DRAINAGE LETTER
FOR THE
STOCKPILE GRADING PLAN
FOR
CLEARWAY, LOT 5

EL PASO COUNTY, COLORADO

SEPTEMBER 2022

Prepared for:
UPG, LLC
6395 E Platte Ave.
Colorado Springs, CO 80915
(719)-227-0500

Prepared by:

CIVIL CONSULTANTS,INC.

212 N. Wahsatch, Suite 305
Colorado Springs, CO 80903
(719) 955-5485

Project #44-042

PCD Project No. CDR-2214

DRAINAGE LETTER
FOR THE
STOCKPILE GRADING PLAN
FOR
CLEARWAY, LOT 5

DRAINAGE PLAN STATEMENTS

ENGINEERS STATEMENT

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

COLORADO REGISTERED
VIRGIL A. SANCHEZ
37160
9-14-22
PROFESSIONAL ENGINEER

Virgil A. Sanchez, P.E. #37160
For and on Behalf of M&S Civil Consultants, Inc

DEVELOPER'S STATEMENT

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

BY: UPG,LLC by member

TITLE: member
DATE: 09/13/22

ADDRESS: UPG, LLC
6395 E. Platte Ave.
Colorado Springs, CO 80915

EL PASO COUNTY'S STATEMENT

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

BY: _____ DATE: _____
County Engineer/ECM Administrator

APPROVED
Engineering Department
11/14/2022 7:35:01 AM
dsdnijkamp
EPC Planning & Community Development Department

CONDITIONS:

DRAINAGE LETTER
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APPENDIX

DRAINAGE LETTER
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PURPOSE

This document is intended to serve as the Drainage Letter for the Clearway, Lot 5. The purpose of this document is to identify and analyze the on and offsite drainage patterns and to ensure that post development runoff is routed through the site safely and in a manner that satisfies the requirements set forth by the El Paso County Drainage Criteria Manual.

GENERAL LOCATION AND DESCRIPTION

Clearway, Lot 5 is located in the north quarter of Section 18, Township 14 South, Range 65 West of the 6th P.M. in El Paso County, Colorado. The parcel is bound to the north by existing commercial buildings approximately 6 feet from the northern boundary, and the East Fork Sand Creek Sub-tributary to the south and to the east by Cherokee Metropolitan District property, and to the west by City of Colorado Springs property and northwest by The Wrangler Mobile Home Park. As shown on the enclosed FIRM panel, a channel known as the East Fork of Sand Creek Sub-tributary flows from north to south approximately 15 feet from the eastern boundary of the site. The site is located within the greater Sand Creek Drainage Basin and is tributary to the Sand Creek Channel via the East Fork Sand Creek Sub-Tributary. A vicinity map showing the location of the site has been provided in the appendix of this report.

In the existing condition, both the parcel and offsite contributing watershed lands are sparsely vegetated, with ground cover consisting primarily of native grasses ranging in density from moderate to good. Slopes across the parcel typically range between 2% to 50%. Offsite flows reaching development are contributed in part from areas of The Wrangler Mobile Home Park and the City of Colorado Springs property along the western boundary, from platted commercial property to the north and northeast.

The proposed temporary earthen stockpile will be constructed at the northeast corner of the site and is anticipated to span a width and breadth of 100’ by 125’. Temporary improvement to the site will include construction of a vehicle tracking pad and silt fence to prevent soil migration and insure clean streets. In the near future the stockpiled material will be spread across the site for the proposed development which will include a warehouse/office parking lot.

Flows produced within the site upon construction of the stockpile will follow the patterns established pre-construction and are not anticipated to negatively affect the site.

PREVIOUS STUDIES AND PLANS

The following reports and plans were review in the process of preparing this drainage study:

- Drainage Letter for 6395 E. Platte Avenue, Colorado Springs, El Paso County, Colorado, by Law & Mariotti Consultants, Inc., Revised April 2003
- Grading & Erosion Control Plan for 6395 E. Platte Avenue, Colorado Springs, El Paso County, Colorado, by Law & Mariotti Consultants, Inc.
- Drainage Letter Clearway No. 3 El Paso County, Colorado, by Oliver E Watts, 2000
- Drainage Letter and Grading and Erosion Control Plan, Platte View Office Complex Lots 1 and 2, Clearway Subdivision, El Paso County, Colorado, by Kiowa Engineering Corporation October 1998
- Platte View Office Park Grading and Erosion Control Plan, by Kiowa Engineering Corporation, October 1998
- Clearway Properties 9335 E. Platte Avenue, El Paso County, Colorado, Final Design – Sand Creek Channel Improvements, dated July 10, 1996
- Preliminary and Final Drainage Study, Clearway Subdivision 9335 E. Platte Avenue, El Paso County, Colorado , by Kiowa Engineering Corporation, March 1996
- Sand Creek Drainage Basin Planning Study, - Preliminary Design Report, City of Colorado Springs, El Paso County, Colorado, by Kiowa Engineering Corporation, Rev, October 1995

SOILS

Soils for this project are delineated by the map in the appendix as Ellicott Loamy Coarse Sand (28) on the southeast corner of the property and Blakeland Loamy Sandy (8) throughout the majority of the property, both of which are characterized as Hydrologic Soil Types "A". Soils in the study area are shown as mapped by Soil Conservation Service in the "Soils Survey of El Paso County Area".

HYDROLOGIC CALCULATIONS

Hydrologic calculations were performed using the El Paso County and City of Colorado Springs Storm Drainage Design Criteria manual and where applicable the Urban Storm Drainage Criteria Manual. The Rational Method was used to estimate stormwater runoff anticipated from design storms with 5-year and 100-year recurrence intervals.

HYDRAULIC CALCULATIONS

Hydraulic calculations were estimated using the Manning's Formula and the methods described in the El Paso County and City of Colorado Springs Storm Drainage Design Criteria manual. The relevant data sheets are included in the appendix of this report.

FLOODPLAIN STATEMENT

A portion of the site lies within the 100 year floodplain according to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panel No. 08041C0543 F, effective date March 17, 1997 and the more recent FIRM Panel No. 08041C0754 G, effective date December 7, 2018. Base Flood Elevation (BFE) lines from FIRM Panel No. 08041C0754G (NGVD29) are used for hydraulic calculations, drainage maps, and a discussion within this report. No development is anticipated to occur within the floodplain located at the northwest corner of the site. See Proposed Drainage Map and the FIRM Panels located in the appendix of this report for details. No portions of the proposed stockpile are within the 100 year flood zone. The required channel improvements for the adjacent portion of Sand Creek per the Drainage Basin Planning Study (DBPS) were constructed with Clearwater No. 2, Lot 4 therefore no improvements are required with improvement to this lot whether they be temporary or permanent.

DRAINAGE CRITERIA

This drainage analysis has been prepared in accordance with the current El Paso County Drainage Criteria Manual and where applicable the City of Colorado Springs DCM Volume 1 dated May 2014 effective January 2015. Hydrologic calculations were performed to determine runoff quantities for the 5-year and 100-year frequency storms for developed conditions using the Rational Method as required for basins having areas less than 130 acres (in accordance with Chapter 6 of the City of Colorado Springs DCM Volume 1).

EXISTING DRAINAGE CONDITIONS

Clearway, Lot 5 site consists of 2.97 acres situated north and west of the East Fork Sub-tributary of Sand Creek. There are no existing structures within the site. In accordance with El Paso County's Engineering Criteria Manual (ECM) and Drainage Criteria Manual's (DCM Vol. 1 & 2), an existing conditions hydrologic analysis was performed to determine existing flow quantities entering and exiting the subject site so a comparison to post development discharge rates could be made. As shown on the enclosed Existing Drainage Map (located in the appendix of this report) the existing site terrain within the parcel generally slopes from north to south at grades that vary between 2% to 50%. An existing 6-8" concrete retaining wall lies approximately 6-12 feet from the northern boundary of the site and protects a portion of the site from erosion effects from the offsite, commercial area runoff from the north. The East Fork Sand Creek Sub-Tributary continues from north to south approximately 10 feet from the eastern boundary of the site. It was observed that existing channel banks appear to be stable with established vegetation and minimal scour. The existing channel is to remain, and no improvements have been determined to be necessary for this reach of the channel (See "Background" in the Appendix). as improvements were previously completed with Filing 1 in 2019. An overlay of the 100 yr floodplain (Zone AE) is shown on the Floodplain Map in the appendix, of which 0.28 acres overlaps the southeast corner of the site. Refer to the enclosed Existing Drainage Map in the appendix for visual representation of the detailed, existing drainage patterns discussed below.

Detailed Drainage Discussion

Design Point 1 ((DP1), Q5 = 7.3 cfs, Q100 = 14.0 cfs) receives runoff produced by **Basin D** (Q5 = 7.3 cfs, Q100 = 14.0 cfs), which consists of commercial, gravel and native grass covered platted land located along the northeast parcel property boundary. Runoff produced by **Basin D** is conveyed as sheet flow and earthen swale to the east towards **Design Point 1.** These flows will be routed via a retaining wall to **Design Point 2**.

Design Point 2 (**(DP2)**, Q5 = 22.5 cfs, Q100 = 42.3 cfs) receives runoff produced by **Basin B** (Q5 = 8.9 cfs, Q100 = 16.6 cfs), **Basin C** (Q5 = 8.3 cfs, Q100 = 15.4 cfs) and **DP 1**. These basins consist of platted commercial lots and a 30 foot street for ingress/egress. Flows produced by **DP1** join with flows from **Basin C** and are conveyed by a retaining wall along the south border of **Basin C**. Runoff produced by **Basins B and Basin C** is conveyed as sheet flow towards **Design Point 2.** Runoff from **Design Point 2** continues southeast towards **Basin F**.

Design Point 3 (**(DP3)**, Q5 = 22.8 cfs, Q100 = 44.6 cfs) receives runoff produced by **DP 2** and **Basin F** (Q5 = 0.3 cfs, Q100 = 2.5 cfs), which consists of native grass covered platted land located northeastern portion of the property. Runoff from these shall be conveyed as sheet flow to the southeast and is released along the southeast boundary of Basin F at **Design Point 3**. The runoff eventually outfalls offsite into the East Fork Sand Creek Sub-Tributary.

Design Point 4 (**(DP4)**, Q5 = 9.3 cfs, Q100 = 27.0 cfs) receives runoff produced by **Basin A** (Q5 = 9.3 cfs, Q100 = 27.0 cfs), which consist of developed gravel and un-developed native grass covered platted land located along the west portion of the property boundary. Runoff produced by **Basin A** is conveyed as sheet flow to the southeast towards **DP 4** on the west portion of the property boundary. Runoff from **DP 4** continues southeast towards **Basin E**.

Design Point 5 (**(DP5)**, Q5 = 9.6 cfs, Q100 = 28.9 cfs) receives runoff produced by **DP 4** and **Basin E** (Q5 = 0.3 cfs, Q100 = 2.3 cfs), which consists of native grass covered platted land located at the west portion of the property boundary. Runoff from **DP 4** and **Basin E** is conveyed as sheet flow to the south and southwest and is captured by an existing swale on the western property boundary, then routed southeast towards **DP 5.** This runoff outfalls into the existing channel shared by **Basin G**, which drains southeast to the East Fork Sand Creek Sub-Tributary.

Design Point 6 (**(DP6)**, Q5 = 31.0 cfs, Q100 = 72.3 cfs) receives runoff produced by **DP 3**, **DP 5** and **Basin G** (Q5 = 0.3 cfs, Q100 = 2.5 cfs), which consists of native grass covered platted land located at the southeast portion of the property. Runoff from **DP 3, DP 5** and **Basin G** is conveyed as sheet flow and by an offsite swale the existing channel along the southern portion of the property boundary near **DP 6.** This runoff continues to the southwest within the East Fork Sand Creek Sub-Tributary. The cumulative runoff values are from the onsite flows and do not include the East Fork Sand Creek Sub-Tributary upstream flows. The values provided by FEMA for Sand Creek East Fork Sub-Tributary at confluence with Sand Creek East Fork is 1970 cfs for the 100year event.

PROPOSED DRAINAGE CHARACTERISTICS

The proposed earthen stockpile will be constructed at the northeast corner of the site and is anticipated to span 100' by 125'. Additional temporary improvement to the site will include construction of a vehicle tracking pad and silt fence to prevent soil migration and insure clean streets. Flows produced within the site upon construction of the stockpile will follow the patterns established pre-construction and are not anticipated to negatively affect the site. A detailed description of the proposed drainage characteristics follows:

Detailed Drainage Discussion

Design Point 1 ((DP1), Q5 = 7.3 cfs, Q100 = 14.0 cfs) receives runoff produced by **Basin D** (Q5 = 7.3 cfs, Q100 = 14.0 cfs), which consists of commercial, gravel and native grass covered platted land located along the northeast parcel property boundary. Runoff produced by **Basin D** is conveyed as sheet flow and earthen swale to the east towards **Design Point 1.** These flows will be routed via a retaining wall to **Design Point 2**.

Design Point 2 (**(DP2)**, Q5 = 22.5 cfs, Q100 = 42.3 cfs) receives runoff produced by **Basin B** (Q5 = 8.9 cfs, Q100 = 16.6 cfs), **Basin C** (Q5 = 8.3 cfs, Q100 = 15.4 cfs) and **DP 1**. These basins consist of platted commercial lots and a 30 foot street for ingress/egress. Flows produced by **DP1** join with flows from **Basin C** and are conveyed by a retaining wall along the south border of **Basin C**. Runoff produced by **Basins B and Basin C** is conveyed as sheet flow towards **Design Point 2.** Runoff from **Design Point 2** continues southeast towards **Basin F**.

Design Point 3 (**(DP3)**, Q5 = 22.8 cfs, Q100 = 44.6 cfs) receives runoff produced by **DP 2** and **Basin F** (Q5 = 0.3 cfs, Q100 = 2.5 cfs), which consists of native grass covered platted land located northeastern portion of the property. It is within this basin that the stockpile will be housed. Runoff from these basins shall be conveyed around the stockpile to the south and east to where it would historically discharge at **Design Point 3.** As per the proposed stockpile grading and erosion control plan, the intermittent placement of straw bales (as shown on the enclosed drainage map) at the base of the stockpile will increase the flow distance of the runoff and reduce velocities of the consolidated flow. Placing the straw bale checks placed at an angle adverse to flow will also allow low velocity pockets in which sediment fallout to occur. Flows reaching the eastern boundary continue offsite as in the historic condition eventually out falling into the East Fork Sand Creek Sub-Tributary. It is important to note that construction plans which will redistribute the earthen "stockpiled" material across the site as a portion of the onsite development are being concurrently reviewed at the time of the writing of this report. Earthmoving activities for the site include stockpiling and spreading are planned to occur thru the fall and into the winter months of 2022 when the expected precipitation is significantly reduced and the large event storm are unlikely.

Design Point 4 (**(DP4)**, Q5 = 9.3 cfs, Q100 = 27.0 cfs) receives runoff produced by **Basin A** (Q5 = 9.3 cfs, Q100 = 27.0 cfs), which consist of developed gravel and un-developed native grass covered platted land located along the west portion of the property boundary. Runoff produced by **Basin A** is conveyed as sheet flow to the southeast towards **DP 4** on the west portion of the property boundary. Runoff from **DP 4** continues southeast towards **Basin E**.

Design Point 5 (**(DP5)**, Q5 = 9.6 cfs, Q100 = 28.9 cfs) receives runoff produced by **DP 4** and **Basin E** (Q5 = 0.3 cfs, Q100 = 2.3 cfs), which consists of native grass covered platted land located at the west portion of the property boundary. Runoff from **DP 4** and **Basin E** is conveyed as sheet flow to the south and southwest and is captured by an existing swale on the western property boundary, then routed southeast towards **DP 5.** This runoff outfalls into the existing channel shared by **Basin G**, which drains southeast to the East Fork Sand Creek Sub-Tributary.

Design Point 6 (**(DP6)**, Q5 = 31.0 cfs, Q100 = 72.3 cfs) receives runoff produced by **DP 3**, **DP 5** and **Basin G** (Q5 = 0.3 cfs, Q100 = 2.5 cfs), which consists of native grass covered platted land located at the southeast portion of the property. Runoff from **DP 3, DP 5** and **Basin G** is conveyed as sheet flow and by an offsite swale the existing channel along the southern portion of the property boundary near **DP 6.** This runoff continues to the southwest within the East Fork Sand Creek Sub-Tributary. The cumulative runoff values are from the onsite flows and do not include the East Fork Sand Creek Sub-Tributary upstream flows. The values provided by FEMA for Sand Creek East Fork Sub-Tributary at confluence with Sand Creek East Fork is 1970 cfs for the 100year event.

EROSION CONTROL

It is the policy of the El Paso County that we submit a grading and erosion control plan with the drainage report. Proposed silt fence, vehicle traffic control, and concrete washout area are proposed as erosion control measures. The costs for these measures have been provided on the Grading and Erosion Control plan.

CONSTRUCTION COST OPINION

No drainage facilities are being constructed at this time. Costs associated with the grading and erosion control are included within the Financial Assurance Estimate.

DRAINAGE & BRIDGE FEES – CLEARWAY, LOT 5

Fees not required as this Filing was previously platted.

SUMMARY

Per this final drainage report, the placement of a stockpile onsite will not significantly alter the existing drainage patterns on the site. Care should be taken to insure that erosion control measures are in place and are adequately maintained and post storm sewer inspections are performed in accordance with the Stormwater Management Plan. The temporary stockpile of earthen material within the Clearway, Lot 5 site will not adversely affect adjacent or downstream properties.

REFERENCES

1. "El Paso County and City of Colorado Springs Drainage Criteria Manuals"

2. "Urban Storm Drainage Criteria Manual"

3. SCS Soils Map for El Paso County.

4. Flood Insurance Rate Map (FIRM), Federal Emergency Management Agency (Map No. 08041C0543F), Effective date March 17, 1997.

5. Flood Insurance Rate Map (FIRM), Federal Emergency Management Agency (Map No. 08041C0754G), Effective date December 7, 2018.

6. "Sand Creek Drainage Basin Planning Study, Preliminary Design Report", Revised March 1996, by Kiowa Engineering Corporation.

7. Drainage Letter for 6395 E. Platte Avenue, Colorado Springs, El Paso County, Colorado, by Law & Mariotti Consultants, Inc., Revised April 2003

8. Grading & Erosion Control Plan for 6395 E. Platte Avenue, Colorado Springs, El Paso County, Colorado, by Law & Mariotti Consultants, Inc.

9. Drainage Letter Clearway No. 3 El Paso County, Colorado, by Oliver E Watts, 2000

10. Drainage Letter and Grading and Erosion Control Plan, Platte View Office Complex Lots 1 and 2, Clearway Subdivision, El Paso County, Colorado, by Kiowa Engineering Corporation October 1998

11. Platte View Office Park Grading and Erosion Control Plan, by Kiowa Engineering Corporation, October 1998

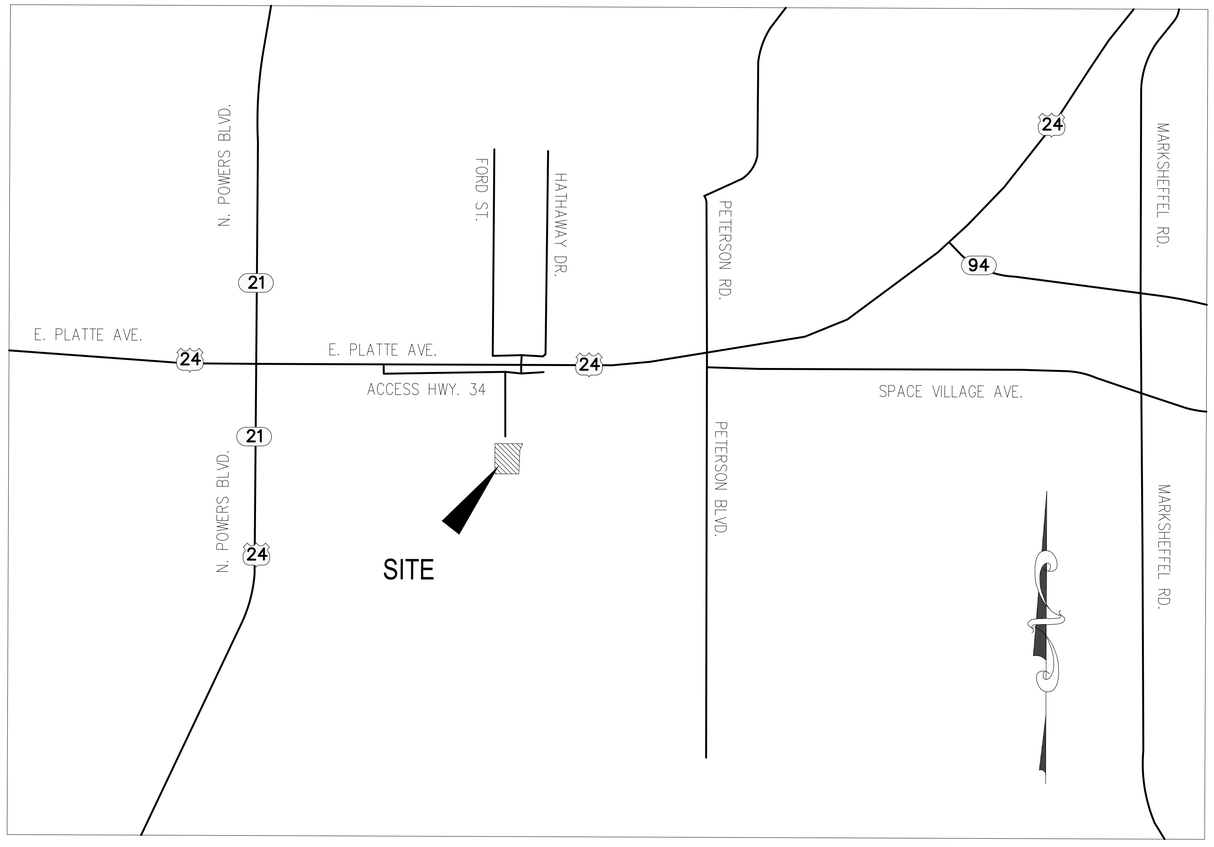
12. Clearway Properties 9335 E. Platte Avenue, El Paso County, Colorado, Final Design – Sand Creek Channel Improvements, dated July 10, 1996

13. Preliminary and Final Drainage Study, Clearway Subdivision 9335 E. Platte Avenue, El Paso County, Colorado , by Kiowa Engineering Corporation, March 1996

14. Sand Creek Drainage Basin Planning Study, - Preliminary Design Report, City of Colorado Springs, El Paso County, Colorado, by Kiowa Engineering Corporation, Rev, October 1995

APPENDIX

VICINITY MAP



VICINITY MAP

N.T.S.

CLEARWAY

LOT 5

VICINITY MAP

PROJECT NO. 44-042
DESIGNED BY: TAU
DRAWN BY: TAU
CHECKED BY: VAS

SCALE:
HORIZONTAL: N/A
VERTICAL: N/A

DATE: 05-20-2022

SHEET 1 OF 1

VIC01

212 N. WAHSATCH AVE., STE 305
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

CIVIL CONSULTANTS, INC.

VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160

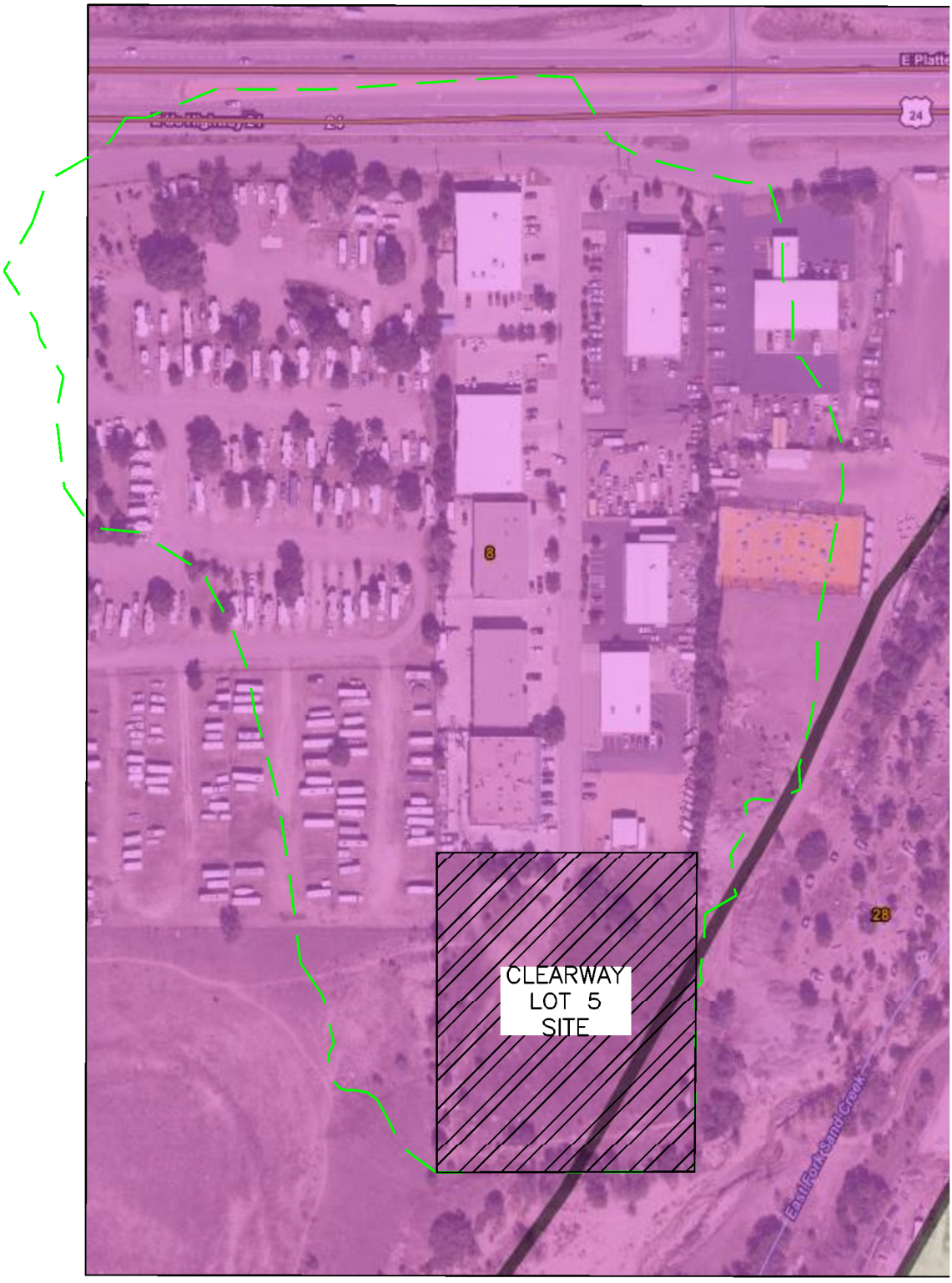
FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

REVISIONS:

NO.	DATE:	BY:	DESCRIPTION:	APRV'D. BY:	DATE:

File: O:\44042A-Wire Nut Vitamins\Dwg\Eng Exhibits\44-042 Vicinity Map.dwg Plotstamp: 5/15/2022 11:36 AM

SOILS MAP



NOT TO SCALE

Summary by Map Unit — El Paso County Area, Colorado (CO625)

Summary by Map Unit — El Paso County Area, Colorado (CO625)		
Map unit symbol	**Map unit name**	**Rating**
8	Blakeland loamy sand, 1 to 9 percent slopes	A
28	Ellicott loamy coarse sand, 0 to 5 percent slopes	A
111	Water	

CLEARWAY, LOT 5

SOILS MAP

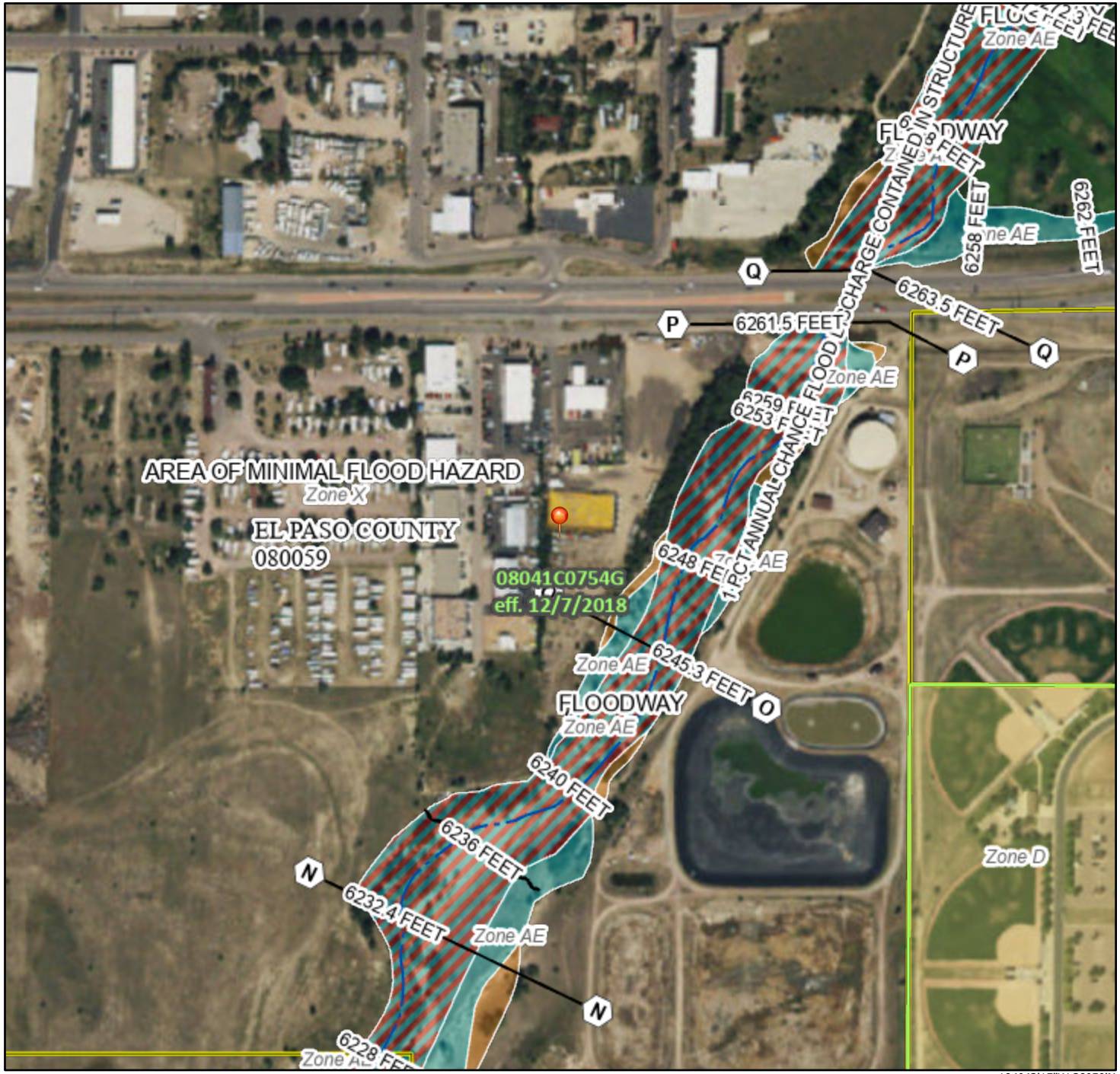
M&S CIVIL CONSULTANTS, INC.

FIRM PANEL

National Flood Hazard Layer FIRMette

FEMA

104°42'52"W 38°50'28"N



104°42'15"W 38°50'N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 5/16/2022 at 9:02 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

HYDROLOGIC CALCULATIONS

CLEARWAY, LOT 5 (WIRENUT) STOCKPILE GRADING PLAN
EXISTING CONDITIONS DRAINAGE CALCULATIONS
(Area Runoff Coefficient Summary)

			STREETS/DEVELOPED			*DEVELOPED LOTS*			*UNDEVELOPED/LANDSCAPE*			*RUNOFF COEFFICIENT*	
BASIN	**TOTAL AREA** *(SF)*	**TOTAL AREA** *(Acres)*	**AREA** *(Acres)*	**C_5**	**C_{100}**	**AREA** *(Acres)*	**C_5**	**C_{100}**	**AREA** *(Acres)*	**C_5**	**C_{100}**	**C_5**	**C_{100}**
A	***431946.186***	9.92	0.00	0.90	0.96	9.13	0.30	0.50	0.78	0.08	0.35	***0.28***	***0.49***
B	***133523.312***	3.07	0.00	0.90	0.96	3.07	0.73	0.81	0.00	0.08	0.35	***0.73***	***0.81***
C	***119110.0794***	2.73	0.00	0.90	0.96	2.73	0.73	0.81	0.00	0.08	0.35	***0.73***	***0.81***
D	***134064.3175***	3.08	1.44	0.73	0.81	1.63	0.59	0.70	0.00	0.08	0.35	***0.66***	***0.75***
E	***42111.756***	0.97	0.00	0.90	0.96	0.00	0.08	0.35	0.97	0.08	0.35	***0.08***	***0.35***
F	***46802.057***	1.07	0.00	0.90	0.96	0.00	0.08	0.35	1.07	0.08	0.35	***0.08***	***0.35***
G	***47704.938***	1.10	0.00	0.90	0.96	0.00	0.08	0.35	1.10	0.08	0.35	***0.08***	***0.35***

CLEARWAY, LOT 5 (WIRENUT) STOCKPILE GRADING PLAN
EXISTING CONDITIONS DRAINAGE CALCULATIONS
(Area Drainage Summary)

From Area Runoff Coefficient Summary				*OVERLAND*				*STREET / CHANNEL FLOW*				*Time of Travel (T_t)*		*INTENSITY **		*TOTAL FLOWS*	
BASIN	**AREA TOTAL** *(Acres)*	**C_5** *From DCM Table 5-1*	**C_{100}** *From DCM Table 5-1*	**C_5**	**Length** *(ft)*	**Height** *(ft)*	**T_C** *(min)*	**Length** *(ft)*	**Slope** *(%)*	**Velocity** *(fps)*	**T_t** *(min)*	**TOTAL** *(min)*	**CHECK** *(min)*	**I_5** *(in/hr)*	**I_{100}** *(in/hr)*	**Q_5** *(c.f.s.)*	**Q_{100}** *(c.f.s.)*
A	9.92	0.28	0.49	0.28	100	2	11.7	1174	0.5%	0.7	27.4	39.1	17.1	3.3	5.6	***9.3***	***27.0***
B	3.07	0.73	0.81	0.73	100	2	5.3	775	1.3%	2.3	5.7	11.0	14.9	4.0	6.7	***8.9***	***16.6***
C	2.73	0.73	0.81	0.73	100	2	5.3	675	1.5%	2.4	4.6	9.9	14.3	4.1	6.9	***8.3***	***15.4***
D	3.08	0.66	0.75	0.66	100	2	6.4	673	1.9%	1.4	8.1	14.5	14.3	3.6	6.0	***7.3***	***14.0***
E	0.97	0.08	0.35	0.08	50	2	8.2	298	8.4%	2.0	2.4	10.7	11.9	4.0	6.8	***0.3***	***2.3***
F	1.07	0.08	0.35	0.08	100	2	14.7	138	6.5%	1.8	1.3	15.9	11.3	3.9	6.6	***0.3***	***2.5***
G	1.10	0.08	0.35	0.08	100	1	18.4	169	14.8%	2.7	1.0	19.5	11.5	3.9	6.6	***0.3***	***2.5***

* Intensity equations assume a minimum travel time of 5 minutes.

Calculated by: TAU
Date: 3/31/2022
Checked by: VAS

CLEARWAY, LOT 5 (WIRENUT) STOCKPILE GRADING PLAN
EXISTING CONDITIONS DRAINAGE CALCULATIONS
(Basin Routing Summary)

From Area Runoff Coefficient Summary				*OVERLAND*				*PIPE / CHANNEL FLOW*				*Time of Travel (T_t)*	*INTENSITY **		*TOTAL FLOWS*		
DESIGN POINT	**CONTRIBUTING BASINS**	**CA_5**	**CA_{100}**	**C_5**	**Length** *(ft)*	**Height** *(ft)*	**T_C** *(min)*	**Length** *(ft)*	**Slope** *(%)*	**Velocity** *(fps)*	**T_t** *(min)*	**TOTAL** *(min)*	**I_5** *(in/hr)*	**I_{100}** *(in/hr)*	**Q_5** *(c.f.s.)*	**Q_{100}** *(c.f.s.)*	COMMENTS
1	**D**	2.02	2.31									14.3	3.6	6.0	***7.3***	***14.0***	conveyed by sheet flow and swale
				use D BASIN Tc													
2	**DP1, B, C**	6.25	7.01									14.3	3.6	6.0	***22.5***	***42.3***	conveyed by private street c&g
				use DP1 Tc													
3	**DP2, F**	6.34	7.39									14.3	3.6	6.0	***22.8***	***44.6***	conveyed by swale to East Fork Sand Creek
				use DP2 Tc													
4	**A**	2.80	4.84									17.1	3.3	5.6	***9.3***	***27.0***	conveyed to Lot 5
				use A BASIN Tc													
5	**DP4, E**	2.88	5.18									17.1	3.3	5.6	***9.6***	***28.9***	conveyed to East Fork Sand Creek
				use DP4 Tc													
6	**G, DP3, DP5**	9.30	12.95									17.1	3.3	5.6	***31.0***	***72.3***	conveyed to East Fork Sand Creek
				use DP5 Tc													

CLEARWAY, LOT 5 (WIRENUT) STOCKPILE GRADING PLAN
PROPOSED CONDITIONS DRAINAGE CALCULATIONS
(Area Runoff Coefficient Summary)

			STREETS/DEVELOPED			*DEVELOPED LOTS*			*UNDEVELOPED/LANDSCAPE*			*RUNOFF COEFFICIENT*	
BASIN	**TOTAL AREA** *(SF)*	**TOTAL AREA** *(Acres)*	**AREA** *(Acres)*	**C_5**	**C_{100}**	**AREA** *(Acres)*	**C_5**	**C_{100}**	**AREA** *(Acres)*	**C_5**	**C_{100}**	**C_5**	**C_{100}**
A	***431946.186***	9.92	0.00	0.90	0.96	9.13	0.30	0.50	0.78	0.08	0.35	***0.28***	***0.49***
B	***133523.312***	3.07	0.00	0.90	0.96	3.07	0.73	0.81	0.00	0.08	0.35	***0.73***	***0.81***
C	***119110.0794***	2.73	0.00	0.90	0.96	2.73	0.73	0.81	0.00	0.08	0.35	***0.73***	***0.81***
D	***134064.3175***	3.08	1.44	0.73	0.81	1.63	0.59	0.70	0.00	0.08	0.35	***0.66***	***0.75***
E	***42111.756***	0.97	0.00	0.90	0.96	0.00	0.08	0.35	0.97	0.08	0.35	***0.08***	***0.35***
F	***46802.057***	1.07	0.00	0.90	0.96	0.00	0.08	0.35	1.07	0.08	0.35	***0.08***	***0.35***
G	***47704.938***	1.10	0.00	0.90	0.96	0.00	0.08	0.35	1.10	0.08	0.35	***0.08***	***0.35***

CLEARWAY, LOT 5 (WIRENUT) STOCKPILE GRADING PLAN
PROPOSED CONDITIONS DRAINAGE CALCULATIONS
(Area Drainage Summary)

From Area Runoff Coefficient Summary				*OVERLAND*				*STREET / CHANNEL FLOW*				*Time of Travel (T_t)*		*INTENSITY **		*TOTAL FLOWS*	
BASIN	**AREA TOTAL**	**C_5**	**C_{100}**	**C_5**	**Length**	**Height**	**T_C**	**Length**	**Slope**	**Velocity**	**T_t**	**TOTAL**	**CHECK**	**I_5**	**I_{100}**	**Q_5**	**Q_{100}**
	(Acres)	*From DCM Table 5-1*			*(ft)*	*(ft)*	*(min)*	*(ft)*	*(%)*	*(fps)*	*(min)*	*(min)*	*(min)*	*(in/hr)*	*(in/hr)*	*(c.f.s.)*	*(c.f.s.)*
A	9.92	0.28	0.49	0.28	100	2	11.7	1174	0.5%	0.7	27.4	39.1	17.1	3.3	5.6	***9.3***	***27.0***
B	3.07	0.73	0.81	0.73	100	2	5.3	775	1.3%	2.3	5.7	11.0	14.9	4.0	6.7	***8.9***	***16.6***
C	2.73	0.73	0.81	0.73	100	2	5.3	675	1.5%	2.4	4.6	9.9	14.3	4.1	6.9	***8.3***	***15.4***
D	3.08	0.66	0.75	0.66	100	2	6.4	673	1.9%	1.4	8.1	14.5	14.3	3.6	6.0	***7.3***	***14.0***
E	0.97	0.08	0.35	0.08	50	2	8.2	298	8.4%	2.0	2.4	10.7	11.9	4.0	6.8	***0.3***	***2.3***
F	1.07	0.08	0.35	0.08	100	2	14.7	138	6.5%	1.8	1.3	15.9	11.3	3.9	6.6	***0.3***	***2.5***
G	1.10	0.08	0.35	0.08	100	1	18.4	169	14.8%	2.7	1.0	19.5	11.5	3.9	6.6	***0.3***	***2.5***

* Intensity equations assume a minimum travel time of 5 minutes.

Calculated by: TAU
Date: 3/31/2022
Checked by: VAS

CLEARWAY, LOT 5 (WIRENUT) STOCKPILE GRADING PLAN
PROPOSED CONDITIONS DRAINAGE CALCULATIONS
(Basin Routing Summary)

From Area Runoff Coefficient Summary				*OVERLAND*				*PIPE / CHANNEL FLOW*				*Time of Travel (T_t)*	*INTENSITY **		*TOTAL FLOWS*		
DESIGN POINT	**CONTRIBUTING BASINS**	**CA_5**	**CA_{100}**	**C_5**	**Length** *(ft)*	**Height** *(ft)*	**T_C** *(min)*	**Length** *(ft)*	**Slope** *(%)*	**Velocity** *(fps)*	**T_t** *(min)*	**TOTAL** *(min)*	**I_5** *(in/hr)*	**I_{100}** *(in/hr)*	**Q_5** *(c.f.s.)*	**Q_{100}** *(c.f.s.)*	COMMENTS
1	**D**	2.02	2.31									14.3	3.6	6.0	***7.3***	***14.0***	conveyed by sheet flow and swale
				use D BASIN Tc													
2	**DP1, B, C**	6.25	7.01									14.3	3.6	6.0	***22.5***	***42.3***	conveyed by private street c&g
				use DP1 Tc													
3	**DP2, F**	6.34	7.39									14.3	3.6	6.0	***22.8***	***44.6***	conveyed by swale to East Fork Sand Creek
				use DP2 Tc													
4	**A**	2.80	4.84									17.1	3.3	5.6	***9.3***	***27.0***	conveyed to Lot 5
				use A BASIN Tc													
5	**DP4, E**	2.88	5.18									17.1	3.3	5.6	***9.6***	***28.9***	conveyed to East Fork Sand Creek
				use DP4 Tc													
6	**G, DP3, DP5**	9.30	12.95									17.1	3.3	5.6	***31.0***	***72.3***	conveyed to East Fork Sand Creek
				use DP5 Tc													

5yr Stockpile Swale 2%

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Channel Slope	0.020	ft/ft
Discharge	22.80	cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+60	0.00
0+64	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+64, 1.00)	0.030

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results		
Normal Depth	6.1	in
Roughness Coefficient	0.030	
Elevation	0.51	ft
Elevation Range	0.0 to 1.0	ft
Flow Area	8.2	ft²
Wetted Perimeter	32.4	ft
Hydraulic Radius	3.0	in
Top Width	32.33	ft
Normal Depth	6.1	in
Critical Depth	6.0	in
Critical Slope	0.021	ft/ft
Velocity	2.79	ft/s
Velocity Head	0.12	ft
Specific Energy	0.63	ft
Froude Number	0.979	
Flow Type	Subcritical	

GVF Input Data		
Downstream Depth	0.0	in

5yr Stockpile Swale 2%

GVF Input Data	
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	6.1 in
Critical Depth	6.0 in
Channel Slope	0.020 ft/ft
Critical Slope	0.021 ft/ft

5yr Stockpile Swale 10%

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.100 ft/ft
Discharge	22.80 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+60	0.00
0+64	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+64, 1.00)	0.030

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	4.5 in
Roughness Coefficient	0.030
Elevation	0.37 ft
Elevation Range	0.0 to 1.0 ft
Flow Area	4.5 ft²
Wetted Perimeter	23.9 ft
Hydraulic Radius	2.2 in
Top Width	23.89 ft
Normal Depth	4.5 in
Critical Depth	6.0 in
Critical Slope	0.021 ft/ft
Velocity	5.11 ft/s
Velocity Head	0.41 ft
Specific Energy	0.78 ft
Froude Number	2.086
Flow Type	Supercritical

GVF Input Data	
Downstream Depth	0.0 in

5yr Stockpile Swale 10%

GVF Input Data	
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	4.5 in
Critical Depth	6.0 in
Channel Slope	0.100 ft/ft
Critical Slope	0.021 ft/ft

100yr Stockpile swale 2%

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.020 ft/ft
Discharge	44.60 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+60	0.00
0+64	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+64, 1.00)	0.030

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	7.8 in
Roughness Coefficient	0.030
Elevation	0.65 ft
Elevation Range	0.0 to 1.0 ft
Flow Area	13.5 ft²
Wetted Perimeter	41.7 ft
Hydraulic Radius	3.9 in
Top Width	41.57 ft
Normal Depth	7.8 in
Critical Depth	7.9 in
Critical Slope	0.019 ft/ft
Velocity	3.30 ft/s
Velocity Head	0.17 ft
Specific Energy	0.82 ft
Froude Number	1.022
Flow Type	Supercritical

GVF Input Data	
Downstream Depth	0.0 in

100yr Stockpile swale 2%

GVF Input Data	
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	7.8 in
Critical Depth	7.9 in
Channel Slope	0.020 ft/ft
Critical Slope	0.019 ft/ft

100 yr Stockpile Swale 10%

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.100 ft/ft
Discharge	44.60 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+60	0.00
0+64	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+64, 1.00)	0.030

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	5.8 in
Roughness Coefficient	0.030
Elevation	0.48 ft
Elevation Range	0.0 to 1.0 ft
Flow Area	7.4 ft²
Wetted Perimeter	30.8 ft
Hydraulic Radius	2.9 in
Top Width	30.73 ft
Normal Depth	5.8 in
Critical Depth	7.9 in
Critical Slope	0.019 ft/ft
Velocity	6.05 ft/s
Velocity Head	0.57 ft
Specific Energy	1.05 ft
Froude Number	2.176
Flow Type	Supercritical

GVF Input Data	
Downstream Depth	0.0 in

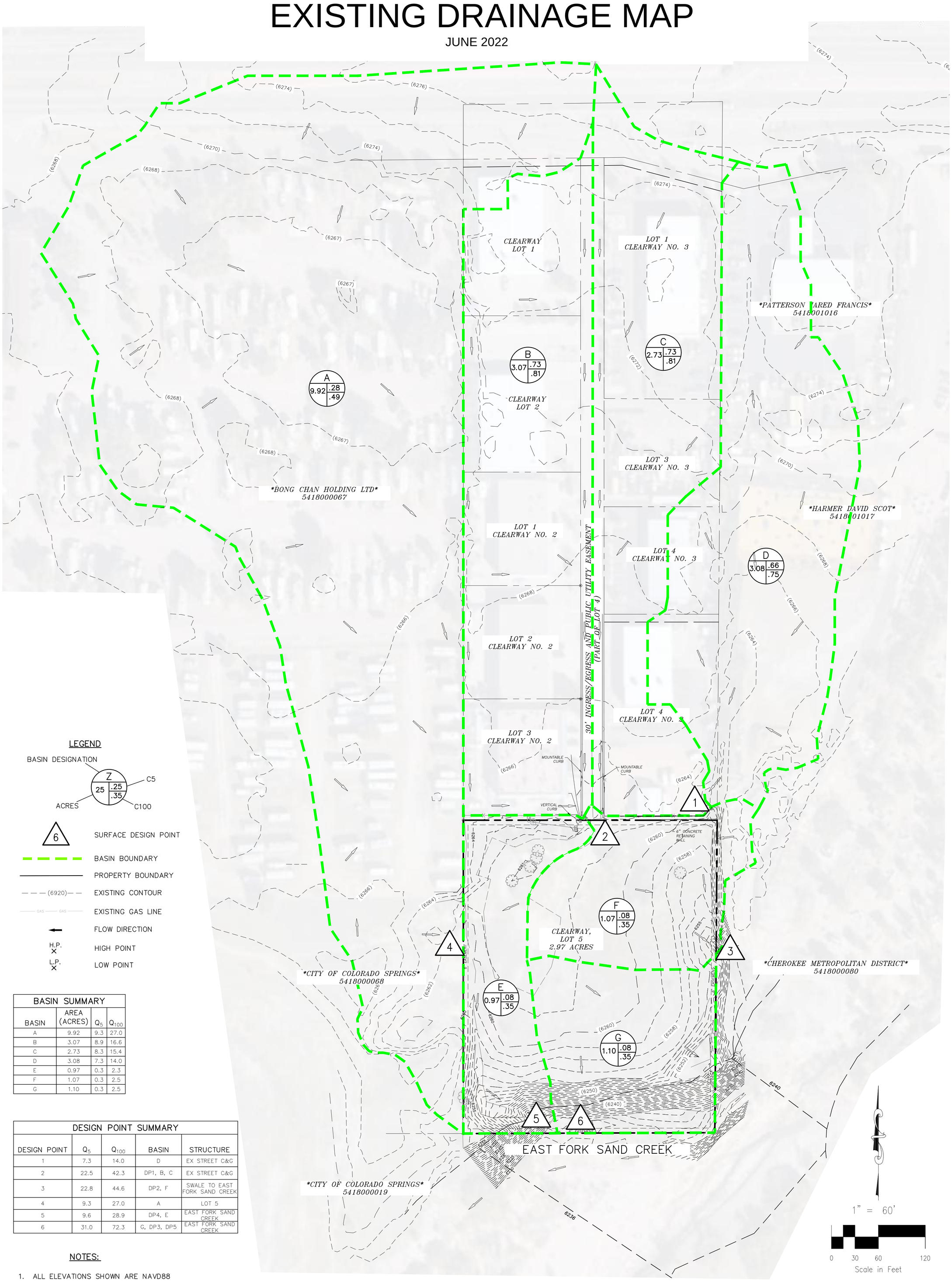
100 yr Stockpile Swale 10%

GVF Input Data	
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	5.8 in
Critical Depth	7.9 in
Channel Slope	0.100 ft/ft
Critical Slope	0.019 ft/ft

EXISTING AND PROPOSED DRAINAGE MAPS

CLEARWAY, LOT 5 (WIRENUT)
STOCKPILE GRADING PLAN
CITY OF COLORADO SPRINGS, STATE OF COLORADO
EXISTING DRAINAGE MAP
JUNE 2022



LEGEND

BASIN DESIGNATION — Z: 25 ACRES; .25 / .35; C5 / C100

6 — SURFACE DESIGN POINT

BASIN BOUNDARY

PROPERTY BOUNDARY

(6920) EXISTING CONTOUR

GAS GAS EXISTING GAS LINE

FLOW DIRECTION

H.P. HIGH POINT

L.P. LOW POINT

BASIN SUMMARY

BASIN	AREA (ACRES)	Q_5	Q_{100}
A	9.92	9.3	27.0
B	3.07	8.9	16.6
C	2.73	8.3	15.4
D	3.08	7.3	14.0
E	0.97	0.3	2.3
F	1.07	0.3	2.5
G	1.10	0.3	2.5

DESIGN POINT SUMMARY

DESIGN POINT	Q_5	Q_{100}	BASIN	STRUCTURE
1	7.3	14.0	D	EX STREET C&G
2	22.5	42.3	DP1, B, C	EX STREET C&G
3	22.8	44.6	DP2, F	SWALE TO EAST FORK SAND CREEK
4	9.3	27.0	A	LOT 5
5	9.6	28.9	DP4, E	EAST FORK SAND CREEK
6	31.0	72.3	G, DP3, DP5	EAST FORK SAND CREEK

NOTES:

1. ALL ELEVATIONS SHOWN ARE NAVD88
2. ALL RUNOFF IS TRIBUTARY TO THE EAST FORK SAND CREEK DRAINAGE BASIN

VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160

FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

CIVIL CONSULTANTS, INC.

212 N. WAHSATCH AVE., STE 305
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

CLEARWAY, LOT 5

EXISTING DRAINAGE MAP

PROJECT NO. 44-042

DESIGNED BY: TAU
DRAWN BY: DLM
CHECKED BY: VAS

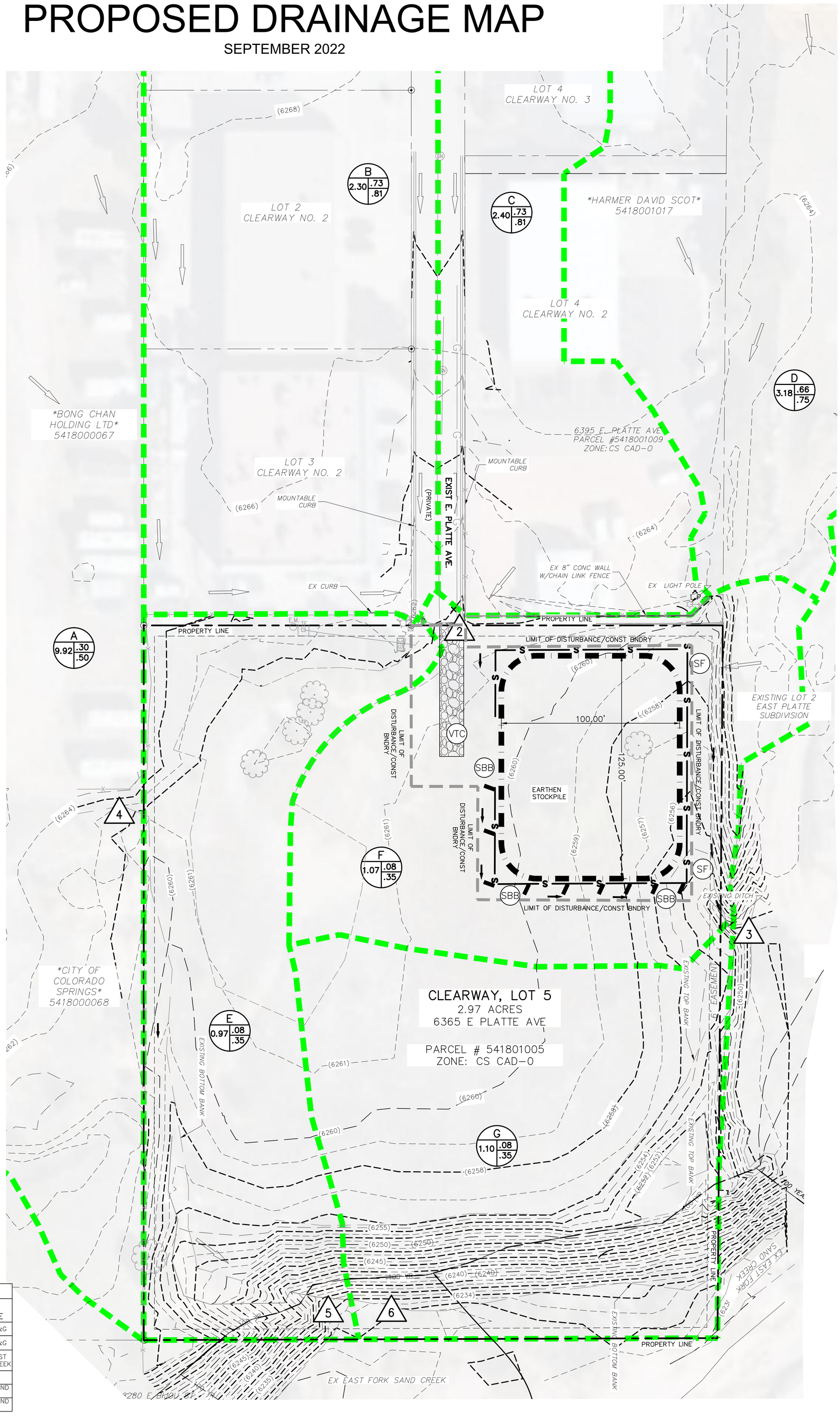
SCALE: HORIZONTAL: 1"=60' VERTICAL: N/A

DATE: 06/02/2022

SHEET 1 OF 1

EDM

CLEARWAY, LOT 5 (WIRENUT)
STOCKPILE GRADING PLAN
CITY OF COLORADO SPRINGS, STATE OF COLORADO
PROPOSED DRAINAGE MAP
SEPTEMBER 2022



1" = 30'

0 15 30 60
Scale in Feet

LEGEND

BASIN DESIGNATION — Z / 25 / .25 / .35 — C5 / C100 — ACRES

- 6 — SURFACE DESIGN POINT
- BASIN BOUNDARY
- PROPERTY BOUNDARY
- (6920) — EXISTING CONTOUR
- GAS — EXISTING GAS LINE
- FLOW DIRECTION
- H.P. — HIGH POINT
- L.P. — LOW POINT
- EROSION CONTROL BALES

BASIN SUMMARY			
BASIN	AREA (ACRES)	Q_5	Q_{100}
A	9.92	9.3	27.0
B	3.07	8.9	16.6
C	2.73	8.3	15.4
D	3.08	7.3	14.0
E	0.97	0.3	2.3
F	1.07	0.3	2.5
G	1.10	0.3	2.5

DESIGN POINT SUMMARY				
DESIGN POINT	Q_5	Q_{100}	BASIN	STRUCTURE
1	7.3	14.0	D	EX STREET C&G
2	22.5	42.3	DP1, B, C	EX STREET C&G
3	22.8	44.6	DP2, F	SWALE TO EAST FORK SAND CREEK
4	9.3	27.0	A	LOT 5
5	9.6	28.9	DP4, E	EAST FORK SAND CREEK
6	31.0	72.3	G, DP3, DP5	EAST FORK SAND CREEK

NOTES
1. REFER TO EXISTING DRAINAGE MAP FOR BASINS A, B, C, AND D.

VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160

FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

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PHONE: 719.955.5485

CLEARWAY, LOT 5
PROPOSED DRAINAGE MAP

PROJECT NO. 44-042	SCALE: HORIZONTAL: 1"=30' VERTICAL: N/A	DATE: 09/14/2022	
DESIGNED BY: DLM DRAWN BY: TAU CHECKED BY: VAS		SHEET 1 OF 1	PDM