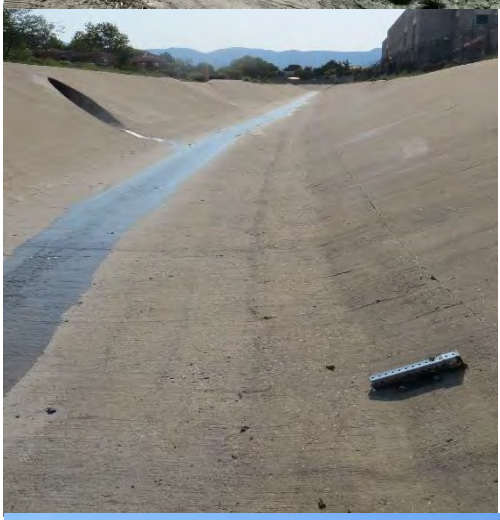
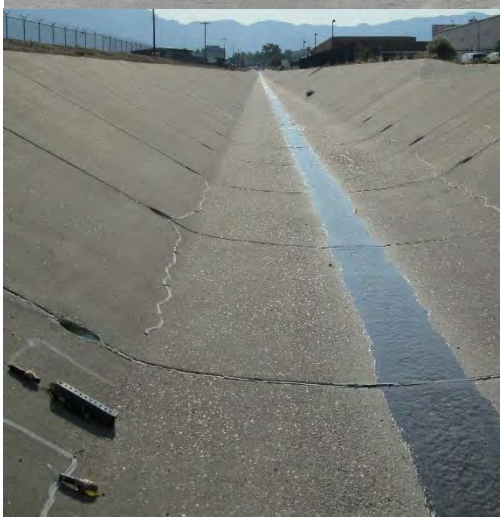
LEVELOGGER REPORT FOR MARCH – JUNE 2022





AUGUST 8, 2022

Prepared for:

AMAFCA
2600 Prospect Avenue NE
Albuquerque, NM 87107

Prepared by:

Bohannan Huston

Engineering
Spatial Data
Advanced Technologies

LEVELOGGER REPORT

FOR

MARCH – JUNE 2022

AUGUST 8, 2022

Prepared for:

AMAFCA

2600 PROSPECT AVENUE NE

ALBUQUERQUE, NM 87107

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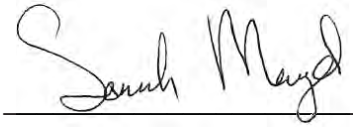
Prepared by:

08/08/2022

Sarah Ganley, P.E., ENV-SP Date



08/08/2022

Savannah Maynard Date

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I. EXECUTIVE SUMMARY

Eight storm events were recorded by the Leveloggers and analyzed for this report during the four-month period between March – June 2022. During this report period there were 78 days, from March 30 through June 17, without measurable precipitation which is the 12th longest dry period Albuquerque has seen in its history. The Leveloggers recorded six storm events within a two week period in June and the total rainfall was approximately 2.38 inches, as recorded from the National Oceanic and Atmospheric Administration (NOAA) Weather Data. This is the highest number of storm events and amount of rainfall recorded by the Leveloggers during the month of June since Levelogger monitoring began in October 2016. No illicit discharge indicators were detected during the AMAFCA site visits to the 14 Levelogger sites during this reporting period.

II. OVERVIEW OF LEVELOGGER COLLECTION PROGRAM

Bohannan Huston, Inc. (BHI) completed data analysis of 14 AMAFCA Leveloggers installed in the channels contributing stormwater runoff to the North Diversion Channel (NDC). This report summarizes the Levelogger analysis results for data collected in fiscal year (FY) 2022 from March to June 2022.

The Leveloggers analyzed and reported include, from north to south (see site locations in Figure 1.):

1. North Camino Arroyo
2. La Cueva Arroyo
3. North Domingo Baca
4. North Pino Arroyo
5. South Pino Arroyo
6. Bear Canyon Arroyo
7. Vineyard Arroyo
8. Grantline Arroyo
9. Hahn Arroyo
10. Embudo Arroyo
11. San Mateo Storm Drain Outfall to Embudo
12. Campus Wash
13. Lower Bear – Upstream (Wyoming)
14. Lower Bear – Downstream (Spain)

AMAFCA provided BHI with the compensated Levelogger data for each of the four (4) months discussed in this report. BHI applied the relevant rating curves to the compensated Levelogger data to calculate flow rates and volumes of stormwater runoff recorded at each Levelogger site location during storm events. The rating curves for the Levelogger locations were determined in the *North Diversion Channel Inlets – Hydraulic Analysis* (BHI, 2016), and the more recent rating curve analysis related to the Lower Bear locations.

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Author: thuynh

A. LEVELOGGER DATA COLLECTION SUMMARY FOR MARCH – JUNE 2022

1. LEVELOGGER MONTHLY SITE VISITS

AMAFCA visited each Levelogger site monthly to download collected flow depth data and to replace the deployed instruments with newly maintained Leveloggers. During the Levelogger visits, AMAFCA visually screened each channel for general maintenance needs and signs of illicit discharge. Staining in the channel, oil sheens, presence of foam, and/or dumped debris are typical indicators of potential illicit discharges. Small nuisance flows within the channels are normal and routinely observed within the NDC watershed and are not considered indicative of an illicit discharge.

No signs of illicit discharge were observed during the March to June 2022 Levelogger collection period site visits. AMAFCA obtained and provided site photos looking upstream and downstream of each Levelogger to document the visual screening and appearance of the channels. All acquired photos are provided by month, see pages 5 – 18, for each Levelogger location covered in this report.

Table 1 provides a summary of the number of visual screenings conducted and the number of potential illicit discharge indicators observed at each AMAFCA Levelogger site location for this reporting period, as well as the cumulative total of each for the complete FY 2022 (June 2021 – July 2022) time period, to date. No illicit discharge indicators were detected during the AMAFCA site visits to the 14 Levelogger sites during this time period.

Table 1: Summary of Visual Screenings and Potential Illicit Discharges Detected

AMAFCA/City of Albuquerque Facility - Levelogger Data Site Location	Number of Visual Screenings July 2021 – July 2022													Cumulative Total of Visual Screenings Completed	Number of Potential Illicit Discharge Indicators Detected July 2021 – July 2022			Cumulative Total of Illicit Discharge Indicators Detected
	July 2021	August 2021	September 2021	October 2021	November 2021	December 2021	January 2022	February 2022	March 2022	April 2022	May 2022	June 2022	July 2022		Aug. – Nov. 2021	Dec. 2021 – March 2022	April – July 2022	
North Camino Arroyo	1	1	1	1	1	1	1	1	1	1	1	1	1	**13**	0	0	0	**0**
La Cueva Arroyo	1	1	1	1	1	1	1	1	1	1	1	1	1	**13**	0	0	0	**0**
North Domingo Baca	1	1	1	1	1	1	1	1	1	1	1	1	1	**13**	0	0	0	**0**
North Pino Arroyo	1	1	1	1	1	1	1	1	1	1	1	1	1	**13**	0	0	0	**0**
South Pino Arroyo	1	1	1	1	1	1	1	1	1	1	1	1	1	**13**	0	0	0	**0**
Bear Canyon Arroyo	1	1	1	1	1	1	1	1	1	1	1	1	1	**13**	0	0	0	**0**
Vineyard Arroyo	1	1	1	1	1	1	1	1	1	1	1	1	1	**13**	0	0	0	**0**
Grantline Arroyo	1	1	1	1	1	1	1	1	1	1	1	1	1	**13**	0	0	0	**0**
Hahn Arroyo	1	1	1	1	1	1	1	1	1	1	1	1	1	**13**	0	0	0	**0**
Embudo Arroyo	1	1	1	1	1	1	1	1	1	1	1	1	1	**13**	0	0	0	**0**
San Mateo Drain	1	1	1	1	1	1	1	1	1	1	1	1	1	**13**	0	0	0	**0**
Campus Wash	1	1	1	1	1	1	1	1	1	1	1	1	1	**13**	0	0	0	**0**
Lower Bear – Upstream (Wyoming)	1	1	1	1	1	1	1	1	1	1	1	1	1	**13**	0	0	0	**0**
Lower Bear – Downstream (Spain)	1	1	1	1	1	1	1	1	1	1	1	1	1	**13**	0	0	0	**0**

Months associated with site visits to collect the Levelogger data summarized in this report. Site visits retrieve data for the prior month – for example, the April 2022 site visit retrieved the March 2022 Levelogger data.

North Camino Arroyo

April 7, 2022	May 5, 2022	June 2, 2022	July 7, 2022

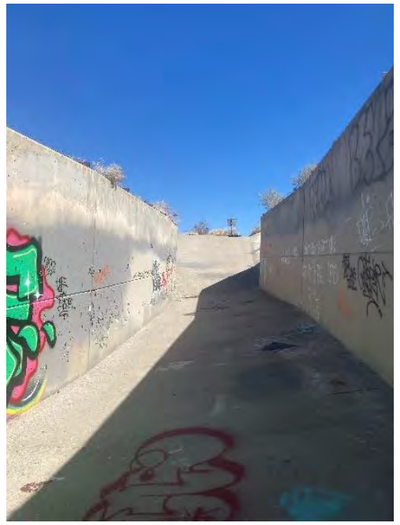
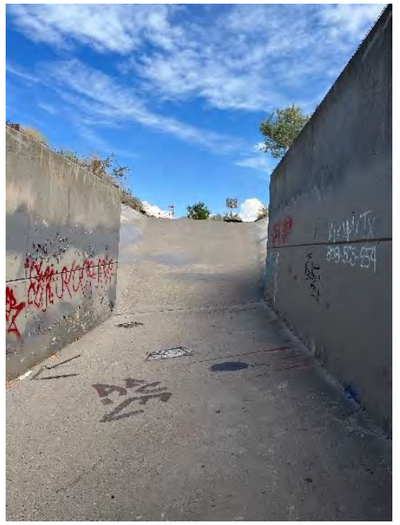

		

Photo 1: North Camino Arroyo – Looking Upstream	**Photo 2: North Camino Arroyo – Looking Upstream**	**Photo 3: North Camino Arroyo – Looking Upstream**	**Photo 4: North Camino Arroyo – Looking Upstream**

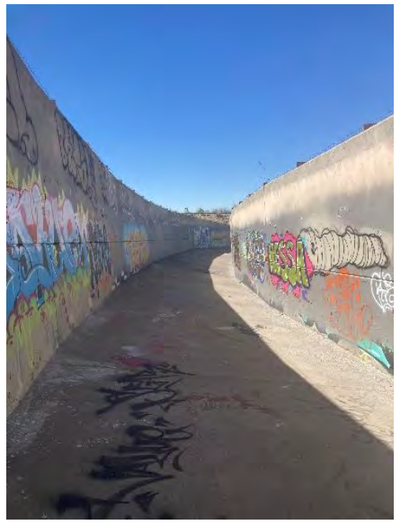
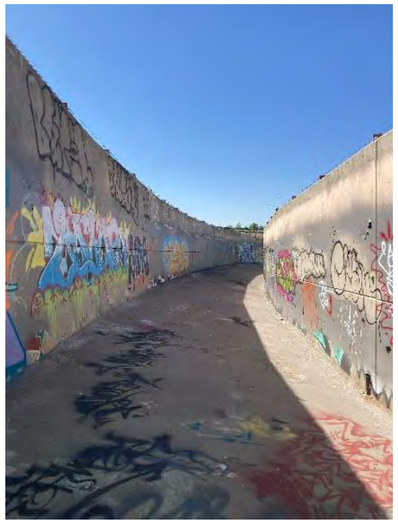
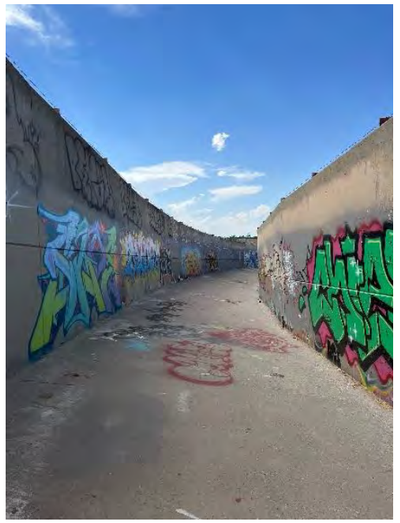
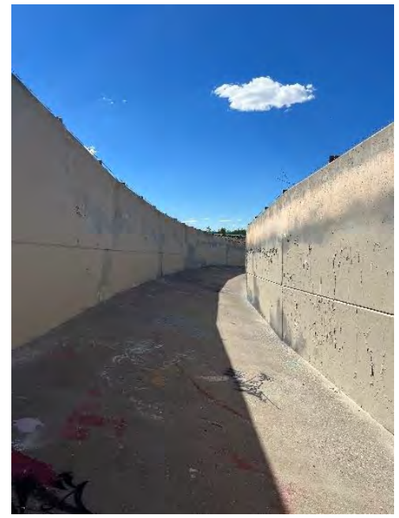

			

Photo 5: North Camino Arroyo Looking Downstream	**Photo 6: North Camino Arroyo – Looking Downstream**	**Photo 7: North Camino Arroyo – Looking Downstream**	**Photo 8: North Camino Arroyo – Looking Downstream**

La Cueva Arroyo

April 7, 2022	May 5, 2022	June 2, 2022	July 7, 2022

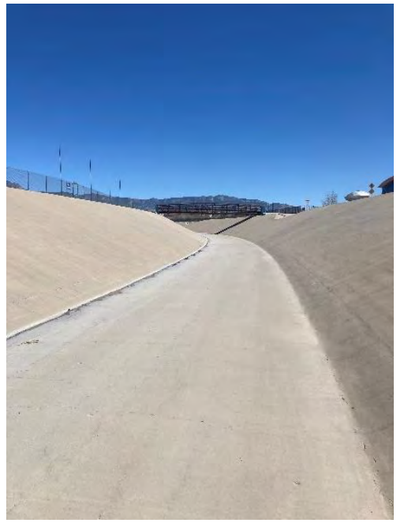
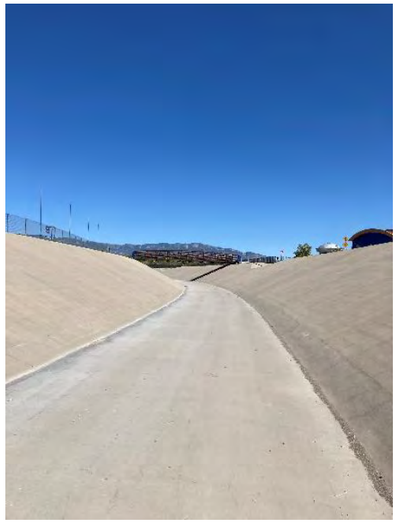
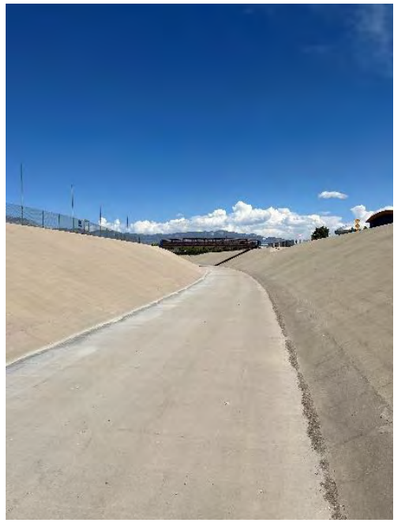
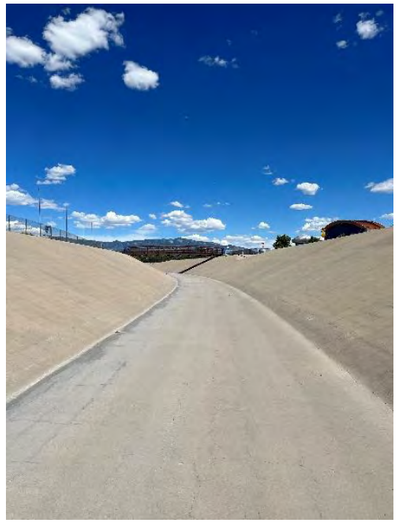

			

Photo 9: La Cueva Arroyo – Looking Upstream	**Photo 10: La Cueva Arroyo – Looking Upstream**	**Photo 11: La Cueva Arroyo – Looking Upstream**	**Photo 12: La Cueva Arroyo – Looking Upstream**

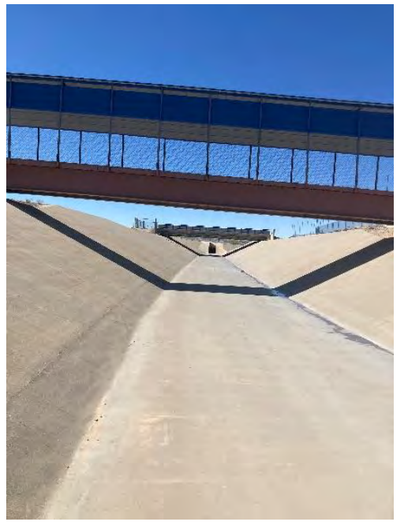
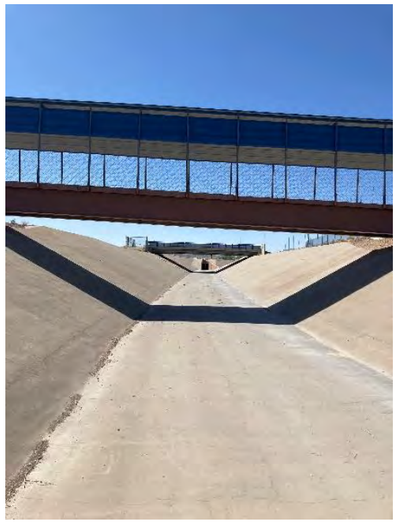
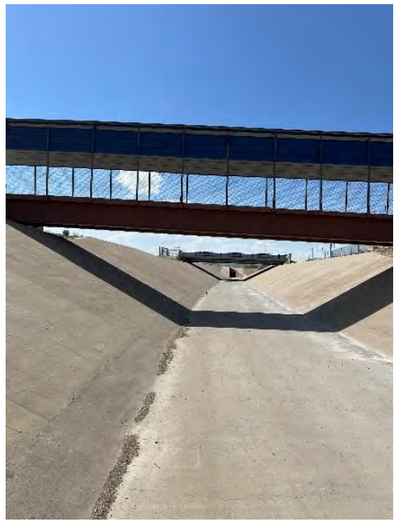
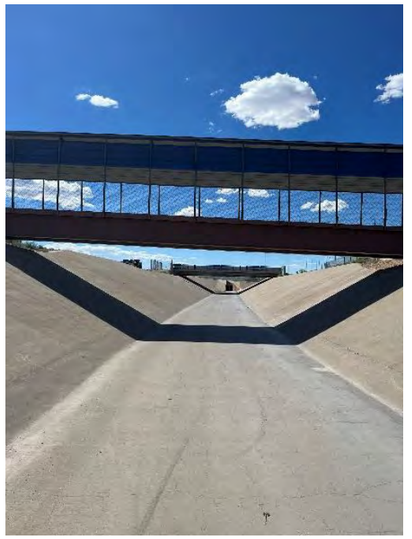

			

Photo 13: La Cueva Arroyo – Looking Downstream	**Photo 14: La Cueva Arroyo – Looking Downstream**	**Photo 15: La Cueva Arroyo – Looking Downstream**	**Photo 16: La Cueva Arroyo – Looking Downstream**

North Domingo Baca

April 7, 2022	May 5, 2022	June 2, 2022	July 7, 2022

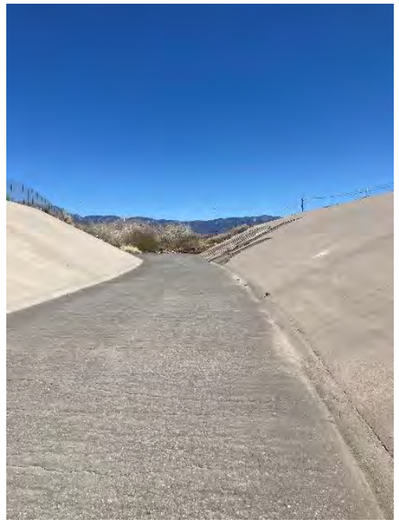
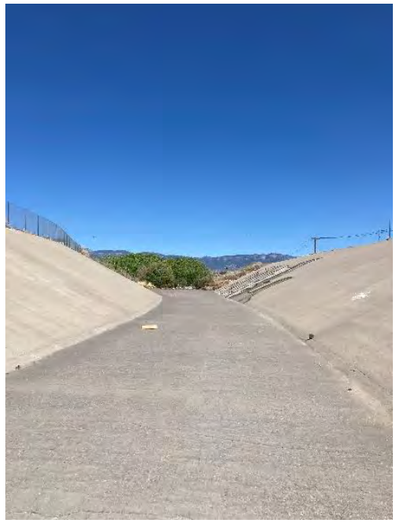
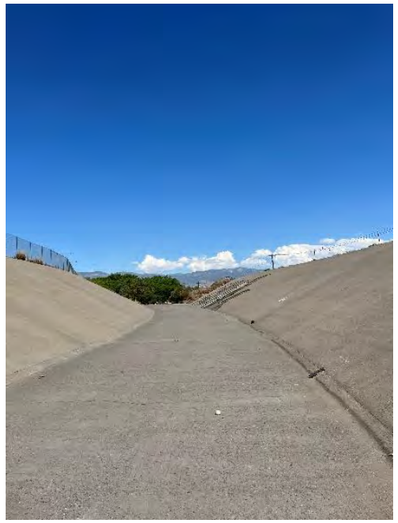
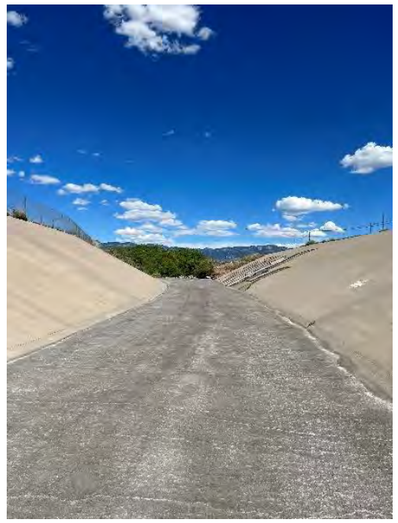

			

Photo 17: North Domingo Baca – Looking Upstream	**Photo 18: North Domingo Baca – Looking Upstream**	**Photo 19: North Domingo Baca – Looking Upstream**	**Photo 20: North Domingo Baca – Looking Upstream**

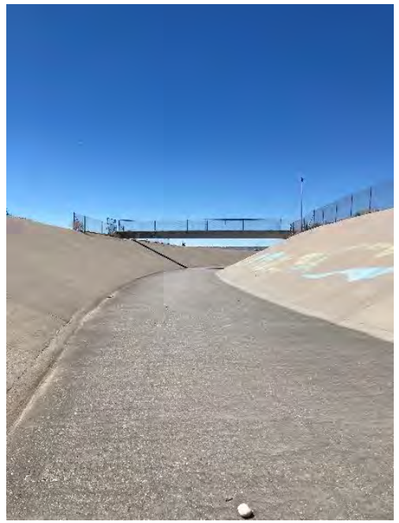
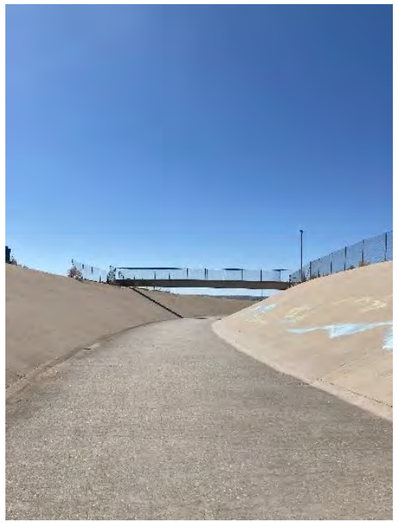
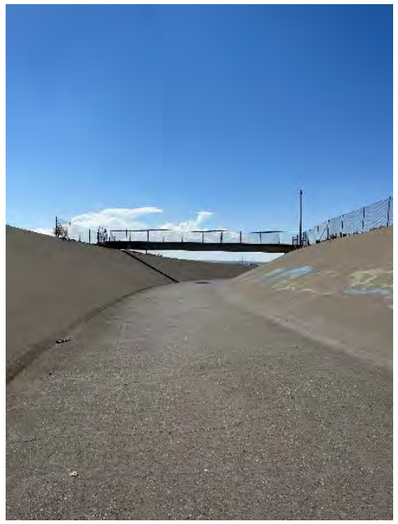
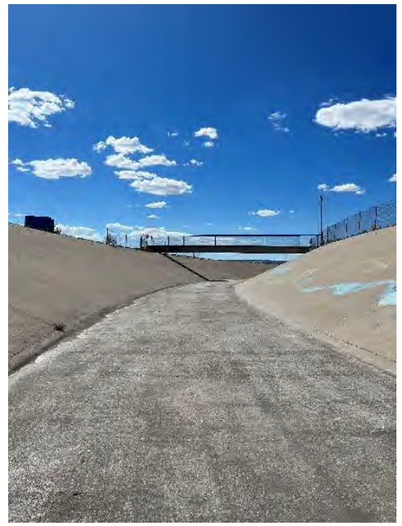
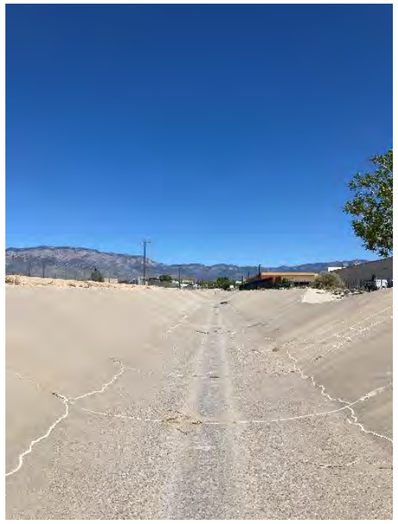
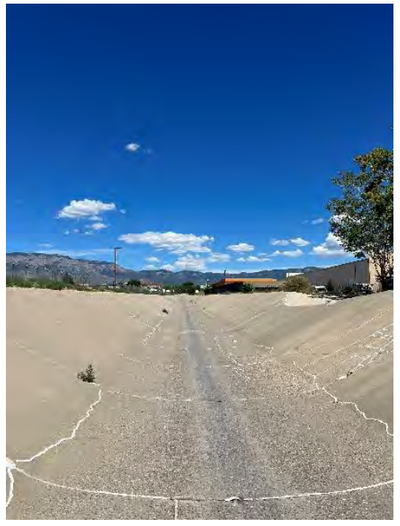

			

Photo 21: North Domingo Baca – Looking Downstream	**Photo 22: North Domingo Baca – Looking Downstream**	**Photo 23: North Domingo Baca – Looking Downstream**	**Photo 24: North Domingo Baca – Looking Downstream**

North Pino Arroyo

April 7, 2022	May 5, 2022	June 2, 2022	July 7, 2022
			
Photo 25: North Pino Arroyo – Looking Upstream	**Photo 26: North Pino Arroyo – Looking Upstream**	**Photo 27: North Pino Arroyo – Looking Upstream**	**Photo 28: North Pino Arroyo – Looking Upstream**

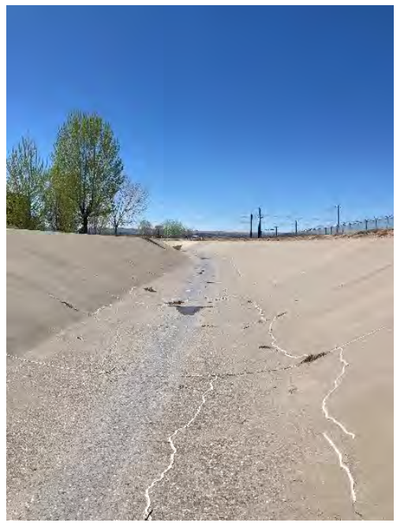
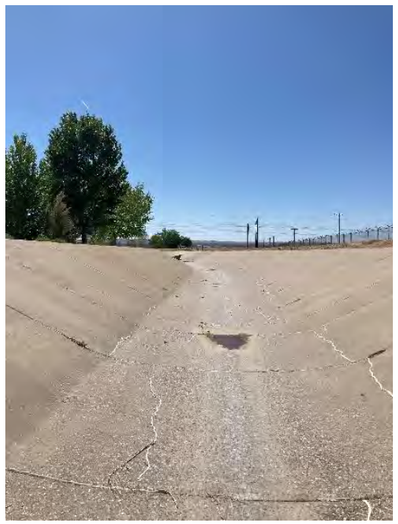
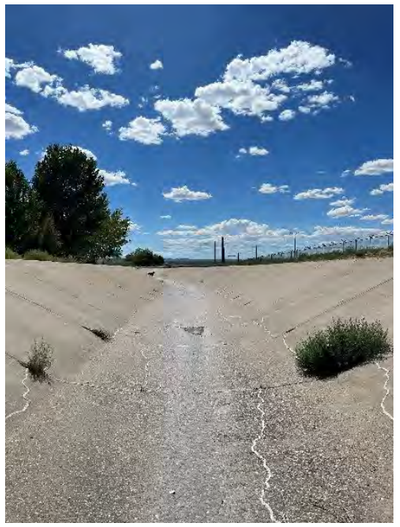

			

Photo 29: North Pino Arroyo – Looking Downstream	**Photo 30: North Pino Arroyo – Looking Downstream**	**Photo 31: North Pino Arroyo – Looking Downstream**	**Photo 32: North Pino Arroyo – Looking Downstream**

South Pino Arroyo

April 7, 2022	May 5, 2022	June 2, 2022	July 7, 2022

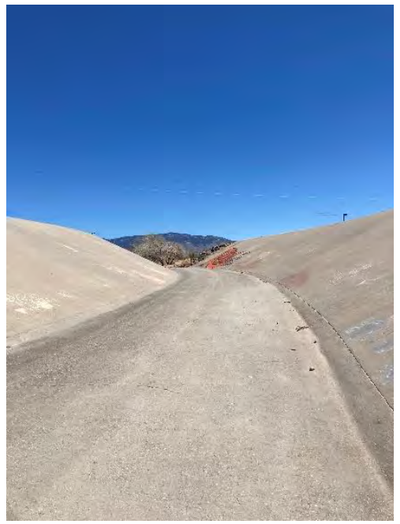
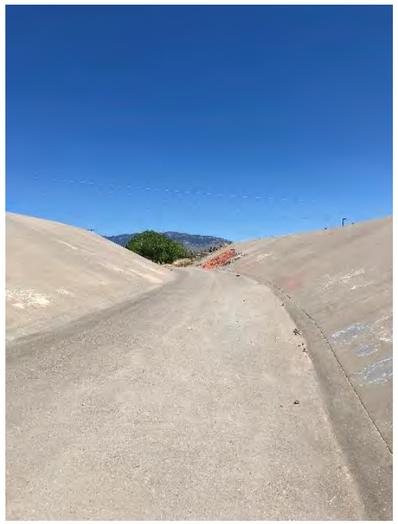
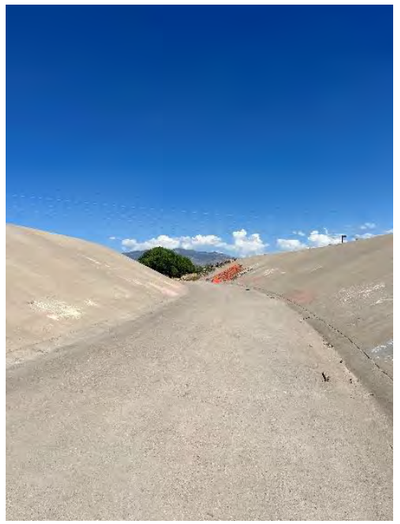
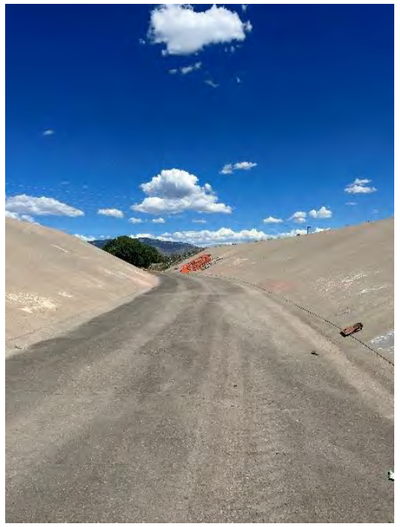

			

Photo 33: South Pino Arroyo – Looking Upstream	**Photo 34: South Pino Arroyo – Looking Upstream**	**Photo 35: South Pino Arroyo – Looking Upstream**	**Photo 36: South Pino Arroyo – Looking Upstream**

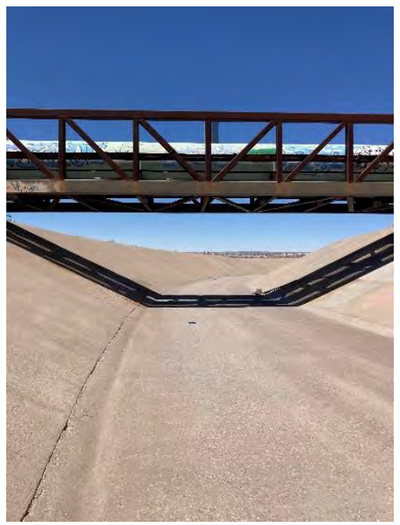
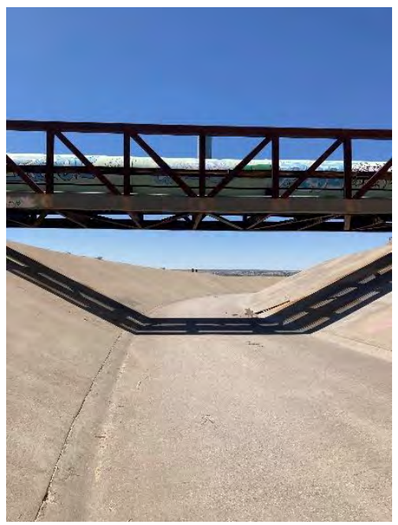
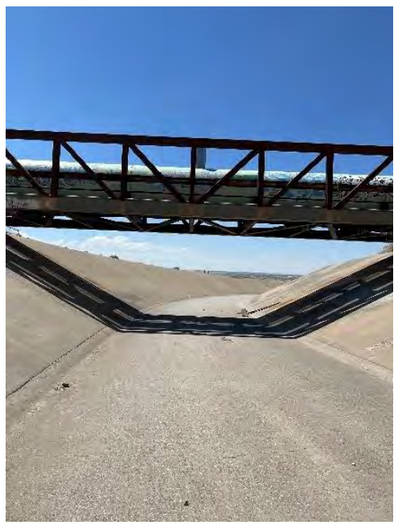
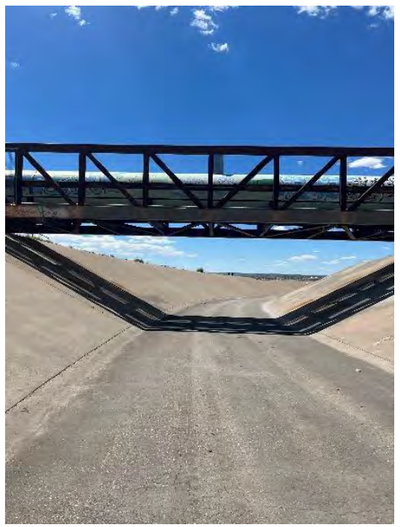
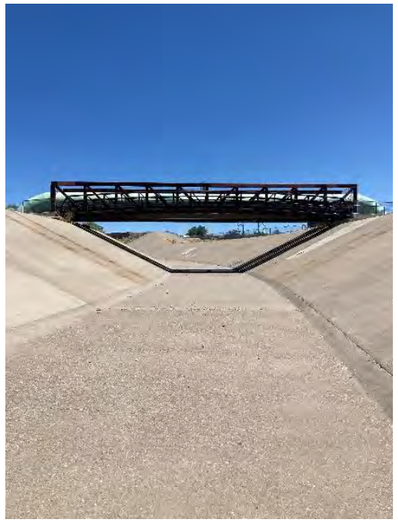
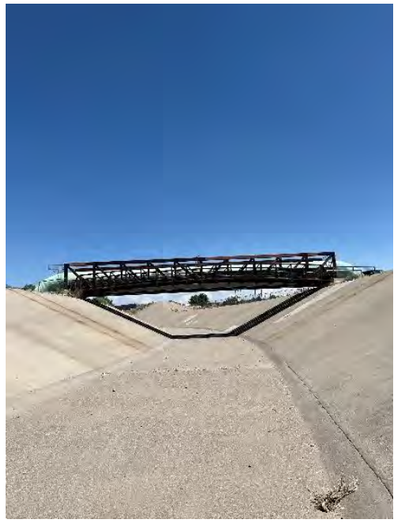
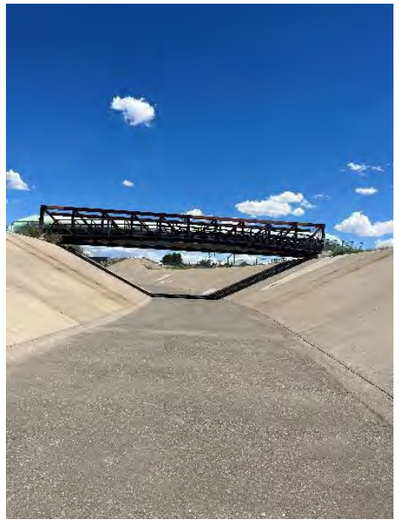
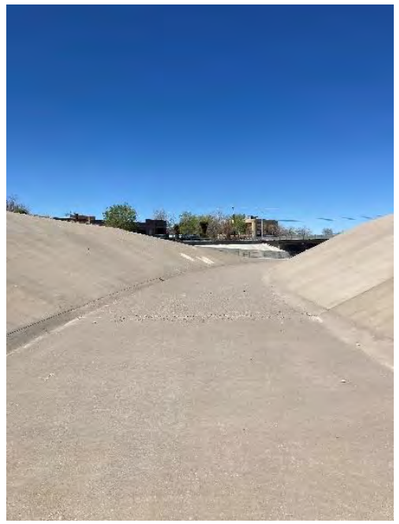
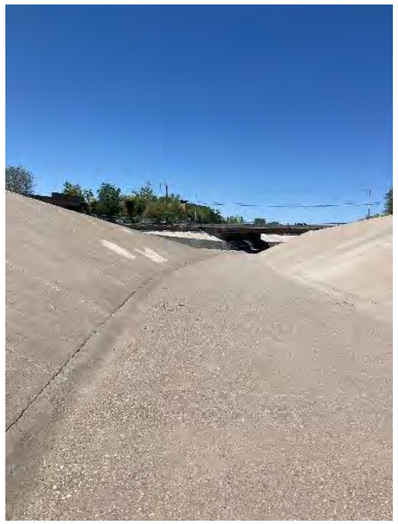
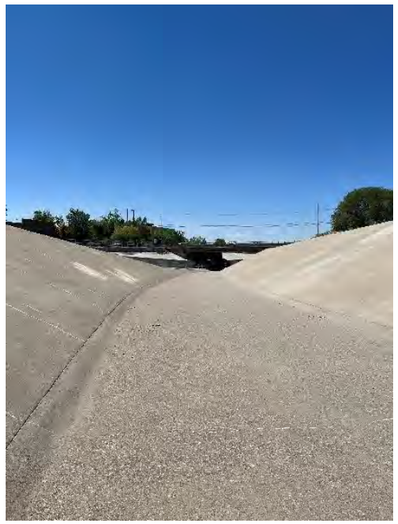
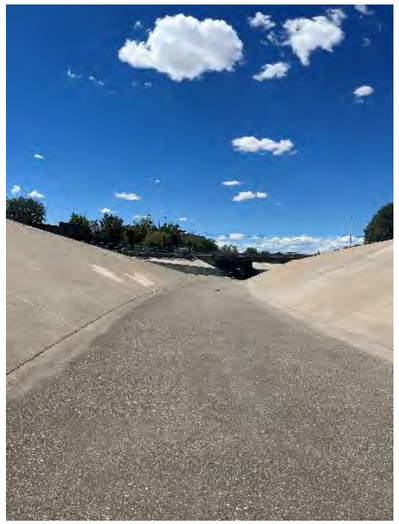

			

Photo 37: South Pino Arroyo – Looking Downstream	**Photo 38: South Pino Arroyo – Looking Downstream**	**Photo 39: South Pino Arroyo – Looking Downstream**	**Photo 40: South Pino Arroyo – Looking Downstream**

Bear Canyon Arroyo	April 7, 2022	May 5, 2022	June 2, 2022	July 7, 2022
				
	Photo 41: Bear Canyon Arroyo – Looking Upstream	**Photo 42: Bear Canyon Arroyo – Looking Upstream**	**Photo 43: Bear Canyon Arroyo – Looking Upstream**	**Photo 44: Bear Canyon Arroyo – Looking Upstream**
				
	Photo 45: Bear Canyon Arroyo– Looking Downstream	**Photo 46: Bear Canyon Arroyo– Looking Downstream**	**Photo 47: Bear Canyon Arroyo– Looking Downstream**	**Photo 48: Bear Canyon Arroyo– Looking Downstream**

Vineyard Arroyo

April 7, 2022	May 5, 2022	June 2, 2022	July 7, 2022

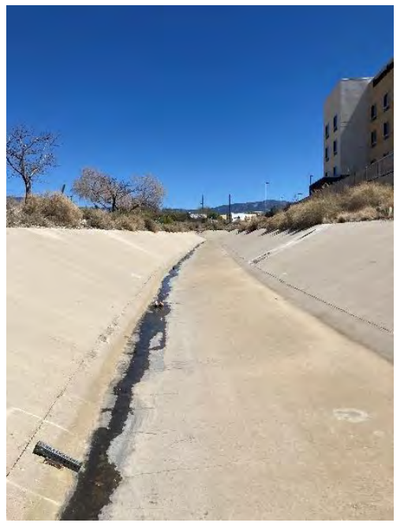
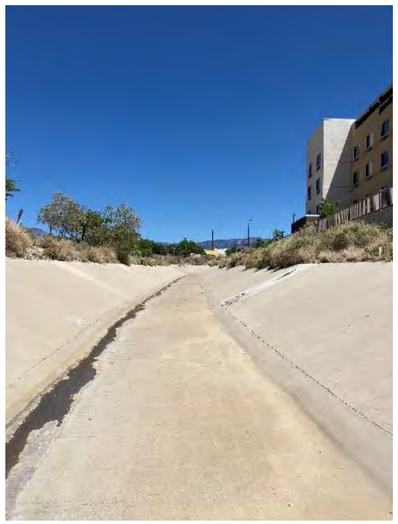
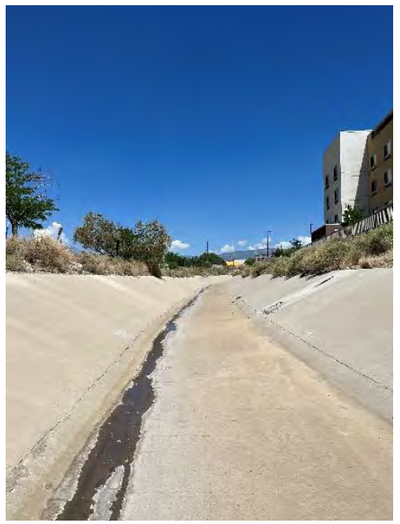
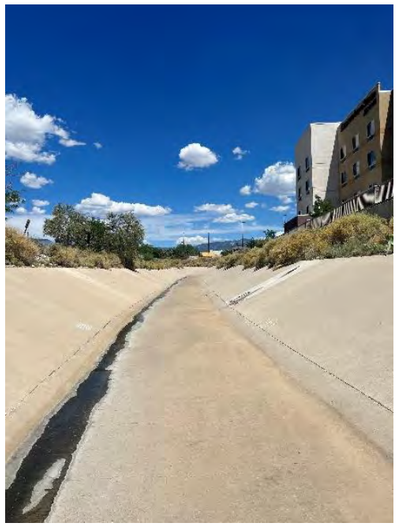

			

Photo 49: Vineyard Arroyo – Looking Upstream	**Photo 50: Vineyard Arroyo – Looking Upstream**	**Photo 51: Vineyard Arroyo – Looking Upstream**	**Photo 52: Vineyard Arroyo – Looking Upstream**

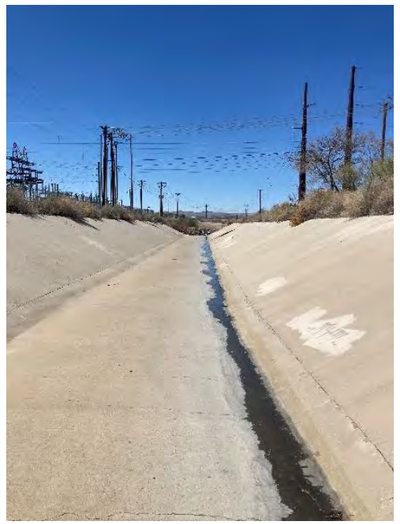
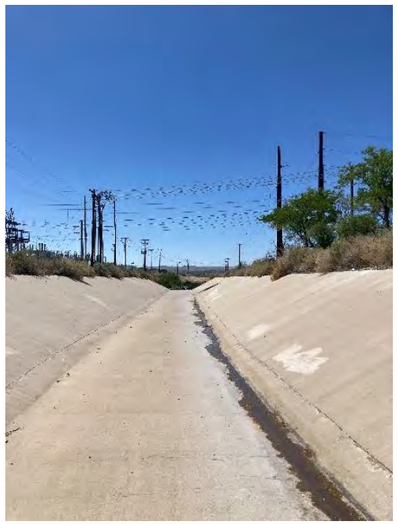
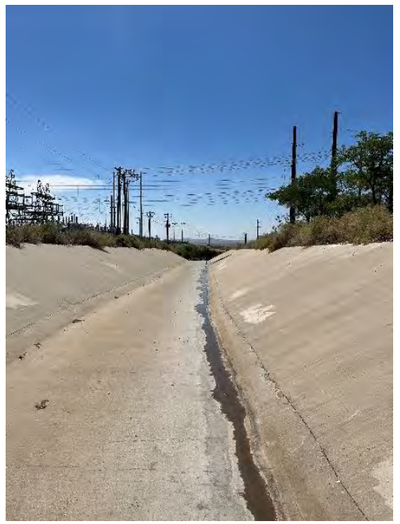
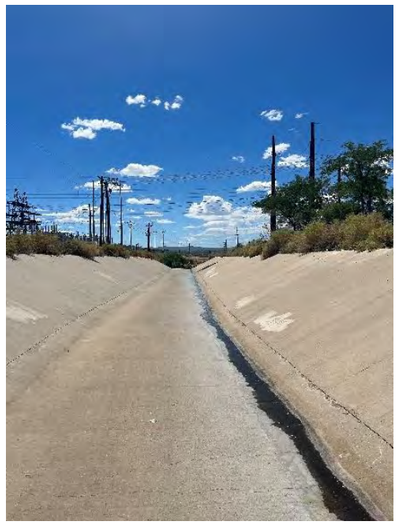

			

Photo 53: Vineyard Arroyo – Looking Downstream	**Photo 54: Vineyard Arroyo – Looking Downstream**	**Photo 55: Vineyard Arroyo – Looking Downstream**	**Photo 56: Vineyard Arroyo – Looking Downstream**

Grantline Arroyo

April 7, 2022	May 5, 2022	June 2, 2022	July 7, 2022

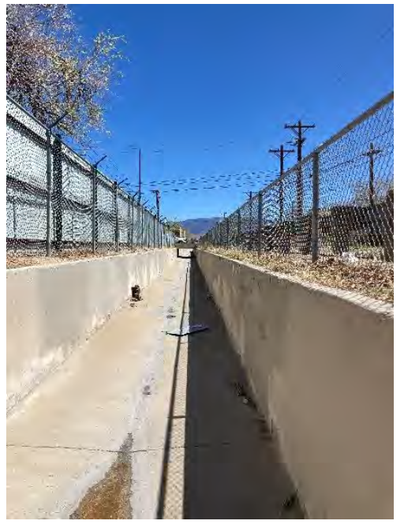
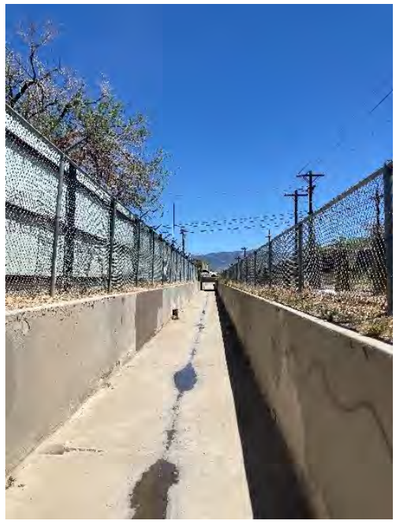
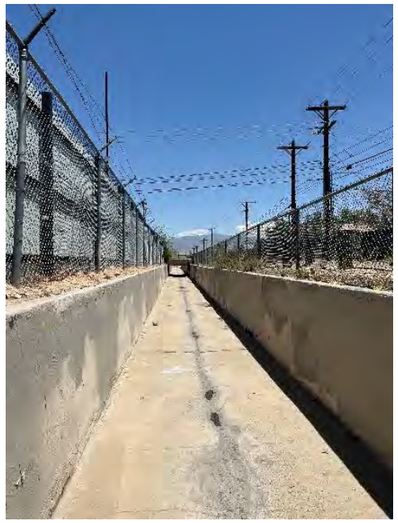
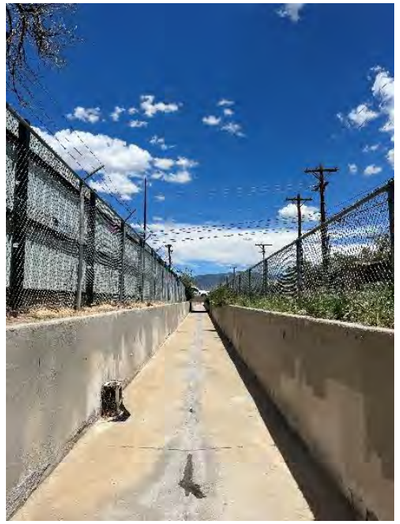
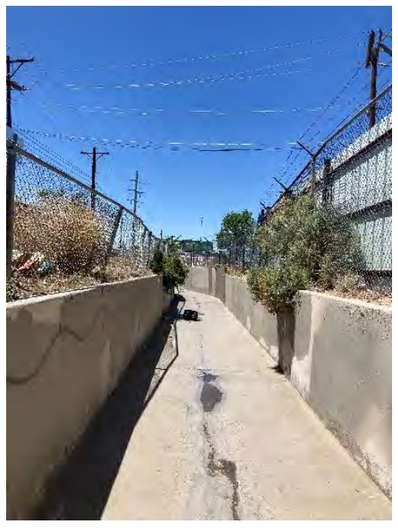
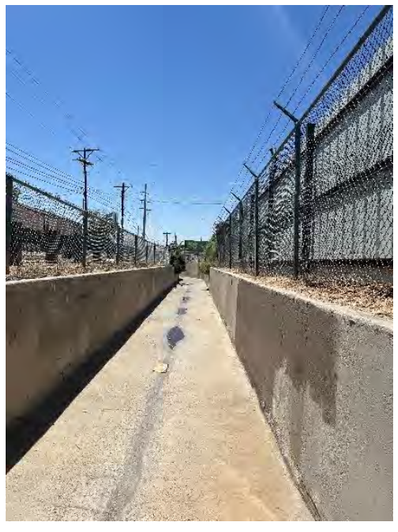
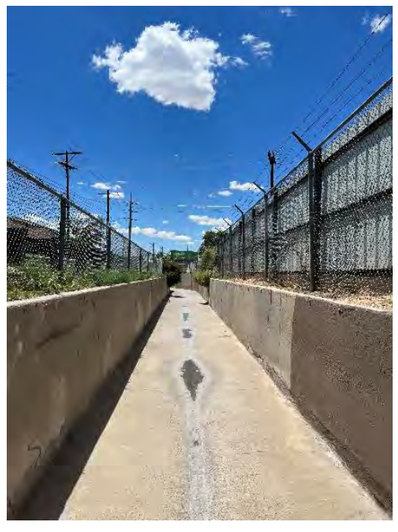

			

Photo 57: Grantline Arroyo – Looking Upstream	**Photo 58: Grantline Arroyo – Looking Upstream**	**Photo 59: Grantline Arroyo – Looking Upstream**	**Photo 60: Grantline Arroyo – Looking Upstream**
			
Photo 61: Grantline Arroyo – Looking Downstream	**Photo 62: Grantline Arroyo – Looking Downstream**	**Photo 63: Grantline Arroyo – Looking Downstream**	**Photo 64: Grantline Arroyo – Looking Downstream**

Hahn Arroyo

April 7, 2022	May 5, 2022	June 2, 2022	July 7, 2022

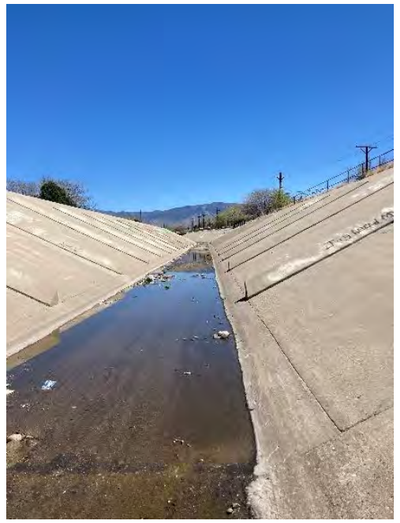
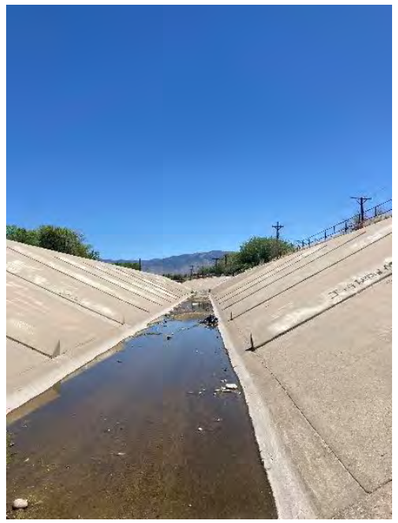
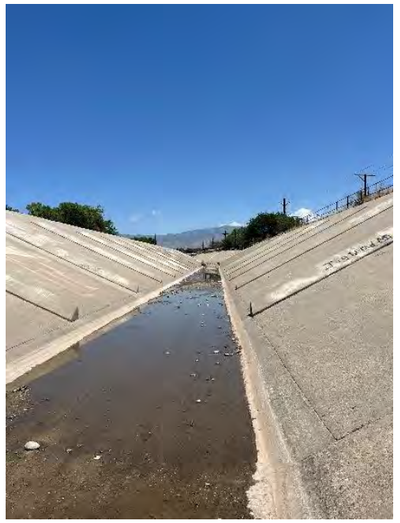
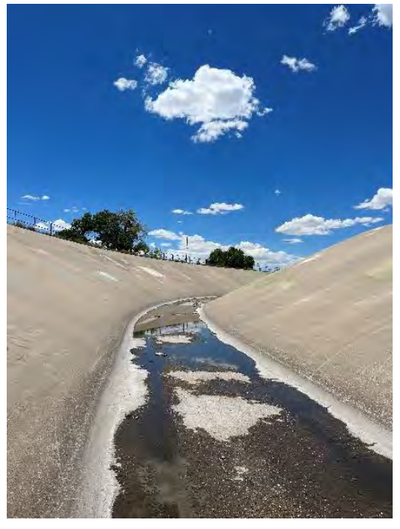

		

Photo 65: Hahn Arroyo – Looking Upstream	**Photo 66: Hahn Arroyo – Looking Upstream**	**Photo 67: Hahn Arroyo – Looking Upstream**	**Photo 68: Hahn Arroyo – Looking Upstream**
			
Photo 69: Hahn Arroyo – Looking Downstream	**Photo 70: Hahn Arroyo – Looking Downstream**	**Photo 71: Hahn Arroyo – Looking Downstream**	**Photo 72: Hahn Arroyo – Looking Downstream**

San Mateo Storm Drain

April 7, 2022	May 5, 2022	June 2, 2022	July 7, 2022

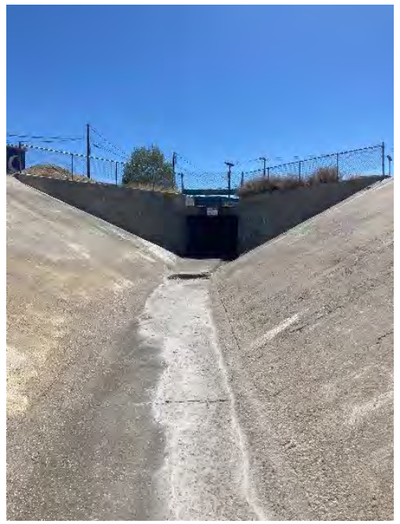
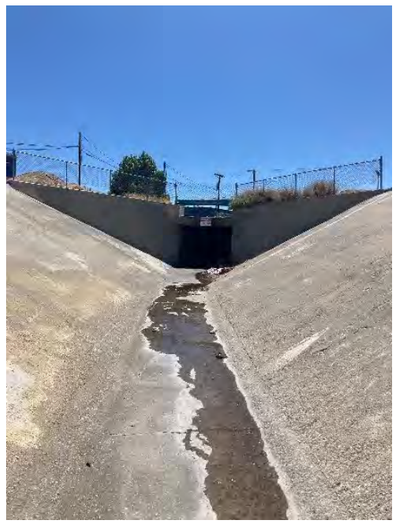
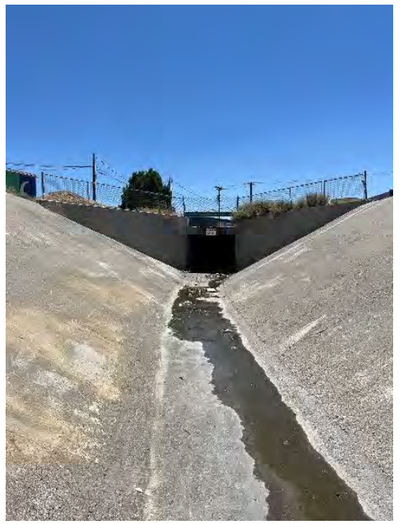
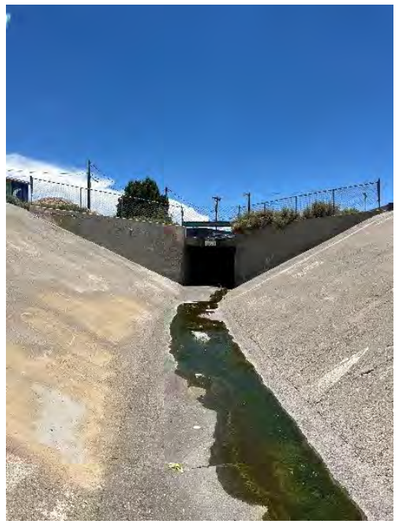
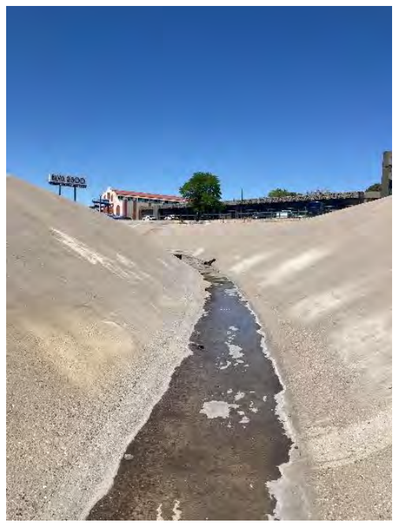
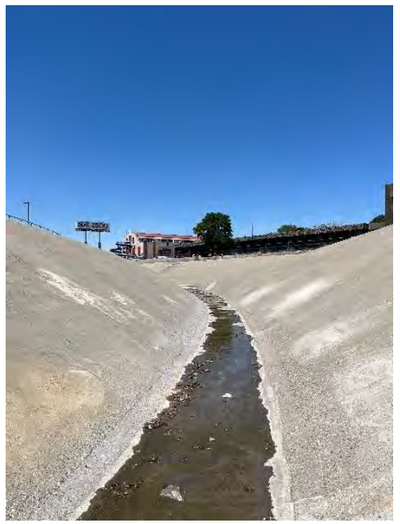

			

Photo 73: San Mateo Storm Drain – Looking Upstream	**Photo 74: San Mateo Storm Drain – Looking Upstream**	**Photo 75: San Mateo Storm Drain – Looking Upstream**	**Photo 76: San Mateo Storm Drain – Looking Upstream**
			
Photo 77: San Mateo Storm Drain – Looking Downstream	**Photo 78: San Mateo Storm Drain – Looking Downstream**	**Photo 79: San Mateo Storm Drain – Looking Downstream**	**Photo 80: San Mateo Storm Drain – Looking Downstream**

Embudo Arroyo

April 7, 2022	May 5, 2022	June 2, 2022	July 7, 2022

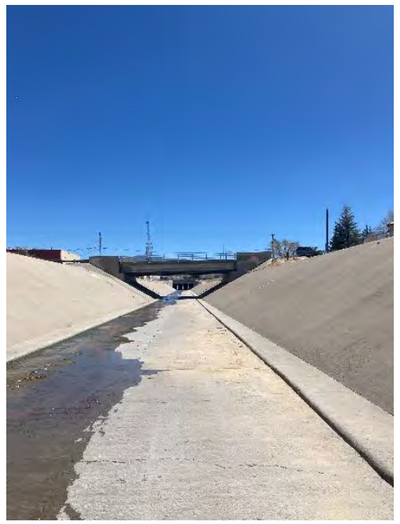
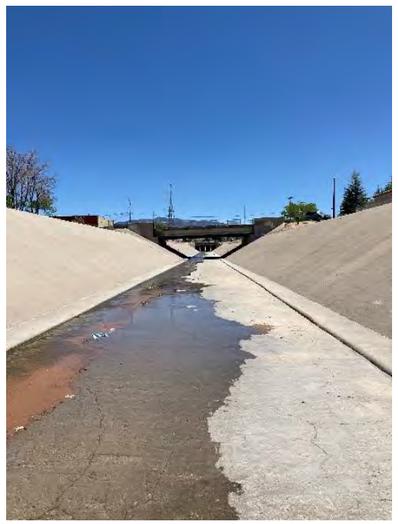
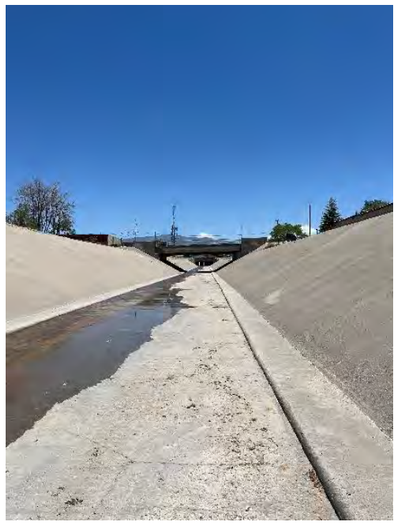
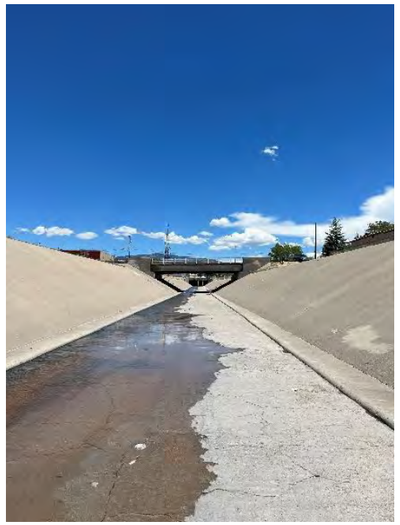

			

Photo 81: Embudo Arroyo – Looking Upstream	**Photo 82: Embudo Arroyo – Looking Upstream**	**Photo 83: Embudo Arroyo – Looking Upstream**	**Photo 84: Embudo Arroyo – Looking Upstream**

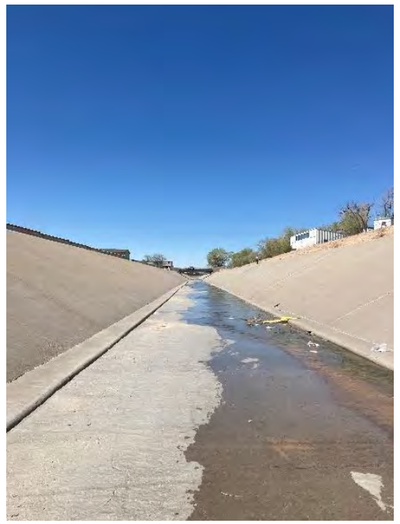
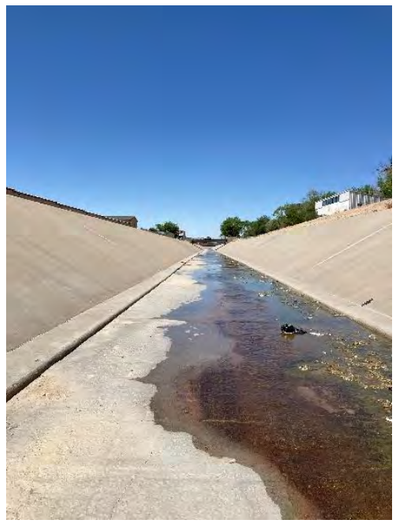
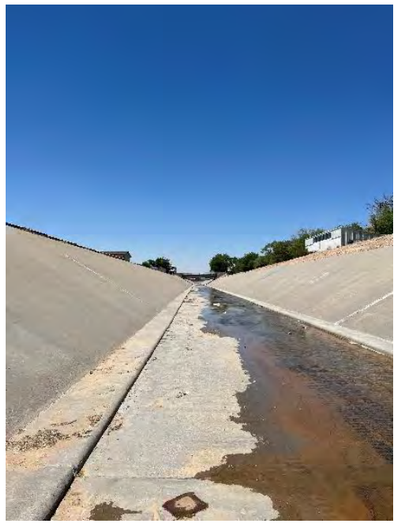

		

Photo 85: Embudo Arroyo – Looking Downstream	**Photo 86: Embudo Arroyo – Looking Downstream**	**Photo 87: Embudo Arroyo – Looking Downstream**	**Photo 88: Embudo Arroyo – Looking Downstream**

Campus Wash

April 7, 2022	May 5, 2022	June 2, 2022	July 7, 2022

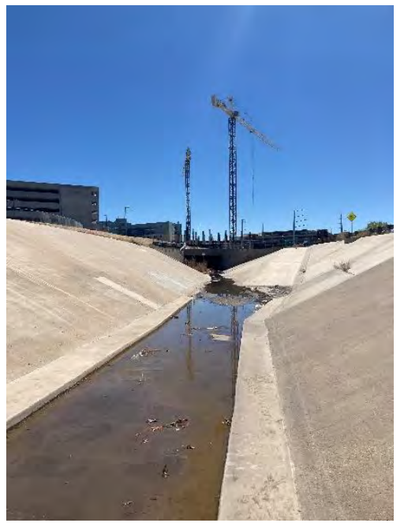
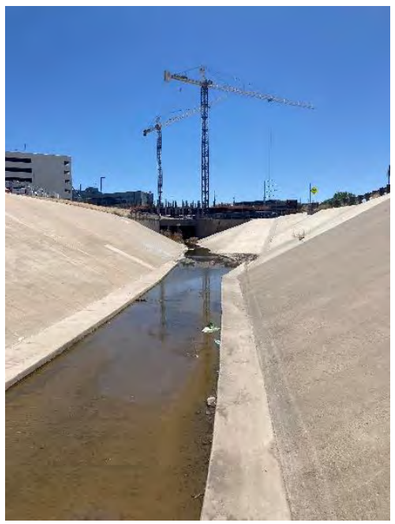
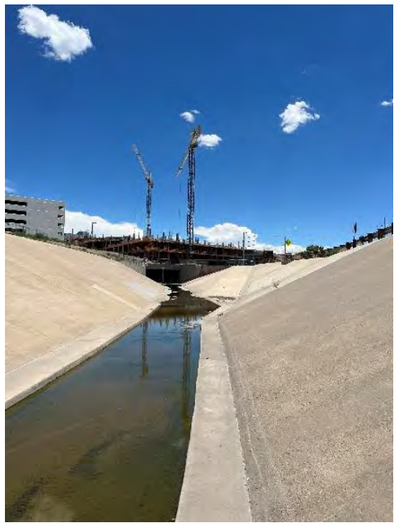

			

Photo 89: Campus Wash – Looking Upstream	**Photo 90: Campus Wash – Looking Upstream**	**Photo 91: Campus Wash – Looking Upstream**	**Photo 92: Campus Wash – Looking Upstream**

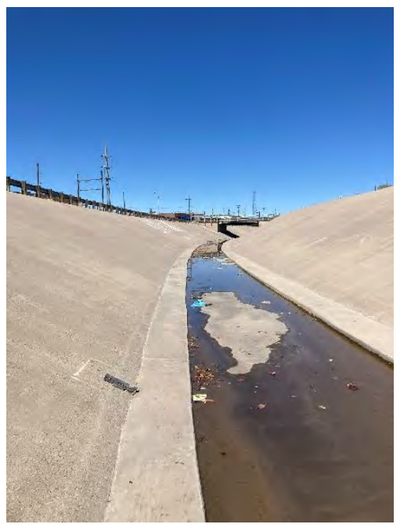
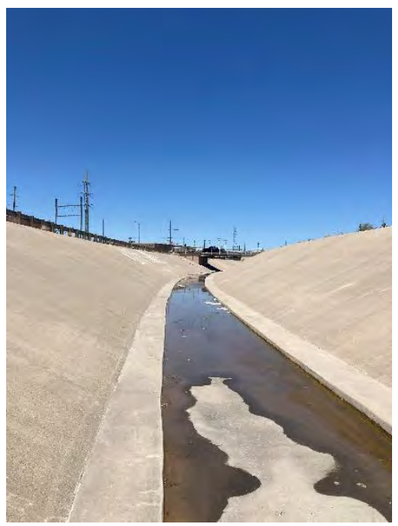
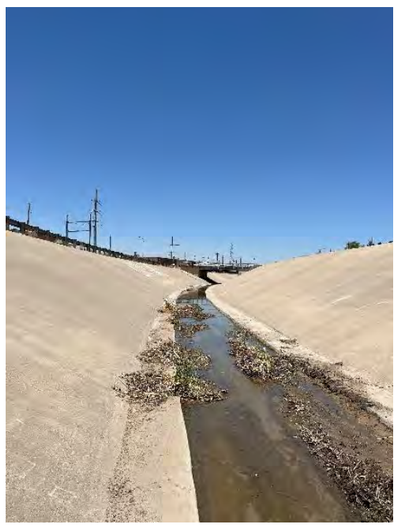
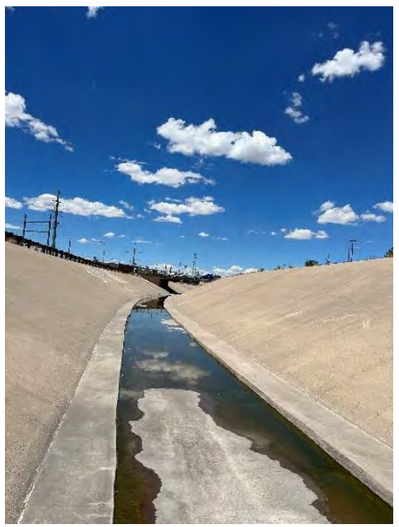

			

Photo 93: Campus Wash – Looking Downstream	**Photo 94: Campus Wash – Looking Downstream**	**Photo 95: Campus Wash – Looking Downstream**	**Photo 96: Campus Wash – Looking Downstream**

Lower Bear – Wyoming (Upstream)

April 7, 2022	May 5, 2022	June 2, 2022	July 7, 2022

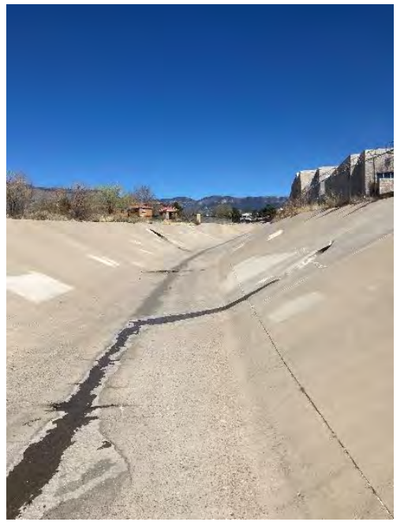
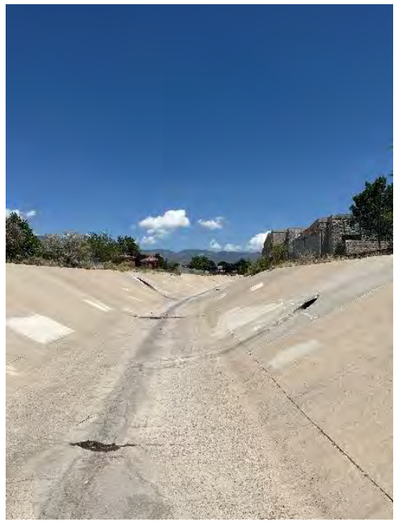
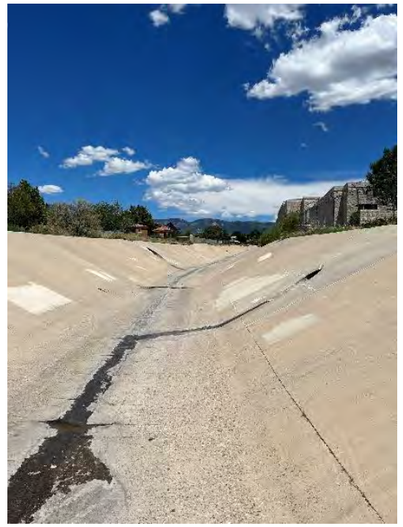

			

Photo 97: Lower Bear (Wyoming) – Looking Upstream	**Photo 98: Lower Bear (Wyoming) – Looking Upstream**	**Photo 99: Lower Bear (Wyoming) – Looking Upstream**	**Photo 100: Lower Bear (Wyoming) – Looking Upstream**

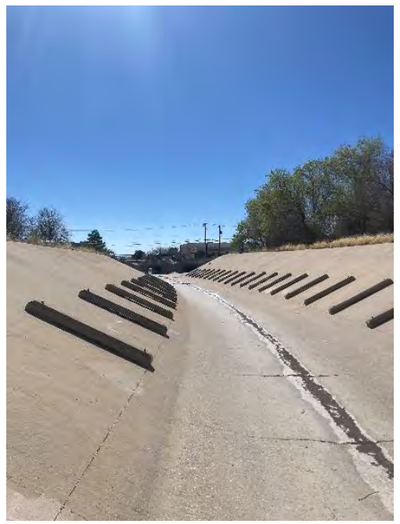
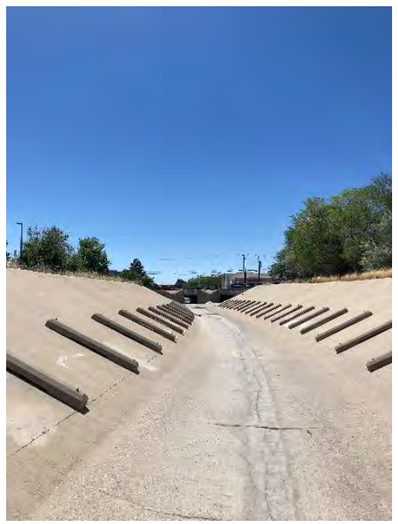
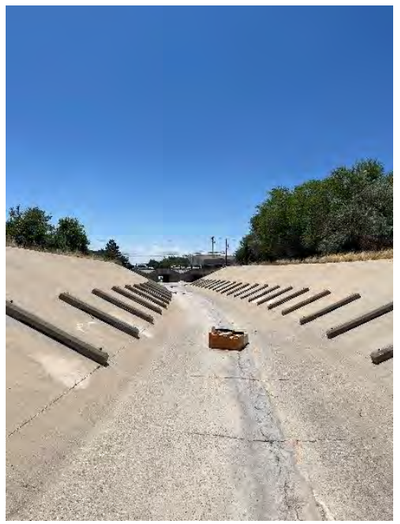
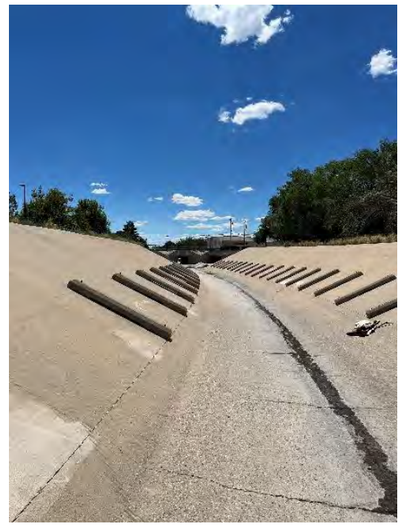
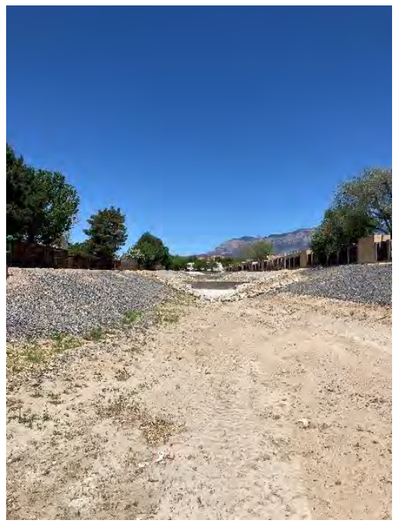
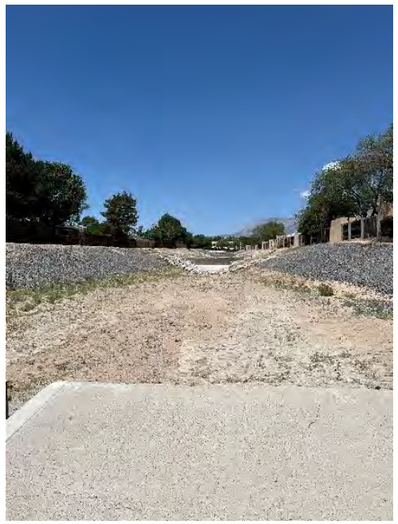
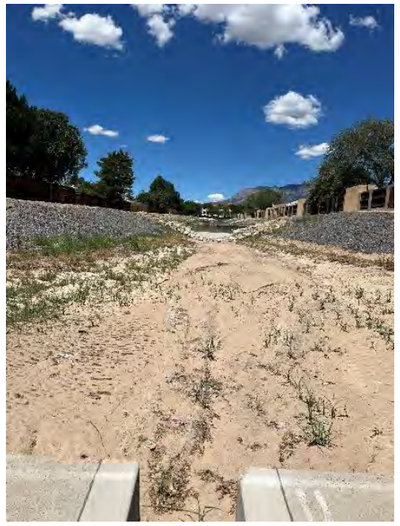

			

Photo 101: Lower Bear (Wyoming) – Looking Downstream	**Photo 102: Lower Bear (Wyoming) – Looking Downstream**	**Photo 103: Lower Bear (Wyoming) – Looking Downstream**	**Photo 104: Lower Bear (Wyoming) – Looking Downstream**

Lower Bear – Spain (Downstream)

April 7, 2022	May 5, 2022	June 2, 2022	July 7, 2022
			
Photo 105: Lower Bear (Spain) – Looking Upstream	**Photo 106: Lower Bear (Spain) – Looking Upstream**	**Photo 107: Lower Bear (Spain) – Looking Upstream**	**Photo 108: Lower Bear (Spain) – Looking Upstream**
			
Photo 109: Lower Bear (Spain) – Looking Downstream	**Photo 110: Lower Bear (Spain) – Looking Downstream**	**Photo 111: Lower Bear (Spain) – Looking Downstream**	**Photo 112: Lower Bear (Spain) – Looking Downstream**

2. ANALYSIS APPROACH

All compensated data from the Leveloggers was analyzed and converted to flow data using the relevant rating curves, for storm events that occurred from March 2022 through June 2022 within each watershed. The Community Collaborative Rain, Hail, & Snow Network (CoCoRaHS) gage total precipitation data near or in each respective watershed was reviewed to determine when storm events occurred. Storm events were compared with the Levelogger flow data results to determine storm hydrographs at each of the Levelogger locations. The CoCoRaHS data for each storm event is shown in each Storm Event figure provided later in this report.

The U.S. Geological Survey (USGS) gages within the watershed were also used to view storm event runoff results in nearby locations and to compare to Levelogger results. USGS stream gages within the NDC watershed were used to verify storm runoff events within the watershed. The “USGS 08329900 North Floodway Channel near Alameda” gage did not report flow rates during this reporting period, and has not been fully operational since August 12, 2021, due to maintenance issues. The “USGS 08329700 Campus Wash at Albuquerque” and “USGS 08329840 Hahn Arroyo in Albuquerque” gages were utilized to review and compare storm event runoff for the Campus Wash and Hahn Arroyo Leveloggers, respectively.

3. NOTIFICATION OF NON-STORMWATER FLOWS FROM ALBUQUERQUE BERNALILLO COUNTY WATER UTILITY AUTHORITY (ABCWUA)

Albuquerque Bernalillo County Water Utility Authority (ABCWUA) regularly notifies AMAFCA of planned non-stormwater flows into AMAFCA channels (for example, from well maintenance releases). In addition, AMAFCA receives monthly Discharge Monitoring Reports (DMRs) of Sanitary Sewer Overflows (SSOs) from ABCWUA. The notifications from ABCWUA related to the Leveloggers runoff data were reviewed to ensure that non-stormwater flow within AMAFCA channels was not analyzed as stormwater runoff. During this reporting period, the ABCWUA discharged non-stormwater flows intermittently from the Charles Well #2 into the Embudo Arroyo starting the week of May 6, 2022. This discharge was not recorded by the Embudo Levelogger and was not analyzed as a storm event. The ABCWUA also discharged non-stormwater flows intermittently starting the week of June 27, 2022 from the Ridgecrest Well #4 into the Embudo Arroyo. This discharge was not recorded by the Embudo Levelogger and was not analyzed as a storm event.

III. WATERSHED VIEW – RAINFALL RUNOFF RESPONSE TO STORM EVENTS

The Levelogger and rainfall data were viewed on a watershed basis and are presented in this report using GIS figures. This geospatial analysis and presentation were completed to improve the understanding of storm event rainfall runoff response for the contributing, Levelogger monitored watersheds in the NDC.

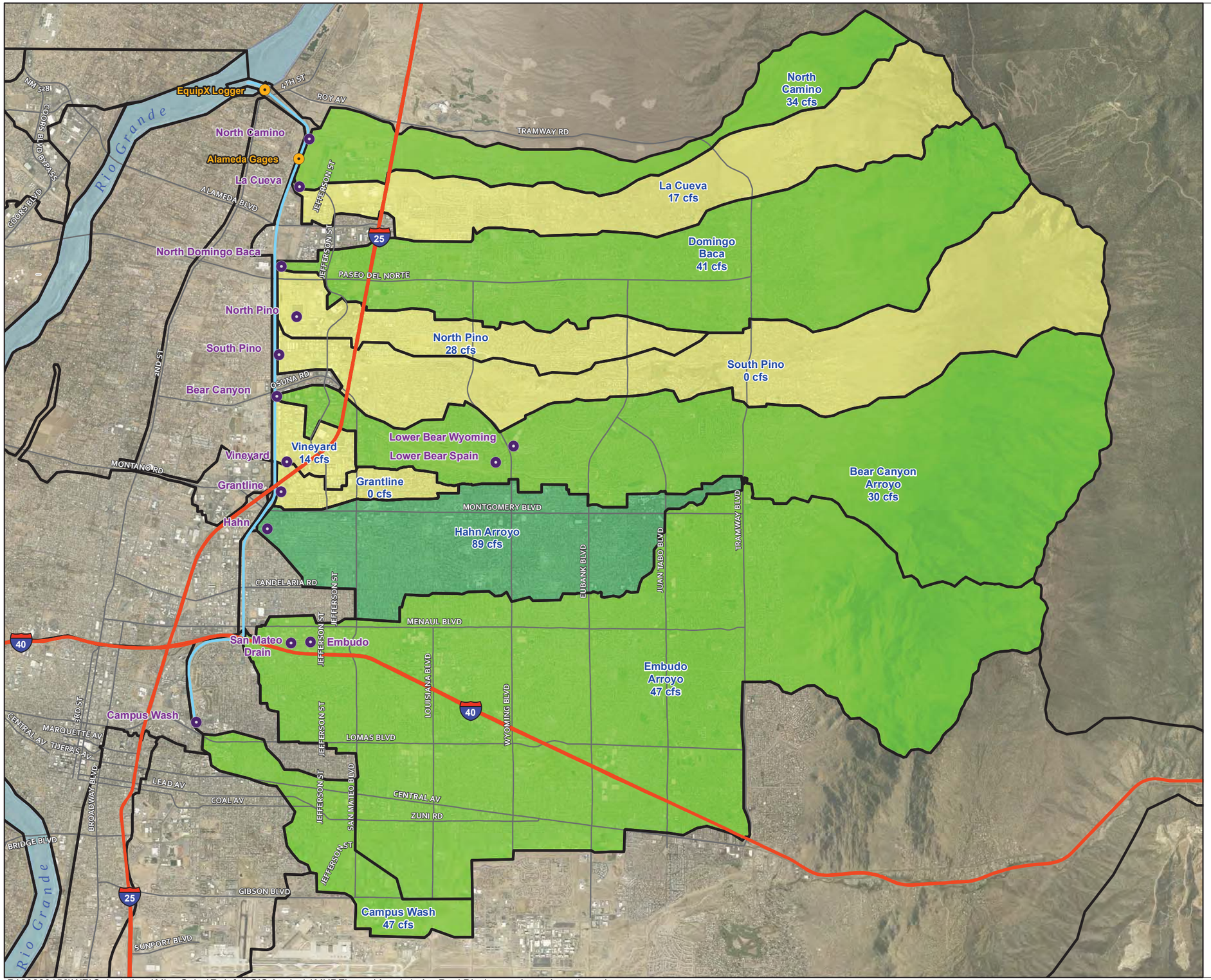
Figure 2 shows the average peak discharge in cubic feet per second (cfs) for all storm events measured by the Leveloggers for the four months reported, March 2022 to June 2022, which provides a view of the relative peak flows monitored for storms in each contributing watershed. During this reporting period, eight storms were recorded by the Leveloggers. Figure 3 shows the average peak discharge measured by the Leveloggers for all storm events during the annual dry season period of November 1 through June 30 from November 2016 to June 2022, which includes 87 storm events and provides a longer term analysis of the relative peak flows monitored for storms during the dry season in each contributing watershed.

Next, the total peak discharge values divided by the total area of each watershed in acres (ac) was calculated. Figure 4 shows the discharge per acre (cfs/ac) for the eight storm events measured by the Leveloggers for the four dry season months reported – March to June 2022. Figure 5 shows this same comparison measured by the Leveloggers for all storm events during the annual dry season period of November 1 through June 30 from November 2016 to June 2022.

The third geospatial analysis shows the summation of the total runoff volume values from the analyzed storm events. Figure 6 provides an overall view of stormwater runoff volume per watershed in acre-feet (ac-ft) for the eight storms during the four dry season months reported, March to June 2022, and Figure 7 shows these values measured by the Leveloggers for all storm events during the annual dry season period of November 1 through June 30 from November 2016 to February 2022. The existing detention facilities within each watershed are included in each of these figures to provide an understanding of stormwater volume storage available within each watershed.

Analysis was completed to relate the measured total runoff volume from the analyzed storm events in acre-feet (ac-ft) to the amount of precipitation received (as reported at the Albuquerque Sunport). Figure 8 shows the total runoff volume per inch of rainfall (ac-ft/in) for the eight storm events measured by the Leveloggers for the four dry season months reported, March to June 2022, for each watershed. Figure 9 shows the total runoff volume per inch of rainfall (ac-ft/in) measured by the Leveloggers for all storm events during the

annual dry season period of November 1 through June 30 from November 2016 to June 2022. The figures also include the existing detention facilities within each watershed to provide an understanding of stormwater volume storage available within each watershed.



Average Peak Discharge (cfs)

Measured by Leveloggers per Watershed Over 4 Dry Season Months (March - June 2022)

Figure 2

- Levelogger Sites
- NDC Levelogger Sites
- North Diversion Channel
- Watersheds

Average Peak Runoff (cfs)

- 0 - 30
- 31 - 60
- 61 - 100
- 101 - 200
- > 201

N

0 6,000 12,000 Feet

1 inch equals 1 mile

AMAFCA

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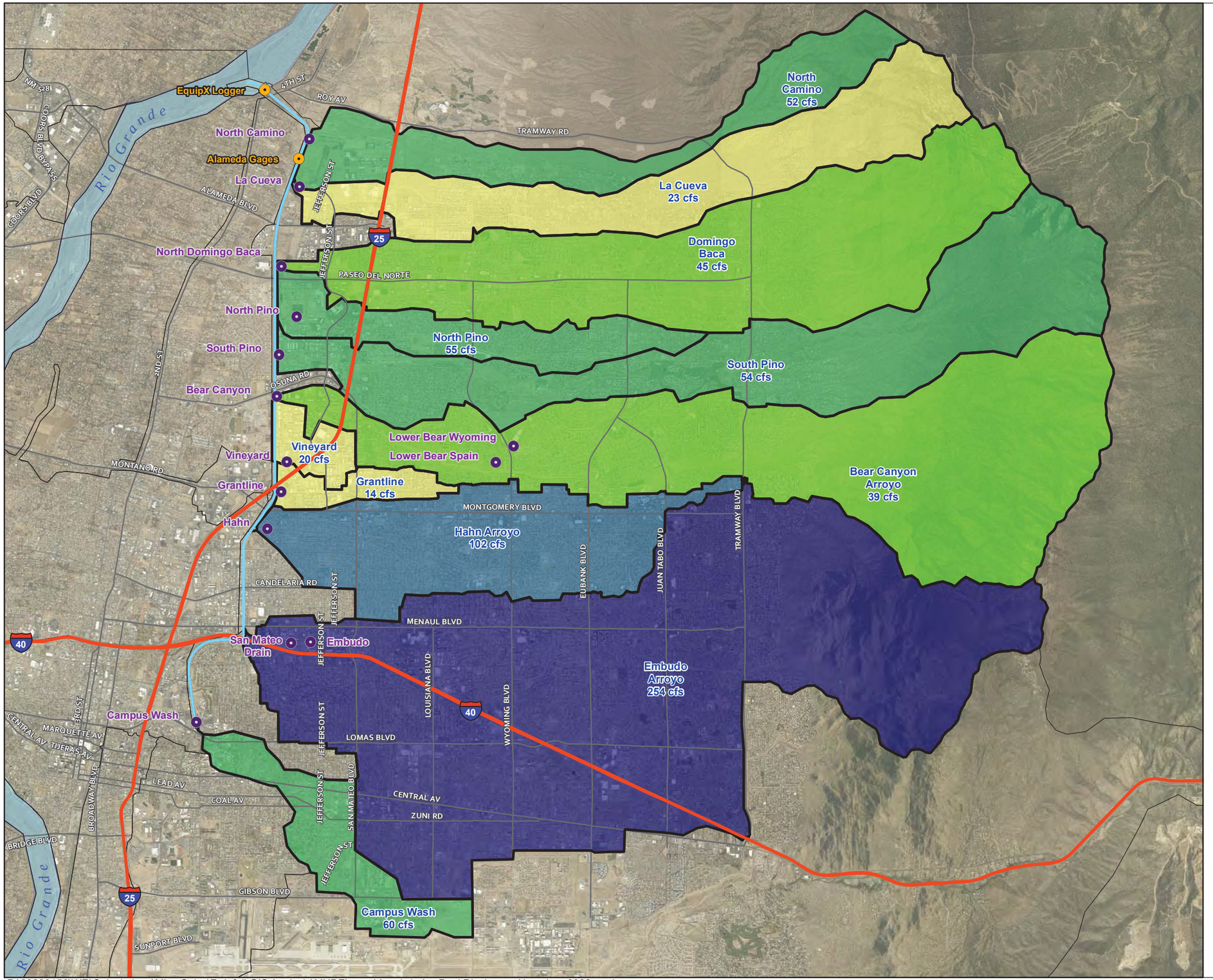
Author: smaynard



Average Peak Discharge (cfs)

Measured by Leveloggers per Watershed During Dry Season Months (November - June) From November 2016 - June 2022

Figure 3

- Levelogger Sites
- NDC Levelogger Sites
- North Diversion Channel
- Watersheds

Average Peak Runoff (cfs)

- 0 - 30
- 31 - 50
- 51 - 65
- 66 - 110
- > 111

N

0 6,000 12,000 Feet

1 inch equals 1 mile

AMAFCA

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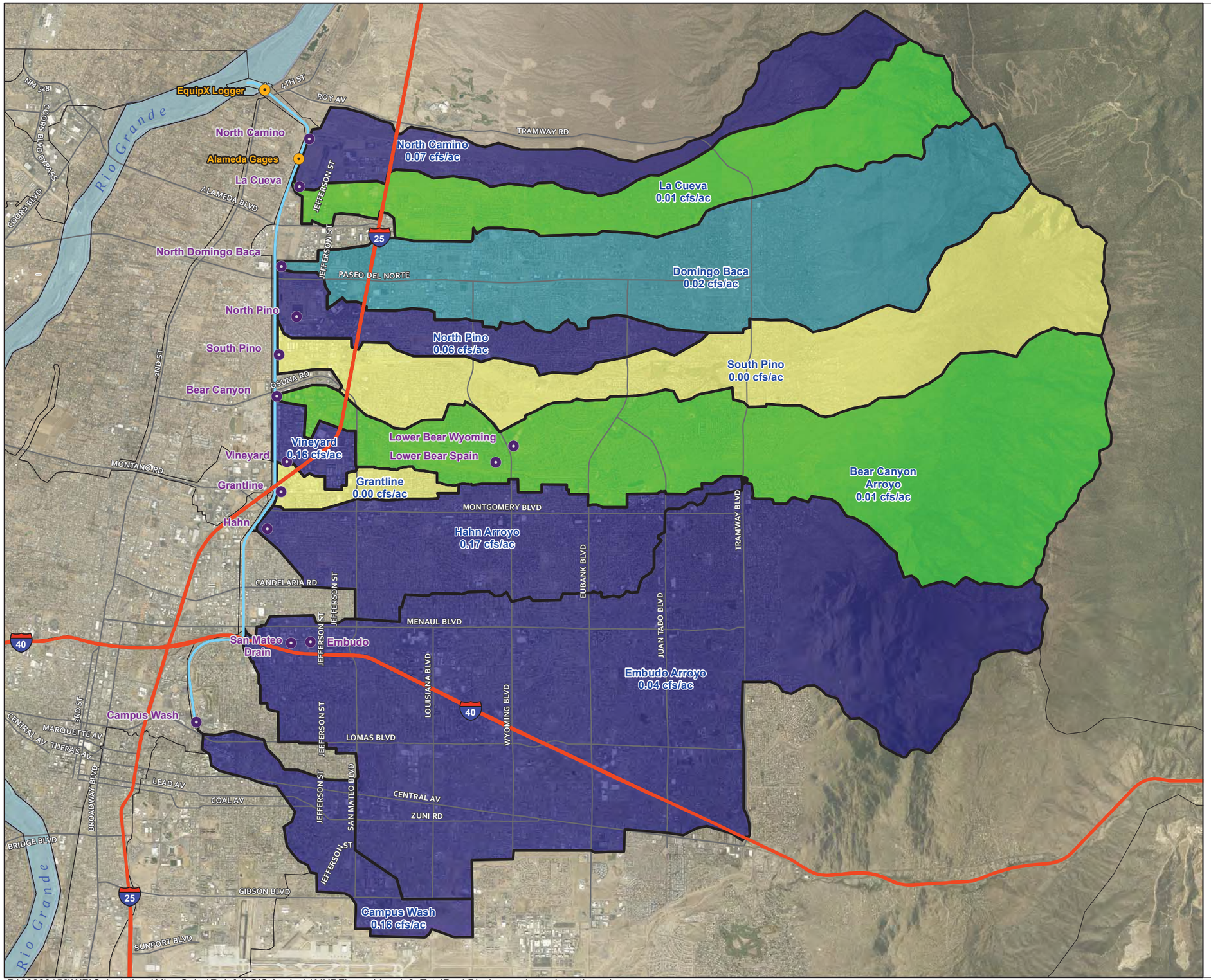
Author: smaynard

Total Peak Discharge per Acre (cfs/ac)

Measured by Leveloggers per Watershed Over 4 Dry Season Months (March - June 2022)

Figure 4



- Levelogger Sites
- NDC Levelogger Sites
- North Diversion Channel
- Watersheds

Total Peak Discharge Per Acre (cfs/ac)

- 0
- 0 - 0.01
- 0.01 - 0.02
- > 0.03

N

0 6,000 12,000 Feet

1 inch equals 1 mile

AMAFCA

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Author: smaynard

Total Peak Discharge per Acre (cfs/ac)

Measured by Leveloggers per Watershed During Dry Season Months (November - June) From November 2016 - June 2022

Figure 5

- Levelogger Sites
- NDC Levelogger Sites
- North Diversion Channel
- Watersheds

Total Peak Discharge per Acre (cfs/ac)

- 0.1 - 0.2
- 0.3 - 0.7
- 0.8 - 0.9
- 0.9 - 1.5
- > 1.5

N

0 6,000 12,000 Feet

1 inch equals 1 mile

AMAFCA

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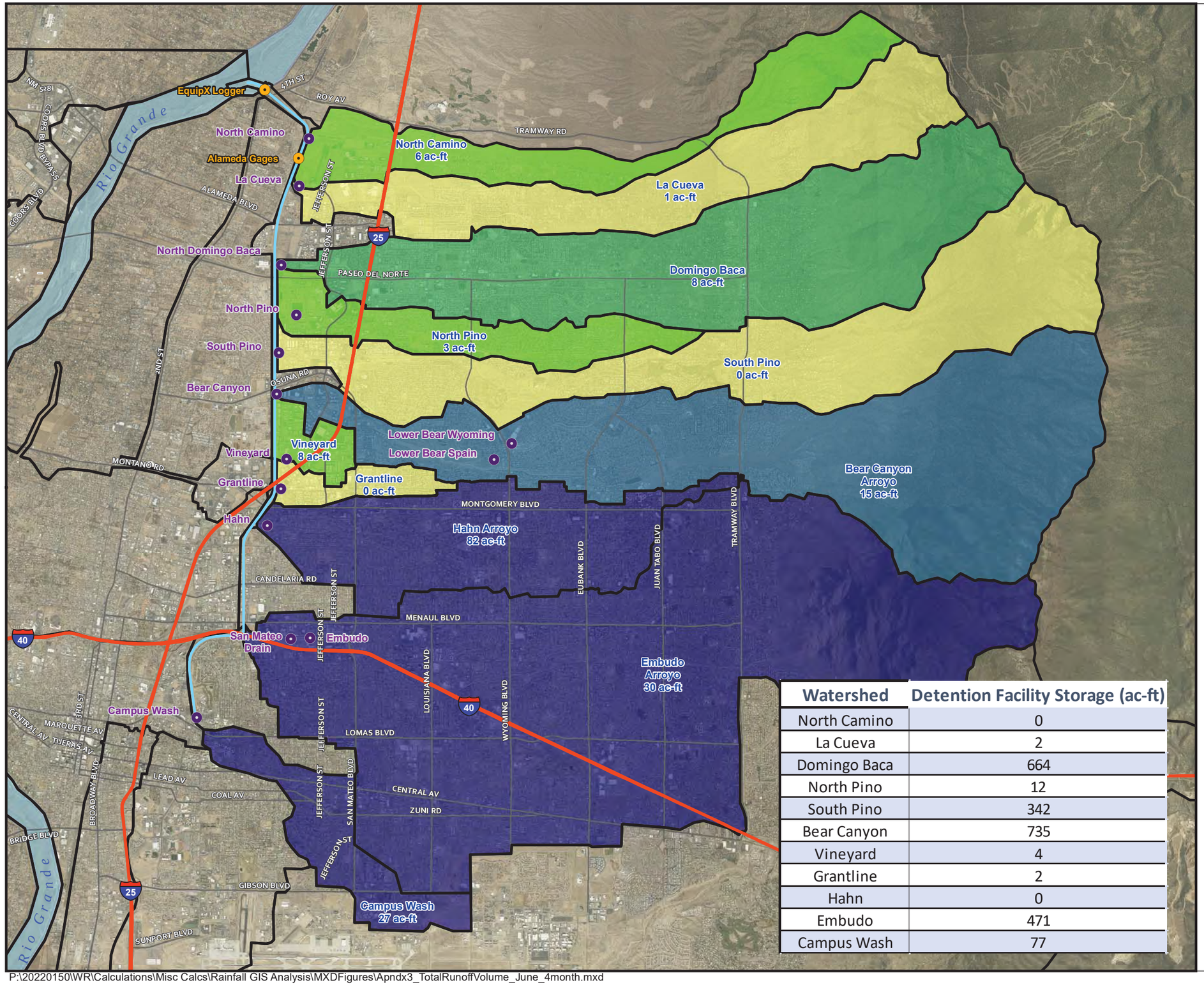
Author: smaynard

Total Runoff Volume (ac-ft)

Measured by Leveloggers per Watershed Over 4 Dry Season Months (March - June 2022)

Figure 6



Watershed	Detention Facility Storage (ac-ft)
North Camino	0
La Cueva	2
Domingo Baca	664
North Pino	12
South Pino	342
Bear Canyon	735
Vineyard	4
Grantline	2
Hahn	0
Embudo	471
Campus Wash	77

- Levelogger Sites
- NDC Levelogger Sites
- North Diversion Channel
- Watersheds

Total Runoff Volume (ac-ft)

- 0 - 2
- 3 - 8
- 9 - 10
- 11 - 23
- > 24

N

0 6,000 12,000 Feet

1 inch equals 1 mile

AMAFCA

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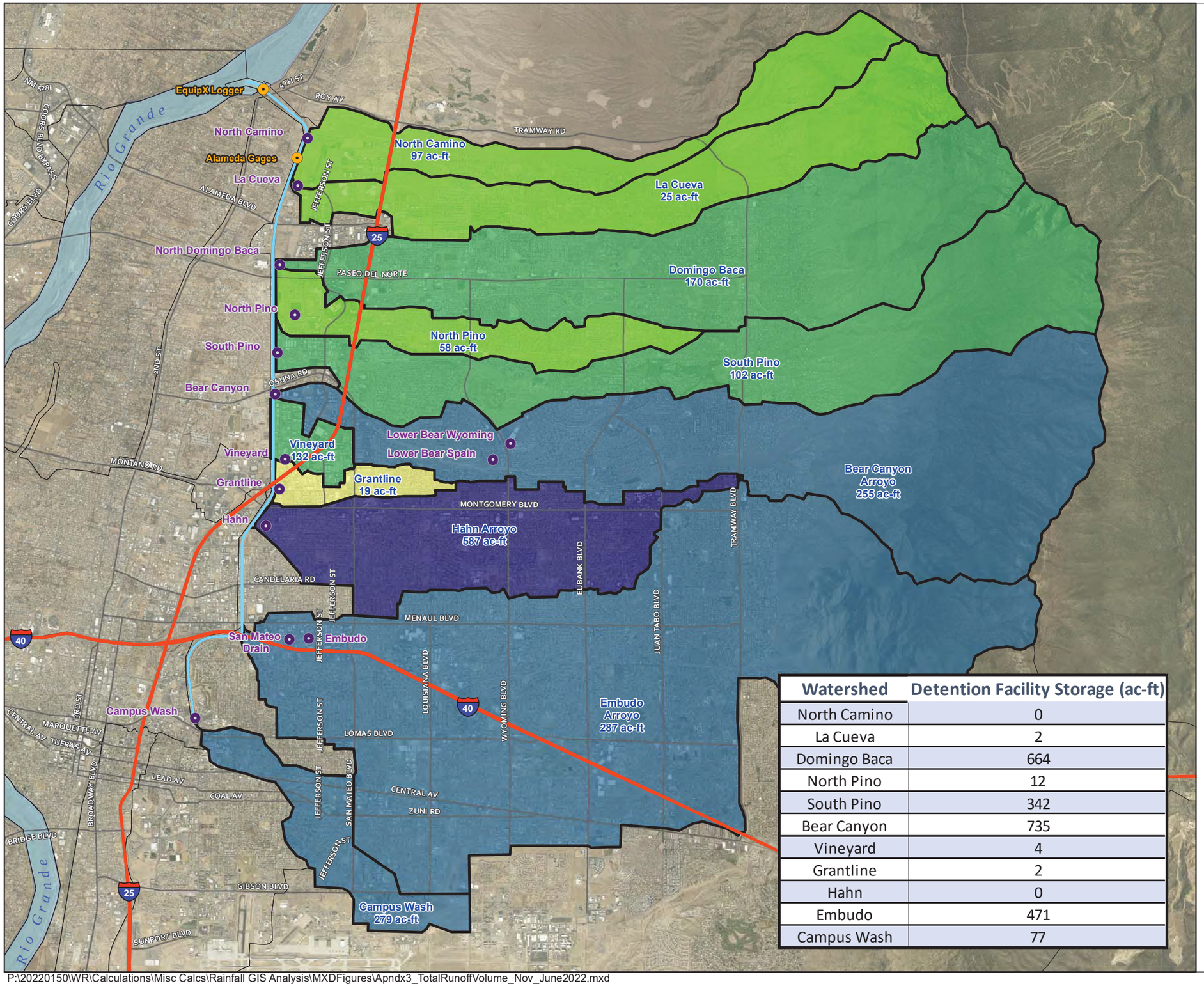
Author: smaynard

Total Runoff Volume (ac-ft)

Measured by Leveloggers per Watershed During Dry Season Months (November - June) From November 2016 - June 2022

Figure 7



Watershed	Detention Facility Storage (ac-ft)
North Camino	0
La Cueva	2
Domingo Baca	664
North Pino	12
South Pino	342
Bear Canyon	735
Vineyard	4
Grantline	2
Hahn	0
Embudo	471
Campus Wash	77

- Levelogger Sites
- NDC Levelogger Sites
- North Diversion Channel
- Watersheds

Total Runoff Volume (ac-ft)

- 0 - 20
- 21 - 100
- 101 - 200
- 201 - 350
- > 350

N

0 6,000 12,000 Feet

1 inch equals 1 mile

AMAFCA

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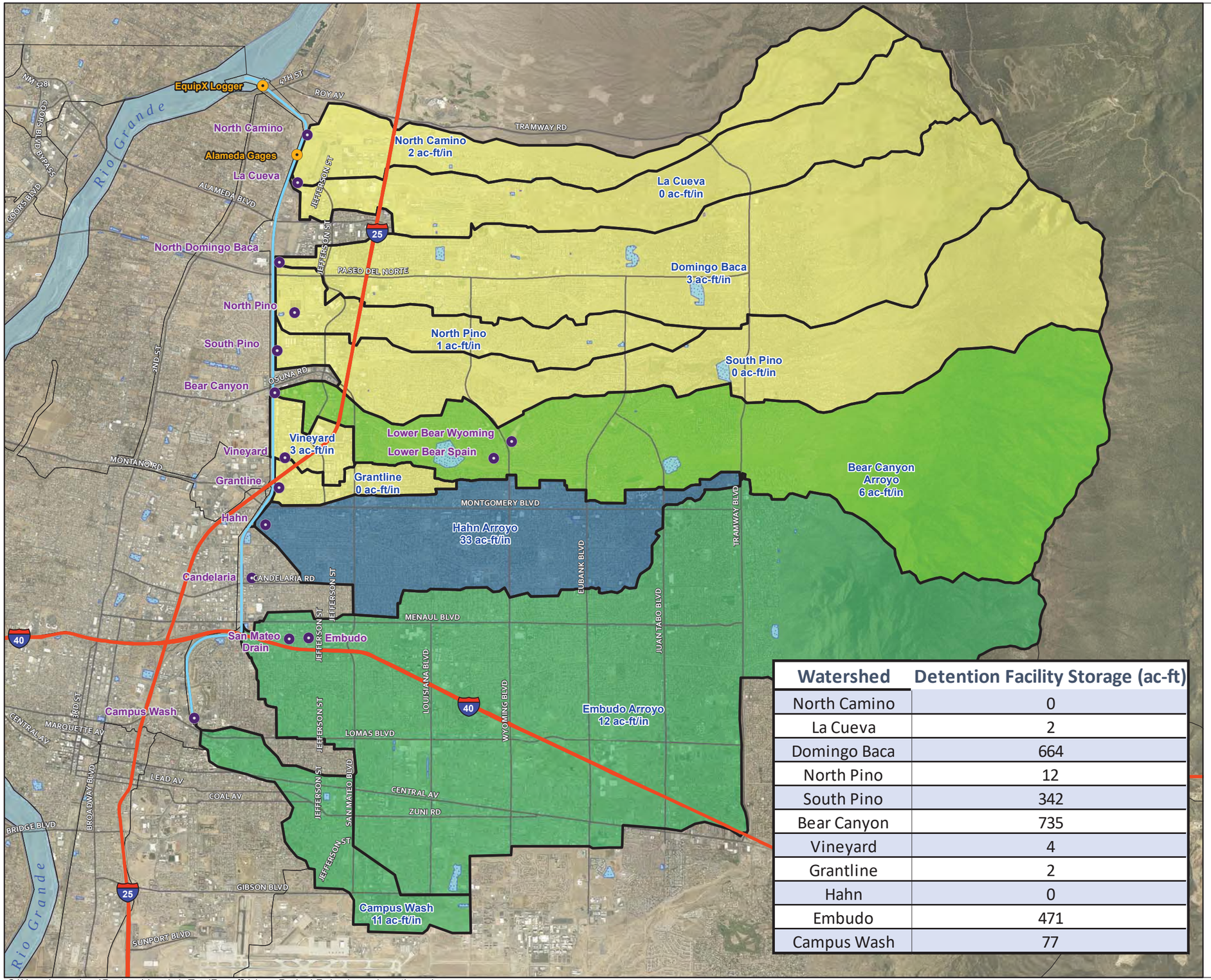
Author: smaynard

Total Runoff Volume per Inch of Rainfall (ac-ft/in Rainfall)

Measured by Leveloggers per Watershed Over 4 Dry Season Months (March - June 2022)

Figure 8



Watershed	Detention Facility Storage (ac-ft)
North Camino	0
La Cueva	2
Domingo Baca	664
North Pino	12
South Pino	342
Bear Canyon	735
Vineyard	4
Grantline	2
Hahn	0
Embudo	471
Campus Wash	77

- Levelogger Sites
- NDC Levelogger Sites
- North Diversion Channel
- Watersheds

Total Runoff Volume Per Inch Rainfall (ac-ft/in)

- 0 - 5
- 6 - 10
- 11 - 20
- 21 - 40
- > 41

N

0 6,000 12,000 Feet

1 inch equals 1 mile

AMAFCA

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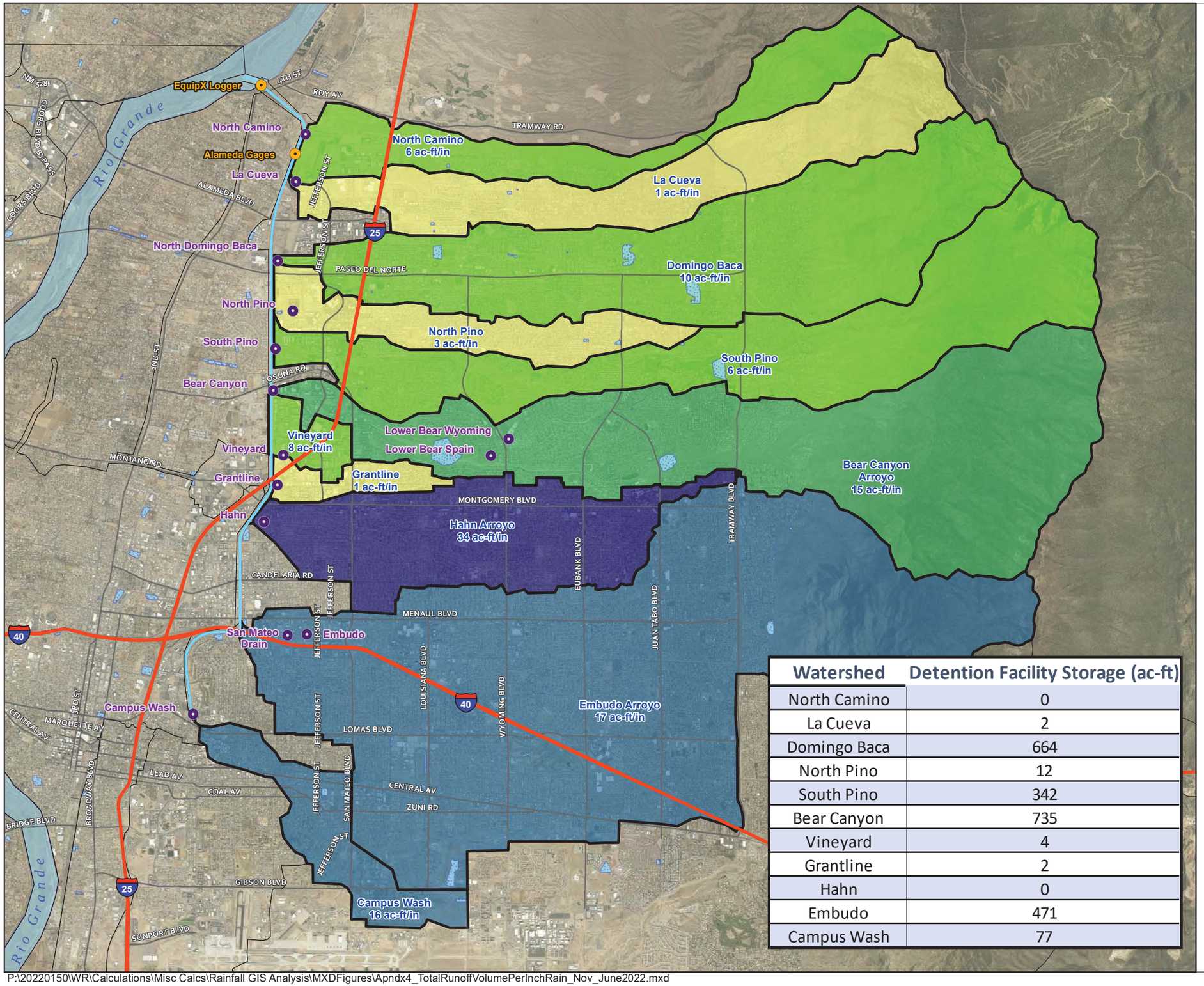
Author: smaynard

Total Runoff Volume per Inch of Rainfall (ac-ft/in Rainfall)

Measured by Leveloggers per Watershed During Dry Season Months (November - June) From November 2016 - June 2022

Figure 9



Watershed	Detention Facility Storage (ac-ft)
North Camino	0
La Cueva	2
Domingo Baca	664
North Pino	12
South Pino	342
Bear Canyon	735
Vineyard	4
Grantline	2
Hahn	0
Embudo	471
Campus Wash	77

- Levelogger Sites
- NDC Levelogger Sites
- North Diversion Channel
- Watersheds

Total Runoff Volume per Inch Rainfall (ac-ft/in)

- 0 - 5
- 6 - 10
- 11 - 15
- 16 - 25
- > 26

N

0 6,000 12,000 Feet

1 inch equals 1 mile

AMAFCA

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Author: smaynard

IV. MARCH 2022 COLLECTION PERIOD DATA

Two storm events were documented on the CoCoRaHS website during the March collection period for this analysis of the Leveloggers; these storms occurred on March 23 and March 30, 2022.

Information for these storm event are presented below and includes CoCoRaHS rainfall data, Levelogger measured peak flow rates and runoff volume data, and a spatially represented map of the CoCoRaHS station point rainfall data using the ArcGIS “kriging” tool as well as peak flows reported for each Levelogger.

Table 4 summarizes the monitored runoff volume and peak flow for the storm events for each Levelogger for the March collection period. The monthly total rainfall for the watersheds for the March collection period, as reported by CoCoRaHS station point rainfall data, is shown in Figure 14.

A. MARCH 23, 2022

On March 23, 2022, a storm event occurred. Table 2 presents the daily CoCoRaHS data for this storm event for all the NDC watersheds with Levelogger sites. The bar chart in Figure 10 graphically shows the recorded Levelogger peak flow rates and runoff volume data for the Levelogger locations. The CoCoRaHS data for this storm event was added into ArcGIS; the data is presented spatially related to the underlying watersheds in Figure 11.

Table 2: March 23, 2022 Storm Event CoCoRaHS Total Precipitation Data

Average CoCoRaHS Rainfall/Snow Melt for NDC Watershed: 0.25 inches Sunport Rainfall Gage (NOAA): 0.14 inches		
Watershed	**Range of CoCoRaHS Reported Precipitation Totals (inches)**	**Average of CoCoRaHS Reported Precipitation Data (inches)**
***North Camino Arroyo	--	--
***La Cueva Arroyo	--	--
North Domingo Baca	0.11 to 0.28	0.19
North Pino Arroyo	0.35	0.35
South Pino Arroyo	0.19 to 0.23	0.21
**Bear Canyon Arroyo	0.18 to 0.25	0.20
***Vineyard Arroyo	--	--
***Grantline Arroyo	--	--
Hahn Arroyo	0.11 to 0.48	0.25
*Embudo Arroyo	0.14 to 0.45	0.28
*San Mateo Drain	0.14 to 0.45	0.28
Campus Wash	0.30	0.30
**Lower Bear – Upstream (Wyoming)	0.18 to 0.25	0.20
**Lower Bear – Downstream (Spain)	0.18 to 0.25	0.20

**Embudo and San Mateo share the same watershed as delineated by AMAFCA in GIS.*

***Bear Canyon and the Lower Bear Leveloggers share the same watershed.*

****North Camino, La Cueva, Vineyard and Grantline basins had no CoCoRaHS reporting stations for this storm event.*

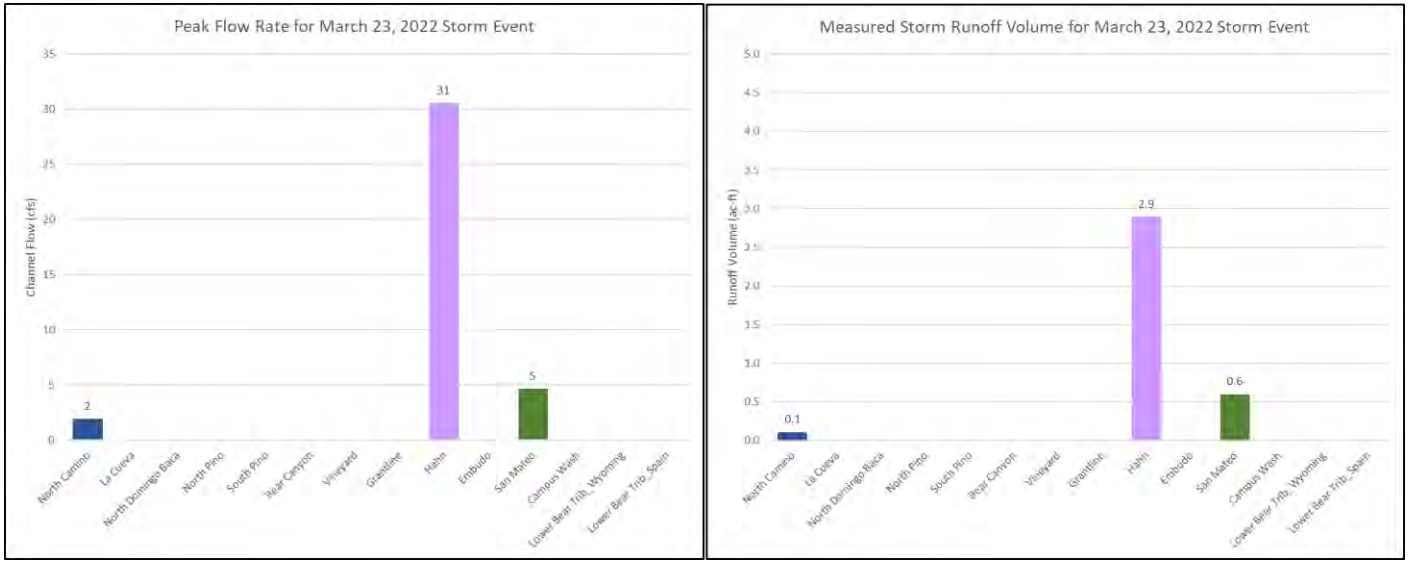

Figure 10: March 23, 2022 Storm Event, Peak Flow Rates and Runoff Volume

AMAFCA
Levelogger Runoff and CoCoRaHS Rainfall
March 23, 2022
Storm Event

Figure 11

▲ CoCoRaHS Stations with reported rainfall (in)

North Diversion Channel

Watersheds

Flow Rate (cfs)	Rainfall (in.)
Not Recorded	0.0 - 0.10
0.1- 25.0	0.11 - 0.20
25.1 - 50.0	0.21 - 0.30
50.1 - 100.0	0.31 - 0.40
100.1- 150.0	0.41 - 0.50
150.1 - 200.0	0.51 - 0.60
200.1 - 500.0	0.61 - 0.70
>500.0	0.71 - 0.80
	0.81 - 0.90
	0.91 - 1.00
	1.01 - 1.10
	1.11 - 1.20
	>1.21

Avg. CoCoRaHS Rainfall for NDC Watershed: 0.25 in.

Data Use Limitation: Precipitation data displayed using Kriging Interpolation Method. Surface should not be used to extract precise location dependent rainfall data outside the immediate area of rainfall gauges. Note: Bernalillo County rainfall gauges outside of NDC Watershed that recorded rainfall contributed to this rainfall surface output but are not displayed in the map view.

N

0 6,000 12,000 Feet

1 inch = 1 mile

AMAFCA

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Author: mcrooks

B. MARCH 30, 2022

On March 30, 2022, a storm event occurred. Table 3 presents the daily CoCoRaHS data for this storm event for all the NDC watersheds with Levelogger sites. The bar chart in Figure 12 graphically shows the recorded Levelogger peak flow rates and runoff volume data for the Levelogger locations. The CoCoRaHS data for this storm event was added into ArcGIS; the data is presented spatially related to the underlying watersheds in Figure 13.

Table 3: March 30, 2022 Storm Event CoCoRaHS Total Precipitation Data

Average CoCoRaHS Rainfall/Snow Melt for NDC Watershed: 0.16 inches Sunport Rainfall Gage (NOAA): 0.06 inches		
Watershed	**Range of CoCoRaHS Reported Precipitation Totals (inches)**	**Average of CoCoRaHS Reported Precipitation Data (inches)**
***North Camino Arroyo	--	--
***La Cueva Arroyo	--	--
North Domingo Baca	0.07 to 0.18	0.14
North Pino Arroyo	0.15	0.15
South Pino Arroyo	0.11 to 0.15	0.13
**Bear Canyon Arroyo	0.13 to 0.20	0.16
***Vineyard Arroyo	--	--
***Grantline Arroyo	--	--
Hahn Arroyo	0.05 to 0.23	0.18
*Embudo Arroyo	0.10 to 0.24	0.18
*San Mateo Drain	0.10 to 0.24	0.18
Campus Wash	0.08	0.08
**Lower Bear – Upstream (Wyoming)	0.13 to 0.20	0.16
**Lower Bear – Downstream (Spain)	0.13 to 0.20	0.16

**Embudo and San Mateo share the same watershed as delineated by AMAFCA in GIS.*

***Bear Canyon and the Lower Bear Leveloggers share the same watershed.*

****North Camino, La Cueva, Vineyard and Grantline basins had no CoCoRaHS reporting stations for this storm event.*

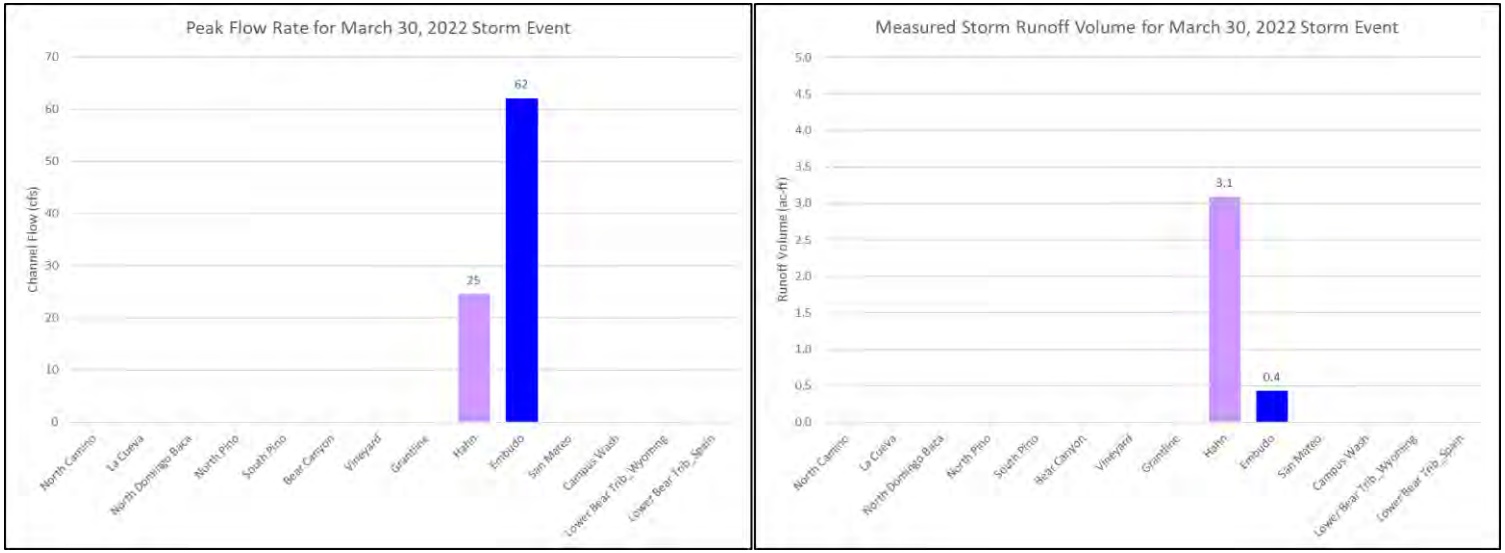

Figure 12: March 30, 2022 Storm Event, Peak Flow Rates and Runoff Volume

AMAFCA
Levelogger Runoff and CoCoRaHS Rainfall
March 30, 2022
Storm Event

Figure 13

▲ CoCoRaHS Stations with reported rainfall (in)

North Diversion Channel

Watersheds

Flow Rate (cfs)	Rainfall (in.)
Not Recorded	0.0 - 0.10
0.1- 25.0	0.11 - 0.20
25.1 - 50.0	0.21 - 0.30
50.1 - 100.0	0.31 - 0.40
100.1- 150.0	0.41 - 0.50
150.1 - 200.0	0.51 - 0.60
200.1 - 500.0	0.61 - 0.70
>500.0	0.71 - 0.80
	0.81 - 0.90
	0.91 - 1.00
	1.01 - 1.10
	1.11 - 1.20
	>1.21

Avg. CoCoRaHS Rainfall for NDC Watershed: 0.16 in.

Data Use Limitation: Precipitation data displayed using Kriging Interpolation Method. Surface should not be used to extract precise location dependent rainfall data outside the immediate area of rainfall gauges. Note: Bernalillo County rainfall gauges outside of NDC Watershed that recorded rainfall contributed to this rainfall surface output but are not displayed in the map view.

N

0 6,000 12,000 Feet

1 inch = 1 mile

AMAFCA

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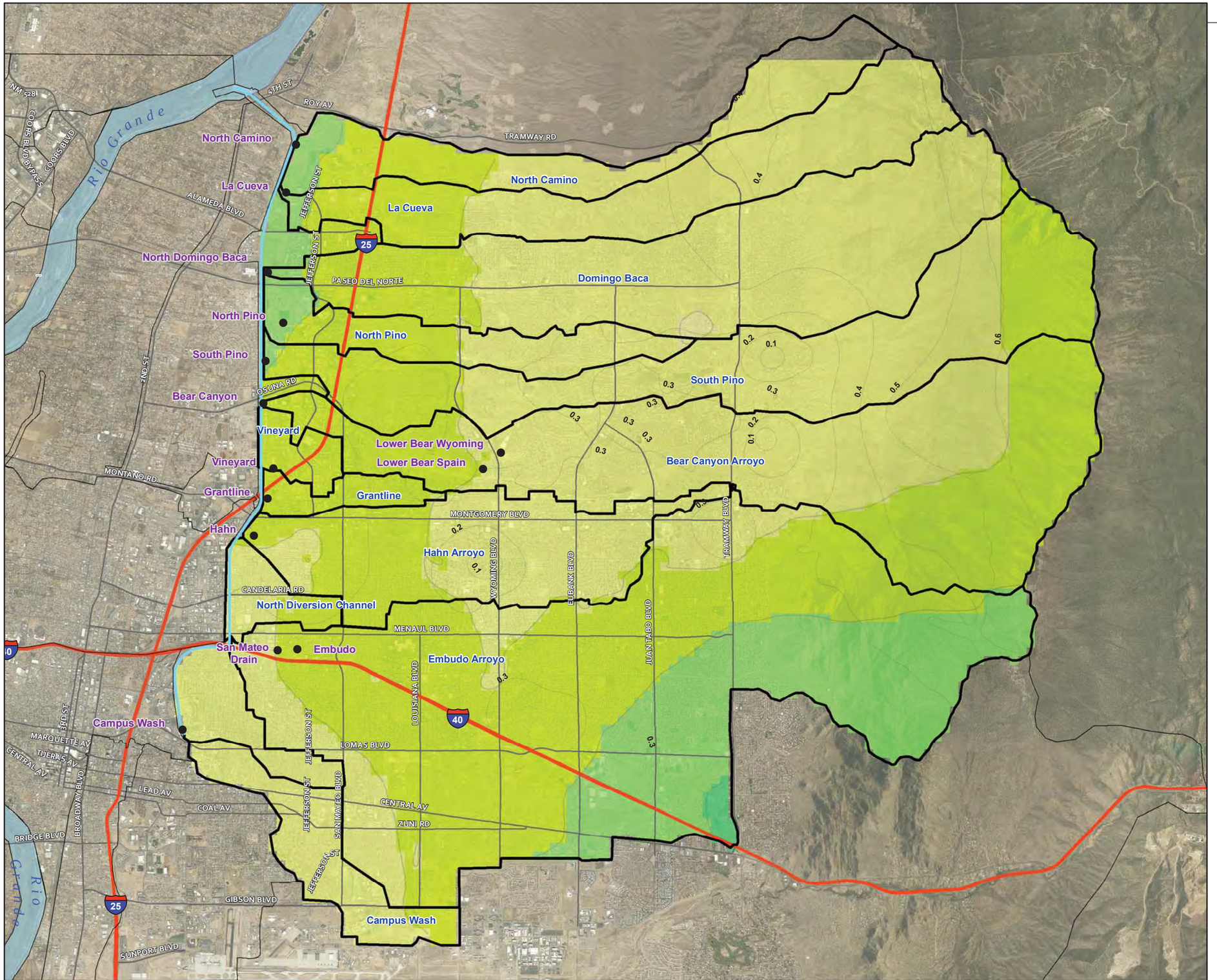
Author: mcrooks

Table 4: March 2022 Collection Period Runoff Measured at Levelogger Sites

Storm Event Date	March 23	March 30
Location	**Runoff Volume (ac-ft)**	
North Camino Arroyo	0.1	--
La Cueva Arroyo	--	--
North Domingo Baca	--	--
North Pino Arroyo	--	--
South Pino Arroyo	--	--
Bear Canyon Arroyo	--	--
Vineyard Arroyo	--	--
Grantline Arroyo	--	--
Hahn Arroyo	2.9	3.1
Embudo Arroyo	--	0.4
San Mateo Drain	0.6	--
Campus Wash	--	--
Lower Bear – Upstream (Wyoming)	--	--
Lower Bear – Downstream (Spain)	--	--
Location	**Peak Flow (cfs)**	
North Camino Arroyo	2	--
La Cueva Arroyo	--	--
North Domingo Baca	--	--
North Pino Arroyo	--	--
South Pino Arroyo	--	--
Bear Canyon Arroyo	--	--
Vineyard Arroyo	--	--
Grantline Arroyo	--	--
Hahn Arroyo	31	25
Embudo Arroyo	--	62
San Mateo Drain	5	--
Campus Wash	--	--
Lower Bear – Upstream (Wyoming)	--	--
Lower Bear – Downstream (Spain)	--	--

CoCoRaHS Rainfall Total March 2022 Collection Period

Figure 14



- Levelogger Sites
- North Diversion Channel
- Watersheds

Rainfall (in.)

0.00 - 0.10	0.71 - 0.80
0.11 - 0.20	0.81 - 0.90
0.21 - 0.30	0.91 - 1.00
0.31 - 0.40	1.01 - 1.10
0.41 - 0.50	1.11 - 1.20
0.51 - 0.60	>1.21
0.61 - 0.70	

*Rainfall recorded for this storm event included both rainfall and snowmelt

N

0 6,000 12,000 Feet

1 inch = 1 mile

AMAFCA

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Author: smaynard

V. APRIL 2022 COLLECTION PERIOD DATA

The month of April did not have any precipitation events. The data for April was collected on May 5, 2022. AMAFCA manually compensated the Levelogger data during this collection period due to the Barologger being sent out for a diagnostic test.

VI. MAY 2022 COLLECTION PERIOD DATA

The month of May did not have any precipitation events. The data for May was collected on June 2, 2022. AMAFCA manually compensated the Levelogger data during this collection period due to the Barologger being sent out for a diagnostic test. AMAFCA received and installed the repaired Barologger on May 17, 2022 and it was ready for use for Barologger data compensation starting in the month of June.

VII. JUNE 2022 COLLECTION PERIOD DATA

Six storm events were reported by Leveloggers during the month of June. This is the greatest number of storm events recorded by the Leveloggers during the month of June since starting Levelogger monitoring in October 2016.

Information for these storm events is presented below and includes CoCoRaHS rain data, Levelogger measured peak flow rates and runoff volume data, and a spatially represented map of the CoCoRaHS station point rainfall data using the ArcGIS “kriging” tool as well as peak flows reported for each Levelogger.

Table 11 summarizes the monitored runoff volume and peak flow per storm event for each Levelogger for the June collection period. AMAFCA reported that the Grantline Levelogger did not record properly during the month of June; therefore the June analysis does not include data for the Grantline Levelogger. The monthly total rainfall for the watersheds for the June collection period, as reported by CoCoRaHS station point rainfall data, is shown in Figure 27.

A. JUNE 17, 2022

On June 17, 2022, a storm event occurred. Table 5 presents the daily CoCoRaHS data for this storm event for all the NDC watersheds with Levelogger sites. The bar chart in Figure 15 graphically shows the recorded Levelogger peak flow rates and runoff volume data for the Levelogger locations. The CoCoRaHS data for this storm event was added into ArcGIS; the data is presented spatially related to the underlying watersheds in Figure 16.

Table 5: June 17, 2022 Storm Event CoCoRaHS Total Precipitation Data

Average CoCoRaHS Rainfall for NDC Watershed: 0.60 inches Sunport Rainfall Gage (NOAA): 0.27 inches		
Watershed	**Range of CoCoRaHS Reported Precipitation Totals (inches)**	**Average of CoCoRaHS Reported Precipitation Data (inches)**
***North Camino Arroyo	--	--
La Cueva Arroyo	0.60	0.60
North Domingo Baca	0.52 to 1.03	0.73
North Pino Arroyo	0.94	0.94
South Pino Arroyo	0.68 to 1.06	0.82
**Bear Canyon Arroyo	0.44 to 0.65	0.53
***Vineyard Arroyo	--	--
***Grantline Arroyo	--	--
Hahn Arroyo	0.44 to 1.17	0.64
*Embudo Arroyo	0.35 to 0.89	0.49
*San Mateo Drain	0.35 to 0.89	0.49
Campus Wash	0.37 to 0.77	0.57
**Lower Bear – Upstream (Wyoming)	0.44 to 0.65	0.53
**Lower Bear – Downstream (Spain)	0.44 to 0.65	0.53

**Embudo and San Mateo share the same watershed as delineated by AMAFCA in GIS.*

***Bear Canyon and the Lower Bear Leveloggers share the same watershed.*

****North Camino, Vineyard, and Grantline basins had no CoCoRaHS reporting stations for this storm event.*

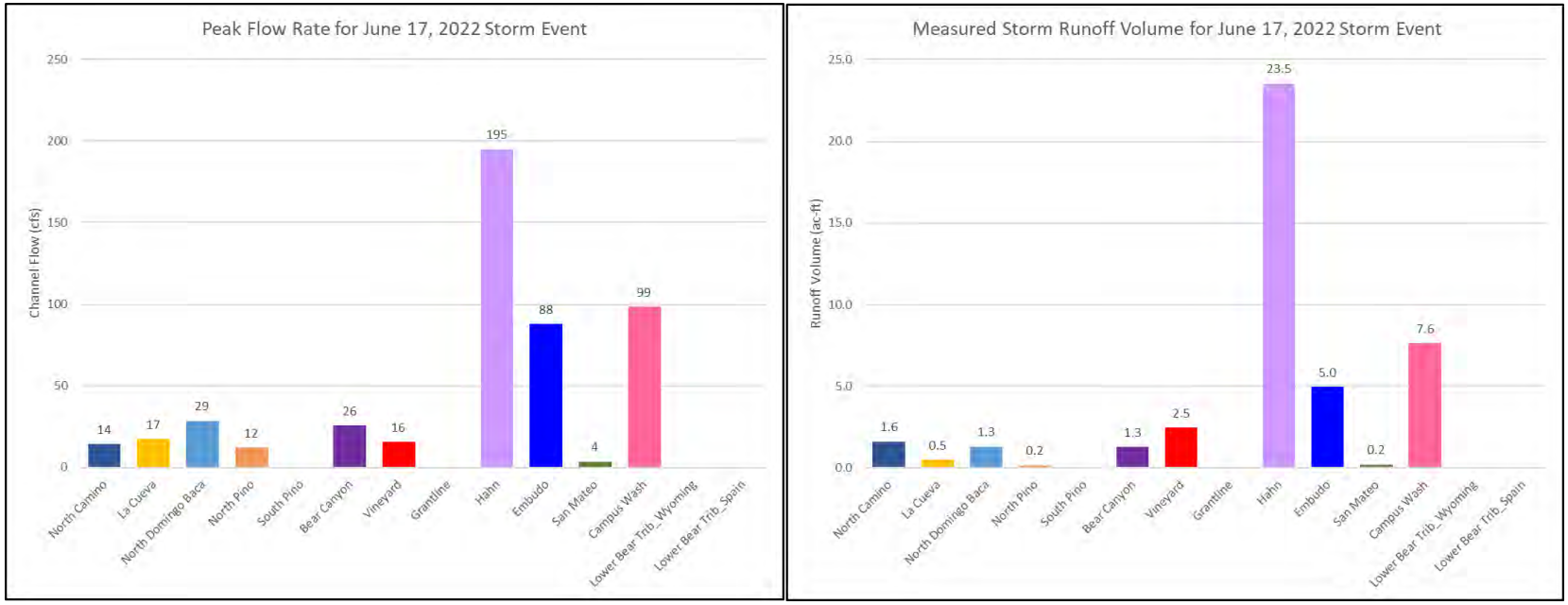

Figure 15: June 17, 2022 Storm Event, Peak Flow Rates and Runoff Volume

AMAFCA
Levelogger Runoff and CoCoRaHS Rainfall
June 17, 2022
Storm Event

Figure 16

▲ CoCoRaHS Stations with reported rainfall (in)

North Diversion Channel

Watersheds

Flow Rate (cfs)	Rainfall (in.)
Not Recorded	0.0 - 0.10
0.1- 25.0	0.11 - 0.20
25.1 - 50.0	0.21 - 0.30
50.1 - 100.0	0.31 - 0.40
100.1- 150.0	0.41 - 0.50
150.1 - 200.0	0.51 - 0.60
200.1 - 500.0	0.61 - 0.70
>500.0	0.71 - 0.80
	0.81 - 0.90
	0.91 - 1.00
	1.01 - 1.10
	1.11 - 1.20
	>1.21

Avg. CoCoRaHS Rainfall for NDC Watershed: 0.60 in.

Data Use Limitation: Precipitation data displayed using Kriging Interpolation Method. Surface should not be used to extract precise location dependent rainfall data outside the immediate area of rainfall gauges. Note: Bernalillo County rainfall gauges outside of NDC Watershed that recorded rainfall contributed to this rainfall surface output but are not displayed in the map view.

N

0 6,000 12,000 Feet

1 inch = 1 mile

AMAFCA

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Author: mcrooks

B. JUNE 18, 2022

On June 18, 2022 rainfall was occurring most of the day and some of the Leveloggers reported two runoff peaks. Both runoff peaks were reported as one storm event for the day because the CoCoRaHS rainfall data reports one value for the entire day and does not provide storm event timing information. Table 6 presents the daily CoCoRaHS data for this storm event for all the NDC watersheds with Levelogger sites. The bar chart in Figure 17 graphically shows the recorded Levelogger peak flow rates and runoff volume data for the Levelogger locations. The CoCoRaHS data for this storm event was added into ArcGIS; the data is presented spatially related to the underlying watersheds in Figure 18.

Table 6: June 18, 2022 Storm Event CoCoRaHS Total Precipitation Data

Average CoCoRaHS Rainfall for NDC Watershed: 0.20 inches Sunport Rainfall Gage (NOAA): 0.31 inches		
Watershed	**Range of CoCoRaHS Reported Precipitation Totals (inches)**	**Average of CoCoRaHS Reported Precipitation Data (inches)**
***North Camino Arroyo	--	--
La Cueva Arroyo	0.09	0.09
North Domingo Baca	0.10 to 0.42	0.21
North Pino Arroyo	0.13	0.13
South Pino Arroyo	0.15 to 0.33	0.24
**Bear Canyon Arroyo	0.17 to 0.35	0.27
***Vineyard Arroyo	--	--
***Grantline Arroyo	--	--
Hahn Arroyo	0.11 to 0.22	0.16
*Embudo Arroyo	0.10 to 0.43	0.20
*San Mateo Drain	0.10 to 0.43	0.20
Campus Wash	0.15 to 0.16	0.16
**Lower Bear – Upstream (Wyoming)	0.17 to 0.35	0.27
**Lower Bear – Downstream (Spain)	0.17 to 0.35	0.27

**Embudo and San Mateo share the same watershed as delineated by AMAFCA in GIS.*

***Bear Canyon and the Lower Bear Leveloggers share the same watershed.*

****North Camino, Vineyard, and Grantline basins had no CoCoRaHS reporting stations for this storm event.*

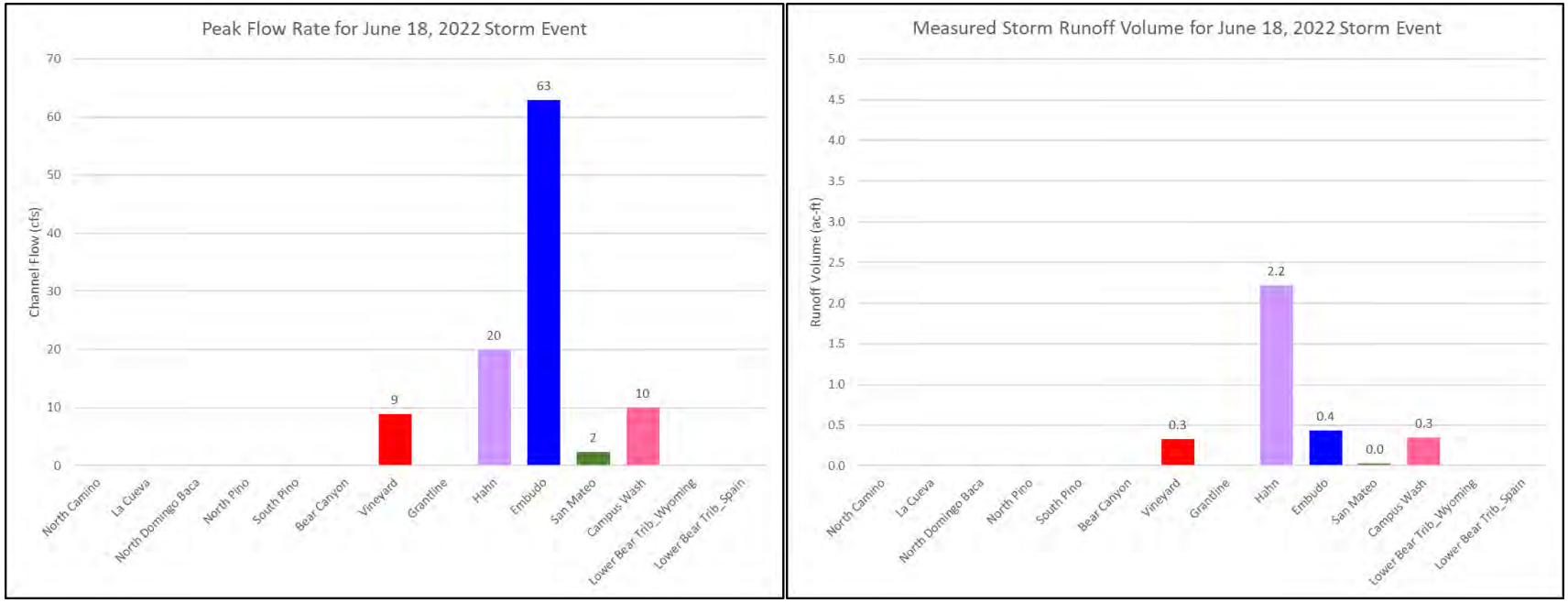
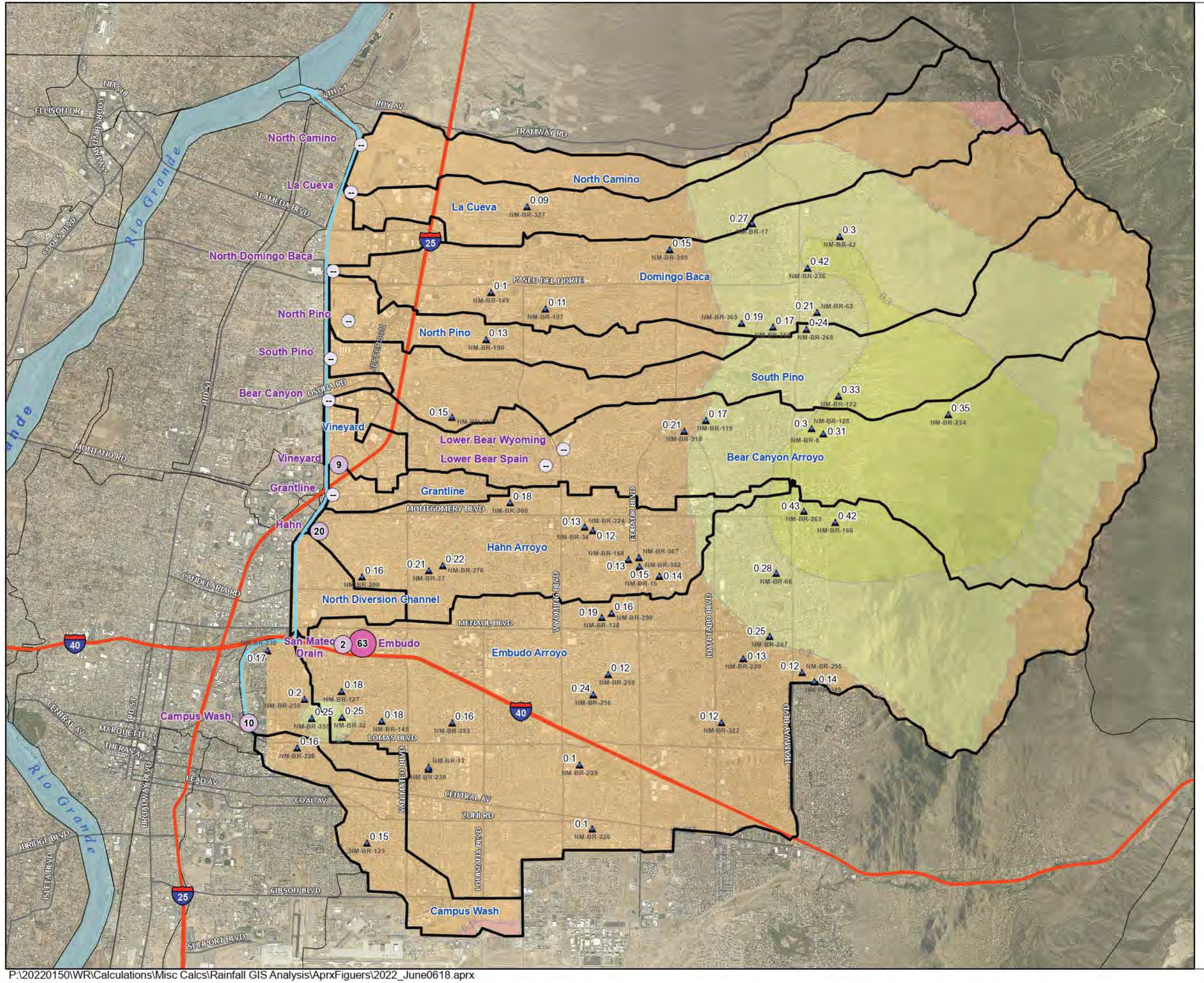


Figure 17: June 18, 2022 Storm Event, Peak Flow Rates and Runoff Volume

AMAFCA Levelogger Runoff and CoCoRaHS Rainfall June 18, 2022 Storm Event

Figure 18



Flow Rate (cfs)

- Not Recorded
- 0.1- 25.0
- 25.1 - 50.0
- 50.1 - 100.0
- 100.1- 150.0
- 150.1 - 200.0
- 200.1 - 500.0
- >500.0

Rainfall (in.)

- 0.0 - 0.10
- 0.11 - 0.20
- 0.21 - 0.30
- 0.31 - 0.40
- 0.41 - 0.50
- 0.51 - 0.60
- 0.61 - 0.70
- 0.71 - 0.80
- 0.81 - 0.90
- 0.91 - 1.00
- 1.01 - 1.10
- 1.11 - 1.20
- >1.21

▲ CoCoRaHS Stations with reported rainfall (in)

North Diversion Channel

Watersheds

Avg. CoCoRaHS Rainfall for NDC Watershed: 0.20 in.

Data Use Limitation: Precipitation data displayed using Kriging Interpolation Method. Surface should not be used to extract precise location dependent rainfall data outside the immediate area of rainfall gauges. Note: Bernalillo County rainfall gauges outside of NDC Watershed that recorded rainfall contributed to this rainfall surface output but are not displayed in the map view.

N

0 6,000 12,000 Feet

1 inch = 1 mile

AMAFCA

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Author: mcrooks

C. JUNE 19, 2022

On June 19, 2022, rainfall was occurring most of the day and the Leveloggers reported two different runoff peaks. Both runoff peaks were reported as one storm event for the day because the CoCoRaHS rainfall data reports one value for the entire day and does not provide storm event timing information. Table 7 presents the daily CoCoRaHS data for this storm event for all the NDC watersheds with Levelogger sites. The bar chart in Figure 19 graphically shows the recorded Levelogger peak flow rates and runoff volume data for the Levelogger locations. The CoCoRaHS data for this storm event was added into ArcGIS; the data is presented spatially related to the underlying watersheds in Figure 20.

Table 7: June 19, 2022 Storm Event CoCoRaHS Total Precipitation Data

Average CoCoRaHS Rainfall for NDC Watershed: 0.30 inches Sunport Rainfall Gage (NOAA): 0.25 inches		
Watershed	**Range of CoCoRaHS Reported Precipitation Totals (inches)**	**Average of CoCoRaHS Reported Precipitation Data (inches)**
***North Camino Arroyo	--	--
La Cueva Arroyo	0.00	0.00
North Domingo Baca	0.28 to 0.43	0.36
North Pino Arroyo	0.45	0.45
South Pino Arroyo	0.34 to 0.43	0.39
**Bear Canyon Arroyo	0.33 to 0.48	0.39
***Vineyard Arroyo	--	--
***Grantline Arroyo	--	--
Hahn Arroyo	0.22 to 0.42	0.32
*Embudo Arroyo	0.14 to 0.31	0.22
*San Mateo Drain	0.14 to 0.31	0.22
Campus Wash	0.24	0.24
**Lower Bear – Upstream (Wyoming)	0.33 to 0.48	0.39
**Lower Bear – Downstream (Spain)	0.33 to 0.48	0.39

**Embudo and San Mateo share the same watershed as delineated by AMAFCA in GIS.*

***Bear Canyon and the Lower Bear Leveloggers share the same watershed.*

****North Camino, Vineyard, and Grantline basins had no CoCoRaHS reporting stations for this storm event.*

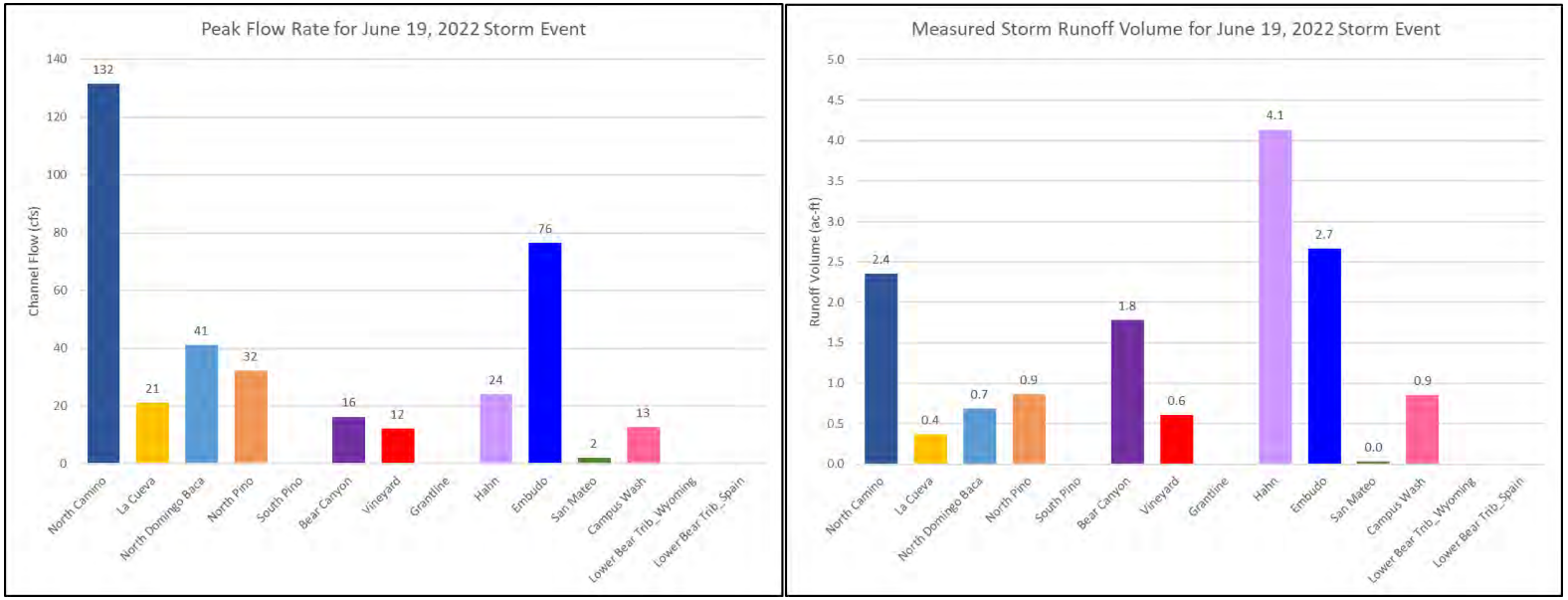

Figure 19: June 19, 2022 Storm Event, Peak Flow Rates and Runoff Volume

AMAFCA
Levelogger Runoff and CoCoRaHS Rainfall
June 19, 2022
Storm Event

Figure 20

▲ CoCoRaHS Stations with reported rainfall (in)

North Diversion Channel

Watersheds

Flow Rate (cfs)	Rainfall (in.)
Not Recorded	0.0 - 0.10
0.1- 25.0	0.11 - 0.20
25.1 - 50.0	0.21 - 0.30
50.1 - 100.0	0.31 - 0.40
100.1- 150.0	0.41 - 0.50
150.1 - 200.0	0.51 - 0.60
200.1 - 500.0	0.61 - 0.70
>500.0	0.71 - 0.80
	0.81 - 0.90
	0.91 - 1.00
	1.01 - 1.10
	1.11 - 1.20
	>1.21

Avg. CoCoRaHS Rainfall for NDC Watershed: 0.30 in.

Data Use Limitation: Precipitation data displayed using Kriging Interpolation Method. Surface should not be used to extract precise location dependent rainfall data outside the immediate area of rainfall gauges. Note: Bernalillo County rainfall gauges outside of NDC Watershed that recorded rainfall contributed to this rainfall surface output but are not displayed in the map view.

N

0 6,000 12,000 Feet

1 inch = 1 mile

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Author: mcrooks

D. JUNE 22, 2022

On June 22, 2022, a storm event occurred. Table 8 presents the daily CoCoRaHS data for this storm event for all the NDC watersheds with Levelogger sites. The bar chart in Figure 21 graphically shows the recorded Levelogger peak flow rates and runoff volume data for the Levelogger locations. The CoCoRaHS data for this storm event was added into ArcGIS; the data is presented spatially related to the underlying watersheds in Figure 22.

Table 8: June 22, 2022 Storm Event CoCoRaHS Total Precipitation Data

Average CoCoRaHS Rainfall for NDC Watershed: 0.23 inches Sunport Rainfall Gage (NOAA): 0.56 inches		
Watershed	**Range of CoCoRaHS Reported Precipitation Totals (inches)**	**Average of CoCoRaHS Reported Precipitation Data (inches)**
***North Camino Arroyo	--	--
La Cueva Arroyo	0.00	0.00
North Domingo Baca	0.13 to 0.42	0.25
North Pino Arroyo	0.34	0.34
South Pino Arroyo	0.07 to 0.24	0.16
**Bear Canyon Arroyo	0.10 to 0.20	0.15
***Vineyard Arroyo	--	--
***Grantline Arroyo	--	--
Hahn Arroyo	0.00 to 0.51	0.26
*Embudo Arroyo	0.07 to 0.39	0.21
*San Mateo Drain	0.07 to 0.39	0.21
Campus Wash	0.21 to 0.34	0.28
**Lower Bear – Upstream (Wyoming)	0.10 to 0.20	0.15
**Lower Bear – Downstream (Spain)	0.10 to 0.20	0.15

**Embudo and San Mateo share the same watershed as delineated by AMAFCA in GIS.*

***Bear Canyon and the Lower Bear Leveloggers share the same watershed.*

****North Camino, Vineyard, and Grantline basins had no CoCoRaHS reporting stations for this storm event.*

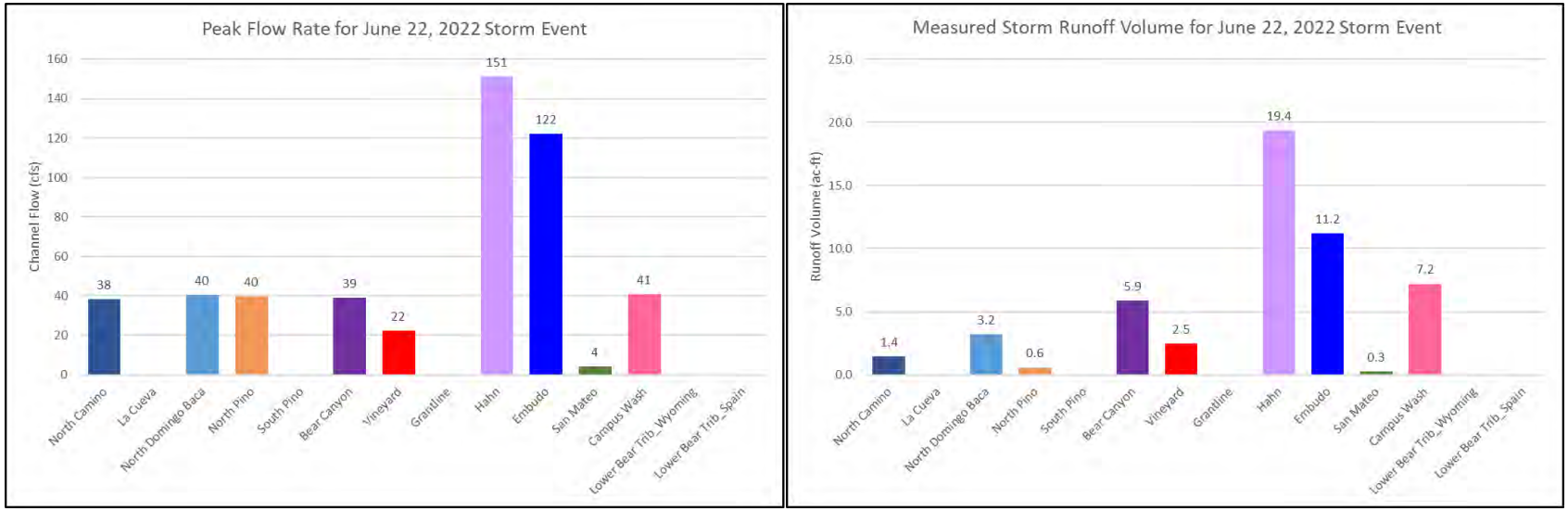
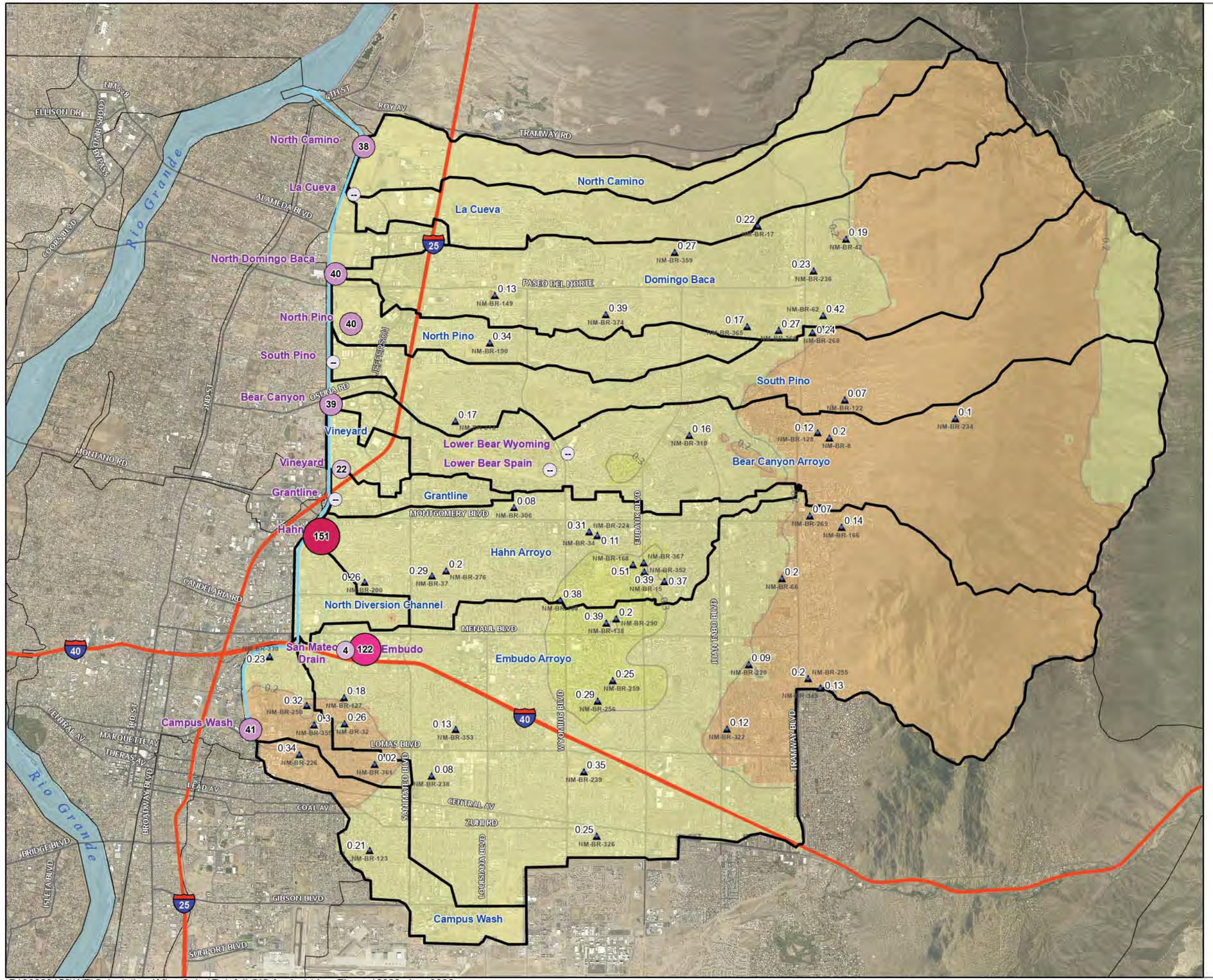


Figure 21: June 22, 2022 Storm Event, Peak Flow Rates and Runoff Volume

AMAFCA
Levelogger Runoff and CoCoRaHS Rainfall
June 22, 2022
Storm Event

Figure 22



North Diversion Channel

Watersheds

Flow Rate (cfs)	Rainfall (in.)
Not Recorded	0.0 - 0.10
0.1- 25.0	0.11 - 0.20
25.1 - 50.0	0.21 - 0.30
50.1 - 100.0	0.31 - 0.40
100.1- 150.0	0.41 - 0.50
150.1 - 200.0	0.51 - 0.60
200.1 - 500.0	0.61 - 0.70
>500.0	0.71 - 0.80
	0.81 - 0.90
	0.91 - 1.00
	1.01 - 1.10
	1.11 - 1.20
	>1.21

Avg. CoCoRaHS Rainfall for NDC Watershed: 0.23 in.

Data Use Limitation: Precipitation data displayed using Kriging Interpolation Method. Surface should not be used to extract precise location dependent rainfall data outside the immediate area of rainfall gauges. Note: Bernalillo County rainfall gauges outside of NDC Watershed that recorded rainfall contributed to this rainfall surface output but are not displayed in the map view.

N

0 6,000 12,000 Feet

1 inch = 1 mile

AMAFCA

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Author: mcrooks

E. JUNE 26, 2022

On June 26, 2022, a storm event occurred. Table 9 presents the daily CoCoRaHS data for this storm event for all the NDC watersheds with Levelogger sites. The bar chart in Figure 23 graphically shows the recorded Levelogger peak flow rates and runoff volume data for the Levelogger locations. The CoCoRaHS data for this storm event was added into ArcGIS; the data is presented spatially related to the underlying watersheds in Figure 24.

Table 9: June 26, 2022 Storm Event CoCoRaHS Total Precipitation Data

Average CoCoRaHS Rainfall for NDC Watershed: 0.36 inches Sunport Rainfall Gage (NOAA): 0.67 inches		
Watershed	**Range of CoCoRaHS Reported Precipitation Totals (inches)**	**Average of CoCoRaHS Reported Precipitation Data (inches)**
***North Camino Arroyo	--	--
La Cueva Arroyo	0.00	0.00
North Domingo Baca	0.15 to 0.66	0.43
North Pino Arroyo	0.10	0.10
South Pino Arroyo	0.65 to 0.72	0.69
**Bear Canyon Arroyo	0.30 to 1.01	0.56
***Vineyard Arroyo	--	--
***Grantline Arroyo	--	--
Hahn Arroyo	0.16 to 0.29	0.22
*Embudo Arroyo	0.16 to 0.72	0.33
*San Mateo Drain	0.16 to 0.72	0.33
Campus Wash	0.17 to 0.18	0.18
**Lower Bear – Upstream (Wyoming)	0.30 to 1.01	0.56
**Lower Bear – Downstream (Spain)	0.30 to 1.01	0.56

**Embudo and San Mateo share the same watershed as delineated by AMAFCA in GIS.*

***Bear Canyon and the Lower Bear Leveloggers share the same watershed.*

****North Camino, Vineyard, and Grantline basins had no CoCoRaHS reporting stations for this storm event.*

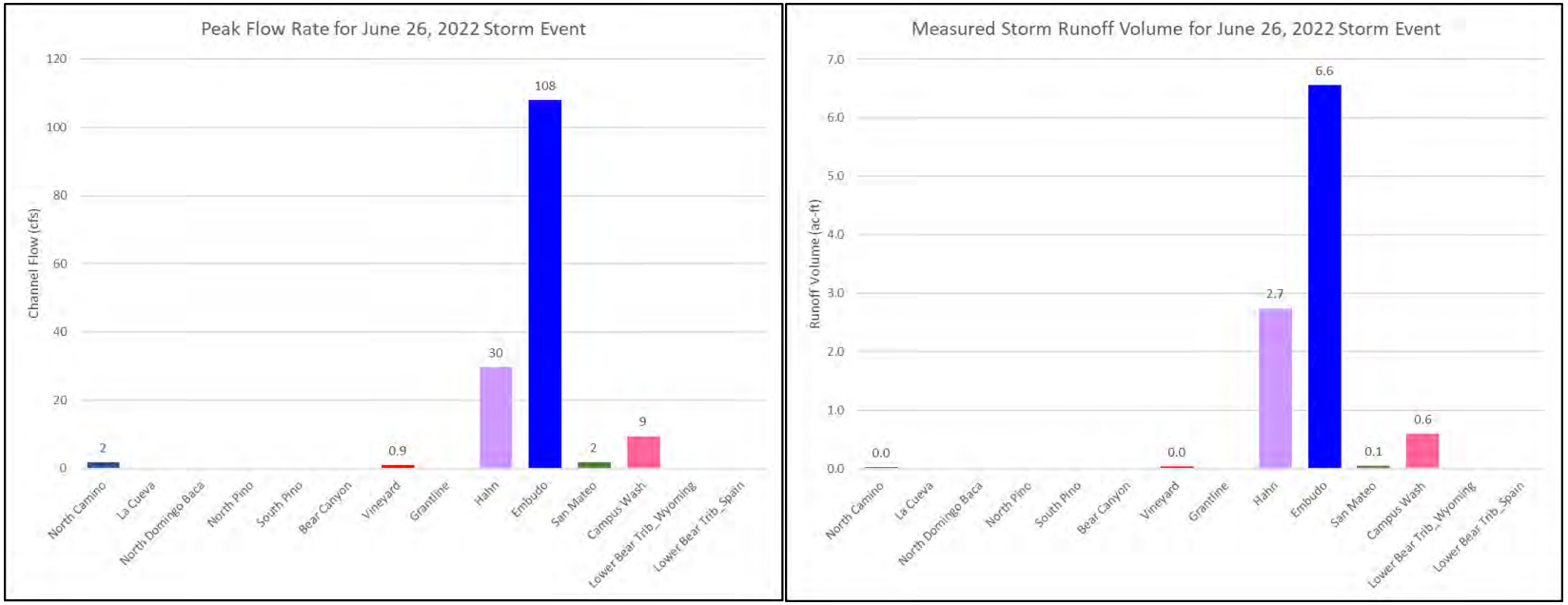

Figure 23: June 26, 2022 Storm Event, Peak Flow Rates and Runoff Volume

AMAFCA
Levelogger Runoff and CoCoRaHS Rainfall
June 26, 2022
Storm Event

Figure 24

▲ CoCoRaHS Stations with reported rainfall (in)

North Diversion Channel

Watersheds

Flow Rate (cfs)	Rainfall (in.)
Not Recorded	0.0 - 0.10
0.1- 25.0	0.11 - 0.20
25.1 - 50.0	0.21 - 0.30
50.1 - 100.0	0.31 - 0.40
100.1- 150.0	0.41 - 0.50
150.1 - 200.0	0.51 - 0.60
200.1 - 500.0	0.61 - 0.70
>500.0	0.71 - 0.80
	0.81 - 0.90
	0.91 - 1.00
	1.01 - 1.10
	1.11 - 1.20
	>1.21

Avg. CoCoRaHS Rainfall for NDC Watershed: 0.36 in.

Data Use Limitation: Precipitation data displayed using Kriging Interpolation Method. Surface should not be used to extract precise location dependent rainfall data outside the immediate area of rainfall gauges. Note: Bernalillo County rainfall gauges outside of NDC Watershed that recorded rainfall contributed to this rainfall surface output but are not displayed in the map view.

N

0 6,000 12,000 Feet

1 inch = 1 mile

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Author: mcrooks

F. JUNE 27, 2022

On June 27, 2022, a storm event occurred. Table 10 presents the daily CoCoRaHS data for this storm event for all the NDC watersheds with Levelogger sites. The bar chart in Figure 25 graphically shows the recorded Levelogger peak flow rates and runoff volume data for the Levelogger locations. The CoCoRaHS data for this storm event was added into ArcGIS; the data is presented spatially related to the underlying watersheds in Figure 26.

Table 10: June 27, 2022 Storm Event CoCoRaHS Total Precipitation Data

Average CoCoRaHS Rainfall for NDC Watershed: 0.64 inches Sunport Rainfall Gage (NOAA): 0.24 inches		
Watershed	**Range of CoCoRaHS Reported Precipitation Totals (inches)**	**Average of CoCoRaHS Reported Precipitation Data (inches)**
***North Camino Arroyo	--	--
La Cueva Arroyo	0.00	0.00
North Domingo Baca	0.50 to 0.73	0.62
North Pino Arroyo	0.48 to 0.48	0.48
South Pino Arroyo	0.47 to 0.87	0.72
**Bear Canyon Arroyo	0.67 to 0.88	0.76
***Vineyard Arroyo	--	--
***Grantline Arroyo	--	--
Hahn Arroyo	0.00 to 0.71	0.58
*Embudo Arroyo	0.43 to 0.82	0.66
*San Mateo Drain	0.43 to 0.82	0.66
Campus Wash	0.56 to 0.70	0.63
**Lower Bear – Upstream (Wyoming)	0.67 to 0.88	0.76
**Lower Bear – Downstream (Spain)	0.67 to 0.88	0.76

**Embudo and San Mateo share the same watershed as delineated by AMAFCA in GIS.*

***Bear Canyon and the Lower Bear Leveloggers share the same watershed.*

****North Camino, Vineyard, and Grantline basins had no CoCoRaHS reporting stations for this storm event.*

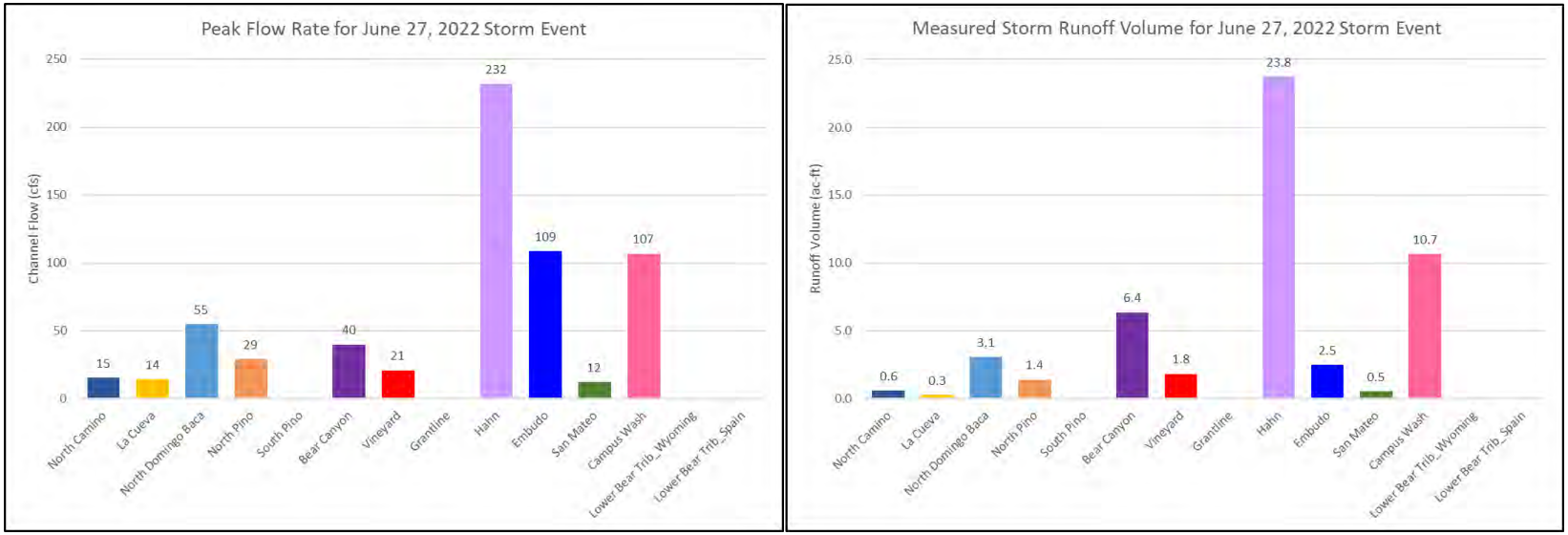

Figure 25: June 27, 2022 Storm Event, Peak Flow Rates and Runoff Volume

AMAFCA
Levelogger Runoff and CoCoRaHS Rainfall
June 27, 2022
Storm Event

Figure 26

▲ CoCoRaHS Stations with reported rainfall (in)

North Diversion Channel

Watersheds

Flow Rate (cfs)	Rainfall (in.)
Not Recorded	0.0 - 0.10
0.1- 25.0	0.11 - 0.20
25.1 - 50.0	0.21 - 0.30
50.1 - 100.0	0.31 - 0.40
100.1- 150.0	0.41 - 0.50
150.1 - 200.0	0.51 - 0.60
200.1 - 500.0	0.61 - 0.70
>500.0	0.71 - 0.80
	0.81 - 0.90
	0.91 - 1.00
	1.01 - 1.10
	1.11 - 1.20
	>1.21

Avg. CoCoRaHS Rainfall for NDC Watershed: 0.64 in.

Data Use Limitation: Precipitation data displayed using Kriging Interpolation Method. Surface should not be used to extract precise location dependent rainfall data outside the immediate area of rainfall gauges. Note: Bernalillo County rainfall gauges outside of NDC Watershed that recorded rainfall contributed to this rainfall surface output but are not displayed in the map view.

N

0 6,000 12,000 Feet

1 inch = 1 mile

AMAFCA

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Author: mcrooks

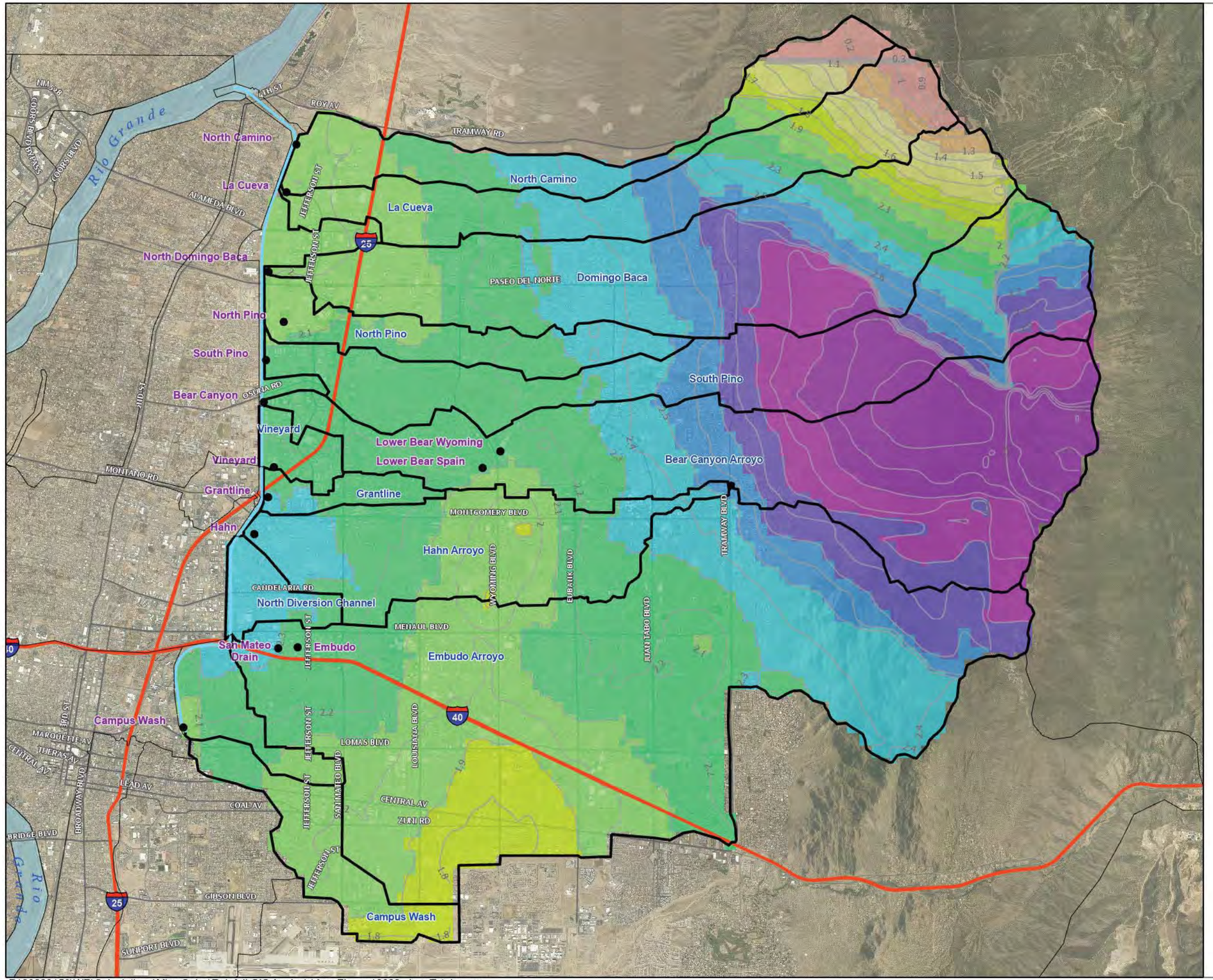
Table 11: June 2022 Collection Period Runoff Measured at Levelogger Sites

Storm Event Date:	June 17	June 18	June 19	June 22	June 26	June 27
Location	**Runoff Volume (ac-ft)**					
North Camino Arroyo	1.6	--	2.4	1.4	0.03	0.6
La Cueva Arroyo	0.5	--	0.4	--	--	0.3
North Domingo Baca	1.3	--	0.7	3.2	--	3.1
North Pino Arroyo	0.2	--	0.9	0.6	--	1.4
South Pino Arroyo	--	--	--	--	--	--
Bear Canyon Arroyo	1.3	--	1.8	5.9	--	6.4
Vineyard Arroyo	2.5	0.3	0.6	2.5	0.04	1.8
**Grantline Arroyo	--	--	--	--	--	--
Hahn Arroyo	23.5	2.2	4.1	19.4	2.7	23.8
Embudo Arroyo	5.0	0.4	2.7	11.2	6.6	2.5
San Mateo Drain	0.2	0.03	0.03	0.3	0.1	0.5
Campus Wash	7.6	0.3	0.9	7.2	0.6	10.7
Lower Bear – Upstream (Wyoming)	--	--	--	--	--	--
Lower Bear – Downstream (Spain)	--	--	--	--	--	--
Location	**Peak Flow (cfs)**					
North Camino Arroyo	14	--	132	38	2	15
La Cueva Arroyo	17	--	21	--	--	14
North Domingo Baca	29	--	41	40	--	55
North Pino Arroyo	12	--	32	40	--	29
South Pino Arroyo	--	--	--	--	--	--
Bear Canyon Arroyo	26	--	16	39	--	40
Vineyard Arroyo	16	9	12	22	1	21
**Grantline Arroyo	--	--	--	--	--	--
Hahn Arroyo	195	20	24	151	30	232
Embudo Arroyo	88	63	76	122	108	109
San Mateo Drain	4	2	2	4	2	12
Campus Wash	99	10	13	41	9	107
Lower Bear – Upstream (Wyoming)	--	--	--	--	--	--
Lower Bear – Downstream (Spain)	--	--	--	--	--	--

***Grantline Levelogger did not record properly during the month of June.*

CoCoRaHS Rainfall Total June 2022 Collection Period

Figure 27



- Levelogger Sites
- North Diversion Channel
- Watersheds

Rainfall (in.)

<1.1	2.31 - 2.50
1.11 - 1.30	2.51 - 2.70
1.31 - 1.50	2.71 - 2.90
1.51 - 1.70	2.91 - 3.10
1.71 - 1.90	>3.10
1.91 - 2.10	
2.11 - 2.30	

*Rainfall recorded for this storm event included both rainfall and snowmelt

N

0 6,000 12,000 Feet

1 inch = 1 mile

AMAFCA

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Author: mcrooks

VIII. SUMMARY

This is the third and final Levelogger program report for FY 2022. The first report covered the four month time frame of July 2021 – October 2021, and the second report for FY 2022 covered the time period from November 2021 – February 2022.

For the four month period covered in this report, March – June 2022, eight storm events, two in March 2022 and six in June 2022, were recorded by the Leveloggers and analyzed in this report. During this reporting period, there were no illicit discharge indicators detected during the AMAFCA site visits.

One storm event occurred on March 23, 2022, with a total rainfall of 0.14-inches within the NDC watershed. The Leveloggers recorded runoff at only three locations. The low runoff for the event on March 23, 2022, was likely due to the storm being a mixture of rain and snow. Snowmelt has slower runoff, smaller peak discharges, and lower peak runoff is difficult to decipher with the Leveloggers. The second March storm event occurred on March 30, 2022, with a total rainfall of 0.06-inches within the NDC watershed. The Leveloggers recorded runoff at only two locations.

Six storm events were recorded by Leveloggers during the month of June. This is the greatest number of storm events recorded by the Leveloggers during the month of June since starting Levelogger monitoring in October 2016. The average rainfall for the storm events in June 2022 ranged from 0.20-inches to 0.64-inches. The June storms were generally widespread across the NDC watershed, with Leveloggers recording runoff at five to ten locations per storm event.