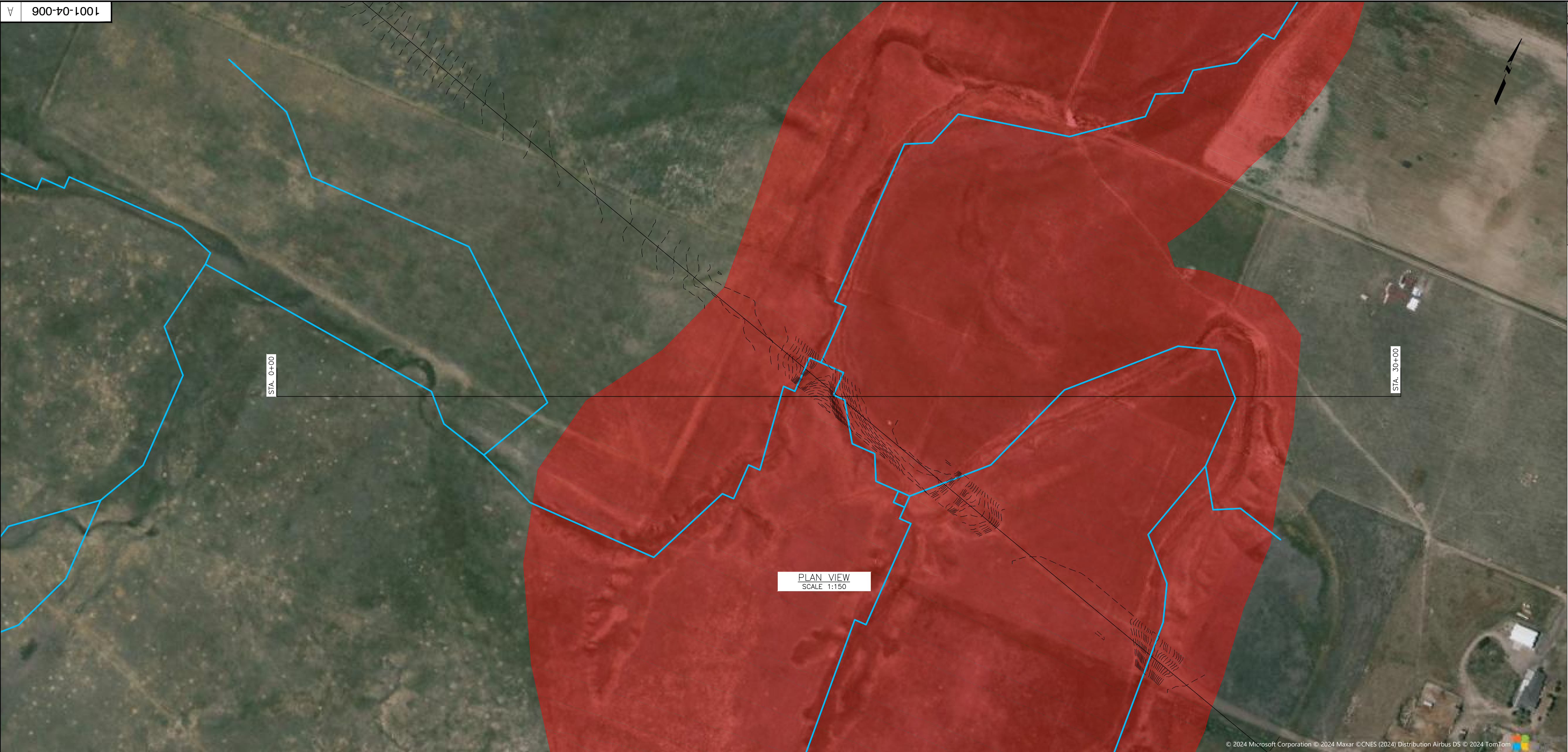


NOTES:

- Showing extent of FEMA 100 Year Floodplain Delineation boundaries
- Elevations based on 3DEP LIDAR digital terrain model.

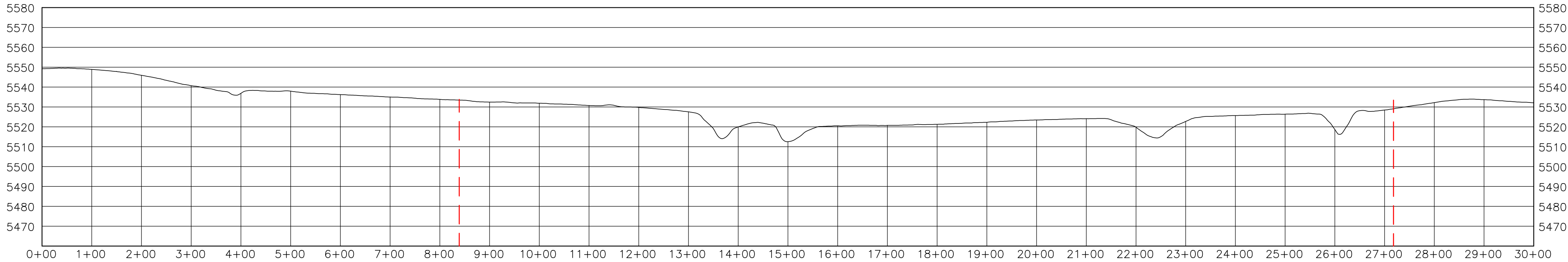
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REVISION NUMBER	ADH DRAWN BY	11-22-24 DATE REVISED	JHH CHECKED BY	JHH PROJECT ENGINEER	SAS APPROVED BY	
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DENVER EXPANSION PROJECT SCOTT CITY TO DENVER PIPELINE						
FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 431.73 ARAPAHOE COUNTY COLORADO						
DRAWN BY	ADH	SCALE: AS NOTED	A.F.E.	—		
DATE DRAWN	11-22-24	DRAWING NO.				
CHECKED BY	JHH	1001-04-005				
PROJECT ENGINEER	JHH					
APPROVED BY	SAS					
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BASIN PROPERTIES:

MP	433.42	mi
Station	2288458.79	ft
Lat	39.6614	degrees
Long	-104.3700	degrees
Stream Name	Wolf Creek to Kiowa Creek	
FEMA FIRMPanel	08001C1025H	
RegionName	Foothills_Region_Peak_Flow_2016_5099	
AreaSqMi	68.04	mi ²
16H100Y	3.79	in
OUTLET ELEV	5518	ft
STATSCLAY	17.63	%
100YFlow	6520	cfs
PRECIP	18.08	in
BSLDEM10M	4	%
CSL108SLFP	28.6	ft/mi
ELEV	5988	ft
RCN	64.01	
TOC	26.2	hrs



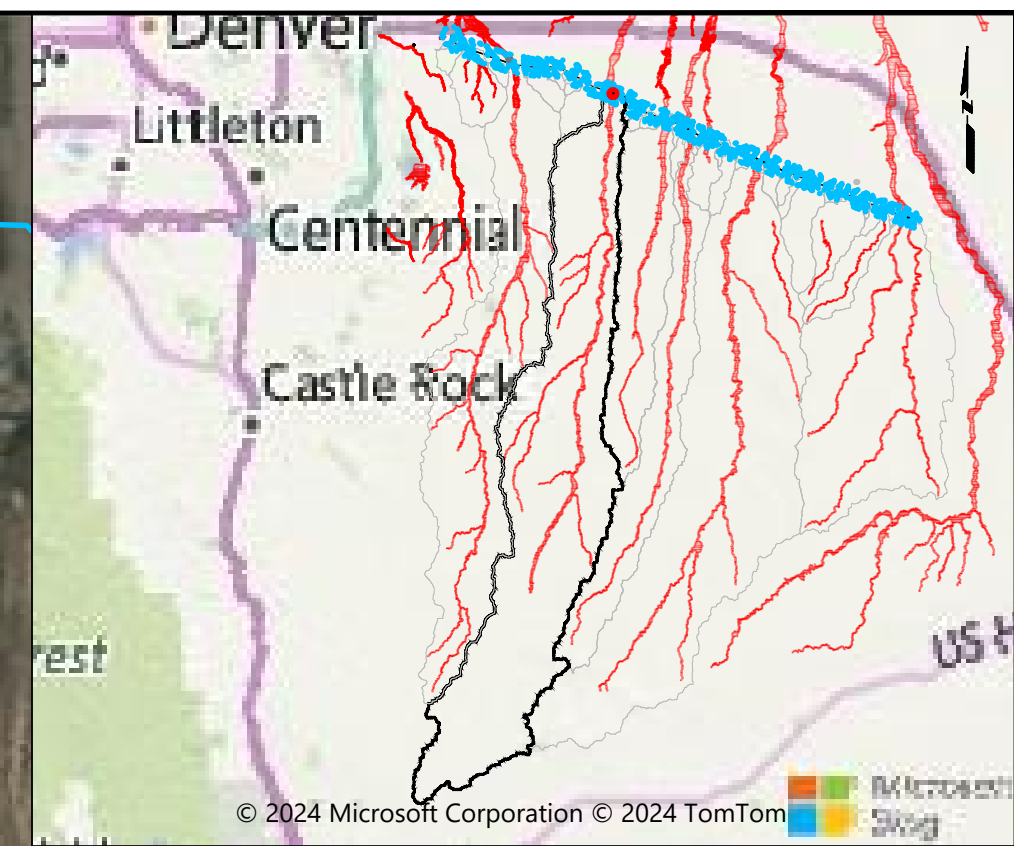
NOTES:

- Showing extent of FEMA 100 Year Floodplain Delineation boundaries
- Elevations based on 3DEP LIDAR digital terrain model.

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DENVER EXPANSION PROJECT SCOTT CITY TO DENVER PIPELINE FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 433.42 ARAPAHOE COUNTY COLORADO						
DRAWN BY	ADH	SCALE: AS NOTED	A.F.E.	-		
DATE DRAWN	11-22-24	DRAWING NO.				
CHECKED BY	JHH	1001-04-006				
PROJECT ENGINEER	JHH					
APPROVED BY	SAS					

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BASIN PROPERTIES:		
MP	437.18	mi
Station	2308298.74	ft
Lat	39.6852	degrees
Long	-104.4320	degrees
Stream Name	Kowa Creek	
FEMA FIRF Panel	0800C1000H	
Region Name	Foothills_Region_Peak_Flow_2016_5099	
AreaSqMi	234.08	mi ²
I6H100Y	3.76	in
OUTLET ELEV	5556	ft
STATSLAY	15.72	ft
100YrFlow	11200	cfs
PRECIP	19.23	in
BSLDEM10M	6	%
CSL1085LFP	29.7	ft/mi
ELEV	6594	ft
RON	60.56	
TOC	39.53	hrs



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DENVER EXPANSION PROJECT

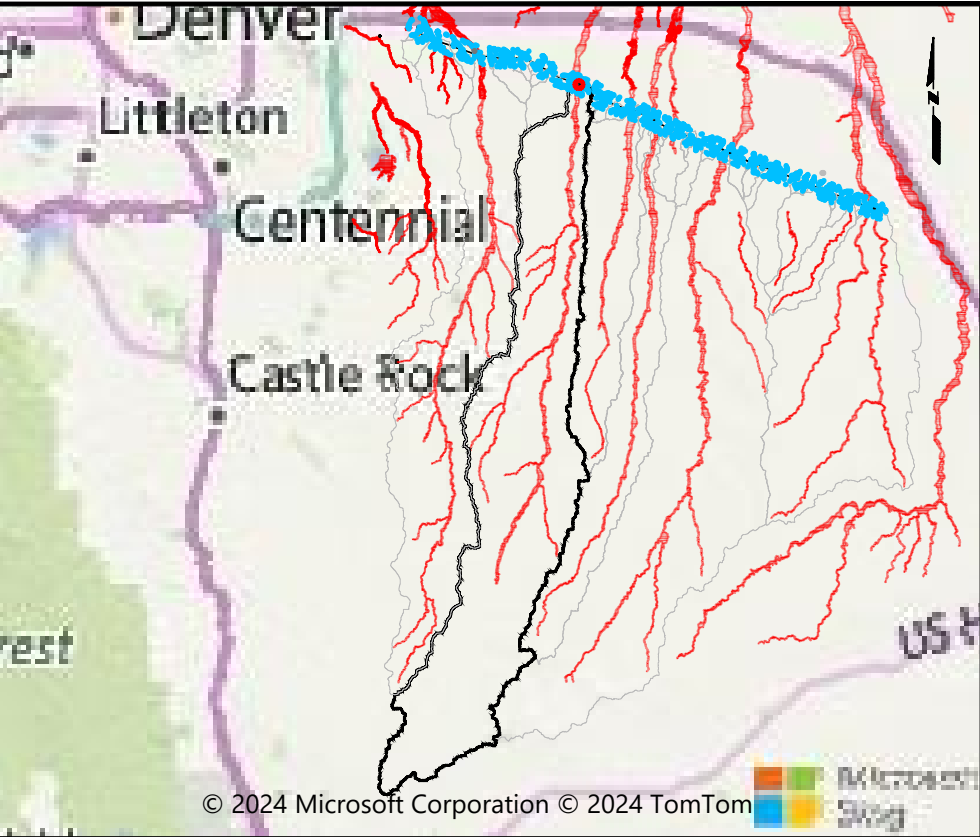
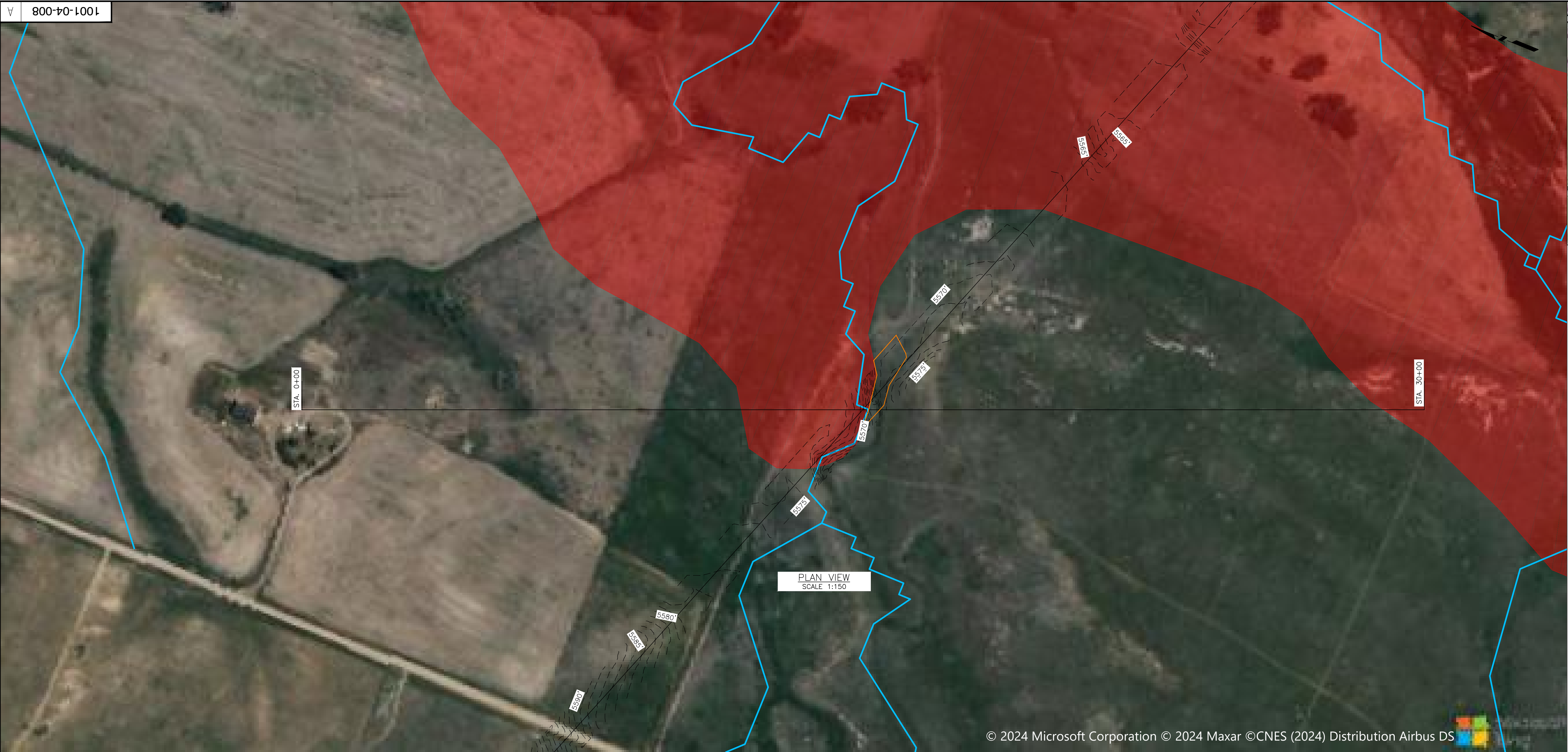
SCOTT CITY TO DENVER PIPELINE

FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 437.18

ARAPAHOE COUNTY COLORADO

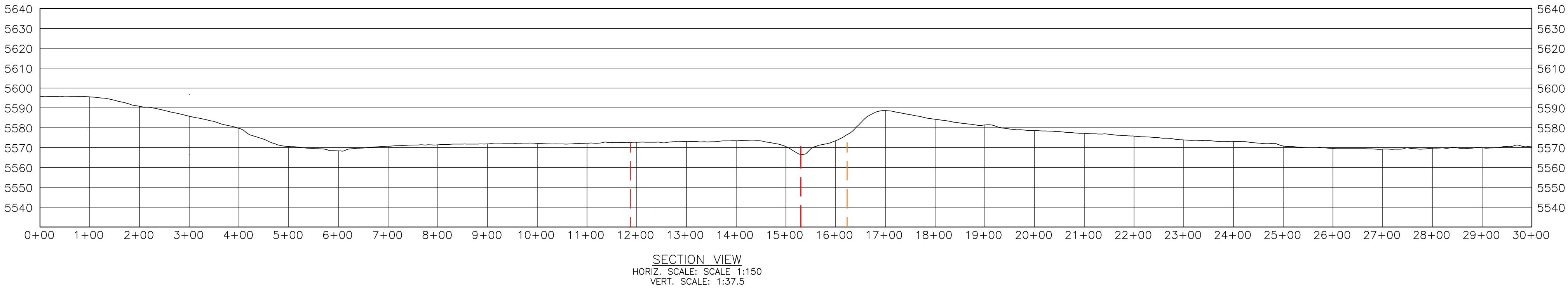
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DATE DRAWN	11-22-24	DRAWING NO.		
CHECKED BY	JHH	1001-04-007		
PROJECT ENGINEER	JHH			
APPROVED BY	SAS			

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BASIN PROPERTIES:

MP	437.48	mi
Station	2309899.15	ft
Lat	39.6867	degrees
Long	-104.4370	degrees
Stream Name	Unnamed Tributary to Kiowa Creek	
FEMA FIRM Panel	08001C1000H	
Region Name	Foothills_Region_Peak_Flow_2016_5099	
Area SqM	6.73	mi ²
16H100Y	3.77	in
OUTLET ELEV	5566	ft
STATSCLAY	28.5	%
100Y Flow	2690	cfs
PRECIP	17.33	in
BSLDEM10M	5	%
CSL108SLFP	41.8	ft/mi
ELEV	5743	ft
FCN	76.51	
TOC	4.69	hrs

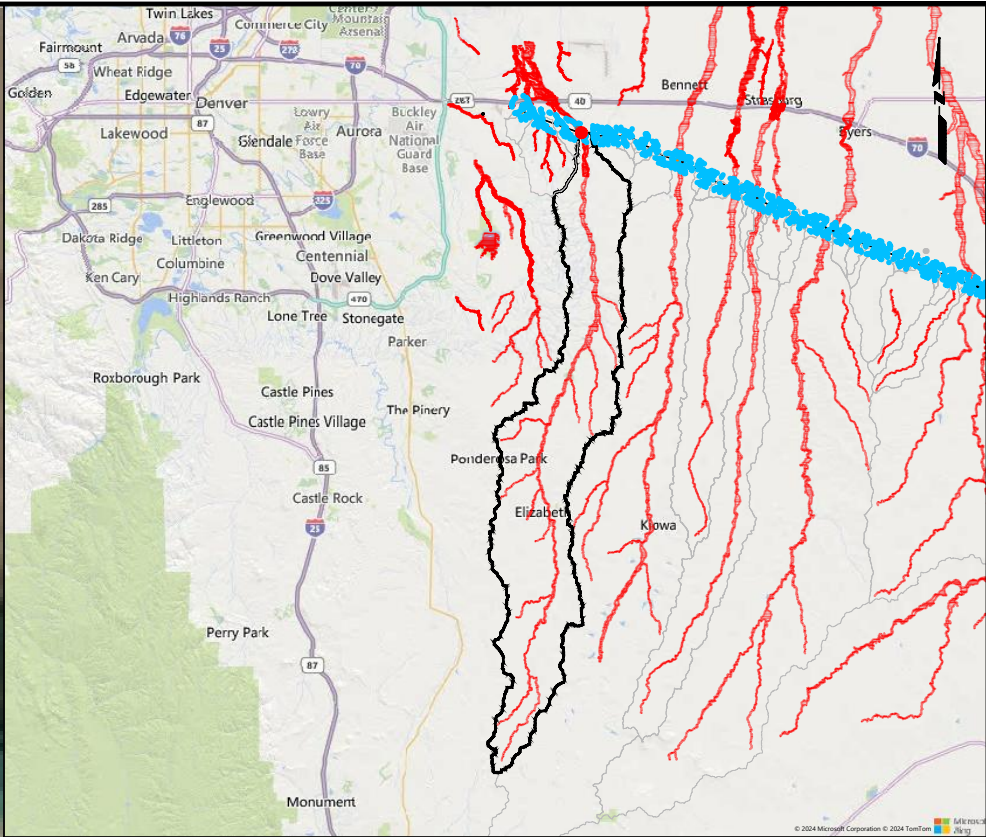
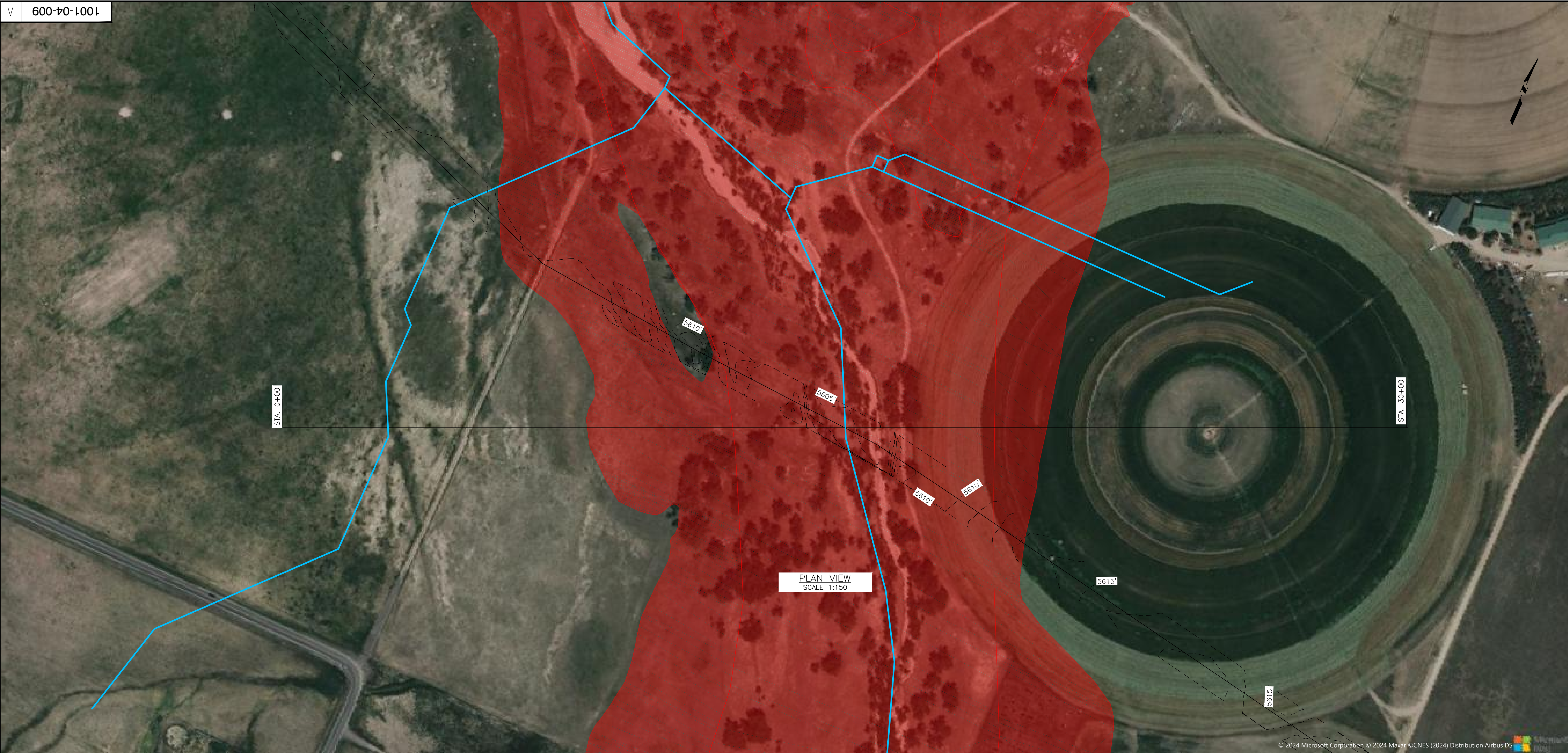


- NOTES:
- Showing extent of FEMA 100 Year Floodplain Delineation boundaries, channel has migrated and boundary appears to extend 93 ft to the east
 - Elevations based on 3DEP LIDAR digital terrain model.

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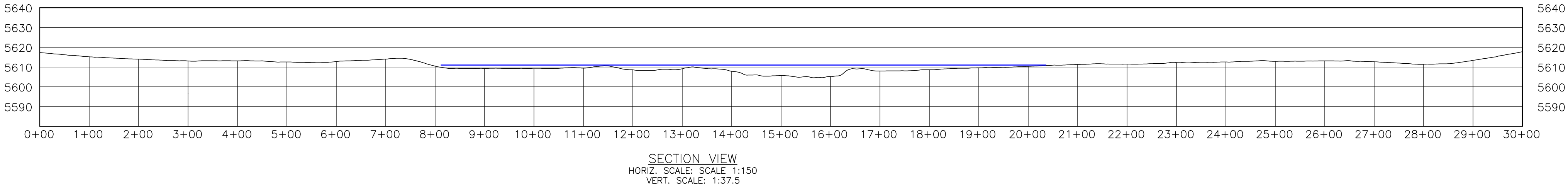
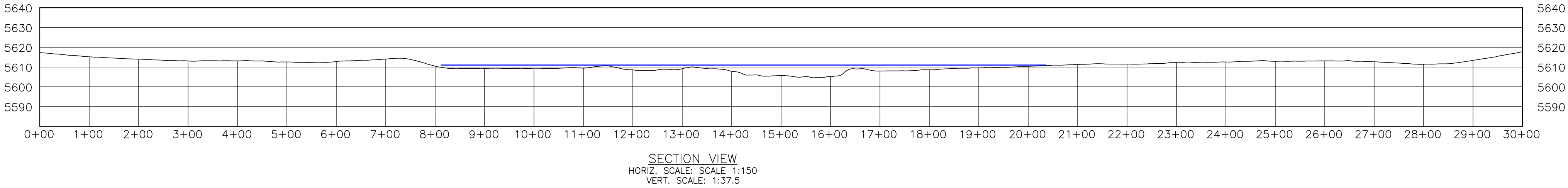
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SCOTT CITY TO DENVER PIPELINE						
FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 437.48						
ARAPAHOE COUNTY COLORADO						
DRAWN BY		ADH	SCALE: AS NOTED	A.F.E.	—	
DATE DRAWN		11-22-24	DRAWING NO.			
CHECKED BY		JHH	1001-04-008			
PROJECT ENGINEER		JHH				
APPROVED BY		SAS				
					A	



BASIN PROPERTIES:

MP	444.07	mi
Station	2344704.49	ft
Lat	39.7131	degrees
Long	-104.5520	degrees
Stream Name	Box Elder Creek to Middle South Platte-Cherry Creek	
FEMA FIRM Panel	08001C0960H	
RegionName	Foothills Region Peak Flow 2016 5099	
AreaSqM	164.77	mi ²
16H100Y	3.71	in
OUTLET ELEV	5606	ft
STATSCLAY	16.96	%
100YFlow	11164*	cfs
PRECIP	19.2	in
BSLDEM10M	5	%
CSL108SLFP	28.5	ft/mi
ELEV	6448	ft
FCN	62.37	
TOC	37.38	hrs



NOTES:

- Showing extent of FEMA 100 Year Floodplain Delineation and Regulatory BFE/HGL.
- Elevations based on 3DEP LIDAR digital terrain model.

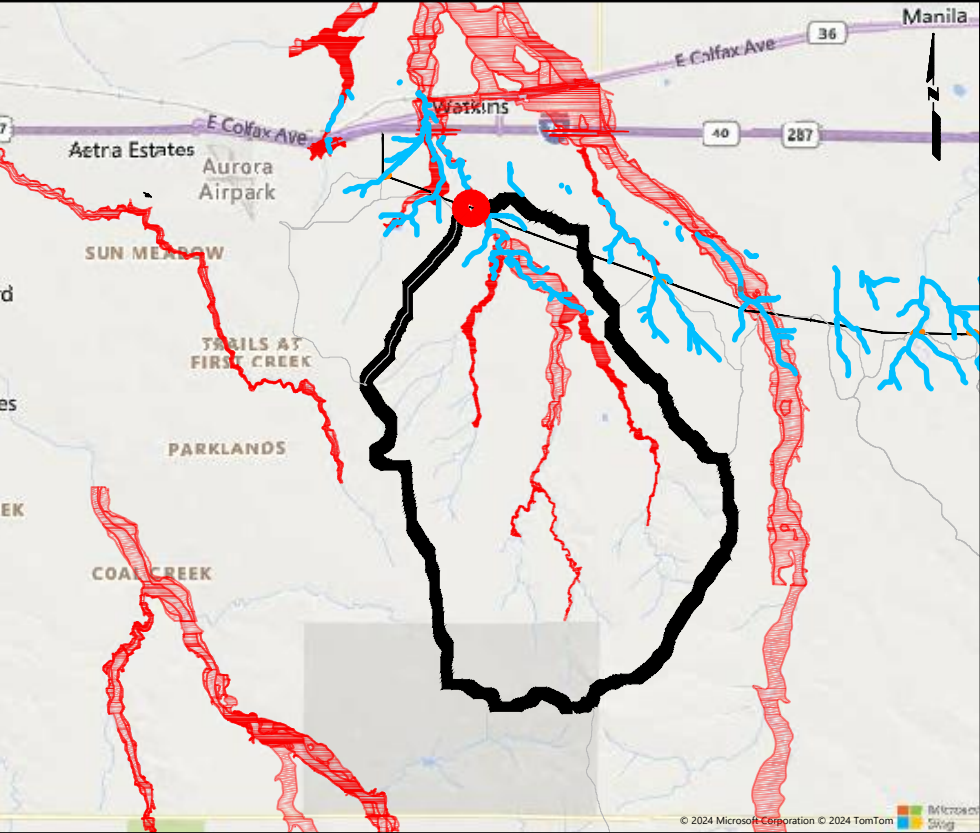
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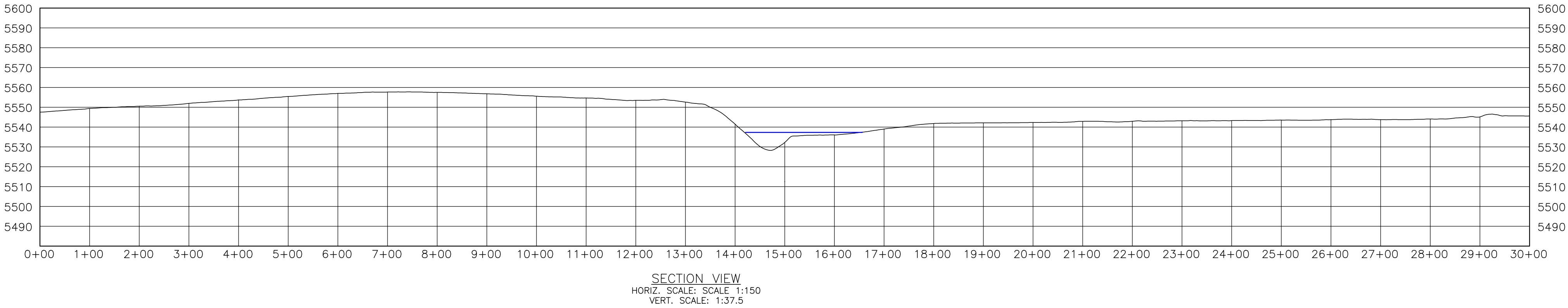
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REVISION NUMBER	DRAWN BY	DATE	CHECKED BY	PROJECT ENGINEER	APPROVED BY	
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DENVER EXPANSION PROJECT SCOTT CITY TO DENVER PIPELINE						
FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 444.07 ARAPAHOE COUNTY COLORADO						
DRAWN BY	ADH	SCALE: AS NOTED	A.F.E.	-		
DATE DRAWN	11-22-24	DRAWING NO.				
CHECKED BY	JHH	1001-04-009				
PROJECT ENGINEER	JHH					
APPROVED BY	SAS					

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BASIN PROPERTIES:

MP	447.25	mi
Station	2361491.58	ft
Lat	39.7287	degrees
Long	-104.6080	degrees
Stream Name	Coyote Run to Box Elder Creek to Middle South Platte-Cherry Creek	
FEMA FIRM Panel	08001C0951J	
RegionName	Foothills_Region_Peak_Flow_2016_5099	
AreaSqM	12.52	mi ²
16H100Y	3.00	in
OUTLETELEV	5528	ft
STATSCLAY	25.55	%
100YFlow	5804*	cfs
PRECIP	18.35	in
BSLDEM10M	4	%
CSL108SLFP	46.9	ft/mi
ELEV	5727	ft
RCN	78.2	
TOC	5.4	hrs

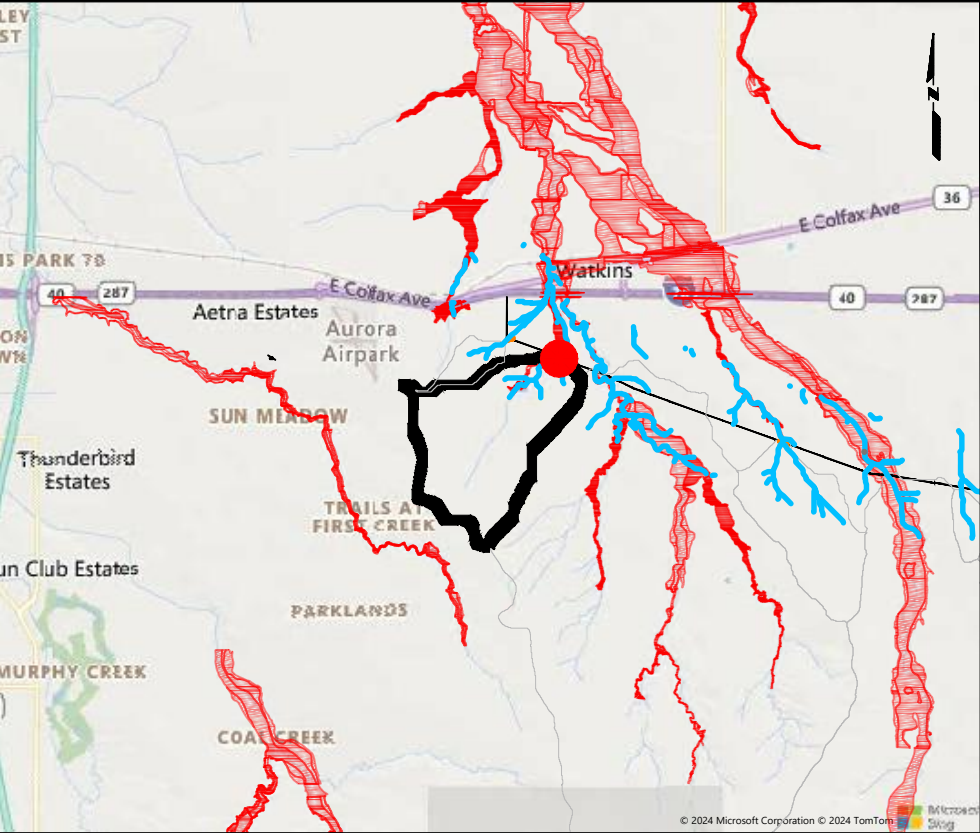


- NOTES:
- Showing extent of FEMA 100 Year Floodplain Delineation and Regulatory BFE/HGL.
 - Elevations based on 3DEP LiDAR digital terrain model.

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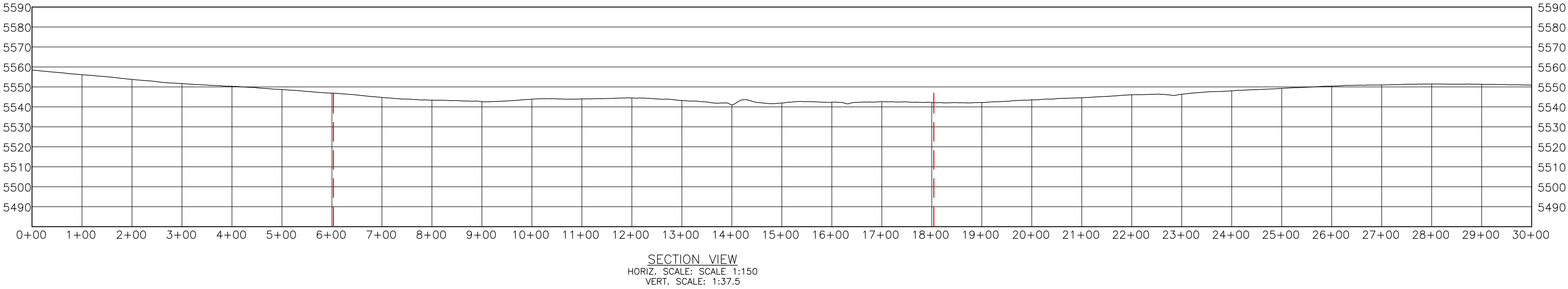
A	Issued for Review	ADH	11-22-24	JHH	JHH	SAS
REVISION NUMBER	DRAWN BY	DATE REVISED	CHECKED BY	PROJECT ENGINEER	APPROVED BY	
						
DENVER EXPANSION PROJECT SCOTT CITY TO DENVER PIPELINE						
FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 447.25 ARAPAHOE COUNTY COLORADO						
DRAWN BY	ADH	SCALE: AS NOTED	A.F.E.	-		
DATE DRAWN	11-22-24	DRAWING NO.				
CHECKED BY	JHH	1001-04-010				
PROJECT ENGINEER	JHH					
APPROVED BY	SAS					

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BASIN PROPERTIES:

MP	447.65	mi
Station	2363572.15	ft
Lat	39.7307	degrees
Long	-104.6150	degrees
Stream Name	Unnamed Tributary to Coyote Run to Middle South Platte-Cherry Creek	
FEMA FIRM Panel	08001C0851J	
RegionName	Foothills_Region_Peak_Flow_2016_5099	
AreaSqM	2.03	mi ²
16H100Y	3.00	in
OUTLETELEV	5538	ft
STATSCLAY	25.3	%
100YFlow	589	cfs
PRECIP	18.13	in
BSLDEM10M	2	%
CSL108SLFP	71.9	ft/mi
ELEV	5634	ft
RCN	85.04	
TOC	2.59	hrs



- NOTES:
- Showing extent of FEMA 100 Year Floodplain Delineation boundaries
 - Elevations based on 3DEP LIDAR digital terrain model.

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DENVER EXPANSION PROJECT SCOTT CITY TO DENVER PIPELINE FLOOD PLAIN DELINEATION MAP DRAINAGE AT MP 447.65 ARAPAHOE COUNTY COLORADO <table><tr><td>DRAWN BY</td><td>ADH</td><td>SCALE: AS NOTED</td><td>A.F.E.</td><td>—</td></tr><tr><td>DATE DRAWN</td><td>11-22-24</td><td colspan="3">DRAWING NO.</td></tr><tr><td>CHECKED BY</td><td>JHH</td><td colspan="3" rowspan="2">1001-04-011</td></tr><tr><td>PROJECT ENGINEER</td><td>JHH</td></tr><tr><td>APPROVED BY</td><td>SAS</td><td colspan="3"></td></tr></table>							DRAWN BY	ADH	SCALE: AS NOTED	A.F.E.	—	DATE DRAWN	11-22-24	DRAWING NO.			CHECKED BY	JHH	1001-04-011			PROJECT ENGINEER	JHH	APPROVED BY	SAS			
DRAWN BY	ADH	SCALE: AS NOTED	A.F.E.	—																								
DATE DRAWN	11-22-24	DRAWING NO.																										
CHECKED BY	JHH	1001-04-011																										
PROJECT ENGINEER	JHH																											
APPROVED BY	SAS																											