

**NPDES PERMIT No.  
NMR04A000**

**FY 2022  
MS4 ANNUAL REPORT**

**FOR**

**ALBUQUERQUE METROPOLITAN ARROYO  
FLOOD CONTROL AUTHORITY**

**DECEMBER 1, 2022**



**2600 PROSPECT AVENUE NE  
ALBUQUERQUE, NM 87107  
(505) 884-2215**





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**FY 2022 MS4 Annual Report Summary Form for AMAFCA**

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  - Part I.C.3.a – Endangered Species Act (ESA) Requirements – Dissolved Oxygen Strategy
- 2. Temperature Program Summary**
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- 6. Construction Site Stormwater Runoff Control Program Summary**
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**8. Pollution Prevention/Good Housekeeping Program & Control of Floatables Program Summary**

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**10. Public Education, Outreach, Involvement, and Participation Program**

- Part I.D.5.g – Public Education and Outreach on Stormwater Impacts
- Part I.D.5.h – Public Involvement and Participation
  - Mid Rio Grande Stormwater Quality Team (MRGSQT) Outcomes Report for Fiscal Year 2021-2022 (July 1, 2021 to June 30, 2022)

**11. Dry Weather Discharge Screening Program Summary**

- Part III.A.2 – Dry Weather Discharge Screening of MS4
  - City of Albuquerque Dry Weather Screening of Outfalls 2022 Report

## Annual Report Format



**National Pollutant Discharge Elimination System Stormwater Program  
MS4 Annual Report Form**



Check box if you are submitting an individual Annual Report with cooperative program elements ☒

Check box if you are submitting an individual Annual Report with individual program elements ☐

Check box if this is a new name, address, etc. ☐

### 1. MS4(s) Information

Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA)

Name of MS4

Jerry

Lovato

Executive Engineer

Name of Contact Person (First)

(Last)

(Title)

505-884-2215

jlovato@amafca.org

Telephone (including area code)

E-mail

2600 Prospect Ave. NE

Mailing Address

Albuquerque

NM

87107

City

State

ZIP code

What size population does your MS4(s) serve?

562,599

NPDES number

NMR04A016

What is the reporting period for this report? (mm/dd/yyyy)

From

Jul 1, 2021

to

Jun 30, 2022

### 2. Water Quality Priorities

A. Does your MS4(s) discharge to waters listed as impaired on a state 303(d) list? ☒ Yes ☐ No

B. If yes, identify each impaired water, the impairment, whether a TMDL has been approved by EPA for each, and whether the TMDL assigns a wasteload allocation to your MS4(s). Use a new line for each impairment, and attach additional pages as necessary.

Impaired Water	Impairment	Approved TMDL	TMDL assigns WLA to MS4
Rio Grande (Isleta -Tijeras)	E. coli	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Rio Grande (Isleta -Tijeras)	DO, PCBs & Hg-Fish Consumpti	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Rio Grande (Tijeras - Alameda)	DO & Temperature	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Rio Grande (Tijeras - Alameda)	PCBs & Hg-Fish Consumption A	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No



**2. B. Continued**

Impaired Water	Impairment	Approved TMDL		TMDL assigns WLA to MS4	
Rio Grande (Tijeras - Alameda)	E. coli	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Rio Grande (Alameda - US550)	PCBs & Hg-Fish Consumption <sup>A</sup>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Rio Grande (Alameda - US550)	Gross Alpha, adjusted & PCBs	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Rio Grande (Alameda - US550)	E. coli	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

C. What specific sources contributing to the impairment(s) are you targeting in your stormwater program?

Pet waste (E. coli) within the watershed & potential low DO related to the NDC outfall.

- D. Do you discharge to any high-quality waters (e.g., Tier 2, Tier 3, outstanding natural resource waters, or other state or federal designation)? ☐ Yes ☒ No
- E. Are you implementing additional specific provisions to ensure their continued integrity? ☐ Yes ☐ No

**3. Public Education and Public Participation**

- A. Is your public education program targeting specific pollutants and sources of those pollutants? ☒ Yes ☐ No
- B. If yes, what are the specific sources and/or pollutants addressed by your public education program?

AMAFCA's programs target specific sources & pollutants, as required in MS4 Permit.

- C. Note specific successful outcome(s) (e.g., quantified reduction in fertilizer use; NOT tasks, events, publications) fully or partially attributable to your public education program during this reporting period.

Please refer to [www.keeptheriogrand.org](http://www.keeptheriogrand.org) website for documentation related to successful outcomes.

- D. Do you have an advisory committee or other body comprised of the public and other stakeholders that provides regular input on your stormwater program? ☒ Yes ☐ No

**4. Construction**

- A. Do you have an ordinance or other regulatory mechanism stipulating:
- Erosion and sediment control requirements? ☒ Yes ☐ No
- Other construction waste control requirements? ☒ Yes ☐ No
- Requirement to submit construction plans for review? ☒ Yes ☐ No
- MS4 enforcement authority? ☒ Yes ☐ No
- B. Do you have written procedures for:
- Reviewing construction plans? ☒ Yes ☐ No
- Performing inspections? ☒ Yes ☐ No
- Responding to violations? ☒ Yes ☐ No
- C. Identify the number of active construction sites  $\geq 1$  acre in operation in your jurisdiction at any time during the reporting period.
- D. How many of the sites identified in 4.C did you inspect during this reporting period?
- E. Describe, on average, the frequency with which your program conducts construction site inspections.

Inspections complied with CGP requirements for inspection frequency.

- F. Do you prioritize certain construction sites for more frequent inspections? ☐ Yes ☒ No

If Yes, based on what criteria?

- G. Identify which of the following types of enforcement actions you used during the reporting period for construction activities, indicate the number of actions, or note those for which you do not have authority:

☐ Yes Notice of violation  No Authority ☒

☐ Yes Administrative fines  No Authority ☒

☐ Yes Stop Work Orders  No Authority ☐

☐ Yes Civil penalties  No Authority ☒

☐ Yes Criminal actions  No Authority ☒

☐ Yes Administrative orders  No Authority ☒

☐ Yes Other

- H. Do you use an electronic tool (e.g., GIS, data base, spreadsheet) to track the locations, inspection results, and enforcement actions of active construction sites in your jurisdiction? ☒ Yes ☐ No

- I. What are the 3 most common types of violations documented during this reporting period?

There were no violations requiring enforcement during FY 2022.

- J. How often do municipal employees receive training on the construction program?

Annually

## 5. Illicit Discharge Elimination

- A. Have you completed a map of all outfalls and receiving waters of your storm sewer system? ☒ Yes ☐ No

- B. Have you completed a map of all storm drain pipes and other conveyances in the storm sewer system? ☒ Yes ☐ No

- C. Identify the number of outfalls in your storm sewer system.

5

- D. Do you have documented procedures, including frequency, for screening outfalls? ☒ Yes ☐ No

- E. Of the outfalls identified in 5.C, how many were screened for dry weather discharges during this reporting period?

5 - All outfalls

- F. Of the outfalls identified in 5.C, how many have been screened for dry weather discharges at any time since you obtained MS4 permit coverage?

5 - All outfalls

- G. What is your frequency for screening outfalls for illicit discharges? Describe any variation based on size/type.

Typically, outfalls are visually screened monthly.

- H. Do you have an ordinance or other regulatory mechanism that effectively prohibits illicit discharges? ☐ Yes ☒ No

- I. Do you have an ordinance or other regulatory mechanism that provides authority for you to take enforcement action and/or recover costs for addressing illicit discharges? ☐ Yes ☒ No

J. During this reporting period, how many illicit discharges/illegal connections have you discovered?

K. Of those illicit discharges/illegal connections that have been discovered or reported, how many have been eliminated?

L. How often do municipal employees receive training on the illicit discharge program?

## 6. Stormwater Management for Municipal Operations

A. Have stormwater pollution prevention plans (or an equivalent plan) been developed for:

All public parks, ball fields, other recreational facilities and other open spaces	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
All municipal construction activities, including those disturbing less than 1 acre	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
All municipal turf grass/landscape management activities	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
All municipal vehicle fueling, operation and maintenance activities	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
All municipal maintenance yards	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
All municipal waste handling and disposal areas	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Other

B. Are stormwater inspections conducted at these facilities? ☒ Yes ☐ No

C. If Yes, at what frequency are inspections conducted?

D. List activities for which operating procedures or management practices specific to stormwater management have been developed (e.g., road repairs, catch basin cleaning).

E. Do you prioritize certain municipal activities and/or facilities for more frequent inspection? ☐ Yes ☒ No

F. If Yes, which activities and/or facilities receive most frequent inspections?

G. Do all municipal employees and contractors overseeing planning and implementation of stormwater-related activities receive comprehensive training on stormwater management? ☒ Yes ☐ No

H. If yes, do you also provide regular updates and refreshers? ☒ Yes ☐ No

I. If so, how frequently and/or under what circumstances?

## 7. Long-term (Post-Construction) Stormwater Measures

A. Do you have an ordinance or other regulatory mechanism to require:

Site plan reviews for stormwater/water quality of all new and re-development projects?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Long-term operation and maintenance of stormwater management controls?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Retrofitting to incorporate long-term stormwater management controls?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

B. If you have retrofit requirements, what are the circumstances/criteria?

C. What are your criteria for determining which new/re-development stormwater plans you will review (e.g., all projects, projects disturbing greater than one acre, etc.)?

D. Do you require water quality or quantity design standards or performance standards, either directly or by reference to a state or other standard, be met for new development and re-development? ☒ Yes ☐ No

E. Do these performance or design standards require that pre-development hydrology be met for:

Flow volumes ☐ Yes ☒ No

Peak discharge rates ☒ Yes ☐ No

Discharge frequency ☒ Yes ☐ No

Flow duration ☐ Yes ☒ No

F. Please provide the URL/reference where all post-construction stormwater management standards can be found.

<https://www.amafca.org>

G. How many development and redevelopment project plans were reviewed during the reporting period to assess impacts to water quality and receiving stream protection?

H. How many of the plans identified in 7.G were approved?

I. How many privately owned permanent stormwater management practices/facilities were inspected during the reporting period?

J. How many of the practices/facilities identified in I were found to have inadequate maintenance?

K. How long do you give operators to remedy any operation and maintenance deficiencies identified during inspections?

L. Do you have authority to take enforcement action for failure to properly operate and maintain stormwater practices/facilities? ☐ Yes ☒ No

M. How many formal enforcement actions (i.e., more than a verbal or written warning) were taken for failure to adequately operate and/or maintain stormwater management practices?

N. Do you use an electronic tool (e.g., GIS, database, spreadsheet) to track post-construction BMPs, inspections and maintenance? ☒ Yes ☐ No

O. Do all municipal departments and/or staff (as relevant) have access to this tracking system? ☒ Yes ☐ No

P. How often do municipal employees receive training on the post-construction program?

## 8. Program Resources

A. What was the annual expenditure to implement MS4 permit requirements this reporting period?

B. What is next year's budget for implementing the requirements of your MS4 NPDES permit?

C. This year what is/are your source(s) of funding for the stormwater program, and annual revenue (amount or percentage) derived from each?

Source:  Amount \$  OR %

Source:  Amount \$  OR %

Source:  Amount \$  OR %

D. How many FTEs does your municipality devote to the stormwater program (specifically for implementing the stormwater program; not municipal employees with other primary responsibilities)?

E. Do you share program implementation responsibilities with any other entities? ☒ Yes ☐ No

Entity	Activity/Task/Responsibility	Your Oversight/Accountability Mechanism
Various	Storm Water Quality Team (SWQT)	Signed Joint Agreement
Various	Technical Advisory Group (TAG)	Signed Joint Agreement
Various	Compliance Monitoring Coop. (CMC)	Signed Joint Agreement

#### 9. Evaluating/Measuring Progress

A. What indicators do you use to evaluate the overall effectiveness of your stormwater management program, how long have you been tracking them, and at what frequency? These are not measurable goals for individual management practices or tasks, but large-scale or long-term metrics for the overall program, such as macroinvertebrate community indices, measures of effective impervious cover in the watershed, indicators of in-stream hydrologic stability, etc.

Indicator	Began Tracking (year)	Frequency	Number of Locations
<i>Example: E. coli</i>	2003	Weekly April–September	20
Various (EPA approved analyte list)	2016	Qualifying events (up to 7)	3
Various/EPA approved analyte list	2014	Wet weather, annually	8
Various/EPA approved analyte list	2021	Wet weather, annually	11
Please contact AMAFCA			
for additional information			

B. What environmental quality trends have you documented over the duration of your stormwater program? Reports or summaries can be attached electronically, or provide the URL to where they may be found on the Web.

Trends and data collected by CMC & AMAFCA has been provided to NMED for additional analysis.

#### 10. Additional Information

Please attach any additional information on the performance of your MS4 program, including information required in Parts I.C and III.B. If providing clarification to any of the questions on this form, please provide the question number (e.g., 2C) in your response.

#### Certification Statement and Signature

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

☒ Yes ☐ No

Federal regulations require this application to be signed as follows: **For a municipal, State, Federal, or other public facility:** by either a principal executive or ranking elected official.

Signature



Jerry Lovato, PE, Executive Engineer

Name of Certifying Official, Title

12/01/2022

Date (mm/dd/yyyy)

NOI Section	ID	Permit Activity Description	Plan SWMP Rev. 6 - July 1, 2021	Measurable Goal SWMP Rev. 6 - July 1, 2021	Status of Implementation and Performance Assessment Permit Year July 2021 to June 2022 (FY 2022)
	3	<b>Part I.C - Special Conditions</b>			
	4	<b>Compliance with Water Quality Standards – General Requirements - Part I.C.1.a - c</b>			
Not Included in NOI	5	<u>Part I.C.1 - Compliance with Water Quality Standards</u> - Pursuant to Clean Water Act §402(p)(3)(B)(iii) and 40 CFR §122.44(d)(1), this permit includes provisions to ensure that discharges from the permittee's MS4 do not cause or contribute to exceedances of applicable surface water quality standards, in addition to requirements to control discharges to the maximum extent practicable (MEP) set forth in Part I.D. Permittees shall address storm water management through development of the SWMP that shall include the following elements and specific requirements included in Part VI (sections below).	<u>Part I.C.1</u> - AMAFCA's proposed plan for compliance with related Permit activities are described in the applicable sections of the AMAFCA SWMP.	• AMAFCA's measurable goals for compliance with related Permit activities are described in the applicable sections of the AMAFCA SWMP.	See specific Permit section and activity.
Not Included in NOI	6	<u>Part I.C.1.a</u> - Permittee's discharges shall not cause or contribute to an exceedance of surface water quality standards (including numeric and narrative water quality criteria) applicable to the receiving waters. In determining whether the SWMP is effective in meeting this requirement or if enhancements to the plan are needed, the permittee shall consider available monitoring data, visual assessment, and site inspection reports.	<u>Part I.C.1.a</u> - Compare AMAFCA monitoring data results to applicable surface water quality standards that occur in the following programs: Compliance with Water Quality Standards - Dissolved Oxygen Program, Compliance with Water Quality Standards - PCB Program, Compliance with Water Quality Standards - Temperature Program, Compliance with Water Quality Standards - Discharges to Impaired Waters with Approved TMDL Program, and the Wet Weather Monitoring Program. Refer to these sections for additional information.	• Compare AMAFCA monitoring data results to applicable surface water quality standards that occur in the following programs: Compliance with Water Quality Standards - Dissolved Oxygen Program, Compliance with Water Quality Standards - PCB Program, Compliance with Water Quality Standards - Temperature Program, Compliance with Water Quality Standards - Discharges to Impaired Waters with Approved TMDL Program, and the Wet Weather Monitoring Program. • AMAFCA's measurable goals for compliance with related Permit activities are described in the applicable sections of the AMAFCA SWMP.	See specific Permit section and activity.
Not Included in NOI	7	<u>Part I.C.1.b</u> - Applicable surface water quality standards for discharges from the permittees' MS4 are those that are approved by EPA and any other subsequent modifications approved by EPA upon the effective date of this permit found at New Mexico Administrative Code §20.6.4. Discharges from various portions of the MS4 also flow downstream into waters with Pueblo of Isleta and Pueblo of Sandia Water Quality Standards.	<u>Part I.C.1.b</u> - Compare AMAFCA monitoring data results to the applicable New Mexico Administrative Code §20.6.4, Pueblo of Isleta Water Quality Standards (amended on 3/18/2002, effective 7/22/2005 per EPA website), and Pueblo of Sandia Water Quality Standards (effective 3/9/2010). Compare AMAFCA monitoring data results to applicable surface water quality standards that occur in the following programs: Compliance with Water Quality Standards - Dissolved Oxygen Program, Compliance with Water Quality Standards - PCB Program, Compliance with Water Quality Standards - Temperature Program, Compliance with Water Quality Standards - Discharges to Impaired Waters with Approved TMDL Program, and the Wet Weather Monitoring Program. Refer to these sections for additional information.	• Compare AMAFCA monitoring data results to applicable surface water quality standards that occur in the following programs: Compliance with Water Quality Standards - Dissolved Oxygen Program, Compliance with Water Quality Standards - PCB Program, Compliance with Water Quality Standards - Temperature Program, Compliance with Water Quality Standards - Discharges to Impaired Waters with Approved TMDL Program, and the Wet Weather Monitoring Program. • AMAFCA's measurable goals for compliance with related Permit activities are described in the applicable sections of the AMAFCA SWMP.	See specific Permit section and activity.



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Not Included in NOI	8	<p><u>Part I.C.1.c</u> - The permittee shall notify EPA and the Pueblo of Isleta in writing as soon as practical but not later than 30 calendar days following each Pueblo of Isleta water quality standard exceedance at an in-stream sampling location. In the event that EPA determines that a discharge from the MS4 causes or contributes to an exceedance of applicable surface water quality standards and notifies the permittee of such an exceedance, the permittee shall, within sixty (60) days of notification, submit to EPA, NMED, Pueblo of Isleta (upon request) and Pueblo of Sandia (upon request), a report that describes controls that are currently being implemented and additional controls that will be implemented to prevent pollutants sufficient to ensure that the discharge will no longer cause or contribute to an exceedance of applicable surface water quality standards. The permittee shall implement such additional controls upon notification by EPA and shall incorporate such measures into their SWMP as described in Part I.D of this permit. NMED or the affected Tribe may provide information documenting exceedances of applicable water quality standards caused or contributed to by the discharges authorized by this permit to EPA Region 6 and request EPA take action under this paragraph.</p>	<p><u>Part I.C.1.c</u> - AMAFCA will notify EPA and the Pueblo of Isleta of any Pueblo of Isleta of water quality standard exceedances at an in-stream sampling location (within the Rio Grande). Notification will be in writing as soon as practicable.</p> <p>Lab reports are typically received within 45 days of a sampling event. Preliminary review of the results typically requires 5 days. AMAFCA will include requirements to their contractors to review and report in-stream exceedances in a timely manner so that AMAFCA can better meet this requirement. AMAFCA will notify EPA and the Pueblo of Isleta within 30 days of the data review to determine a Pueblo of Isleta water quality standard exceedance at an in-stream (within the Rio Grande) sampling location. The Permit is unclear if this notification is required just for MS4 Permit compliance sampling, or if this includes results from other monitoring, such as citizen science projects. AMAFCA will provide this notification for in-stream samples that AMAFCA is involved with sampling, that result in a Pueblo of Isleta water quality standard exceedance.</p> <p>In addition, AMAFCA will continue to use sondes in the Rio Grande to monitor DO and temperature (refer to the Compliance with Water Quality Standards - Dissolved Oxygen (DO) Program). AMAFCA will continue to provide Isleta Pueblo with access to the real-time DO and temperature sonde data.</p>	<p>• AMAFCA will notify EPA and the Pueblo of Isleta of any Pueblo of Isleta water quality standard exceedances at an in-stream sampling location (within the Rio Grande). Notification will be in writing as soon as practicable.</p> <p>• AMAFCA will add the in-stream notification of Pueblo of Isleta water quality standard exceedance to monitoring reporting tasks with sub-consultants to ensure that results are reviewed and reported in a timely manner.</p> <p>• AMAFCA will continue to use sondes in the Rio Grande to monitor DO and temperature (refer to the Compliance with Water Quality Standards - Dissolved Oxygen Program). AMAFCA will continue to provide Isleta Pueblo with access to the real-time DO and temperature sonde data.</p>	<p><b>Met FY 2022 Goals.</b></p> <p>• AMAFCA notified EPA and the Pueblo of Isleta of any Pueblo of Isleta water quality standard exceedances at any in-stream sampling location (within the Rio Grande). Notification was in writing as soon as practical. AMAFCA notified the Pueblo of Isleta and EPA of exceedances related to CMC monitoring, AMAFCA water quality monitoring, and citizen science monitoring (BEMP).</p>

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	9	<b>Compliance with Water Quality Standards – Dissolved Oxygen &amp; Part I.C.1.d and Endangered Species Act (ESA) Requirements - Dissolved Oxygen Strategy - Part I.C.3.a</b>			
Not Included in NOI	10	<p>According to the requirements in <u>Part I.C.1.d</u> and <u>Part I.C.3.a.(ii)</u>, the permittees shall revise the May 1, 2012 Strategy to continue taking measures to address concerns regarding discharges to the Rio Grande by implementing controls to eliminate conditions that cause or contribute to exceedances of applicable dissolved oxygen water quality standards in waters of the United States.</p> <p>The permittee shall, as part of this revised strategy, complete the following activities [activities are listed in sections below]. Activities listed are a combination of permit activities in Part I.C.1.d - Special Conditions, Compliance with Water Quality Standards, Phase I Dissolved Oxygen Program and Part I.C.3.a - Dissolved Oxygen Strategy in Receiving Waters of the Rio Grande.</p>	<p><u>Part I.C.1.d</u> and <u>Part I.C.3.a.(ii)</u> - The potential for low DO discharges to the Rio Grande at the NDC Embayment has been a concern which AMAFCA has been addressing, with the USFWS and EPA, since 2004. Several strategies, including various NDC Embayment modifications, have been implemented from 2011-2014. In 2015-2016, AMAFCA completed construction, after coordination with USFWS, of the NDC Outfall Grade Control Structures Modification Project and NDC Embayment Regrading Project.</p> <p>The NDC Embayment was filled in and regraded in 2015-2016, thereby removing the constant hydraulic connection between the Rio Grande and the NDC Bathtub/Outfall. In normal river flow conditions, water from the Rio Grande will not be able to stagnate in the Embayment and create low DO conditions. These improvement projects provide control measures to eliminate conditions that cause or contribute to exceedances of applicable DO water quality standards.</p> <p>These NDC projects and this Dissolved Oxygen Program Strategy were coordinated with the USFWS. AMAFCA received a Final BO from the USFWS and Special Conditions from USACE allowing the NDC Embayment to be filled in and revegetated.</p>	<p>• AMAFCA has completed the NDC Outfall Grade Control Structures Modification Project to fill in and revegetate the NDC Embayment and will continue following the terms of the Final BO from the USFWS and Final Special Conditions from USACE. This project is the revised strategy for the MS4 Permit elements related to DO.</p> <p>• A new vegetation assessment study and removal training will be conducted to determine the types of vegetation and optimal time for seeding. A revised monitoring plan, developed in consultation with the USACE, will be in place moving forward.</p>	<p><b>Met FY 2022 Goals.</b></p> <p>• In FY 2022, AMAFCA provided written correspondence to the USACE and discussed the re-vegetation required at the NDC outfall in the Special Conditions of the USACE Regional General Permit for vegetation monitoring of this area with the USACE. AMAFCA is consulting with USACE to satisfy the Special Conditions for this USACE Regional General Permit.</p>
Not Included in NOI	11	<p><u>Part I.C.1.d.(i)</u> and <u>Part I.C.3.a.(i)</u> - Identify (or continue identifying) structural elements, natural or man-made topographical and geographical formations, MS4 operations activities, or oxygen demanding pollutants contributing to reduced dissolved oxygen in the receiving waters of the Rio Grande. Both dry and wet weather discharges shall be addressed. Assessment may be made using available data or collecting additional data;</p>	<p><u>Part I.C.1.d.(i)</u> and <u>Part I.C.3.a.(i)</u>- The NDC Outfall/Embayment is the primary structural element identified by AMAFCA, City of Albuquerque, EPA, and USFWS as potentially contributing to low dissolved oxygen (DO) in the receiving waters of the Rio Grande. This Dissolved Oxygen Strategy is primarily focused on addressing this element.</p> <p>No other specific structural elements in the watershed have been identified as contributing to reduced DO in the receiving waters of the Rio Grande. Other stormwater outfalls, including the South Diversion Channel/Tijeras Arroyo, Calabacillas Arroyo, San Antonio Arroyo, will continue to be monitored.</p> <p>AMAFCA will continue to operate sondes in the Rio Grande deployed for monitoring DO and temperature. The sonde locations throughout the length of the Rio Grande through the UA will assist AMAFCA with bracketing segments of the Rio Grande to better understand elements that may be contributing to reduced DO in the receiving waters of the Rio Grande. DO results from AMAFCA monitoring efforts will assist AMAFCA in determining if there are other elements that may be contributing to reduced DO in the receiving waters of the Rio Grande. AMAFCA will update its SWMP if any other specific structural elements in the watershed are identified as contributing to reduced DO in the receiving waters of the Rio Grande.</p>	<p>• AMAFCA will follow the monitoring measurable goals in Part I.C.1.d.(iii) below.</p> <p>• Related to identifying structural elements in the watershed that may be contributing to reduced DO, AMAFCA will continue to use sondes in the Rio Grande to monitor DO and temperature; the sonde data will provide valuable data related to potential DO - stormwater related connections.</p>	<p><b>Met FY 2022 Goals.</b></p> <p>• In FY 2022, related to identifying structural elements in the watershed that may be contributing to reduced DO, AMAFCA operated four sondes in the Rio Grande (US 550 at Bernalillo, Sandia Pueblo Boundary, Central Ave., and Isleta Pueblo Boundary). Additional details on the sonde monitoring are available below and in the Dissolved Oxygen Program Summary for the Annual Report.</p> <p>• Related to identifying structural elements in the watershed that may be contributing to reduced DO, AMAFCA collected and analyzed DO data from stormwater samples collected for the MS4 program (cooperative monitoring, AMAFCA monitoring, and Citizen Science monitoring). Details on this monitoring are provided in the Dissolved Oxygen Program Summary for the Annual Report.</p>

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Not Included in NOI	12	<p><u>Part I.C.1.d.(ii)</u> - Continue implementing controls, and updating/revising as necessary, to eliminate structural elements or the discharge of pollutants at levels that cause or contribute to exceedances of applicable water quality standards for dissolved oxygen in waters of the United States;</p>	<p><u>Part I.C.1.d.(iii)</u> - The primary controls for this DO Program are the NDC Outfall Grade Control Structures Modification Project and Embayment Grading Project. The water quality improvement goal for the NDC Outfall Grade Control Structures Modification Project is to improve maintenance operations, thereby improving efficiency of sediment, trash and debris removal due to better access and improved geometry. The NDC Embayment Regrading Project, as discussed above, removes the constant hydraulic connection between the Rio Grande and the NDC Bathtub/Outfall. These improvement projects provide control measures to mitigate conditions that cause or contribute to exceedances of applicable DO WQSS.</p> <p>In addition to the NDC Outfall and Embayment Projects, AMAFCA will continue to install stormwater quality structures within the watershed. AMAFCA plans, designs, and builds regional stormwater BMPs throughout the watershed to help eliminate the discharge of pollutants that cause or contribute to exceedances of applicable water quality standards for DO in waters of the Rio Grande.</p> <p>Pollutant source reduction strategies, such as public education and encouragement of GI/LID, are also part of the ongoing controls for this Program. AMAFCA actively participates in the MRGSQT, which organizes and leads public education, outreach, involvement, and participation activities which relate to this Program.</p>	<ul style="list-style-type: none"> <li>• AMAFCA will continue to plan, design, and build structural BMPs (regional water quality structures) throughout the MRG watershed.</li> <li>• AMAFCA will continue to contribute and participate in the MRGSQT which provides public education, outreach, and participation opportunities related to stormwater impacts to water quality.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>• AMAFCA continued to use floating booms in the NDC Outfall to assist with trash and debris collection. Removal of trash and debris will assist with mitigating low DO issues in this area.</li> <li>• AMAFCA continued to plan, design and build structural BMPs (regional water quality structures) throughout the MRG watershed. Refer to the Construction Control Measure and the Post Construction Control Measure for additional information.</li> <li>• AMAFCA continued to contribute and participate in the MRGSQT - refer to the Public Education and Outreach Control Measure and the Public Involvement and Participation Control Measure for additional information.</li> </ul>
Not Included in NOI	13	<p><u>Part I.C.1.d.(iii)</u> Continue sampling for DO and temperature in the North Diversion Channel (NDC) Embayment until the data indicate the discharge does not exceed applicable DO water quality standards in waters of the United States.</p> <p>This coincides with the requirements in <u>Part I.C.3.a.(ii).(a)</u>, the revised strategy shall include:</p> <p>A. A Monitoring Plan describing all procedures necessary to continue conducting continuous monitoring of DO and temperature in the NDC Embayment and at 1 location in the Rio Grande downstream of the mouth of the NDC within the action area (e.g., Central Bridge).</p> <p>B. A Quality Assurance and Quality Control (QA/QC) Plan describing all standard operating procedures, quality assurance and quality control plans, maintenance and implementation schedules that will assure timely and accurate collection and reporting of water temperature, DO, oxygen saturation, and flow. The QA/QC plan should include all procedures for estimating oxygen data when any oxygen monitoring equipment fail.</p>	<p><u>Part I.C.1.d.(iii)</u> - With the NDC Embayment filled in since 2016, AMAFCA cannot physically measure the DO in the Embayment. AMAFCA will provide continuous monitoring of DO and temperature (using sondes) in the Rio Grande at the most appropriate locations for the purpose of complying with the MS4 Permit requirements in <u>Part I.C.1.d.(iii)</u> and <u>Part I.C.3.a.(ii).(a)</u>. The sonde locations throughout the stretch of the Rio Grande through the Urbanized Area (UA) will assist AMAFCA with bracketing segments of the Rio Grande to better understand locations of elements that may be contributing to reduced DO in the receiving waters of the Rio Grande.</p> <p>For compliance with this Permit Activity, AMAFCA will deploy sondes to provide continuous DO, oxygen saturation, and temperature monitoring; sondes are currently located at the following locations:</p> <ul style="list-style-type: none"> <li>- Rio Grande at US 550 Bridge in Bernalillo</li> <li>- Rio Grande at Sandia Pueblo Boundary (just above the confluence with the NDC outfall)</li> <li>- Rio Grande at Central Ave. Bridge</li> <li>- Rio Grande at the Isleta Dam</li> </ul> <p>Note - sonde locations may change based on the results and program needs as well as river stage.</p> <p><u>Part I.C.3.a.(ii).(a) A and B</u> - For the sonde monitoring, AMAFCA has standard operating procedures, quality assurance plans, maintenance, and implementation schedules in place.</p>	<ul style="list-style-type: none"> <li>• For compliance with this Permit Activity, AMAFCA will deploy sondes in the most appropriate locations to provide continuous DO and temperature monitoring.</li> <li>• AMAFCA will continue following the standard operating procedures, quality assurance plans, maintenance, and implementation schedules that are in place for the sonde monitoring. AMAFCA will continue to pursue, as applicable, data collection and reporting improvements to this program.</li> <li>• AMAFCA will continue to provide Isleta Pueblo with access to the real-time DO and temperature sonde data.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>• Related to the NDC Embayment monitoring, AMAFCA deployed four sondes to provide continuous DO, pH, water depth, turbidity, and temperature monitoring at the following locations: US 550 Bridge in Bernalillo, Sandia Pueblo Boundary, Central Ave., and Isleta Dam. Additional details on the sonde program and results are provided in the In-Stream Water Quality Memos, which are available upon request. Use of sondes in the Rio Grande have physical challenges that make the measurement, monitoring, and maintenance difficult as well as time/staff intensive. There are times when the sonde data is not available due to maintenance and other issues with the equipment.</li> <li>• In FY 2022, AMAFCA continued to operate real-time telemetry capabilities to these four sondes allowing AMAFCA to be aware of sonde issues in real time resulting in less data gaps. The sonde data was shared with the Pueblo of Isleta to improve data sharing and coordination with watershed stakeholders.</li> <li>• AMAFCA and monitoring consultants followed the standard operating procedures, quality assurance plan, maintenance, and implementation schedules that are in place for the sonde monitoring.</li> </ul>

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Not Included in NOI	14	<p><u>Part I.C.1.d.(iv)</u> Submit a revised strategy to FWS for consultation and EPA for approval within a year of the effective date of the permit and progress reports with the subsequent annual reports. Progress reports to include:</p> <p>(a) Summary of data.</p> <p>(b) Activities undertaken to identify MS4 discharge contribution to exceedances of applicable dissolved oxygen water quality standards in waters of the United States. Including summary of findings of the assessment required in Part I.C.1.d.(i).</p> <p>(c) Conclusions drawn, including support for any determinations.</p> <p>(d) Activities undertaken to eliminate MS4 discharge contribution to exceedances of applicable dissolved oxygen water quality standards in waters of the United States.</p> <p>(e) Account of stakeholder involvement.</p> <p><u>Part I.C.3.a.(i)</u> - The permittees shall submit a summary of findings and a summary of activities undertaken with each Annual Report. The SWMP submitted with the first and fourth annual reports must include a detailed description of controls implemented (or/and proposed control to be implemented) along with corresponding measurable goals. (Applicable to all permittees).</p>	<p><u>Part I.C.1.d.(iv)</u> - AMAFCA completed the NDC project in 2016 to fill in and revegetate the NDC Embayment following the terms of the Final BO from the USFWS and Final Special Conditions from USACE. USFWS was consulted during this project and made aware of the revised strategy. The AMAFCA MS4 Annual Report and supporting documentation will be considered as the Progress Report. A separate progress report will not be submitted to EPA and USFWS. The MS4 Annual Report will include the Annual Incidental Take Report as an Attachment to the Annual Report.</p> <p><u>Part I.C.3.a.(i)</u> - The Annual Report will include a summary of example activities undertaken to identify elements contributing to reduced dissolved oxygen in the receiving waters of the Rio Grande and changes or improvements to the Strategy for implementation of controls to eliminate exceedances of applicable water quality standards for dissolved oxygen in waters of the United States.</p>	<ul style="list-style-type: none"> <li>• AMAFCA completed the NDC Outfall Grade Control Structures Modification Project to fill in and revegetate the NDC Embayment following the terms of the Final BO from the USFWS and Final Special Conditions from USACE.</li> <li>• Vegetation assessments in this area will continue to be conducted following the current monitoring plan, developed in consultation with the USACE.</li> <li>• AMAFCA will complete the Incidental Take Report and follow the Incidental Take Reporting requirements and data submittal requirements.</li> <li>• AMAFCA will include a summary of example activities in each Annual Report. AMAFCA will incorporate documentation by reference into the Annual Report and plans to document progress on the AMAFCA website.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>• Refer to ID #10 above for information related to the USACE Regional General Permit.</li> <li>• AMAFCA completed the Annual Incidental Take analysis and this is included in the Dissolved Oxygen Program Summary for the Annual Report. AMAFCA followed their procedure for completing this Annual Incidental Take Report to ensure the current MS4 Permit requirements were met and that this report is consistently completed each year. This procedure is available upon request.</li> <li>• AMAFCA has completed this section of the Annual Report to serve as a progress report for this Permit element.</li> </ul>
Not Included in NOI	15	<p>According to the requirements in <u>Part I.C.3.a.(ii)</u>, the permittees shall ensure that actions to reduce pollutants or remedial activities selected for the NDC Embayment and its watershed are implemented such that there is a reduction in frequency and magnitude of all low oxygen stormwater discharge events that occur in the Embayment or downstream in the MRG as indicated in Table 1.c. Actions to meet the year 3 measurable goals must be taken within 2 years from the effective date of the permit. Actions to meet the year 5 measurable goals must be taken within 4 years from the effective date of the permit.</p>	<p><u>Part I.C.3.a.(ii)</u> - The result of removing the NDC Embayment and hydraulically disconnecting the NDC stormwater flows from the Rio Grande will minimize low DO conditions at this location. The Embayment has had historical issues with stagnate ponded water creating low DO conditions. The monitoring activities described above will be used to assess that the Embayment project functions as planned and that low DO conditions are reduced in both frequency and magnitude.</p>	<ul style="list-style-type: none"> <li>• AMAFCA will compare the DO monitoring results for "qualifying events" as defined by USFWS with the MS4 Permit measurable goals as listed in Table 1.c , using the table in Appendix G in the MS4 Permit.</li> <li>• AMAFCA will utilize Levellogger data to better define volumetric runoff events that discharge to the Rio Grande.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>• AMAFCA continued to use the MS4 Permit measurable goal analysis and reporting in the Annual Incidental Take Report and this is included in the Dissolved Oxygen Program Summary for the Annual Report. In addition, AMAFCA followed the procedure for completing this analysis to ensure the current MS4 Permit requirements were met and that this form is consistently completed each year.</li> <li>• AMAFCA continued analyzing the Levellogger data in the NDC watershed and at the equipment crossing in comparison to the "qualifying events" as defined by USFWS.</li> <li>• From the AMAFCA FY 2022 In-Stream Water Quality Monitoring Memos, which report on the AMAFCA sonde data, the DO fell slightly below 5 mg/L related to storm events within the watershed, refer to the Dissolved Oxygen Program Summary for additional information.</li> <li>• In FY 2022, one (1) of the seventeen (17) NDC qualifying events were found to be hypoxic . The oxygen percent saturation was estimated be below 54.3 percent, which is an hypoxic event and 2,932 Rio Grande Silvery Minnows (RGSM) were estimated to be harassed. The RGSM harassments for FY 2022 were impacted by the extremely low flows in the Rio Grande and the number of RGSM harassments were well below the 32,616 harassments allowed per year.</li> </ul>

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Not Included in NOI	16	According to the requirements in Part I.C.3.a.(ii).(b), the permittees (COA and AMAFCA) shall provide: A. An Annual Incidental Take Report to EPA and the Service that includes the following information: beginning and end date of any qualifying stormwater events, DO values and water temperature in the NDC Embayment, DO values and water temperature at a downstream monitoring station in the MRG, flow rate in the NDC, mean daily flow rate in the MRG, evaluation of oxygen and temperature data as either anoxic or hypoxic using Table 2 of the BO, and estimate the number of silvery minnows taken based on Appendix A of the BO. Electronic copy of The Annual Incidental Take Report should be provided with the annual report required under Part III.B no later than December 1 for the proceeding calendar year.	Part I.C.3.a.(ii).(b).A - AMAFCA will complete the Incidental Take Report, which estimates the potential Rio Grande Silvery Minnow (RGSM) take using the method defined by USFWS for the BO (MRG Watershed Permit BO dated August 21, 2014 - Cons. #22420-2011-F-0024-R001). Using the BO procedure, AMAFCA will determine or measure, as technically feasible, the necessary data elements required for calculation of the predicted incidental takes during qualifying storm events. The definition of a qualifying storm event (for this Permit Activity) may be reassessed as the Levellogger data is analyzed for NDC Outfall and Embayment area. This activity may require additional follow-up with the EPA and the USFWS. The Annual Incidental Take Report will be provided with each Annual Report.	<ul style="list-style-type: none"> <li>• AMAFCA will determine and/or measure, as technically feasible, the necessary data elements required for calculation of the predicted incidental takes during qualifying storm events.</li> <li>• AMAFCA will complete the Annual Incidental Take Report.</li> <li>• AMAFCA will provide EPA and USFWS with a copy of the Annual Incidental Take Report with each Annual Report submitted no later than December 1st for the preceding calendar year, as required under Part III.B.</li> </ul>	<b>Met FY 2022 Goals.</b> <ul style="list-style-type: none"> <li>• The Annual Incidental Take Report was completed to meet the Dec. 1, 2022 deadline for the Annual Report and is provided in the Program Summary.</li> </ul>
Not Included in NOI	17	According to the requirements in Part I.C.3.a.(ii).(b), the permittees (COA and AMAFCA) shall provide: B. A summary of data and findings with each annual report to EPA and the FWS. All data collected (including provisional oxygen and water temperature data, and associated metadata), transferred, stored, summarized, and evaluated shall be included in the annual report. If additional data is requested by EPA or the FWS, COA and AMAFCA shall provide such information within two weeks upon request. The revised strategy required under Part I.C.3.a.(ii), the Annual Incidental Take Reports required under Part I.C.3.a.(ii).(b).A, and annual reports required under Part III.B can be submitted to FWS via e-mail nmesfo@fws.gov and Joel lusk@fws.gov, or by mail to the New Mexico Ecological Services field office, 2105 Osuna Road NE, Albuquerque, New Mexico 87113. [Note - as of July 2022, Debra Hill is the new contact at USFWS. add email]	Part I.C.3.a.(ii).(b).B - AMAFCA will provide EPA and USFWS with the necessary data elements required for calculation of the predicted incidental takes during qualifying storm events and the Annual Incidental Take Report, required under Part I.C.3.a.(ii).(b).A. If additional data is requested by EPA or the USFWS, AMAFCA will provide requested information within two (2) weeks upon request.  AMAFCA will assess the DO on the same time frame as the MS4 Permit requires for the Annual Report – July 1 to June 30. Each Annual Report will be submitted no later than December 1 for the preceding calendar year, as required under Part III.B.	<ul style="list-style-type: none"> <li>• AMAFCA will provide EPA and USFWS the required data and information with each Annual Report submittal, required under Part III.B, no later than December 1 for the preceding calendar year.</li> </ul>	<b>Met FY 2022 Goal.</b> <ul style="list-style-type: none"> <li>• AMAFCA submitted AMAFCA's FY 2022 MS4 Annual Report with the MS4 Dissolved Oxygen Program Summary, the Incidental Take results, and applicable In-Stream Water Quality Monitoring (sonde) memos, as required under Part III.B.</li> </ul>

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	18	<b>Compliance with Water Quality Standards – PCBs - Part I.C.1.e</b>			
Not Included in NOI	19	According to the requirements in <u>Part I.C.1.e</u> , the permittee shall address concerns regarding PCBs in channel drainage areas specified in Part I.C.1.e.(vi) by developing or continue updating/revising and implementing a strategy to identify and eliminate controllable sources of PCBs that cause or contribute to exceedances of applicable water quality standards in waters of the United States. COA and AMAFCA shall submit a progress report with the first and with the subsequent annual reports.	<u>Part I.C.1.e</u> - The results from the 2012-2014 monitoring of the NDC watershed indicated the presence of PCBs at the Grantline and N. Camino Inlets. Based on the data, MS4 partners concluded that there are no "hot spots" in the municipal area that are continuing to produce PCBs with the possible exception of the Grantline and N. Camino watersheds. In 2014-2017, AMAFCA continued activities to identify and eliminate controllable sources of PCBs specific to these two channels. A water quality consultant was tasked with reviewing and assessing all past PCB data for the NDC, identifying commercial and industrial properties that may have contributed PCBs to the North Camino and the Grantline Channel, researching past PCB releases from PNM in these areas, and providing additional PCB monitoring activity recommendations. In addition, a Field Sampling Plan (FSP), Sampling Analysis Plan (SAP), and a Quality Assurance Project Plan (QAPP) for soil and sediment sampling were developed. Sediment sampling and analysis for PCBs in the North Camino and the Grantline Channel were provided to NMED for consultation and direction. Based on the data collection and analysis results from the first five (5) years of the MS4 Permit term (2014-2019), AMAFCA has met its goals and objectives related to the PCB investigation and no further PCB sampling by AMAFCA is anticipated. If future PCB sampling is needed, AMAFCA will utilize the developed FSP, SAP, and QAPP and coordinate with EPA, NMED, and other MS4s, as applicable.	• Based on the data collection and analysis results from the first five (5) years of the MS4 Permit term (2014-2019), AMAFCA has met its goals and objectives related to the PCB investigation and no further PCB sampling by AMAFCA is anticipated. If future PCB sampling is needed, AMAFCA will utilize the developed FSP, SAP, and QAPP and coordinate with EPA, NMED, and other MS4s, as applicable.	<b>Met FY 2022 Goals.</b> • As reported to EPA in 2018, after considering the analyses completed over the 5 year period (2014-2019), AMAFCA has met its goals and objectives related to the PCB investigation and no additional PCB sampling and analysis by AMAFCA, in the Grantline or North Camino Watersheds, was completed in FY 2019 through FY 2022. If future PCB sampling is needed, AMAFCA will utilize the developed FSP, SAP, and QAPP and coordinate with EPA, NMED, and other MS4s, as applicable.
Not Included in NOI	20	<u>Part I.C.1.e</u> - The progress reports shall include: (i) Summary of data. (ii) Findings regarding controllable sources of PCBs in the channel drainages area specified in Part I.C.1.e.(vi) that cause or contribute to exceedances of applicable water quality standards in waters of the US via the discharge of municipal stormwater. (iii) Conclusions drawn, including supporting information for any determinations. (iv) Activities undertaken to eliminate controllable sources of PCBs in the drainage areas specified in Part I.C.1.e. (vi) that cause or contribute to exceedances of applicable water quality standards in waters of the US via the discharge of municipal stormwater including proposed activities that extend beyond the 5 year permit term. (v) Account of stakeholder involvement in the process. (vi) Channel Drainage Areas: The PCB strategy required in Part I.C.1.e is only applicable to: COA and AMAFCA Areas: San Jose Drain and North Diversion Channel. Bernalillo County Areas: Adobe Acres Drain, Alameda Outfall Channel, Paseo del Norte Outfall Channel, and Sanchez Farm Drainage Area.	<u>Part I.C.1.e</u> - Based on ownership responsibilities, COA will continue to take the lead regarding follow-up PCB permit activities on the SJD, and AMAFCA will continue to take the lead on follow-up PCB permit activities on the NDC. Bernalillo County will take the lead on Adobe Acres Drain, Alameda Outfall Channel, Paseo del Norte Outfall Channel, and Sanchez Farm Drainage Area, as assigned in the MS4 Permit. Based on the data collection and analysis results from the first five (5) years of the MS4 Permit term (2014-2019), AMAFCA has met its goals and objectives related to the PCB investigation and no further PCB sampling by AMAFCA is anticipated. Results from any continued study will be provided to NMED for consultation and direction. If future PCB sampling is needed, AMAFCA will utilize the developed FSP, SAP, and QAPP and coordinate with EPA, NMED, and other MS4s, as applicable.  AMAFCA will continue internal watershed stormwater quality monitoring, which typically collects samples that are screened for PCBs at eight (8) locations. Collection of these samples are weather and equipment dependent. No additional Compliance Monitoring Cooperative (CMC) monitoring is required until a new MS4 Permit is issued. However, the CMC members will evaluate and may choose to continue sampling to support their MS4 program needs during administrative continuance. CMC monitoring would include collecting samples, and screening for PCBs, at two (2) locations within the Rio Grande - one upstream of the MS4 and one downstream of the MS4. This program uses Method 1668 for testing PCBs. Monitoring results obtained from AMAFCA's internal stormwater quality assessment monitoring program and any continued CMC stormwater quality monitoring are available upon request.	• Based on the data collection and analysis results from the first five (5) years of the MS4 Permit term (2014-2019), AMAFCA has met its goals and objectives related to the PCB investigation and no further PCB sampling by AMAFCA is anticipated. If future PCB sampling is needed, AMAFCA will utilize the developed FSP, SAP, and QAPP and coordinate with EPA, NMED, and other MS4s, as applicable.  • Results from any continued study will be provided to NMED. The Annual Report will serve as the progress report for additional PCB findings, if applicable. AMAFCA will incorporate documentation by reference into the Annual Report and plans to document progress on the AMAFCA website.  • AMAFCA will continue its internal stormwater quality assessment monitoring program, which includes collecting samples, and screening for PCBs, at eight (8) locations. The monitoring program typically includes collecting one stormwater sample per season (wet and dry), weather and equipment permitting, and screening for PCBs. This program uses screening Method 608 and follow-up sampling with Method 1668 if PCBs are detected.	<b>Met FY 2022 Goals.</b> • For AMAFCA's internal stormwater quality monitoring program, during the FY 2022 wet season (July 2021 - October 2021), stormwater samples from eight (8) of the AMAFCA monitoring locations were screened for PCBs; all the PCB screening results were reported as Not Detected (ND). AMAFCA's stormwater monitoring program also collected eight (8) stormwater samples in the FY 2022 dry season (November 2021 to June 2021) that were screened for PCBs and all sample results were reported as Not Detected (ND). The watershed screening utilized Method 608 with the understanding that if results are detected with the screening method, AMAFCA would then sample and test with Method 1668. The monitoring memos are available upon request.



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Not Included in NOI	21	<p><u>Part I.C.1.e.(vi)</u> - A cooperative strategy to address PCBs in the COA, AMAFCA and Bernalillo County's drainage areas may be developed between Bernalillo County, AMAFCA, and COA. If a cooperative strategy is developed, the cooperative strategy shall be submitted to EPA within three (3) years from the effective date of the permit and submit a progress report with the fourth and with subsequent annual reports,</p> <p>Note: COA and AMAFCA must continue implementing the existing PCB strategy until a new Cooperative PCB Strategy is submitted to EPA.</p>	<p><u>Part I.C.1.e.(vi)</u> - An updated cooperative strategy, if warranted, will be discussed with COA, AMAFCA, and Bernalillo County through the cooperative MS4 Technical Advisory Group (MS4 TAG). If a cooperative strategy is agreed to, work will begin to develop an agreement and develop a cooperative strategy to submit to EPA.</p>	<p>• AMAFCA will discuss the updated cooperative strategy option, if warranted, with COA and Bernalillo County through the cooperative MS4 TAG.</p>	<p><b>Met FY 2022 Goal.</b></p> <p>• AMAFCA continued discussing the cooperative strategy option with COA and Bernalillo County through the cooperative MS4 TAG. PCB study plans and results within the watershed were discussed and shared between AMAFCA, COA, and Bernalillo County.</p>

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	22	<b>Compliance with Water Quality Standards – Temperature - Part I.C.1.f</b>			
Not Included in NOI	23	According to the requirements in <u>Part I.C.1.f</u> , the permittees must continue assessing the potential effect of stormwater discharges in the Rio Grande by collecting and evaluating additional data. If the data indicates there is a potential of stormwater discharges contributing to exceedances of applicable temperature water quality standards in waters of the United States, within 30 days such as findings, the permittees must develop and implement a strategy to eliminate conditions that cause or contribute to these exceedances. If the data indicates there is a potential of stormwater discharges contributing to exceedances of applicable temperature water quality standards in waters of Rio Grande, within 30 days such as findings, the permittees must develop and implement a strategy to eliminate conditions that cause or contribute to these exceedances.	<u>Part I.C.1.f</u> - AMAFCA and the original MS4 co-permittees (COA, NMDOT, and UNM) under MS4 Permit No. NMS000101 do not believe that stormwater discharges adversely affect temperature in the Rio Grande. In order to prove this assertion, temperature data from 1982 to 2012 was assembled and analyzed. This data analysis proved the assertion that the receiving waters of the Rio Grande are not adversely affected by the temperature of stormwater from the Albuquerque MS4. This data was presented in an initial report that was submitted to EPA on May 1, 2012. However, to meet the MS4 Permit requirements, AMAFCA continued assessing the potential effect of stormwater discharges in the Rio Grande by collecting and evaluating additional temperature data. From 2012 to 2017, temperature monitoring never showed a temperature exceedance at any of the monitoring locations in the watershed or in the river.	• AMAFCA's measurable goals for compliance with the Permit activities are described in the sections below.	See specific Permit activity below.
Not Included in NOI	24	The strategy must include: <u>Part I.C.1.f.(i)</u> - Identify structural controls, post construction design standards, or pollutants contributing to raised temperatures in the receiving waters of the Rio Grande. Both dry and wet weather discharges shall be addressed. Assessment may be made using available data or collecting additional data; <u>Part I.C.1.f.(ii)</u> - Develop and implement controls to eliminate structural controls, post construction design standards, or the discharge of pollutants at levels that cause or contribute to exceedances of applicable water quality standards for temperature in waters of the United States; and	<u>Part I.C.1.f.(i)</u> - AMAFCA has data supporting the fact that stormwater discharges do not adversely affect temperature in the Rio Grande. Assessment continues using temperature data collected in the Rio Grande using sondes (sondes are part of the Dissolved Oxygen - Compliance with Water Quality Standards and Endangered Species Act MS4 Permit program requirements). The four (4) sondes in the Rio Grande have real-time telemetry capabilities. The sonde locations throughout the length of the Rio Grande through the UA will assist AMAFCA with bracketing segments of the Rio Grande to better understand elements that may be contributing to high temperatures in the receiving waters of the Rio Grande. <u>Part I.C.1.f.(ii)</u> - If the temperature data trends begins to indicate that stormwater discharges are adversely affecting temperature in the Rio Grande, AMAFCA will develop a strategy to understand the causes and contributions. If this occurs, AMAFCA will work with COA in developing this strategy as it relates to the watershed. It is anticipated that development of controls will be a part of the strategy. The 30 day timeline in the MS4 Permit is not long enough to develop and implement a watershed wide strategy; AMAFCA and COA will work with EPA as needed to develop a reasonable time frame.	• Temperature data will continue to be collected in the Rio Grande using sondes. The sonde data will be available upon request.	<b>Met FY 2022 Goals.</b> • In FY 2022, temperature data was collected in the Rio Grande using the four sondes that are described in the Dissolved Oxygen MS4 Permit program section of the Annual Report. In addition, temperature data was collected during Wet Weather monitoring during AMAFCA's internal stormwater quality monitoring and during the Citizen Science sampling. • In FY 2022, the sondes recorded two (2) temperature exceedances of the 32.2 °C water quality standard in the Rio Grande related to precipitation within the watershed in July 2021 (FY 2022), both occurring at the Central Ave. Bridge sonde. In-stream monitoring memos discuss this data further are available upon request. The temperature graphs from the sondes are provided in the Temperature Program Summary for this Annual Report.
Not Included in NOI	25	<u>Part I.C.1.f.(iii)</u> - Provide a progress report with the first and with subsequent Annual Reports. The progress reports shall include: (a) Summary of data. (b) Activities undertaken to identify MS4 discharge contribution to exceedances of applicable temperature water quality standards in waters of the United States. (c) Conclusions drawn, including supporting information for any determinations. (d) Activities undertaken to reduce MS4 discharge contribution to exceedances of applicable temperature water quality standards in waters of the United States. (e) Accounting of stakeholder involvement.	<u>Part I.C.1.f.(iii)</u> - AMAFCA will include progress regarding temperature impacts from stormwater to the Rio Grande that include adherence to schedule, activities undertaken, monitoring results, and conclusions drawn with Annual Reports, as applicable. AMAFCA will incorporate documentation by reference into the Annual Report and plans to document progress on the AMAFCA website.  AMAFCA has provided data from 1982 to 2017 showing that the Rio Grande is not adversely affected by the temperature of stormwater from the Albuquerque MS4. The temperature monitoring results do not show a temperature exceedance at any of the monitoring locations in the watershed or in the river.	• Any update of data, activities, and conclusions regarding temperature impacts from stormwater to the Rio Grande will be provided with each Annual Report, if applicable. AMAFCA will incorporate documentation by reference into the Annual Report and plans to document progress on the AMAFCA website.	<b>Met FY 2022 Goals.</b> • This Annual Report serves as a progress report to EPA. Temperature data collected in the Rio Grande during FY 2022 continues to show that temperature exceedances in the Rio Grande due to stormwater from the contributing Albuquerque watershed are not occurring. AMAFCA, through its Annual Reports and associated communication with EPA, has provided data from 1982 to 2022 showing that the Rio Grande is not adversely affected by the temperature of stormwater from the Albuquerque MS4. • In FY 2022, AMAFCA continued to operate real-time telemetry capabilities to these four sondes allowing AMAFCA to be aware of sonde issues in real time resulting in less data gaps. Login information to view the was shared with the Pueblo of Isleta to improve data sharing and coordination with watershed stakeholders.

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	26	<b>Discharges to Impaired Waters With Approved TMDLs - Part I.C.2.b.(i) and TABLE 1.a - TMDL Bacteria Program- Part I.C.2.b.(iii)</b>			
Not Included in NOI	27	<p>According to the requirements in <u>Part I.C.2.b.(i)</u>, if the permittee discharges to an impaired water body with an approved TMDL (see MS4 Permit, Appendix B), where stormwater has the potential to cause or contribute to the impairment, the permittee shall include in the SWMP controls targeting the pollutant(s) of concern along with any additional or modified controls required in the TMDL and this section. As stated in the Permit, Appendix B, a bacteria TMDL for the Middle Rio Grande was approved by the New Mexico Water Quality Control Commission on April 13, 2010, and by EPA on June 30, 2010. The new TMDL modifies: 1) the indicator parameter for bacteria from fecal coliform to E. coli, and 2) the way the WLAs are assigned</p> <p>The SWMP and required Annual Reports must include information on implementing any focused controls required to reduce the pollutant(s) of concern as described below:</p>	<p><u>Part I.C.2.b.(i)</u> - A bacteria TMDL for the Middle Rio Grande was approved by the New Mexico Water Quality Control Commission on April 13, 2010, and by EPA on June 30, 2010. AMAFCA's proposed plans for compliance with the Permit activities are described in the sections below.</p>	<p>AMAFCA's measurable goals for compliance with the Permit activities are described in the sections below.</p>	See specific Permit activity below.
Not Included in NOI	28	<p><u>Part I.C.2.b.(i).(a)</u>, Targeted Controls: The SWMP submitted with the first Annual Report must include a detailed description of all targeted controls to be implemented, such as identifying areas of focused effort or implementing additional BMPs that will be implemented to reduce the pollutant(s) of concern in the impaired waters. and <u>Part I.C.2.b.(i).(b)</u>, Measurable Goals: For each targeted control, the SWMP must include a measurable goal and an implementation schedule describing BMPs to be implemented during each year of the permit term. Where the impairment is for bacteria, the permittee must, at minimum comply with the activities and schedules described in Table 1.a of Part I.C.2.b.(iii).</p> <p>As required in <u>Part I.C.2.b.(i).(e)</u>, the permittee shall include focused BMPs addressing the five areas below:</p> <p><u>A. Sanitary Sewer Systems</u> - improve sanitary sewers; fix lift stations; identify and implement O&amp;M procedures; improve violation reporting; and prevent overflows;</p> <p><u>B. On-site Sewage Facilities</u> - address failing systems and inadequate maintenance of On-Site Sewage Facilities;</p>	<p><u>Part I.C.2.b.(i).(a), (b), &amp; (e)</u> -AMAFCA's proposed plan for targeted controls and measurable goals (see column to right) for bacteria include:</p> <p><u>A. Sanitary Sewer Systems - Targeted Controls:</u> There are no sanitary sewer systems owned or operated by AMAFCA within AMAFCA owned property. Related to the Illicit Discharges and Improper Disposal Control Measure, AMAFCA will receive monthly DMRs of sanitary sewer overflows (SSO) from ABCWUA. These will be evaluated to ensure that the SSOs did not impact AMAFCA facilities.</p> <p><u>B. On-site Sewage Facilities - Targeted Controls:</u> There are no on-site sewage facilities owned or operated by AMAFCA within AMAFCA-owned property.</p>	<p><u>A. Sanitary Sewer Systems - Measurable Goals:</u></p> <ul style="list-style-type: none"> <li>• There are no sanitary sewer systems owned or operated by AMAFCA within AMAFCA-owned property.</li> <li>• Through the IDDE Program, AMAFCA will continue coordination with ABCWUA, who will inform AMAFCA of any SSOs that potentially impact AMAFCA facilities. AMAFCA will receive monthly DMRs of SSOs from ABCWUA. These will be evaluated to ensure that the SSOs did not impact AMAFCA facilities. AMAFCA will continue to add these to GIS to improve tracking of the SSOs.</li> </ul> <p><u>B. On-site Sewage Facilities - Measurable Goals:</u></p> <ul style="list-style-type: none"> <li>• Not applicable to AMAFCA</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <p><u>A. Sanitary Sewer Systems:</u></p> <ul style="list-style-type: none"> <li>• There are no sanitary sewer systems owned or operated by AMAFCA within AMAFCA owned property.</li> <li>• AMAFCA received and reviewed the monthly DMR forms from ABCWUA. All ABCWUA reports in FY 2022 were reported as "NEAH - No Evidence of Adverse Health/Environmental Impact". AMAFCA also has entered these into GIS to improve tracking of the SSOs.</li> <li>• AMAFCA can and has accepted sanitary sewer flows given emergency overflow conditions in the watershed to help protect the Rio Grande water quality.</li> <li>• AMAFCA investigated applicable illicit discharge complaints received through the 311 call in program, as well as other complaints received directly by AMAFCA staff through e-mail, phone, or observation.</li> </ul> <p><u>B. On-site Sewage Facilities:</u></p> <ul style="list-style-type: none"> <li>• Not applicable to AMAFCA</li> </ul>

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Not Included in NOI	29	Continuation of five areas in Part I.C.2.b.(i).(e) -  <u>C. Illicit Discharges and Dumping</u> - effort to reduce waste sources of bacteria; for ex., septic systems, grease traps, and grit traps;  <u>D. Animal Sources</u> - management programs to identify and target sources such as zoos, pet waste, and horse stables;  <u>E. Residential Education</u> - bacteria from residential sites; fats, oils, and grease (FOG) clogging sanitary sewer lines and resulting overflows; decorative ponds; and pet waste.	<u>Part I.C.2.b.(i).(a), (b), &amp; (e)</u> - Continuation - AMAFCA's proposed plan for targeted controls and measurable goals (see column to right) for bacteria include:  <u>C. Illicit Discharges and Dumping - Targeted Controls:</u> AMAFCA has a robust IDDE Program. In the IDDE program, AMAFCA has focused on homeless camp cleanup and other efforts that target sources of bacteria. In addition, AMAFCA has manual and mechanical trash contracts to address IDDE cleanup. Refer to the Illicit Discharges and Improper Disposal Control Measure for additional information.  <u>D. Animal Sources - Targeted Controls:</u> AMAFCA will continue its focus on reducing pet waste through its Mutt Mitt Stations Program and its involvement with the MRGSQT educational outreach "Scoop the Poop" and/or "There is No Poop Fairy" campaigns.  <u>E. Residential Education - Targeted Controls:</u> AMAFCA will address this area through Public Education and Outreach and Public Involvement and Participation Control Measures through its involvement with the MRGSQT.	<u>C. Illicit Discharges and Dumping - Measurable Goals:</u> • AMAFCA will address the Illicit Discharge and Dumping through its IDDE Program; refer to the Illicit Discharges and Improper Disposal Control Measure for additional information. This IDDE program includes illicit discharge monitoring by AMAFCA staff and crew that often involves weekly discussion at staff meetings. Reports of discharge are cooperatively investigated by staff including, if appropriate, tracking and documentation procedures. An annual budget line item exists for contracts to address IDDE cleanup.  <u>D. Animal Sources - Measurable Goals:</u> • AMAFCA will continue to provide Mutt Mitt Stations and bags in an effort to reduce pet waste reaching stormwater. • AMAFCA will continue to contribute and participate in the MRGSQT. Through the MRGSQT, pet waste will be targeted through the "Scoop the Poop" and/or "There is No Poop Fairy" campaigns and other programs. • As funding becomes available, AMAFCA will participate and/or conduct microbial source tracking (MST) studies in the Middle Rio Grande.  <u>E. Residential Education - Measurable Goals:</u> • The MRGSQT Outcomes Report will summarize the activities and is available upon request and AMAFCA plans to share this document on its website.	<b>Met FY 2022 Goals.</b> <u>C. Illicit Discharges and Dumping:</u> • Refer to the Illicit Discharges and Improper Disposal Control section of the Annual Report for FY 2022 performance and implementation status.  <u>D. Animal Sources:</u> • AMAFCA has continued the Mutt Mitt Station program. Tracking procedures continued in FY 2022 for this program. • The MRGSQT Outcomes Report summarizes the educational and outreach programs for FY 2022. This report is available upon request. Pet waste education is a large component of the cooperative MRGSQT outreach efforts.  <u>E. Residential Education:</u> • The MRGSQT Outcomes Report summarizes the educational and outreach programs for FY 2022. This report is available upon request.
	30	<u>Part I.C.2.b.(i).(c).B</u> - Identification of Measurable Goal: The SWMP must identify a measurable goal for the pollutant(s) of concern. The value of the measurable goal must be based on one of the following options in the Permit - AMAFCA is using Option B:  B. Alternatively, if multiple permittees are discharging into the same impaired water body with an approved TMDL (which has an aggregate WLA for all permitted stormwater MS4s), the MS4s may combine or share efforts, in consultation with/and the approval of NMED, to determine an alternative sub-measurable goal derived from the WLA for the pollutant(s) of concern (e.g., bacteria) for their respective MS4. The SWMP must clearly define this alternative approach and must describe how the sub-measurable goals would cumulatively support the aggregate WLA. Where an aggregate WLA measurable goal has been broken into sub-measurable goals for individual MS4s, each permittee is only responsible for progress in meeting its WLA sub-measurable goal.	<u>Part I.C.2.b.(i).(c).B</u> - AMAFCA identified in its NOI that it was seeking, as part of a group of MS4s, an alternative sub-measurable goal for TMDL control under this part of the Permit. NMED and EPA were informed of this decision and NMED has worked with the CMC to help establish the cooperative waste load allocation (WLA) values and methodology for calculating E. coli loading. AMAFCA will continue following the established methodology for applying this to the CMC monitoring results.	• AMAFCA, as part of the CMC, will use the analytical results obtained in the Rio Grande during the CMC sampling and calculate an E. coli loading to compare with the waste load allocation allotted for the cooperative portion for the two defined stream assessment units of the Rio Grande (Isleta to Alameda and Alameda to Angostura). These calculations will be provided in each Annual Report, if applicable, as part of the CMC monitoring memos. AMAFCA will incorporate documentation by reference into the Annual Report and plans to provide documentation on the AMAFCA website.	<b>Met FY 2022 Goal.</b> • The required CMC sampling for the MS4 Permit term in the Rio Grande (2016 to 2019) was completed in FY 2019. The MRG Watershed Based MS4 Permit entered into administrative continuance in Dec. 2019 when EPA Region 6 did not issue a new MS4 Permit before the current MS4 Permit expirations date. The MRG TAG sent EPA an Administrative Continuance letter dated October 15, 2019. Until a new MS4 Permit is issued, there are no compliance monitoring requirements in the Rio Grande.  There was one (1) qualifying storm event monitored by the CMC in FY 2022. E. coli loading calculations were completed in FY 2022. AMAFCA has memos summarizing the CMC wet weather monitoring activity, results, and E. coli loading calculations. These memos are available upon request.

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Not Included in NOI	31	<p>According to the requirements in <u>Part I.C.2.b.(i).(f)</u>, the permittee shall monitor or assess progress in achieving measurable goals and determining the effectiveness of BMPs, and shall include documentation of this monitoring or assessment in the SWMP and Annual Reports. In addition, the SWMP must include methods to be used. This program element may be coordinated with the monitoring required in Part III.A. The permittee may use the following methods, either individually or in conjunction to evaluate progress towards the measurable goal and improvements in water quality as follows:</p> <p>A. Evaluating Program Implementation Measures or B. Assessing Improvements in Water Quality</p> <p>Progress towards achieving the measurable goal shall be reported in the Annual Report. Annual reports shall report the measurable goal and the year(s) during the permit term that the MS4 conducted additional sampling or other assessment activities.</p>	<p><u>Part I.C.2.b.(i).(f)</u> - AMAFCA will assess and evaluate the program and progress in achieving the targeted controls and measurable goals listed above by tracking the number of educational outreach opportunities conducted and tracking the number of people reached through the educational outreach program. AMAFCA will incorporate documentation by reference into the Annual Report and plans to document progress on the AMAFCA website.</p> <p>AMAFCA is part of the Compliance Monitoring Cooperative (CMC) group, established in 2016, with 12 watershed partners cooperating for the Wet Weather Monitoring Program requirements. In addition, AMAFCA will monitor and test for E. coli at its facilities within the watershed. This internal monitoring program sampling will be done in accordance with Part III.A of the MS4 Permit and will assist with a water quality assessment of the overall watershed related to E. coli.</p>	<ul style="list-style-type: none"> <li>The MRGSQT Outcomes Report will track the number of educational outreach opportunities conducted and list the number of people reached through the educational outreach program. This report is available upon request and AMAFCA plans to share this document on its website.</li> <li>AMAFCA will conduct stormwater monitoring in accordance with the Wet Weather Monitoring Program, Part III.A.1 as part of the CMC. The goals and plan for this program are described in the Wet Weather Monitoring Program portion of this SWMP.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>The MRGSQT Outcomes Report summarizes the educational and outreach programs for FY 2022. This report is available upon request.</li> <li>AMAFCA has continued involvement with the Compliance Monitoring Cooperative (CMC) group, established in 2016, with 12 watershed partners cooperating for the Wet Weather Monitoring Program requirements. At the end of FY 2019, the CMC members have met all Wet Weather sample collection requirements in the MS4 Permit. The MRG Watershed Based MS4 Permit entered into administrative continuance in Dec. 2019 when EPA Region 6 did not issue a new MS4 Permit before the current MS4 Permit expirations date. The MRG TAG sent EPA an Administrative Continuance letter dated October 15, 2019. Until a new MS4 Permit is issued, there are not compliance monitoring requirements in the Rio Grande. There was one (1) qualifying storm event monitored by the CMC in FY 2022. If the CMC does continue wet weather compliance monitoring during administrative continuance of this MS4 Permit, AMAFCA will summarize, as applicable, any wet weather monitoring activity, results, and E. coli loading calculations in future Program Summaries.</li> </ul>
Not Included in NOI	32	<p><u>Part I.C.2.b.(i).(g)</u> - If, by the end of the 3rd year from the effective date of the permit, the permittee observes no progress toward the measurable goal either from program implementation or water quality assessments, the permittee shall identify alternative focused BMPs that address new or increased efforts towards the measurable goal. As appropriate, the MS4 may develop a new approach to identify the most significant sources of the pollutant(s) of concern and shall develop alternative focused BMPs (this may also include information that identifies issues beyond the MS4's control). These revised BMPs must be included in the SWMP and subsequent Annual Reports. Where the permittee originally used a measurable goal based on an aggregated WLA, the permittee may combine or share efforts with other MS4s discharging to the same impaired stream segment to determine an alternative sub-measurable goal for the pollutant(s) of concern for their respective MS4s, as described in <u>Part I.C.2.b.(i).(c).B</u> above. Permittees must document the proposed schedule for the development and subsequent adoption of alternative measurable goals for the pollutant(s) of concern for their respective MS4s and associated assessment of progress in meeting those individual goals.</p>	<p><u>Part I.C.2.b.(i).(g)</u> - AMAFCA, in cooperation with the TAG, MRGSQT, and CMC has observed progress towards E. coli controls and measurable goals. However, the impairment for E. coli has been re-listed in NMED's 2020-2022 State of New Mexico Clean Water Act Section 303(d)/Section 305(b) Integrated Report for 3 of the 4 assessment segments along the river within the Middle Rio Grande corridor; all 4 assessment segments in the Middle Rio Grande, from Isleta Pueblo Boundary to Angostura, currently has an E. coli impairment. The CMC will continue to collect data during administrative continence of the Permit to determine if the E. coli trend that previously de-listed the impairment or data that re-listed the impairment is the baseline.</p> <p>AMAFCA will annually assess and evaluate the program and progress in achieving the measurable goals listed in the sections above. In addition to the measurable goals listed above, Microbial Source Tracking (MST) studies may be a tool used for the assessment and evaluation of the program. AMAFCA will also continue to participate in regional water quality studies and plans, as opportunities become available, to continue to look for collaborative opportunities to improve this program.</p>	<ul style="list-style-type: none"> <li>AMAFCA will continue to annually assess and evaluate the program and progress in achieving the measurable goals listed above. In addition to the measurable goals listed above, Microbial Source Tracking (MST) studies may be a tool used for the assessment and evaluation of the program.</li> <li>AMAFCA will continue to participate in regional water quality studies and plans, as opportunities become available.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>The required CMC sampling for the MS4 Permit term in the Rio Grande (2016 to 2019) was completed in FY 2019. The MRG Watershed Based MS4 Permit entered into administrative continuance in Dec. 2019 when EPA Region 6 did not issue a new MS4 Permit before the current MS4 Permit expirations date. Additional details are provided above. The MRGSQT has funded dry weather E.coli data collection by students in the Bosque Ecosystem Monitoring Program (BEMP) program to better understand the baseline concentration of E. coli before storm events.</li> <li>AMAFCA discussed the MRG TMDL for E. coli with the AMAFCA Board throughout the fall of 2021. Technical work completed by Weston was presented to the Board.</li> </ul>

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Not Included in NOI	33	Part I.C.2.b.(iii) - Table 1.a, Identify potential significant sources of the pollutant of concern entering your MS4.	Part I.C.2.b.(iii) - Table 1.a - In 2014-2015, AMAFCA contracted with a consultant to restudy the bacteria within the Middle Rio Grande, specifically to evaluate the bacteria data over the recent history to report the trend analysis and the impact to the Rio Grande. The report for this study, Middle Rio Grande Rio Grande E. coli Analysis and Research report for AMAFCA by water quality on-call engineer (CDM Smith), is available from AMAFCA upon request. An updated bacterial source tracking study is being assessed with COA and will be considered during this Permit term.  AMAFCA, through the MRGSQT, has contracted with BEMP to study E. coli at various locations along the Rio Grande during dry weather in an effort to identify potential sources of E. coli.  For determining the source (area) of E. coli, AMAFCA will continue its internal watershed stormwater quality monitoring. Collection of these samples are weather and equipment dependent.	<ul style="list-style-type: none"> <li>AMAFCA, with its co-permittees from the 2012 MS4 Phase I Permit, have completed several studies related to identifying potential significant sources of the pollutant of concern entering the MRG Watershed MS4 area. The results of these studies will be used to guide the overall program plan and goals. An updated bacterial source tracking study is being assessed with COA and will be considered during this Permit term.</li> <li>AMAFCA, with the MRGSQT, has contracted with BEMP to study E. coli at various locations along the Rio Grande during dry weather in an effort to identify potential sources of E. coli.</li> <li>For determining the source (area) of E. coli, AMAFCA will continue its internal watershed stormwater quality monitoring. AMAFCA monitoring memos for the internal watershed stormwater quality monitoring are available upon request.</li> </ul>	<b>Met FY 2022 Goals.</b> <ul style="list-style-type: none"> <li>Plots of the AMAFCA collected E. coli data are included in AMAFCA's internal watershed stormwater quality monitoring reports, which are available upon request.</li> <li>AMAFCA, through the MRGSQT, has contracted with BEMP in calendar year 2022 to study E. coli at various locations along the Rio Grande during dry weather and after qualifying storm events in an effort to identify potential sources of E. coli. Results from this study are available upon request.</li> <li>The monitoring memos for FY 2022 for AMAFCA's internal watershed stormwater quality monitoring are available upon request.</li> </ul>
Not Included in NOI	34	From Part I.C.2.b.(iii) - Table 1.a, Develop (or modify an existing program- for prior permittees under NMS000101) and implement a public education program to reduce the discharge of bacteria in municipal stormwater contributed by (if applicable) by pets, recreational and exhibition livestock, and zoos.	Part I.C.2.b.(iii) - Table 1.a - As stated above, AMAFCA will continue its focus on reducing pet waste through providing Mutt Mitt Stations and through continued involvement with the MRGSQT educational outreach "Scoop the Poop" campaign.	<ul style="list-style-type: none"> <li>AMAFCA will continue to provide Mutt Mitt Stations and bags.</li> <li>AMAFCA will contribute and participate in the MRGSQT.</li> <li>The MRGSQT Outcomes Report will summarize the activities related to targeting pet waste sources and residential education targeting bacteria sources. This report is available upon request and AMAFCA plans to share this documentation on its website.</li> </ul>	<b>Met FY 2022 Goals.</b> <ul style="list-style-type: none"> <li>AMAFCA continued its focus on reducing pet waste through providing Mutt Mitt Stations. Mutt Mitt Station supporting data for FY 2022 is available upon request.</li> <li>In FY 2022, AMAFCA continued to contribute to and participated in the MRGSQT, which included educational outreach for the "Scoop the Poop" and "There is no Poop Fairy" campaigns.</li> <li>The MRGSQT Outcomes Report summarizes the educational and outreach programs for FY 2022. This report is available upon request.</li> </ul>



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Not Included in NOI	35	From <u>Part I.C.2.b.(iii) - Table 1.a</u> , Develop (or modify an existing program- for prior permittees under NMS000101) and implement a program to reduce the discharge of bacteria in municipal stormwater contributed by areas within your MS4 served by on-site wastewater treatment systems.	<u>Part I.C.2.b.(iii) - Table 1.a</u> - As stated above, this is not applicable to AMAFCA. Through the IDDE Program, AMAFCA will continue coordination with ABCWUA, who will inform AMAFCA of any sanitary sewer overflows that impact AMAFCA facilities.	• As stated above, this is not applicable to AMAFCA. Through the IDDE Program, AMAFCA will continue coordination with ABCWUA, who will inform AMAFCA of any sanitary sewer overflows that impact AMAFCA facilities.	<b>Met FY 2022 Goal.</b> • AMAFCA received and reviewed the monthly DMR forms from ABCWUA. All ABCWUA reports in FY 2022 were reported as "NEAH - No Evidence of Adverse Health/Environmental Impact". These reports are available upon request. These have also been entered into GIS to improve tracking and identify potential trends of the SSOs.
Not Included in NOI	36	From <u>Part I.C.2.b.(iii) - Table 1.a</u> , Review results to date from the Illicit Discharge Detection and Elimination program (see Part I.D.5.e) and modify as necessary to prioritize the detection and elimination of discharges contributing bacteria to the MS4.	<u>Part I.C.2.b.(iii) - Table 1.a</u> - AMAFCA will incorporate this Permit requirement into the IDDE program, refer to the SWMP - Table 6: Illicit Discharges and Improper Disposal - for additional information.	• AMAFCA will address this Permit activity in the IDDE Program, refer to the SWMP - Table 6: Illicit Discharges and Improper Disposal - for additional information.	<b>Met FY 2022 Goal.</b> • AMAFCA addresses this Permit activity in the Illicit Discharges and Improper Disposal Control Measure.
Not Included in NOI	37	<u>Part I.C.2.b.(iii) - Table 1.a</u> - Develop (or modify an existing program- for prior permittees under NMS000101) and implement a program to reduce the discharge of bacteria in municipal stormwater contributed by other significant source identified in the Illicit Discharge Detection and Elimination program (see Part I.D.5.e).	<u>Part I.C.2.b.(iii) - Table 1.a</u> - This requirement will be addressed in conjunction with AMAFCA's IDDE Program, refer to the SWMP Table 6: Illicit Discharges and Improper Disposal, for additional information. AMAFCA will review its IDDE Program results annually and identify illicit discharges (specific as well as general types of discharges and/or locations of discharges) that contributed bacteria to the MS4. Strategies will be developed to address these specific or general IDDEs. Development and implementation of strategies will depend on the IDDE program results.	• AMAFCA will review its IDDE Program results annually.	<b>Met FY 2022 Goals.</b> • AMAFCA addresses this Permit activity in the Illicit Discharges and Improper Disposal Control Measure.
Not Included in NOI	38	Include in the Annual Reports progress on program implementation and reducing the bacteria and updates their measurable goals as necessary. As required in <u>Part I.C.2.b.(i).(d)</u> , the Annual Report must include an analysis of how the selected BMPs have been effective in contributing to achieving the measurable goal and shall include graphic representation of pollutant trends, along with computations of annual percent reductions achieved from the baseline loads and comparisons with the target loads.	<u>Part I.C.2.b.(i).(d)</u> - The MRGSQT Outcomes Report will track the number of educational outreach opportunities conducted, list the number of people reached through the educational outreach program, and summarize the activities related to targeting pet waste sources as well as residential education targeting bacteria sources. This report is available upon request and AMAFCA plans to share this document on its website. In addition, if strategies are developed to address IDDEs found to contribute bacteria to the MS4, these will be reported in subsequent Annual Reports. AMAFCA will report annually on compliance monitoring to monitor and test for E. coli. This reporting will be done in accordance with Part III.A (Wet Weather Monitoring Program) of the MS4 Permit and will help with a water quality assessment of the overall watershed related to E. coli. Graphical representation of E. coli trends will also be completed annually.	• The MRGSQT Outcomes Report is available upon request and AMAFCA plans to share this document on its website. • Strategies developed to address IDDEs found to contribute bacteria to the MS4 will be reported in subsequent Annual Reports. AMAFCA will incorporate documentation by reference into the Annual Report and plans to document progress on the AMAFCA website. • AMAFCA will report annually on compliance monitoring to monitor and test for E. coli. This reporting will be done in accordance with Part III.A (Wet Weather Monitoring Program) of the MS4 Permit. • Graphical representation of E. coli trends will also be completed annually.	<b>Met FY 2022 Goals.</b> • The MRGSQT Outcomes Report summarizes the educational and outreach programs for FY 2022. This report is available upon request. • Plots of the AMAFCA collected E. coli data are included in AMAFCA's internal watershed stormwater quality monitoring reports, which are available upon request.

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	39	<b>Discharges to Impaired Waters Without Approved TMDLs - Part I.C.2.b.(ii)</b>			
Not Included in NOI	40	According to the requirements in <u>Part I.C.2.b.(ii)</u> , if the permittee discharges directly into an impaired water body without an approved TMDL, the permittee shall perform the following activities (described in sections below).	<p><u>Part I.C.2.b.(ii)</u> - The Rio Grande impairments are listed on the EPA Annual Report Summary Form, pages 1-2.</p> <p>The Tijeras Arroyo upstream of the Four Hills Bridge is impaired for nutrient/eutrophication. The Tijeras Arroyo upstream of the Four Hills Bridge is all privately owned land. AMAFCA's operation and maintenance authority and access to the Tijeras Arroyo terminate at the Four Hills Bridge. Therefore, there are no requirements in this SWMP to comply with the activities and schedules related to Impairment for Nutrients in Table 1.b in <u>Part I.C.2.b.(iii)</u>. AMAFCA does monitor for nutrients through its Wet Weather Monitoring Program, see Table 10 of the SWMP.</p>	<ul style="list-style-type: none"> <li>• Impairment for Dissolved Oxygen is addressed in the Endangered Species Act (ESA) section - Part I.C.3. The SWMP section for Part I.C.3 describes the proposed plan and measurable goals.</li> <li>• Impairment for PCBs is addressed in Compliance with Water Quality Standards - PCBs - Part I.C.1.e. The SWMP section for Part I.C.1.e describes the proposed plan and measurable goals.</li> <li>• Impairment for Temperature is addressed in Compliance with Water Quality Standards - Temperature - Part I.C.1.f. The SWMP section for Part I.C.1.f describes the proposed plan and measurable goals.</li> <li>• Compliance monitoring (Part III.A) includes Gross Alpha testing. Future assessment related to the impairment will be based on results of those samples.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>• AMAFCA addresses this Permit activity in other Permit sections - please refer to these sections of the Annual Report for the FY 2022 status of implementation and performance assessment.</li> <li>- Dissolved Oxygen is addressed in the Endangered Species Act (ESA) section - Part I.C.3.</li> <li>- PCBs are addressed in Compliance with Water Quality Standards - PCBs - Part I.C.1.e.</li> <li>- Temperature is addressed in Compliance with Water Quality Standards - Temperature - Part I.C.1.f.</li> <li>- Gross Alpha is part of the Wet Weather Monitoring - Part III.A.</li> </ul>
Not Included in NOI	41	<p><u>Part I.C.2.b.(ii).(a)</u> - The permittee shall:</p> <p>A. Determine whether the MS4 may be a source of the pollutant(s) of concern by referring to the CWA §303(d) list and then determining if discharges from the MS4 would be likely to contain the pollutant(s) of concern at levels of concern. The evaluation of CWA §303(d) list parameters should be carried out based on an analysis of existing data (e.g., IDDE Program) conducted within the permittee's jurisdiction.</p> <p>B. Ensure that the SWMP includes focused BMPs, and corresponding measurable goals, that the permittee will implement, to reduce, the discharge of pollutant(s) of concern that contribute to the impairment of the water body. Only applicable if the permittee determines that the MS4 may discharge the pollutant(s) of concern to an impaired water body without a TMDL. The SWMP submitted with the first Annual Report must include a detailed description of proposed controls to be implemented along with measurable goals.</p> <p>C. Amend the SWMP to include any BMPs to address the pollutant(s) of concern.</p>	<p><u>Part I.C.2.b.(ii).(a)</u> - Most of the impaired pollutants of concern are specifically addressed in other sections of the MS4 Program and therefore in other sections of the SWMP. Please refer to: Dissolved Oxygen and Endangered Species Act (ESA) section - Part I.C.3; PCBs are addressed in Compliance with Water Quality Standards - PCBs - Part I.C.1.e; and Temperature is addressed in Compliance with Water Quality Standards - Temperature - Part I.C.1.f.</p> <p>Compliance monitoring (Part III.A) includes Gross Alpha testing. The testing will allow AMAFCA to determine background level relative to stormwater discharges. Future assessment related to this impairment will be based on results of those samples.</p>	<p>• Refer to other SWMP sections for:</p> <ul style="list-style-type: none"> <li>- Dissolved Oxygen is addressed in the Endangered Species Act (ESA) section - Part I.C.3.</li> <li>- PCBs are addressed in Compliance with Water Quality Standards - PCBs - Part I.C.1.e.</li> <li>- Temperature is addressed in Compliance with Water Quality Standards - Temperature - Part I.C.1.f.</li> <li>• Compliance monitoring (Part III.A) includes Gross Alpha testing. Future assessment and strategies related to this impairment will be based on results of the stormwater samples.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>• AMAFCA addresses this Permit activity in other Permit sections. Please refer to these sections of the Annual Report for the FY 2022 status of implementation and performance assessment.</li> <li>- Dissolved Oxygen is addressed in the Endangered Species Act (ESA) section - Part I.C.3.</li> <li>- PCBs are addressed in Compliance with Water Quality Standards - PCBs - Part I.C.1.e.</li> <li>- Temperature is addressed in Compliance with Water Quality Standards - Temperature - Part I.C.1.f.</li> <li>- Gross Alpha is addressed in the Wet Weather Monitoring - Part III.A.</li> </ul>

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	42	<b>Endangered Species Act (ESA) Requirements - Sediment Pollutant Load Reduction Strategy - Part I.C.3.b</b>			
Not Included in NOI	43	According to the requirements in <u>Part I.C.3.b</u> , the permittee must develop, implement, and evaluate a sediment pollutant load reduction strategy to assess and reduce pollutant loads associated with sediment (e.g., metals, etc. adsorbed to or traveling with sediment, as opposed to clean sediment) into the receiving waters of the Rio Grande. The strategy must include the following elements (see sections below):	<u>Part I.C.3.b</u> - AMAFCA's proposed plan for compliance with the Permit activities are described in the sections below.	AMAFCA's measurable goals for compliance with the Permit activities are described in the sections below.	See specific Permit activity below.
Not Included in NOI	44	<u>Part I.C.3.b.(i)</u> - Sediment Assessment: The permittee must identify and investigate areas within its jurisdiction that may be contributing excessive levels (e.g., levels that may contribute to exceedance of applicable Water Quality Standards) of pollutants in sediments to the receiving waters of the Rio Grande as a result of stormwater discharges. The permittee must identify structural elements, natural or man-made topo-graphical and geographical formations, MS4 operations activities, and areas indicated as potential sources of sediments and pollutants in the receiving waters of the Rio Grande. At the time of assessment, the permittee shall record any observed erosion of soil or sediment along ephemeral channels, arroyos, or stream banks, noting the scouring or sedimentation in streams. The assessment should be made using available data from federal, state, or local studies supplemented as necessary with collection of additional data. The permittee must describe, in the first Annual Report, all standard operating procedures, quality assurance plans to assure that accurate data are collected, summarized, evaluated and reported.	<u>Part I.C.3.b.(i)</u> - All AMAFCA projects are regional flood control or water quality projects. Stormwater runoff from other MS4s enter AMAFCA facilities, which function as regional flood control facilities and also function as BMPs to capture sediment from stormwater before the stormwater continues to the Rio Grande. In the MRG MS4, AMAFCA is not adversely contributing to the sediment pollutant load, but rather functioning to capture the sediment pollutant load generated throughout the watershed by MS4s contributing runoff to AMAFCA facilities. A large portion of AMAFCA's routine activities include sediment removal from its facilities. AMAFCA has implemented a crew tracking system to measure the sediment removal quantities at all of its facilities. The data collected will be used by AMAFCA for the required MS4 Sediment Assessment. As part of AMAFCA's regular O&M activities, AMAFCA will continue the sediment assessment phase by tracking and estimating the volume of sediment removed from their stormwater facilities annually. The tracking of this data will continue and will be valuable to AMAFCA as it applies to this program and to future planning activities.  In addition, AMAFCA will continue a rainfall and runoff monitoring program to quantitatively relate sediment removal to rainfall quantity, location, and runoff volume. AMAFCA has standard operating procedures (SOPs) related to operation and maintenance and a scheduling spreadsheet for inspections. These SOPs and procedures ensure that AMAFCA has accurate data related to sediment removal activities.	<ul style="list-style-type: none"> <li>AMAFCA's facilities function as BMPs for sediment removal. AMAFCA's O&amp;M activities, which include sediment removal, will be scheduled, tracked, and evaluated for the Sediment Assessment requirement for this Permit activity.</li> <li>AMAFCA will continue using a crew tracking system to measure the sediment removal quantities at all of its facilities and use this information for the Sediment Assessment. AMAFCA will continue to utilize GIS to view this information to better understand the watershed.</li> <li>AMAFCA will continue with a rainfall and runoff monitoring program to continue to quantitatively relate sediment removal to rainfall quantity, location, and runoff volume.</li> </ul>	<b>Met FY 2022 Goals.</b> <ul style="list-style-type: none"> <li>In FY 2022, AMAFCA adhered to its current established procedures in the "AMAFCA O&amp;M Manual for Dams" and the "AMAFCA O&amp;M Repair Replacement and Rehabilitation Manual" for sediment removal activities. Refer to the Pollution Retention/ Good Housekeeping Control Measure for additional information.</li> <li>AMAFCA's crew tracking system and database lists each of its stormwater quality facilities, by drainage basin. These facilities are also shown on the AMAFCA Maintenance Map, available online: <a href="http://www.amafca.org/maps-2/">http://www.amafca.org/maps-2/</a>.</li> <li>In FY 2022, AMAFCA continued to operate and analyze data from 14 Levelloggers located at the channelized inlets to the NDC on AMAFCA ROW. This project is the initial runoff monitoring phase and AMAFCA started utilizing this data to quantitatively relate sediment removal to rainfall quantity, location, and runoff volume. Additional information is available upon request.</li> </ul>

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Not Included in NOI	45	<p><u>Part I.C.3.b.(ii)</u> - Estimate Baseline Loading: Based on the results of the sediment pollutants assessment required in Part I.C.3.b.(i) above, the permittee must provide estimates of baseline total sediment loading and relative potential for contamination of those sediments by urban activities for drainage areas, sub-watersheds, Impervious Areas (IAs), and/or Directly Connected Impervious Area (DCIAs) draining directly to a surface waterbody or other feature used to convey waters of the United States. Sediment loads may be provided for targeted areas in the entire Middle Rio Grande Watershed using an individual or cooperative approach. Any data available and/or preliminary numeric modeling results may be used in estimating loads.</p>	<p><u>Part I.C.3.b.(ii)</u> - In 2016, the COA, with cooperation from AMAFCA and area MS4s, completed an initial sediment assessment, "City of Albuquerque 2016 Sediment Assessment". This initial study assisted in establishing the baseline for the sediment assessment. In FY 2019, AMAFCA cooperated with Bernalillo County, who led the effort for the watershed to complete the estimated baseline sediment loading evaluation. Sediment loads are provided for targeted areas in the entire Middle Rio Grande Watershed using a cooperative approach. The "Progress Evaluation Report for the Sediment Pollutant Load Reduction Strategy" report, June 25, 2019 summarizes the sediment loading evaluation at five main outfalls into the Rio Grande. The data AMAFCA collected in the Sediment Assessment was used for estimating baseline sediment loading to its facilities. AMAFCA will review the "Progress Evaluation Report for the Sediment Pollutant Load Reduction Strategy" report and discuss the findings with the watershed MS4s. The results of this study may be used to guide the overall program plans and goals.</p> <p>Rainfall events and generated runoff are related to loading (sediment transport). AMAFCA has developed and began implementation of a rainfall and runoff monitoring program to begin to quantitatively tie sediment quantities reaching AMAFCA facilities (sediment removal volumes) to rainfall quantity, location, and runoff volumes.</p>	<p>• AMAFCA will review the "Progress Evaluation Report for the Sediment Pollutant Load Reduction Strategy" report and discuss the findings with the watershed MS4s. The results of this study may be used to guide the overall program plans and goals. Updates to the Sediment Pollutant Load Reduction Strategy will be implemented, as applicable.</p> <p>• AMAFCA will continue with the development and implementation of a rainfall and runoff monitoring program to begin to quantitatively tie sediment removal to rainfall quantity, location, and runoff volume.</p>	<p><b>Met FY 2022 Goals.</b></p> <p>• AMAFCA has reviewed the "Progress Evaluation Report for the Sediment Pollutant Load Reduction Strategy" report, June 25, 2019 which summarizes the sediment loading evaluation at five main outfalls into the Rio Grande. In FY 2022, there were no updates to report.</p> <p>• In FY 2022, AMAFCA continued to operate and analyze data from 14 Levelloggers located at the channelized inlets to the NDC on AMAFCA ROW. Additional information is available upon request.</p>

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Not Included in NOI	46	<p><u>Part I.C.3.b.(iii)</u> - Targeted Controls: Include a detailed description of all proposed targeted controls and BMPs that will be implemented to reduce sediment pollutant loads, calculated in Part I.C.3.b.(ii) above, during the next ten (10) years of permit issuance. For each targeted control, the permittee must include interim measurable goals (e.g., interim sediment pollutant load reductions) and an implementation and maintenance schedule, including interim milestones, for each control measure, and as appropriate, the months and years in which the MS4 will undertake the required actions. Any data available and/or preliminary numeric modeling results may be used in establishing the targeted controls, BMPs, and interim measurable goals. The permittee must prioritize pollutant load reduction efforts and target areas (e. g. drainage areas, sub watersheds, IAs, DCIAs) that generate the highest annual average pollutant loads.</p>	<p><u>Part I.C.3.b.(iii)</u> - AMAFCA facilities function as regional flood control facilities as well as BMPs to remove sediment from stormwater before the stormwater reaches the Rio Grande. In the MRG MS4, AMAFCA is not adversely contributing to the sediment pollutant load, but rather functioning to capture the sediment pollutant load generated throughout the watershed by MS4s contributing runoff to AMAFCA facilities. As such, AMAFCA does not want to reduce the sediment loads but rather implement targeted controls to increase the capture of sediment in its facilities.</p> <p>The completed analysis of the Sediment Assessment and Estimated Baseline Loading will be used by AMAFCA to improve their program to target and prioritize sediment removal throughout the watershed. AMAFCA will continue to estimate the annual volume of sediment removed from each control facility. The AMAFCA operations and maintenance crew and subcontractors track the volume of floatables, sediment, trash, and debris removed from AMAFCA facilities on a daily basis. This tracking procedure includes the location of removal by facility and watershed. AMAFCA will continue to utilize the 2017 updated, cooperative waste characterization study, updating the "AMAFCA/Albuquerque MS4 Floatable and Gross Pollutant Study" conducted in 2005, to assist with determining needed controls and BMPs that may be implemented to reduce sediment pollutant loads. AMAFCA will continue analyzing, planning, and constructing needed sediment control BMPs. The AMAFCA Project Schedule process may be utilized in part for identifying, ranking, and planning area BMPs. AMAFCA's Mutt Mitt stations program will continue as a targeted BMP to reduce pollutants (specifically E. coli) present in sediment within the MS4.</p>	<ul style="list-style-type: none"> <li>• AMAFCA will review the "Progress Evaluation Report for the Sediment Pollutant Load Reduction Strategy" report and discuss the findings with the watershed MS4s. The results of this study may be used to guide the overall program plans and goals. Updates to the Sediment Pollutant Load Reduction Strategy will be implemented, as applicable.</li> <li>• AMAFCA will continue to estimate the annual volume of sediment removed from each control facility. The AMAFCA operations and maintenance crew and subcontractors track the volume of floatables, sediment, trash, and debris removed from AMAFCA facilities on a daily basis. This tracking procedure includes the location of removal by facility and watershed.</li> <li>• AMAFCA will continue utilizing the updated, cooperative waste characterization study in the watershed to assist with determining needed controls and BMPs that may be implemented to reduce sediment pollutant loads.</li> <li>• AMAFCA will continue analyzing, planning, and constructing needed sediment control BMPs. The AMAFCA Project Schedule process may be utilized in part for identifying, ranking, and planning area BMPs.</li> <li>• AMAFCA will continue its Mutt Mitt program focusing on reducing pollutants (specifically E. coli) present in sediment within the MS4.</li> </ul>	<p><b>No Goals Required for FY 2022.</b></p> <ul style="list-style-type: none"> <li>• The "Progress Evaluation Report for the Sediment Pollutant Load Reduction Strategy" report was completed at the end of FY 2019. An important element of the Strategy is the use of targeted controls and BMPs to reduce sediment transport by stormwater into the receiving water of the Rio Grande. In FY 2022, AMAFCA continued to maintain, design and construct BMPs throughout its jurisdiction to reduce sediment transport by stormwater into the receiving water of the Rio Grande.</li> <li>• In FY 2022, AMAFCA continued use of the crew tracking system and database to estimate the volume of trash, homeless debris, sediment, and vegetation removed from its water quality facilities. Additional details are available upon request.</li> <li>• In FY 2022, AMAFCA continued its Mutt Mitt Station Program. Summary information for the Mutt Mitt Stations is available upon request.</li> </ul>
Not Included in NOI	47	<p><u>Part I.C.3.b.(iv)</u> - Monitoring and Interim Reporting: The permittee shall monitor or assess progress in achieving interim measurable goals and determining the effectiveness of BMPs, and shall include documentation of this monitoring or assessment in the SWMP and Annual Reports. In addition, the SWMP must include methods to be used. This program element may be coordinated with the monitoring required in Part III.A.</p>	<p><u>Part I.C.3.b.(iv)</u> - AMAFCA will annually assess progress for this program. AMAFCA will monitor the volume of sediment captured by each of its facilities by measuring the volume of sediment removed from each facility. Documentation of this monitoring will be done using the tracking spreadsheet and procedure. AMAFCA will incorporate documentation by reference into the Annual Report and plans to document progress on the AMAFCA website. In addition, as mentioned above, AMAFCA will use the "Progress Evaluation Report for the Sediment Pollutant Load Reduction Strategy" report to guide the overall program plans and goals. Related monitoring also occurs through the Levellogger program, monitoring rainfall events and generated runoff. Monitoring and assessment will be considered during the development of future program plans and goals.</p>	<ul style="list-style-type: none"> <li>• AMAFCA will incorporate documentation by reference into the Annual Report.</li> <li>• Documentation of volume of sediment removed will continue to be done using the crew tracking spreadsheet and procedure.</li> <li>• AMAFCA Levellogger information are available upon request and AMAFCA plans to share related documents on its website.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>• In FY 2022, AMAFCA continued utilizing the crew tracking system and database for sediment assessment and estimating baseline loading. Additional information is available upon request.</li> <li>• In FY 2022, AMAFCA continued to operate and analyze data from 14 Levelloggers located at the channelized inlets to the NDC on AMAFCA ROW. Additional information is available upon request.</li> </ul>

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Not Included in NOI	48	<p><u>Part I.C.3.b.(v)</u> - Progress Evaluation and Reporting: The permittee must assess the overall success of the Sediment Pollutant Load Reduction Strategy and document both direct and indirect measurements of program effectiveness in a Progress Report to be submitted with the fifth Annual Report. Data must be analyzed, interpreted, and reported so that results can be applied to such purposes as documenting effectiveness of the BMPs and compliance with the ESA requirements specified in Part I.C.3.b. The Progress Report must include:</p> <p>(a) A list of species likely to be within the action area; (b) Type and number of structural BMPs installed; (c) Evaluation of pollutant source reduction effects; (d) Any recommendation based on program evaluation; (e) Description of how the interim sediment load reduction goals established in Part I.C.3.b.(iii) were achieved; and (f) Future planning activities needed to achieve increase of sediment load reduction required in Part I.C.3.d.(iii).</p>	<p><u>Part I.C.3.b.(v)</u> - AMAFCA facilities function as regional flood control facilities as well as BMPs to remove sediment from stormwater before the stormwater reaches the Rio Grande. In the MRG MS4, AMAFCA is not adversely contributing to the sediment pollutant load, but rather functioning to capture the sediment pollutant load generated throughout the watershed by MS4s contributing runoff to AMAFCA facilities. AMAFCA's goal is to implement targeted controls to increase the capture of sediment in its facilities rather than reducing sediment loads. AMAFCA worked cooperatively with Bernalillo County, City of Albuquerque, and SSCAFCA to complete this MS4 Permit requirement. The Progress Report on the Sediment Pollutant Load Reduction Strategy. This Progress report meets the MS4 Permit requirements, including:</p> <p>(a) A list of species likely to be within the action area; (b) Type and number of structural BMPs installed; (c) Evaluation of pollutant source reduction effects; (d) Any recommendation based on program evaluation; (e) Description of how the interim sediment load reduction goals established in Part I.C.3.b.(iii) were achieved; and (f) Future planning activities needed to achieve increase of sediment load reduction required in Part I.C.3.d.(iii).</p> <p>Related to the elements required by this Progress report, AMAFCA will continue to 1) maintain a cumulative list of AMAFCA's retrofit BMPs and 2) may utilize the AMAFCA Project Schedule process in part for identifying, ranking, and planning area BMPs to meet recommendations from this program evaluation.</p>	<p>• AMAFCA has completed this report and provided this to EPA with the FY 2019 Annual Report, December 1, 2019, a Progress Report on the Sediment Pollutant Load Reduction Strategy. AMAFCA cooperated with Bernalillo County, who led the effort for the watershed to complete the estimated baseline sediment loading. The City of Albuquerque and SSCAFCA also cooperated on this watershed wide strategy.</p> <p>• Related to requirement (c), AMAFCA will continue to maintain a cumulative list of AMAFCA's retrofit BMPs. AMAFCA will incorporate documentation by reference into the Annual Report and plans to document progress on the AMAFCA website.</p> <p>• Related to requirement (d) AMAFCA's Project Schedule process may be utilized in part for identifying, ranking, and planning area BMPs to meet recommendations from this program evaluation.</p>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>• The submission of the "Progress Evaluation Report for the Sediment Pollutant Load Reduction Strategy" report, June 25, 2019 with the FY 2019 Annual Report completes and meets the MS4 Permit requirements. Moving forward, future activities (planned, as well as implemented) determined to be needed to achieve improved sediment load reduction will be summarized in the Annual Reports. In FY 2022, there were no updates to report.</li> <li>• A cumulative list of AMAFCA's retrofit BMPs is available in upon request.</li> <li>• Related to requirement (c), the program elements above describe AMAFCA's methods for evaluation of pollutant source reduction effects.</li> <li>• Related to requirement (d), AMAFCA utilized the 2022 AMAFCA Project Schedule to focus on project priority BMPs for the community.</li> </ul>
Not Included in NOI	49	<p><u>Part I.C.3.b.(vi)</u> - Critical Habitat: Verify that the installation of stormwater BMPs will not occur in or adversely affect currently listed endangered or threatened species critical habitat by reviewing the activities and locations of stormwater BMP installation within the location of critical habitat of currently listed endangered or threatened species at the FWS website <a href="http://criticalhabitat.fws.gov/crithab/">http://criticalhabitat.fws.gov/crithab/</a>.</p>	<p><u>Part I.C.3.b.(vi)</u> - AMAFCA considers critical habitat for all of its projects, working closely with the USFWS and USACE, as required, and will continue this practice related to any BMPs installed related to sediment capture and removal.</p>	<p>• AMAFCA will continue its practice of coordination with the USFWS and USACE, as required, related to AMAFCA's facility construction projects.</p>	<p><b>Met FY 2022 Goal.</b></p> <ul style="list-style-type: none"> <li>• In FY 2022, AMAFCA provided written correspondence to the USACE and discussed the re-vegetation required at the NDC outfall in the Special Conditions of the USACE Regional General Permit for vegetation monitoring of this area with the USACE. AMAFCA is consulting with USACE to satisfy the Special Conditions for this USACE Regional General Permit.</li> </ul>



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	50	<b>Part I.D.5 - Stormwater Management Plan (SWMP) Control Measures</b>			
	51	<b>TABLE 2: Construction Site Stormwater Runoff Control - Part I.D.5.a</b>			
See NOI Sections Below	52	<u>Part I.D.5.a.(i)</u> The permittee shall develop, revise, implement, and enforce a program to reduce pollutants in any stormwater runoff to the MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. Reduction of stormwater discharges from construction activity disturbing less than one acre must be included in the program if that construction activity is part of a larger common plan of development or sale that would disturb one acre or more. Permittees previously covered under permit NMS000101 or NMR040000 must continue existing programs, updating as necessary, to comply with the requirements of this permit. (Note: Highway Departments and Flood Control Authorities may only apply the construction site stormwater management program to the permittee's own construction projects).	<u>Part I.D.5.a.(i)</u> - AMAFCA does not have jurisdiction over COA or Bernalillo County departments responsible for planning, review, permitting, or approval of public and private construction activities. However, AMAFCA does have jurisdiction over AMAFCA construction projects. Therefore, AMAFCA's Construction Site Stormwater Runoff Control Program addresses stormwater management during construction of AMAFCA projects that result in a land disturbance of greater than or equal to one acre, specifically when the construction contract is under AMAFCA. Coordination will continue to occur between AMAFCA's Stormwater Quality Engineer, Project Manager, Development Review Engineer, Drainage Engineer, Field Engineer, and Executive Engineer to ensure that the Program controls erosion and maintains sediment on site.	<ul style="list-style-type: none"> <li>• Coordinate the Construction Site Stormwater Runoff Control Program requirements (as detailed in the Program and in sections below) with AMAFCA's Stormwater Quality Engineer, Project Manager, Development Review Engineer, Drainage Engineer, Field Engineer, and Executive Engineer to ensure that the Program controls erosion and maintains sediment on site for qualifying AMAFCA construction projects, as required under the Construction General Permit (CGP).</li> </ul>	<p><b>Met FY 2022 Goal.</b></p> <ul style="list-style-type: none"> <li>• AMAFCA construction projects and activities were discussed at weekly staff meetings and at monthly AMAFCA Board meetings, allowing coordination among AMAFCA staff to ensure that the Program controls are followed for active and upcoming qualifying AMAFCA construction projects.</li> <li>• AMAFCA continued to follow its Construction Site Stormwater Runoff Control Program.</li> </ul>
1.1	53	Development of an ordinance or other regulatory mechanism as required in <u>Part I.D.5.a.(ii)(a)</u> .	<u>Part I.D.5.a.(ii)(a)</u> - To the extent permitted by law, AMAFCA will comply with the requirements of this section. As applicable, AMAFCA will begin inserting MS4 Permit elements into construction contracts to provide AMAFCA with an enforceable contract mechanism. AMAFCA will also continue to work with the cooperative MS4 Technical Advisory Group (TAG) and other agencies to discuss and help develop regulatory mechanisms. Except for special circumstances, AMAFCA's regular maintenance activities do not disturb more than 5 acres at a time.	<ul style="list-style-type: none"> <li>• AMAFCA will begin inserting MS4 Permit elements into construction contracts to provide AMAFCA with an improved enforceable contract mechanism.</li> <li>• AMAFCA will continue to work with the MS4 TAG and other agencies to discuss and help develop regulatory mechanisms.</li> <li>• Except for special circumstances, AMAFCA's regular maintenance activities will not disturb more than 5 acres at a time.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>• AMAFCA contractually requires NPDES compliance with the CGP for qualifying projects. Construction sites greater than one (1) acre in size located on AMAFCA property for which AMAFCA holds the construction contract.</li> <li>• AMAFCA continued to be involved in the MS4 TAG, facilitating cooperation and coordination with other MS4s in the Middle Rio Grande.</li> <li>• In FY 2022, AMAFCA staff did not report any regular maintenance activities that disturbed more than 5 acres at a time.</li> </ul>

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1.2	54	Develop requirements and procedures as required in Part I.D.5.a.(ii)(b) through Part I.D.5.a.(ii)(h). These Permit sections include requirements for AMAFCA to implement and enforce requirements for construction site operators to:  Part I.D.5.a.(ii)(b) - implement appropriate erosion and sediment control BMPs; Part I.D.5.a.(ii)(c) - control waste at the construction site that may cause adverse impacts to water quality; Part I.D.5.a.(ii)(d) - Procedures for site plan review which incorporate consideration of potential water quality impacts; Part I.D.5.a.(ii)(e) - Procedures for receipt and consideration of information submitted by the public; Part I.D.5.a.(ii)(f) - Procedures for site inspection (during construction) and enforcement of control measures, including provisions to ensure proper construction, operation, maintenance, and repair.	Part I.D.5.a.(ii)(b) - As part of AMAFCA's Program, AMAFCA engineers will continue to review all site plans and the SWPPPs to ensure implementation of appropriate BMPs and consistency with federal, state, and local sediment and erosion control requirements for AMAFCA projects. Pre-construction meetings will be held prior to beginning construction and SWPPP BMPs will be reviewed and discussed. Part I.D.5.a.(ii)(c) - AMAFCA ensures control of waste at construction sites during the SWPPP review, in accordance with the MS4 and CGP requirements. Part I.D.5.a.(ii)(d) - In a cooperative effort with COA and Bernalillo County, the AMAFCA Development Review Engineer reviews private development that has a connection to AMAFCA facilities for projects disturbing at least one (1) acre. This review includes stormwater conveyance, water quality, and erosion control. In addition, AMAFCA staff performs and will continue to perform incremental reviews of all AMAFCA projects during design to assure quality control and design efficiency. Part I.D.5.a.(ii)(e) - AMAFCA will post a contact phone number at all required construction sites to ensure the public can contact AMAFCA with information. Part I.D.5.a.(ii)(f) - AMAFCA has procedures for construction site inspections of control measures to ensure compliance with the Construction General Permit (CGP). AMAFCA also has procedures in place to ensure site stabilization after NOT is filed.	• Review site plans and the SWPPPs (using the EPA SWPPP checklist) for AMAFCA projects disturbing at least one (1) acre in order to consider potential water quality impacts and ensure consistency with federal, state, and local sediment and erosion control requirements. • Conduct pre-construction meetings on AMAFCA construction projects disturbing at least one (1) acre prior to beginning earth-disturbing activities in order to discuss the SWPPP and BMPs. • SWPPP review will include ensuring the plans addresses control of waste at construction sites for AMAFCA projects. • In a cooperative effort with COA and Bernalillo County, the AMAFCA Development Review Engineer will review submitted private development that has a connection to AMAFCA facilities for projects disturbing at least one (1) acre. Review may include stormwater conveyance, water quality, and erosion control. • AMAFCA will post a contact phone number at all required construction sites. • AMAFCA will continue to utilize construction inspection procedures for control measures to ensure compliance with the Construction General Permit (CGP).	<b>Met FY 2022 Goals.</b> • AMAFCA continued to follow its Construction Site Stormwater Runoff Control Program. • AMAFCA reviewed 100% of the AMAFCA project SWPPPs using the most recent EPA CGP SWPPP checklist/template to guide the reviews. NOIs were submitted for 100% of the FY 2022 CGP qualifying AMAFCA projects. • AMAFCA conducted pre-construction meetings for all qualifying AMAFCA construction projects prior to beginning earth-disturbing activities. • AMAFCA's SWPPP reviews included ensuring the plan addresses control of waste at construction sites. • AMAFCA's Development Review Engineer reviewed private development that had a connection to AMAFCA facilities for projects disturbing at least one acre. Review included stormwater conveyance, water quality and erosion control. • AMAFCA verified that the Contractors posted an AMAFCA contact phone number, as required, at AMAFCA construction sites. • AMAFCA continued to utilize construction inspection procedures for control measures to ensure compliance with the CGP.
	55	Continued...Develop requirements and procedures as required in Part I.D.5.a.(ii)(b) through Part I.D.5.a.(ii)(h). Part I.D.5.a.(ii)(g) - to educate and train permittee personnel and developers, construction site operators, contractors and supporting personnel; and Part I.D.5.a.(ii)(h) - for keeping records of and tracking all regulated construction activities within the MS4 - site reviews, inspections, inspection reports, warning letters and other enforcement documents. A summary of the number and frequency of site reviews, inspections (including inspector's checklist for oversight of sediment and erosion controls and proper disposal of construction wastes) and enforcement activities that are conducted annually and cumulatively during the permit term shall be included in each Annual Report.	Part I.D.5.a.(ii)(g) - AMAFCA will provide MS4 construction site inspection training for its staff and invite other agencies to attend trainings, when possible. In addition, construction site SWPPPs will continue to be discussed regularly by AMAFCA personnel. Part I.D.5.a.(ii)(h) - AMAFCA will maintain records of all AMAFCA-led projects disturbing at least one (1) acre within its rights-of-way. This will include AMAFCA's Construction Site Stormwater Runoff Control Program records, including NOIs, NOI tracking, inspection reports, non-conformance documents, and training documents. AMAFCA will maintain its MS4 Strategies and Procedures Notebook. AMAFCA's license agreements relative to CGP compliance for non-AMAFCA projects that occur within its rights-of-way are the responsibility of the licensee.	• AMAFCA will continue to provide MS4 construction site inspection training for its staff and invite other agencies responsible for construction projects. In addition, construction site SWPPPs will continue to be discussed at weekly staff meetings, included in daily reports by field personnel, and discussed at AMAFCA Board meetings. • AMAFCA will maintain records of all construction projects disturbing at least one (1) acre within its rights-of-way that do not qualify for a Low Erosivity Waiver (LEW). • AMAFCA will maintain a tracking spreadsheet for the Construction Site Stormwater Runoff Control Program elements for AMAFCA-led projects.	<b>Met FY 2022 Goals.</b> • AMAFCA attended the EPA and NMED webinar training for the new 2022 CGP. In addition, construction site SWPPPs were discussed at weekly staff meetings and at monthly AMAFCA Board meetings, as needed. AMAFCA staff also attended the virtual EPA Region 6 Stormwater Conference. In addition, in Sept. 2021, AMAFCA attended and presented on stormwater quality treatment trains at the StormCon conference in Milwaukee, WI. • AMAFCA continued to maintain all construction project records disturbing at least one (1) acre within its rights-of-way. • AMAFCA continued to maintain all construction project records disturbing at least one (1) acre within its rights-of-way.

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1.3	56	<u>Part I.D.5.a.(iii)</u> . Annually conduct site inspections of 100 percent of all construction projects cumulatively disturbing one (1) or more acres as required in Part I.D.5.a.(iii).	<u>Part I.D.5.a.(iii)</u> - As part of AMAFCA's Program, AMAFCA staff will continue to perform field inspections of AMAFCA construction projects which disturb at least one (1) acre. At a minimum, each project will be inspected once after filing the NOI (including follow-up inspections for any nonconformances) and at the NOT. An inspection form has been developed and will be used for all inspections. Should the contractor fail to operate, maintain and repair the BMPs and control measures, AMAFCA staff have the contractual authority to temporarily suspend work, withhold/stop payment, or terminate the contract should such issues go uncorrected. AMAFCA's license agreements for non-AMAFCA projects that occur within its rights-of-way are not inspected by AMAFCA and are the responsibility of the licensee. As AMAFCA partners with other MS4s, such as COA, UNM, or ExpoNM on construction projects, AMAFCA will continue to coordinate with those cooperating MS4s in order to assign responsibility of conducting site inspections.	<ul style="list-style-type: none"> <li>AMAFCA will complete the inspections per the Construction Site Stormwater Runoff Control Program Plan for 100% of the active construction sites under contract by AMAFCA which disturb at least one (1) acre. AMAFCA will provide each contractor with a rain gage for each construction site to facilitate construction inspections.</li> <li>AMAFCA's Stormwater Quality Engineer will track all MS4 inspections using the NOI Construction Inspection Tracking spreadsheet.</li> <li>AMAFCA will maintain copies of the completed MS4 construction inspection forms.</li> <li>AMAFCA will continue membership and involvement in the cooperative MS4 TAG, which will facilitate cooperation and coordination with other MS4s in the Middle Rio Grande.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>For qualifying projects - construction sites greater than 1 acre in size for which AMAFCA holds the construction contract - AMAFCA conducted site inspections for 100% of the projects in accordance with this MS4 Permit in FY 2022. In FY 2022, there was no need to suspend work.</li> <li>AMAFCA continued to track all AMAFCA projects disturbing at least one acre, including the NOI and NOT filing and MS4 inspections.</li> <li>AMAFCA maintains copies of all MS4 construction inspections forms.</li> <li>AMAFCA continued to be involved in the MS4 TAG, facilitating cooperation and coordination with other MS4s in the Middle Rio Grande.</li> </ul>
1.4	57	<u>Part I.D.5.a.(iv)</u> . Coordinate with all departments and boards with jurisdiction over the planning, review, permitting, or approval of public and private construction projects/activities within the permit area as required in Part I.D.5.a.(iv). Planning documents include, but are not limited to: comprehensive or master plans, subdivision ordinances, general land use plan, zoning code, transportation master plan, specific area plans, such as sector plan, site area plans, corridor plans, or unified development ordinances.	<p><u>Part I.D.5.a.(iv)</u> - AMAFCA does not have jurisdiction over the planning, review, permitting, or approval of non-AMAFCA public and private construction activities. Therefore, AMAFCA's program is limited to AMAFCA-owned properties. Regular coordination among AMAFCA staff, as well as with Board members, occurs and will continue.</p> <p>In a cooperative effort with COA and Bernalillo County, the AMAFCA Development Review Engineer will continue to coordinate with and to review public and private development that has a connection to AMAFCA facilities for projects disturbing at least one (1) acre.</p>	<ul style="list-style-type: none"> <li>AMAFCA will continue regular coordination amongst AMAFCA engineering staff and Board members to verify that BMPs are in place to control erosion during construction on AMAFCA-owned properties.</li> <li>AMAFCA will continue to meet monthly with the Board and will continue to seek Board approval for jointly funded water quality projects.</li> <li>In a cooperative effort with COA and Bernalillo County, the AMAFCA Development Review Engineer reviews submitted public and private development that has a connection to AMAFCA facilities for projects disturbing at least one (1) acre. These reviews may include stormwater conveyance, water quality, and erosion control.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>AMAFCA construction projects and activities were discussed weekly in the AMAFCA staff meeting, allowing coordination among the Stormwater Quality Engineer, Project Manager, Development Review Engineer, Drainage Engineer, Field Engineer, Executive Engineer and Project Managers.</li> <li>AMAFCA Board meetings typically occurred monthly during this reporting period. Board agendas and meeting minutes are available online: <a href="http://www.amafca.org/board/">http://www.amafca.org/board/</a></li> <li>In addition, AMAFCA's Development Review Engineer reviewed all public and private development that has a connection to AMAFCA facilities. These reviews included stormwater conveyance, quality and erosion control considerations.</li> </ul>

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1.5	58	Evaluation of GI/LID/Sustainable practices in site plan reviews as required in Part I.D.5.a.(v). The site plan review must include an evaluation of opportunities for use of GI/LID/ Sustainable practices and when the opportunity exists, encourage project proponents to incorporate such practices into the site design to mimic the pre-development hydrology of the previously undeveloped site. For purposes of this permit, pre-development hydrology shall be met according to Part I.D.5.b of this Permit (consistent with any limitations on that capture). Include a reporting requirement of the number of plans that had opportunities to implement these practices and how many incorporated these practices.	<p><u>Part I.D.5.a.(v)</u> - AMAFCA does not have jurisdiction over site plan reviews of public and private construction activities, and AMAFCA does not program any private development type projects. AMAFCA ultimately has no authority to accept or reject public and private development projects.</p> <p>AMAFCA will continue to encourage use of sustainable practices during the review phase of projects within AMAFCA's rights-of-way and turn-key projects that AMAFCA will take over for operation and maintenance after construction. AMAFCA will encourage an evaluation of sustainable GI/LID practice opportunities within the watershed.</p> <p>The reporting requirement for the number of plans that AMAFCA reviews, typically because of a connection to an AMAFCA facility, that had opportunities to implement these practices will be reported annually. Because of lack of jurisdictional authority, AMAFCA is typically not told how many improvements were implemented. Therefore the number of improvements implemented will not be reported in the AMAFCA MS4 Annual Report.</p>	<ul style="list-style-type: none"> <li>• AMAFCA will continue to encourage use of sustainable practices during the review phase of projects.</li> <li>• AMAFCA will annually report the number of plans that were reviewed within AMAFCA's rights-of-way and turn-key projects that AMAFCA will take over for operation and maintenance after construction that had opportunities to implement GI/LID/Sustainable practices.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>• AMAFCA continued to encourage use of sustainable practices during the review phase of projects.</li> <li>• AMAFCA's Development Review Engineer reviewed private development that has a connection to AMAFCA facilities. In FY 2022, 195 plans were reviewed by the AMAFCA Development Review Engineer; opportunities to potentially implement GI/LID/ Sustainable practices were considered, as appropriate, during these reviews. A copy of the Development Review Engineer's tracking list is available upon request.</li> <li>• AMAFCA continued to collaborate with Ciudad Soil and Water Conservation District to assist with water quality focused subdivision plan reviews, which are required for developments &gt; 5 ac.</li> </ul>
Not Included in NOI	59	Update the SWMP document and annual report as required in Part I.D.5.a.(vi) and in Part I.D.5.a.(vii). <u>Part I.D.5.a.(vi)</u> The permittee must include in the SWMP a description of the mechanism(s) that will be utilized to comply with each of the elements required in Part I.D.5.a.(i) throughout Part I.D.5.a.(v), including description of each individual BMP (both structural or non-structural) or source control measures and its corresponding measurable goal.	<p><u>Part I.D.5.a.(vi)</u> - The above sections of the SWMP describe the mechanism(s) AMAFCA utilizes to comply with each of the elements required in Part I.D.5.a.(i) throughout Part I.D.5.a.(v) and the corresponding measurable goal(s). AMAFCA will annually evaluate and revise the Construction Site Stormwater Runoff Control Program elements, as necessary, to ensure that AMAFCA's Program meets the MS4 Permit requirements.</p>	<ul style="list-style-type: none"> <li>• Evaluate and revise the Construction Site Stormwater Runoff Control Program, as necessary, to ensure that AMAFCA's Program meets the MS4 Permit requirements.</li> <li>• Update the SWMP, as necessary.</li> </ul>	<p><b>Met FY 2022 Goal.</b></p> <ul style="list-style-type: none"> <li>• AMAFCA's Program was reviewed by the Stormwater Quality Engineer for this reporting period. The program was reviewed as part of this Annual Report.</li> </ul>
Not Included in NOI	60	Update the SWMP document and annual report as required in Part I.D.5.a.(vi) and in Part I.D.5.a.(vii). <u>Part I.D.5.a.(vii)</u> - The permittee shall assess the overall success of the program, and document the program effectiveness in the Annual Report. The permittee must include in each Annual Report: <u>Part I.D.5.a.(vii).(a)</u> - A summary of the frequency of site reviews, inspections and enforcement activities that are conducted annually and cumulatively during the permit term. <u>Part I.D.5.a.(vii).(b)</u> - The number of plans that had the opportunity to implement GI/LID/Sustainable practices and how many incorporated the practices.	<p><u>Part I.D.5.a.(vii)</u> - AMAFCA will assess the overall success of the program, and document the program effectiveness in the Annual Report.</p> <p><u>Part I.D.5.a.(vii).(a)</u> - AMAFCA will include in each Annual Report a summary of the number and frequency of site reviews and inspections activities that are conducted annually and cumulatively during the permit term.</p> <p><u>Part I.D.5.a.(vii).(b)</u> - AMAFCA will include the number of plans that had the opportunity to implement GI/LID/Sustainable practices from the plans that were reviewed within AMAFCA's rights-of-way and turn-key projects that AMAFCA will take over for operation and maintenance after construction. AMAFCA ultimately lacks jurisdictional authority to accept public and private development projects.</p>	<ul style="list-style-type: none"> <li>• Included in each Annual Report will be a summary of the number and frequency of construction site reviews and inspection activities that are conducted annually and cumulatively during the Permit term.</li> <li>• Included in each Annual Report will be a summary of the plans that had the opportunity to implement GI/LID/Sustainable practices from the plans that were reviewed within AMAFCA's rights-of-way and turn-key projects that AMAFCA will take over for operation and maintenance after construction. This documentation is included above.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>• This Annual Report documents the program effectiveness and program success in the status of implementation and performance assessment for each MS4 Permit requirements.</li> <li>• There were 3 active AMAFCA construction projects in FY 2022.</li> <li>• The number of plans reviewed by the AMAFCA Development Review Engineer is reported above; opportunities to potentially implement GI/LID/ Sustainable practices were considered, as appropriate, during these reviews.</li> </ul>

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1.6	61	Enhance the program to include the elements in Part I.D.5.a.(viii) through Part I.D.5.a.(x). These include: <u>Part I.D.5.a.(viii)</u> - Use of stormwater educational materials; <u>Part I.D.5.a.(ix)</u> - Develop or update existing construction handbooks; and <u>Part I.D.5.a.(x)</u> - construction inspections may be carried out in conjunction with other inspections and use a screening prioritization process.	<u>Part I.D.5.a.(viii)</u> - AMAFCA will continue to use stormwater educational materials, either developed locally or provided by EPA, NMED, environmental groups, public interest groups, trade organizations, and/or other MS4s. AMAFCA will continue to host training cooperative sessions with the watershed MS4s. <u>Part I.D.5.a.(ix)</u> - AMAFCA, along with other MS4s, provided external review to NMDOT on their 2020 update of the National Pollutant Discharge Elimination System Manual, Stormwater Management Guidelines for Construction, MS4 and Industrial Activities. <u>Part I.D.5.a.(x)</u> - AMAFCA will continue to incorporate a screening prioritization process for construction inspections.	<ul style="list-style-type: none"> <li>The MRGSQT Outcomes Report will summarize the activities where educational materials were dispersed and shared with the public. This report is available upon request and AMAFCA plans to share this document on its website.</li> <li>AMAFCA will explore opportunities for training cooperative sessions held with the watershed MS4s during the reporting period.</li> <li>AMAFCA will follow procedures, as applicable, outlined in the 2020 update of the National Pollutant Discharge Elimination System Manual, Stormwater Management Guidelines for Construction, MS4 and Industrial Activities.</li> <li>AMAFCA will continue to incorporate a screening prioritization process for construction inspections.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>AMAFCA's educational efforts are summarized and included in the MRGSQT Outcomes Report. This is available upon request.</li> <li>AMAFCA continued to utilize the most recent EPA CGP SWPPP checklist/template to guide the reviews of SWPPP documents.</li> <li>AMAFCA conducted site inspections for 100% of the AMAFCA construction projects in accordance with this MS4 Permit in FY 2022.</li> </ul>
1.7	62	Item from MS4 Permit NOI. Describe other proposed activities to address the Construction Stormwater Management in New Development and Redevelopment Measure.	<p>AMAFCA will continue to utilize the Annual Report and SWMP revision process as a means to perform a self-audit with the goal to improve its MS4 Programs.</p> <p>AMAFCA will maintain and update, as necessary, its MS4 Strategies and Procedures Notebook for this MS4 Program.</p>	<ul style="list-style-type: none"> <li>AMAFCA will document progress made, if any, related to the Annual Report and SWMP revision process as a means to perform a self-audit on the MS4 Program elements.</li> <li>AMAFCA will maintain and update, as necessary, its MS4 Strategies and Procedures Notebook.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>AMAFCA continued to utilize the Annual Report process as a means to perform a self-audit on the MS4 Program elements.</li> </ul>

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	63	<b>TABLE 3: Post-Construction Stormwater Management in New Development and Redevelopment- Part I.D.5.b</b>			
See NOI Sections Below	64	Part I.D.5.b.(i) The permittee must develop, revise, implement, and enforce a program to address stormwater runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into the MS4. The program must ensure that controls are in place that would prevent or minimize water quality impacts. Permittees previously covered under NMS000101 or NMR040000 must continue existing programs, updating as necessary, to comply with the requirements of this permit. (Note: Highway Departments and Flood Control Authorities may only apply the post-construction stormwater management program to the permittee's own construction projects).	Part I.D.5.b.(i) - All AMAFCA projects are regional flood control or water quality projects. AMAFCA does not have jurisdiction over private or public (non-AMAFCA) development or redevelopment projects - this responsibility lies with COA, NMDOT, or Bernalillo County. AMAFCA facilities receive stormwater after it flows through new development and redevelopment. As a result, some permit activities in this section do not apply to AMAFCA.  AMAFCA's routine operation & maintenance (O&M) activities address post-construction stormwater management at all AMAFCA facilities.	• Coordinate O&M activities with AMAFCA's Stormwater Quality Engineer, Project Manager, Development Review Engineer, Drainage Engineer, GIS Manager, Field Engineer, and Executive Engineer.	<b>Met FY 2022 Goal.</b> • AMAFCA O&M activities continued to be discussed and coordinated weekly in the AMAFCA staff meeting, allowing coordination among the Stormwater Quality Engineer, Project Manager, Development Review Engineer, Drainage Engineer, Field Engineer, and Executive Engineer.
2.1	65	Development of strategies as required in Part I.D.5.b.(ii).(a). Strategies which include a combination of structural and/or non-structural BMPs to control pollutants in stormwater runoff.	Part I.D.5.b.(ii).(a) - All AMAFCA projects are regional flood control or stormwater quality projects - functioning as BMPs. AMAFCA will continue to include both structural and non-structural BMPs to control pollutants in stormwater runoff from AMAFCA owned facilities.  AMAFCA may continue to coordinate with watershed MS4s and other entities within its jurisdiction to discuss areas requiring drainage and water quality improvements, project priorities, and multi-agency funding opportunities. As part of the development of the AMAFCA Project Schedule, a system review will be completed. AMAFCA will publish projects, including schedule and cost sharing, in the biennial AMAFCA Project Schedule.  AMAFCA will continue development of this program element in its MS4 Strategies and Procedures Notebook for this Program.	• AMAFCA will continue to include both structural and non-structural BMPs to control pollutants in stormwater runoff from AMAFCA owned facilities. • AMAFCA may coordinate with watershed MS4s as well as other entities within its jurisdiction during project review, complete a system review, and publish projects, including schedule and cost sharing, in the biennial AMAFCA Project Schedule. • AMAFCA will continue development of this program element in its MS4 Strategies and Procedures Notebook.	<b>Met FY 2022 Goals.</b> • AMAFCA continued to include both structural and non-structural BMPs to control pollutants in stormwater runoff from AMAFCA owned facilities. In addition, several structural BMPs have been constructed under the Agency and Area-Wide contract and Miscellaneous contract maintenance activities during the Permit term. A complete list of A&AW by FY can be provided upon request. • AMAFCA continued to work with the watershed MS4s, cooperative MS4 TAG, and other agencies to discuss and help develop strategies, where feasible, to contractually require and/or suggest BMPs on projects that AMAFCA may take over for operation and maintenance after construction. • AMAFCA published the 2022 Project Schedule which covers a six-year planning horizon (2022-2027). Coordination meetings with watershed MS4s, TAG members, and other entities occurred during the development of this Project Schedule. Coordination meetings with watershed MS4s, TAG members, and other entities occurred during the development of this Project Schedule and included the ranking of stormwater quality projects. • In FY 2022, the MRGSQT members continued discussions and agency implementation related to the Post-Construction Stormwater Quality Design Standards in the Middle Rio Grande Watershed study. This memo is available upon request.
2.2	66	Development of an ordinance or other regulatory mechanism as required in Part I.D.5.b.(ii).(b).	Part I.D.5.b.(ii).(b) - It is not within AMAFCA's jurisdiction to enact ordinances or other legal authority mechanisms. AMAFCA is unable to develop, implement, or enforce any ordinances or regulatory mechanisms required in this section.	• AMAFCA will continue to work with the cooperative MS4 TAG and other agencies to discuss and help develop regulatory mechanisms.	<b>Met FY 2022 Goal.</b> • AMAFCA continued to be involved in the MS4 TAG, facilitating cooperation and coordination with other MS4s in the Middle Rio Grande.

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2.3	67	Implementation and enforcement, via the ordinance or other regulatory mechanism of site design standards as required in <u>Part I.D.5.b.(ii).(b)</u> .	<u>Part I.D.5.b.(ii).(b)</u> - It is not within AMAFCA's jurisdiction to enact ordinances or other legal authority mechanisms. AMAFCA is unable to develop, implement, or enforce any ordinances or regulatory mechanisms required in this section.	• AMAFCA will continue to work with the cooperative MS4 TAG and other agencies to discuss and help develop regulatory mechanisms.	<b>Met FY 2022 Goal.</b> • AMAFCA continued to work with the MS4 TAG and other agencies to discuss and help develop strategies, where feasible, to contractually require post-construction BMPs on projects that AMAFCA will take over for operation and maintenance after construction.
2.4	68	Ensure appropriate implementation of post-construction structural controls as required in <u>Part I.D.5.b.(ii).(c)</u> and <u>Part I.D.5.b.(ii).(d)</u> .	<u>Part I.D.5.b.(ii).(c)</u> - AMAFCA will continue to ensure the appropriate implementation of structural BMPs on AMAFCA owned projects through pre-construction design review (see Construction Site Stormwater Runoff Control Measure). For watershed cooperative elements, AMAFCA occasionally partners with other MS4s, such as the COA, UNM, and ExpoNM, on construction of structural BMPs. AMAFCA is also a member of the MS4 TAG. <u>Part I.D.5.b.(ii).(d)</u> - AMAFCA will conduct inspections at the beginning and end of construction, (see Construction Site Stormwater Runoff Control Measure), conduct Post-Construction inspection and maintenance (AMAFCA's routine O&M activities address post-construction stormwater management), and enforce contractual penalty provisions for noncompliance by the Operator during construction. These items will be discussed periodically with the AMAFCA Field Engineer.	• AMAFCA will ensure the appropriate implementation of structural BMPs on AMAFCA owned projects through pre-construction design review (see Construction Site Stormwater Runoff Control Measure). • AMAFCA will continue to work with the watershed MS4s, TAG, and other agencies to discuss cooperative implementation of structural BMPs. • AMAFCA will conduct inspections as required during construction, (see Construction Site Stormwater Runoff Control Measure). • AMAFCA's Post-Construction inspections and maintenance will be through the AMAFCA O&M activities (see Pollution Prevention /Good Housekeeping Control Measure).	<b>Met FY 2022 Goals.</b> • See the Construction Site Stormwater Runoff Control Measure for pre-construction design review and inspections during construction. • AMAFCA continued to be involved in the MS4 TAG, facilitating cooperation and coordination with other MS4s in the Middle Rio Grande. • See the Pollution Prevention/Good Housekeeping Control Measure for post-construction inspections and maintenance, which are part of AMAFCA O&M activities. These inspections and maintenance continued to be discussed in the AMAFCA weekly staff meetings. • In FY 2022, the MRGSQT members continued discussions and agency implementation related to the Post-Construction Stormwater Quality Design Standards in the Middle Rio Grande Watershed study. This memo is available upon request.



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2.5	69	Develop procedures as required in <a href="#">Part I.D.5.b.(ii).(e)</a> - Procedure to develop and implement an educational program for project developers regarding designs to control water quality effects from stormwater, and a training program for plan review staff regarding stormwater standards, site design techniques and controls, including training regarding GI/LID/ Sustainability practices. Training may be developed independently or obtained from outside resources; <a href="#">Part I.D.5.b.(ii).(f)</a> - Procedures for site inspection and enforcement to ensure proper long-term operation, maintenance, and repair of storm water management practices that are put into place as part of construction projects/activities; <a href="#">Part I.D.5.b.(ii).(g)</a> - Procedures to control the discharge of pollutants related to commercial application and distribution of pesticides, herbicides, and fertilizers; and <a href="#">Part I.D.5.b.(ii).(h)</a> - Procedure or system to review and update, as necessary, the existing program to ensure that storm water controls or management practices for new development and redevelopment projects/ activities continue to meet the requirements and objectives of the permit.	<a href="#">Part I.D.5.b.(ii).(e)</a> - As a cooperative program, AMAFCA contributes to the Mid Rio Grande Stormwater Quality Team (MRGSQT), which includes training on GI/LID and sustainability practices. This is achieved by sponsoring conferences featuring GI/LID lectures, such as the annual Land and Water Summit. Reporting on the MRGSQT activities will be part of Public Education and Outreach on Stormwater Impacts Control Measure. <a href="#">Part I.D.5.b.(ii).(f)</a> - AMAFCA is responsible for all long term inspection, operation, maintenance, and repair of its own facilities. AMAFCA will perform inspections, maintenance and repair in accordance with the established procedures in the "AMAFCA O&M Manual for Dams", the "AMAFCA O&M Repair Replacement and Rehabilitation Manual", and Project O&M Plan (Plan No. 7). This is covered in the Pollution Prevention/Good Housekeeping Control Measure. <a href="#">Part I.D.5.b.(ii).(g)</a> - AMAFCA will only allow licensed staff or professionally licensed contractors to apply herbicides and pesticides within AMAFCA rights-of-way (AMAFCA does not apply fertilizers in its operations). This is covered in the Pollution Prevention/Good Housekeeping Control Measure. <a href="#">Part I.D.5.b.(ii).(h)</a> - AMAFCA's routine O&M activities address post-construction stormwater management at all AMAFCA facilities.	<ul style="list-style-type: none"><li>• As a cooperative program, AMAFCA contributes to the MRGSQT. AMAFCA's educational efforts are included in the MRGSQT Outcomes Report which will summarize, if applicable, the activities where educational materials were dispersed and shared with project developers. This report is available upon request and AMAFCA plans to share this document on its website.</li><li>• AMAFCA will provide MS4 training for its staff and invite other agencies responsible for construction projects. AMAFCA may participate in other agencies' MS4 trainings.</li><li>• AMAFCA's Post-Construction inspections and maintenance are conducted following the AMAFCA O&amp;M procedures (see Pollution Prevention /Good Housekeeping Control Measure).</li><li>• AMAFCA will only allow licensed staff or professionally licensed contractors to apply herbicides and pesticides within AMAFCA rights-of-way (AMAFCA does not apply fertilizers in its operations).</li><li>• AMAFCA will compile and document applicable program procedures in its MS4 Strategies and Procedures Notebook.</li></ul>	<b>Met FY 2022 Goals.</b> <ul style="list-style-type: none"><li>• AMAFCA participated in and contributed to the MRGSQT. AMAFCA sponsored the Land and Water Summit and participated in the planning committee. AMAFCA was involved with the 2022 planning committee for the Land and Water Summit. In addition, AMAFCA was a participant with the Arid LID Coalition (promotes the use of Low Impact Development &amp; Green Infrastructure practices in arid environments). In FY 2022, AMAFCA was not an attendee at the EPA Region 6 Stormwater Conference because not conference was held.</li><li>• AMAFCA only allows certified staff or professionally licensed contractors to apply herbicides and pesticides within AMAFCA right-of-way. This is also discussed in Pollution Prevention/Good Housekeeping and Public Education and Outreach Control Measures of this Annual Report.</li></ul>
2.6	70	Coordinate internally with all departments and boards with jurisdiction over the planning, review, permitting, or approval of public and private construction projects/ activities within the permit area as required in <a href="#">Part I.D.5.b.(iii)</a> related to developed hydrology mimicking pre-development hydrology.	<a href="#">Part I.D.5.b.(iii)</a> - AMAFCA does not have any internal departments or boards with jurisdiction. AMAFCA will coordinate with all entities as necessary. AMAFCA will coordinate internally and, to the extent possible and applicable, design AMAFCA facilities for compliance with developed hydrology mimicking pre-development hydrology. For AMAFCA led DMPs, Sediment Studies, Facility Plans, and WQ studies, AMAFCA will require, to the extent possible and applicable, that developed hydrology mimic pre-development hydrology. The NM OSE regulates the water delivery to the Rio Grande in order to meet water delivery requirements to Texas; therefore, AMAFCA's objective is to design its facilities to drain within 96 hours per the OSE requirements.	<ul style="list-style-type: none"><li>• AMAFCA will coordinate internally on studies and projects for MS4 Permit compliance with developed hydrology mimicking pre-development hydrology. AMAFCA will abide by the NM OSE rule and plan/design its facilities to drain within 96 hours per the OSE requirements.</li><li>• AMAFCA will continue to follow the standard practice for Drainage Master Plans (DMPs) options development and consider two options for developed condition hydrology flowrates and volumes: 1) determine pond locations and volumes required on a sub-basin by sub-basin basis to mimic pre-development hydrology and, 2) determine pond locations and volumes required on a regional approach basis to mimic pre-development hydrology.</li></ul>	<b>Met FY 2022 Goals.</b> <ul style="list-style-type: none"><li>• AMAFCA continued to coordinate internally related to developed hydrology mimicking pre-development hydrology. All active AMAFCA Drainage Management and Water Quality Plans considered the MS4 Permit stormwater quality design standard defined in Part I.D.5.b.(ii)(b).</li><li>• In FY 2022, the MRGSQT members continued discussions and agency implementation related to the Post-Construction Stormwater Quality Design Standards in the Middle Rio Grande Watershed study. This memo is available upon request.</li></ul>

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2.7	71	As required in <u>Part I.D.5.b.(iv)</u> , the permittee must assess all existing codes, ordinances, planning documents and other applicable regulations, for impediments to the use of GI/LID/Sustainable practices.	<u>Part I.D.5.b.(iv)</u> - AMAFCA does not have jurisdictional authority pertaining to codes, ordinances, planning documents and other applicable regulations, for impediments to the use of GI/LID/Sustainable practices.  AMAFCA will provide information, as requested, and coordinate with other watershed MS4s for assessment of existing codes, ordinances, planning documents and other applicable regulations for impediments to the use of GI/LID/Sustainable practices.  The NM OSE regulates the water delivery to the Rio Grande in order to meet water delivery requirements to Texas; therefore, AMAFCA's objective is to design its facilities to drain within 96 hours per the OSE requirements.	• AMAFCA will provide information, as requested, and coordinate and cooperate with other watershed MS4s for the assessment of existing codes, ordinances, planning documents, and other applicable regulations for impediments to the use of GI/LID/Sustainable practices.	<b>Met FY 2022 Goal.</b> • This Permit activity was conducted cooperatively with Bernalillo County in FY 2018. FY 2022 continued to focus on understanding the impediments and beginning discussions to address the findings. • AMAFCA participated as a review partner for the Bernalillo County's updated technical standards which includes the GSI/LID standards document. During FY 2020-2022, Bernalillo County began the process of updating its Technical Standards. Integration of GSI/LID into the Technical Standards and review process was a key focus of this update. As a part of this update, the County developed a stand-alone Green Stormwater Infrastructure / Low Impact Development Standards document that identifies GSI/LID best management practices (BMPs) that are arid-appropriate and support Bernalillo County's Stormwater Quality Ordinance, representing an increased commitment from the County toward the goal of broad implementation of GSI/LID in the Middle Rio Grande watershed.
2.8	72	As required in <u>Part I.D.5.b.(iv)</u> , develop and submit a report of the assessment findings on GI/LID/Sustainable practices.	<u>Part I.D.5.b.(iv)</u> - AMAFCA does not have jurisdictional authority pertaining to codes, ordinances, planning documents and other applicable regulations, for impediments to the use of GI/LID/Sustainable practices. However, to the extent permitted by law, AMAFCA will comply with the requirements of this section. AMAFCA will provide information, as requested, and coordinate with other watershed MS4s for assessment of existing codes, ordinances, planning documents and other applicable regulations for impediments to the use of GI/LID/Sustainable practices.	<b>Met Permit Requirement - Activity is Complete. No additional measurable goals.</b> • AMAFCA provided information, as requested, and coordinated and cooperated with other watershed MS4s for the development of a report of the assessment of finding from Part I.D.5.b.(iv). This was completed in March 2017 and was submitted to the EPA with the Annual Report, due Dec. 1, 2017.	<b>No Goals Required for FY 2022.</b> <b>Met Permit Requirement - Activity is Complete.</b> • This Permit activity was conducted cooperatively with Bernalillo County in FY 2017 and this activity is complete.

NOI Section	ID	Permit Activity Description	Plan SWMP Rev. 6 - July 1, 2021	Measurable Goal SWMP Rev. 6 - July 1, 2021	Status of Implementation and Performance Assessment Permit Year July 2021 to June 2022 (FY 2022)
Not Included in NOI	73	As required in <u>Part I.D.5.b.(v)</u> , Alternative compliance for infeasibility due to Site Constraints. <u>Part I.D.5.b.(v).(a)</u> - Infeasibility to manage the design standard volume specified in Part I.D.5.b.(ii).(b), or a portion of the design standard volume, onsite may result from site constraints including: <u>A.</u> too small a lot outside of the building footprint to create the necessary infiltrative capacity even with amended soils; <u>B.</u> soil instability as documented by a thorough geotechnical analysis; <u>C.</u> a site use that is inconsistent with capture and reuse of storm water; <u>D.</u> other physical conditions; or, <u>E.</u> to comply with applicable requirements for on-site flood control structures leaves insufficient area to meet the standard. <u>Part I.D.5.b.(v).(b)</u> - A determination that it is infeasible to manage the design standard volume specified in Part I.D.5.b.(ii).(b), or a portion of the design standard volume, on site may not be based solely on the difficulty or cost of implementing onsite control measures, but must include multiple criteria that rule out an adequate combination of the practices set forth in Part I.D.5.b.(v).	<u>Part I.D.5.b.(v).(a) and (b)</u> - As previously mentioned, all AMAFCA projects are regional flood control or stormwater quality projects that function as BMPs, and AMAFCA does not have jurisdictional authority pertaining to new development or redevelopment activities. Therefore, AMAFCA itself will likely not have requirements for alternative compliance regarding infeasibility to manage the post construction design standard volume. However, AMAFCA's regional facilities may offer other MS4s an option for alternative compliance to manage the post-construction stormwater quality volume. The on-site stormwater management decisions and feasibility will typically be determined during development by other agencies (COA, Bernalillo County, etc.). AMAFCA will continue coordination with and support these agency decisions, as appropriate. AMAFCA's involvement will typically occur during the development review or stake-holder review.	• AMAFCA will continue to coordinate with and support these agency decisions, as appropriate, related to on-site stormwater management decisions and feasibility. AMAFCA's involvement will typically occur during the development review or stake-holder review. AMAFCA's regional facilities may offer other MS4s an option for alternative compliance to manage the post-construction stormwater quality volume.	<b>Met FY 2022 Goal.</b> • AMAFCA coordinated with and supported community agency decisions, as appropriate, related to on-site stormwater management decisions and feasibility. AMAFCA's involvement typically occurred during the development review or stake-holder review.
Not Included in NOI	74	<u>Part I.D.5.b.(v)</u> continued - <u>Part I.D.5.b.(v).(c)</u> - This permit does not prevent imposition of more stringent requirements related to flood control. Where both the permittee's site design standard ordinance or policy and local flood control requirements on site cannot be met due to site conditions, the standard may be met through a combination of on-site and off-site controls. <u>Part I.D.5.b.(v).(d)</u> - Where applicable New Mexico water law limits the ability to fully manage the design standard volume on site, measures to minimize increased discharge consistent with requirements under New Mexico water law must still be implemented. <u>Part I.D.5.b.(v).(e)</u> - In instances where an alternative to compliance with the standard on-site is chosen, technical justification as to the infeasibility of on-site management of the entire design standard volume, or a portion of the design standard volume, is required to be documented by submitting to the permittee a site-specific hydrologic and/or design analysis conducted and endorsed by a registered professional engineer, geologist, architect, and/or landscape architect.	<u>Part I.D.5.b.(v).(c)</u> - AMAFCA's primary function is to provide regional flood control; this includes stormwater quality projects that function as BMPs. Flood control requirements will continue to be required. <u>Part I.D.5.b.(v).(d)</u> - The NM ISC/OSE regulates the water delivery to the Rio Grande in order to meet water delivery requirements to Texas; therefore, AMAFCA's objective is to design its facilities to drain within 96 hours per the OSE requirements. Using AMAFCA facilities for off-site mitigation would assure the community that New Mexico water law limits are being met at the AMAFCA facilities. <u>Part I.D.5.b.(v).(e)</u> - Alternatives to compliance for on-site requirements are discussed below. AMAFCA itself will likely not have requirements for alternative compliance regarding infeasibility to manage the post construction stormwater quality volume. However, AMAFCA's regional facilities may offer other MS4s an option for alternative compliance to manage the post construction stormwater quality volume.	• AMAFCA will continue its primary function is to provide regional flood control; this includes stormwater quality projects that function as BMPs. Flood control requirements will continue to be required. • AMAFCA will abide by the NM OSE rule and plan/design its facilities to drain within 96 hours per the ISC/OSE guidance document. Using AMAFCA facilities for off-site mitigation would assure the community that New Mexico water law limits are being met at the AMAFCA facilities. • AMAFCA's regional facilities may offer other MS4s an option for alternative compliance to manage the post construction stormwater quality volume.	<b>Met FY 2022 Goals.</b> • AMAFCA continued its primary function to provide regional flood control; this included stormwater quality projects that function as BMPs. Flood control requirements will continue to be required. • AMAFCA abided by the NM ISC/ OSE rule and plan/design its facilities to drain within 96 hours per the ISC/OSE requirements and guidelines. • AMAFCA continued discussions with Middle Rio Grande MS4 permittees regarding using AMAFCA's regional facilities as an option for alternative compliance to manage the post construction stormwater quality volume.

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Not Included in NOI	75	<p>As required in <u>Part I.D.5.b.(v).(f)</u>, when a Permittee determines a project applicant has demonstrated infeasibility due to site constraints specified in Part I.D.5.b.(v) to manage the design standard volume specified in Part I.D.5.b.(ii).(b) or a portion of the design standard volume on-site, the Permittee shall require one of the following mitigation options:</p> <p><u>A.</u> The off-site mitigation option only applies to redevelopment sites and cannot be applied to new development. Management of the standard volume, or a portion of the volume, may be implemented at another location within the MS4 area, approved by the permittee. The permittee shall identify priority areas within the MS4 in which mitigation projects can be completed and shall determine who will be responsible for long-term maintenance on off-site mitigation projects.</p> <p><u>B.</u> Implementation of a project that has been determined to provide an opportunity to replenish regional ground water supplies at an offsite location.</p> <p><u>C.</u> Payment in lieu may be made to the permittee, who will apply the funds to a public storm water project. MS4s shall maintain a publicly accessible database of approved projects for which these payments may be used.</p>	<p><u>Part I.D.5.b.(v).(f)</u> - AMAFCA may continue to coordinate with watershed MS4s and other entities within its jurisdiction to discuss areas requiring drainage and water quality improvements, project priorities, and multi-agency funding opportunities. Off-site stormwater quality mitigation projects will be included in these discussions. As part of the development of the AMAFCA Project Schedule, a system review will be completed. AMAFCA will publish projects, including schedule and cost sharing, in the biennial AMAFCA Project Schedule.</p> <p>AMAFCA, as part of the MS4 TAG, has discussed with EPA Region 6 (verbally and in writing) the MS4 Permit language for this section. The MS4 TAG members and EPA discussed how some of the terms/language of the Permit may limit the flexibility of the MS4s to allow off-site stormwater mitigation. The MS4s identified terms in the Permit which restrict the flexibility to achieve stormwater quality objectives by using alternate methods of compliance with post-construction permit requirements. The MS4 TAG provided this in writing to EPA on August 19, 2017 (letter from Dave Gatterman, SSCAFCA, "August 8, 2016 Meeting Follow-up"). This letter included scanned page 30 of Permit No. NMR04A000 to illustrate language changes the MS4 TAG think would allow the permittees to move forward and comply with both the Permit and state statute.</p> <p>Removing these limitations relative to post construction runoff will better allow the permittees flexibility to comply with New Mexico water law, protect the quality of the river, and not overly constrict development of our arid watershed. AMAFCA will continue discussions with EPA Region 6 regarding Permit language related to off-site stormwater mitigation.</p>	<p>• AMAFCA may coordinate with watershed MS4s as well as other entities during project review, complete a system review, and publish projects, including schedule and cost sharing, in the biennial AMAFCA Project Schedule. Off-site stormwater quality mitigation projects may be included in these discussions.</p> <p>• AMAFCA will continue discussions with EPA Region 6 regarding Permit language related to off-site stormwater mitigation. Removing these Permit limitations relative to post construction runoff will better allow the permittees flexibility to comply with New Mexico water law, protect the quality of the river, and not overly constrict development of our arid watershed.</p>	<p><b>Met FY 2022 Goals.</b></p> <p>• AMAFCA published the 2022 Project Schedule which covers a six-year planning horizon (2022-2027). Coordination meetings with watershed MS4s, TAG members, and other entities occurred during the development of this Project Schedule. Coordination meetings with watershed MS4s, TAG members, and other entities occurred during the development of this Project Schedule and included the ranking of stormwater quality projects.</p> <p>• AMAFCA continued discussions with stakeholders regarding Permit language related to off-site stormwater quality mitigation. Utilizing the Permit opportunities relative to post construction runoff will better allow the permittees flexibility to comply with New Mexico water law, protect the quality of the river and not overly constrict development of our arid watershed.</p>
2.9	76	<p>Estimation of the number of acres of IA and DCIA as required in <u>Part I.D.5.b.(vi)</u>.</p>	<p><u>Part I.D.5.b.(vi)</u> - AMAFCA will estimate the Impervious Area (IA) and Directly Connected Impervious Area (DCIA) within AMAFCA's jurisdiction and/or rights of way.</p>	<p>• AMAFCA will estimate the IA and DCIA within AMAFCA's jurisdiction and/or rights of way. AMAFCA will update this estimate, as appropriate, given development in the watersheds. This will be a cooperative effort with other watershed MS4s.</p>	<p><b>Met FY 2022 Goal.</b></p> <p>• This Permit activity was conducted cooperatively in FY 2022 and IA values were updated in FY 2022 with AMAFCA projects.</p>

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2.10	77	<p>Inventory and priority ranking as required in <a href="#">Part I.D.5.b.(vii)</a> for MS4-owned property and infrastructure (including public right-of-way) that may have the potential to be retrofitted with control measures designed to control the frequency, volume, and peak intensity of stormwater discharges to and from its MS4.</p> <p>The NM Office of the State Engineer (OSE) regulates the water delivery to the Rio Grande in order to meet water delivery requirements to Texas; therefore, AMAFCA's objective is to design its facilities to drain within 96 hours per the OSE requirements.</p>	<p><a href="#">Part I.D.5.b.(vii)</a> - AMAFCA will continue to keep an inventory and develop a priority ranking of AMAFCA owned properties and facilities that may have the potential for retrofitted control measures and stormwater quality facilities and BMPs. AMAFCA may continue to coordinate with watershed MS4s and other entities within its jurisdiction to discuss areas requiring drainage and water quality retrofits, project priorities, and multi-agency funding. AMAFCA will publish projects, including schedule and cost sharing, in the biennial AMAFCA Project Schedule. As part of the development of the AMAFCA Project Schedule, a system review will be completed. Internally, using the Project Schedule, water quality projects and water quality retrofit projects may be ranked and tabulated. AMAFCA may evaluate the existing BMPs based on their effectiveness and capacity in order to identify where additional BMPs are needed.</p> <p>AMAFCA is also a member of the cooperative MS4 TAG, facilitating cooperation and coordination with other watershed MS4s.</p> <p>AMAFCA will operate and maintain Levelloggers in major inlets into the NDC on AMAFCA ROW and analyze the data to assist in the priority ranking.</p> <p>AMAFCA will complete, as allowed, updated hydrologic analyses for the Rio Grande watersheds to assist with determining priority ranking.</p>	<ul style="list-style-type: none"> <li>• AMAFCA may continue to coordinate with watershed MS4s and other entities within its jurisdiction to discuss the areas requiring drainage and water quality retrofitting within the Middle Rio Grande Watershed, project priorities, and multi-agency funding contributions.</li> <li>• AMAFCA will publish the AMAFCA-funded projects, including the schedule and proposed cost-sharing, in the biennial AMAFCA Project Schedule. As part of the development of the AMAFCA Project Schedule, a system review will be completed. AMAFCA may utilize the Project Schedule, in part, to rank and tabulate water quality projects and water quality retrofit projects.</li> <li>• AMAFCA will continue membership and involvement in the cooperative MS4 TAG which will facilitate cooperation and coordination with other MS4s in the Middle Rio Grande.</li> <li>• AMAFCA will operate and maintain Levelloggers in major channel inlets into the NDC on AMAFCA ROW and analyze the data to assist with priority ranking.</li> <li>• AMAFCA will complete updated hydrologic analyses, utilizing the AMAFCA White Paper Methodology, for the NDC watersheds, to assist with determining priority ranking.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>• AMAFCA published the 2022 Project Schedule which covers a six-year planning horizon (2022-2027). Coordination meetings with watershed MS4s, TAG members, and other entities occurred during the development of this Project Schedule.</li> <li>• Coordination meetings with watershed MS4s, TAG members, and other entities occurred during the development of this Project Schedule and included the ranking of stormwater quality projects.</li> <li>• AMAFCA continued to operate and analyze data from 14 Levelloggers located at the channelized inlets to the NDC on AMAFCA ROW. Memos from this monitoring program are available upon request.</li> <li>• In FY 2022, AMAFCA continued working on Drainage Management Plans (DMPs) and Water Quality Plans to plan for flood protection and water quality volumes.</li> </ul>
2.11	78	<p>Incorporate watershed protection elements into regular planning or policy documents as required in <a href="#">Part I.D.5.b.(viii)</a>. As applicable to each permittee's MS4 jurisdiction, policy and/or planning documents must include the following:</p> <p><a href="#">Part I.D.5.b.(viii).(a)</a> - A description of master planning and project planning procedures to control the discharge of pollutants to and from the MS4.</p> <p><a href="#">Part I.D.5.b.(viii).(b)</a> - Minimize the amount of impervious surfaces (roads, parking lots, roofs, etc.) within each watershed, by controlling the unnecessary creation, extension and widening of impervious parking lots, roads and associated development.</p> <p><a href="#">Part I.D.5.b.(viii) (c)</a> - Identify environmentally and ecologically sensitive areas that provide water quality benefits and serve critical watershed functions within the MS4 and ensure requirements to preserve, protect, create and/or restore these areas are developed and implemented during the plan and design phases of projects in these identified areas.</p>	<p><a href="#">Part I.D.5.b.(viii).(a)</a> - AMAFCA will continue to produce and publish the biennial AMAFCA Project Schedule for all regional drainage and water quality projects within AMAFCA's jurisdiction that will either be led or partly funded by AMAFCA. For the projects led by AMAFCA, watershed protection elements may be incorporated, when feasible, into drainage management plans, as appropriate, in order to identify watersheds which can be retrofitted with regional water quality facilities.</p> <p><a href="#">Part I.D.5.b.(viii).(b)</a> - This section is not applicable to AMAFCA's projects, which are regional flood control or water quality projects.</p> <p><a href="#">Part I.D.5.b.(viii).(c)</a> - During planning of AMAFCA projects, environmentally and ecologically sensitive areas that provide water quality benefits are considered.</p>	<ul style="list-style-type: none"> <li>• Produce and publish the AMAFCA Project Schedule for CY 2016 and every other year thereafter.</li> <li>• AMAFCA may coordinate with MS4s to provide input for project planning of infrastructure retrofitting.</li> <li>• For projects led by AMAFCA, watershed protection elements may be incorporated into Drainage Management Plans, as appropriate, in order to identify watersheds which potentially can be retrofitted with regional water quality facilities.</li> <li>• All AMAFCA projects will obtain USFWS, USACE, and/or pueblo consultation, if required.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>• AMAFCA published the 2022 Project Schedule which covers a six-year planning horizon (2022-2027). Coordination meetings with watershed MS4s, TAG members, and other entities occurred during the development of this Project Schedule.</li> <li>• Coordination meetings with watershed MS4s, TAG members, and other entities occurred during the development of this Project Schedule and included the ranking of stormwater quality projects.</li> <li>• In FY 2022, AMAFCA continued working on Drainage Management Plans (DMPs) and Water Quality Plans to plan for flood protection and water quality volumes.</li> </ul>

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2.11	79	<p>Continuation of incorporate watershed protection elements into regular planning or policy documents as required in Part I.D.5.b.(viii).</p> <p><u>Part I.D.5.b.(viii).(d)</u> - Implement stormwater management practices that minimize water quality impacts to streams, including disconnecting direct discharges to surface waters from impervious surfaces such as parking lots.</p> <p><u>Part I.D.5.b.(viii).(e)</u> - Implement stormwater management practices that protect and enhance groundwater recharge as allowed under the applicable water rights laws.</p> <p><u>Part I.D.5.b.(viii).(f)</u> - Seek to avoid or prevent hydromodification of streams and other water bodies caused by development, including roads, highways, and bridges.</p> <p><u>Part I.D.5.b.(viii).(g)</u> - Develop and implement policies to protect native soils, prevent topsoil stripping, and prevent compaction of soils.</p> <p><u>Part I.D.5.b.(viii).(h)</u> - The program must be specifically tailored to address local community needs (e.g. protection to drinking water sources, reduction of water quality impacts) and must be designed to attempt to maintain pre-development runoff conditions.</p>	<p><u>Part I.D.5.b.(viii).(d)</u> - This section is rarely applicable to AMAFCA's projects. In the arid southwest, direct discharges to surface waters are rare.</p> <p><u>Part I.D.5.b.(viii).(e)</u> - The NM OSE regulates the water delivery to the Rio Grande in order to meet water delivery requirements to Texas; therefore, AMAFCA's objective is to design its facilities to drain within 96 hours per the OSE requirements.</p> <p><u>Part I.D.5.b.(viii).(f)</u> - AMAFCA projects, to the extent feasible and as consistent with O&amp;M of sediment removal, will continue to seek to avoid or prevent hydromodification of streams and other water bodies.</p> <p><u>Part I.D.5.b.(viii).(g)</u> - AMAFCA projects and those in coordination with other MS4s, will, to the extent possible, protect native soils, prevent topsoil stripping, and prevent compaction of soils.</p> <p><u>Part I.D.5.b.(viii).(h)</u> - AMAFCA does not have jurisdictional authority pertaining to development or redevelopment activities. However, through AMAFCA's involvement with the MRGSQT and TAG, AMAFCA will support programs tailored to address local community needs and that are designed to attempt to maintain pre-development runoff conditions.</p>	<p>• AMAFCA will develop written procedures that include applicable watershed protection elements in Part I.D.5.b.(viii).(f), (g) and (h) as required in the MS4 Permit and as applicable to AMAFCA.</p> <p>• AMAFCA will continue to contribute and participate in the MRGSQT, which supports programs tailored to address local community needs and are designed to attempt to maintain pre-development runoff conditions.</p> <p>• AMAFCA will complete updated hydrologic analyses, utilizing the AMAFCA White Paper Methodology, for the NDC watersheds, to assist with understanding options for maintaining pre-development runoff conditions.</p>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>• Many of these applicable Permit activities are being conducted cooperatively.</li> <li>• AMAFCA continued to contribute and participate in the MRGSQT, which supports programs tailored to address local community needs and are designed to attempt to maintain pre-development runoff conditions.</li> </ul>

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Not Included in NOI	80	<p>Update the SWMP document and annual report as required in Part I.D.5.b.(ix) and Part I.D.5.b.(x). The permittee must update the SWMP as necessary to include a description of the mechanism(s) utilized to comply with the permit elements listed above as well as the citations/descriptions of design standards for structural and non-structural controls to control pollutants in runoff. The following information must be included in each Annual Report:</p> <p>Part I.D.5.b.(x).(a) - Include a summary and analysis of all maintenance, inspections and enforcement, and the number and frequency of inspections performed annually.</p> <p>Part I.D.5.b.(x).(b) - A cumulative listing of the annual modifications made to the Post-Construction Stormwater Management Program, and</p> <p>Part I.D.5.b.(x).(c) - According to the schedule presented in Table 3, the permittee must:</p> <p>A. Report the no. of MS4-owned properties and infrastructure that have been retrofitted with control measures designed to control the frequency, volume, and peak intensity of stormwater discharges.</p> <p>B. As required in Part I.D.5.b.(vi), report the tabulated results for IA &amp; DCIA and its estimation methodology.</p>	<p>Part I.D.5.b.(ix) - AMAFCA will update the SWMP as necessary to comply with the permit elements listed above as well as the citations and descriptions of design standards for structural and non-structural controls to control pollutants in stormwater runoff, including discussion of the methodology used during design for estimating impacts to water quality and selecting structural and non-structural controls.</p> <p>Part I.D.5.b.(x).(a) - AMAFCA tracks all crew activity related to maintenance of all water quality structures.</p> <p>Part I.D.5.b.(x).(b) - AMAFCA does not have any development or redevelopment projects - all AMAFCA projects are regional flood control or water quality projects. AMAFCA will continue to maintain a cumulative listing of the annual modifications made to the Post-Construction Stormwater Management Program.</p> <p>Part I.D.5.b.(x).(c).A - AMAFCA will continue to maintain a list of properties and infrastructure within AMAFCA rights-of-way that have been retrofitted with control measures designed to control frequency, volume and peak intensity of stormwater discharges.</p> <p>Part I.D.5.b.(x).(c).B - AMAFCA will estimate the Impervious Area (IA) and Directly Connected Impervious Area (DCIA) within AMAFCA's jurisdiction and/or rights of way (refer to ID 76).</p>	<p>• AMAFCA will update the SWMP as necessary to comply with the permit elements listed above.</p> <p>• AMAFCA will continue to annually inspect and track all crew activity related to maintenance of all AMAFCA owned water quality structures.</p> <p>• AMAFCA will continue to maintain a cumulative listing of the annual modifications made to the Post-Construction Stormwater Management Program.</p> <p>• AMAFCA will continue to provide a cumulative list of AMAFCA's retrofit BMPs. AMAFCA will incorporate documentation by reference into the Annual Report and plans to document progress on the AMAFCA website.</p> <p>• AMAFCA will estimate the IA and DCIA within AMAFCA's jurisdiction and/or rights of way. AMAFCA will update this estimate, as appropriate, given development in the watersheds. This will be a cooperative effort with other watershed MS4s (refer to ID 76).</p>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>• AMAFCA conducted site inspections for 100% of the AMAFCA construction projects in accordance with this MS4 Permit in FY 2022.</li> <li>• Lists of MS4 program modifications and facility modifications/retrofits are available upon request.</li> </ul>



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2.12	81	Enhance the program to include the elements in <u>Part I.D.5.b.(xi)</u> and <u>Part I.D.5.a.(xii)</u> . These include: <u>Part I.D.5.b.(xi)</u> - Use of stormwater educational materials; and <u>Part I.D.5.b.(xii)</u> - When choosing appropriate BMPs, the permittee may participate in locally-based watershed planning efforts, which attempt to involve a diverse group of stakeholders including interested citizens. and <u>Part I.D.5.b.(xiii)</u> - The permittee may incorporate the following elements in the Post-Construction Stormwater Management in New Development and Redevelopment program required in Part I.D.5.b.(ii)(b): (a) Provide requirements and standards to direct growth to identified areas to protect environmentally and ecologically sensitive areas such as floodplains and/or other areas with endangered species and historic properties concerns; (b) Include requirements to maintain and/or increase open space/buffers along sensitive water bodies, minimize impervious surfaces, and minimize disturbance of soils and vegetation; and (c) Encourage in fill development in higher density urban areas, and areas with existing storm sewer infrastructure.	<u>Part I.D.5.b.(xi)</u> - As part of the MRGSQT, AMAFCA will continue to use stormwater educational materials, either developed locally or provided by EPA, NMED environmental groups, public interest groups, trade organizations, and/or other MS4 as well as utilizing the MRGSQT. <u>Part I.D.5.b.(xii)</u> - AMAFCA may continue to participate in the watershed-planning efforts with other MS4s in order to publish the AMAFCA Project Schedule biennially. AMAFCA will continue membership and involvement in the cooperative MS4 TAG, which will facilitate cooperation and coordination with other MS4s in the Middle Rio Grande watershed. <u>Part I.D.5.b.(xiii)</u> - These program enhancements are outside the AMAFCA's authority and mission. However, AMAFCA will cooperate with other watershed MS4s, as applicable, to support this program enhancement.	<ul style="list-style-type: none"> <li>• AMAFCA will continue to contribute and participate in the MRGSQT. The MRGSQT Outcomes Report will summarize the activities where educational materials were dispersed and shared with the public. This report is available upon request and AMAFCA plans to share this document on its website.</li> <li>• AMAFCA may coordinate with MS4s for project planning of infrastructure retrofitting. AMAFCA will continue to produce and publish the AMAFCA Project Schedule for CY 2016 and every other year thereafter.</li> <li>• AMAFCA will continue membership and involvement in the cooperative MS4 Technical Advisory Group (MS4 TAG) which will facilitate cooperation and coordination with other MS4s in the Middle Rio Grande.</li> </ul>	<b>Met FY 2022 Goals.</b> <ul style="list-style-type: none"> <li>• AMAFCA continued to contribute and participate in the MRGSQT, which supports post-construction education and outreach programs. The MRGSQT Outcomes Report is available upon request.</li> <li>• AMAFCA published the 2022 Project Schedule which covers a six-year planning horizon (2022-2027). Coordination meetings with watershed MS4s, TAG members, and other entities occurred during the development of this Project Schedule. Coordination meetings with watershed MS4s, TAG members, and other entities occurred during the development of this Project Schedule and included the ranking of stormwater quality projects.</li> <li>• AMAFCA continued to be involved in the MS4 TAG group, facilitating cooperation and coordination with other MS4s in the Middle Rio Grande.</li> <li>• AMAFCA participated as a review partner for the Bernalillo County's updated technical standards which includes the GSI/LID standards document. During FY 2020-2022, Bernalillo County began the process of updating its Technical Standards. Integration of GSI/LID into the Technical Standards and review process was a key focus of this update. As a part of this update, the County developed a stand-alone Green Stormwater Infrastructure / Low Impact Development Standards document that identifies GSI/LID best management practices (BMPs) that are arid-appropriate and support Bernalillo County's Stormwater Quality Ordinance, representing an increased commitment from the County</li> </ul>
2.13	82	Item from MS4 Permit NOI. Describe other proposed activities to address the Post-Construction Stormwater Management in New Development and Redevelopment Measure.	Because AMAFCA is a flood control authority, the legal authority and jurisdiction granted to it by the State of New Mexico is limited. AMAFCA has begun requiring, and will continue to require, MS4 permit elements into construction contracts.	<ul style="list-style-type: none"> <li>• AMAFCA will continue, as appropriate, to insert MS4 Permit elements into construction contracts to provide AMAFCA with a contractual mechanism for MS4 elements.</li> </ul>	<b>Met FY 2022 Goals.</b> <ul style="list-style-type: none"> <li>• AMAFCA continued to, as appropriate, insert MS4 Permit elements into construction contracts to provide AMAFCA with a contractual mechanism for MS4 elements.</li> </ul>

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	83	<b>TABLE 4: Pollution Prevention/Good Housekeeping for Municipal/Co-permittee Operations - Part I.D.5.c</b>			
3.1	84	Develop or update the Pollution Prevention/Good Housekeeping program to include the elements in Part I.D.5.c.(i). Elements include: <u>Part I.D.5.c.(i).(a)</u> - Employee training program to incorporate pollution prevention and good housekeeping, including a tracking procedure; <u>Part I.D.5.c.(i).(b)</u> - O&M activities, schedules, and long term inspections procedures for structural and non-structural stormwater controls; <u>Part I.D.5.c.(i).(c)</u> - Controls for reducing or eliminating the discharge of pollutants from AMAFCA maintenance and storage yards and shop; <u>Part I.D.5.c.(i).(d)</u> - Procedures for properly disposing of waste removed from separate storm sewers and facilities listed in Part I.D.5.c.(i).(c) (such as dredged spoil, accumulated sediments, floatables, and other debris); <u>Part I.D.5.c.(i).(e)</u> - Procedures to ensure that new flood management projects assess the impacts on water quality and examine existing projects for incorporating additional water quality protection devices or practices .	<u>Part I.D.5.c.(i)</u> - AMAFCA will continue its Pollution Prevention/Good Housekeeping Program. <u>Part I.D.5.c.(i).(a)</u> - AMAFCA will continue employee training to incorporate pollution prevention and good housekeeping; <u>Part I.D.5.c.(i).(b)</u> - AMAFCA will adhere to its current O&M and Safety procedures, which include employee training for maintenance of AMAFCA flood control and water quality facilities and BMPs. <u>Part I.D.5.c.(i).(c)</u> - AMAFCA will implement and maintain controls for reducing the discharge of pollutants from AMAFCA maintenance and storage yards and shop; <u>Part I.D.5.c.(i).(d)</u> - AMAFCA will develop procedures, where appropriate, for properly disposing of waste removed from AMAFCA facilities (sediment, floatables, and other debris); <u>Part I.D.5.c.(i).(e)</u> - AMAFCA ensures that new projects will assess the impacts on water quality and existing projects will be examined for retrofit opportunities as part of AMAFCA's Post Construction Control Measures.	<ul style="list-style-type: none"><li>• AMAFCA will document training provided to its employees &amp; include pollution prevention and good housekeeping into training, as needed.</li><li>• AMAFCA encourages that crew members are trained in spill prevention &amp; control, as well as truck fueling activities during the Permit term.</li><li>• AMAFCA will adhere to its current O&amp;M and Safety Procedures.</li><li>• In the Annual Report, AMAFCA will consider projected costs for the operation and maintenance of its stormwater quality facilities.</li><li>• AMAFCA will continue development of this program element in its MS4 Strategies and Procedures Notebook. This will address stormwater controls for AMAFCA's yard and standard operating procedures, as applicable, for disposal activities.</li><li>• AMAFCA will review new projects to assess the impacts on water quality and will examine existing projects for retrofit opportunities as part of AMAFCA's Post Construction Control Measure.</li></ul>	<b>Met FY 2022 Goals.</b> <ul style="list-style-type: none"><li>• In FY 2022, stormwater continued to be a topic at the weekly staff and monthly crew meetings, including discussions related to pollution prevention and good housekeeping.</li><li>• Training records for AMAFCA staff &amp; crew is available upon request.</li><li>• In FY 2022, AMAFCA adhered to its current O&amp;M and Safety Procedures.</li><li>• The FY 2022 annual cost for maintenance of its stormwater quality facilities is available upon request.</li><li>• Refer to AMAFCA's Post Construction Control Measure in this Annual Report for additional information on new and retrofit project assessments for impacts on water quality.</li><li>• AMAFCA published the 2022 Project Schedule which covers a six-year planning horizon (2022-2027). Coordination meetings with watershed MS4s, TAG members, and other entities occurred during the development of this Project Schedule. Coordination meetings with watershed MS4s, TAG members, and other entities occurred during the development of this Project Schedule and included the ranking of stormwater quality projects.</li></ul>
3.2	85	The program will include the elements in Part I.D.5.c.(ii). These include: <u>Part I.D.5.c.(ii).(a)</u> - Develop or update the existing list of all stormwater quality facilities by drainage basin, including location and description;	<u>Part I.D.5.c.(ii).(a)</u> - As part of the Program, AMAFCA will continue to up-date a map of all stormwater quality facilities by drainage basin, including location and description.	<ul style="list-style-type: none"><li>• AMAFCA will continue to up-date a map of all AMAFCA stormwater quality facilities by drainage basin, including location and description.</li></ul>	<b>Met FY 2022 Goal.</b> <ul style="list-style-type: none"><li>• AMAFCA's crew tracking system and database lists each of its stormwater quality facilities, by drainage basin. These facilities are also shown on AMAFCA Maintenance Map, available online: <a href="http://www.amafca.org/maps-2/">http://www.amafca.org/maps-2/</a></li></ul>
3.2	86	<u>Part I.D.5.c.(ii).(b)</u> - Develop or modify existing operational manual for de-icing activities addressing alternate materials and methods to control impacts to stormwater quality;	<u>Part I.D.5.c.(ii).(b)</u> - N/A - AMAFCA only has jurisdiction to maintain its facilities; AMAFCA does not engage in the following: de-icing, roadway debris control, street sweeping, or roadway pollutant removal.	N/A	N/A
3.2 & 3.4	87	<u>Part I.D.5.c.(ii).(c)</u> - Develop or modify existing program to control pollution in stormwater runoff from equipment and vehicle maintenance yards and maintenance center operations located within the MS4;	<u>Part I.D.5.c.(ii).(c)</u> - For compliance with this section of the MS4 Permit, AMAFCA's focus is to evaluate and modify, where necessary, the existing program to control pollution in stormwater runoff from AMAFCA's equipment and vehicle maintenance yard and satellite facilities.	<ul style="list-style-type: none"><li>• AMAFCA will continue to implement and maintain the recommended administrative and structural BMPs, as appropriate, from the Good Housekeeping Inspection Reports for AMAFCA facilities.</li><li>• AMAFCA will continue development of this program element in its MS4 Strategies and Procedures Notebook.</li></ul>	<b>Met FY 2022 Goals.</b> <ul style="list-style-type: none"><li>• AMAFCA continued to review the Good Housekeeping Assessments for AMAFCA facilities.</li></ul>

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3.2	88	Part <u>I.D.5.c.(ii).(d)</u> - Develop or modify existing street sweeping program. Assess possible benefits from changing frequency or timing of sweeping activities or utilizing different equipment for sweeping activities;	Part <u>I.D.5.c.(ii).(d)</u> - N/A - AMAFCA only has jurisdiction to maintain its facilities; AMAFCA does not engage in the following: de-icing, roadway debris control, street sweeping, or roadway pollutant removal.	N/A	N/A

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3.2	89	<u>Part I.D.5.c.(ii).(e)</u> - A description of procedures used by permittees to target roadway areas most likely to contribute pollutants to and from the MS4 (i.e., runoff discharges directly to sensitive receiving water, roadway receives majority of de-icing material, roadway receives excess litter, roadway receives greater loads of oil and grease);	<u>Part I.D.5.c.(ii).(e)</u> - AMAFCA only has jurisdiction to maintain its facilities; AMAFCA does not engage in the following: de-icing, roadway debris control, street sweeping, or roadway pollutant removal. AMAFCA will continue coordination, as applicable, with other MS4s in the watershed related to illicit discharge detection and elimination from roadways - refer to the Illicit Discharges and Improper Disposal Control Measure.	N/A	N/A
3.2	90	<u>Part I.D.5.c.(ii).(f)</u> - Develop or revise existing standard operating procedures for collection of used motor vehicle fluids (at a minimum oil and antifreeze) and toxics (including paint, solvents, fertilizers, pesticides, herbicides, and other hazardous materials) used in permittee operations or discarded in the MS4, for recycle, reuse, or proper disposal.	<u>Part I.D.5.c.(ii).(f)</u> - For compliance with this section of the MS4 Permit, AMAFCA's focus is to evaluate and modify, where necessary, the existing program to control pollution in stormwater runoff from the equipment and vehicle maintenance yard.	<ul style="list-style-type: none"> <li>• AMAFCA will maintain the existing program to control polluted stormwater runoff from its equipment and maintenance yard.</li> <li>• AMAFCA will continue to implement and maintain the recommended BMPs, as appropriate, from the Good Housekeeping Inspection Report for AMAFCA facilities.</li> <li>• AMAFCA will continue development of this program element in its MS4 Strategies and Procedures Notebook.</li> </ul>	<b>Met FY 2022 Goals.</b> <ul style="list-style-type: none"> <li>• AMAFCA continued the existing program to control pollutants to stormwater runoff from its equipment and maintenance yard.</li> <li>• AMAFCA coordinated with local landfills for appropriate testing requirements for material disposal as a result of maintaining agency equipment, as needed.</li> <li>• AMAFCA continued to review the Good Housekeeping Assessments for AMAFCA facilities.</li> </ul>

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3.2	91	Part I.D.5.c.(ii).(g) - Standard operating procedure for disposal of accumulated sediments, floatables, and debris;	Part I.D.5.c.(ii).(g) - AMAFCA performs waste disposal for sediment, floatables, and other debris in accordance with the "AMAFCA Operations and Maintenance Manual for Dams" and "AMAFCA Operation and Maintenance Repair Replacement and Rehabilitation Manual" (OMRRR). As a cooperative program, AMAFCA is a participant in an OMRRR with Bernalillo County, the MRGCD, and the Bureau of Reclamation related to facilities that are connected to MRGCD ditches (primarily in the SW Valley of Albuquerque).	<ul style="list-style-type: none"> <li>Continue to perform all waste disposal for sediment, floatables, and other debris in accordance with the operation and maintenance manuals and direct vendor contractors to collect and dispose of trash, floatables, and debris.</li> <li>AMAFCA will develop standard operating procedures, as applicable, for these disposal activities and include them in the program's MS4 Strategies and Procedures Notebook section.</li> <li>AMAFCA will continue to participate, as appropriate, in the Operation Maintenance Repair, Replacement, and Rehabilitation (OMRRR) - Southwest Valley Flood Reduction Project cooperative program with MRGCD, Bernalillo County, and Bureau of Reclamation.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>AMAFCA continued to perform all waste disposal for sediment, floatables and other debris in accordance with the O&amp;M manuals and direct vendor contractors to collect and dispose of trash, floatables, and debris.</li> <li>AMAFCA continued to follow standard operating procedures, as applicable.</li> <li>AMAFCA coordinated with local landfills for appropriate testing requirements for material disposal as a result of maintaining agency equipment, as needed.</li> <li>AMAFCA continued to participate in the OMRRR - cooperative program with MRGCD, Bernalillo County, and Bureau of Reclamation.</li> </ul>
3.2	92	Part I.D.5.c.(ii).(h) - litter source control program, include targeted public awareness campaign;	Part I.D.5.c.(ii).(h) - Through involvement in the MRGSQT, AMAFCA will continue to collaborate with the MS4 permittees to improve upon the existing litter source control program, including a targeted public awareness campaign.	<ul style="list-style-type: none"> <li>AMAFCA will continue its involvement with and financial support of the MRGSQT.</li> <li>AMAFCA will continue to collaborate with the MS4 permittees to improve upon the existing litter source control program.</li> <li>The MRGSQT Outcomes Report is available upon request and AMAFCA plans to share this document on its website.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>AMAFCA continued to contribute and participate in the MRGSQT, which supports litter source control public awareness programs. The MRGSQT Outcomes Report is available upon request. A summary of trash removed from each AMAFCA facility is available upon request.</li> </ul>
3.2	93	Part I.D.5.c.(ii).(i) - Develop or review and revise, as necessary, the criteria, procedures and schedule to evaluate existing flood control devices, structures and drainage ways to assess the potential of retrofitting to provide additional pollutant removal from stormwater. Implement routine review to ensure new and/or innovative practices are implemented where applicable.	Part I.D.5.c.(ii).(i) - AMAFCA may continue to coordinate with watershed MS4s and other entities within its jurisdiction to discuss areas requiring drainage and water quality retrofits, project priorities, and multi-agency funding. AMAFCA will publish projects, including schedule and cost sharing, in the biennial AMAFCA Project Schedule.  Operation and Maintenance procedures, inspections, repairs, and retrofits are evaluated through the annual cooperative Agency and Area Wide and Miscellaneous contracts.	<ul style="list-style-type: none"> <li>AMAFCA may continue to coordinate with watershed MS4s and other entities within its jurisdiction to discuss the areas requiring drainage and water quality retrofitting within the Middle Rio Grande Watershed, project priorities, and multi-agency funding contributions. AMAFCA will continue to produce and publish the biennial AMAFCA Project Schedule, which includes projects for retrofitting existing flood control devices, structures and drainage ways to provide additional pollutant removal from stormwater.</li> <li>AMAFCA will continue to participate in the cooperative Agency and Area Wide contract and utilize the Miscellaneous contract to address rehabilitation, repair, and retrofit activities for AMAFCA structures.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>AMAFCA published the 2022 Project Schedule which covers a six-year planning horizon (2022-2027). Coordination meetings with watershed MS4s, TAG members, and other entities occurred during the development of this Project Schedule. Coordination meetings with watershed MS4s, TAG members, and other entities occurred during the development of this Project Schedule and included the ranking of stormwater quality projects.</li> <li>AMAFCA continued to utilize the Agency and Area Wide and Miscellaneous contracts to address rehabilitation, repair and retrofit activities for AMAFCA structures and cooperative maintenance projects.</li> </ul>

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3.2	94	<u>Part I.D.5.c.(ii).(j)</u> - Enhance inspection and maintenance programs by coordinating with maintenance personnel to ensure that a target number of structures per basin are inspected and maintained per quarter;	<u>Part I.D.5.c.(ii).(j)</u> - AMAFCA has in place a well-defined and implemented routine inspection and O&M program that includes both formal and informal inspections and maintenance schedules. This program will be enhanced to ensure a target number of structures per basin are inspected and maintained per quarter, as required by the MS4 Permit, for annual compliance with the MS4 Permit.  AMAFCA will enhance its inspection and maintenance programs, as required by the MS4 Permit, through improved coordination with the Stormwater Quality Engineer, Field Engineer, Maintenance Superintendent, and AMAFCA Maintenance Crew. AMAFCA will, depending on funding available, utilize the Agency and Area Wide and Miscellaneous contracts to address portions of the required inspection and maintenance.	<ul style="list-style-type: none"> <li>AMAFCA will continue coordination between maintenance personnel and staff to ensure that, on average, two (2) structures per basin are inspected and maintained per quarter.</li> <li>AMAFCA will, depending on funding available, utilize the Agency and Area Wide and Miscellaneous contracts to address portions of the required inspection and maintenance.</li> </ul>	<b>Met FY 2022 Goals.</b> <ul style="list-style-type: none"> <li>AMAFCA O&amp;M activities are discussed at weekly staff and monthly crew meetings and allowing coordination among staff and crew.</li> <li>In this Permit term, AMAFCA's Field Engineer and Maintenance Crew inspected AMAFCA structures as required by the MS4 Permit.</li> <li>AMAFCA continued to participate in the Agency and Area Wide contract and issue tasks under the annual Miscellaneous contract to address rehabilitation, repair and retrofit activities for AMAFCA structures.</li> </ul>
3.2	95	<u>Part I.D.5.c.(ii).(k)</u> - Enhance the existing program to control the discharge of floatables and trash from the MS4 by implementing source control of floatables in industrial and commercial areas;	<u>Part I.D.5.c.(ii).(k)</u> - AMAFCA does not have jurisdiction over industrial and commercial areas in the MS4. AMAFCA will continue coordination with the MRG MS4s, as well as involvement with the MRGSQT and the MS4 TAG, to enhance the program to control the discharge of floatables and trash from the MS4 by implementing source control of floatables in industrial and commercial areas.	<ul style="list-style-type: none"> <li>AMAFCA will continue its involvement with and financial support of the MRGSQT.</li> <li>AMAFCA will continue to collaborate with the MS4 permittees to improve upon the source control of floatables in industrial and commercial areas.</li> <li>AMAFCA will continue membership and involvement in the cooperative MS4 TAG.</li> </ul>	<b>Met FY 2022 Goals.</b> <ul style="list-style-type: none"> <li>AMAFCA continued to contribute and participate in the MRGSQT, which supports trash and litter control public awareness programs.</li> <li>AMAFCA continued to be involved in the MS4 TAG group, facilitating cooperation and coordination with other MS4s in the Middle Rio Grande.</li> </ul>
3.2	96	<u>Part I.D.5.c.(ii).(l)</u> - Include in each Annual Report, a cumulative summary of retrofit evaluations conducted during the permit term on existing flood control devices, structures and drainage ways to benefit water quality. Update the SWMP to include a schedule (with priorities) for identified retrofit projects;	<u>Part I.D.5.c.(ii).(l)</u> - AMAFCA may continue to coordinate with watershed MS4s and other entities within its jurisdiction to discuss areas requiring drainage and water quality retrofits, project priorities, and multi-agency funding. As part of the development of the AMAFCA Project Schedule, a system review will be completed. AMAFCA will publish projects, including schedule and cost sharing, in the biennial AMAFCA Project Schedule. Using the Project Schedule process, water quality projects and water quality retrofit projects may be ranked and prioritized.	<ul style="list-style-type: none"> <li>AMAFCA will continue to provide a cumulative list of AMAFCA's retrofit BMPs. AMAFCA will incorporate documentation by reference into the Annual Report and plans to document progress on the AMAFCA website - refer to the Post-Construction Control Measure.</li> <li>AMAFCA will continue including facility evaluations as part of AMAFCA studies, including drainage management plans, facility plans, and other analysis projects, as appropriate.</li> <li>AMAFCA will continue to include BMP/water quality facility retrofit projects in the biennial Project Schedule.</li> </ul>	<b>Met FY 2022 Goals.</b> <ul style="list-style-type: none"> <li>AMAFCA published the 2022 Project Schedule which covers a six-year planning horizon (2022-2027). Coordination meetings with watershed MS4s, TAG members, and other entities occurred during the development of this Project Schedule. Coordination meetings with watershed MS4s, TAG members, and other entities occurred during the development of this Project Schedule and included the ranking of stormwater quality projects.</li> </ul>

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3.2	97	<p><u>Part I.D.5.c.(ii).(m)</u> - Flood management projects: review and revise, as necessary, technical criteria guidance documents and program for the assessment of water quality impacts and incorporation of water quality controls into future flood control projects. The criteria guidance document must include the following elements:</p> <p><u>Part I.D.5.c.(ii).(m).A.</u> - Describe how new flood control projects are assessed for water quality impacts.</p> <p><u>Part I.D.5.c.(ii).(m).B.</u> - Provide citations and descriptions of design standards that ensure water quality controls are incorporated in future flood control projects.</p> <p><u>Part I.D.5.c.(ii).(m).C.</u> - Include method for permittees to update standards with new and/or innovative practices.</p> <p><u>Part I.D.5.c.(ii).(m).D.</u> - Describe master planning and project planning procedures and design review procedures.</p>	<p><u>Part I.D.5.c.(ii).(m).A.</u> - AMAFCA, through its processes, will assess new flood control projects for water quality impacts. As new flood control projects are constructed, AMAFCA will consider the appropriate time and location for the collection of water quality data to assess project water quality impacts. During facility planning, AMAFCA will adhere to current and future drainage and water quality management plans passed by the AMAFCA Board of Directors, Bernalillo County Commission, or Albuquerque City Council. AMAFCA will continue its proactive policy of incorporating stormwater quality BMPs into new flood control projects when feasible. AMAFCA will publish projects, including schedule and cost sharing, in the biennial AMAFCA Project Schedule. Using the Project Schedule process, water quality projects and water quality retrofit projects may be ranked and prioritized.</p> <p><u>Part I.D.5.c.(ii).(m).B.</u> - AMAFCA is assessing the use of National design standards related to water quality controls.</p> <p><u>Part I.D.5.c.(ii).(m).C.</u> - AMAFCA will continually assess design standards and practices, technical specifications, and BMPs and implement them, as applicable.</p> <p><u>Part I.D.5.c.(ii).(m).D.</u> - AMAFCA has established procedures for master planning through its Drainage Master Plan development, project planning procedures using its Project Schedule, and design review procedures used by its Development Review Engineer.</p>	<p>• AMAFCA has all of the elements of the Technical Criteria Guidance Document as part of their various programs but not as part of one document. Many of these elements are done in cooperation with watershed MS4s.</p> <p>• AMAFCA's Project Schedule process includes, in part, coordination with watershed MS4s, TAG members, and other entities within its jurisdiction and may include the ranking of flood control and stormwater quality projects.</p> <p>• AMAFCA is assessing the use of National design standards related to water quality controls.</p> <p>• AMAFCA will continually assess design standards and practices and implementing them, as applicable.</p> <p>• AMAFCA will continue to follow its established procedures for Drainage Master Plan development, project planning procedures using its Project Schedule, and design review procedures used by its Development Review Engineer.</p>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>• AMAFCA published the 2022 Project Schedule which covers a six-year planning horizon (2022-2027). Coordination meetings with watershed MS4s, TAG members, and other entities occurred during the development of this Project Schedule.</li> <li>• Coordination meetings with watershed MS4s, TAG members, and other entities occurred during the development of this Project Schedule and included the ranking of stormwater quality projects.</li> <li>• AMAFCA is assessing the use of ASCE's "Standard Guidelines for the Design of Urban Stormwater Systems, Standard Guidelines for Installation of Urban Stormwater Systems, and Standard Guidelines for the Operation and Maintenance of Urban Stormwater Systems" for national design standards related to water quality controls.</li> <li>• AMAFCA participated as a review partner for the Bernalillo County's updated technical standards which includes the GSI/LID standards document. During FY 2020-2022, Bernalillo County began the process of updating its Technical Standards. Integration of GSI/LID into the Technical Standards and review process was a key focus of this update. As a part of this update, the County developed a stand-alone Green Stormwater Infrastructure / Low Impact Development Standards document that identifies GSI/LID best management practices (BMPs) that are arid-appropriate and support Bernalillo County's Stormwater Quality Ordinance, representing an increased commitment from the County toward the goal of broad implementation of GSI/LID in the</li> </ul>
3.2	98	<p><u>Part I.D.5.c.(ii).(n)</u> -Develop procedures to control the discharge of pollutants related to the storage and application of pesticides, herbicides, and fertilizers applied, by the permittee's employees or contractors, to public right-of-ways, parks, and other municipal property. The permittee must provide an updated description of the data monitoring system for all permittee departments utilizing pesticides, herbicides and fertilizers.</p>	<p><u>Part I.D.5.c.(ii).(n)</u> - AMAFCA will only allow licensed staff or professionally licensed contractors to apply herbicides and pesticides within AMAFCA rights-of-way (AMAFCA does not apply fertilizers in its operations). In addition, AMAFCA will review, as necessary, leases and licenses, to ensure wording is included addressing the control of discharge of pollutants related to the storage and application of pesticides, herbicides, and fertilizers applied by entities leasing or licensed to use AMAFCA lands. AMAFCA will develop a tracking system to monitor herbicides and pesticides within AMAFCA rights-of-way (AMAFCA does not apply fertilizers in its operations). AMAFCA will store all herbicides and pesticides according to direction by product vendors.</p>	<p>• AMAFCA personnel will typically not apply fertilizers in its operations.</p> <p>• AMAFCA will only allow professional licensed contractors or licensed crew members to apply herbicides and pesticides within AMAFCA rights-of-way.</p> <p>• AMAFCA will be reviewing, as necessary, leases and licenses, to ensure wording is included addressing the control of discharge of pollutants related to the storage and application of herbicides, pesticides, and fertilizers applied by entities leasing or licensed to use AMAFCA lands.</p> <p>• AMAFCA will continue developing a tracking system to monitor herbicide and pesticide applications within AMAFCA ROW.</p> <p>• AMAFCA will store all herbicides and pesticides according to direction by product vendors.</p>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>• In FY 2022, the AMAFCA licensed crew member or professional licensed contractors were used when herbicide and/or pesticide application was necessary.</li> <li>• Herbicide and pesticide storage was reviewed as part of the Good Housekeeping assessment.</li> <li>• AMAFCA has a tracking system for the herbicide and pesticide inventory.</li> </ul>
3.3	99	<p>Develop or update a list and a map of industrial facilities owned or operated by the permittee as required in <u>Part I.D.5.c.(iii)</u>.</p>	<p><u>Part I.D.5.c.(iii)</u> - N/A - No EPA Multi Sector General Permit (MSGP) facilities within AMAFCA rights-of-way. This has been discussed and confirmed with NMED. This was submitted to EPA in AMAFCA's NOI and accepted.</p>	N/A	N/A



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Not Included in NOI	100	Update the SWMP document and annual report as required in I.D.5.c.(iv) and Part I.D.5.c.(v).  <u>Part I.D.5.c.(iv)</u> - The permittee must include in the SWMP a description of the mechanism(s) utilized to comply with each of the elements required in Part I.D.5.c.(i) throughout Part I.D.5.c.(iii) and its corresponding measurable goal. and <u>Part I.D.5.c.(v)</u> - The permittee shall assess the overall success of the program, and document the program effectiveness in the Annual Report.	<u>Part I.D.5.c.(iv)</u> - AMAFCA's Stormwater Quality Engineer will review the program requirements for the above-mentioned SWMP elements during the Annual Report process. The measurable goals in this section of the SWMP are the mechanisms used to comply with the Permit elements. A strategy to implement any new program requirements will be developed as needed. <u>Part I.D.5.c.(v)</u> - The Annual Report will serve as the progress report for this program, if applicable. AMAFCA will incorporate documentation by reference into the Annual Report.	• As part of the Annual Report process, the Stormwater Quality Engineer will review the program requirements listed in Part I.D.5.c, for the above-mentioned SWMP elements and develop a strategy to implement any new program requirements. • The Annual Report will serve as the progress report for this program, if applicable. AMAFCA will incorporate documentation by reference into the Annual Report.	<b>Met FY 2022 Goals.</b> • During the Annual Report preparation, AMAFCA's Stormwater Quality Engineer reviewed the program requirements listed in Part I.D.5.c, for the program SWMP elements, and considered program needs and requirements. • This Annual Report documents the program effectiveness and program success in the status of implementation and performance assessment for each MS4 Permit requirement.

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	101	<b>TABLE 5: Industrial and High Risk Runoff - Part I.D.5.d</b>			
4	102	As described in <u>Part I.D.5.d</u> , the permittees shall: (i) control through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by stormwater discharges associated with industrial activity and the quality of stormwater discharged from sites of industrial activity as defined in 40 CFR 122.26(b)(14)(i)-(ix) and (xi). If no such industrial activities are in a permittees jurisdiction, that permittee may certify that this program element does not apply.	<u>Part I.D.5.d</u> - Activity removed from AMAFCA's SWMP (Rev. 0, December 1, 2015). AMAFCA certifies with submittal of this SWMP that no such industrial activities are in AMAFCA's jurisdiction and this program element does not apply. This was submitted to EPA in AMAFCA's NOI and accepted.	N/A	N/A

NOI Section	ID	Permit Activity Description	Plan SWMP Rev. 6 - July 1, 2021	Measurable Goal SWMP Rev. 6 - July 1, 2021	Status of Implementation and Performance Assessment Permit Year July 2021 to June 2022 (FY 2022)
	103	<b>TABLE 6: Illicit Discharges and Improper Disposal - Part I.D.5.e</b>			
See NOI Sections Below	104	As described in <u>Part I.D.5.e.(i)</u> , the permittee shall develop, revise, implement, and enforce a program to detect and eliminate illicit discharges (as defined at 40 CFR 122.26(b)(2)) entering the MS4. Permittees previously covered under NMS000101 or NMR040000 must continue existing programs while updating those programs, as necessary, to comply with the requirements of this permit. The permittee must (see required items listed below):	<u>Part I.D.5.e.(i)</u> - AMAFCA has developed a program to detect and eliminate illicit discharges. The program elements, as they relate to the permit requirements, are described in detail below.	<ul style="list-style-type: none"> <li>The AMAFCA Stormwater Quality Engineer will continue to review, revise, and implement the Illicit Discharge Detection and Elimination Program requirements, as needed.</li> <li>AMAFCA will continue to update the current written procedure for this program element as part of the MS4 Strategies and Procedures Notebook.</li> </ul>	<b>Met FY 2022 Goals.</b> <ul style="list-style-type: none"> <li>In FY 2022, AMAFCA followed its policy of immediate coordination with downstream MS4 permittees and/or appropriate local, state, tribal, or federal regulatory agencies when such discharges were detected by AMAFCA personnel. The Illicit Discharge Response Plan requires that AMAFCA alert the proper agency, if required.</li> </ul>
5.1	105	Mapping as required in <u>Part I.D.5.e.(i).(a)</u> . Develop, if not already completed, a storm sewer system map, showing the names and locations of all outfalls as well as the names and locations of all waters of the United States that receive discharge from those outfalls. Identify all discharge points into major drainage channels draining more than twenty (20) percent of the MS4 area;	<u>Part I.D.5.e.(i).(a)</u> - AMAFCA will continue to update its Maintenance Responsibilities for Drainage Facilities in the Albuquerque Metropolitan Area (Map). This is a color coded, detailed maintenance map showing all AMAFCA facilities (water quality BMPs, channels, large diameter storm drains, ponds, berms or dikes, dams, and receiving waters) and AMAFCA outfalls. AMAFCA cooperates with COA, NMDOT, Bernalillo County, SCAFCA, Village of Los Ranchos, and MRGCD to collect their data for AMAFCA's map. This map is available on the AMAFCA website: <a href="http://www.amafca.org/maps-2/">http://www.amafca.org/maps-2/</a>	<ul style="list-style-type: none"> <li>AMAFCA will continue to keep this maintenance map up-to-date for AMAFCA facilities and other MS4 permittee facilities, as information is provided. Cooperation with other MS4s will continue related to this map.</li> <li>AMAFCA will continue to update the map and publish this map on-line.</li> </ul>	<b>Met FY 2022 Goals.</b> <ul style="list-style-type: none"> <li>In FY 2022, AMAFCA updated the GIS and webpage Interactive Map. This map is available online: <a href="http://www.amafca.org/maps-2/">http://www.amafca.org/maps-2/</a></li> </ul>
5.2	106	Ordinance (or other control method) as required in <u>Part I.D.5.e.(i)(b)</u> .	<p>Because AMAFCA is a flood control authority, the legal authority and jurisdiction granted to it by the State of New Mexico is limited.</p> <p><u>Part I.D.5.e.(i)(b)</u> - AMAFCA will contractually and/or administratively require the control of non-stormwater discharges from third-party operations within AMAFCA's jurisdiction and/or rights of way to the extent allowable under State, Tribal, or local law.</p>	<ul style="list-style-type: none"> <li>AMAFCA will begin development of contractually and/or administratively requiring the control of non-stormwater discharges on turn-key projects that AMAFCA will take over for operation and maintenance after construction to the extent allowable under State, Tribal, or local law.</li> </ul>	N/A

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5.3	107	Develop and implement a IDDE plan as required in <a href="#">Part I.D.5.e.(i).(c)</a> . The permittee must include the following elements in the plan: A. Procedures for locating priority areas likely to have illicit discharges including field tests for selected pollutant indicators (ammonia, boron, chlorine, color, conductivity, detergents, E. coli, enterococci, total coliform, fluoride, hardness, pH, potassium, conductivity, surfactants), and visually screening outfalls during dry weather; B. Procedures for enforcement, including enforcement escalation procedures for recalcitrant or repeat offenders; C. Procedures for removing the source of the discharge; D. Procedures for program evaluation and assessment; and E. Procedures for coordination with adjacent municipalities and/or state, tribal, or federal regulatory agencies to address situations where investigations indicate the illicit discharge originates outside the MS4 jurisdiction.	<a href="#">Part I.D.5.e.(i).(c)</a> - AMAFCA will continue to assess its IDDE program, as appropriate.	<ul style="list-style-type: none"> <li>• AMAFCA will continue to implement the updated IDDE program elements.</li> <li>• AMAFCA will continue membership and involvement in the cooperative MS4 Technical Advisory Group (MS4 TAG) which will facilitate cooperation and coordination with other MS4s in the Middle Rio Grande related to the IDDE program.</li> <li>• AMAFCA will continue development of this program element in its MS4 Strategies and Procedures Notebook.</li> </ul>	<b>Met FY 2022 Goals.</b> <ul style="list-style-type: none"> <li>• AMAFCA continued to be involved in the MS4 TAG group, facilitating cooperation and coordination with other MS4s in the Middle Rio Grande.</li> <li>• AMAFCA continued its membership and involvement in the cooperative MS4 TAG, which facilitated cooperation and coordination with other MS4s in the Middle Rio Grande related to the IDDE program.</li> <li>• In FY 2022, AMAFCA continued to add the ABCWUA DMR reports for SSOs to the AMAFCA GIS database to help identify sources, trends, and issues. ABCWUA's CMOM Annual Report (which includes the Overflow Emergency Response Plan) is available upon request.</li> <li>• AMAFCA continued utilizing established IDDE screening procedures, protocols, and plan.</li> </ul>
5.4	108	Develop an education program as required in <a href="#">Part I.D.5.e.(i).(d)</a> . Develop an education program to promote, publicize, and facilitate public reporting of illicit connections or discharges, and distribution of outreach materials. The permittee shall inform public employees, businesses and the general public of hazards associated with illegal discharges and improper disposal of waste.	<a href="#">Part I.D.5.e.(i).(d)</a> - AMAFCA will continue to participate in the MRGSQT and collaborate with the MS4 permittees to provide educational information regarding stormwater quality to the community. This information will promote, publicize, and facilitate public reporting of illicit connections or discharges, and distribution of outreach materials. This program informs the public of hazards associated with illicit discharges and improper waste disposal, as well as proper ways to dispose of hazardous wastes.	<ul style="list-style-type: none"> <li>• AMAFCA will continue work with the MRGSQT to inform the general public of the hazards associated with illegal discharges and improper disposal of waste.</li> <li>• AMAFCA will continue its involvement with and financial support of BEMP and through the MRGSQT.</li> <li>• The MRGSQT Outcomes Report is available upon request and AMAFCA plans to share this document on its website.</li> <li>• AMAFCA will continue an in-house training program for its administrative, engineering, and field employees regarding illegal discharges and improper disposal of waste.</li> </ul>	<b>Met FY 2022 Goals.</b> <ul style="list-style-type: none"> <li>• AMAFCA continued its partnership with the MRGSQT to inform the general public of the hazards associated with illegal discharges and improper disposal of waste.</li> <li>• In FY 2022, AMAFCA continued its involvement with and financial support of BEMP and through the MRGSQT. The MRGSQT Outcomes Report summarizes the educational and outreach programs for FY 2022. This report is available upon request.</li> <li>• Stormwater continues to be a topic at the weekly staff and monthly crew meetings, including discussions related to pollution prevention and good housekeeping. In addition, pertaining to AMAFCA employees, AMAFCA continues utilizing the IDDE Incident Report Form.</li> </ul>

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5.5	109	Establish a hotline as required in <a href="#">Part I.D.5.e.(i),(e)</a> .	<a href="#">Part I.D.5.e.(i),(e)</a> - MS4s that are members of the MRGSQT benefit from the Albuquerque 311 Citizen Contact Center. The 311 service is a single telephone number for all non-emergency inquiries and services. This program includes citizen calls regarding illicit discharges.	• MS4s in the watershed will continue to participate in the 311 call in program.	<b>Met FY 2022 Goal.</b> • AMAFCA investigated and documented all jurisdictional illicit discharge complaints received through the 311 call in program, as well as other complaints received directly by AMAFCA staff through e-mail, phone, or observation and received through ABCWUA DMR Sanitary Sewer Overflow Report provided to AMAFCA. AMAFCA continued use of the IDDE Incident Report Form which is used to report illicit discharges that were witnessed by or reported to AMAFCA staff. The 311 complaints that are not in AMAFCA's jurisdictional are directed to the jurisdictional agency. • AMAFCA continued to discuss illicit discharges (events, issues, and follow-up) at every weekly staff meeting. • A copy of the IDDE Incident Report Form as well as the current Illicit Discharge Response Plan and testing procedures is available upon request.
5.6	110	Investigate suspected significant/severe illicit discharges as required in <a href="#">Part I.D.5.e.(i),(f)</a> . Investigate suspected significant/severe illicit discharges within forty-eight (48) hours of detection and all other discharges as soon as practicable; elimination of such discharges as expeditiously as possible; and, requirement of immediate cessation of illicit discharges upon confirmation of responsible parties.  Illicit Discharge is defined in 40 CFR 122.26(b)(2) as "illicit discharge means any discharge to a municipal separate storm sewer that is not composed entirely of stormwater except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities."	<a href="#">Part I.D.5.e.(i),(f)</a> - AMAFCA will continue its policy of investigation of suspected significant/severe illicit discharges within forty-eight (48) hours of detection/reporting and all other discharges as soon as practicable. AMAFCA plans to continue removing/treating such discharges as expeditiously as possible and requiring immediate cessation of illicit discharges upon confirmation of responsible parties. AMAFCA will continue its procedures for illicit discharge investigation and use of its IDDE Incident Report Form.  "Illicit discharge" also covers illegal or improper disposal or dumping of wastes into AMAFCA facilities. For AMAFCA, "illicit discharges" typically fall into two categories: (1) liquid discharge, or (2) solid discharge (dumped trash, debris, dirt/sediment, tires). Liquid discharges are considered urgent in order to quickly determine if they are significant/severe illicit discharges and are investigated within forty-eight (48) hours of detection. Solid discharge are investigated and identified for clean-up during the weekly staff meetings.	• AMAFCA will continue its policy of investigation of suspected significant/severe illicit discharges within 48 hours of detection and all other discharges as soon as practicable. • MS4s in the watershed will continue to participate in the 311 call in program. • AMAFCA will continue membership and involvement in the cooperative MS4 Technical Advisory Group (MS4 TAG) which will facilitate cooperation and coordination with other MS4s in the Middle Rio Grande related to investigation of illicit discharges. • AMAFCA will continue development of this program element in its MS4 Strategies and Procedures Notebook.	<b>Met FY 2022 Goals.</b> • In FY 2022, AMAFCA continued its policy of investigation of suspected significant/severe illicit discharges within 48 hours of detection and all other discharges as soon as practicable. • In addition, AMAFCA investigated and documented all jurisdictional illicit discharge complaints received through the 311 call in program, as well as other complaints received directly by AMAFCA staff through e-mail, phone, or observation and received through ABCWUA DMR Sanitary Sewer Overflow Report provided to AMAFCA. The 311 complaints that are not in AMAFCA's jurisdiction are directed to the jurisdictional agency. • AMAFCA continued to be involved in the MS4 TAG group, facilitating cooperation and coordination with other MS4s in the Middle Rio Grande.

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5.7	111	Review complaint records and develop a targeted source reduction program as required in <u>Part I.D.5.e.(i).(g)</u> . Review complaint records for the last permit term and develop a targeted source reduction program for those illicit discharge/improper disposal incidents that have occurred more than twice in two (2) or more years from different locations.	<u>Part I.D.5.e.(i).(g)</u> - AMAFCA will continue its policy of reviewing complaint records. In addition, complaint records that are determined to be illicit discharges will be added to the AMAFCA GIS database. The location, date, type of illicit discharge, and source (if known) will be documented. This database was developed in 2014 and is updated annually. To meet the Permit requirements in Table 1.a (Part I.C.2), regarding discharges to impaired waters with a TMDL (E. coli), AMAFCA's review of complaint records will include a focus on illicit discharges contributing bacteria to the MS4. AMAFCA will develop a targeted source reduction program for those illicit discharge/improper disposal incidents that have occurred more than twice in 2 or more years from different locations. AMAFCA coordinates with COA and the Albuquerque Bernalillo Water Utility Authority (ABCWUA) for notification of illicit discharges.	<ul style="list-style-type: none"> <li>• AMAFCA will continue its policy of reviewing complaint records. This will include a focus on illicit discharges contributing bacteria to the MS4.</li> <li>• Annually, AMAFCA will reevaluate its targeted source reduction program. Potential future targets will be determined and cooperative efforts for targeted source reduction programs with MRGSQT members will be considered.</li> <li>• AMAFCA will continue adding illicit discharge complaint records for the Permit term to the AMAFCA GIS database to help identify sources and trends.</li> <li>• AMAFCA will continue development of this program element in its MS4 Strategies and Procedures Notebook.</li> <li>• AMAFCA will continue coordination with other agencies for this program element.</li> </ul>	<b>Met FY 2022 Goals.</b> <ul style="list-style-type: none"> <li>• In FY 2022, AMAFCA continued to keep a record of the MS4 311 call in program complaints and communicated with the appropriate co-permittees regarding these complaints.</li> <li>• In FY 2022, AMAFCA continued to add the ABCWUA DMR reports for SSOs to the AMAFCA GIS database to help identify sources, trends, and issues. ABCWUA's CMOM Annual Report (which includes the Overflow Emergency Response Plan) is available upon request.</li> </ul>
Not Included in NOI	112	As required in <u>Part I.D.5.e.(ii)</u> , the permittee shall address the following categories of non-stormwater discharges or flows (e.g., illicit discharges) only if they are identified as significant contributors of pollutants to the MS4: water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(90)), uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, and street wash water. Note: Discharges or flows from fire fighting activities are excluded from the effective prohibitions against non-stormwater and need only be addressed where they are identified a significant sources of pollutants to water of the United States).	<u>Part I.D.5.e.(ii)</u> - Any such discharge that is identified as a significant contributor of pollutants to the AMAFCA MS4, or is causing or contributing to a water quality standards violation, will be addressed as an illicit discharge pursuant to Part I.D.5.e of the MS4 Permit. The Permit lists authorized non-stormwater discharges in Part I.D.5.e.(ii). Many of these authorized non-stormwater discharges are not applicable to AMAFCA and none of these discharges are expected to be significant contributors of pollutants to the MS4. The AMAFCA Stormwater Quality Engineer will continue coordination & communication with ABCWUA regarding well flushing and rehabilitation schedules to ensure that AMAFCA is aware of authorized non-stormwater discharges into its facilities.	<ul style="list-style-type: none"> <li>• The AMAFCA Stormwater Quality Engineer will review this list annually to check that the categories of authorized non-stormwater discharges are still not considered significant contributors of pollutants to the MS4.</li> <li>• The AMAFCA Stormwater Quality Engineer will communicate with ABCWUA regarding well flushing and rehabilitation schedules to ensure that AMAFCA is aware of authorized non-stormwater discharges into its facilities.</li> </ul>	<b>Met FY 2022 Goals.</b> <ul style="list-style-type: none"> <li>• The AMAFCA Stormwater Quality Engineer reviewed this list as part of the Annual Report preparation to check that the categories of authorized non-stormwater discharges are still not considered significant contributors of pollutants to the MS4.</li> <li>• The AMAFCA Stormwater Quality Engineer continued coordination &amp; communication with ABCWUA regarding well flushing schedules to ensure that AMAFCA was aware of authorized non-stormwater discharges into its facilities.</li> </ul>

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5.8	113	As required in <u>Part I.D.5.e.(iii)</u> , the permittee must screen the entire jurisdiction at least once every five (5) years and high priority areas at least once every year. High priority areas include any area where there is ongoing evidence of illicit discharges or dumping, or where there are citizen complaints on more than five (5) separate events within twelve (12) months. The permittee must: (a) Include in its SWMP document a description of the means, methods, quality assurance and controls protocols, and schedule for successfully implementing the required screening, field monitoring, laboratory analysis, investigations, and analysis evaluation of data collected. (b) Comply with the dry weather screening program established in Table 6 and the monitoring requirements specified in Part III.A.2. (c) If applicable, implement the priority ranking system developed in previous permit term.	AMAFCA will continue to make progress with its IDDE activities and program. Much of this effort may be in coordination with MS4 permittees COA, Bernalillo County, and NMDOT, as the AMAFCA facilities are stormwater collectors for the basins that are primarily controlled by other MS4 programs, rules, and regulations. <u>Part I.D.5.e.(ii).(a)</u> - IDDE screening methods and protocols for implementing the required screening, field monitoring, laboratory analysis, investigations, and analysis evaluation of data collected has been developed. AMAFCA has in place a well-defined and implemented routine inspection and O&M program that includes both formal and informal inspections. These O&M inspections are part of the IDDE screening program. <u>Part I.D.5.e.(ii).(b)</u> - AMAFCA screening procedures and protocols will comply with the dry weather screening program monitoring requirements specified in Part III.A.2 of the MS4 Permit. COA and AMAFCA have a cooperative dry weather screening program. In addition, as part of AMAFCA's Levellogger monitoring, AMAFCA screens all inlets to the NDC on AMAFCA ROW monthly. <u>Part I.D.5.e.(ii).(c)</u> - For AMAFCA, facility screening is part of AMAFCA's routine O&M activities. All areas are screened and there are no low priority areas.	• AMAFCA has developed screening procedures, protocols, and plan. • AMAFCA will continue routine inspections through its O&M program, including both formal and informal inspections. These O&M inspections are part of the IDDE screening program. • As a cooperative program, COA will continue to perform dry weather screening. • AMAFCA will screen major channelized inlets to the NDC on AMAFCA ROW monthly through its Levellogger monitoring program. • AMAFCA will continue membership and involvement in the cooperative MRGSQT and TAG, which will facilitate cooperation and coordination with other MS4s in the Middle Rio Grande related to screening for illicit discharges.	<b>Met FY 2022 Goals.</b> • AMAFCA continued utilizing established IDDE screening procedures, protocols, and plan. • In FY 2022, AMAFCA continued routine inspections through its O&M program, including both formal and informal inspections. These O&M inspections were part of the IDDE screening program. • As a cooperative program, COA continued to perform dry weather screening. Additional information for this is provided in Dry Weather Screening section of the Annual Report. • AMAFCA continued its Levellogger monitoring program in FY 2022 which includes monthly dry weather screening of 14 channelized inlets to the NDC on AMAFCA ROW. Copies of the Levellogger memos are available upon request. • AMAFCA continued membership and involvement in the cooperative MRGSQT and TAG, both which facilitated cooperation and coordination with other MS4s in the Middle Rio Grande related to screening for illicit discharges.
5.9	114	Develop, update, and implement a Waste Collection Program as required in <u>Part I.D.5.e.(iv)</u> .	<u>Part I.D.5.e.(iv)</u> - Activity removed from AMAFCA's SWMP. Public waste collection is the responsibility of the municipalities. AMAFCA does not have the jurisdictional authority to perform these activities. AMAFCA will continue to regularly collect waste within its rights-of-way. This was submitted to EPA in AMAFCA's NOI and accepted.	N/A	N/A
5.10	115	Develop, update and implement a Spill Prevention and Response program to prevent, contain, and respond to spills that may discharge into the MS4 as required in <u>Part I.D.5.e.(v)</u> . The Spill Prevention and Response program shall include: (a) Where discharge of material resulting from a spill is necessary to prevent loss of life, personal injury, or severe property damage, the permittee(s) shall take, or ensure the party responsible for the spill takes, all reasonable steps to control or prevent any adverse effects to human health or the environment: and (b) The spill response program may include a combination of spill response actions by the permittee (and/or another public or private entity), and legal requirements for private entities within the permittee's municipal jurisdiction.	<u>Part I.D.5.e.(v)</u> - AMAFCA will continue its Spill Prevention and Response program. This program element relates to Illicit Discharge, reporting requirements, crew training, spill response materials on hand (in maintenance vehicles), and good housekeeping. For AMAFCA facilities, AMAFCA encourages that crew members are trained in spill prevention and control (refer to Pollution Prevention/Good Housekeeping Control Measure).	• AMAFCA will continue development of its cooperative Spill Response Program with agency partners and as part of its MS4 Strategies and Procedures Notebook. • AMAFCA encourages that crew members are trained in spill prevention and control (refer to Pollution Prevention/Good Housekeeping Control Measure). • AMAFCA will continue membership and involvement in the cooperative MS4 TAG and the MRGSQT, which will facilitate cooperation and coordination with other MS4s in the Middle Rio Grande related to spill prevention and response.	<b>Met FY 2022 Goals.</b> • AMAFCA continued to follow the Spill Response Plan. • AMAFCA continued development of its cooperative Spill Response Program with agency partners. As part of this cooperative, MS4s have established contracts with an environmental clean-up company to assist the MRG MS4s with IDDE response. • AMAFCA continued to be involved in the MS4 TAG group, facilitating cooperation and coordination with other MS4s in the Middle Rio Grande.



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Not Included in NOI	116	<p><u>Part I.D.5.e.(vi)</u> - The permittee must include in the SWMP a description of the mechanism(s) utilized to comply with each of the elements required in Part I.D.5.e.(i) throughout Part I.D.5.e.(v) and its corresponding measurable goal.</p> <p>A description of the means, methods, quality assurance and controls protocols, and schedule for successfully implementing the required screening, field monitoring, laboratory analysis, investigations, and analysis evaluation of data collected; and</p> <p><u>Part I.D.5.e.(vii)</u> - The permittee shall assess the overall success of the program, and document the program effectiveness in the Annual Report.</p>	<p><u>Part I.D.5.e.(vi)</u> - AMAFCA's Stormwater Quality Engineer will review the program requirements listed for the above-mentioned program elements, during the Annual Report process. A review of the screening completed and the data collected, if any, will be available upon request and AMAFCA will incorporate documentation by reference into the Annual Report and plans to document progress on the AMAFCA website. A strategy to implement any new program requirements will be developed as needed. AMAFCA will maintain and update, as necessary, its MS4 Strategies and Procedures Notebook for this MS4 Program.</p> <p><u>Part I.D.5.e.(vii)</u> - AMAFCA will document the program effectiveness and program success. AMAFCA will incorporate documentation by reference into the Annual Report.</p>	<ul style="list-style-type: none"> <li>As part of the Annual Report process each year, the Stormwater Quality Engineer will review the program requirements listed in Part I.D.5.e, for the above-mentioned SWMP elements, and develop a strategy, if applicable, to implement any new program requirements.</li> <li>A review of the screening completed and the data collected, if any, will be available upon request and AMAFCA will incorporate documentation by reference into the Annual Report and plans to document progress on the AMAFCA website.</li> <li>AMAFCA will document the program effectiveness and program success. AMAFCA will incorporate documentation by reference into the Annual Report.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>AMAFCA's Program was reviewed by the Storm Water Quality Engineer for the reporting period as part of this Annual Report process.</li> <li>Screening documentation in the Levellogger monitoring memos is available upon request. The Levellogger locations focus on the NDC watershed, which is a water quality priority area for AMAFCA because of the larger residential, industrial, and commercial developments in this watershed.</li> <li>This Annual Report documents the program effectiveness and program success in the status of implementation and performance assessment for each MS4 Permit requirement.</li> </ul>
5.11	117	<p>Enhance the program to include requirements in <u>Part I.D.5.e.(ix)</u>. The permittee may: (a) Divide the jurisdiction into assessment areas where monitoring at fewer locations still provides sufficient information; (b) Downgrade high priority areas after the area has been screened at least once and there are citizen complaints on no more than 5 separate events within a 12 month period; (c) Rely on a cooperative program with other MS4s for detection and elimination of illicit discharges and illegal dumping; (d) If cooperative program, required detection program frequencies may be based on the combined jurisdictional area rather than individual jurisdictional areas to reduce total number of screening locations; (e) After screening a non-high priority area once, adopt an "in response to complaints only" IDDE for that area (no more than 2 separate events within a 12 month period); (f) Enhance the program to utilize methodologies consistent with those described in "Illicit Discharge Detection and Elimination, A Guidance Manual for Program Development and Technical Assessments."</p>	<p><u>Part I.D.5.e.(ix).(a)</u> - AMAFCA operates and maintains Levelloggers and rainfall gauges for the NDC watershed to better understand runoff and evaluate monitoring locations. Future telemetry project will add screening capabilities for other outfalls.</p> <p><u>Part I.D.5.e.(ix).(b)</u> - This enhancement may be considered and included in the future.</p> <p><u>Part I.D.5.e.(ix).(c)</u> - AMAFCA currently coordinates with MS4s, as appropriate, and the ABCWUA for notification of illicit discharges. AMAFCA will continue to pursue developing similar cooperative coordination with other agencies.</p> <p><u>Part I.D.5.e.(ix).(d) and (e)</u> - These cooperative elements may be considered in the future.</p> <p><u>Part I.D.5.e.(ix).(f)</u> - AMAFCA had a consultant evaluate the AMAFCA IDDE program and develop recommendations for improving the program in order to comply with the MS4 Permit. The report included evaluating the procedures and methodologies described in "IDDE, A Guidance Manual for Program Development and Technical Assessments", for incorporation into AMAFCA's IDDE program. AMAFCA will continue to implement recommendations from this report, as appropriate.</p>	<ul style="list-style-type: none"> <li>AMAFCA will document progress made, if any, with these program enhancement activities.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>In FY 2022, AMAFCA continued monitoring water Levelloggers to better understand runoff and evaluate monitoring locations and needs. Monthly, throughout FY 2022, the Levelloggers were monitored in the field with accompanying photo documentation and this allowed for additional dry weather/IDDE screening.</li> <li>In FY 2022, AMAFCA worked with COA and ABCWUA for notification of illicit discharges. AMAFCA also cooperated with Bernalillo County and NMDOT related to IDDE in FY 2022.</li> </ul>
5.12	118	<p>Item from MS4 Permit NOI. Describe other proposed activities to address the Illicit Discharges and Improper Disposal Measure.</p>	<p>AMAFCA will continue to utilize the Annual Report process as a means to perform a self-audit with the goal to improve its MS4 Programs.</p>	<ul style="list-style-type: none"> <li>AMAFCA will annually document progress made, if any, related to the Annual Report and SWMP revision process as a means to perform a self-audit on the MS4 Program elements.</li> </ul>	<p><b>Met FY 2022 Goal.</b></p> <ul style="list-style-type: none"> <li>AMAFCA continued to utilize the Annual Report process as a means to perform a self-audit on the MS4 Program elements.</li> </ul>

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	119	<b>TABLE 7: Control of Floatables Discharges - Part I.D.5.f</b>			
6.1	120	As required in <u>Part I.D.5.f.(i)</u> , the permittee must develop, update, and implement a program to address and control floatables in discharges into the MS4. The floatables control program shall include source controls and, where necessary, structural controls. Permittees previously covered under NMS000101 or NMR04A000 must continue existing programs while updating those programs, as necessary, to comply with the requirements of this permit. The permittee shall develop or update a schedule to implement as required in <u>Part I.D.5.f.(i).(a)</u> . Note: AMAFCA and COA should update the schedule according to the findings of the 2005 AMAFCA/COA Floatable and Gross Pollutant Study and other studies.	<u>Part I.D.5.f.(i) and (i).(a)</u> - AMAFCA will continue to implement a program to address and control floatables in discharges into the MS4. AMAFCA will continue to install stormwater quality features to control floatables, such as ported risers, trash racks, and screened inlets in both new construction and retrofits where appropriate. AMAFCA will continue to coordinate with COA relative to structural BMPs within AMAFCA rights-of-way.	<ul style="list-style-type: none"> <li>• The AMAFCA Stormwater Quality Engineer will continue to review, revise, and implement a program to address and control floatables in discharges into the MS4. AMAFCA will develop a written procedure for this program element.</li> <li>• AMAFCA will continue to cooperate and coordinate with COA relative to structural BMPs within AMAFCA rights-of-way.</li> <li>• AMAFCA will continue membership and involvement in the cooperative MS4 Technical Advisory Group (MS4 TAG), which will facilitate cooperation and coordination with other MS4s in the Middle Rio Grande related control of floatables discharges.</li> <li>• AMAFCA will continue utilizing the manual trash collection contracts.</li> <li>• AMAFCA is pursuing developing a cooperative program for this program element.</li> </ul>	<b>Met FY 2022 Goals.</b> <ul style="list-style-type: none"> <li>• The AMAFCA Storm Water Quality Engineer continued to implement a program to address and control floatables in discharges into the MS4.</li> <li>• AMAFCA continued to be involved in the MS4 TAG, facilitating cooperation and coordination with other MS4s in the Middle Rio Grande.</li> <li>• AMAFCA continued utilizing the manual trash collection contracts in FY 2022.</li> <li>• Photos of AMAFCA operations to remove floatables and sediment in FY 2022 are provided in the Pollution Prevention/ Good Housekeeping Program &amp; Control of Floatables Program Summary.</li> </ul>
6.2	121	Estimate the annual volume of floatables and trash removed from each control facility and characterize the floatable type as required in <u>Part I.D.5.f.(i).(b)</u> .	<u>Part I.D.5.f.(i).(b)</u> - AMAFCA will continue to estimate the annual volume of floatables and trash removed from each control facility as well as to characterize the floatable type. The AMAFCA operations and maintenance crew and subcontractors track the volume of floatables, sediment, trash, and debris removed from AMAFCA facilities. This tracking procedure includes the location of removal by facility and watershed.	<ul style="list-style-type: none"> <li>• AMAFCA will continue to estimate the annual volume of floatables and trash removed from each control facility and characterize the floatable type.</li> <li>• AMAFCA will continue to utilize crew activity tracking, allowing AMAFCA to better and more easily determine the volume of floatables and sediment removed from each AMAFCA facility.</li> <li>• AMAFCA has updated, cooperative waste characterization study in the watershed during the Permit term.</li> </ul>	<b>Met FY 2022 Goals.</b> <ul style="list-style-type: none"> <li>• In FY 2022, AMAFCA continued to implement its crew tracking system and database. A summary of trash, sediment, and vegetation removed within AMAFCA's jurisdiction is included in the relevant Program Summary.</li> </ul>
6.3	122	Item from MS4 Permit NOI. Describe other proposed activities to address the Control of Floatables Discharges Measure.	AMAFCA will continue to utilize the Annual Report and SWMP revision process as a means to perform a self-audit with the goal to improve its MS4 Programs.	• AMAFCA will document progress made, if any, related to the Annual Report and SWMP revision process as a means to perform a self-audit on the MS4 Program elements.	<b>Met FY 2022 Goal.</b> <ul style="list-style-type: none"> <li>• AMAFCA continued to utilize the Annual Report process as a means to perform a self-audit on the MS4 Program elements.</li> </ul>
Not Included in NOI	123	Update the SWMP document and Annual Report as required in <u>Part I.D.5.f.(ii)</u> and <u>Part I.D.5.f.(iii)</u> . <u>Part I.D.5.f.(ii)</u> - The permittee must include in the SWMP description of the mechanism(s) utilized to comply with each of the elements required in <u>Part I.D.5.f.(i)</u> . <u>Part I.D.5.f.(iii)</u> - The permittee shall assess the overall success of the program, and document the program effectiveness in the Annual Report.	<u>Part I.D.5.f.(ii)</u> - AMAFCA's Stormwater Quality Engineer will review the program requirements listed for the above-mentioned program elements, during the Annual Report process. A strategy to implement any new program requirements or improve the compliance with program requirements will be developed as needed. <u>Part I.D.5.f.(iii)</u> - AMAFCA will document the program effectiveness and program success. AMAFCA will incorporate documentation by reference into the Annual Report.	<ul style="list-style-type: none"> <li>• As part of the Annual Report process each year, the Stormwater Quality Engineer will review the program requirements listed in <u>Part I.D.5.f</u>, for the above-mentioned SWMP elements, and assess the overall success of the program. AMAFCA will document the program effectiveness and program success. AMAFCA will incorporate documentation by reference into the Annual Report.</li> </ul>	<b>Met FY 2022 Goals.</b> <ul style="list-style-type: none"> <li>• In FY 2022, as part of the Annual Report development, AMAFCA's Storm Water Quality Engineer reviewed the program requirements listed in <u>Part I.D.5.f</u> for this section.</li> <li>• This Annual Report and associated Program Summaries document the program effectiveness and program success in the status of implementation and performance assessment for each MS4 Permit requirement. Additional documentation available upon request.</li> </ul>

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	124	<b>TABLE 8: Public Education and Outreach on Stormwater Impacts - Part I.D.5.g</b>			
7.1	125	Develop, revise, implement, and maintain an education and outreach program as required in <u>Part I.D.5.g.(i)</u> and <u>Part I.D.5.g.(ii)</u> . This comprehensive stormwater program should educate the community, employees, businesses, and the general public of hazards associated with the illegal discharges and improper disposal of waste and about the impact that stormwater discharges on local waterways, as well as the steps that the public can take to reduce pollutants in stormwater.	<u>Part I.D.5.g.(i)</u> - Through involvement in the MRGSQT and Bernalillo County, AMAFCA will continue to collaborate with the MS4 permittees to implement and improve upon the existing Public Education and Outreach program. The MRGSQT has a consulting firm under contract to act as Stormwater Coordinator and assist the team in providing public education and outreach on stormwater impacts. Included in the Stormwater Coordinator scope is to provide an Outcomes Report to the team members to summarize the yearly outreach activities through different media and methods, target audiences, and estimate of people reached. In addition to the cooperative elements with MRGSQT, AMAFCA will continue to conduct education and outreach presentations to the community specific to AMAFCA facilities and water quality.	<ul style="list-style-type: none"> <li>• AMAFCA will continue to contribute to and participate in the MRGSQT.</li> <li>• AMAFCA will continue to conduct education and outreach presentations to the community specific to AMAFCA facilities and water quality. AMAFCA's efforts will be included in the MRGSQT Outcomes Report. This report is available upon request and AMAFCA plans to share this document on its website.</li> </ul>	<b>Met FY 2022 Goals.</b> <ul style="list-style-type: none"> <li>• AMAFCA continued to contribute to and participate in the MRGSQT.</li> <li>• AMAFCA's efforts are included in the MRGSQT Outcomes Report, which is available upon request.</li> </ul>
Not Included in NOI	126	<u>Part I.D.5.g.(ii)</u> , the permittee must implement a public education program to distribute educational knowledge to the community or conduct equivalent outreach activities about the impacts of storm water discharges on water bodies and the steps that the public can take to reduce pollutants in storm water runoff. The permittee must: <u>Part I.D.5.g.(ii)(a)</u> , Define the goals and objectives of the program based on high priority community-wide issues; <u>Part I.D.5.g.(ii)(b)</u> , Develop or utilize appropriate educational materials, such as printed materials, billboard and mass transit advertisements, signage at select locations, radio advertisements, television advertisements, and websites.	<u>Part I.D.5.g.(ii)(a)</u> - The MRGSQT has developed a matrix to define the Public Education and Outreach objectives, priorities, and target audiences. The matrix will be reviewed and updated, as necessary, throughout the Permit term.  <u>Part I.D.5.g.(ii)(b)</u> - The MRGSQT will continue to develop and utilize appropriate educational materials such as brochures, media campaigns, public presentations/events, giveaways, display booths/kiosks, signage at select locations, and postings on social media sites (Facebook) and websites. The types of materials utilized by the MRGSQT are summarized in the annual Outcomes Report.	<ul style="list-style-type: none"> <li>• AMAFCA, through its participation in the MRGSQT will review, throughout the Permit term, and update, as necessary, the program matrix to define the Public Education and Outreach and Public Involvement and Participation objectives, priorities, and target audiences.</li> <li>• The MRGSQT will continue to develop and utilize appropriate educational materials such as brochures, media campaigns, public presentations/events, giveaways, display booths/kiosks, signage at select locations, and postings on social media sites (Facebook) and websites.</li> </ul>	<b>Met FY 2022 Goals.</b> <ul style="list-style-type: none"> <li>• The MRGSQT continued to use the matrix this year to guide the Public Education and Outreach and Public Involvement and Participation objectives, priorities, and target audiences.</li> <li>• The types of materials utilized are summarized in the MRGSQT Outcomes Report, which is available upon request. The Facebook page and website (<a href="http://www.keeptheriogrande.org">www.keeptheriogrande.org</a>) remained active in FY 2022.</li> <li>• MRGSQT continued to distribute BMP brochures for specific industries (Contractors, Food Preparation or Service, Parking Lots and Drive Through Lanes, Fueling Stations, Vehicle and Equipment Repair, Carpet and Upholstery Cleaning, Scrap Metal Recycling, and Landscaping). These are available upon request.</li> </ul>

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Not Included in NOI	127	<u>Part I.D.5.g.(ii).(c)</u> , Inform individuals and households about ensuring proper septic system maintenance, ensuring the proper use and disposal of landscape and garden chemicals including fertilizers and pesticides, protecting and restoring riparian vegetation, and properly disposing of used motor oil or household hazardous wastes;	<u>Part I.D.5.g.(ii).(c)</u> - The MRGSQT's program matrix and Public Education and Outreach programs include proper septic system maintenance, proper use and disposal of landscape and garden chemicals including fertilizers and pesticides, and properly disposing of household hazardous wastes.	<ul style="list-style-type: none"> <li>The MRGSQT will continue to include these specific educational areas in their program matrix and reporting on these areas in their annual Outcomes Report.</li> </ul>	<p><b>Met FY 2022 Goal.</b></p> <ul style="list-style-type: none"> <li>The MRGSQT Outcomes Report typically includes a table summarizing the MS4 Permit Public Education and Outreach Component/reference with the MRGSQT activities, as well as including the type of audiences reached. In addition, information on these topics is available on the MRGSQT website (<a href="http://www.keepertheriogrande.org">www.keepertheriogrande.org</a>).</li> <li>In FY 2022, the MRGSQT continued distribution of brochures targeting septic system education.</li> <li>AMAFCA and Bernalillo County continued to distribute BMPs brochures for specific industries. Landscaping was one industry area of focus.</li> <li>Both COA and Bernalillo County sponsor Household Hazardous Waste (HHW) collection events throughout the year.</li> </ul>
Not Included in NOI	128	<u>Part I.D.5.g.(ii).(d)</u> , Inform individuals and groups how to become involved in local stream and beach restoration activities as well as activities that are coordinated by youth service and conservation corps or other citizen groups.	<u>Part I.D.5.g.(ii).(d)</u> - The MRGSQT, which AMAFCA is a member, utilizes volunteers throughout communities within the watershed to assist with park, open space, trail, and river cleanup projects. Communication for Public Education and Outreach and Public Involvement and Participation is achieved by activities organized with youth service groups, conservation corps, and other citizen groups. In addition, AMAFCA will continue to foster Public Education and Outreach and Public Involvement and Participation programs, including Earth Force - Keep it Clean student outreach, Talking Talons Youth Leadership Activities, and Rocky Mountain Youth Corps programs.	<ul style="list-style-type: none"> <li>The MRGSQT will continue communication for public involvement and participation activities as well as assist with communication for Public Education and Outreach and Public Involvement and Participation activities organized by youth service groups, conservation corps, and other citizen groups. These volunteer activities will be summarized in the annual MRGSQT Outcomes Report. The MRGSQT Outcomes Report is available upon request and AMAFCA plans to share this document on its website.</li> <li>Through the MRGSQT, two partner education programs, BEMP and , are supported. is an innovative, long-term outreach program that integrates water resource topics with computer technology, student writing, and a hands-on curriculum to meet specific, measurable outcomes. The main objective of the Stormwater Science outreach education program BEMP is to teach students that the health of the Rio Grande is directly related to the health of the surrounding watershed.</li> <li>AMAFCA will continue to foster Public Education and Outreach and Public Involvement and Participation programs, including Earth Force, Talking Talons Youth Leadership Activities, and Rocky Mountain Youth Corps programs.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>The MRGSQT Outcomes Report typically documents volunteer participation in park, open space, trail and river cleanup projects. Due to the COVID pandemic, participation in these activities have been impacted. The Keep the Rio Grande website has been updated to better assist with implementation of this activity.</li> <li>Through the MRGSQT, three partner education and student involvement programs, Arroyo Classroom, BEMP and , were supported in FY 2022.</li> </ul>

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Not Included in NOI	129	<u>Part I.D.5.g.(ii).(e)</u> , Use tailored public education program, using a mix of locally appropriate strategies, to target specific audiences and communities. Examples of strategies include distributing brochures or fact sheets, sponsoring speaking engagements before community groups, providing public service announcements, implementing educational programs targeted at school age children, and conducting community-based projects such as storm drain stenciling, and watershed cleanups;	<u>Part I.D.5.g.(ii).(e)</u> - The MRGSQT will continue to organize comprehensive Public Education and Outreach programs with appropriate strategies to target specific audiences in the Middle Rio Grande community.	<ul style="list-style-type: none"> <li>The MRGSQT will continue to include comprehensive education programs with appropriate strategies to target specific audiences in the Middle Rio Grande community. The target audiences for the educational programs will be identified in the Outcomes Report.</li> </ul>	<p><b>Met FY 2022 Goal.</b></p> <ul style="list-style-type: none"> <li>The MRGSQT Outcomes Report includes information on the comprehensive Public Education and Outreach programs, community events, presentations, and participation activities in FY 2022. The MRGSQT participated in a wide variety of community events. Through the MRGSQT, three partner education and student involvement programs, Arroyo Classroom, BEMP and , were supported in FY 2022. The target audiences for these activities are typically identified in the Outcomes Report. The Keep the Rio Grande website has been updated to better assist with implementation of this activity.</li> </ul>
Not Included in NOI	130	<u>Part I.D.5.g.(ii).(f)</u> , Use materials or outreach programs directed toward targeted groups of commercial, industrial, and institutional entities likely to have significant stormwater impacts. For example, providing information to restaurants on the impact of grease clogging storm drains and to garages on the impact of oil discharges. The permittee may tailor the outreach program to address the viewpoints and concerns of all communities, particularly minority and disadvantaged communities, as well as any special concerns relating to children. The permittee must make information available for non-English speaking residents, where appropriate.	<u>Part I.D.5.g.(ii).(f)</u> - The MRGSQT will continue to include Public Education and Outreach programs directed toward commercial, industrial, engineering/contractors, and other institutional entities to meet the MS4 Permit requirements. Where outreach target groups include Spanish-speaking residents, MRGSQT may have Spanish-translations available of public meeting announcements and data sheets. The need for bi-lingual outreach will be assessed by the MRGSQT as needed.	<ul style="list-style-type: none"> <li>The MRGSQT cooperative programs will continue to include information on Public Education and Outreach and Public Involvement and Participation programs directed toward commercial, industrial, engineering/contractors, and other institutional entities.</li> <li>Where outreach target groups include Spanish-speaking residents, MRGSQT may have Spanish-translations available of public meeting announcements and data sheets. The need for bi-lingual outreach will be assessed by the MRGSQT as needed.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>The MRGSQT Outcomes Report includes information on Public Education and Outreach and Public Involvement and Participation programs directed toward commercial, industrial, engineering/ contractors, and other institutional entities.</li> <li>The MRGSQT continued to distribute BMP brochures for specific industries (Contractors, Food Preparation or Service, Parking Lots and Drive Through Lanes, Fueling Stations, Vehicle and Equipment Repair, Carpet and Upholstery Cleaning, Scrap Metal Recycling, and Landscaping). These materials are available upon request.</li> </ul>

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7.2	131	<p>Update the SWMP document and Annual Report as required in Part I.D.5.g.(iii) and Part I.D.5.g.(iv).</p> <p><u>Part I.D.5.g.(iii)</u>, The permittee must include the following information in the SWMP document:</p> <p>(a) A description of a program to promote, publicize, facilitate public reporting of the presence of illicit discharges or water quality associated with discharges from MS4s;</p> <p>(b) A description of the education activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials;</p> <p>(c) A description of the mechanism(s) utilized to comply with each of the elements required in Part I.D.5.g.(i) and Part I.D.5.g.(ii) and its corresponding measurable goal.</p> <p><u>Part I.D.5.g.(iv)</u>, The permittee must assess the overall success of the program, and document both direct and indirect measurements of program effectiveness in the Annual Report.</p>	<p><u>Part I.D.5.(g).(iii)</u> - (a) MS4s that are members of the MRGSQT benefit from the Albuquerque 311 Citizen Contact Center. Reports for illicit discharge can be done by phone, on-line, e-mail, or through an app on cellular phones.</p> <p>(b) Educational and public outreach activities are primarily handled through the MRGSQT.</p> <p>(c) This SWMP, AMAFCA's Annual Reports, and the MRGSQT outreach coordinator contract all serve as mechanisms to comply with the elements in this section of the permit. Refer to the above SWMP program elements for additional information. AMAFCA's Stormwater Quality Engineer will review the program requirements listed for the above-mentioned program elements during the SWMP update and Annual Report process. A strategy to implement any new program requirements or improve compliance with the program requirements will be discussed with the MRGSQT and developed as needed.</p> <p><u>Part I.D.5.(g).(iv)</u> - AMAFCA will document the program effectiveness and program success. AMAFCA will incorporate documentation by reference into the Annual Report and plans to document progress on the AMAFCA website.</p>	<ul style="list-style-type: none"> <li>The AMAFCA Stormwater Quality Engineer will review and include the program requirements listed in Part I.D.5.g during the SWMP update and Annual Report process.</li> <li>AMAFCA will document the program effectiveness and program success. AMAFCA will incorporate documentation by reference into the Annual Report and plans to document progress on the AMAFCA website.</li> <li>AMAFCA (both through the MRGSQT and individually) will use surveys to assist with determining the effectiveness of programs.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>The SWMP was reviewed during the FY 2022 Annual Report development.</li> <li>The MRGSQT website (<a href="http://www.keepertheriogrando.org">www.keepertheriogrando.org</a>) has links related reporting illicit discharge and the COA website promotes the 311 Citizen Contact Center.</li> <li>AMAFCA projects require SWPPP Management boards for all their construction projects to provide the public with contact information for reporting indicators of stormwater discharges.</li> <li>This Annual Report and the MRGSQT Outcomes Report document the program effectiveness and program success in the status of implementation and performance assessment for each MS4 Permit requirement in this section of the Permit.</li> <li>The MRGSQT utilized updated stormwater surveys to assess the effectiveness of the Public Education and Outreach and Public Involvement and Participation program elements. An example of the MRGSQT/ AMAFCA survey, as well as survey results trendline data, is available upon request.</li> </ul>

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7.2	132	Enhance the program to include Program Flexibility Elements in Part I.D.5.g.(v) through Part I.D.5.g.(viii). <u>Part I.D.5.g.(v)</u> , Where necessary to comply with the MS4 Permit, the permittee should develop a program or modify/revise an existing education and outreach program to: (a) Promote, publicize, and facilitate the use of GI/LID/Sustainability practices; and (b) Include an integrated public education program regarding litter reduction, reduction in pesticide/herbicide use, recycling, and disposal (including yard waste, hazardous waste materials, and used motor vehicle fluids), and GI/ LID/ Sustainable practices (as allowed by the NM OSE).	<u>Part I.D.5.g.(v).(a) and (b)</u> - AMAFCA will continue to include in its (and in the cooperative MRGSQT) Public Education and Outreach program: GI/LID/sustainability practices, litter reduction, herbicide and pesticide proper use and reduction (AMAFCA does not apply fertilizers in its operations), recycling, proper disposal of hazardous waste, proper disposal motor vehicle fluids, and proper disposal of yard waste.	• AMAFCA will document progress made with these program enhancement activities.	<b>Met FY 2022 Goal.</b> • The MRGSQT, in which AMAFCA is a partner, sponsored the Land and Water Summit March 2-4, 2022, to promote professional education regarding green stormwater infrastructure (GSI)/LID. AMAFCA was involved in organizing the agenda for this Land and Water Summit. In addition, AMAFCA was involved with the Arid LID Coalition whose goal is to promote the use of Low Impact Development & Green Infrastructure practices in arid environments through workshops, education, and collaboration. In FY 2022, AMAFCA attended the EPA Region 6 Stormwater Conference virtually August 2020. In Sept. 2021, AMAFCA attended and presented on stormwater quality treatment trains at the StormCon conference in Milwaukee, WI. The MRGSQT's website <a href="http://www.keepergrand.org">www.keepergrand.org</a> and Facebook page also includes educational information regarding GSI/LID, recycling, and proper disposal of various waste, like yard, household hazardous, and pet waste. Several MRGSQT activities directly focused on litter reduction, recycling, and waste disposal, including the Illegal Dumping Campaign. The MRGSQT Outcomes Report is available upon request and provides information related to these Public Education and Outreach and Public Involvement and Participation activities.
Not Included in NOI	133	Enhance the program to include Program Flexibility Elements in Part I.D.5.g.(v) through Part I.D.5.g.(viii) [continued] <u>Part I.D.5.g.(vi)</u> , The permittee may collaborate or partner with other MS4 operators to maximize the program and cost effectiveness of the required outreach.	<u>Part I.D.5.g.(vi)</u> - The MRGSQT is a cooperative effort allowing watershed MS4 participants to maximize their education, outreach, participation, and involvement programs in a cost effective manner. Through involvement in the MRGSQT, AMAFCA will continue to collaborate with the MS4 permittees to implement and improve upon the existing Public Education and Outreach and Public Involvement and Participation programs.	• AMAFCA will continue to contribute to and participate in the MRGSQT in order to maximize their Public Education and Outreach and Public Involvement and Participation programs in a cost effective manner.	<b>Met FY 2022 Goal.</b> • AMAFCA continued to contribute to and participate in the MRGSQT.
Not Included in NOI	134	Enhance the program to include Program Flexibility Elements in Part I.D.5.g.(v) through Part I.D.5.g.(viii). [continued] <u>Part I.D.5.g. (vii)</u> , The education and outreach program may use citizen hotlines as a low-cost strategy to engage the public in illicit discharge surveillance.	<u>Part I.D.5.g.(vii)</u> - MS4s that are members of the MRGSQT benefit from the Albuquerque 311 Citizen Contact Center. The 311 service is a single telephone number for all non-emergency inquiries and services. This program includes citizen calls regarding illicit discharges and notifies AMAFCA of such calls within its jurisdiction.	• MS4s that are members of the MRGSQT benefit from the Albuquerque 311 Citizen Contact Center. This is discussed in more detail in the Illicit Discharges and Improper Disposal Control Measure.	<b>Met FY 2022 Goal.</b> • AMAFCA continued to participate in the 311 citizen hotline as well as the Illegal Dumping Partnership, which has various jurisdictional reporting contacts. The MRGSQT website ( <a href="https://keepergrand.org/resources/">https://keepergrand.org/resources/</a> ) has additional information. This is discussed in more detail in the Illicit Discharges and Improper Disposal section of the Annual Report.

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Not Included in NOI	135	<p>Enhance the program to include Program Flexibility Elements in Part I.D.5.g.(v) through Part I.D.5.g.(viii). [continued]</p> <p><u>Part I.D.5.g. (viii)</u>, The permittee may use stormwater educational materials provided by the State, Tribe, EPA, environmental groups, public interest or trade organ., or other MS4s. The permittee may also integrate the education and outreach program with existing education and outreach programs in the MRG area. Examples of existing programs include: Classroom education on stormwater that allows students to develop watershed map to help students visualize area impacted and develop pet specific education. As well as education and outreach programs for commercial activities, lawn and garden activities, sustainable practices, pet waste management, proper disposal of household waste, trash management, water conservation practices designed to reduce pollutants in stormwater for home residences. Existing programs should include regular employee trainings with industry groups and contribute and participate in Stormwater Quality Team.</p>	<p><u>Part I.D.5.g.(viii)</u> - The MRGSQT may utilize educational materials provided by the State, Tribe, EPA, environmental groups, public interest or trade organizations, or other MS4s.</p>	<ul style="list-style-type: none"> <li>The MRGSQT may utilize materials, as appropriate, provided by the State, Tribe, EPA, environmental groups, public interest or trade organizations, or other MS4s. The types of materials and program focus for the materials utilized will be summarized in the annual MRGSQT Outcomes Report. This report is available upon request and AMAFCA plans to share this document on its website.</li> </ul>	<p><b>Met FY 2022 Goal.</b></p> <ul style="list-style-type: none"> <li>Educational materials are provided on the MRGSQT website (<a href="https://keeptheriogrand.org">https://keeptheriogrand.org</a>) and are typically summarized in the MRGSQT Outcomes Report.</li> </ul>



NOI Section	ID	Permit Activity Description	Plan SWMP Rev. 6 - July 1, 2021	Measurable Goal SWMP Rev. 6 - July 1, 2021	Status of Implementation and Performance Assessment Permit Year July 2021 to June 2022 (FY 2022)
	136	<b>TABLE 9: Public Involvement and Participation - Part I.D.5.h</b>			
8.1	137	Develop (or update), implement, and maintain a public involvement and participation plan as required in Part I.D.5.h.(ii). This plan should provide opportunities for participation in the review, modification and implementation of the SWMP; develop and implement a process by which public comments to the plan are received and reviewed by the person(s) responsible for the SWMP; and make the SWMP available to the public and to the operator of any MS4 or Tribal authority receiving discharges from the MS4.	Part I.D.5.h.(ii) - AMAFCA will continue its Public Involvement and Participation program to encourage public involvement in the review, modification and implementation of the AMAFCA SWMP.	<ul style="list-style-type: none"> <li>• AMAFCA will post the draft SWMP, any SWMP amendments or modifications, and draft Annual Reports to the <a href="http://www.amafca.org">www.amafca.org</a> website with an explanation of the public comment period and instructions on how to submit comments. The posted documents will provide explanations of substantial changes, if applicable.</li> <li>• At least 30-days prior to submission of each updated SWMP, AMAFCA will provide public notice and make a draft copy of the updated SWMP available for public review and comment.</li> <li>• At least 45-days prior to submission of each Annual Report, AMAFCA will provide public notice and make a draft copy of the Annual Report available for public review and comment, as required in Part III.B of the MS4 Permit.</li> <li>• AMAFCA will implement, and update as needed, the Public Involvement and Participation Plan.</li> </ul>	<b>Met FY 2022 Goals.</b> <ul style="list-style-type: none"> <li>• AMAFCA posted the availability of a draft Annual Report on the <a href="http://www.AMAFCA.org">www.AMAFCA.org</a> website as well as posted a notice in the Albuquerque Journal (major newspaper for Albuquerque and the surrounding area) with an explanation of the public comment period and instructions on how to submit comments.</li> <li>• AMAFCA met the Permit required 45-day notice period for the draft FY 2022 Annual Report.</li> </ul>
8.1	138	As required in Part I.D.5.h.(iii), the Public Involvement and Participation Plan shall include a comprehensive planning process which involves public participation and where necessary intergovernmental coordination. The permittee must include the following elements in the plan: (a) A detailed description of the general plan for informing the public of involvement and participation opportunities, including types of activities; target audiences; how interested parties may access the SWMP; and how the public was involved in development of the SWMP; (b) The development and implementation of at least one (1) assessment of public behavioral change following a public education and/or participation event; (c) A process to solicit involvement by environmental groups, environmental justice communities, civic organizations or other neighborhoods /organizations interested in water quality-related issues; and (d) An evaluation of opportunities to utilize volunteers for stormwater pollution prevention activities and awareness throughout the area.	Part I.D.5.h.(iii) - As allowed in this Permit section's "Program Flexibility Elements", AMAFCA, through its involvement with the MRGSQT, has integrated this section of the Public Involvement and Participation program with the existing Public Education and Outreach programs in the Middle Rio Grande area.  The program includes: (a) A general plan for public of involvement and participation opportunities, including types of activities; target audiences; how interested parties may access the SWMP; and how to encourage public involvement in development and updates of the SWMP; (b) The development and implementation of water quality surveys to assess public knowledge and behavioral change following a public education and/or participation event; (c) A process to solicit involvement in development and updates of the SWMP through following the 45-day Annual Report and 30-day SWMP public comment period; and (d) An evaluation of opportunities to utilize volunteers for stormwater pollution prevention activities, including maintaining Mutt Mitt stations.	<ul style="list-style-type: none"> <li>• AMAFCA will contribute and participate in the MRGSQT, which participates in public events and solicits public participation and feedback by way of volunteer participation and water quality surveys. Both the BEMP and program include participation metrics. In addition, the MRGSQT has developed and will include surveys for public behavior changes and feedback at their events.</li> <li>• AMAFCA will continue to follow the 45-day Annual Report and 30-day SWMP public comment period during the term of this Permit.</li> <li>• AMAFCA will continue to provide Mutt Mitt stations and seek volunteers to maintain the stations. AMAFCA will continue tracking this activity and reviewing metrics during the term of this Permit.</li> </ul>	<b>Met FY 2022 Goal.</b> <ul style="list-style-type: none"> <li>• AMAFCA continued to contribute to and participate in the MRGSQT; the Outcomes Report is available upon request. BEMP, River Xchange, and Arroyo Classroom programs continued in FY 2022.</li> <li>• AMAFCA met the Permit required notice period for the FY 2022 Annual Report documents public review.</li> <li>• When appropriate, AMAFCA held project specific project meetings to solicit involvement from organization interested in water quality related issues. In addition, AMAFCA participates in the Water Protection Advisory Board and presented with the City and County on the MS4 program on May 13, 2022.</li> <li>• AMAFCA continued its focus on reducing pet waste through providing Mutt Mitt Stations, maintained by community volunteers. Summary information for the Mutt Mitt Stations Program is available upon request.</li> </ul>

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8.2	139	Comply with State, Tribal, and local notice requirements when implementing a Public Involvement and Participation Program as required in <a href="#">Part I.D.5.h.(iv)</a> . Reporting notification requirements also in <a href="#">Part III.D.4</a> .	<a href="#">Part I.D.5.h.(iv)</a> & <a href="#">Part III.D.4</a> - AMAFCA will provide digital copies of all MS4 compliance reporting documents to the NMED, Pueblos of Sandia and Isleta as required of the MS4 Permit. The SWMP and Annual Reports are also available on the amafca.org website.	<ul style="list-style-type: none"> <li>• AMAFCA will provide digital copies of MS4 compliance reporting documents, as appropriate, to the NMED, Pueblos of Sandia and Isleta as required here and in Part III.D.4 of the MS4 Permit.</li> <li>• AMAFCA will continue to post the SWMP and Annual Reports on the www.amafca.org website.</li> </ul>	<p><b>Met FY 2022 Goal.</b></p> <ul style="list-style-type: none"> <li>• AMAFCA provided copies of the FY 2022 Annual Report to the NMED, Pueblo of Sandia, and Pueblo of Isleta as required here and in Part III.D.4 of the MS4 Permit.</li> <li>• AMAFCA continued its process of posting the current SWMP and the most recent Annual Report on the www.keeptheriogrand.org and/or www.amafca.org websites.</li> </ul>
8.3	140	Include elements as required in <a href="#">Part I.D.5.h.(v)</a> . The public participation process must reach out to all economic and ethnic groups. Opportunities for members of the public to participate in program development and implementation include serving as citizen representatives on a local stormwater management panel, attending public hearings, working as citizen volunteers to educate other individuals about the program, assisting in program coordination with other preexisting programs, or participating in volunteer monitoring efforts.	<a href="#">Part I.D.5.h.(v)</a> - As allowed in this Permit section's "Program Flexibility Elements", AMAFCA, through its involvement with the MRGSQT cooperative programs, has integrated this section of the Public Involvement and Participation program with existing Public Education and Outreach programs in the Middle Rio Grande area. AMAFCA will continue to include stormwater quality information for the public at events, including public meetings. AMAFCA may have Spanish translations, as needed, of public meeting announcements and data sheets.	<ul style="list-style-type: none"> <li>• AMAFCA will continue to include (along with the cooperative MRGSQT programs) water quality information for the public at events, including public meetings. Where neighborhoods include Spanish-speaking residents, MRGSQT may have Spanish-translations available of public meeting announcements and data sheets. By attending a variety of events at widespread locations throughout the area and by using the leading area newspaper (Albuquerque Journal) to advertise events, the MRGSQT ensures that a wide-range of economic and ethnic groups are reached, as documented in the Outreach Report.</li> <li>• AMAFCA will use the Watershed Protection Advisory Board, Public Involvement Committee as a mechanism to reach out to the community for volunteers and to solicit input through public meetings and discussions.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>• AMAFCA participated in the Watershed Protection Advisory Board (WPAB) Public Involvement Committee (PIC).</li> </ul>

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8.4	141	Update the SWMP document and Annual Report as required in Part I.D.5.h.(vi), Part I.D.5.h.(vii), and Part I.D.5.h.(viii). The permittee must include in the SWMP a description of the mechanisms utilized to comply with each of the elements required in Parts I.D.5.h.(i) through part I.D.5.h.(iv) and its corresponding measurable goal. The permittee shall assess the overall success of the program, and document the program effectiveness in the Annual Report. The permittee must provide public accessibility of the SWMP and Annual Reports online via the Internet and during normal business hours at the MS4 operator's main office for public inspection and copying consistent with any applicable federal, state, tribal, or local open records requirements. Upon a showing of significant public interest, the MS4 operator is encouraged to hold a public meeting (or include in the agenda of in a regularly scheduled city council meeting, etc.) on the NOI, SWMP, and Annual Reports.	<p>Part I.D.5.h.(vi) - AMAFCA's Stormwater Quality Engineer will review the program requirements listed for the above-mentioned program elements during the SWMP update and Annual Report process. A strategy to implement any new program requirements or improve compliance with the program requirements will be discussed with the MRGSQT, if applicable, and developed as needed.</p> <p>Part I.D.5.h.(vii) - AMAFCA will document the program effectiveness and program success. AMAFCA will incorporate documentation by reference into the Annual Report.</p> <p>Part I.D.5.h.(viii) - AMAFCA will provide public accessibility of the SWMP and Annual Reports online via the Internet on the www.amafca.org website.</p> <p>At least 30-days prior to submission of each updated SWMP, AMAFCA will provide public notice and make a draft copy of the updated SWMP available for public review and comment and at least 45-days prior to submission of each Annual Report, AMAFCA will provide public notice and make a draft copy of the Annual Report available for public review and comment, as required in Part III.B of the MS4 Permit.</p>	<ul style="list-style-type: none"> <li>The AMAFCA Stormwater Quality Engineer will review and include the program requirements listed in Part I.D.5.g during the SWMP update and Annual Report process.</li> <li>AMAFCA will document the program effectiveness and program success. AMAFCA will incorporate documentation by reference into the Annual Report.</li> <li>AMAFCA will provide public accessibility of the current SWMP document and the most recent Annual Report online via the Internet on the www.amafca.org website.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>AMAFCA continued to utilize the Annual Report process as a means to perform a self-audit on the MS4 Program elements.</li> <li>This Annual Report and the MRGSQT Outcomes Report document the program effectiveness and program success in the status of implementation and performance assessment for each MS4 Permit requirement. The MRGSQT Outcomes Report document is available upon request.</li> <li>AMAFCA continued to provide public accessibility of the current SWMP document and the most recent Annual Report online via the Internet (www.amafca.org and/or www.keepertheriogrando.org) and during normal business hours at the AMAFCA office. AMAFCA is located at 2600 Prospect Avenue NE, Albuquerque, NM 87107. The phone number is 505-884-2215.</li> <li>AMAFCA met the Permit required 45-day notice period for the FY 2022 Annual Report. Documentation for the public review notices are provided in this section of the Annual Report.</li> </ul>
8.5	142	Enhance the program to include requirements in Part I.D.5.h.(ix). The permittee may integrate the public involvement and participation program with existing education and outreach programs in the Middle Rio Grande area. Example of existing programs include: Adopt-A-Stream Programs; Attitude Surveys; Community Hotlines (e.g. establishment of a '311'-type number and system established to handle storm-water-related concerns, setting up a public tracking/reporting.	<p>Part I.D.5.h.(ix) - AMAFCA will continue to include in its (and in the cooperative MRGSQT programs) public involvement and participation programs: funds toward groups which include public participation, such as Boy or Girl Scouts of America, the Bosque Ecosystem Monitoring Program (BEMP), Earth Force - Keep it Clean student outreach, Talking Talons Youth Leadership Activities, and Youth Corps programs. MS4s that are members of the MRGSQT benefit from the Albuquerque 311 Citizen Contact Center.</p>	<ul style="list-style-type: none"> <li>AMAFCA will document progress made with these program enhancement activities. AMAFCA and the MRGSQT will continue to review, update, and enhance public involvement and participation programs. The MRGSQT Outcomes Report will provide the documentation for this Permit activity. This report is available upon request and AMAFCA plans to share this document on its website.</li> <li>MS4s that are members of the MRGSQT benefit from the Albuquerque 311 Citizen Contact Center. This is discussed in more detail in the Illicit Discharges and Improper Disposal Control Measure.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>The MRGSQT Outcomes Report summarizes the public involvement and participation programs and activities for FY 2022. This report is available upon request.</li> <li>AMAFCA continued to participate in the 311 call in program. This is discussed in more detail in the Illicit Discharges and Improper Disposal Control Measure section.</li> </ul>
8.6	143	Item from MS4 Permit NOI. Describe other proposed activities to address the Public Involvement and Participation Measure.	AMAFCA will continue to utilize the Annual Report and SWMP revision process as a means to perform a self-audit with the goal to improve its MS4 Programs.	<ul style="list-style-type: none"> <li>AMAFCA will document progress made, if any, related to the Annual Report and SWMP revision process as a means to perform a self-audit on the MS4 Program elements.</li> </ul>	<p><b>Met FY 2022 Goal.</b></p> <ul style="list-style-type: none"> <li>AMAFCA continued to utilize the Annual Report process as a means to perform a self-audit on the MS4 Program elements.</li> </ul>

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	144	<b>Part III - Monitoring, Assessment and Reporting Requirements</b>			
	145	<b>TABLE 10: Wet Weather Monitoring Program - Part III.A.1</b>			
See NOI Sections Below	146	<p>According to the requirements in <u>Part III.A.1</u>, The permittee must develop, in consultation with NMED and EPA (and affected Tribes if monitoring locations would be located on Tribal lands), and implement a comprehensive monitoring and assessment program. The permittees shall conduct wet weather monitoring to gather information on the response of receiving waters to wet weather discharges from the MS4 during both wet season (July 1 through October 31) and dry season (November 1 through June 30).</p> <p>Wet Weather Monitoring shall be conducted at outfalls, internal sampling stations, and/or in-stream monitoring locations at each water of the US that runs in each entity or entities' jurisdiction(s).</p>	<p><u>Part III.A.1</u> - Wet weather screening is synonymous with compliance monitoring. In the MRG MS4 Permit area, stormwater runoff discharges to the Rio Grande at outfall locations via major drainage channels, storm drains, and pump stations. The Rio Grande, the only perennial river in the watershed, enters the MRG Watershed in one location (North of Albuquerque) and leaves the MRG Watershed south of Albuquerque. Details for this program are provided in the SWMP sections below.</p>	<p>The program details and measurable goals are described below. The Final Sampling Plan for Cooperative Compliance Monitoring (CMC) was submitted to EPA on May 5, 2016. The sampling plan was accepted by the EPA and NMED.</p> <p>The current 2014 Middle Rio Grande Watershed Based Municipal Separate Storm Sewer System (MS4) Permit, NPDES Permit No. NMR04A000, expired on December 19, 2019. The MRG Watershed Based MS4 Permit entered into administrative continuance in Dec. 2019 when EPA Region 6 did not issue a new MS4 Permit before the current MS4 Permit expirations date. The MRG TAG sent EPA an Administrative Continuance letter dated October 15, 2019. Until a new MS4 Permit is issued, there are no wet and dry weather monitoring requirements in the Rio Grande. However, during administrative continuance, the CMC members will evaluate and may choose to continue sampling to support their MS4 program needs, demonstrate program progress, or gather additional data in support of the future Permit compliance.</p>	See specific Permit activity below.

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IV	147	<u>Part III.A.3.1.b. Option B:</u> Cooperative Monitoring Program Develop a cooperative wet weather monitoring program with other permittees in the Middle Rio Grande Watershed. The program will monitor waters coming into the watershed (upstream) and leaving the watershed (downstream). The program must include sampling for TSS, TDS, COD, BOD5, DO, oil and grease, E. coli, pH, total kjeldahl nitrogen, nitrate plus nitrite, dissolved phosphorus, total ammonia plus organic nitrogen, total phosphorus, PCBs and Gross alpha. Monitoring of temperature shall be also conducted at outfalls and/or Rio Grande monitoring locations. Permittees must include additional parameters from monitoring conducted under permits NMS000101, NMR04A000 or/and NMR040001 whose mean values are at or above a WQS. The monitoring program must sample the pollutants for a minimum of 7 storm events per location during the permit term with at least 3 events in the wet season and 2 events in the dry season.	<u>Part III.A.3.1.b. Option B:</u> Cooperative Monitoring Program -The cooperative wet weather compliance monitoring will monitor waters coming into the watershed (upstream) and leaving the watershed (downstream) for a minimum of 7 storm events per location during the Permit term with at least 3 in the events in the wet season and 2 events in the dry season. The wet season is defined in the permit as July 1 through October 31 and the dry season as November 1 through June 30. AMAFCA joined the Compliance Monitoring Cooperative (CMC) group, which includes 12 watershed partners. The participatory permittees have developed a cooperative wet weather compliance monitoring program to assess the effect of stormwater discharges on the receiving water, the Middle Rio Grande. This monitoring plan was reviewed and discussed with NMED and EPA during its development. The cooperative sampling plan was accepted by EPA and permittees submitted the sampling plan on May 5, 2016 and sampling certification to EPA on June 28, 2016. At the end of FY 2019, all Permit required samples have been obtained by the CMC.	<ul style="list-style-type: none"> <li>If the CMC does continue wet weather compliance monitoring during administrative continuance of this Permit, the monitoring program will follow the Permit requirements for parameters tested (TSS, TDS, COD, BOD5, DO, oil and grease, E. coli, pH, total kjeldahl nitrogen, nitrate plus nitrite, dissolved phosphorus, total ammonia plus organic nitrogen, total phosphorus, PCBs, Gross alpha, and temperature). In addition, parameters from stormwater monitoring conducted under Permit NMS000101, whose mean values were at or above a WQS, will also be tested. The complete list of parameters is listed in the CMC sampling plan. In addition, DO, pH, conductivity, and temperature will be analyzed in the field within 15 minutes of sample collection.</li> <li>If the CMC does continue wet weather compliance monitoring during administrative continuance of this Permit, the parameter list may be modified based on a review of the results obtained within the watershed and the program assessment needs for the permittees. AMAFCA will document, as applicable, any wet weather monitoring activity. AMAFCA will incorporate documentation by reference into the Annual Report and plans to document progress on the AMAFCA website.</li> <li>If the CMC does continue wet weather compliance monitoring during administrative continuance of this Permit, the monitoring program will be conducted according to the approved Sampling Plan for Compliance Monitoring.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>The required CMC sampling for the MS4 Permit term in the Rio Grande (2016 to 2019) was completed in FY 2019. The MRG Watershed Based MS4 Permit entered into administrative continuance in Dec. 2019 when EPA Region 6 did not issue a new MS4 Permit before the current MS4 Permit expirations date. The MRG TAG sent EPA an Administrative Continuance letter dated October 15, 2019. Until a new MS4 Permit is issued, there are not compliance monitoring requirements in the Rio Grande. Although compliance sampling is currently not required, the CMC has opted to continue collecting samples while the permit is in administrative continuance. One (1) CMC monitoring and sampling event was conducted in FY 2022. The CMC sampled a wet season storm event on September 1-2, 2022.</li> <li>The CMC maintained a database of the analysis results from the collected samples for the required parameters. This database is available upon request. The E. coli loading and load allocation calculations related to the CMC monitoring program are available upon request for the cooperative monitoring completed in FY 2016 – 2019 and FY 2021 – 2022.</li> </ul>
IV	148	As required in <u>Part III.A.1.e.</u> and <u>Table 10</u> , the permittees shall submit wet weather monitoring preference Option A or Option B to EPA (i.e., individual monitoring program vs. cooperative monitoring program) with NOI submittals.	<u>Part III.A.1.e, Table 10</u> - AMAFCA submitted its NOI in compliance with the permit requirements and schedule. AMAFCA will participate in Option B - cooperative monitoring program.	<ul style="list-style-type: none"> <li>This Permit activity is complete.</li> </ul>	<b>Permit Activity is Complete.</b>
Not Included in NOI	149	<u>Part III.A.1.e, Table 10</u> - Submit a detailed description of the monitoring scheme to EPA and NMED for approval. The monitoring scheme should include: a list of pollutants; a description of monitoring sites with an explanation of why those sites were selected; and a detailed map of all proposed monitoring sites. In addition, as required in <u>Part III.A.1.h</u> , the monitoring program must include a contingency plan for collecting additional monitoring data within the MS4 or at additional appropriate instream locations should monitoring results indicate that MS4 discharges may be contributing to instream exceedances of WQS. The purpose of this additional monitoring effort would be to identify sources of elevated pollutant loadings so they could be addressed by the SWMP.	<u>Part III.A.1.e, Table 10</u> - AMAFCA joined the Compliance Monitoring Cooperative (CMC) group, which includes 12 watershed partners. The participatory permittees have developed a wet weather cooperative monitoring program to assess the effect of stormwater discharges on the receiving water, the Middle Rio Grande. This monitoring plan was reviewed and discussed with NMED and EPA during its development. Multiple drafts were submitted to EPA and NMED by the CMC, including drafts on Sept. 16, 2015 and Dec. 21, 2015. The cooperative monitoring plan was accepted by EPA and permittees submitted the sampling plan on May 5, 2016 and sampling certification to EPA on June 28, 2016. Modifications to this sampling may be submitted to the EPA in the future, as needed for approval.	<ul style="list-style-type: none"> <li>This Permit activity is complete.</li> <li>The CMC members have met all requirements for wet weather compliance monitoring. If the CMC does continue wet weather monitoring during administrative continuance of this Permit, the monitoring program will be conducted according to the EPA/NMED approved monitoring plan.</li> </ul>	<b>Permit Activity is Complete.</b>

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Not Included in NOI	150	<u>Part III.A.1.e, Table 10</u> - Submit certification that all wet weather monitoring sites are operational and begin sampling.	<u>Part III.A.1.e, Table 10</u> - AMAFCA submitted its sampling certification to EPA on June 28, 2016.	<ul style="list-style-type: none"> <li>This Permit activity is complete.</li> <li>AMAFCA, with its cooperative partners, has submitted certifications to the EPA that all wet weather compliance monitoring sites are operational and the CMC has begun sampling, according to the Permit requirements.</li> </ul>	Permit Activity is Complete.
Not Included in NOI	151	<p>As required in <u>Part III.A.1.e</u>, update SWMP document and submit Annual Reports. The results of the Wet Weather Monitoring must be provided in each Annual Report.</p> <p>As required in <u>Part III.D.1</u> -Monitoring results obtained during the reporting period running from July 1st to June 30th shall be submitted on discharge monitoring report (DMR) forms along with the Annual Report required by Part III.B. A separate DMR form is required for each monitoring period (season) specified in Part III.A.I. If any individual analytical test result is less than the minimum quantification level (MQL) listed for that parameter, then a value of zero (0) may be used for that test result for the DMR calculations and reporting requirements. The Annual Report shall include the actual value obtained, if test result is less than the MQL.</p>	<p><u>Part II.A.1.e, Table 10</u> - AMAFCA's Stormwater Quality Engineer will review the program requirement for the above-mentioned program elements, during the Annual Report process. A strategy to implement any new program requirements or improve compliance with the program requirements will be developed as needed.</p> <p><u>Part III.D.1</u> - The wet weather compliance monitoring results obtained by the CMC from July 1st to June 30th will be submitted as required by the EPA using the netDMR online website or as otherwise approved by EPA as part of the cooperative sampling program. EPA has required that the NetDMR online system be used to submit DMR results. Since this Permit will be in administrative continuance, and all required compliance monitoring results have been obtained, AMAFCA anticipates additional coordination with EPA relative to future samples uploaded to the NetDMR system.</p> <p>AMAFCA will continue internal watershed stormwater quality monitoring, which typically collects samples from various locations. Collection of these samples are weather and equipment dependent. Monitoring results obtained from AMAFCA's internal stormwater quality assessment monitoring program and any continued CMC stormwater quality monitoring are available upon request.</p>	<ul style="list-style-type: none"> <li>As part of the Annual Report process each year, the Stormwater Quality Engineer will review the program requirements listed in Part III.A.1, for the above-mentioned SWMP elements, and assess the overall success of the program. AMAFCA will document the program effectiveness and program success. AMAFCA will incorporate documentation by reference into the Annual Report.</li> <li>The CMC members have met all requirements for wet weather compliance monitoring. If the CMC does continue wet weather monitoring during administrative continuance of this Permit, the wet weather compliance monitoring results obtained from July 1st to June 30th will be submitted as required by the EPA using the NetDMR online website or as otherwise approved by EPA as part of the cooperative sampling program. Since this Permit is in administrative continuance, and all required compliance monitoring results have been obtained, AMAFCA anticipates additional coordination with EPA relative to future samples uploaded to the NetDMR system.</li> <li>Monitoring results obtained from AMAFCA's internal stormwater quality assessment monitoring program and any continued CMC stormwater quality monitoring are available upon request.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>Refer to ID # 30 above for monitoring program updates for FY 2022.</li> </ul>

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	152	<b>Dry Weather Discharge Screening of MS4 - Part III.A.2</b>			
Not Included in NOI	153	According to the requirements in <u>Part III.A.2</u> , Each permittee shall identify, investigate, and address areas within its jurisdiction that may be contributing excessive levels of pollutants to the Municipal Separate Storm Sewer System as a result of dry weather discharges (i.e., discharges from separate storm sewers that occur without the direct influence of runoff from storm events, e.g. illicit discharges, allowable non-stormwater, groundwater infiltration, etc.). Due to the arid and semi-arid conditions of the area, the dry weather discharges screening program may be carried out during both wet season (July 1 through October 31) and dry season (November 1 through June 30). Results of the assessment shall be provided in each Annual Report.	<u>Part III.A.2</u> - The program details and measurable goals are described below, in the Pollution Prevention/Good Housekeeping Control Measure, and in the Illicit Discharge and Improper Disposal Control Measure.  There are no perennial streams in the Albuquerque area that contribute to the Rio Grande. As such, the dry weather screening program serves a dual purpose as an illicit discharge screening analysis.	• The program details and measurable goals are described below, in the Pollution Prevention/Good Housekeeping Control Measure, and in the Illicit Discharge and Improper Disposal Control Measure.	<b>Met FY 2022 Goal.</b> • The program details and measurable goals are described below, in the Pollution Prevention/Good Housekeeping Control Measure, and in the Illicit Discharge and Improper Disposal Control Measure.
Not Included in NOI	154	<u>Part III.A.2</u> -This program may be coordinated with the illicit discharge detection and elimination program required in Part I.D.5.e. The dry weather screening program shall be described in the SWMP and comply with the schedules contained in Part I.D.5.e.(iii). The permittee shall: a) Include sufficient screening points to adequately assess pollutant levels from all areas of the MS4. b) Screen for, at a minimum, BOD5, sediment or a parameter addressing sediment (e.g., TSS or turbidity), E. coli, Oil and Grease, nutrients, any pollutant that has been identified as cause of impairment of a waterbody receiving discharges from that portion of the MS4, including temperature. c) Specify the sampling and non-sampling techniques to be issued for initial screening and follow-up purposes. d) Perform monitoring only when an antecedent dry period of at least 72 hours after a rain event greater than 0.1 inch in magnitude is satisfied. Monitoring methodology shall consist of collecting a minimum of 4 grab samples spaced at a minimum interval of 15 minutes each.	<u>Part III.A.2</u> - AMAFCA will continue with the existing, cooperative Dry Weather Screening program in place under MS4 Permit NMS000101. The existing Dry Weather Screening program cooperative program with COA includes screening various locations, which screen 100% of COA/AMAFCA jurisdiction and targets industrial areas. Should any discharge be present in a quantity sufficient for analysis, it will be screened for BOD5, sediment (e.g., TSS or turbidity), E. coli, oil and grease, and nutrients. Any discharge collected will be a grab sample according to the Permit monitoring methodology.  In addition, AMAFCA has in place a well-defined and implemented routine inspection and O&M program that includes both formal and informal inspections and maintenance schedules for its watershed protection elements. Also, as part of AMAFCA's Levellogger monitoring, AMAFCA screens all major channel inlets to the NDC on AMAFCA ROW monthly. These inspections all function as dry weather inspections.  AMAFCA will continue membership and involvement in the cooperative MS4 Technical Advisory Group (MS4 TAG), which will facilitate cooperation and coordination with other MS4s in the Middle Rio Grande related to screening for illicit discharges.	• Under MS4 Permit NMR04A000, COA has taken the lead on this program and is responsible for the dry weather screening and documentation for this existing program. Screening results collected by the COA can be provided upon request. • AMAFCA will continue to perform inspections according to the applicable O&M Manuals and Plans. These inspections also function as dry weather inspections. • As part of AMAFCA's Levellogger monitoring, AMAFCA will continue to inspect all channelized inlets to the NDC on AMAFCA ROW monthly. In addition, AMAFCA will incorporate dry weather inspections into projects, as applicable, to increase the documentation of facility inspections. • AMAFCA will continue membership and involvement in the cooperative MS4 Technical Advisory Group (MS4 TAG) which will facilitate cooperation and coordination with other MS4s in the Middle Rio Grande related to screening for illicit discharges.	<b>Met FY 2022 Goals.</b> • In cooperation with the COA, the Dry Weather Screening results for 39 locations throughout the Middle Rio Grande Watershed, including the AMAFCA MS4, was completed and shared with AMAFCA by COA. The screening followed the requirements in (a) through (d) for this Permit element. The screening report is included as a Program Summary for the Annual Report. • In FY 2022, AMAFCA continued to implement routine inspections and maintenance that includes both formal and informal inspections and maintenance schedules for its watershed protection elements. These inspections also function as dry weather inspections. Refer to the Pollution Prevention/Good Housekeeping Control Measure for additional information. In FY 2022, AMAFCA continued to perform inspections according to the applicable Manuals and Plans. • AMAFCA continued dry weather/illicit discharge inspections with its Levellogger monitoring. Fourteen (14) sites on AMAFCA ROW were inspected monthly and inspections (with photos) documented in the monitoring memos. Refer to the Illicit Discharges and Improper Disposal Program Summary for additional information. • AMAFCA continued to be involved in the MS4 TAG group in FY 2022.

NOI Section	ID	Permit Activity Description	Plan SWMP Rev. 6 - July 1, 2021	Measurable Goal SWMP Rev. 6 - July 1, 2021	Status of Implementation and Performance Assessment Permit Year July 2021 to June 2022 (FY 2022)
	155	<b>Floatables Monitoring - Part III.A.3</b>			
Not Included in NOI	156	<p>According to the requirements in <u>Part III.A.3</u>, The permittees shall establish locations for monitoring/assessing floatable material in discharges to and/or from their MS4. A cooperative monitoring program may be established in partnership with other MS4s to monitor and assess floatable material in discharges to and/or from a joint jurisdictional area or watershed basis.</p> <p>Floatable material shall be monitored at least twice per year at priority locations and at minimum of two (2) stations. The amount of collected material shall be estimated in cubic yards.</p> <p>a) One (1) station should be located in the North Diversion (only applicable to COA and AMAFCA).</p>	<p><u>Part III.A.3</u> - AMAFCA will continue to monitor floatable material and the amount collected in participation with other MS4s. AMAFCA will monitor floatable material in the settling area of the NDC and at the I-25/SDC Baffle Chute Stormwater Quality Facility. Note the NDC settling area is within the AMAFCA easement on Sandia Pueblo property, but that is where AMAFCA has monitored floatables for many years. The requirements in this Permit section will be completed in conjunction with the requirements in TABLE 7: Control of Floatables Discharges - Part I.D.5.f. AMAFCA monitors and tracks collection of floatables at all AMAFCA facilities.</p>	<ul style="list-style-type: none"> <li>• AMAFCA will continue to monitor floatable material and estimate the amount collected at least twice per year at a minimum of 2 stations.</li> <li>• AMAFCA will maintain its 5 drying stations, locations where floatable material, sediment and debris is hauled, separated, and properly disposed of. These stations help AMAFCA meet the requirements for this activity.</li> </ul>	<p><b>Met FY 2022 Goals.</b></p> <ul style="list-style-type: none"> <li>• AMAFCA continued to monitor floatables and the amount collected in the settling area of the NDC and at the I-25/SDC Baffle Chute Stormwater Quality Facility. In addition to these two locations, AMAFCA continued the task of determining the amount of floatables collected from each of the AMAFCA water quality facilities. In FY 2022, AMAFCA continued to use its crew tracking system and database created internally, specifically to meet the MS4 Permit needs. AMAFCA has estimated quantities for the volume of trash, sediment and vegetation removed from its water quality facilities in FY 2022. Refer to the Annual Report Program Summary for additional information related to control of floatables.</li> </ul>



NOI Section	ID	Permit Activity Description	Plan SWMP Rev. 6 - July 1, 2021	Measurable Goal SWMP Rev. 6 - July 1, 2021	Status of Implementation and Performance Assessment Permit Year July 2021 to June 2022 (FY 2022)
	157	<b>Industrial and High Risk Runoff Monitoring - Part III.A.4</b>			
4	158	The permittees shall monitor stormwater discharges from Type 1 and 2 industrial facilities which discharge to the MS4 provided such facilities are located in their jurisdiction. (Note: if no such facilities are in the permittee's jurisdiction, the permittee must certify that this program element does not apply).	Activity removed from AMAFCA's SWMP (Rev. 0, December 1, 2015). AMAFCA certifies with submittal of this SWMP that no such industrial activities are located in AMAFCA's jurisdiction and this program element does not apply. This was submitted to EPA in AMAFCA's NOI and accepted.	N/A	N/A

# **NPDES PERMIT No. NMR04A000**



## **MS4 PROGRAM SUMMARIES FOR ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY**

**DECEMBER 1, 2022**



**2600 PROSPECT AVENUE NE  
ALBUQUERQUE, NM 87107  
(505) 884-2215**



## **Summary of AMAFCA's MS4 Dissolved Oxygen Program FY 2022 (July 1, 2021 – June 30, 2022)**

NPDES Permit No. NMR04A000

Part I.C.1.d - Special Conditions, Compliance with Water Quality Standards and  
Part I.C.3.a - Endangered Species Act (ESA) Requirements - Dissolved Oxygen Strategy

AMAFCA monitors and evaluates the potential effect of stormwater discharges related to dissolved oxygen (DO) in the Rio Grande. The DO of stormwater discharges to the Rio Grande at the North Diversion Channel (NDC) outfall has been monitored by AMAFCA and cooperative Municipal Separate Storm Sewer System (MS4) agencies, with communication with the United States Fish and Wildlife Service (USFWS) and EPA, since 2004. Several strategies and constructed modifications to the NDC Embayment have been implemented from 2011-2016. Currently, in normal river flow conditions, water from the Rio Grande will not stagnate in the NDC Embayment and create low DO conditions. These improvement projects provided control measures to eliminate conditions that cause or contribute to exceedances of applicable DO water quality standards.

In FY 2022, the quality assurance project plan (QAPP), the field sampling plan (FSP), and related Standard Operating Procedures (SOPs) for AMAFCA's stormwater quality monitoring program were reviewed and updated. The format and contents of these documents are modeled after the New Mexico Environment Department (NMED) Surface Water Quality Bureau (SWQB) water quality management programs to facilitate sharing of data between the agencies. These documents provide a framework and detailed methods for the collection and analysis of environmental data as well as provide guidance for generating data that is of the precision, accuracy, and completeness necessary for AMAFCA's program.

In accordance with AMAFCA's Stormwater Management Program (SWMP), AMAFCA has and will continue to assess the potential effect of stormwater discharges into the Rio Grande by collecting and evaluating additional DO data.

### AMAFCA MS4 Sonde Program Summary

The purpose of AMAFCA's Sonde Monitoring Program is to obtain surface water quality data within the Rio Grande to support AMAFCA and the cooperative MS4 agencies with the assessment of surface water quality parameters, as required by the Endangered Species Act requirements incorporated into the MS4 Permit. In addition, the Sonde Monitoring Program data supports determination of long-term surface water quality trends, related to stormwater impacts and impairments, within the Middle Rio Grande. The sondes monitor temperature, barometric pressure, pH, turbidity, DO, DO saturation (%), and water depth above each sonde. AMAFCA has improved the Sonde Program through the years with current access to real-time online data using the HydroVu data management application, allowing quicker response and solutions to maintenance issues.

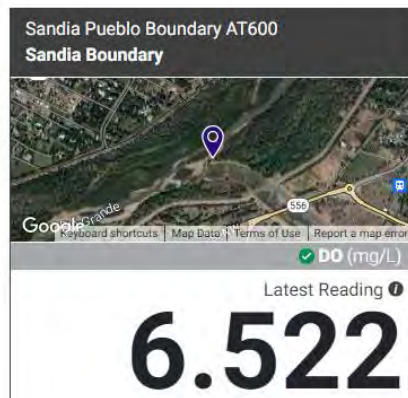
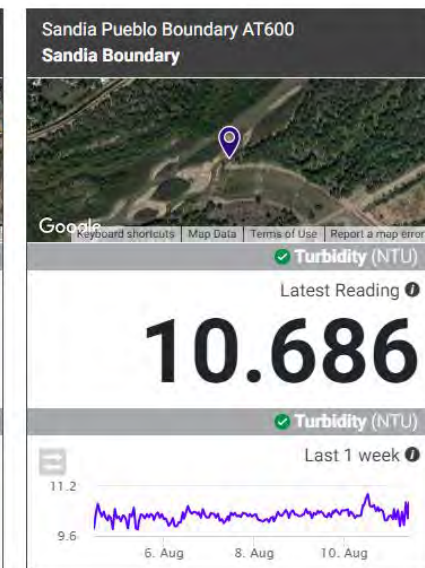
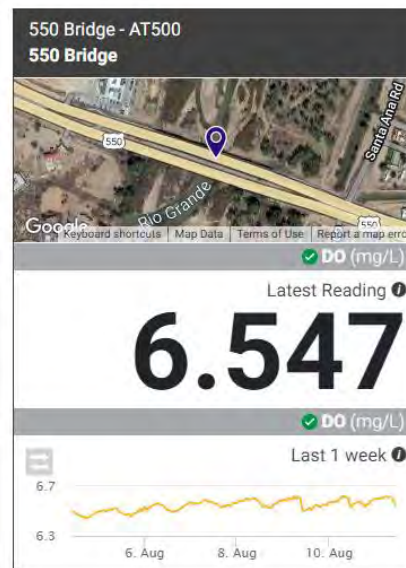
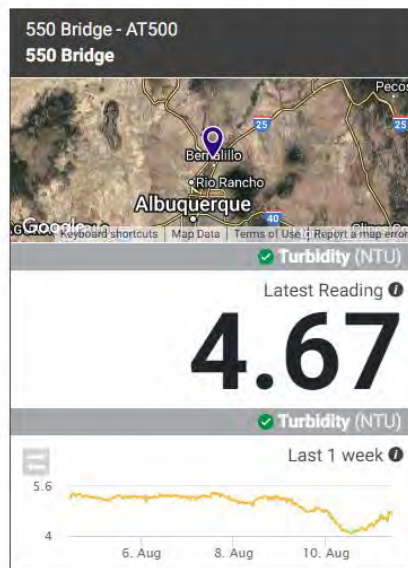


*Photos of AMAFCA Sondes*



AMAFCA Rio Grande WQ Sondes ▾

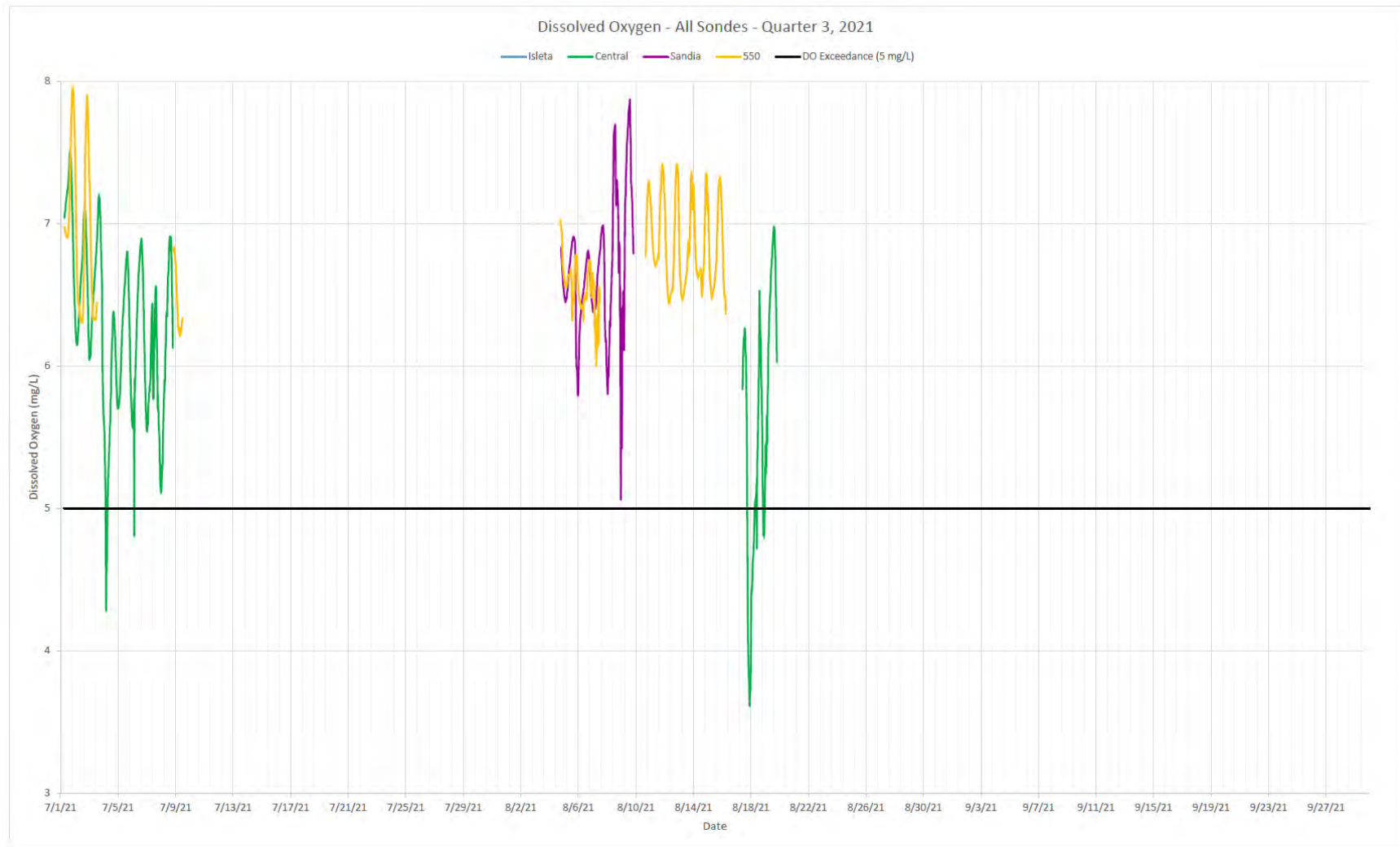
Refresh Data ⓘ Edit



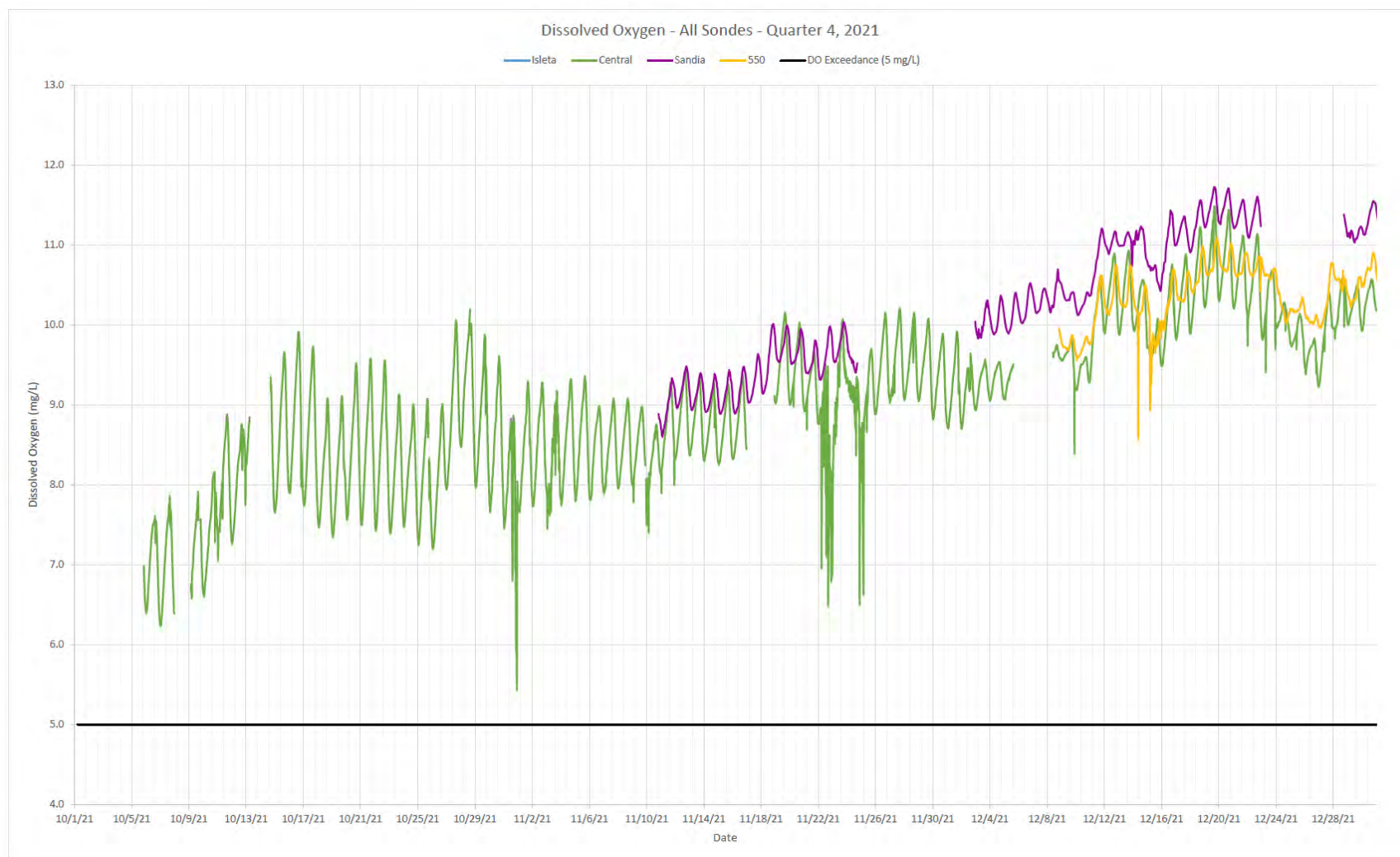
*Image of Online HydroVu Portal Allowing AMAFCA Access to Real-Time Sonde Data in the Rio Grande*

From the AMAFCA FY 2022 In-Stream Water Quality Monitoring Memos, which report on the AMAFCA sonde data, the DO fell slightly below 5 mg/L related to storm events within the watershed for the following locations:

- Central Ave. Bridge – Five dates in FY 2022 (July 2021, August 2021, and June 2022), for a total of approximately 37 hours (0.4 % of the year) – the DO was in the range of 2.1 – 4.8 mg/L.
- Isleta Dam – At various times between June 18, 2022 and June 25, 2022, the DO was below 5 mg/l, in the range of 0.9 – 4.3 mg/L, for approximately 60 hours during these dates. The low DO for 60 hours represents 0.7 % of the year.

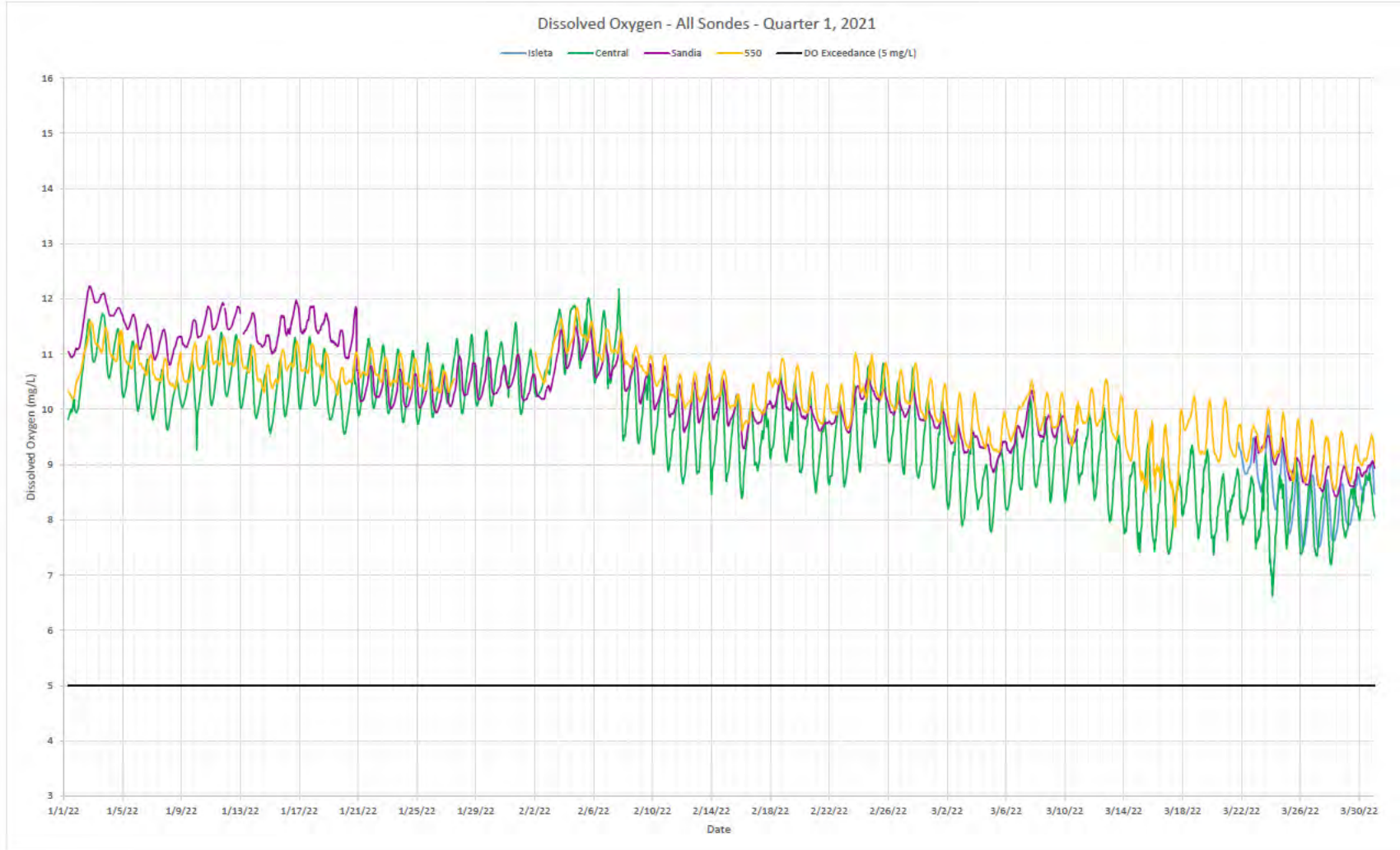


*Plot of DO Data Collected From Sondes Deployed During FY 2022 (July – September 2021)*

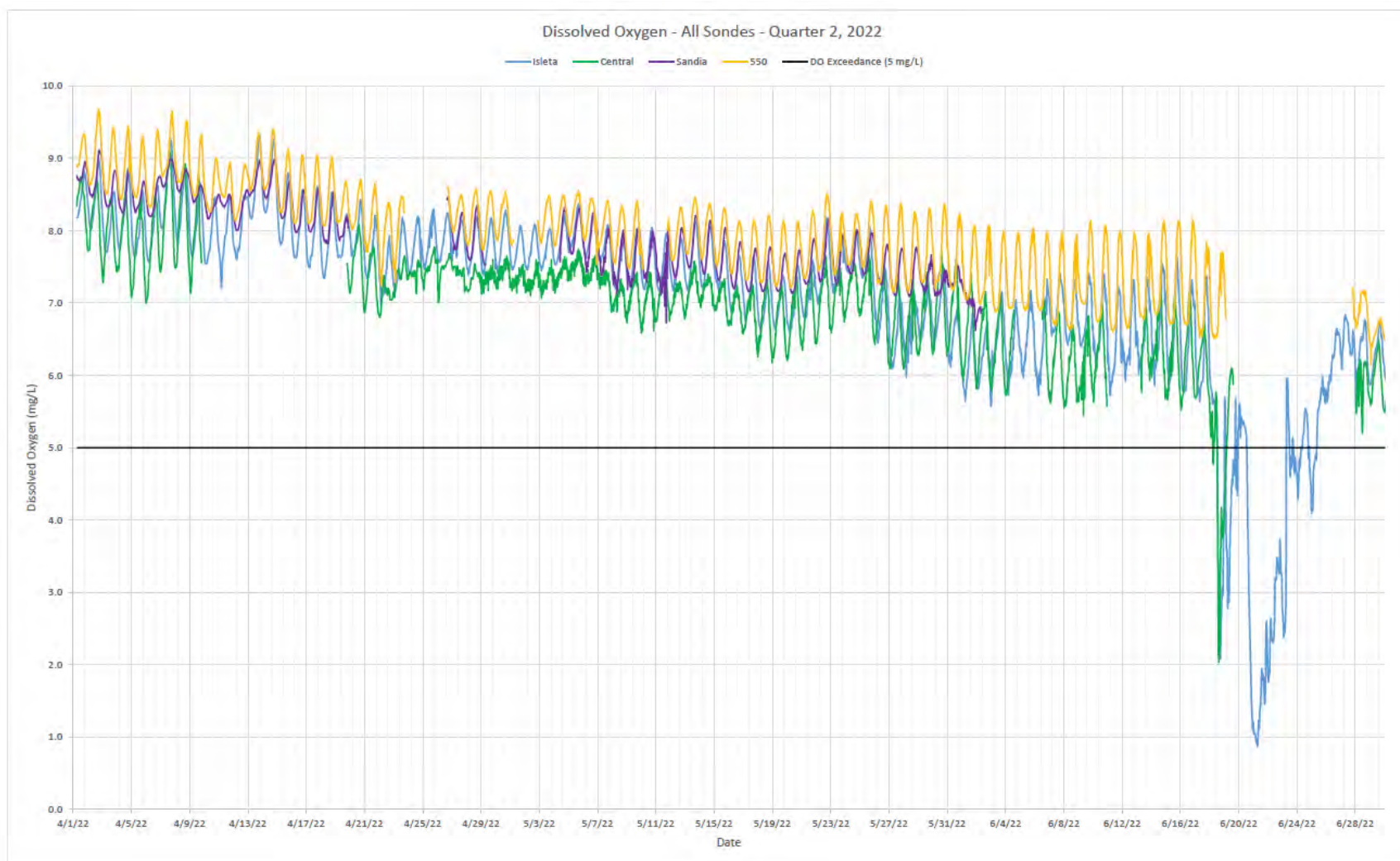


*Plot of DO Data Collected From Sondes Deployed During FY 2022 (October – December 2021)*





*Plot of DO Data Collected From Sondes Deployed During FY 2022 (January – March 2022)*



*Plot of DO Data Collected From Sondes Deployed During FY 2022 (April – June 2022)*

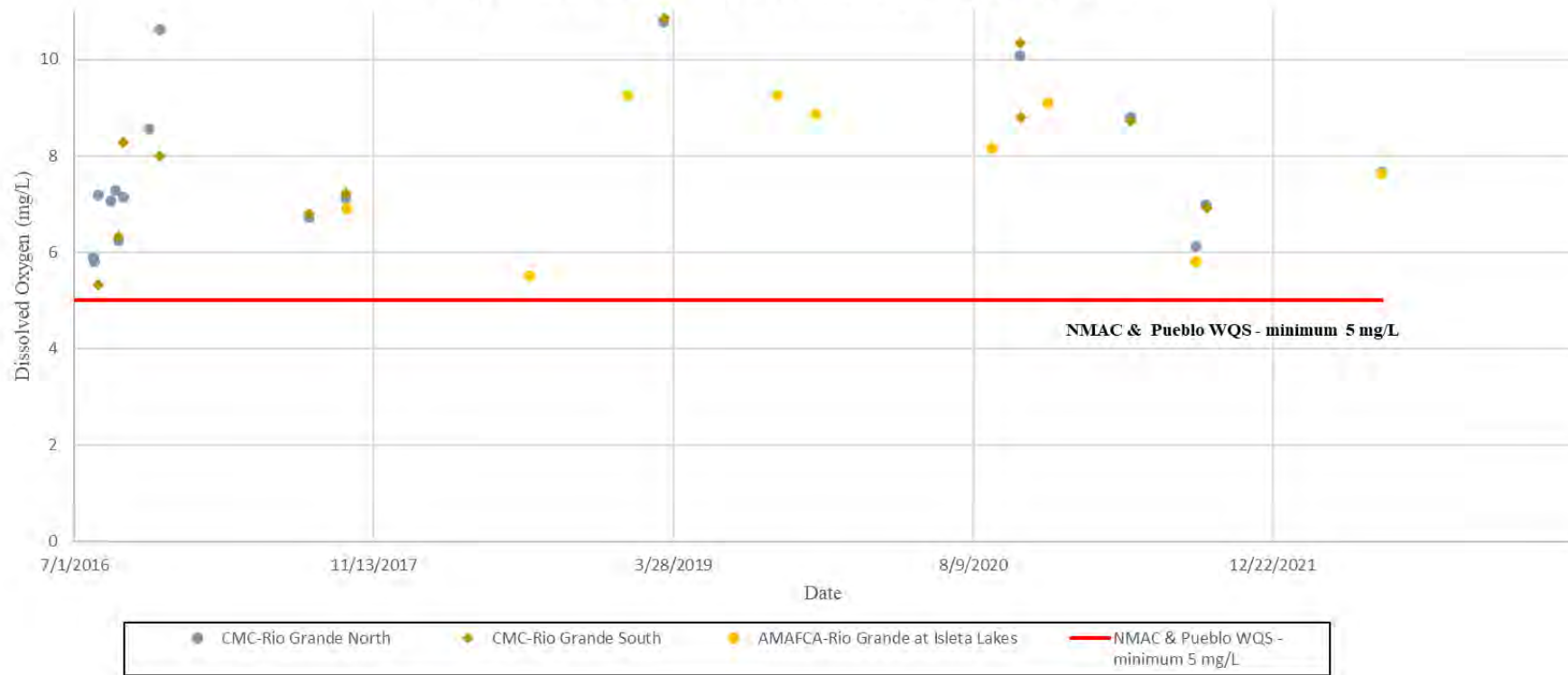
### CMC and AMAFCA Water Quality Monitoring Program Summary for DO

In addition to the Sonde Program, both AMAFCA and the Middle Rio Grande Compliance Monitoring Cooperative (CMC) collect grab samples within the Rio Grande during storm events. Field data is measured, including DO, for these samples. For MS4 Permit compliance, the Middle Rio Grande CMC has two monitoring points where DO field measurements are collected, north and south of the urbanized portion of the river. The AMAFCA Monitoring Program collects samples in the Rio Grande at the downstream (south) end of the watershed (Rio Grande at Isleta Lakes). The graph on page 10 shows the DO data from all AMAFCA and CMC samples collected from July 2016 – June 2022. None of the field DO data collected from these programs, from 2016 to 2022, have recorded DO in the Rio Grande during stormwater discharge events below the water quality standard of 5 mg/L for the Rio Grande (NMAC 20.6.4).



*Collecting a CMC sample from the Rio Grande at  
Angostura Diversion at the upstream (north) end of the  
Middle Rio Grande Watershed*

## Dissolved Oxygen in Rio Grande CMC and AMAFCA Monitoring - 2016 to 2022



*Plot of DO Data Collected from Grab Samples in the Rio Grande Through the AMAFCA and CMC Monitoring Programs*

## AMAFCA Annual Incidental Take Report Summary

The Annual Incidental Take Report estimates the potential Rio Grande Silvery Minnow (RGSM) harassments and lethality near the North Diversion Channel (NDC) outfall, using the method defined by the USFWS for the Biological Opinion (BO) completed in August 2014. This analysis calculates the frequency (number) of anoxic and hypoxic events and determines if the events meet the measurable goals provided in the December 2014 MS4 Permit No. NMR04A000. It also determines the number of RGSM mortalities and harassments using the BO specified methodology.

For the entire MS4 Permit term up until June 2022, including during administrative continuance, zero anoxic events and zero hypoxic events have been identified in the field or during the incidental take analysis. However, in June 2022 the flow conditions in the Rio Grande through Albuquerque were near dry conditions. The low flow conditions in the Rio Grande coupled with stormwater discharge did lead to the first hypoxic event (on June 22, 2022) reported during the permit term (refer to table below). Hypoxic events occur when the oxygen percent saturation in the river is less than 54.3%. Anoxic events occur when the oxygen percent saturation drop below 8.7%.

MRG Watershed MS4 Permit (issued 2014)	Annual Report Year	Measurable Goals Frequency of Anoxic Events/year	Actual No. of Anoxic Events for Year	Measurable Goals Frequency of Hypoxic Events/year	Actual No. of Hypoxic Events for Year
Permit Year 1	July 2015 - June 2016	18	0	36	0
Permit Year 2	July 2016 - June 2017	18	0	36	0
Permit Year 3	July 2017 - June 2018	9	0	18	0
Permit Year 4	July 2018 - June 2019	9	0	18	0
Permit Year 5	July 2019 - June 2020	9	0	18	0
Admin. Continuance	July 2020 - June 2021	9*	0	18*	0
Admin. Continuance	July 2021 - June 2022	9*	0	18*	1
Values in this table are from Table 1.c from MS4 Permit (p. 21 of part 1).					
* MS4 Permit expired and is in administrative continuance. The same measurable goals as Permit Year 5 are assumed.					

*Table Summarizing the Incidental Take Analysis Compared to the MS4 Permit  
Measurable Goals from 2015 – 2022*



ALBUQUERQUE NEWS

# Rio Grande at risk of running dry through Albuquerque

by: [Natalie Wadas](#)

Posted: Jul 21, 2022 / 04:37 PM MDT

Updated: Jul 25, 2022 / 07:54 AM MDT



SHARE    

ALBUQUERQUE, N.M. (KRQE) – The [Rio Grande](#) is at risk of running dry through Albuquerque. Water management officials are warning about what this could mean for local farmers and wildlife.

According to measurements from July 21st, the water flow is about as weak as it's ever been over the past fifty years. "Given the drought conditions that we have and the current water situation that it's very likely that we're going to see drying on the Rio Grande through the Albuquerque area if we don't receive rain soon," says Jason Casuga, CEO and chief engineer for the Middle Rio Grande Conservancy District (MRGCD). Casuga says because of weak snowpack and lack of rain, they can't release water from the reservoirs upstream like Cochiti.

*Snip of News Article Related to Drying of the Rio Grande  
Through the Albuquerque Area in June 2022*

Incidental Take Statement for NDC Discharges to the Rio Grande FY 2022 (July 1, 2021 to June 30, 2022)

NDC Qualifying Storm Event ( >250 cfs and/or V > 13 af)			Q <sub>P</sub> NDC	Q <sub>P</sub> NDC	DO <sub>NDC</sub>	DO Saturation <sub>NDC</sub>	Barometric Pressure <sub>NDC</sub>	Temp <sub>NDC</sub>	DO <sub>Rio Grande</sub>	DO	Q <sub>Daily</sub> Rio Grande	Q <sub>Daily</sub> Rio Grande	No. of RGSM Killed	No. of RGSM Harassed	Was Event Anoxic?	Was Event Hypoxic?
Date	Time	Season														
		(Per BO Table 1)	Actual	Rounded	(Sandia Pueblo Sonde)	(Sandia Pueblo Sonde)	(Sandia Pueblo Sonde or Barologger)	(Sandia Pueblo Sonde or nearest sonde)	Rio Grande at Central	Saturation <sub>Rio Grande</sub>	Actual	Rounded	in Lethal Zone	in Impact Area	Enter 'I' if Yes, 'O' if No	Enter 'I' if Yes, 'O' if No
			08329900	(Per BO App. A)	(mg/L)	(%)	(mm Hg)	(°C)	(mg/L)	(%)	08330000	(Per BO Table 1)	DO % Sat < 8.7%, DO <0.7 mg/L	8.7 %< % DO Sat < 54.3 %, 0.7<DO<4.4 mg/L	(% Sat <= 8.7%; 50% lethality)	(8.7% > % Sat <= 54.3%)
07/03/21	9:15:00 PM	Summer	277	500	6.4	79.49	630.43 <sup>2</sup>	30.35	no data	No Data	1,050	1,000	N/A	N/A	0	0
07/06/21	9:25:00 PM	Summer	371	500	5.8	86.98	631.44 <sup>2</sup>	31.40	5.83	No Data	361	500	N/A	N/A	0	0
07/15/21	6:10:00 AM	Summer	655	500	No Data	82.14	635.00 <sup>3</sup>	No Data	No Data	No Data	91	0	N/A	N/A	0	0
07/18/21	6:20:00 PM	Summer	322	500	No Data	81.48	635.01 <sup>3</sup>	No Data	No Data	No Data	285	500	N/A	N/A	0	0
07/20/21	5:10:00 PM	Summer	2,250	2,500	No Data	81.84	633.08 <sup>3</sup>	No Data	No Data	No Data	122	0	N/A	N/A	0	0
07/27/21	5:25:00 PM	Summer	928	1,000	No Data	No Data	634.31 <sup>3</sup>	No Data	No Data	No Data	527	500	No Data	No Data	No Data	No Data
01/04/22	5:45:00 AM	Winter	1,249 <sup>4</sup>	1,000	11.7	103.67	630.2 <sup>3</sup>	3.1	10.8	No Data	565	500	N/A	N/A	0	0
01/05/22	6:45:00 AM	Winter	517 <sup>4</sup>	500	11.5	103.54	629.2 <sup>3</sup>	3.6	10.5	No Data	483	500	N/A	N/A	0	0
06/17/22	7:15:00 PM	Spring	715 <sup>4</sup>	500	6.2	94.46	630.2 <sup>2</sup>	22.3	6.2	No Data	233	0	N/A	N/A	0	0
06/17/22	11:00:00 PM	Spring	512 <sup>4</sup>	500	5.8	89.40	631.7 <sup>2</sup>	28.8	5.8	No Data	223	0	N/A	N/A	0	0
06/18/22	3:45:00 AM	Spring	252 <sup>4</sup>	500	5.3	74.81	630.4 <sup>2</sup>	23.7	5.3	No Data	217	0	N/A	N/A	0	0
06/19/22	10:45:00 AM	Spring	230 <sup>4</sup>	0	6.0	81.06	631.4 <sup>2</sup>	21.6	6.0	No Data	478	500	N/A	N/A	0	0
06/19/22	9:30:00 PM	Spring	470 <sup>4</sup>	500	4.6	69.37	630.2 <sup>2</sup>	26.8	No Data	No Data	250	500	N/A	N/A	0	0
06/19/22	11:30:00 PM	Spring	193 <sup>4</sup>	0	5.3	80.55 <sup>1</sup>	630.4 <sup>2</sup>	26.8	No Data	No Data	245	0	Calc. DO Sat. OK	Calc. DO Sat. OK	0	0
06/22/22	8:30:00 AM	Summer	1,021 <sup>4</sup>	1,000	2.3	30.79 <sup>1</sup>	634.0 <sup>2</sup>	20.5	No Data	No Data	233	0	Calc. DO Sat. OK	2,932	0	1
06/26/22	5:45:00 AM	Summer	303 <sup>4</sup>	500	6.0	81.86 <sup>1</sup>	635.3 <sup>2</sup>	21.6	No Data	No Data	286	500	Calc. DO Sat. OK	Calc. DO Sat. OK	0	0
06/27/22	1:00:00 AM	Summer	1,948 <sup>4</sup>	2,000	6.3	87.5 <sup>1</sup>	635.8 <sup>2</sup>	22.5	No Data	No Data	405	500	Calc. DO Sat. OK	Calc. DO Sat. OK	0	0
Total #s / Events:													0	2,932	0	1

NOTE: No. of RGSM Killed or Harassed (Columns O and P) is based on lookup tables from BO Appendix A. From BO, p. 72, if stormwater discharges containing less than 0.7 mg/L DO occur during the period of May 15 to 31, then up to 300 larval silvery minnow per year may also die. This did not occur from July 2021 to June 2022.

<sup>1</sup> Sondes did not report DO saturation values on these dates. Used pressure from Barologger data. Calculated DO saturation based on (<https://water.usgs.gov/software/DOTABLES/>).  
<sup>2</sup> Barologger data not available for these dates (or are unreasonably high), pressure taken from NOAA climate data station at Albuquerque International Airport (WBAN: 23050). Data given in inHg, converted to mmHg using <https://www.convertunits.com/from/inHg/to/mmHg>. Data downloaded from: <https://www.ncdc.noaa.gov/cdo-web/datasets/LCD/stations/WBAN:23050/detail>  
<sup>3</sup> The barometric pressure was not recorded by the Sandia Pueblo Sonde for these dates. The corresponding AMAFCA barologger data was used instead.  
<sup>4</sup> No USGS flow data for the NDC available after 8/3/2021, remaining dates taken from AMAFCA Telemetry data. Telemetry data not available between 2/4/22-4/7/22 so qualifying events could not be determined. Review of USGS gage 08329835 (NDC at Embudo) indicates there may not have been qualifying events during this period.

Green Shading	No Incidental Take according to BO; DO in NDC Outfall > 4.4 mg/L and oxygen saturation of 54.3 %. Had sonde data available for complete analysis.
Gray Shading (Sonde Data not available). Incidental Take based on calculated DO concentration or DO saturation (Source: Sonde Data and Program memos from Weston)	Due to low flow conditions in the Rio Grande, no sondes were in the river on 7/27/22.
	Sandia Pueblo sonde was removed from the river on 6/2/22. Used Central sonde for Temp and DO data after 6/2/22. Central sonde stopped reporting after 6/19/22 15:00. Used Isleta sonde for Temp data for the remaining dates.
	Sondes from all locations removed from the river (550: 7/9/21-8/4/21, Sandia: 7/1/21-8/4/21, Central: 7/8/21-8/17/21, Isleta: 7/1/21-9/30/21). No DO or Temp data available for these dates.
Blue Shading	Sondes did not report percent saturation; calculated using <a href="http://water.usgs.gov/software/DOTABLES/">http://water.usgs.gov/software/DOTABLES/</a>
Purple Shading	NDC (Sandia Pueblo) Sonde did not report DO concentration or temperature, used nearest available Sonde DO concentration data and temperature (Central or Isleta).

No. Events w/ Takes for Year:		0	
Estimated Incidental Take			
July 2021 to June 2022		Allowed Per Year	Allowed Over 5-Year Permit Term
Mortalities =	0	2,280	10,410
Harassments =	2,932	32,616	163,080

Incidental Take Allowance Source: Biological Opinion for U.S. Environmental Protection Agency General NPDES Permit No. NMR04A000, Aug. 2014, USFWS

MRG Watershed MS4 Permit (issued 2014)	Annual Report Year	Measurable Goals Frequency of Anoxic Events/Year	Actual No. of Anoxic Events for Year	Measurable Goals Frequency of Hypoxic Events/Year	Actual No. of Hypoxic Events for Year
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Permit Year 2	July 2016 - June 2017	18	0	36	0
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Permit Year 4	July 2018 - June 2019	9	0	18	0
Permit Year 5	July 2019 - June 2020	9	0	18	0
Admin. Continuance	July 2020 - June 2021	9*	0	18*	0
Admin. Continuance	July 2021 - June 2022	9*	0	18*	1

Values in this table are from Table 1.c from MS4 Permit (p. 21 of part 1).  
\* MS4 Permit expired and is in administrative continuance. The same measurable goals as Permit Year 5 are assumed.



**Summary of AMAFCA's MS4  
Temperature Program  
FY 2022 (July 1, 2021 – June 30, 2022)**

NPDES Permit No. NMR04A000

Part I.C.1.f - Special Conditions, Compliance with Water Quality Standards

AMAFCA monitors and evaluates the potential effect of stormwater discharges related to temperature in the Rio Grande. AMAFCA and the original Municipal Separate Storm Sewer System (MS4) co-permittees (the City of Albuquerque, New Mexico Department of Transportation, and the University of New Mexico) assembled and analyzed temperature data from 1982 to 2012. This data analysis proved the assertion that the receiving waters of the Rio Grande are not adversely affected by the temperature of stormwater from the Albuquerque MS4. This data was presented in an initial report that was submitted to EPA on May 1, 2012.

Since 2012, the MS4 permittees have continued to collect and submit temperature data, with each Annual Report, showing that the Rio Grande (receiving water for the Middle Rio Grande watershed) is not adversely affected by the temperature of stormwater from the Albuquerque MS4. AMAFCA has collected data from 2012 to 2022 using tidbit probes and sondes. In accordance with AMAFCA's Stormwater Management Program (SWMP), AMAFCA has and will continue to assess the potential effect of stormwater discharges into the Rio Grande by collecting and evaluating additional temperature data.

In FY 2022, the quality assurance project plan (QAPP), the field sampling plan (FSP), and related Standard Operating Procedures (SOPs) for AMAFCA's stormwater quality monitoring program were reviewed and updated. The format and contents of these documents are modeled after the New Mexico Environment Department (NMED) Surface Water Quality Bureau (SWQB) water quality management programs to facilitate sharing of data between the agencies. These documents provide a framework and detailed methods for the collection and analysis of environmental data as well as provide guidance for generating data that is of the precision, accuracy, and completeness necessary for AMAFCA's program.

**AMAFCA MS4 Sonde Program Summary**

The purpose of AMAFCA's Sonde Monitoring Program is to obtain surface water quality data within the Rio Grande to support AMAFCA and the cooperative MS4 agencies with the assessment of surface water quality parameters, as required by the Endangered Species Act requirements incorporated into the MS4 Permit. In addition, the sonde monitoring program data supports determination of long-term surface water quality trends, related to stormwater impacts and impairments, within the Middle Rio Grande. The sondes monitor temperature, barometric pressure, pH, turbidity, dissolved oxygen (DO), DO saturation (%), and water depth above each sonde. AMAFCA has improved the Sonde Program through the years with current access to real-time online data using the HydroVu data management application, allowing quicker response and solutions to maintenance issues.



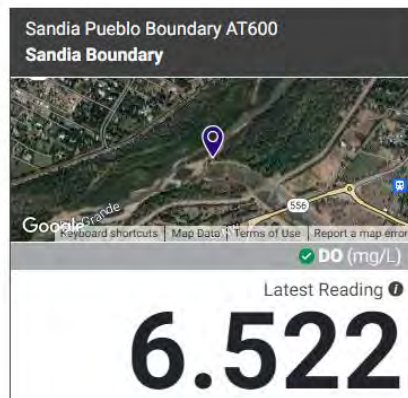
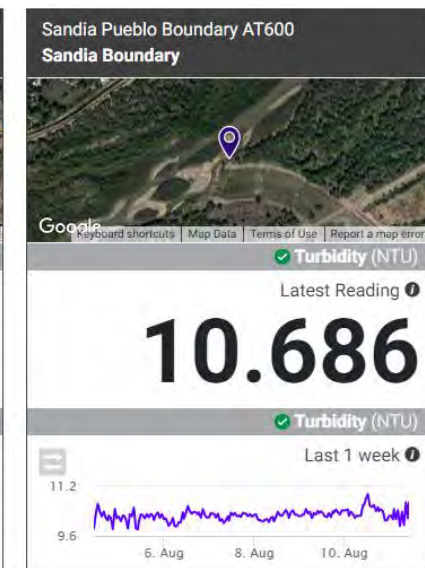
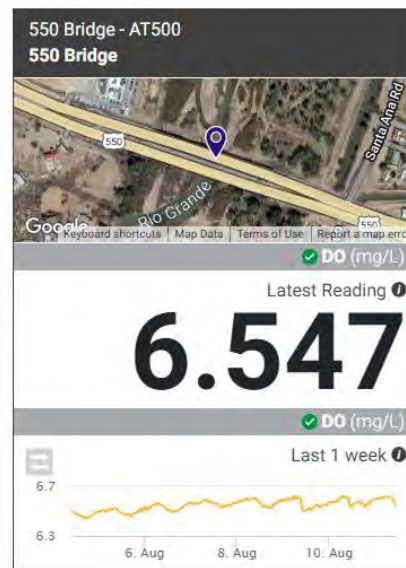
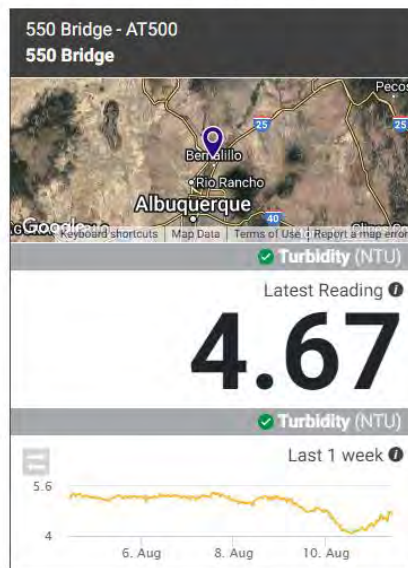
From the AMAFCA FY 2022 In-Stream Water Quality Monitoring Memos, which report on the AMAFCA sonde data, the temperature was below the water quality standard 32.2 °C, which is the maximum temperature water quality standard for Marginal Warmwater Aquatic for the Rio Grande (NMAC 20.6.4) for all (4) four sondes, for all data related to storm events within the watershed except for two (2) instances. There were two (2) temperature exceedances (max. temperature reported of 33.3 °C) indicated by the sondes in July 2021, both occurring at the Central Ave. Bridge sonde. There was precipitation in the watershed when the two (2) exceedances occurred.



*Photos of AMAFCA Sondes*

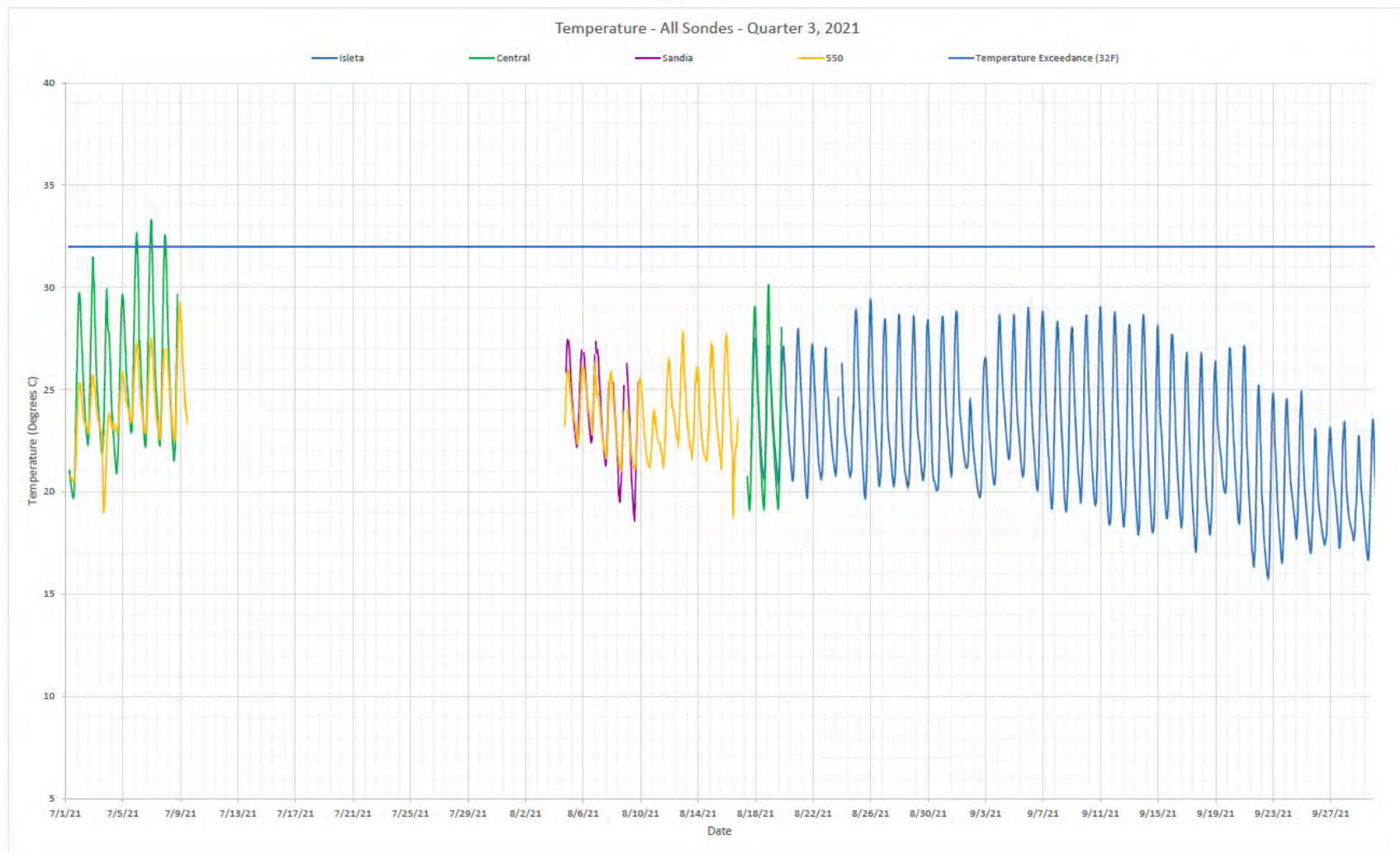
AMAFCA Rio Grande WQ Sondes ▾

Refresh Data ⓘ Edit

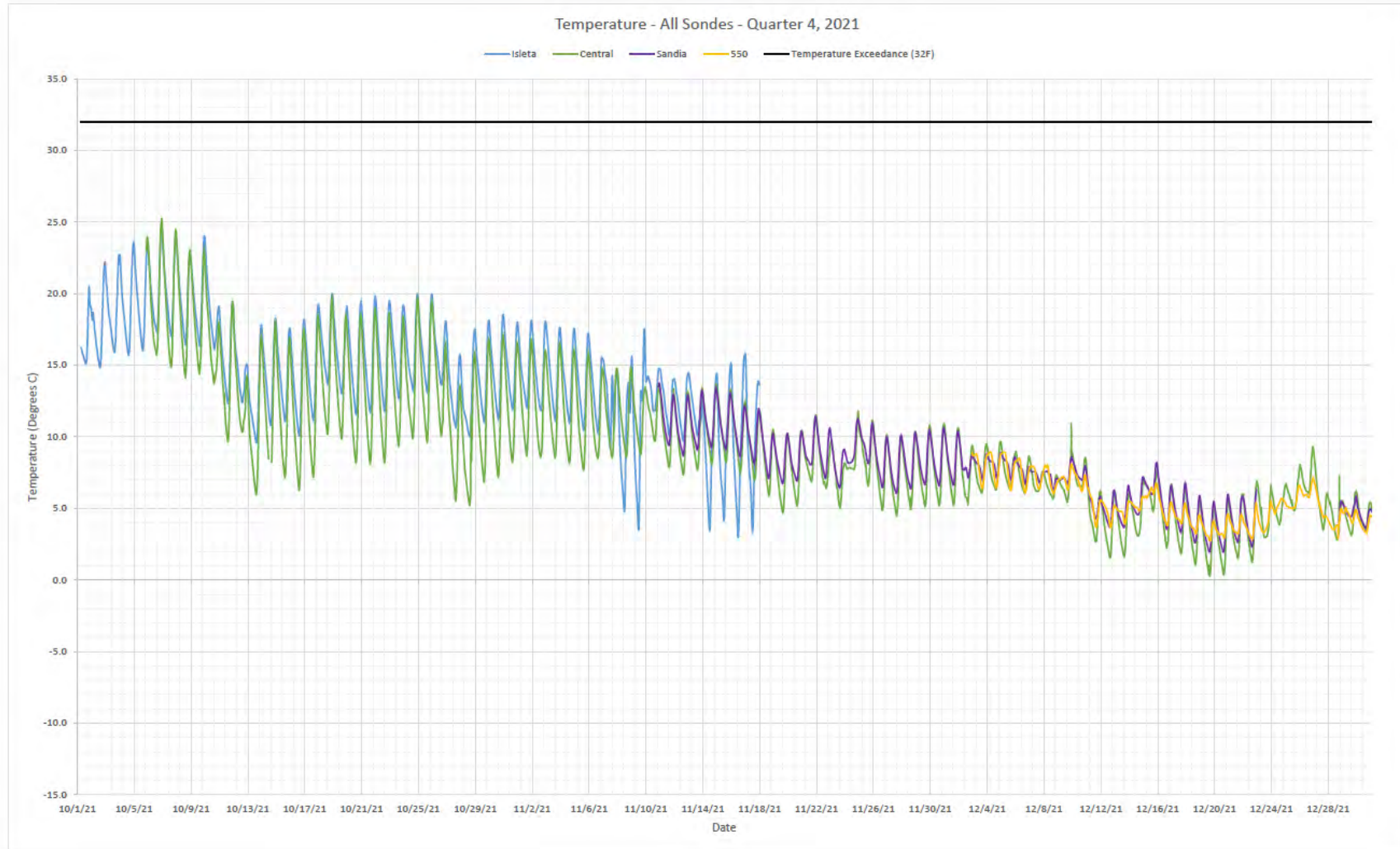


*Image of Online HydroVu Portal Allowing AMAFCA Access to Real-Time Sonde Data in the Rio Grande*

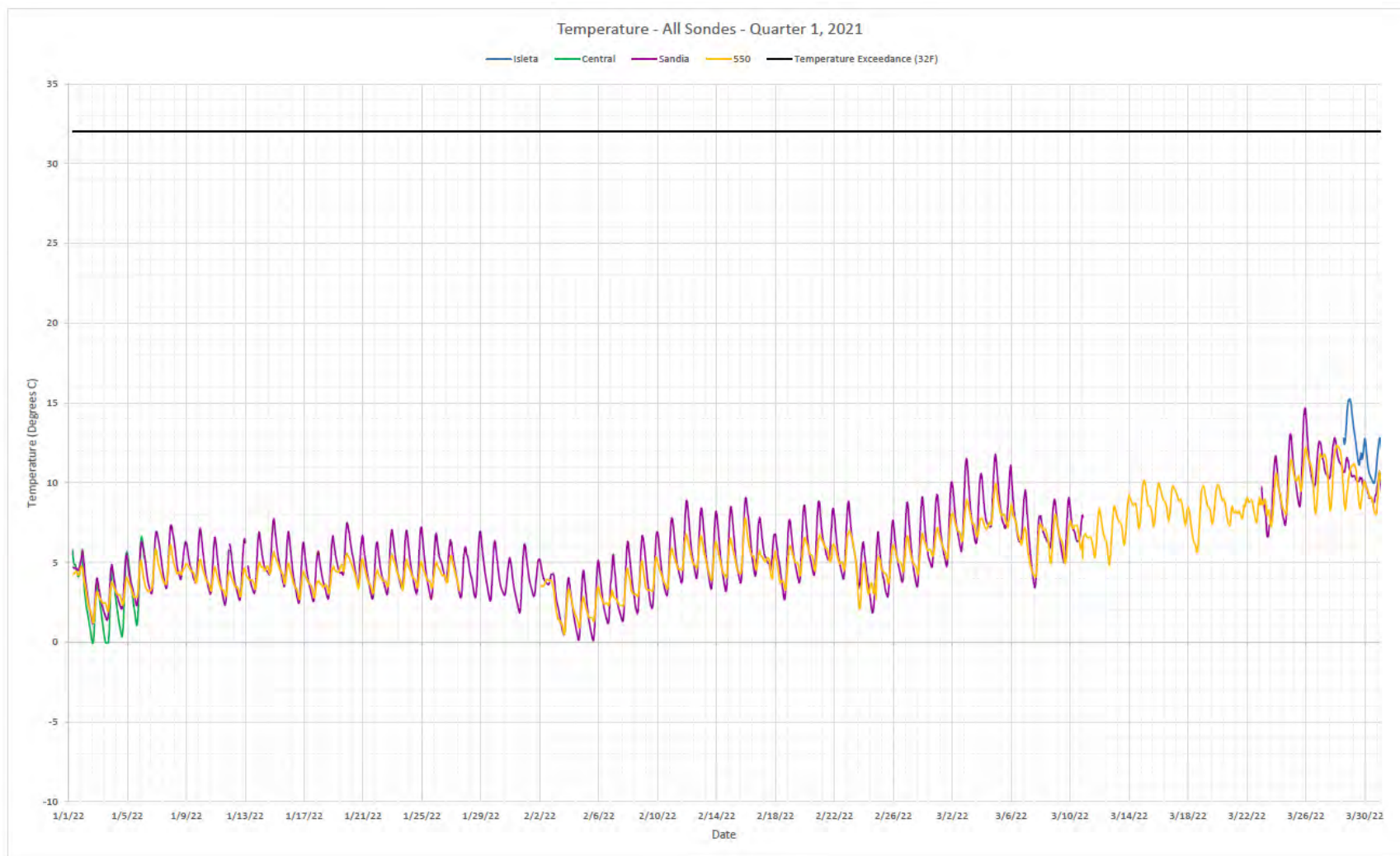




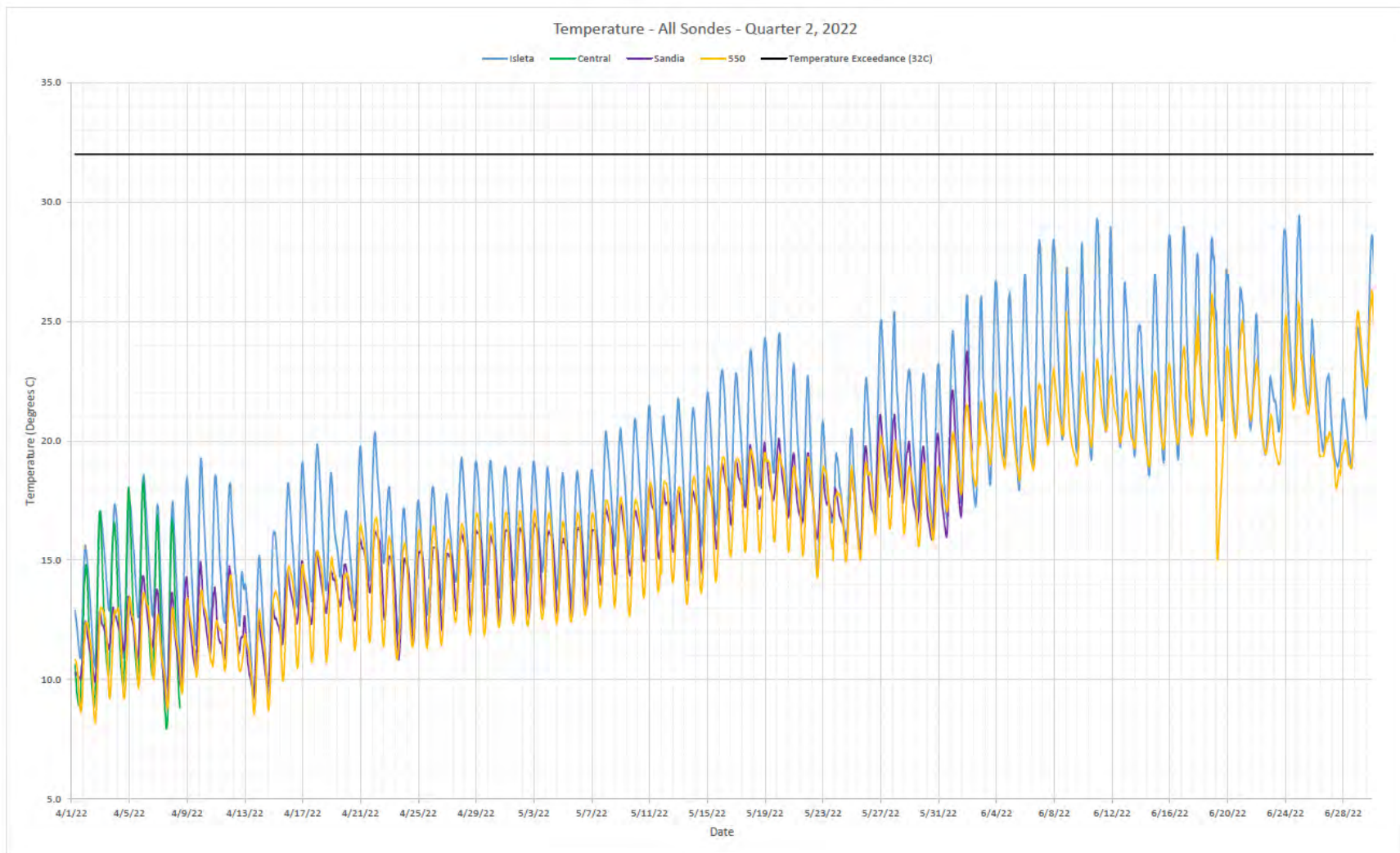
*Plot of Temperature Data Collected From Sondes Deployed During FY 2022 (July – September 2021)*



*Plot of Temperature Data Collected From Sondes Deployed During FY 2022 (October – December 2021)*



*Plot of Temperature Data Collected From Sondes Deployed During FY 2022 (January – March 2022)*



*Plot of Temperature Data Collected From Sondes Deployed During FY 2022 (April – June 2022)*



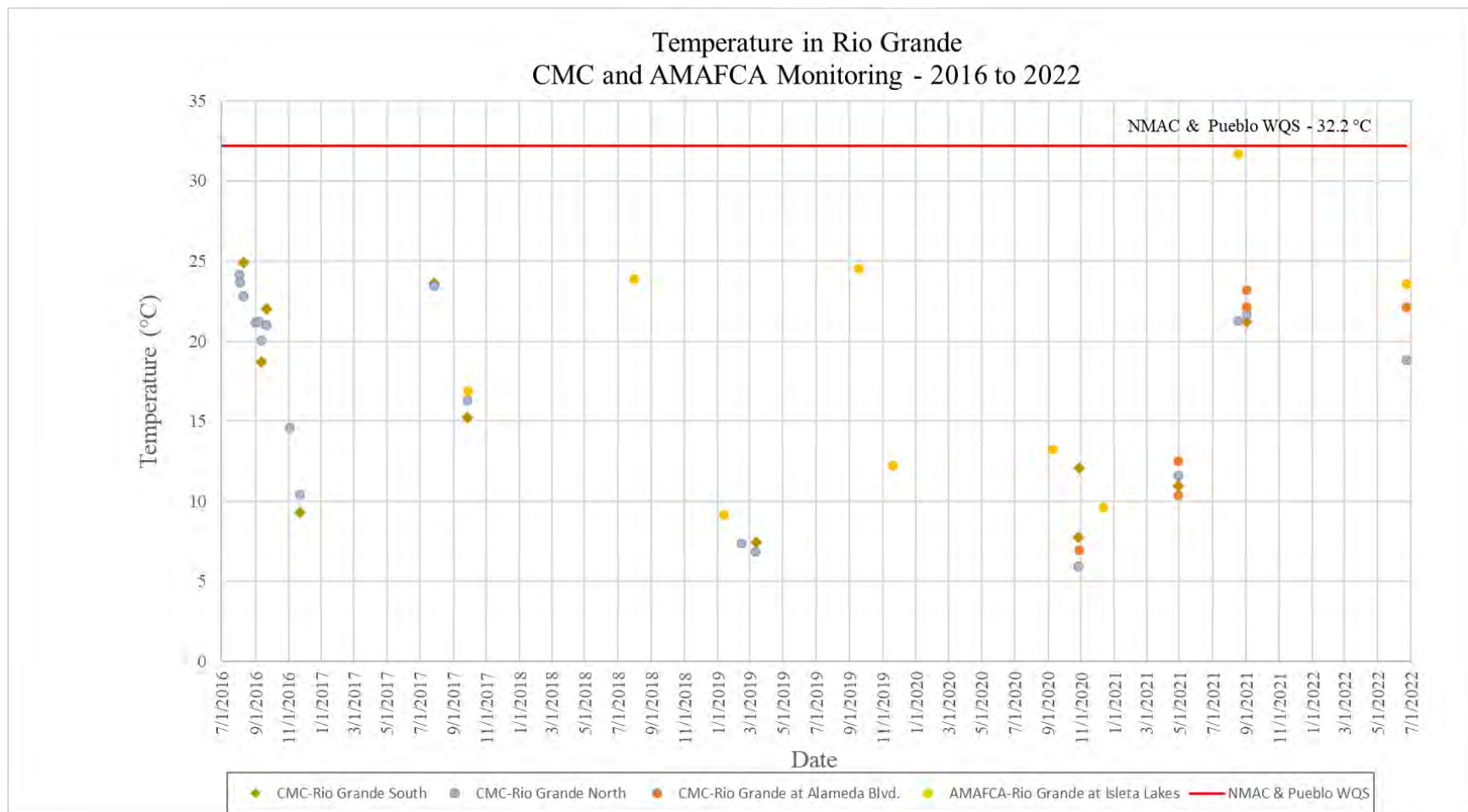
### CMC and AMAFCA Water Quality Monitoring Program Summary

In addition to the Sonde Program, both AMAFCA and the Middle Rio Grande Compliance Monitoring Cooperative (CMC) collect grab samples within the Rio Grande during storm events. Field data is measured, including temperature, for these samples. For MS4 Permit compliance, the Middle Rio Grande CMC has three (3) monitoring points, north and south of the urbanized portion of the river, as well at the Alameda Bridge. The AMAFCA Monitoring Program collects samples in the Rio Grande at the downstream (south) end of the watershed (Rio Grande at Isleta Lakes). The graph on page 9 shows the temperature data from all AMAFCA and CMC samples collected from July 2016 – June 2022. None of the field temperature data collected from these programs have recorded temperature in the Rio Grande during stormwater discharge events above the water quality standard of 32.2 °C.

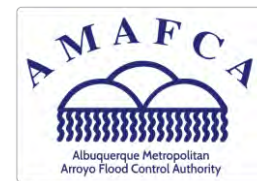


*Collecting a CMC sample from the Rio Grande at  
Angostura Diversion at the upstream (north) end of the  
Middle Rio Grande Watershed*





*Plot of Temperature Data Collected From Grab Samples in the Rio Grande Through the AMAFCA and CMC Monitoring Programs*



**Summary of AMAFCA's MS4  
Discharges to Water Quality Impaired Water Bodies  
with an Approved TMDL Program  
FY 2022 (July 1, 2021 – June 30, 2022)**

NPDES Permit No. NMR04A000

Part I.C.2.b.(i) - Special Conditions, Compliance with Water Quality Standards

Total Maximum Daily Load (TMDL) – E. coli

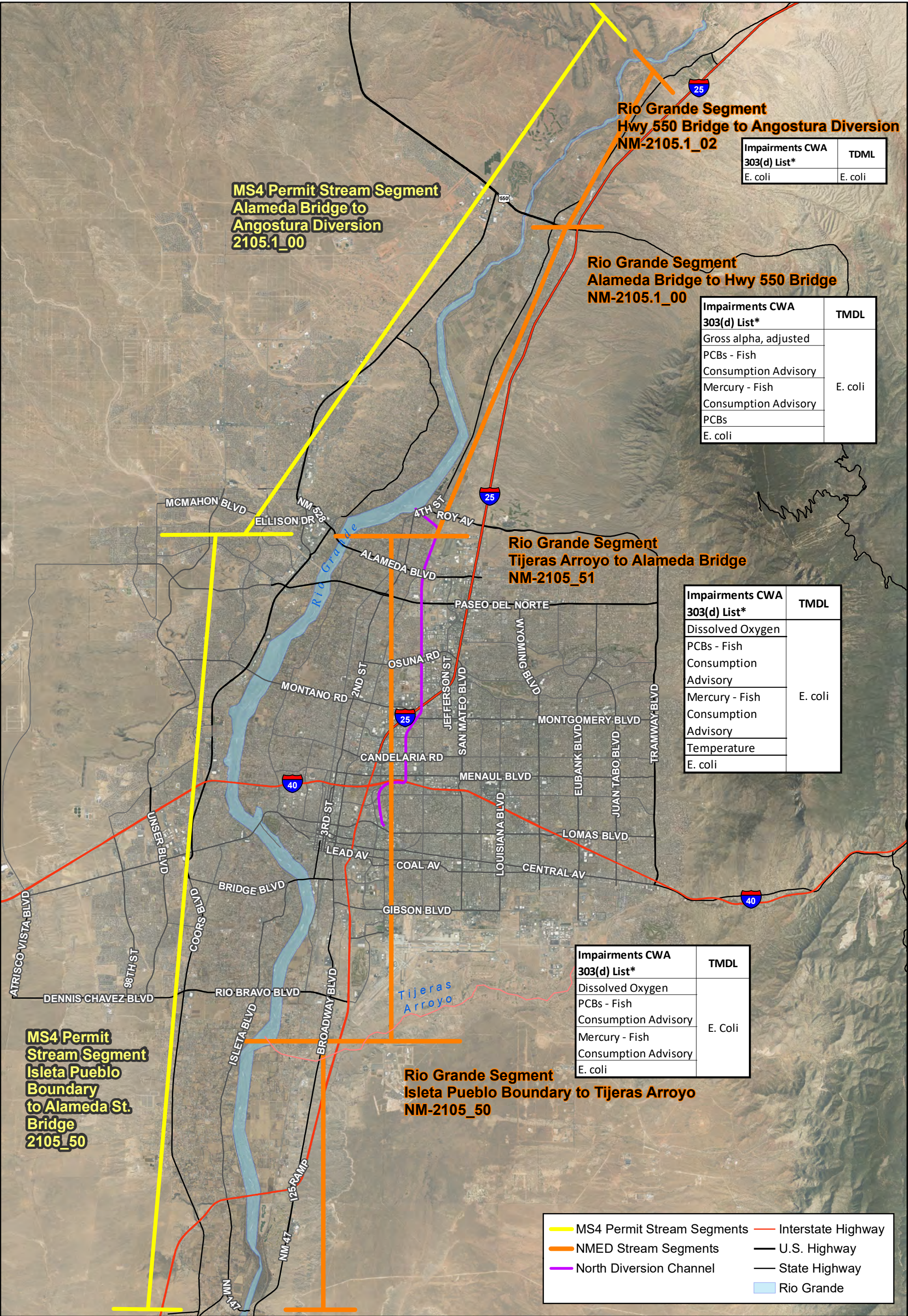
A Total Maximum Daily Load (TMDL) is essentially the regulatory calculation of the maximum amount of a particular pollutant allowed to enter a water body (like the Rio Grande) so that the water body will continue to meet water quality standards for that particular pollutant. A TMDL can also determine a pollutant reduction target and allocates load reductions necessary to the source(s) of the pollutant.

The only TMDL in the Middle Rio Grande (MRG) is Escherichia coliform (E. coli). AMAFCA's required compliance for wet weather stormwater discharges with the Environmental Protection Agency's (EPA) calculated TMDL for E. coli is documented in the Clean Water Act (CWA) 303(d)/305(b) Integrated Report (IR). The IR is updated every three years by a review process that is conducted by the New Mexico Environment Department (NMED). For AMAFCA and other Municipal Separate Storm Sewer System (MS4) permittees in the watershed, compliance sampling is done in the Rio Grande at upstream and downstream locations of the urbanized area to determine the collective E. coli load added to the river in response to a given storm's runoff to the water body.

AMAFCA discussed the MRG TMDL for E. coli with the AMAFCA Board throughout the fall of 2021. Technical work related to the TMDL was completed by Weston and was presented to the AMAFCA Board. The AMAFCA Board memos are attached at the end of this this Program Summary for reference.

AMAFCA and other MS4s covered under the MS4 Permit are required to comply with water quality standards that are comprised of designated uses for surface waters of the state, associated water quality criteria necessary to protect these uses, and an antidegradation policy. Designated uses in the Middle Rio Grande include aquatic life, fish culture, primary and secondary contact (including cultural, religious, or ceremonial purposes), public water supply, industrial water supply, domestic water supply, irrigation, livestock watering, and wildlife habitat. AMAFCA's stormwater discharges protect these uses and fulfill the requirements set forth in the MS4 Permit. Coordinated water quality sample collection programs through AMAFCA, the Stormwater Quality Team, Compliance Monitoring Cooperative (CMC), and Bosque Ecosystem Monitoring Program (BEMP) have been developed and annually funded to monitor, assess, protect, and restore surface water quality to the Middle Rio Grande watershed.





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www.bhinc.com  
800.877.5332



0 12,000 24,000  
1 in = 12,500 ft Feet

### CMC Monitoring

Figure 6  
Rio Grande Impairments &  
TMDL Information

\* Final 2020-2022 State of NM Clean Water Act, Section 303(d)/Section 305(b) Integrated Report



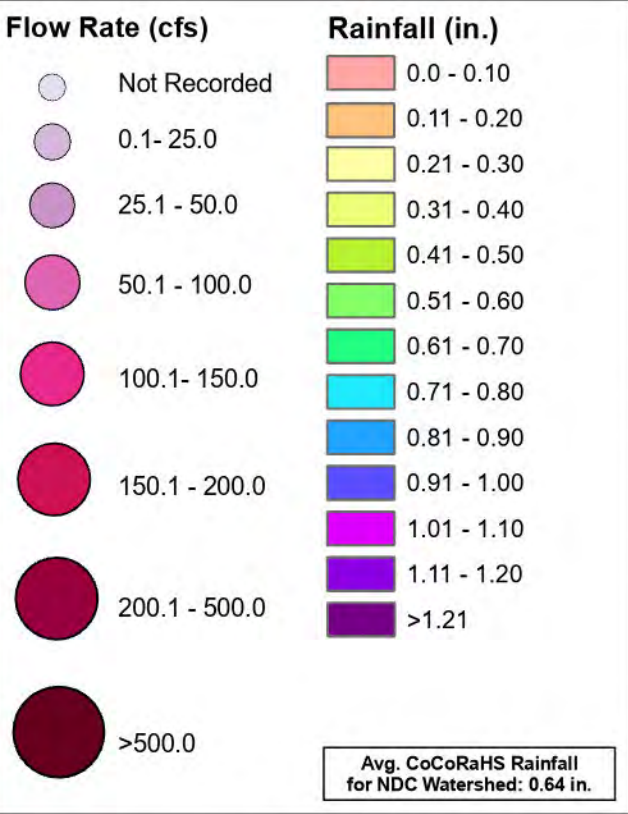
### AMAFCA Flow Monitoring Program

AMAFCA's flow monitoring program monitors stormwater runoff in arroyos contributing runoff to the North Diversion Channel (NDC) and eventually into the Rio Grande. This program supports AMAFCA's Municipal Separate Storm Sewer System (MS4) Discharges to Water Quality Impaired Water Bodies with an Approved TMDL Program to assess stormwater runoff from specific locations, assisting with an understanding on contributing pollutant loads, including E. coli, to the NDC and Rio Grande. The graphics below provide examples of the program flow analysis compared to the rainfall received in each subwatershed.

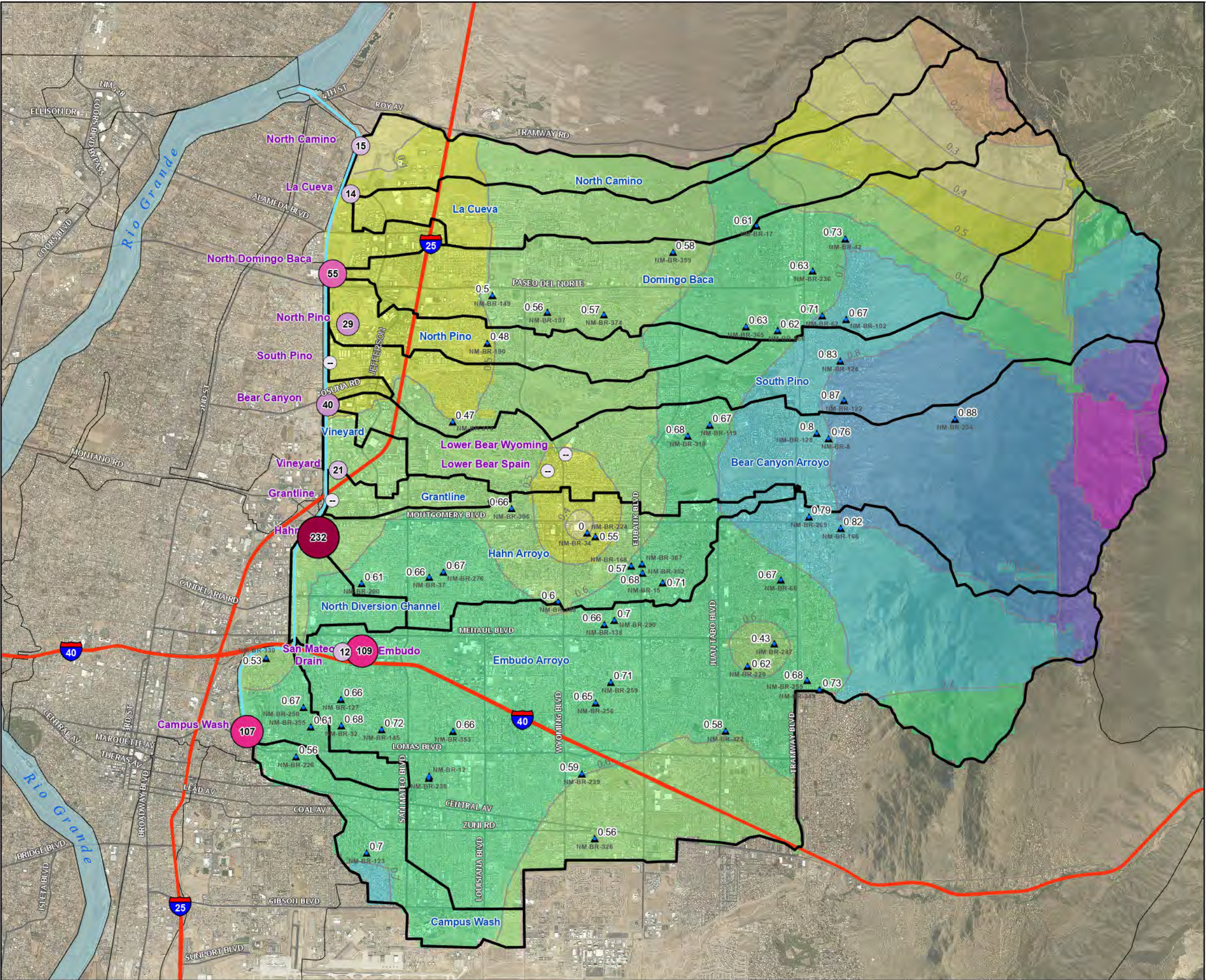
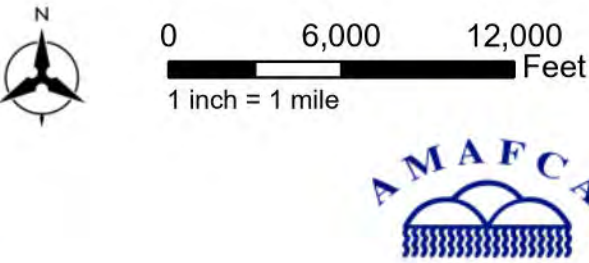


AMAFCA  
Levellogger Runoff and  
CoCoRaHS Rainfall  
June 27, 2022  
Storm Event

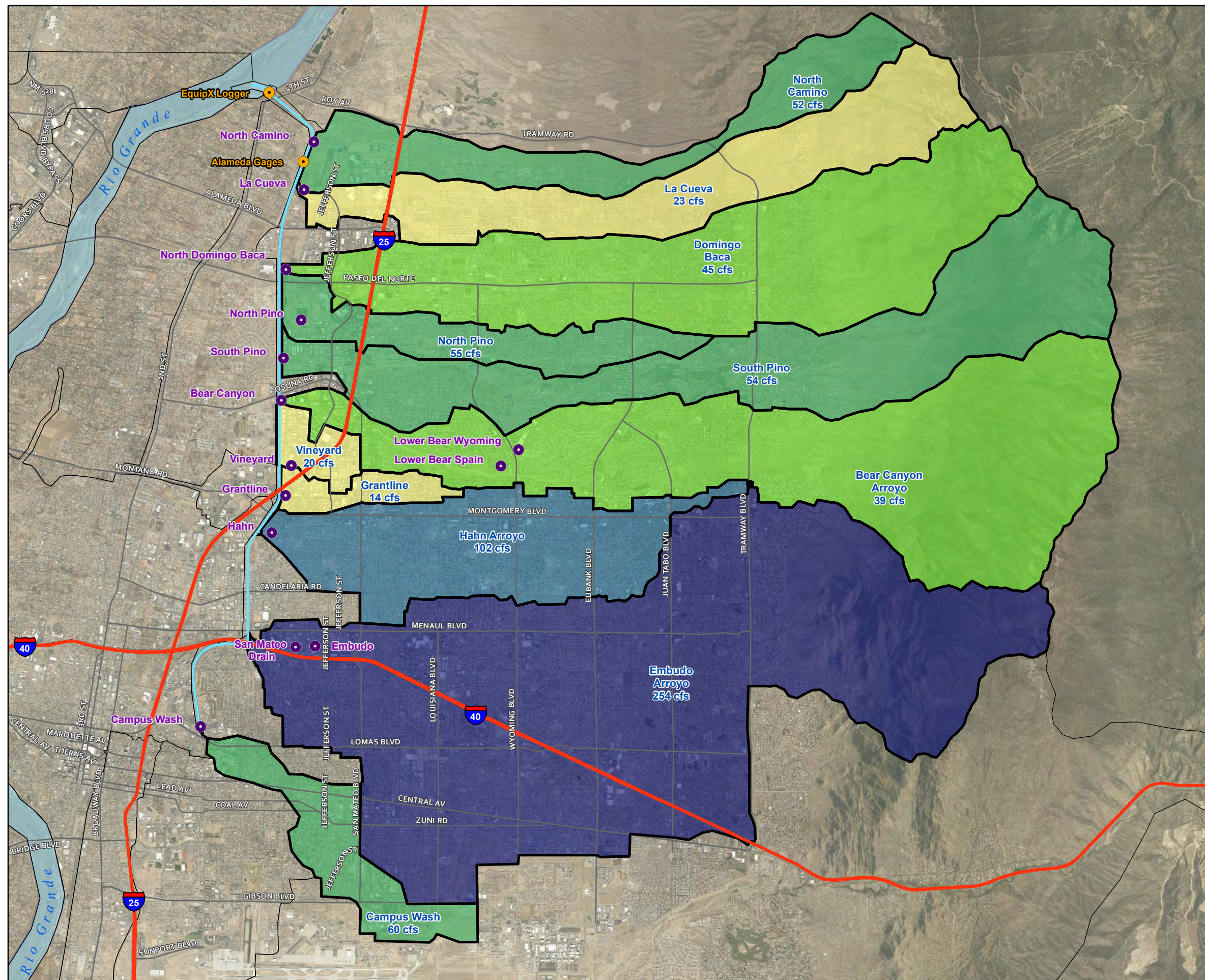
- ▲ CoCoRaHS Stations with reported rainfall (in)
- North Diversion Channel
- Watersheds



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.







## Average Peak Discharge (cfs)

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

- Levellogger Sites
- NDC Levellogger Sites
- North Division Channel
- Watersheds

## Average Peak Runoff (cfs)

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



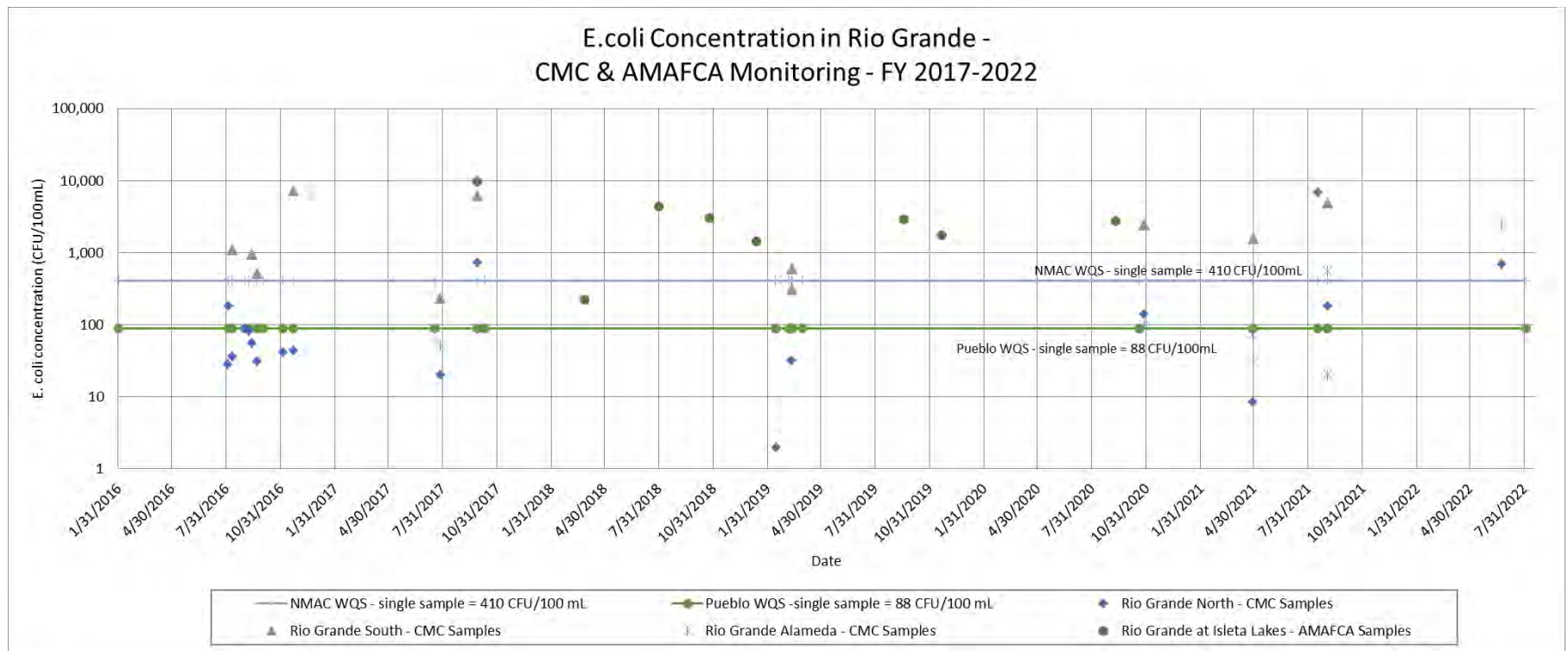
0 6,000 12,000 Feet  
1 inch equals 1 mile





### CMC and AMAFCA Water Quality Monitoring Program for E. coli

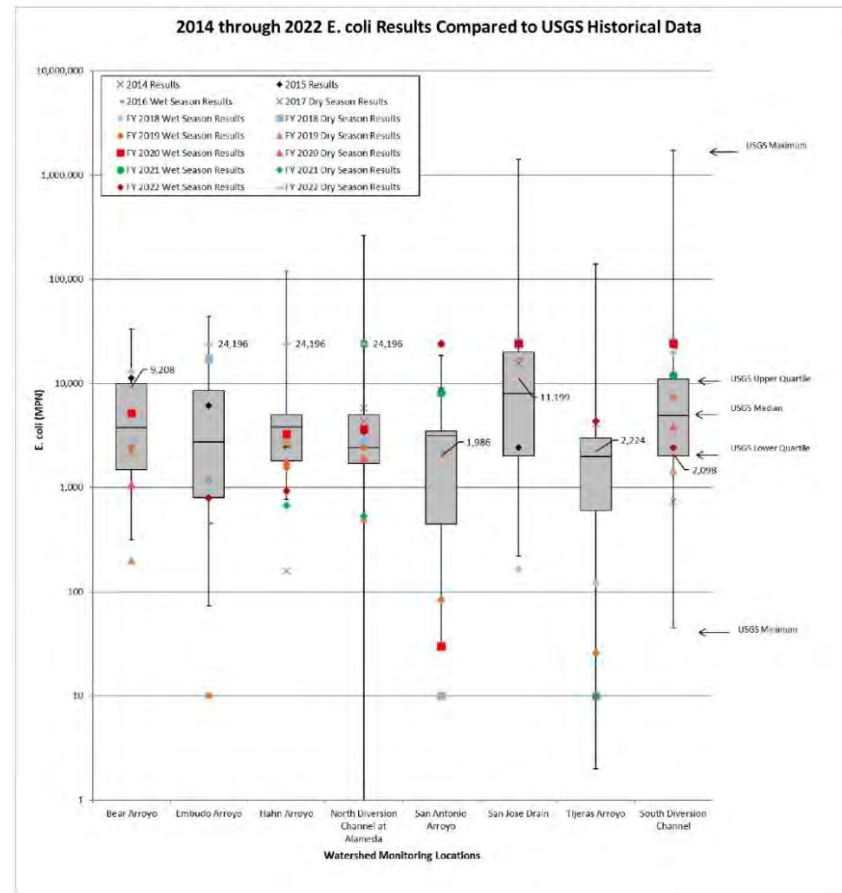
Both AMAFCA and the MRG CMC collect grab samples within the Rio Grande during storm events. E. coli is tested for these in-stream samples. For MS4 Permit compliance, the MRG CMC has three monitoring points, north and south of the urbanized portion of the river, as well at the Alameda Bridge. The AMAFCA monitoring program collects samples in the Rio Grande at the downstream (south) end of the watershed (Rio Grande at Isleta Lakes). The graph below shows the E. coli data from all AMAFCA and CMC samples collected from July 2016 – June 2022. Note, there are numerous E. coli results that exceed the applicable surface water quality standards.



*Plot of E. coli Results From Grab Samples in the Rio Grande Through the AMAFCA and CMC Monitoring Programs.*

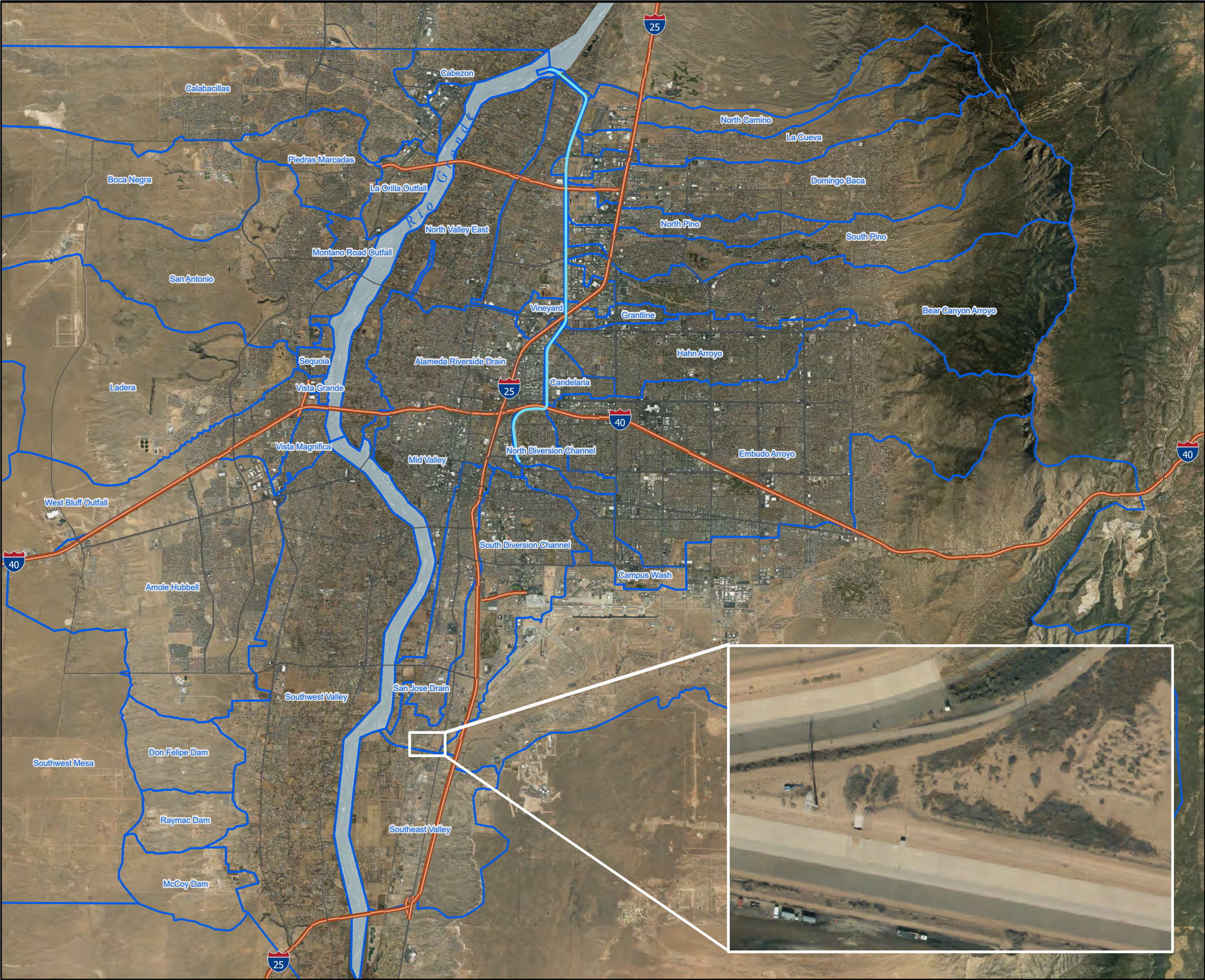
## AMAFCA Water Quality Monitoring Program for E. coli

The AMAFCA monitoring program also collects and analyzes stormwater runoff from monitoring sites within the watershed, before it reaches the Rio Grande. The results from 2014 – 2022 are shown below compared to USGS historical results (maximum, minimum, median, and upper and lower quartile). An interactive PDF showing E. coli data results throughout the North Diversion Watershed from AMAFCA's Water Quality Monitoring Program from FY 2015 Through FY 2022 is provided on the next page .



*AMAFCA Monitoring Program E. coli Results Within the Watershed (Not Including Samples in the Rio Grande) Compared to Historical USGS E. coli Data.*





# Historic E. coli Results at AMAFCA Monitoring Locations FY 2014 - 2023

North Diversion Channel

Watershed

E. coli (CFU/100mL)

Not Collected

0 - 88 (Meets WQS)

89 - 4,000

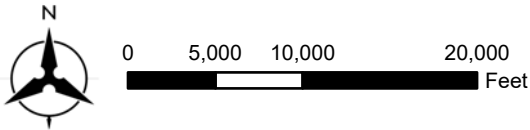
4,001 - 8,000

> 8,000

Dry Season:  
November - June

Wet Season:  
July - October

- Interactive map: select text below to view each map
- [FY 2014 - Dry Season](#)
  - [FY 2015 - Wet Season](#)
  - [FY 2015 - Dry Season](#)
  - [FY 2016 - Wet Season](#)
  - [FY 2016 - Dry Season](#)
  - [FY 2017 - Wet Season](#)
  - [FY 2017 - Dry Season](#)
  - [FY 2018 - Wet Season](#)
  - [FY 2018 - Dry Season](#)
  - [FY 2019 - Wet Season](#)
  - [FY 2019 - Dry Season](#)
  - [FY 2020 - Wet Season](#)
  - [FY 2020 - Dry Season](#)
  - [FY 2021 - Wet Season](#)
  - [FY 2021 - Dry Season](#)
  - [FY 2022 - Wet Season](#)
  - [FY 2022 - Dry Season](#)
  - [FY 2023 - Wet Season](#)





In FY 2022, the quality assurance project plan (QAPP), the field sampling plan (FSP), and related Standard Operating Procedures (SOPs) for AMAFCA's stormwater quality monitoring program were reviewed and updated. The format and contents of these documents are modeled after the New Mexico Environment Department (NMED) Surface Water Quality Bureau (SWQB) water quality management programs to facilitate sharing of data between the agencies. These documents provide a framework and detailed methods for the collection and analysis of environmental data as well as provide guidance for generating data that is of the precision, accuracy, and completeness necessary for AMAFCA's program.

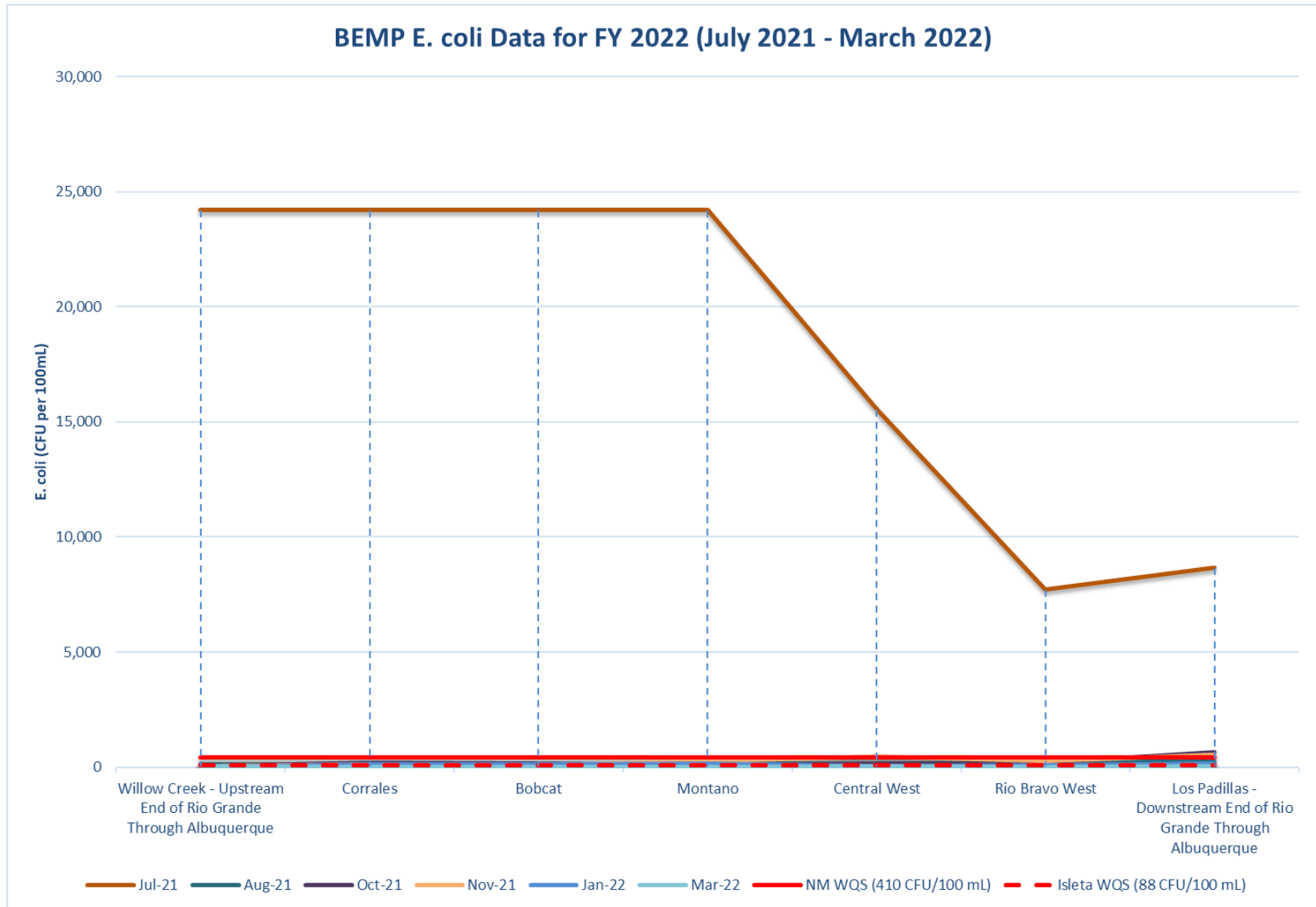


*Photos of AMAFCA Autosamplers Used for the AMAFCA Monitoring Program*

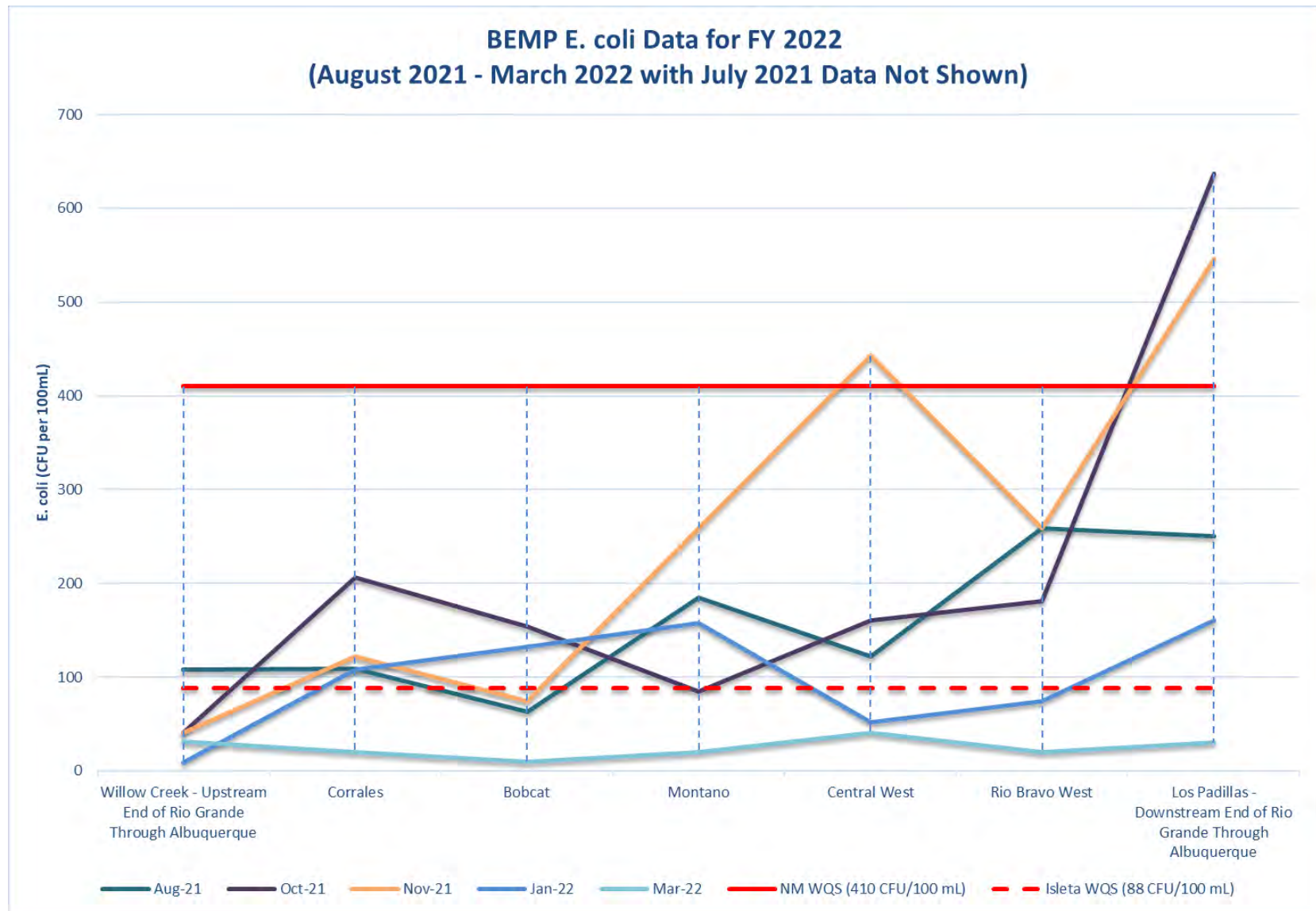
### Bosque Ecosystem Monitoring Program (BEMP)

The Bosque Ecosystem Monitoring Program (BEMP) combines long-term ecological research with community outreach by involving K-12 students and their teachers, as well as university students, in monitoring key indicators of structural and functional change in the Middle Rio Grande riparian forest, or “bosque”. During the 2021-2022 school year, 7,840 students throughout Bernalillo and Sandoval counties connected with their local watershed through participation in BEMP activities, with 845 contacts of this total engaged through purely stormwater science specific lessons. The students’ experiences support science education efforts and help to increase understanding and appreciation of the Rio Grande riparian ecosystem. Students also learn proper monitoring protocols, riparian ecology, and how to use data to answer questions through hands-on science. BEMP findings derived from student-gathered data are used by government agencies to inform multi-million dollar river and riparian management decisions.

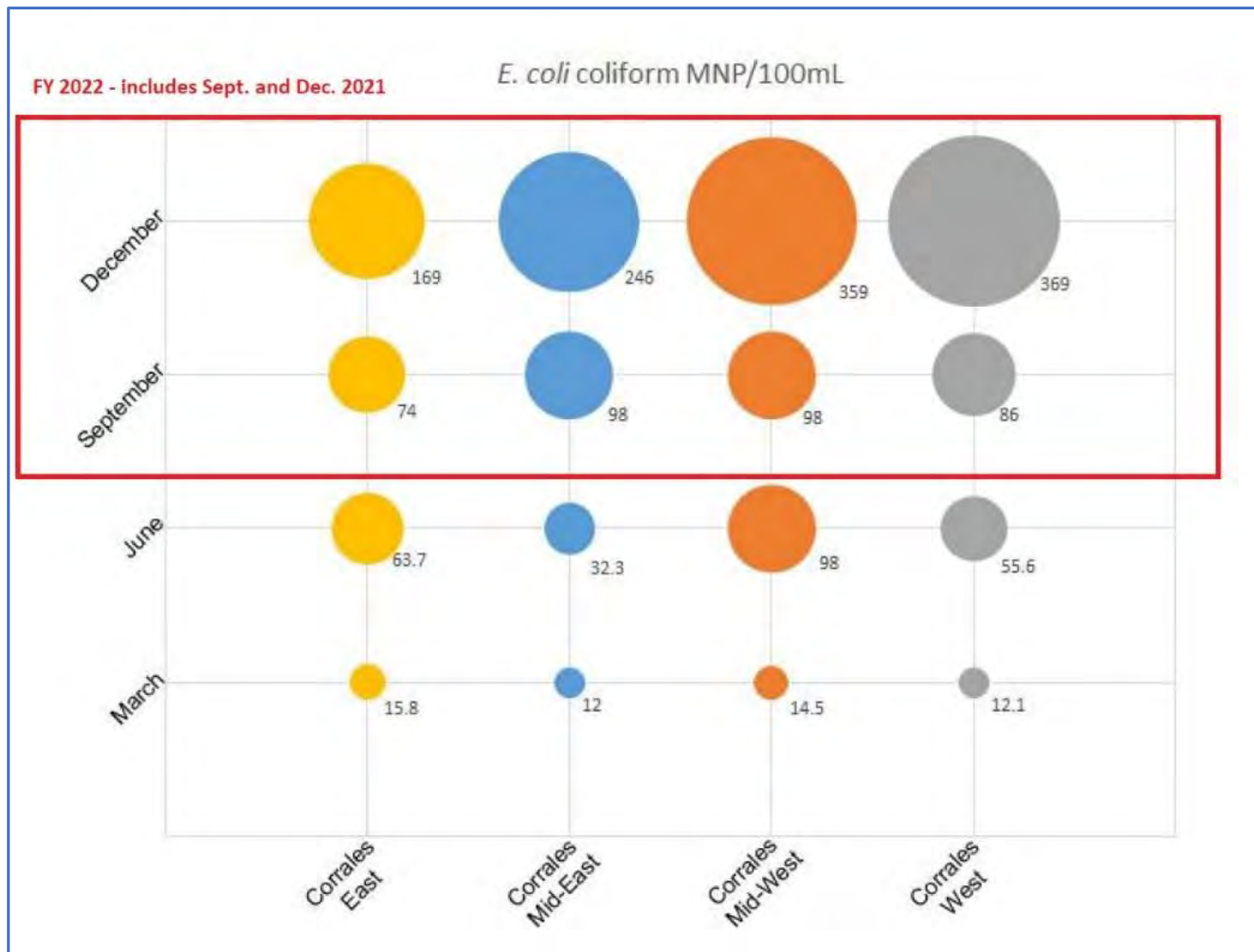
The BEMP sampling supports the collection and analysis of *E. coli* data in the Rio Grande. This program operates on a calendar year and does not follow the fiscal year of this program summary. The BEMP water quality collection consisted of North (upstream) to South (downstream) monthly longitudinal sampling (July through November 2021) and quarterly longitudinal sampling (starting in 2022) along the west bank of the Rio Grande at seven river locations. During FY 2022, transect light sample collections, where water quality was sampled near the east and west banks of the river, occurred at four sample locations (in September and December 2021).



*BEMP E. coli Data for FY 2022.  
The Plot has the Upstream Site (Willow Creek) on the Left and Downstream Site on the Right (Los Padillas).*



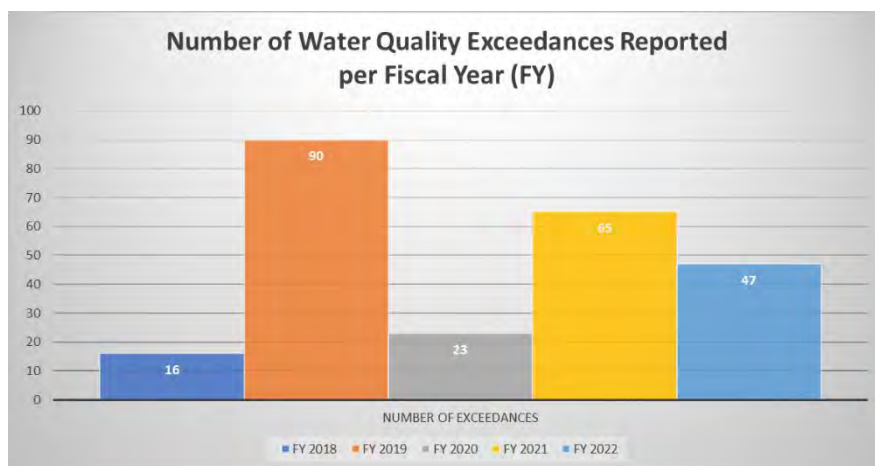
*BEMP E. coli Data for FY 2022. July 2021 Data Not Shown so that the Lower Values are Visible.  
The Plot has the Upstream Site (Willow Creek) on the Left and Downstream Site on the Right (Los Padillas).*



*E. coli* Data From Four Months in FY 2021 & FY 2022 –  
Collected as Transects of Four Samples Across the Rio Grande Near Corrales.



AMAFCA notifies EPA and the Pueblo of Isleta of any water quality standard exceedances at any in-stream sampling locations (within the Rio Grande). AMAFCA also continues to provide the Pueblo of Isleta with access to the real-time DO and temperature sonde data in the Rio Grande. Notification of an exceedance is in writing as soon as practicable after receiving the lab report data. The bar chart below shows the number of exceedance notifications made per fiscal year (FY). The number of exceedances reported vary per FY mainly because the number of BEMP locations and samples collected have changed year to year.



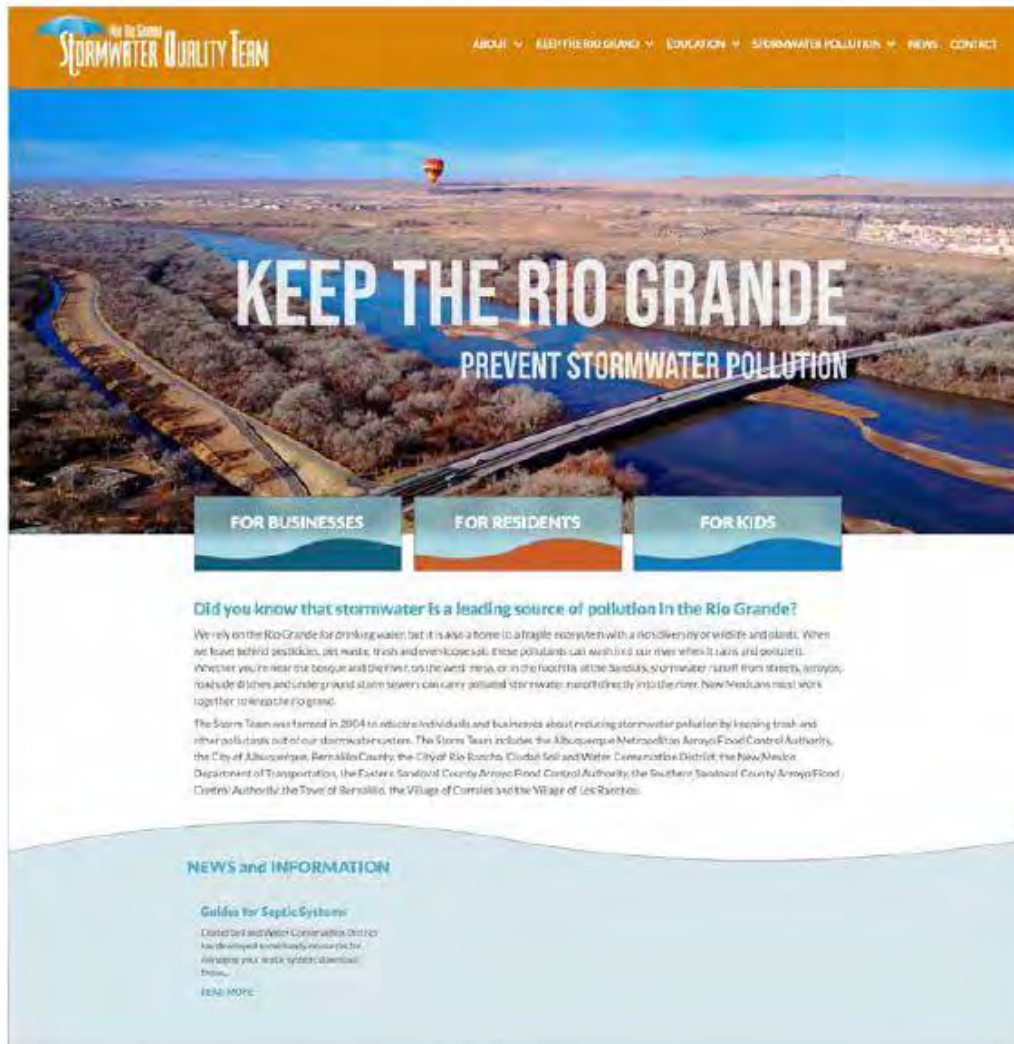
*Number of Water Quality Exceedances in Rio Grande Reported to EPA and Pueblo of Isleta per Fiscal Year.*

### Public Education and Outreach Program

The previous sections of the program summary focus on the monitoring and data collection related to understanding E. coli within the Rio Grande and contributions from the watershed. Non-point source load reduction actions, like those taken by AMAFCA, the Mid Rio Grande Storm Water Quality Team (MRGSQT), and others, are implemented through a wide variety of programs at the state, local and federal level. AMAFCA is a member of the MRGSQT, which has grown to 12 organizations, who leverage their resources to ensure MS4 Permit public education and outreach requirements are met with the goal of preventing and reducing stormwater pollution throughout the watershed from reaching the Rio Grande. These programs may be regulatory, non-regulatory, or incentive-based like a cost-share program. In addition, waterbody restoration can be assisted by voluntary actions on the part of citizen and/or environmental groups. Public education, outreach, involvement, and participation efforts have also been undertaken at the watershed level in the Middle Rio Grande to address the reduction of non-point source loads for the bacterial TMDL (E. coli) and various impairments on New Mexico's 303(d) list. Additional information is available at [www.keeptheriogrand.org](http://www.keeptheriogrand.org) (see image below).

# Mid Rio Grande Stormwater Quality Team

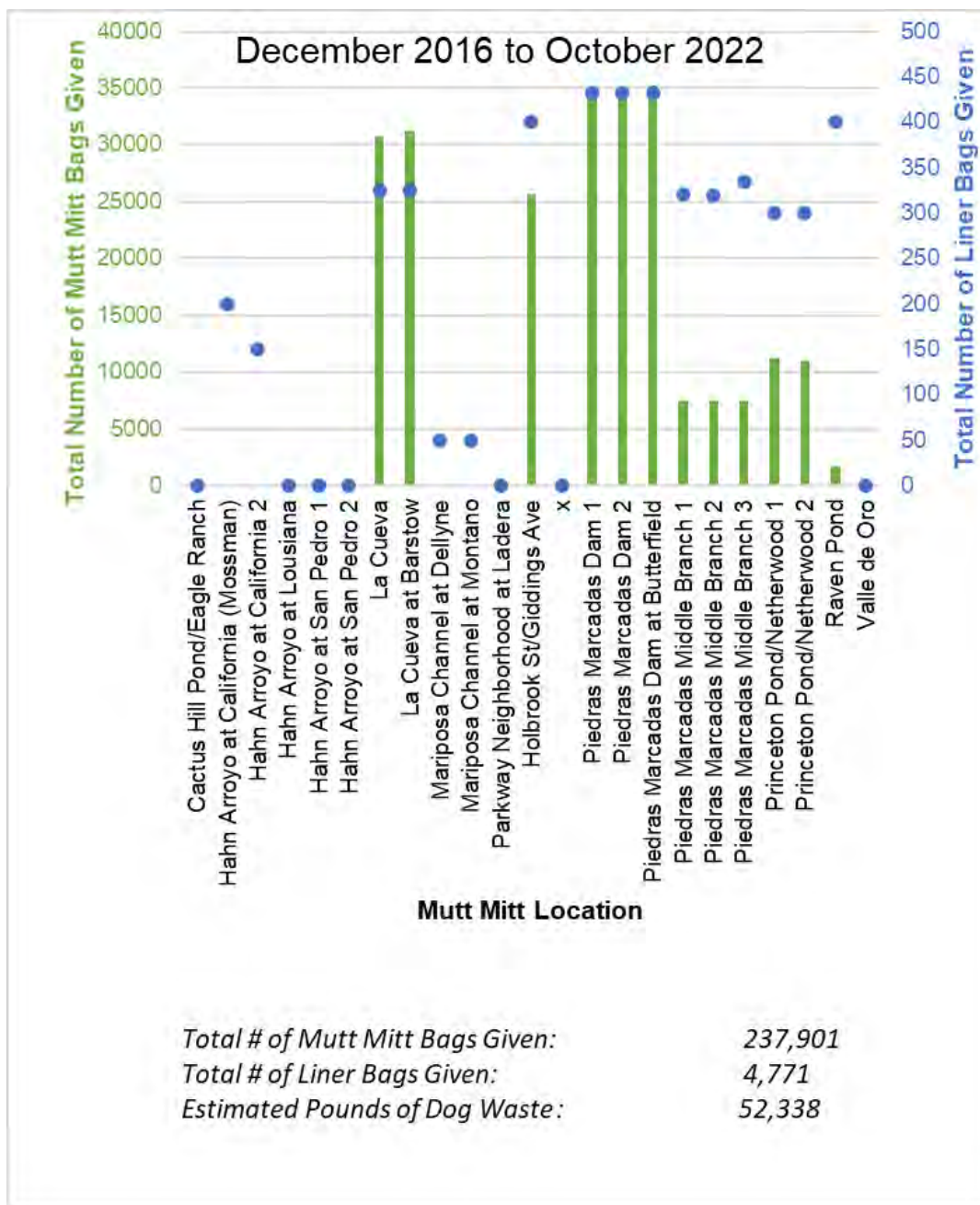
In FY2022 the MRGSQT developed a brand new website.  
<https://keeptheriogrande.org>



*Mid Rio Grande Stormwater Quality Team Updated Website*



In addition, AMAFCA has a Mutt Mitt station program to reduce pet waste and increase public awareness, with the goal of reducing E. coli within the watershed. The Mutt Mitt stations are summarized below.



*Summary of the AMAFCA Mutt Mitt Stations Available Throughout the Watershed  
to Promote Pet Waste Collection and Proper Disposal*

# AMAFCA Board Meeting Memorandum

## Information Item

## Agenda Item 15b

**To:** AMAFCA Board of Directors  
**From:** Patrick J. Chavez, PE, Stormwater Quality Engineer *P C*  
**Date:** September 17, 2021

**Subject:** AMAFCA Compliance with TMDL for E. coli

### Action

**Requested:** None

\*\*\*

AMAFCA's required compliance for wet weather stormwater discharges with the Environmental Protection Agency's (EPA) calculated Total Maximum Daily Load (TMDL) for Escherichia coliform (E. coli) is documented in the Clean Water Act (CWA) 303(d)/305(b) Integrated Report (IR). The IR is updated every three years by a review process that is conducted by the New Mexico Environment Department (NMED). For AMAFCA and other MS4s in the watershed, compliance sampling is done in the Rio Grande at upstream and downstream locations of the urbanized area to determine the collective E. coli load added to the river in response to a given storm's runoff to the water body.

Water quality samples submitted to the lab rarely come back with E. coli concentrations below the standard that has been set for the watershed. Also, independent of the flow in the Rio Grande, the calculated E. coli loading exceeds the amount allocated for AMAFCA and other MS4s in the watershed. Water quality samples collected today from the Rio Grande would yield similar concentrations and/or pollutant loads to samples collected over the last several years. The ultimate result is that AMAFCA has routinely not been in compliance with the TMDL and exceeded the downstream water quality standards for E. coli.

For the assessment units (AUs) along the Middle Rio Grande (MRG), the IR is designed to satisfy the statutory requirements of Section 303(d) and the reporting requirements of 305(b) and 314 of the federal Water Pollution Control Act (33 U.S.C. 1251) commonly known and referred to as the Clean Water Act.

The IR is also designed to serve as a source of basic information on water quality and water pollution control programs in New Mexico. The Comprehensive Assessment and Listing Methodology (CALM) explains how the New Mexico Environment Department (NMED) assesses surface water quality data compared to the most current water quality standards (20.6.4 NMAC) to determine attainment with water quality standards. Tables from Appendix A of the current EPA-approved 2020-2022 IR identify the relevant AUs along the Rio Grande along with associated impairments, current TMDLs, and planned TMDLs for the MRG watershed.

During development of the IR, impaired waterbodies are further evaluated to determine if changes to the standard may be appropriate, whether more data collection is necessary to confirm the impairment, or whether a TMDL or alternative water quality improvement plan should be

scheduled for development. TMDLs and other planning documents provide information on the probable source(s) of the water quality impairment which is used to determine the best approach to improve water quality. An important distinction to reiterate between the IR and the TMDL, in a state like New Mexico lacking primacy, is that one is prepared by NMED and the other by EPA, respectively.

New Mexico's IR includes an estimated year in the "TMDL DATE" field for other pollutants of interest. The estimated year is generally based on NMED's rotational monitoring schedule, prioritization strategy in the long-term vision document (NMED 2015), and severity of the impairment. The "TMDL DATE", as well as the projected "MONITORING SCHEDULE" year, is ultimately dependent upon NMED personnel and financial resources which can change on an annual basis. If a TMDL has already been developed for the noted cause of impairment, the EPA TMDL approval date (MM/DD/YYYY) is reported in the TMDL date field.

The IR prepared by NMED also lists the various designated uses: Irrigation (IRR), Livestock Watering (LW), Marginal Warmwater Aquatic Life (MWWAL), Primary Contact (PC), Public Water Supply (PWS), and Wildlife Habitat (WH). Also tabulated in the IR's Appendix A is the AU's level of attainment (Fully Supporting, Not Supporting, or Not Assessed) and pollutants determined to be the cause(s) of the attainment given the designated use.

The IR Appendix A tables are shown below in a north-to-south order along the Rio Grande from the Angostura Diversion to the Isleta Diversion water quality sampling locations:

Rio Grande (non-pueblo HWY 550 Bridge to Angostura Div)			AU IR CATEGORY	LOCATION DESCRIPTION	
			4A	HUC: 13020203	Rio Grande-Albuquerque
AU ID	WQS REF	WATER TYPE	SIZE	ASSESSED	MONITORING SCHEDULE
NM-2105.1 02	20.6.4.106	RIVER	2.41 MILES	2020	2023
USE	ATTAINMENT	CAUSE(S)	FIRST LISTED	TMDL DATE	PARAMETER IR CATEGORY
IRR	Fully Supporting				
LW	Fully Supporting				
MWWAL	Fully Supporting				
PC	Not Supporting	E. coli	2020	6/30/2010	4A
PWS	Not Assessed				
WH	Fully Supporting				
AU Comment: TMDL for fecal coliform. De-listed for fecal coliform because this criteria was replaced with E. coli during the 2005 triennial. TMDL for E. coli 2010.					

Rio Grande (non-pueblo Alameda Bridge to HWY 550 Bridge)			AU IR CATEGORY	LOCATION DESCRIPTION	
			5/5A	HUC: 13020203 Rio Grande-Albuquerque	
AU ID	WQS REF	WATER TYPE	SIZE	ASSESSED	MONITORING SCHEDULE
NM-2105.1_00	20.6.4.106	RIVER	12.12 MILES	2020	2023
USE	ATTAINMENT	CAUSE(S)	FIRST LISTED	TMDL DATE	PARAMETER IR CATEGORY
IRR	Fully Supporting				
LW	Not Supporting	Gross Alpha, Adjusted	2012	2023 (est.)	5/5A
MWWAL	Not Supporting	Mercury - Fish Consumption Advisory	2020		5/5C
		PCBS - Fish Consumption Advisory	2010		5/5C
		Polychlorinated Biphenyls (PCBs)	2012	2023 (est.)	5/5A
PC	Not Supporting	E. coli	2020	6/30/2010	4A
PWS	Not Assessed				
WH	Not Supporting	Polychlorinated Biphenyls (PCBs)	2012	2023 (est.)	5/5A
<b>AU Comment:</b> TMDL for E. coli (2010). Fish Consumption Advisory listings are based on NMs current fish consumption advisories for this water body. Per USEPA guidance, these advisories demonstrate non-attainment of CWA goals stating that all waters should be "fishable." Therefore, the impaired designated use is the associated aquatic life even though human consumption of the fish is the actual concern.					

Rio Grande (Tijeras Arroyo to Alameda Bridge)			AU IR CATEGORY	LOCATION DESCRIPTION	
			5/5C	HUC: 13020203 Rio Grande-Albuquerque	
AU ID	WQS REF	WATER TYPE	SIZE	ASSESSED	MONITORING SCHEDULE
NM-2105_51	20.6.4.105	RIVER	15.6 MILES	2020	2023
USE	ATTAINMENT	CAUSE(S)	FIRST LISTED	TMDL DATE	PARAMETER IR CATEGORY
IRR	Fully Supporting				
LW	Fully Supporting				
MWWAL	Not Supporting	Mercury - Fish Consumption Advisory	2020		5/5C
		PCBS - Fish Consumption Advisory	2010		5/5C
		Dissolved oxygen	2008	2023 (est.)	5/5A
		Temperature	2010	2023 (est.)	5/5A
PC	Not Supporting	E. coli	2020	6/30/2010	4A
PWS	Not Assessed				
WH	Fully Supporting				
<b>AU Comment:</b> TMDL for E. coli. Fish Consumption Advisory listings are based on NMs current fish consumption advisories for this water body. Per USEPA guidance, these advisories demonstrate non-attainment of CWA goals stating that all waters should be "fishable." Therefore, the impaired designated use is the associated aquatic life even though human consumption of the fish is the actual concern.					



Rio Grande (Isleta Pueblo boundary to Tijeras Arroyo)			AU IR CATEGORY	LOCATION DESCRIPTION	
			5/5A	HUC: 13020203	Rio Grande-Albuquerque
AU ID	WQS REF	WATER TYPE	SIZE	ASSESSED	MONITORING SCHEDULE
NM-2105_50	20.6.4.105	RIVER	5.14 MILES	2020	2023
USE	ATTAINMENT	CAUSE(S)	FIRST LISTED	TMDL DATE	PARAMETER IR CATEGORY
IRR	Fully Supporting				
LW	Fully Supporting				
MWWAL	Not Supporting	PCBS - Fish Consumption Advisory	2010		5/5C
		Mercury - Fish Consumption Advisory	2020		5/5C
		Dissolved oxygen	2008		5/5C
PC	Not Supporting	E. coli	2008	6/30/2010	4A
PWS	Not Assessed				
WH	Fully Supporting				
<b>AU Comment:</b> TMDL for E. coli. Fish Consumption Advisory listings are based on NMs current fish consumption advisories for this water body. Per USEPA guidance, these advisories demonstrate non-attainment of CWA goals stating that all waters should be "fishable." Therefore, the impaired designated use is the associated aquatic life even though human consumption of the fish is the actual concern.					

As can also be noted on the above tables are the planned TMDLs for the MRG watershed AUs between the Highway 550 Bridge to the north and the Tijeras Arroyo to the south: Adjusted Gross Alpha, Polychlorinated Biphenyls (PCBs), Dissolved Oxygen (DO), and Temperature. For Example, the Marginal Warmwater Aquatic Life (MWWAL) designated use for AU ID NM-2015\_51 (Tijeras Arroyo to Alameda Bridge) shows an attainment level of "Not Supporting" and the "CAUSE(S)" listed of Mercury, PCBs, DO, and Temperature. However, only a projected "TMDL DATE" of 2023 (estimated) is shown for DO and Temperature.

For E. coli, the three most north AUs shown in the IR for the MRG watershed have 6/30/2010 in the "TMDL DATE" field but a 2020 date in the "FIRST LISTED" field because the impairment for E. coli was delisted in previous IR versions but the most recent version relisted the impairment. The southern most AU has 2008 in the "FIRST LISTED" field because the impairment for E. coli was never removed from the IR Appendix A tables for the Rio Grande segment.

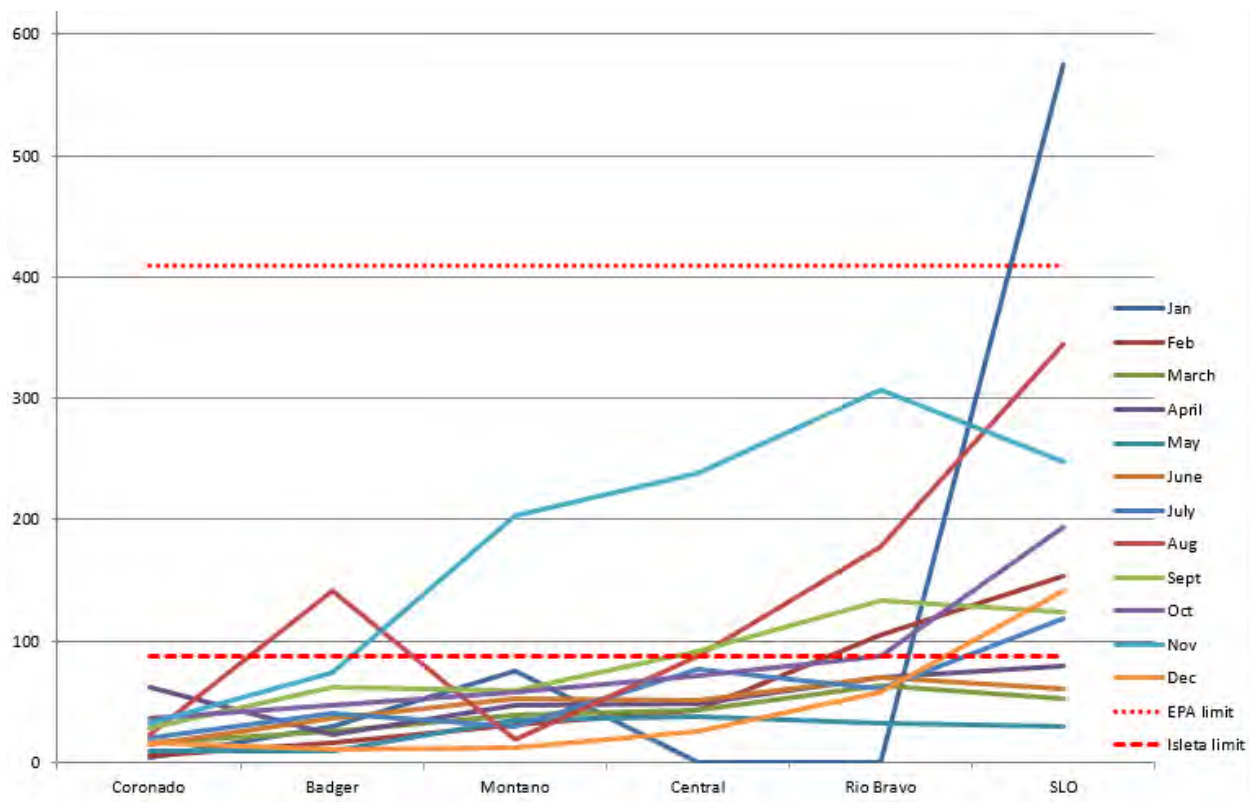
Field observations along the Rio Grande, readily available geographic information system (GIS) layers and land use imagery, and both stakeholder and NMED staff watershed knowledge are combined to develop draft Probable Source lists which are finalized in TMDL documents and summarized in the IR. According to NMED, most surface water quality impairments identified in New Mexico are due to nonpoint sources of water pollution. Probable nonpoint sources include agriculture/grazing, drought-related impacts, flow alteration/diversion, loss of riparian habitat, on-site treatment systems, road/bridge runoff, recreation, streambank modification, waterfowl, and wildlife. Additional data and resources are undeniably needed however to substantiate probable sources.

AMAFCA and other MS4s covered under the Watershed Based Permit (WBP) are required to comply with water quality standards that are comprised of designated uses for surface waters of the state, associated water quality criteria necessary to protect these uses, and an antidegradation policy. Designated uses in the Middle Rio Grande include aquatic life, fish culture, primary and secondary contact (including cultural, religious, or ceremonial purposes), public water supply,

industrial water supply, domestic water supply, irrigation, livestock watering, and wildlife habitat. AMAFCA's stormwater discharges protect these uses and fulfill the requirements set forth in the MS4 WBP. Coordinated water quality sample collection programs through the Stormwater Quality Team (SQT), Compliance Monitoring Cooperative (CMC), and Bosque Ecosystem Monitoring Program (BEMP) have been developed and annually funded to monitor, assess, protect, and restore surface water quality to the MRG watershed after qualifying wet weather storm events of greater than 0.25 inches of rainfall.

Below is an example of the 2019 water quality results from the above-mentioned BEMP E. coli data collection effort. All BEMP samples are collected along the Rio Grande in dry weather conditions. Said another way, these samples are collected on days in which there is no rainfall or runoff from AMAFCA or other MS4s in the watershed to the Rio Grande.

**2019 BEMP Dry Weather Concentrations for E. coli in Rio Grande**



The Isleta Pueblo water quality standard of 88 CFU/100mL for E. coli is shown above as a red-dashed line. The New Mexico water quality standard for E. coli of 410 CFU/100mL is shown above as a red-dotted line. In most months the dry weather downstream samples collected exceeded the relevant water quality standard for E. coli even though there was no runoff from the watershed to the Rio Grande.

Because the dry weather concentration of E. coli in the Rio Grande is most of the time already above the applicable water quality standard, it makes sense that the stormwater discharges from the MRG watershed, given the applicable TMDL, would also appear to exceed the load allocation assigned to the CMC as part of the NMED and EPA approved sampling plan. The table below shows the water quality exceedances for E. coli in pink after sampled storm events from 2017-2018.

Stream Name / Related USGS Gage	Total E. coli Loading in River Exceeds TMDL for River?	Sample at Alameda, Segment midpoint	Estimated CMC E. coli Loading (CFU/day) for Each Segment	Daily Mean Flow (cfs)	Flow Conditions	WLA for CMC Based on Flow Conditions & Stream Segment (CFU/day)	WLA - Potential Exceedance or Acceptable
<i>Alameda to Angostura</i> Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	Yes	N/A*	8.32E+11	639	Dry	3.24E+10	WLA Potential Exceedance
<i>Isleta to Alameda</i> Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	Yes		2.34E+11	703	Mid	4.22E+10	WLA Potential Exceedance
<i>Alameda to Angostura</i> Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	Yes	N/A*	4.67E+11	435	Dry	3.24E+10	WLA Potential Exceedance
<i>Isleta to Alameda</i> Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	Yes		1.02E+11	467	Dry	1.57E+10	WLA Potential Exceedance
<i>Alameda to Angostura</i> Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	Yes	N/A*	1.29E+11	350	Low	1.68E+10	WLA Potential Exceedance
<i>Isleta to Alameda</i> Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	Yes		1.22E+10	251	Low	3.42E+09	WLA Potential Exceedance
<i>Alameda to Angostura</i> Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	No	N/A*	–	710	Mid	No Value	WLA Acceptable
<i>Isleta to Alameda</i> Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	Yes		1.68E+12	881	Mid	4.22E+10	WLA Potential Exceedance

Given the water quality data results collected to date, as demonstrated with the above-referenced sample collection examples, it is obvious the watershed's collective E. coli compliance with the Isleta Pueblo's water quality standard as well as the TMDL for the AUs in the watershed has not been successful. Numerous educational campaigns, slogans, informational brochures, and graduate level research have been utilized to try to better comply with the TMDL for bacteria (see next page).

Consistency in terms of effectiveness has also been an issue for the watershed's efforts to remove the impairment for E. coli in the MRG. In fact, as also stated above, the impairments for E. coli for three of the AUs in the urbanized area were delisted from the 2017-2019 IR published by NMED; but the success was short-lived as the impairments were relisted with the 2020-2022 IR.





Poop Fairy image & campaign materials provided by Greenville County Soil & Water Conservation District in South Carolina. ([www.poopfairy.info](http://www.poopfairy.info).)

## HUMAN EXCREMENT CLEAN UP

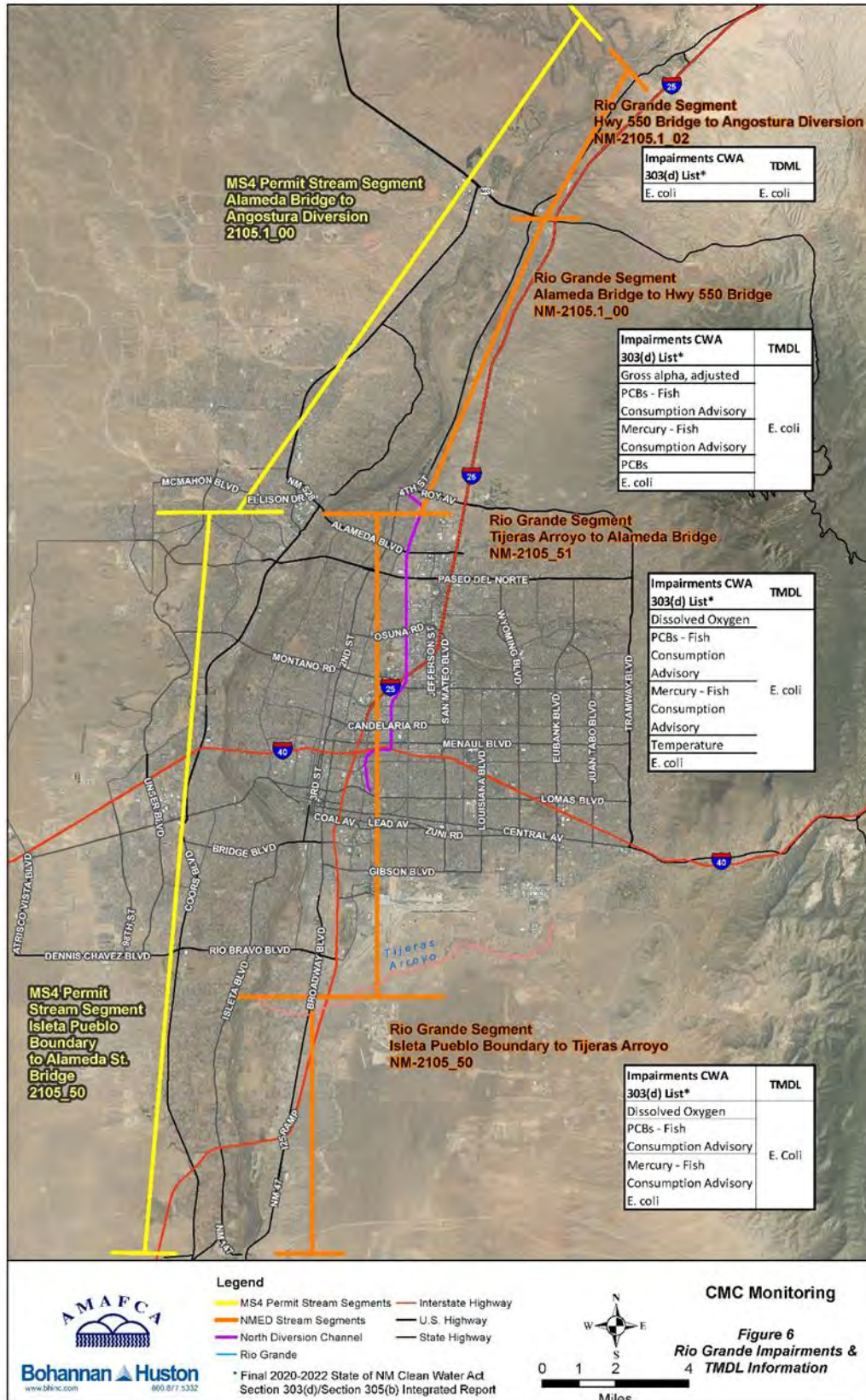
A GUIDE TO PROTECTING YOURSELF, INCLUDING:

- CLEANING & DISINFECTING
- PROPER DISPOSAL
- RESOURCES



**ONE ALBUQUE RQUE** city of albuquerque

The graphic on the following page is another way to express the various water quality impairments and E. coli TMDL with respect to the AUs of the MRG watershed. The MS4 WBP limits of compliance are bracketed in yellow whereas the AUs in the IR are bracketed in orange. In either case, the entire reach from north-to-south has a TMDL for E. coli with Primary Contact (PC) being the designated use that the Rio Grande is “Not Supporting” as also shown in tabular format above.



In conclusion, if dry weather sampling scenarios are yielding concentrations of E. coli above the water quality standard and exceeding the TMDL load allocation assigned to MS4s in the watershed, it begins to raise the question of alternative compliance options for the AMAFCA in wet weather conditions. AMAFCA understands the need to prepare for future water quality TMDLs that may be established as part of NMED's triennial review process but also understands the various compliance issues with the current TMDL for bacteria. AMAFCA's, BEMP's and the CMC's collected data for E. coli supports the fact that compliance with the current TMDL may not ever be possible.

# AMAFCA Board Meeting Memorandum Information Item

## Agenda Item 15c

**To:** AMAFCA Board of Directors  
**From:** Patrick J. Chavez, PE, Stormwater Quality Engineer *PC*  
**Date:** September 17, 2021

**Subject:** Bacteria TMDL – Path Compliance – Presentation by Weston Solutions, Inc.

### Action

**Requested:** None

\*\*\*

Given the combination of water quality successes and failures that MS4s in the watershed have experienced relative to compliance with the Rio Grande's Total Maximum Daily Load (TMDL) for E. coli, it makes scientific sense and a matter of permit compliance that questions have arisen about the potential paths to alternative compliance with the TMDL. AMAFCA has had preliminary discussions with a local on-call water quality consultant with a California office who assists agencies in that state with TMDL compliance options. Presented below are two distinct processes that have been investigated by AMAFCA as possible paths for compliance. A detailed summary of the information that will be presented by Weston Solutions, Inc. is provided below

### **COMPLIANCE PATH 1 - High-Flow Suspension of the Primary Contact Designated Use - Detailed Process Information:**

In order to pursue the High-Flow Suspension of the Primary Contact Designated Use in New Mexico, AMAFCA must follow the New Mexico Environment Department (NMED) Use Attainability Analysis (UAA) process, which falls under 40 CFR 131.10(g); see also ([eCFR :: 40 CFR Part 131 -- Water Quality Standards](https://www.epa.gov/watershed/40-cfr-131-10-g)). (<https://www.env.nm.gov/surface-water-quality/uaa/>).

The following narrative regarding the process required to establish a High Flow Suspension of Primary Contact Designated Use is also presented as a flow chart on the following page. The initial step that has been identified is to notify NMED of the intent to conduct a Use Attainability Analysis (UAA) on the Middle Rio Grande for the bacterial pollutant E.coli. Once a general understanding of the intent of the UAA is achieved between NMED and AMAFCA, a formal notice of intent and work plan will need to be submitted to NMED and EPA R6 for approval.

### Required Work Plan Elements:

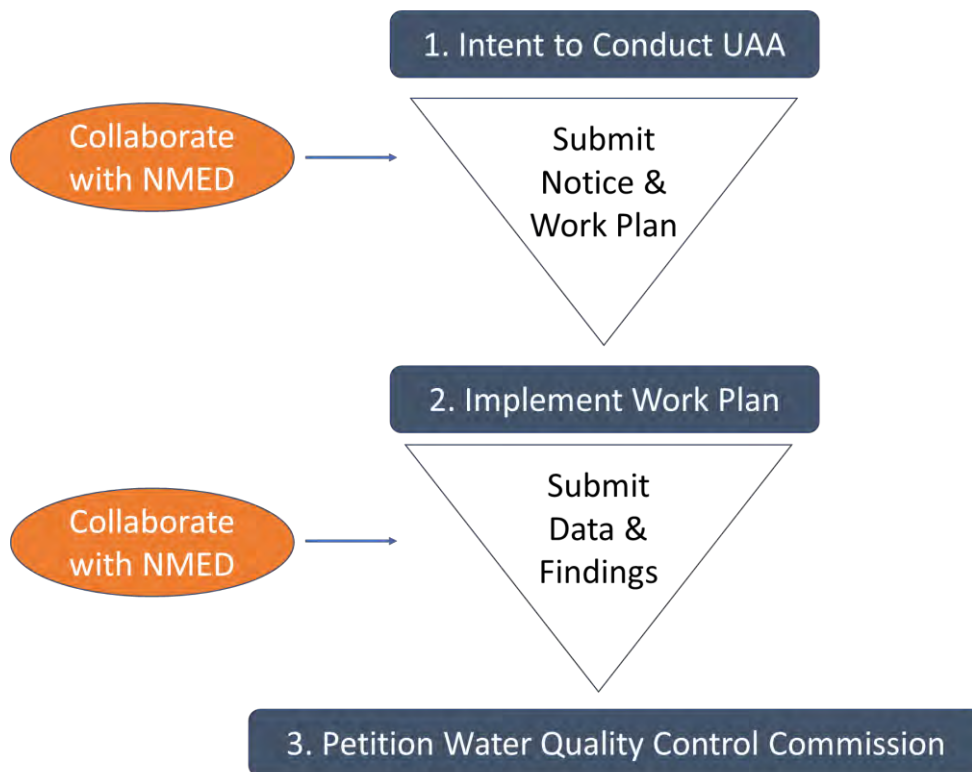
- Water body being consider under the analysis.
- Evidence suggesting the water body is not able to attain the current designated use(s).
- The primary factor under 40 CFR 131.10(g) affecting the attainment of the designated use. A list of all 6 potential factors is included on page 3.



- Scope of data currently available and how it will be used to demonstrate the primary factor affecting attainment. For example, is there an available runoff model for the watershed to estimate river stage levels due to rainfall?
- Scope of data proposed to be gathered under the analysis and how it will be used to demonstrate the factor. For example, is there additional data to be collected, and/or model runs for different scenarios?
- Provisions for public notice (refer to requirements associated with development of Water Quality Standards and rulemaking).
- Proposed means of consultation with appropriate Federal, State, and Tribal agencies.

### High-Flow Suspension of Primary Contact Designated Use

Use Attainability Analysis (per 20.6.4.15 NMAC)



Once the work plan is approved and implemented, you must submit the data and findings to NMED and EPA R6 for discussion. If the findings support a change of designated use, then AMAFCA will need to petition the New Mexico Water Quality Control Commission for a change in designated use of the water body.

Once the designated use change is approved by the WQCC, then AMAFCA will need to discuss

with NMED how these changes to the water quality standards will be documented in the TMDL and elsewhere. It is possible NMED may want to wait until the next triennial review to update the standards but it's not clear what the preference will be until discussions with NMED are conducted.

#### **40 CFR 131.10(g) – Six Primary Factors Potentially Affecting Attainment**

(g) States may designate a use, or remove a use that is *not* an existing use, if the State conducts a use attainability analysis as specified in [paragraph \(j\)](#) of this section that demonstrates attaining the use is not feasible because of one of the six factors in this paragraph. If a State adopts a new or revised water quality standard based on a required use attainability analysis, the State shall also adopt the highest attainable use, as defined in [§ 131.3\(m\)](#).

(1) Naturally occurring pollutant concentrations prevent the attainment of the use; or

(2) Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating State water conservation requirements to enable uses to be met; or

(3) Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or

(4) Dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use; or

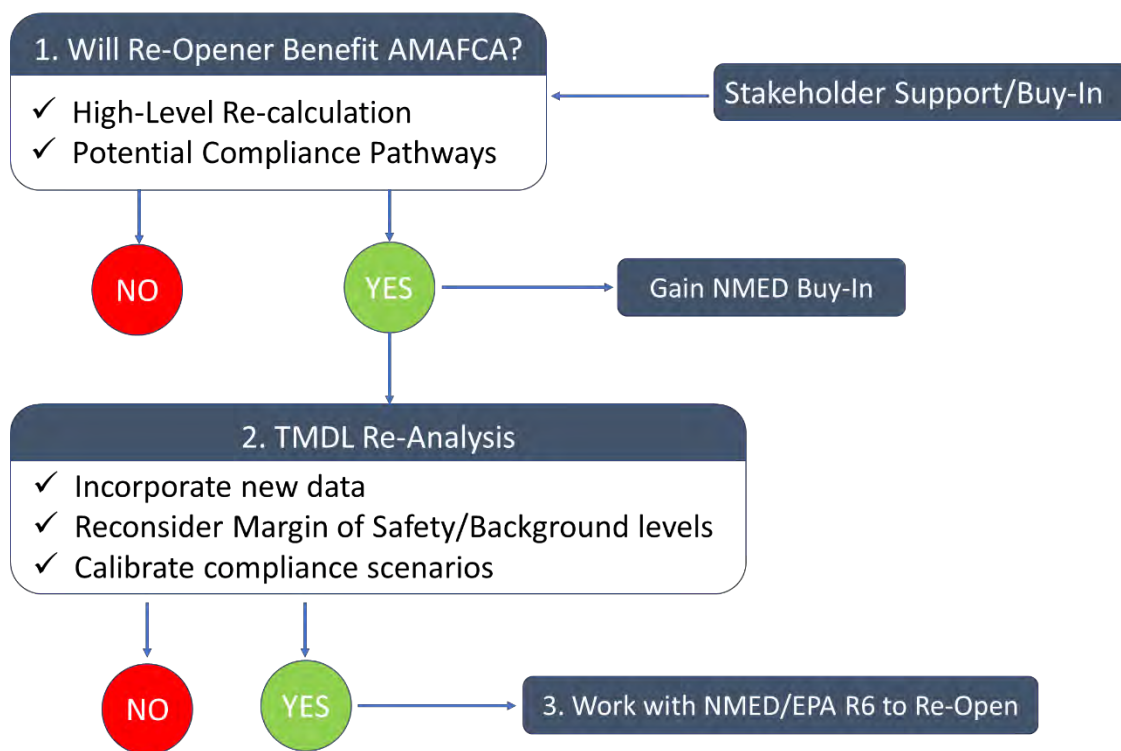
(5) Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses; or

(6) Controls more stringent than those required by sections 301(b) and 306 of the Act would result in substantial and widespread economic and social impact.

## COMPLIANCE PATH 2 - Total Maximum Daily Load (TMDL) Re-Opener – Detailed Process Information:

The workflow path presented below in graphic form is followed by an outline narrative that also describes the TMDL Re-Open process. It should be noted that AMAFCA does not control this process but rather requires NMED to act as the regulatory lead. One constant of note between this process and the previously described path to compliance (High Flow Suspension) is the need for iterative collaboration and agreement from the both the watershed and the relevant regulatory entities (NMED, WQCC, and ultimately EPA)

### TMDL Re-Opener



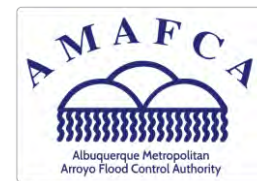


1. TMDL Re-Opener Feasibility and Benefits.

- a. High level TMDL recalculation (want to know if it's going to be beneficial or not)
- b. Question – is there regulatory buy in for risk-based approach? Not all forms of E.coli detected from a given water quality sample are equally dangerous to humans.
- c. Identify potential scenarios for compliance (could be more than one pathway for compliance)
  - i. Examples – Margin of safety (MOS) of 10% vs. current 20%; increase background levels; microbial source tracking scenarios other than from humans (high percentage of bird sources)
- d. Will public support the re-opener?
- e. Re-evaluation using updated criteria (EPA 2012) incorporates new scientific methodology and all special studies conducted since TMDL adopted.
- f. Potential for alternative pathways to compliance.
- g. Reduction of margin of safety, or increase of background concentrations may result in lower E.coli reduction requirement for TMDL compliance.

2. TMDL Re-Analysis Process:

- a. Re-evaluate all available data (focused on dry weather).
- b. Examine data for trends, seasonal patterns (by reach).
- c. Re-evaluate the margin of safety (MOS), originally 20%.
- d. Re-evaluate background levels.
- e. Does the watershed have a working flow/water quality model for the reaches of interest?
- f. Add specificity to potential compliance pathways (from step 1, above).
- g. Use data results to discuss compliance pathways with regulators.
- h. Public outreach must be considered.



**Summary of AMAFCA's MS4  
Discharges to Water Quality Impaired Water Bodies  
without an Approved TMDL Program  
FY 2022 (July 1, 2021 – June 30, 2022)**

NPDES Permit No. NMR04A000

Part I.C.2.b.(ii) - Special Conditions, Compliance with Water Quality Standards

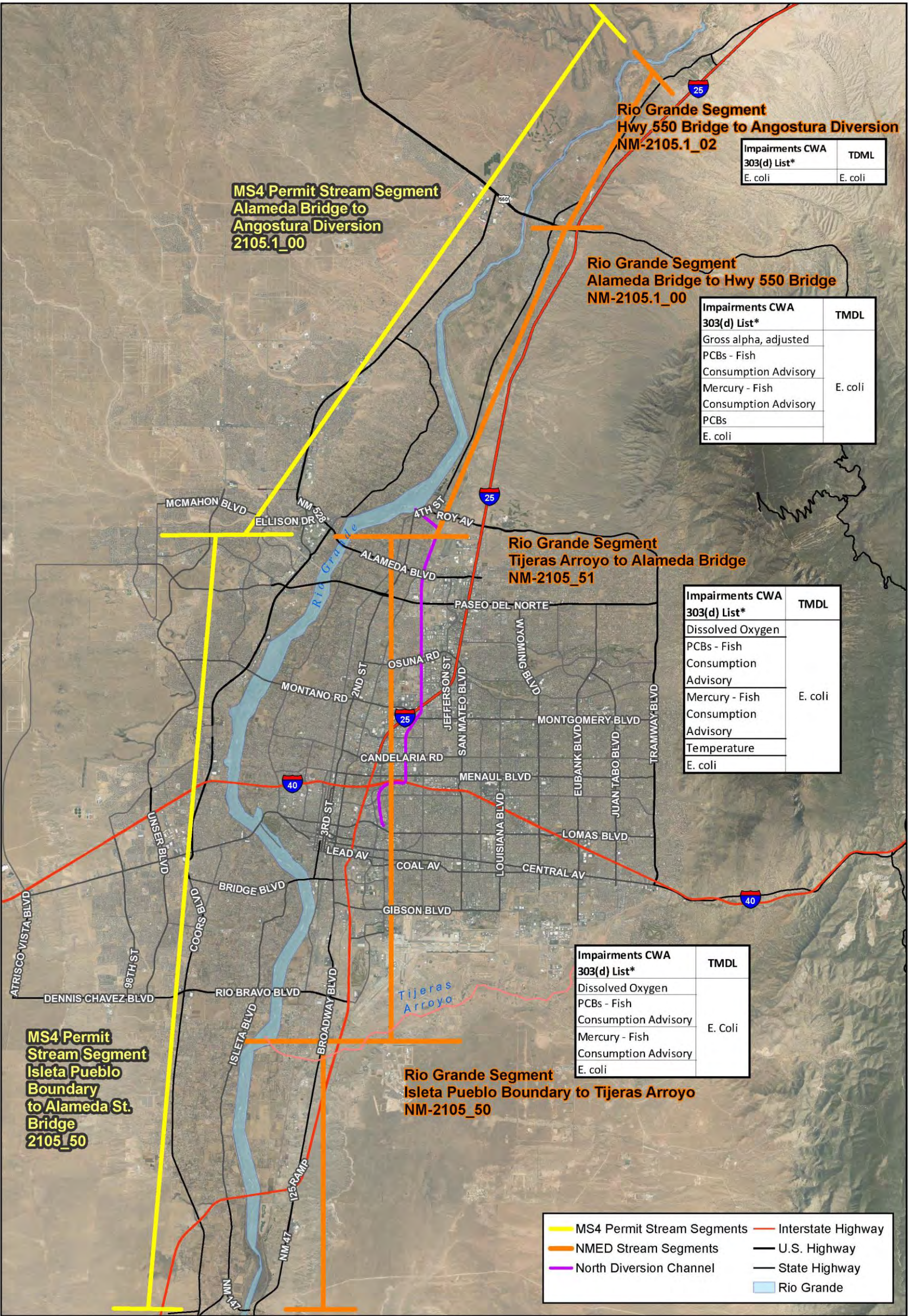
Impairments without Approved TMDLs

Impairments for the Rio Grande are documented in the Clean Water Act (CWA) 303(d)/305(b) Integrated Report (IR). The IR is updated every three years by a review process that is conducted by the New Mexico Environment Department (NMED). For AMAFCA and other Municipal Separate Storm Sewer System (MS4) permittees in the watershed, compliance sampling is done in the Rio Grande at upstream and downstream locations of the urbanized area for impairment parameters, as well as other parameters identified in the MS4 Permit.

AMAFCA and other MS4s covered under the MS4 Permit are required to comply with water quality standards that are comprised of designated uses for surface waters of the state, associated water quality criteria necessary to protect these uses, and an antidegradation policy. Designated uses in the Middle Rio Grande include aquatic life, fish culture, primary and secondary contact (including cultural, religious, or ceremonial purposes), public water supply, industrial water supply, domestic water supply, irrigation, livestock watering, and wildlife habitat. Impairments are identified when sampling results show that the water quality is not meeting the designated uses requirements. Once an impairment is identified; a Total Maximum Daily Load (TMDL) may be considered in the future if continued monitoring does not show improvement. AMAFCA's stormwater discharges protect these uses and fulfill the requirements set forth in the MS4 Permit. Coordinated water quality sample collection programs through AMAFCA, the Stormwater Quality Team, Compliance Monitoring Cooperative (CMC), and Bosque Ecosystem Monitoring Program (BEMP) have been developed and are annually funded to monitor, assess, protect, and restore surface water quality to the Middle Rio Grande watershed.

The current impairments for the Rio Grande stream segments are shown in the figure below.





Impairments in the Rio Grande Segments in the Middle Rio Grande Through Albuquerque



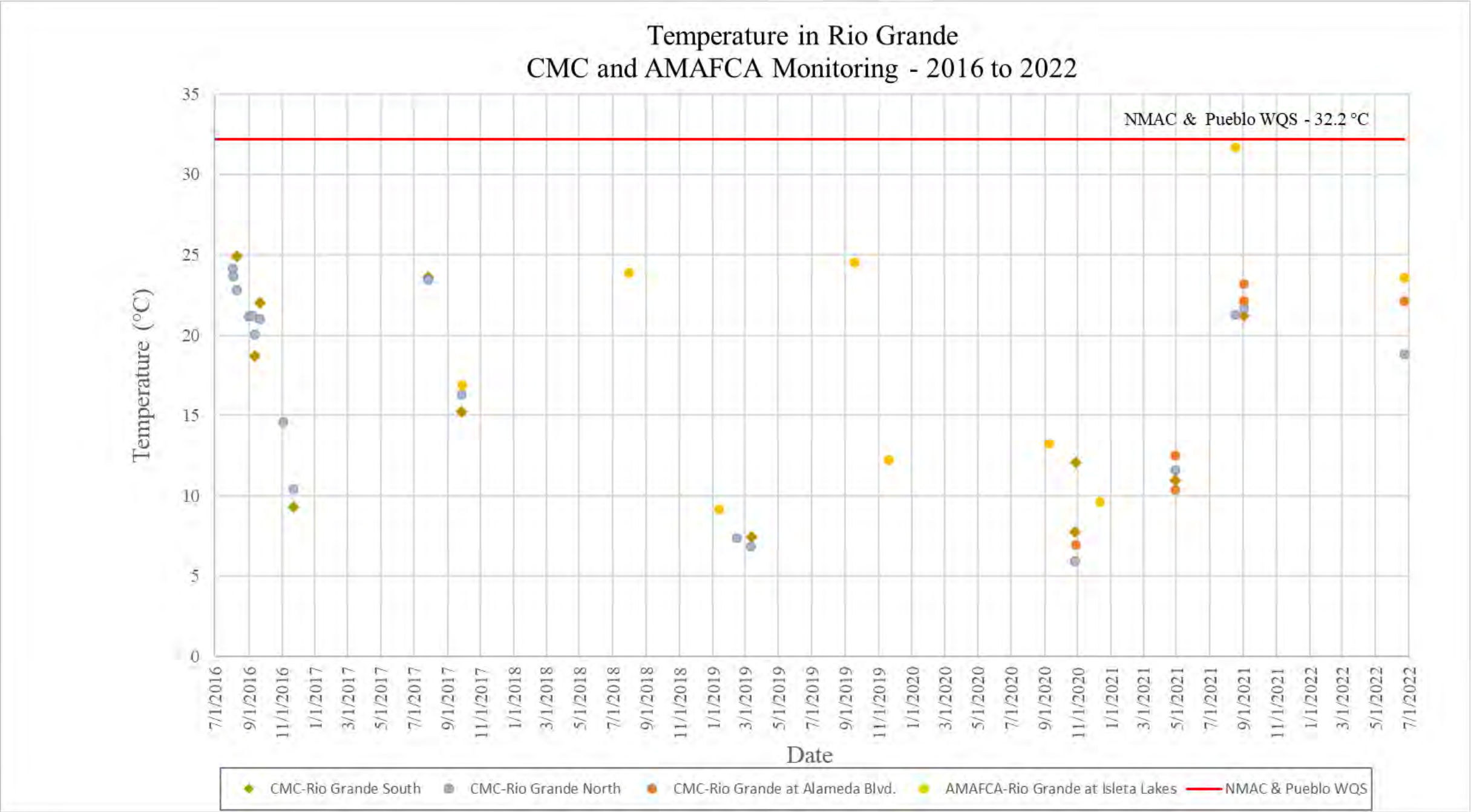
## CMC and AMAFCA Water Quality Monitoring Program for Temperature, Gross Alpha, Mercury, and PCBs

Both AMAFCA and the Middle Rio Grande Compliance Monitoring Cooperative (CMC) collect grab samples within the Rio Grande during storm events. Parameters, including the identified impaired parameters, are tested for these in-stream samples. For MS4 Permit compliance, the Middle Rio Grande CMC has monitoring points north and south of the urbanized portion of the river. The AMAFCA monitoring program collects samples in the Rio Grande at the downstream (south) end of the watershed (Rio Grande at Isleta Lakes). The graphs below show the Temperature and Gross Alpha from AMAFCA and CMC samples collected from 2016 – 2022.

AMAFCA monitors and evaluates the potential effect of stormwater discharges related to temperature in the Rio Grande. AMAFCA and the original MS4 co-permittees (the City of Albuquerque, New Mexico Department of Transportation, and the University of New Mexico) assembled and analyzed temperature data from 1982 to 2012. This data analysis proved the assertion that the receiving waters of the Rio Grande are not adversely affected by the temperature of stormwater from the Albuquerque MS4. This data was presented in an initial report that was submitted to EPA on May 1, 2012.

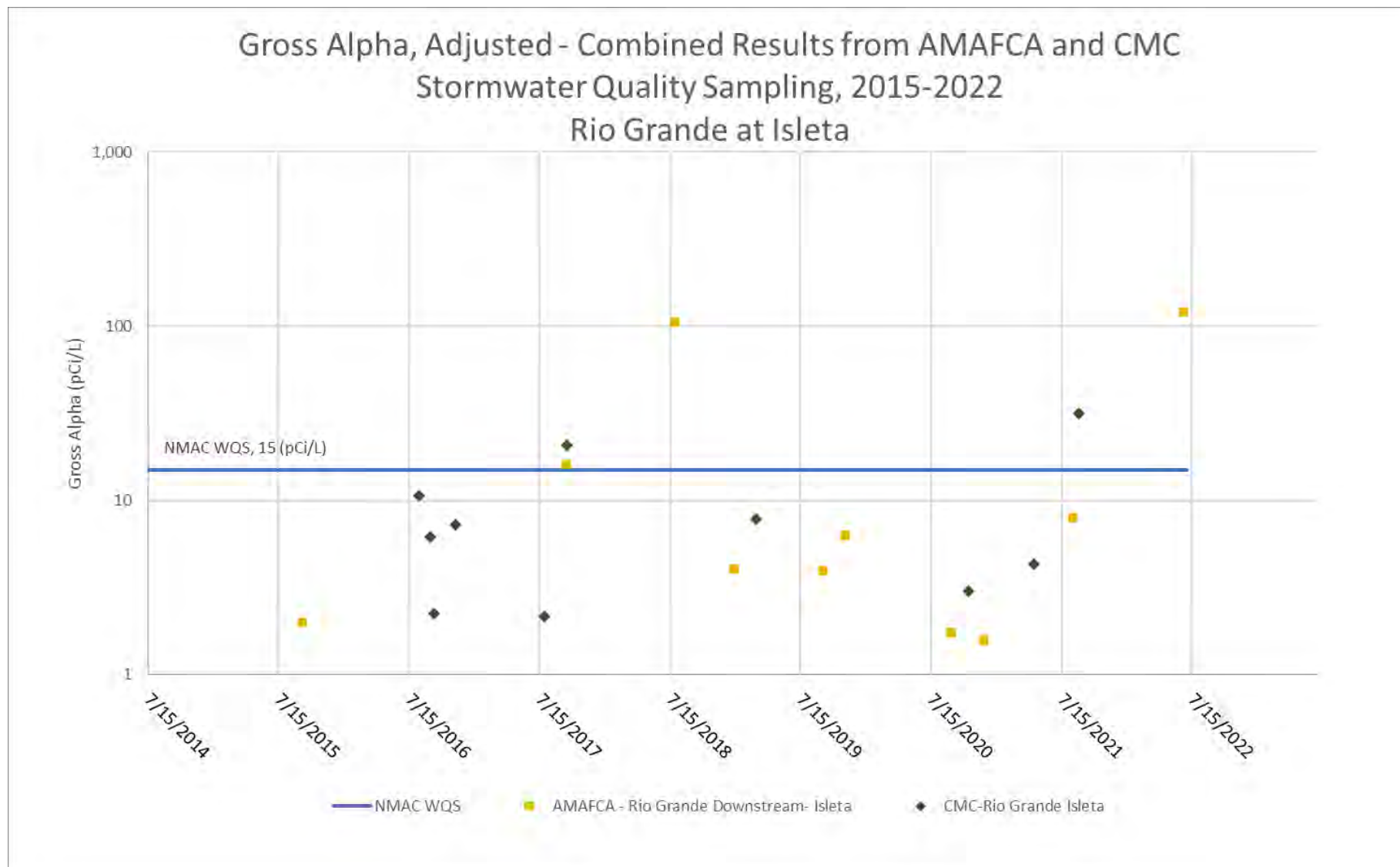
Since 2012, the MS4 permittees have continued to collect and submit temperature data, with each Annual Report showing that the Rio Grande (receiving water for the Middle Rio Grande watershed) is not adversely affected by the temperature of stormwater from the Albuquerque MS4. AMAFCA has collected data from 2012 to 2022 using tidbit probes and sondes. In accordance with AMAFCA's Stormwater Management Program (SWMP), AMAFCA has assessed and will continue to assess the potential effect of stormwater discharges into the Rio Grande by collecting and evaluating additional temperature data. Additional information is available in the Dissolved Oxygen and Temperature Program summary documents.

In FY 2022, the quality assurance project plan (QAPP), the field sampling plan (FSP), and related Standard Operating Procedures (SOPs) for AMAFCA's stormwater quality monitoring program were reviewed and updated. The format and contents of these documents are modeled after the New Mexico Environment Department (NMED) Surface Water Quality Bureau (SWQB) water quality management programs to facilitate sharing of data between the agencies. These documents provide a framework and detailed methods for the collection and analysis of environmental data as well as provide guidance for generating data that is of the precision, accuracy, and completeness necessary for AMAFCA's program.



*Plot of Temperature Data Collected From Grab Samples in the Rio Grande Through the AMAFCA and CMC Monitoring Programs*





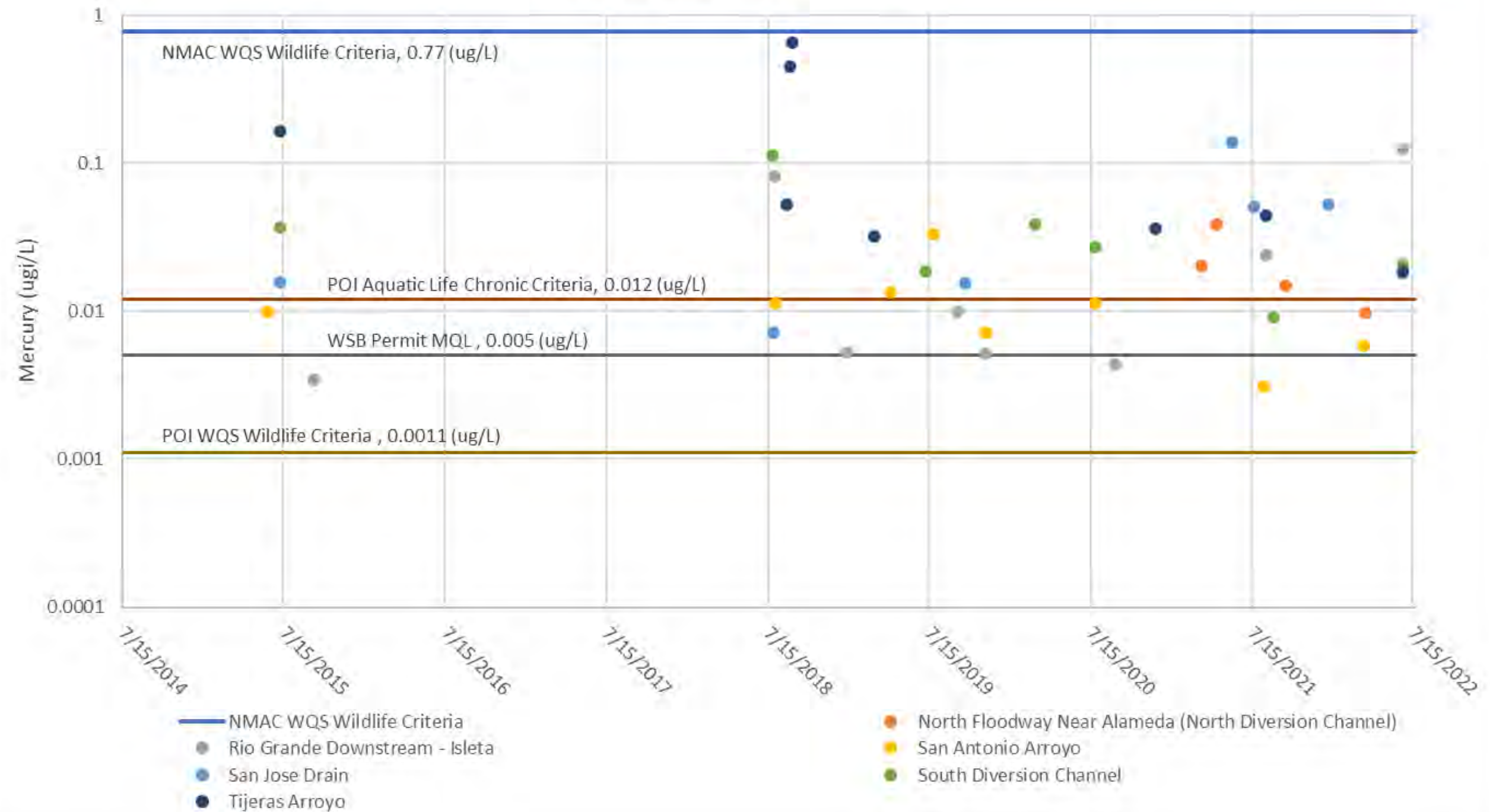
*Gross Alpha Results From Grab Samples in the Rio Grande Through the AMAFCA and CMC Monitoring Programs*

AMAFCA has been monitoring for mercury in stormwater samples and the graph on page 7 shows results obtained throughout the watershed. The CMC has not been monitoring for mercury, as it is not a required parameter in the MS4 Permit. Mercury levels reported as exceeding applicable in-stream water quality standard (WQS) values relate to ‘Wildlife Usage’ WQS for the Pueblo of Isleta; this WQS value is an order of magnitude lower than other mercury WQSs – refer to the table below. AMAFCA has discussed the concern about the magnitude difference and potential error of this WQS with the Pueblo of Isleta related to their Triennial Review.

#### **Water Quality Standards for Mercury for the Middle Rio Grande**

<b>Mercury</b> <b>Pueblo of Isleta</b> <b>Wildlife Usage</b> <b>Criteria</b>	<b>Mercury</b> <b><i>Pueblo of Isleta</i></b> <b><i>&amp; Sandia, Fresh</i></b> <b><i>Water Aquatic</i></b> <b><i>Life Chronic</i></b> <b><i>Toxicity</i></b>	<b>Mercury</b> <b>State of NM</b> <b>NMAC 20.6.4</b> <b><i>Wildlife Habitat</i></b>	<b>Mercury</b> <b>State of NM</b> <b>NMAC 20.6.4</b> <b><i>Drinking Water</i></b> <b><i>Supply</i></b>	<b>Mercury</b> <b><i>Pueblo of Isleta</i></b> <b><i>&amp; Sandia, Fresh</i></b> <b><i>Water Aquatic</i></b> <b><i>Life Acute</i></b> <b><i>Toxicity</i></b>
WQS: 0.0011 ug/L	WQS: 0.012 ug/L	WQS: 0.77 ug/L	WQS: 2 ug/L	WQS: 2.4 ug/L

## Mercury Concentration Results from AMAFCA Stormwater Quality Sampling, 2015-2022

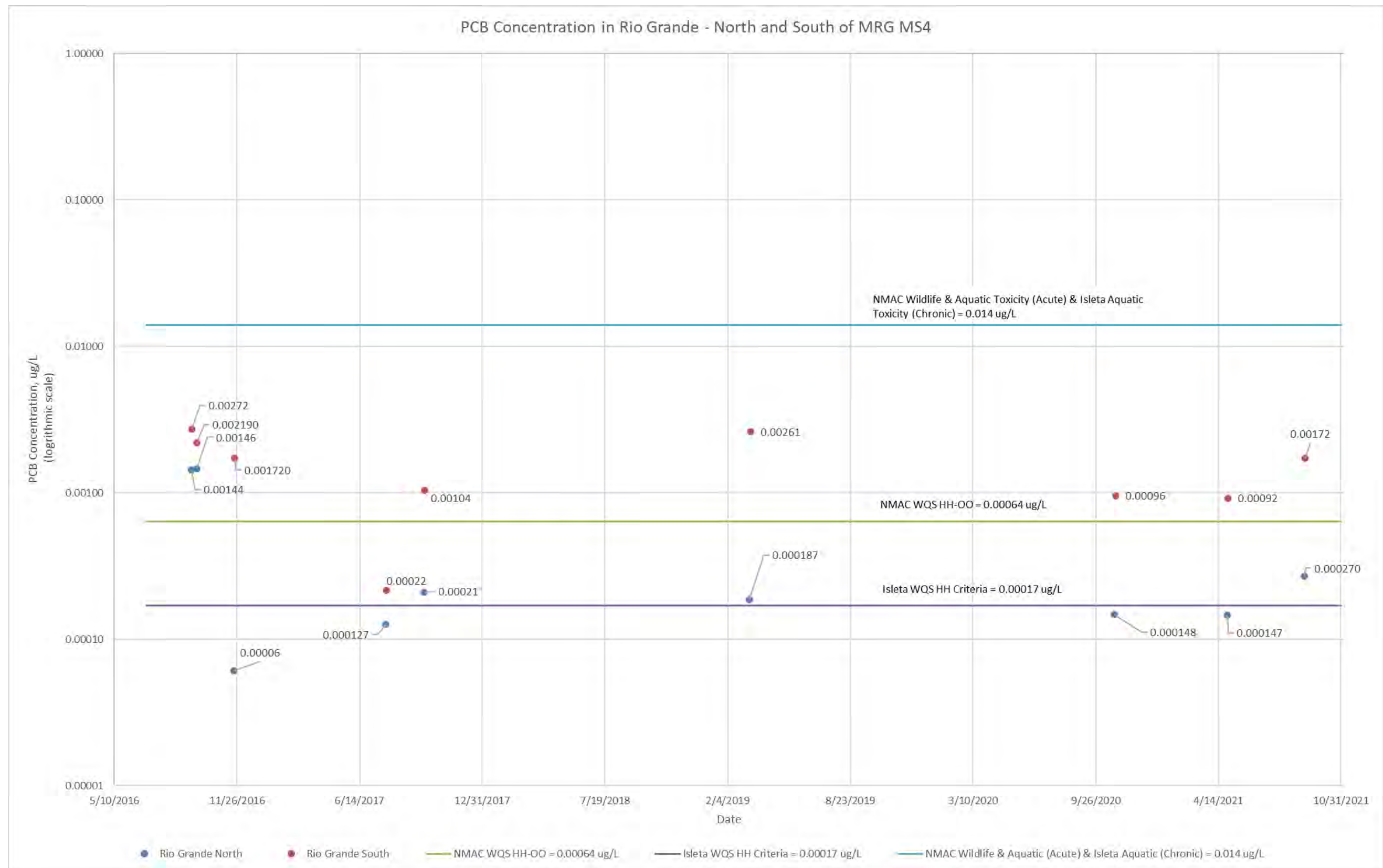


*Mercury Results From Stormwater Samples Collected in the Watershed Through the AMAFCA Monitoring Program*

AMAFCA and the CMC have been monitoring for PCBs in stormwater samples. The current AMAFCA watershed screening (also referred to as non-compliance sampling) is using Method 608 to test for PCBs. If results are detected with the screening method, AMAFCA would then sample and test with Method 1668. Method 608 tests for both PCBs and pesticides. All AMAFCA screening tests for PCBs have been non detect.

The CMC tests all samples for PCBs using Method 1668. This is the required PCB testing methodology for stormwater compliance permit requirements, as is stated in the MS4 Permit, p. 6 of Part III. There are multiple surface WQS values listed for PCBs in both the Pueblo of Isleta and the State of New Mexico standards for the various designated uses. The PCBs measured in samples collected from the Rio Grande during the FY 2022 storm events were all below the minimum quantification level (MQL) established in EPA standards for the MS4 NPDES Permit (Appendix F, 0.2 ug/L for PCBs). The PCB results were also well below the New Mexico Surface WQSs and Pueblo of Isleta Surface WQSs for designated uses, including drinking water (0.5 ug/L) and wildlife habitat, acute aquatic life, and chronic aquatic life (0.014 ug/L). However, the CMC samples from the Rio Grande North (pre-storm) and South (post-storm) locations were above the Pueblo of Isleta human health criteria (based on fish consumption only) WQS for surface waters. The human health-organism only criterion is based upon human consumption of fish and other aquatic life that bioaccumulate contaminants over time. The PCB results from 2016 through 2022 are shown below relative to several of the WQSs for PCBs.





*PCB Results From Stormwater Samples Collected in the Rio Grande Through the CMC*



**Summary of AMAFCA's MS4  
Sediment Pollutant Load Reduction Program  
FY 2022 (July 1, 2021 – June 30, 2022)**

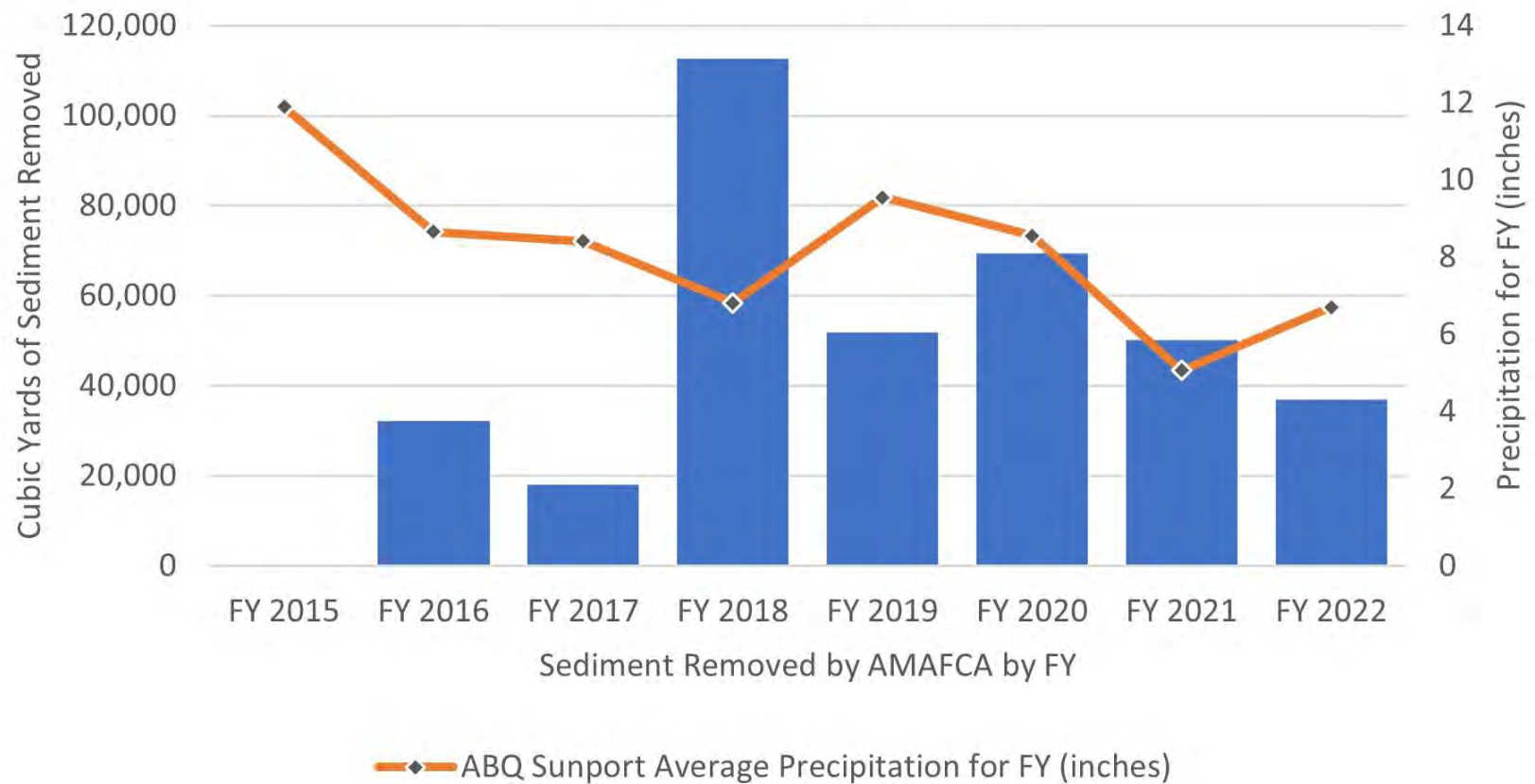
NPDES Permit No. NMR04A000

Part I.C.3.b - Endangered Species Act (ESA) Requirements –  
Sediment Pollutant Load Reduction Strategy

The purpose of this program is to establish a procedure for AMAFCA to develop, implement, and evaluate a sediment pollutant load reduction strategy within the Municipal Separate Storm Sewer System (MS4). All AMAFCA projects are regional flood control or water quality projects. Stormwater runoff from other MS4s enter AMAFCA facilities, which function as both regional flood control facilities and Best Management Practices (BMPs) to remove sediment from stormwater before the stormwater continues to the Rio Grande. All of these facilities can be seen on the AMAFCA Maintenance Map which can be found on AMAFCA's website (at [https://amafca.org/documents/Maintenance\\_Map.pdf](https://amafca.org/documents/Maintenance_Map.pdf)).

In the Middle Rio Grande MS4 area, AMAFCA is not adversely contributing to the sediment pollutant load, but rather functioning to capture the sediment pollutant load generated throughout the watershed by MS4s contributing runoff to AMAFCA facilities. A large portion of AMAFCA's routine Operation and Maintenance (O&M) activities include sediment removal from its facilities. AMAFCA has implemented a crew tracking system to measure the sediment removal quantities at all of its facilities. This tracks sediment removal at each AMAFCA facility and within each defined watershed in the Albuquerque urban area.

## FY Total Sediment Removed by AMAFCA Compared to Precipitation



*Graph Highlighting the Watershed Wide Sediment Removed by AMAFCA Operations*

## FY 2022 Sediment, Debris, and Vegetation Removal from AMAFCA Facilities

July 1, 2021 to June 30, 2022

AMAFCA Facility	Total Total Sediment Removed (CY)	Total Total Debris Removed (CY)*	Total Total Vegetation Removed (CY)
00089 - Zuni-Dallas Regional Pond	6,918	233	103
10000 - No Project	0	0	0
10001 - Shop	0	19	3
10002 - Misc. Projects	0	0	0
10010 - Amole Dam, Channel. & WQ Ponds	0	153	42
10015 - Baca Channel	0	0	0
10020 - Bear Canyon Arroyo	36	73	41
10025 - Bear Canyon Training Dike	65	4	0
10030 - Bear Canyon Tributary Diversion	219	49	6
10035 - Black Arroyo Dam & Channel	18,841	92	44
10045 - Boca Negra Dam & Atrisco Storm Drain	0	12	2
10050 - Borrega Dam & Channel	0	0	0
10055 - Cabezon Channel	0	2	0
10060 - Calabacillas Main Arroyo & Drop Structures	72	8	0
10065 - Corrales Main/Calabacillas/La Orilla	1,290	19	19
10075 - Candelaria Inlet & WQ Pond	385	21	3
10085 - Don Felipe Dam & Pajarito Diversion	396	0	0
10086 - Domingo Baca WQ Structure	30	45	5
10090 - East Amole Surge Pond & Channels (Shamrock & Tempur)	0	0	65
10100 - Embudo Channel	0	170	73
10105 - Fountain Hills Pond	0	0	0
10110 - Grandmas Pond - Paseo del Norte & Coors	0	0	0
10115 - Grantline Inlet & WQ Pond	230	16	3
10120 - Hahn Channel	54	8	0
10125 - Hubbell Dam & Spillway	0	44	2
10130 - John B. Robert Dam	0	10	1
10135 - Kinney Dam	0	18	38
10140 - La Cueva System & WQ Features	36	42	3
10145 - La Cueva Training Dike	0	0	0
10150 - La Cueva Tributary	0	6	0
10160 - Ladera Channel @ 98th Street	0	6	0
10165 - Ladera System - Dams & Mirehaven	0	45	2
10171 - La Presa	174	30	2
10175 - Las Ventanas Dam & North Piedras Marcadas Channel	144	41	111

*Example of FY 2022 AMAFCA Sediment, Debris, and Vegetation Removal Tracking Spreadsheet*





*Photos of AMAFCA Sediment Removal & AMAFCA Maintenance Activities*

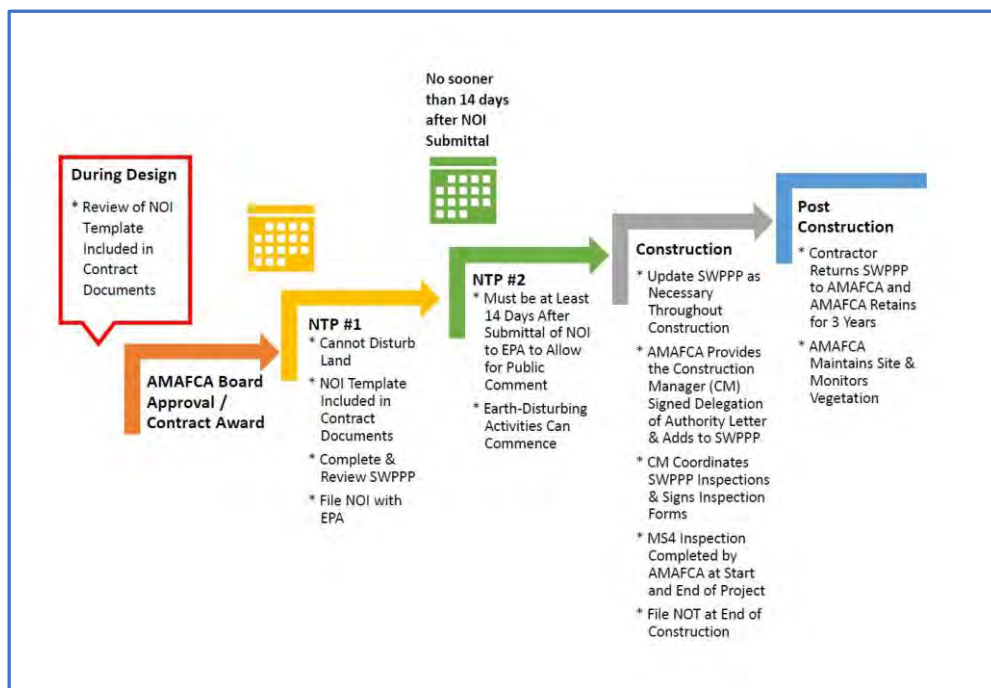
## Summary of AMAFCA's MS4 Construction Site Stormwater Runoff Control Program FY 2022 (July 1, 2021 – June 30, 2022)

NPDES Permit No. NMR04A000

### Part I.D.5.a - Construction Site Stormwater Runoff Control Program

Construction site stormwater runoff control is intended to control polluted stormwater runoff from a construction site to Municipal Separate Storm Sewer Systems (MS4s) that is ultimately discharged into local rivers and streams. Sediment is usually the main pollutant of concern for construction site stormwater runoff. Sediment runoff rates from construction sites are typically 10 to 20 times greater than those of agricultural lands, and 1,000 to 2,000 times greater than those of forest lands. During a short period of time, construction sites can contribute more sediment to streams than can be deposited naturally during several decades. In accordance with AMAFCA's SWMP, AMAFCA has continued and will continue to follow its program to control construction site stormwater runoff.

AMAFCA files Notice of Intent (NOI) documents for a Construction General Permit (CGP) for each of their construction sites that is greater than 1 acre in size. AMAFCA also requires contractors to file CGP NOI documents for any AMAFCA construction sites that are greater than 1 acre in size. AMAFCA reviews each contractor provided SWPPP document to determine their compliance with permit requirements. AMAFCA's timeline related to the CGP requirements, developed as part of the program to control construction site stormwater runoff, is shown below. The second image shows the active AMAFCA construction sites in FY 2022.



*AMAFCA's Timeline Related to the CGP Requirements*



EPA CGP

npdes-ereporting.epa.gov/net-cgp/action/secured/home

United States Environmental Protection Agency

My Requests Resources

Tour Logged in as: PATRICKJCHAVEZ

Show 10 entries

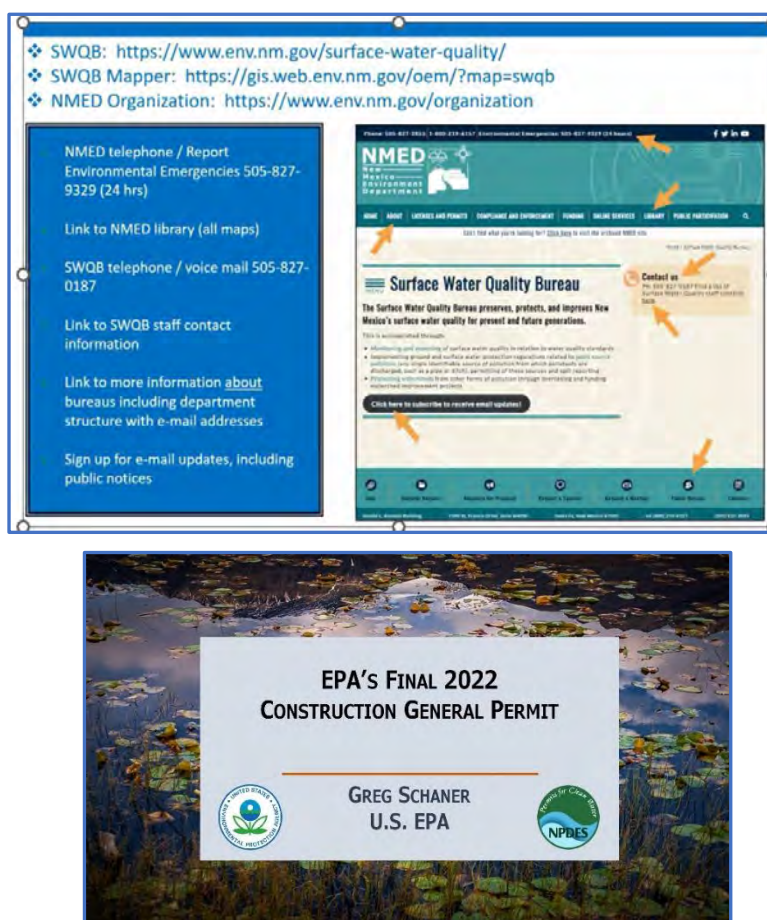
Actions	Project / Site Name	NPDES ID	Submission Status	Submission Type	Coverage Status	Coverage Type	Certified / Submitted Date	Effective Date	Expiration Date	Last Modified Date	Column visibility	Default
Actions	Calabacillas Arroyo Grade Control Structure 2 Extension	NMR10053T	Under Review Ends in 6 days	New	Inactive	General Permit	09/19/2022	-	-	09/19/2022 11:41 AM		
Actions	North Domingo Baca Dam Improvements Project	NMR10053C	Under Review Ends in a day	New	Inactive	General Permit	09/14/2022	-	-	09/14/2022 4:14 PM		
Actions	Valla de Oro Swale Project	NMR10045C	Approved	Change	Active	General Permit	08/15/2022	08/26/2021	02/16/2027	08/15/2022 12:53 PM		
Actions	CAWB GCS 11, Crossing and Bank Protection	NMR1004XF	Approved	New	Active	General Permit	07/08/2022	07/22/2022	02/16/2027	07/22/2022 6:30 PM		
Actions	Valle de Oro Outfall Structure	NMR1002OU	Approved	Discontinuation	Discontinued	Low Erosivity Waiver	07/14/2021	01/10/2020	02/15/2022	07/14/2021 4:00 PM		
Actions	Black Mesa 3 Dam Outlet Raymac Dam to Don Felipe Dam Phase III and IV Project	NMR1002H1	Approved	Termination	Terminated	General Permit	06/15/2021	10/16/2019	02/15/2022	06/15/2021 3:00 PM		
Actions	Lower Bear Tributary Arroyo Regional Flood Control and Water Quality Improvement	NMR1001XR	Approved	Termination	Terminated	General Permit	06/15/2021	03/06/2019	02/15/2022	06/15/2021 3:00 PM		
Actions	Black Mesa 3 Dam Outlet Raymac to McCoy Dam - Phase V	NMR1003C4	Approved	Termination	Terminated	General Permit	06/15/2021	10/15/2020	02/15/2022	06/15/2021 3:00 PM		
Actions	Tijeras Arroyo Sediment Retention Facility Project, Phase 2	NMR1001ZO	Approved	Termination	Terminated	General Permit	10/02/2019	03/27/2019	02/15/2022	10/02/2019 12:00 PM		
Actions	Louisiana-Gibson Regional Drainage Facility at Kirtland AFB	NMR1001J0	Approved	Termination	Terminated	General Permit	08/05/2019	08/30/2018	02/15/2022	08/05/2019 3:00 PM		

Showing 1 to 10 of 14 entries

Previous 1 2 Next

Screen Shot from EPA's Net NPDES Tool Showing Active AMAFCA CGP NOIs

EPA published the final 2022 CGP in January 2022. AMAFCA worked closely with area MS4s to develop and submit comments on the draft 2022 CGP during FY 2021. AMAFCA attended an EPA webinar on February 24, 2022, as well as a New Mexico Environment Department (NMED) webinar on April 21, 2022, on the final 2022 CGP requirements. These webinars assisted with AMAFCA's training and knowledge of the new CGP requirements. During FY 2022, AMAFCA worked to update their program to control construction site stormwater runoff to reflect the new 2022 CGP requirements. These efforts included review and update of the Template & Instructions for Electronic CGP Notice of Intent (NOI) or Low Erosivity Waiver (LEW) Application for AMAFCA Projects, which AMAFCA provides with its construction contract documents to assist contractors and AMAFCA with meeting CGP requirements.



### *AMAFCA Attended 2022 CGP Webinars Presented by NMED and EPA*

In the fall of 2022, EPA released a new Construction Inspection Training Course for CGP Operators. Construction site operators permitted under EPA's 2022 CGP are required to ensure that any individual conducting site inspections is a "qualified person". The 2022 CGP includes new requirements for qualified persons that apply to all sites that receive permit coverage on or after February 17, 2023. Patrick Chavez, AMAFCA's Storm Water Quality Engineer, completed the EPA course and passed the exam and is considered qualified to conduct inspections under Part 4 of the 2022 CGP. Documentation showing Mr. Chavez's successful completion of the EPA course is shown below.





# CERTIFICATE OF COMPLETION

presented to

Patrick J. Chavez, MSCE, PE,  
LEED AP+

who has successfully completed EPA's Construction General Permit (CGP) Site Inspector Training Course  
and passed the final exam

Chris Kloss, Water Permits Division Director



Date Certified: 9/22/2022

Expiration Date: May 17, 2027

By completing this course and passing the final exam, Patrick J. Chavez, MSCE, PE, LEED AP+ has complied with the CGP Part 6.3.a training requirements  
for conducting construction inspections under the 2022 CGP.



*Mr. Chavez successfully completed the EPA CPG Site Inspector Training Course*



**Summary of AMAFCA's MS4  
Post-Construction Stormwater Management Program  
FY 2022 (July 1, 2021 – June 30, 2022)**

NPDES Permit No. NMR04A000

Part I.D.5.b - Post-Construction Stormwater Management in  
New Development and Re-development

Post-construction stormwater runoff is the stormwater that would flow from a project site to the Municipal Separate Storm Sewer System (MS4) after completion of a new development or redevelopment (not during the project construction). Controls for this type of runoff are necessary to maintain or restore stable hydrology in receiving waters by limiting surface runoff rates and volumes and reducing pollutant loadings from sites that undergo development or significant redevelopment.

Post-construction stormwater management in areas undergoing new development or redevelopment is necessary because runoff from these areas has been shown to significantly affect receiving water bodies. The intent of the Post-Construction Stormwater Management requirements in the MS4 Permit, according to EPA, are to:

- Prevent or reduce pollutants in stormwater discharges from reaching the Rio Grande;
- Mimic predevelopment hydrology; and
- Reduce impacts on natural channels and flow paths due to changes in hydrology.

AMAFCA, in conjunction with the area MS4 through the Mid Rio Grande (MRG) Stormwater Quality Team, completed a review and recommendations memo for post-construction stormwater quality design standards in the MRG Watershed in April 2021 (final memo is attached along with AMAFCA's May 14, 2021 Stormwater Quality Volume Calculation for Onsite Retention Board Memorandum). Currently, the MRG MS4 permittees approach the stormwater quality design standard slightly differently.

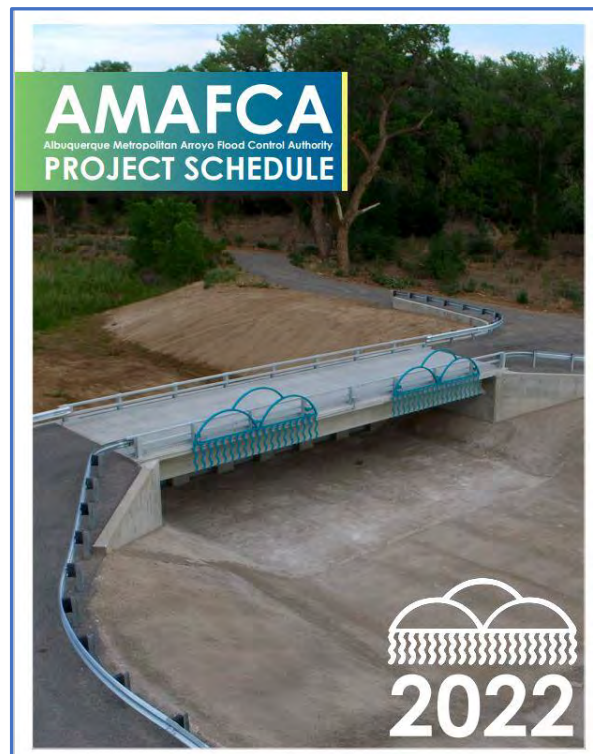
The Post-Construction Stormwater Quality Volume (SWQV) Comparison Tool was created as part of this task to assist the MRG MS4 permittees with comparing the stormwater quality design standards used within the MRG watershed related to post-construction stormwater management. It was recommended that developers be encouraged to include green stormwater infrastructure (GSI) and low impact development (LID) as well as increased landscape areas to reduce the total impervious area of a site, thereby reducing the required SWQV. It was also recommended that water quality and detention inspections include a review of the original impervious area used in the SWQV calculation to ensure that site modifications have not increased the impervious area of a site. The extent of the application and/or adoption of these recommendations for post-construction stormwater quality design standards and inspections will be determined and implemented by each MS4 permittee. Based on analysis from this document and discussions with New Mexico Environment Department (NMED) and EPA, Bernalillo County issued a

memorandum on May 12, 2021, that within 30 calendar days, all new development and redevelopment projects that disturb equal to or greater than 1 acre or are part of a larger common plan of development, will be required to use the rainfall depth to calculate the SWQV for impervious areas (including compacted areas) – this is available on the Bernalillo County website: [https://www.bernco.gov/public-works/wp-content/uploads/sites/76/2021/05/SWQV\\_Calculation\\_memo\\_051221\\_encrypted.pdf](https://www.bernco.gov/public-works/wp-content/uploads/sites/76/2021/05/SWQV_Calculation_memo_051221_encrypted.pdf)

AMAFCA's Drainage Management Plans (DMPs) calculate flood protection and water quality volumes for a given subwatershed's facilities that can accommodate the SWQV independent of the rainfall/runoff numbers used to calculate required on-site retention. AMAFCA's planning documents comply with the MS4 Permit by limiting the discharge from within a subwatershed to the pre-development flow condition. AMAFCA's facilities are designed to attenuate the runoff from a storm event such that the river's flow conditions are essentially unaffected by new development and/or redevelopment.

AMAFCA's development engineer participates in area development reviews and often has the opportunity to comment on and request water quality components for projects. In addition, the AMAFCA Stormwater Quality Engineer participates in reviews subdivision reviews completed by Ciudad Soil and Water Conservation District, in accordance with their authority [47-6-11(F)(4) NMSA]. These reviews often cross-check with area terrain management plans and focus on post-construction runoff quantity, stormwater retention ponds, GSI/LID options, post-construction velocities, and maintenance requirements.

The AMAFCA Project schedule (<https://amafca.org/downloadabledata/AMAFCAProjectSchedule2022%5BReduced-Web%5D.pdf>) identifies future planning efforts, joint funding initiatives, and design and construction projects that AMAFCA hopes to accomplish over the next six years. Planned stormwater quality projects are prioritized as required by the MS4 Permit. The prioritization assists AMAFCA and its Board of Directors in its mission to protect life and property. Projects subject to this scoring have a strong affinity towards water quality improvements, however, projects included in the Project Schedule which are not scored for water quality may still include water quality aspects as part of their scope. This figure below provides a summary of the scoring criteria used for water quality facilities.



Total project cost will ultimately determine the feasibility of a proposed project. As such, projects will be scored based on their total estimated project cost. The point scale below describes how points are assigned based on total project cost.

Total Cost	Points
Less than \$500K	2
Greater than \$500K but less than \$1M	1
Greater than \$1M	0

Location along a flow path to the Rio Grande is taken into consideration when assigning points to each project. Projects are scored higher if they are the only stormwater quality facility along the flow path to the Rio Grande, and lower if there is a facility(ies) above or below the proposed project. The point scale below describes points are assigned based on this location.

Flow path to the Rio Grande	Points
Project only WQ Facility	3
Project downstream of existing WQ Facility	1
Project Upstream of existing WQ Facility	1

If a stormwater quality facility is located within the Bosque - the forested area surrounding the riparian zone of the Rio Grande floodplain - the project was awarded a "bonus" for being the ultimate water quality control measure before stormwater reaches the Rio Grande. The point scale below describes how the bonus points were assigned based on the above criteria.

"Bosque Bonus"	Points
Within Bosque	2
Not Within Bosque	0

**Total Points Scale: 1-7**

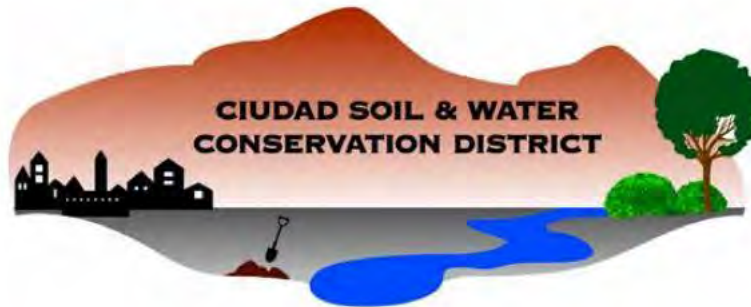
### *AMAFCA Project Schedule Water Quality Facility Scoring Criteria*

In addition, AMAFCA has been a supporter of the annual Land and Water Summit in the Albuquerque area. The Land and Water Summit was created in 1986 by the Xeriscape Council of New Mexico. Developed to bring together design professionals, construction and management companies, agencies, farmers, artists, teachers, hydrologists, ranchers, climatologists, wildlife advocates, homeowners, and policy makers to find sustainable ways to protect and share our state's water and resources, the event is now hosted by Ciudad Soil and Water Conservation District, which serves as the event's fiscal agent. The group's primary goal is to educate the public about resource conservation and best practices for improving and protecting local landscapes – which ties well with the MS4 Post-Construction Stormwater Management education requirements. AMAFCA has been a financial sponsor as well as an active member on the planning committee. For information on the 2022 Land and Water Summit, please visit the conference website: [Past Land and Water Summits • The Land and Water Summit \(landandwatersummitnm.org\)](https://landandwatersummitnm.org)





# Thanks for Your Support!



## Land and Water Planning Committee:

**Steve Glass, Chair • Ciudad Soil and Water Conservation District**

**Kali Bronson, Vice Chair • Bernalillo County**

**Astrid Hueglin, Treasurer • Ciudad Soil and Water Conservation District**

**Erin Blaz • Ciudad Soil and Water Conservation District**

**Patrick Chavez • Albuquerque Metropolitan Arroyo Flood Control Authority**

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**Erika Robers • Groundwork Studio**

**Phyllis Baker, Consultant • Baker Creative**

*2022 Land and Water Summit Planning Committee*

## AMAFCA Board Memorandum

**To:** AMAFCA Board of Directors  
**From:** Patrick J. Chavez, PE, Stormwater Quality Engineer  
**Date:** May 14, 2021  
**Subject:** Stormwater Quality Volume Calculation for Onsite Retention

\*\*\*

Earlier this year the AMAFCA Board of Directors was provided three memos detailing the inconsistent application in the use of rainfall depth and/or runoff depth for calculating the required stormwater quality volume (SWQV) within the watershed. A literature review and assessment of the stormwater quality volume calculation was conducted to prepare the recently published white paper titled *Post-Construction Runoff Values for Middle io Grande Watershed*.

Based on analysis from this document and discussions with NMED and EPA, Bernalillo County issued the attached memorandum on May 12, 2021 that within 30 calendar days all new development and redevelopment projects, that disturb equal to or greater than 1 acre or are part of a larger common plan of development, will be required to use the rainfall depth to calculate the SWQV for impervious areas (including compacted areas).

As described in the above-mentioned informational Board meeting memos, AMAFCA's Drainage Management Plans (DMPs) calculate flood protection and water quality volumes for a given sub-watershed's facilities that can accommodate the SWQV independent of the rainfall/runoff numbers used to calculate required on-site retention. AMAFCA's planning documents comply with the MS4 Permit by limiting the discharge from a new development or redevelopment site within a sub-watershed to the pre-development flow condition. AMAFCA's facilities are designed to attenuate the runoff from a storm event such that the river's flow conditions are essentially unaffected by new and/or redevelopment.

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## MEMORANDUM

**DATE:** April 21, 2021

**TO:** Mid Rio Grande Stormwater Quality Team

**FROM:** Sarah Ganley, PE

**SUBJECT:** **Review and Recommendations for Post-Construction Stormwater Quality Design Standards in the Middle Rio Grande Watershed**

Land development changes the hydrologic properties of a given watershed and generally increases the pollutant load transported by runoff compared to predevelopment conditions. The term stormwater quality volume (SWQV) is generally used to define the amount of stormwater from any given storm that should be captured and treated in order to remove a majority of stormwater pollutants on an average annual basis before it is transported to receiving waters. Since the majority of all rainfall typically occurs in relatively small events, managing the discharge of the SWQV is considered to be a cost-effective standard for minimizing overall pollutant discharge to receiving waters.

The goals of this task related to the post-construction stormwater quality design standards are to:

- 1) Improve the MS4 permittees understanding of the various post-construction stormwater quality design standards in the Middle Rio Grande watershed.
- 2) Review the intent of the Middle Rio Grande Watershed Based (MRG WSB) MS4 Permit, Permit No. NMR04A000, Dec. 19, 2019, and related reference documents associated with post-construction runoff values.
- 3) Consider the equity of the application of differing post-construction stormwater quality design standards within the watershed.
- 4) Assist the MS4 permittees in preparing for the next MRG WSB MS4 Permit related to post-construction requirements.

The intent of the Post-Construction Stormwater Management requirements in the MRG WSB MS4 Permit, according to EPA, are to:

- Prevent or reduce pollutants in stormwater discharges from reaching the Rio Grande;
- Mimic predevelopment hydrology; and
- Reduce impacts on natural channels and flow paths due to changes in hydrology.

The literature review for this task provided multiple explanations of the purpose of using percentile storms to define and simplify a stormwater quality design standard. The quotes shown below are examples that explain that creating a stormwater quality design standard that maintains on site the 90th percentile storm event (new development) and 80th percentile storm event



(redevelopment) reasonably mimics predevelopment hydrology and addresses watershed water quality concerns.

"This permit proposes a **simple stormwater quality design standard** to ensure the hydrology associated with new development and redevelopment sites mirror the predevelopment hydrology of the previously undeveloped site."

*-- Fact Sheet and Supplemental Information for the NPDES General Permit for Municipal Separate Storm Sewer Systems in the Middle Rio Grande Watershed – December 2014*

"...predevelopment condition in the regulated MS4 area of the watershed is defined as the **rainfall depth above which measurable runoff first occurs under natural conditions.**"

*-- Estimating Predevelopment Hydrology in the Middle Rio Grande Watershed, NM, April 2014, Kosco, et. al.*

"...the performance standard to capture the 90th percentile storm event...is a **reasonable surrogate for mimicking predevelopment hydrology** for this watershed. Managing stormwater to predevelopment runoff conditions **will reduce water quality impacts on the receiving water.**"

*-- Estimating Predevelopment Hydrology in the Middle Rio Grande Watershed, NM, April 2014, Kosco, et. al.*

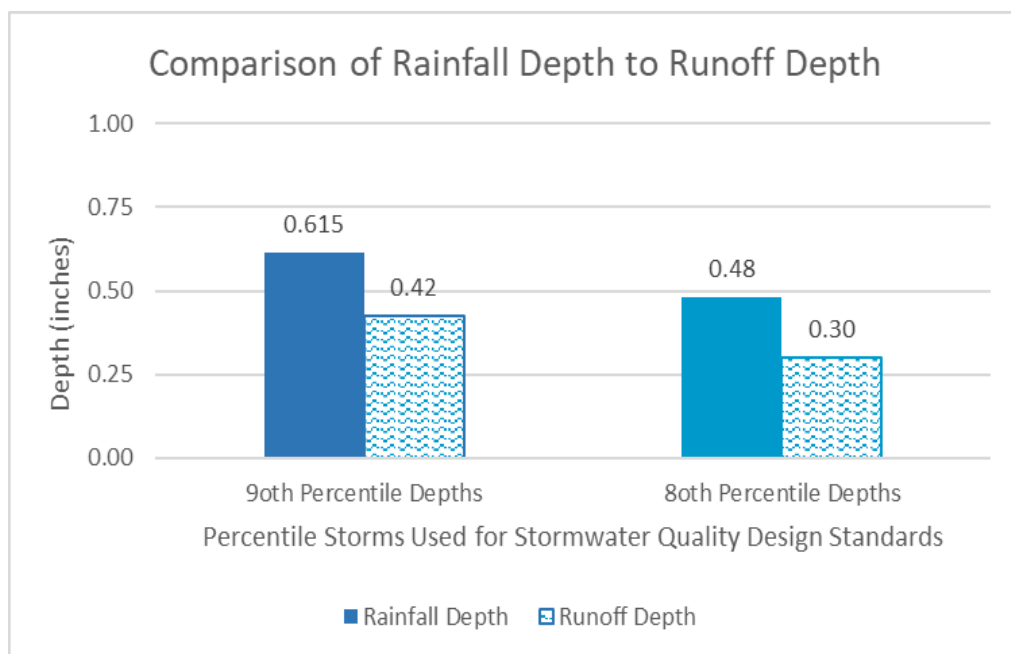
The post-construction predevelopment hydrology requirements in the MRG WSB MS4 Permit are met by agencies by defining a stormwater quality design standard. Post-Construction Part I.D.5 b.(ii).(b) of the MRG MS4 Permit states: "Incorporate a stormwater quality design standard that manages on-site the 90th percentile storm event discharge volume associated with new development sites and 80th percentile storm event discharge volume associated with redevelopment sites, through stormwater controls that infiltrate, evapotranspire the discharge volume,...". In predeveloped conditions, the 90<sup>th</sup> percentile storm represents the rainfall when runoff would first occur.

The MRG MS4 permittees approach the stormwater quality design standard slightly differently. There are three main components that factor into the application of a stormwater quality design standard.

- 1) The rainfall depth values.
- 2) Use of the rainfall depth or a reduced runoff depth in the stormwater quality design standard.
- 3) Area of the site to which the rainfall (or runoff) depth is applied. Some stormwater quality design standards apply this only to the impervious areas, some to all disturbed area, and others to the entire site.

The Post-Construction Stormwater Quality Volume (SWQV) Comparison Tool was created as part of this task to assist the MRG MS4 permittees with comparing the stormwater quality design standards used within the MRG watershed related to post-construction stormwater management. The Post-Construction SWQV Comparison Tool literature review research and findings were shared with the Mid Rio Grande Stormwater Quality Team (MRGSQT) in a virtual meeting on October 20, 2020. Review and feedback on the information and each agency's specific stormwater quality design standard was requested. Bernalillo County provided feedback to BHI and AMAFCA regarding the meeting, SWQV Comparison Tool, and agency stormwater quality design standards.

Figure 1 below illustrates the rainfall and runoff depths that are generally agreed to in the MRG Watershed. Table 1 on Page 4 provides a summary of the MRG watershed rainfall depths and the runoff depths, if applicable, with additional details and related references available in the SWQV Comparison Tool. Currently, there is fairly consistent consensus in the watershed on the rainfall depth value and a lack of consensus on if the rainfall depth or reduced runoff depth should be used in a stormwater quality design standard.



**Figure 1: Comparison of Rainfall and Runoff Depths in the MRG Watershed**

**Table 1: Comparison of Rainfall Depths and Runoff Depths Used Within the MRG Watershed Related to Post-Construction Stormwater Management**

Agency/Reference	New Development		Redevelopment	
	90th Percentile Storm Rainfall Depth	90th Percentile Storm Runoff Depth	80th Percentile Storm Rainfall Depth	80th Percentile Storm Runoff Depth
EPA, Estimating Predevelopment Hydrology in the Middle Rio Grande Watershed, NM, April 2014	0.615"	0.42"	Not stated - 0.48" directed by EPA (Nelly Smith - email included in Attachment to Memo)	Not stated - Calculated runoff value using TR-55, Rainfall depth = 0.48", CN of 98 (impervious) = 0.3"
EPA, Estimating Predevelopment Hydrology in New Mexico, 2015	0.65"	Not stated	0.48"	Not stated
City of Albuquerque, 2017 Memo (marked Draft) - Determination of 80th and 90th Percentile Storms for Stormwater Quality Volume	0.62"	0.42"	0.44"	0.26"
City of Albuquerque, DPM, June 8, 2020	0.62"	0.42"	0.48"	0.26"
Bernalillo County, Ordinance, Chapter 28, Article IV - Stormwater Quality	0.615"	County references 2014 predevelopment document	County references 2014 predevelopment document	County references 2014 predevelopment document
Bernalillo County, Technical Standards Document, currently being developed	0.615"	0.615"	0.48"	0.48"
SSCAFCA, DPM, Section 10, Stormwater Pollution Control	0.6"	0.46"	Not stated	Not stated
City of Rio Rancho, Ordinance, Chapter 153 - Erosion Control; Storm Drainage and Stormwater Quality	0.615"	CORR references 2014 predevelopment document	Not stated	Not stated
NMDOT, Drainage Design Manual, July 2018	0.615"	0.615"	0.48"	0.48"

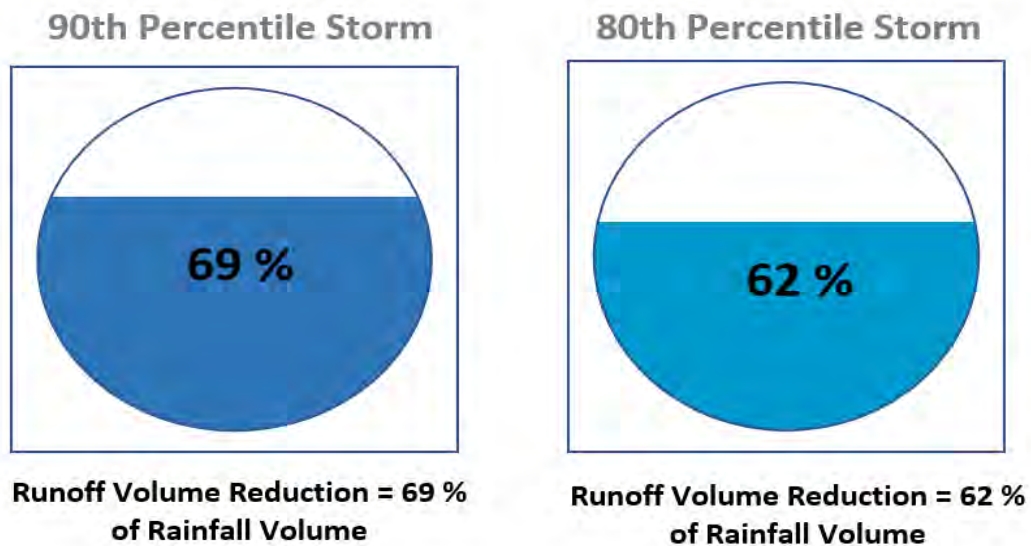
The stormwater quality design standard is typically a SWQV calculation, which is a straightforward calculation:

$$\text{SWQV} = (R/12) * \text{Area} = \text{stormwater quality volume to be treated, in cubic feet}$$

R = 90th or 80th percentile event rainfall depth, in inches  
Area = area of development or redevelopment, in square feet

To understand the magnitude of the impact of using the storm rainfall depth versus the reduced runoff depth in the stormwater quality design standard volume calculation, sample calculations were performed to demonstrate that use of the runoff depth leads to 69-percent lower volume requirements for the 90th percentile storm and 62-percent lower volume requirements for the 80th percentile storm. Figure 2 below illustrates this runoff volume reduction. The New Mexico Environment Department (NMED) Surface Water Quality Bureau shared that the use of the rainfall depth in the SWQV calculation was the intent of the language in the MRG WSB MS4 Permit (email documentation provided as an attachment to this memo).

The area used in the SWQV calculation also has an impact on the magnitude of water quality volume required. The SWQV calculation providing protection to the environment to the maximum extent practicable would apply the rainfall depth over the entire site. At the other end of the spectrum, the SWQV calculation providing protection to the environment to something less than the maximum extent practicable applies the reduced runoff depth to only the impervious areas of a given site. Using the impervious areas to calculate the SWQV is the current, standard practice in much of the MRG watershed. This current approach functions to encourage developers to include green stormwater infrastructure (GSI) and low impact development (LID) as well as increased landscape areas which would reduce the total impervious area of a site, thereby reducing the required SWQV. Compacted or disturbed areas may also be considered in the SWQV calculation if the agency reviewer has concerns about the stormwater quality runoff from these areas.



**Figure 2: Comparison of Volumes if Using Rainfall and Runoff Depths Recommendations**



Based on this literature review, research, and collaborative discussions, use of the rainfall depth in stormwater quality design standards is recommended for site development in the MRG watershed as the most protective standard for water quality. Rainfall depth is defined as 0.615" for the 90th percentile storm event for new development, and 0.48" for the 80th percentile storm event for redevelopment. Use of the runoff depth in stormwater quality design standards is used in the MRG, and it is a reduction in SWQV retention compared to use of the rainfall depth, although it does provide some water quality benefits. The MRG WSB MS4 Permit allows for alternative compliance for infeasibility to manage the SWQV on-site due to site constraints (as defined in the Permit), and some or all of the SWQV could be managed at downstream regional, public facilities that are designed for and have agreed to provide for water quality protection, as applicable for such projects. The intent of the MRG WSB MS4 Permit to prevent or reduce pollutants in stormwater discharges from reaching the Rio Grande and retention of the rainfall depth provides the most water quality protection.

The SWQV is recommended to be calculated for the impervious areas of a site. Compacted or disturbed areas may also be considered in the SWQV calculation. It is recommended that developers be encouraged to include green stormwater infrastructure (GSI) and low impact development (LID) as well as increased landscape areas to reduce the total impervious area of a site, thereby reducing the required SWQV. It is also recommended that water quality and detention inspections include a review of the original impervious area used in the SWQV calculation to ensure that site modifications have not increased the impervious area of a site. The extent of the application and/or adoption of these recommendations for post-construction stormwater quality design standards and inspections will be determined, and implemented by each MS4 permittee.

SJG/ab

Attachment 1 – Email Documentation Related to Rainfall Depth for MRG Watershed from EPA and NMED Surface Water Quality Bureau

**ATTACHMENT 1 –  
EMAIL DOCUMENTATION RELATED TO RAINFALL  
DEPTH FOR MRG WATERSHED FROM EPA AND  
NMED SURFACE WATER QUALITY BUREAU**

From: Sarah Ganley [<mailto:sganley@bhinc.com>]  
Sent: Wednesday, December 16, 2015 9:13 AM  
To: Faidi, Hashem, NMDOT; Morgenstern, Steven, NMDOT  
Cc: Barber, Ted L., NMDOT; Trujillo, Timothy R, NMDOT  
Subject: FW: 80th & 90th percentile storm values for Albuquerque

Hello— based on Nelly's responses – looks like the values to use for Middle Rio Grande MS4 – for post-construction requirements:

80<sup>th</sup> percentile storm = 0.48"

90<sup>th</sup> percentile storm = 0.615"

Thanks,

**Sarah J. Ganley, PE**  
Engineer  
Water Resources  
Direct line: 505-923-3314

## Bohannon Huston

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**From:** Smith, Nelly [<mailto:Smith.Nelly@epa.gov>]  
**Sent:** Wednesday, December 16, 2015 9:09 AM  
**To:** Sarah Ganley <[sganley@bhinc.com](mailto:sganley@bhinc.com)>  
**Cc:** Hashem Faidi ([Hashem.Faidi@state.nm.us](mailto:Hashem.Faidi@state.nm.us)) <[Hashem.Faidi@state.nm.us](mailto:Hashem.Faidi@state.nm.us)>; Steven Morgenstern ([Steven.Morgenstern@state.nm.us](mailto:Steven.Morgenstern@state.nm.us)) <[Steven.Morgenstern@state.nm.us](mailto:Steven.Morgenstern@state.nm.us)>; Tim Trujillo, PE ([TimothyR.Trujillo@state.nm.us](mailto:TimothyR.Trujillo@state.nm.us)) <[TimothyR.Trujillo@state.nm.us](mailto:TimothyR.Trujillo@state.nm.us)>; Barber, Ted L., NMDOT ([Ted.Barber@state.nm.us](mailto:Ted.Barber@state.nm.us)) <[Ted.Barber@state.nm.us](mailto:Ted.Barber@state.nm.us)>  
**Subject:** RE: 80th & 90th percentile storm values for Albuquerque

Yes, Table 2-1 of the 2014 Report does not include the 80<sup>th</sup> percentile value. But Figure 2.6 can be used to extrapolate this value. It is less than 0.5" (as indicated in the Fact Sheet for the MRG MS4 Permit) - 0.48" can be used in the Albuquerque UA.

Thanks!

Nelly Smith  
Municipal Stormwater Coordinator  
EPA Region 6  
Permits and Technical Assistance Section  
NPDES Permits and TMDLs Branch

ph: 214-665-7109  
Email: [smith.nelly@epa.gov](mailto:smith.nelly@epa.gov)

---

**From:** Sarah Ganley [<mailto:sganley@bhinc.com>]  
**Sent:** Wednesday, December 16, 2015 8:47 AM  
**To:** Smith, Nelly  
**Cc:** Hashem Faidi ([Hashem.Faidi@state.nm.us](mailto:Hashem.Faidi@state.nm.us)); Steven Morgenstern ([Steven.Morgenstern@state.nm.us](mailto:Steven.Morgenstern@state.nm.us)); Tim Trujillo, PE ([TimothyR.Trujillo@state.nm.us](mailto:TimothyR.Trujillo@state.nm.us)); Barber, Ted L., NMDOT ([Ted.Barber@state.nm.us](mailto:Ted.Barber@state.nm.us))  
**Subject:** RE: 80th & 90th percentile storm values for Albuquerque

Thanks Nelly –

Based on this – the 90<sup>th</sup> percentile storm value for the Middle Rio Grande is 0.615”.

The ““*Estimating Predevelopment Hydrology in the Middle Rio Grande Watershed, New Mexico, EPA Publication Number 832-R-14-007*” does not have an 80<sup>th</sup> percentile storm value listed – which is a requirement for the post-construction standards. It only has an 85<sup>th</sup>, 90<sup>th</sup> and 95<sup>th</sup>. Is there a specific value you are using for the 80<sup>th</sup> percentile storm in Albuquerque?

Thanks,

Sarah

---

**From:** Smith, Nelly [<mailto:Smith.Nelly@epa.gov>]  
**Sent:** Wednesday, December 16, 2015 7:36 AM  
**To:** Sarah Ganley <[sganley@bhinc.com](mailto:sganley@bhinc.com)>  
**Cc:** Hashem Faidi ([Hashem.Faidi@state.nm.us](mailto:Hashem.Faidi@state.nm.us)) <[Hashem.Faidi@state.nm.us](mailto:Hashem.Faidi@state.nm.us)>; Steven Morgenstern ([Steven.Morgenstern@state.nm.us](mailto:Steven.Morgenstern@state.nm.us)) <[Steven.Morgenstern@state.nm.us](mailto:Steven.Morgenstern@state.nm.us)>; Tim Trujillo, PE ([TimothyR.Trujillo@state.nm.us](mailto:TimothyR.Trujillo@state.nm.us)) <[TimothyR.Trujillo@state.nm.us](mailto:TimothyR.Trujillo@state.nm.us)>; Barber, Ted L., NMDOT ([Ted.Barber@state.nm.us](mailto:Ted.Barber@state.nm.us)) <[Ted.Barber@state.nm.us](mailto:Ted.Barber@state.nm.us)>  
**Subject:** RE: 80th & 90th percentile storm values for Albuquerque

For purpose of implementing the requirements of the MRG MS4 permit you should use the information in the ““*Estimating Predevelopment Hydrology in the Middle Rio Grande Watershed, New Mexico, EPA Publication Number 832-R-14-007*”. (p. 28 of Permit).

Both reports used different data set. The 2015 Report states on Pg. 8:

*The previous predevelopment runoff study (Kosco, et. al., 2014) used data from the Albuquerque International Airport for the period 1950-2012. Because rainfall data for the other stations studied in this report did not extend back to 1950, this report used the most recent 30 year period of record (1983-2013) for all stations which resulted in a slightly higher 90<sup>th</sup> percentile event for Albuquerque.*

*- In terms of implementing the post construction standards in the Albuquerque UA, data should be used from the previous predevelopment runoff study (Kosco, et. al., 2014) or estimated through site specific pre-development hydrology and associated storm event discharge volume using the methodology specified in the 2014 USEPA Technical Report.*

Thanks!

Nelly Smith



Municipal Stormwater Coordinator  
EPA Region 6  
Permits and Technical Assistance Section  
NPDES Permits and TMDLs Branch

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---

**From:** Sarah Ganley [<mailto:sganley@bhinc.com>]  
**Sent:** Wednesday, December 16, 2015 8:19 AM  
**To:** Smith, Nelly  
**Cc:** Hashem Faidi ([Hashem.Faidi@state.nm.us](mailto:Hashem.Faidi@state.nm.us)); Steven Morgenstern ([Steven.Morgenstern@state.nm.us](mailto:Steven.Morgenstern@state.nm.us)); Tim Trujillo, PE ([TimothyR.Trujillo@state.nm.us](mailto:TimothyR.Trujillo@state.nm.us)); Barber, Ted L., NMDOT ([Ted.Barber@state.nm.us](mailto:Ted.Barber@state.nm.us))  
**Subject:** 80th & 90th percentile storm values for Albuquerque

Hi Nelly – In reviewing the two Pre-development hydrology papers for NM, I am unclear of the 80<sup>th</sup> & 90<sup>th</sup> percentile storm values for Albuquerque.

“Estimating Predevelopment Hydrology for Urbanized Areas in New Mexico”, Tetra Tech, March 2015 – has 0.48” for 80<sup>th</sup> and 0.65” for 90<sup>th</sup>

“Estimating Predevelopment Hydrology in the Middle Rio Grande Watershed”, NM, Tetra Tech, April 2014 – does not have a 80<sup>th</sup> percentile storm event listed & the 90<sup>th</sup> percentile = 0.615”

The MRG MS4 Permit NMR04A000 specifically references this report: “Estimation of the 90th or 80th percentile storm event discharge volume is included in EPA Technical Report entitled *“Estimating Predevelopment Hydrology in the Middle Rio Grande Watershed, NewMexico, EPA Publication Number 832-R-14-007”*. (p. 28 of Permit).

I appreciate you help in clarifying these values for the Middle Rio Grande area.

Thanks,

**Sarah J. Ganley, PE**  
Engineer  
Water Resources  
Direct line: 505-923-3314

## **Bohannon Huston**

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**From:** Holcomb, Sarah, NMENV <[sarah.holcomb@state.nm.us](mailto:sarah.holcomb@state.nm.us)>

**Sent:** Friday, April 16, 2021 8:30 AM

**To:** Patrick Chavez <[pchavez@amafca.org](mailto:pchavez@amafca.org)>; Kali Bronson <[kbronson@bernco.gov](mailto:kbronson@bernco.gov)>; Sarah Ganley <[sganley@bhinc.com](mailto:sganley@bhinc.com)>

**Cc:** Dean, Levi, NMENV <[Levi.Dean@state.nm.us](mailto:Levi.Dean@state.nm.us)>; Gatterman, David <[dgatterman@sscafca.com](mailto:dgatterman@sscafca.com)>; Burrell, Monica <[Burrell.Monica@epa.gov](mailto:Burrell.Monica@epa.gov)>; [smith.nelly@epa.gov](mailto:smith.nelly@epa.gov)

**Subject:** RE: Stormwater quality volume calculation

Hi all,

Good morning! Yes, I do believe **the intent behind the calculation was to use the rainfall amount rather than the runoff amount**. Forgive me for not having the time to write an in-depth summary today, but obviously Monica and Nelly can provide you further feedback, if needed.

I hope you all have a great weekend - Be well and hopefully our paths will cross again in the future!

*Sarah Holcomb*

PSRS Program Manager

Office: **505-819-9734** ← NOTE NEW PHONE NUMBER

---

**From:** Patrick Chavez <[pchavez@amafca.org](mailto:pchavez@amafca.org)>

**Sent:** Thursday, April 15, 2021 3:04 PM

**To:** Holcomb, Sarah, NMENV <[sarah.holcomb@state.nm.us](mailto:sarah.holcomb@state.nm.us)>; Kali Bronson <[kbronson@bernco.gov](mailto:kbronson@bernco.gov)>; Sarah Ganley <[sganley@bhinc.com](mailto:sganley@bhinc.com)>

**Cc:** Dean, Levi, NMENV <[Levi.Dean@state.nm.us](mailto:Levi.Dean@state.nm.us)>; Gatterman, David <[dgatterman@sscafca.com](mailto:dgatterman@sscafca.com)>

**Subject:** [EXT] RE: Stormwater quality volume calculation

Hi Sarah:

Just a quick note to follow up on the below email discussion.

After communicating with a few TAG folks we thought it would be a good idea to at least try to memorialize in some fashion your "institutional knowledge" on the below issue of rainfall/runoff. I recall you sharing with most of this email group on a previous zoom call that you recalled the intent (protection to the greatest extent practicable) of the watershed based permit writers to be for MS4s to use rainfall and not runoff when calculating the required post construction storm water quality volume. Is that correct in terms of your understanding of the intent of the calculation?

Sorry to put you on the spot before you leave NMED for your awesome new job. It's just that you truly are one of a kind; and your insights relative to the intent of EPA's permit writer(s) are of great value to the watershed's MS4s.

Thanks again and take care,  
Patrick

Patrick Chavez, MSCE, PE, LEED AP+  
Storm Water Quality Engineer  
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Albuquerque, New Mexico 87107

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**Summary of AMAFCA's MS4  
Pollution Prevention/Good Housekeeping Program  
& Control of Floatables Program  
FY 2022 (July 1, 2021 – June 30, 2022)**

NPDES Permit No. NMR04A000

Part I.D.5.c - Pollution Prevention/Good Housekeeping for Municipal/Co-permittee Operations  
and Part I.D.5.f - Control of Floatables Discharges

AMAFCA, from its elected Board to its Executive Engineer to its maintenance crew, prioritizes the maintenance, operations, and aesthetics of its facilities. As a result, pollution prevention, good housekeeping, and control of floatables are inherent to AMAFCA activities and are part of the AMAFCA culture. With AMAFCA being a non-traditional Municipal Separate Storm Sewer System (MS4), its pollution prevention and good housekeeping program differs from other MS4s in the community in that its program extends throughout the watershed rather than focusing primarily on industrial-type facilities. In accordance with AMAFCA's Stormwater Management Program (SWMP), AMAFCA has followed and will continue to follow its program practices outlined in the programs' strategies and procedures to reduce pollutant runoff from AMAFCA operations. AMAFCA's pollution prevention, good housekeeping, and control of floatables practices pertain to all AMAFCA facilities.

For example, as part of this MS4 Program and through regular business operations, AMAFCA conducts regular inspections and maintenance throughout the watershed for infrastructure that includes 22 flood control dams, 55 smaller flood-control ponds, 78 miles of arroyo channels, 130 water quality structures, 11 miles of underground conduit structures, and 12 miles of dikes and diversion structures. Related to infrastructure, AMAFCA has become a regional leader in integrating flood control infrastructure and stormwater quality facilities. AMAFCA stormwater quality and debris removal facilities annually collect an average of 55,000 cubic yards of sediment and 1,500 cubic yards of trash/floatables from stormwater before the runoff enters the Rio Grande. The Watershed Based MS4 Permit has an additional minimum control measure (MCM) from the typical six MCMs in MS4 Permits that focuses on the control of floatables. Control of floatables ties into pollution prevention and good housekeeping measures and is another area where AMAFCA programs have a widespread, positive impact to the watershed.

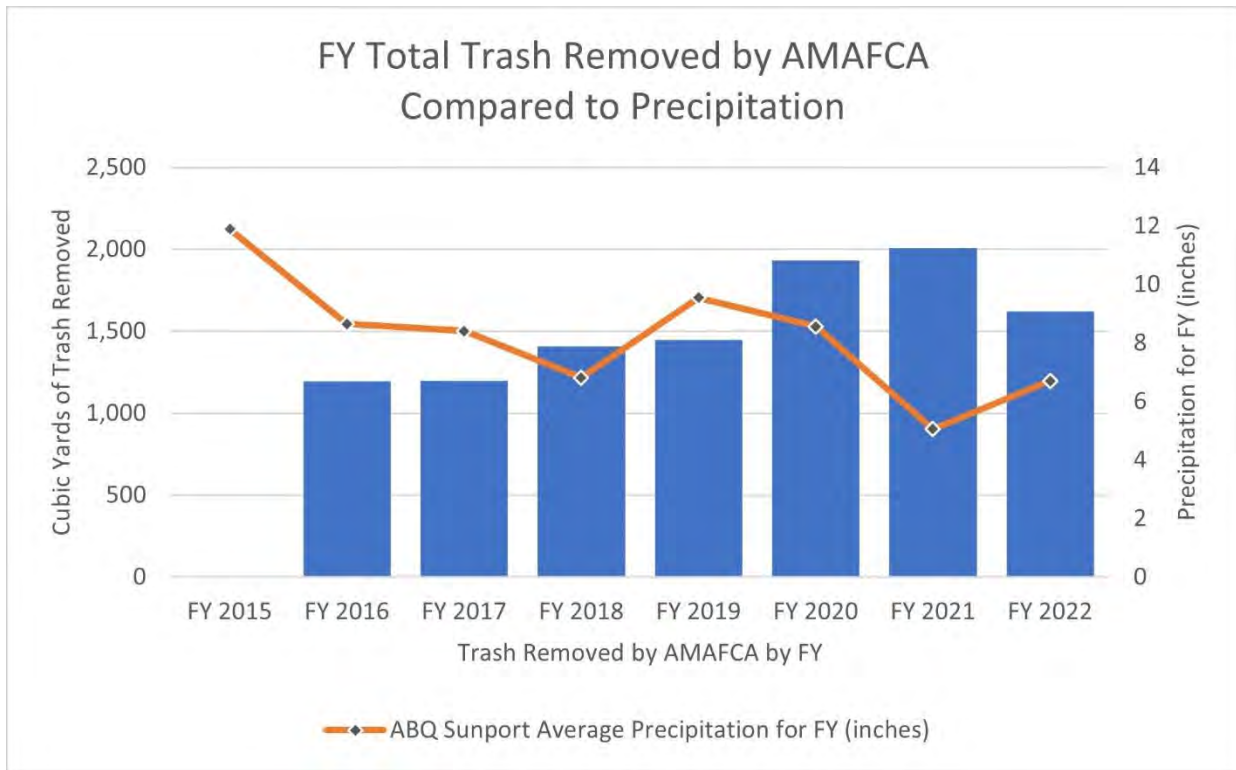
AMAFCA utilizes a detailed crew tracking system to document the AMAFCA crew maintenance and operations activities, many of which support these MS4 Program activities. The tracking includes a list of all AMAFCA facilities, organized by drainage basin. The photos and graphs below highlight the watershed-wide trash, debris, and sediment removed by AMAFCA operations.



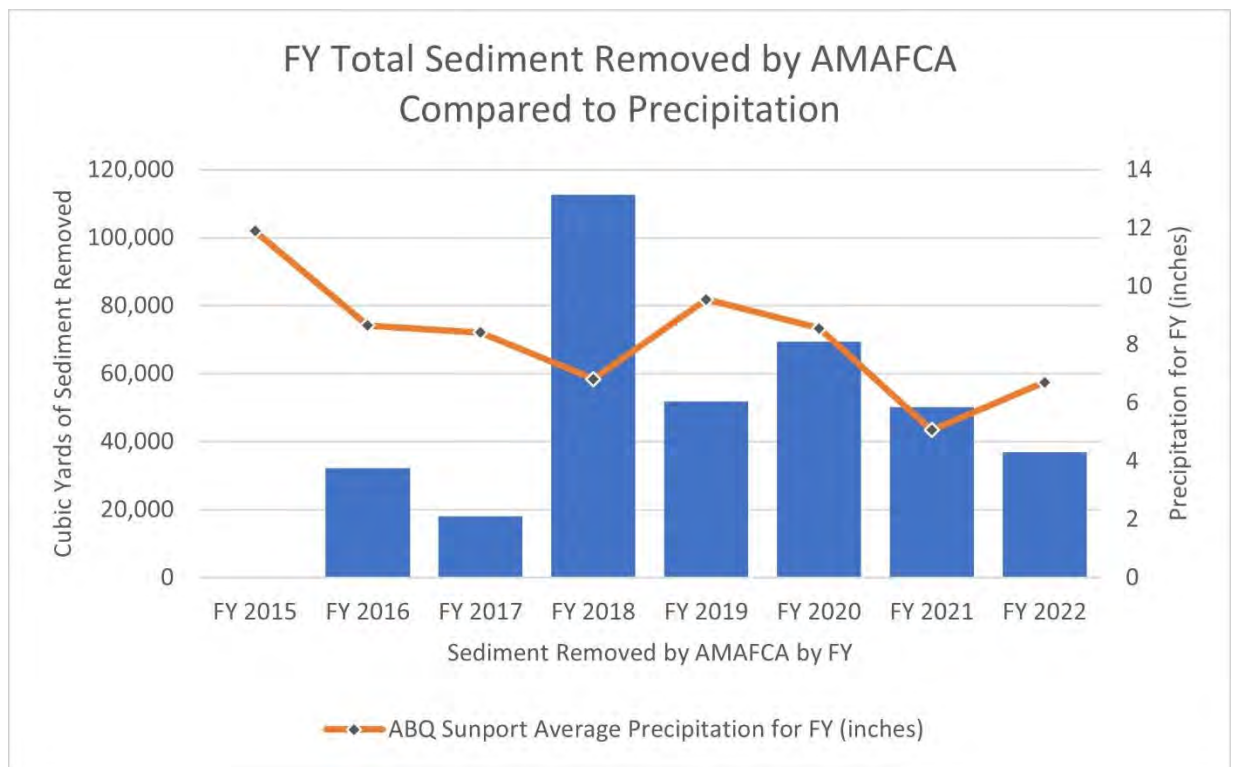


*Capturing Pollutants in AMAFCA Facilities Before They Enter the Rio Grande.*

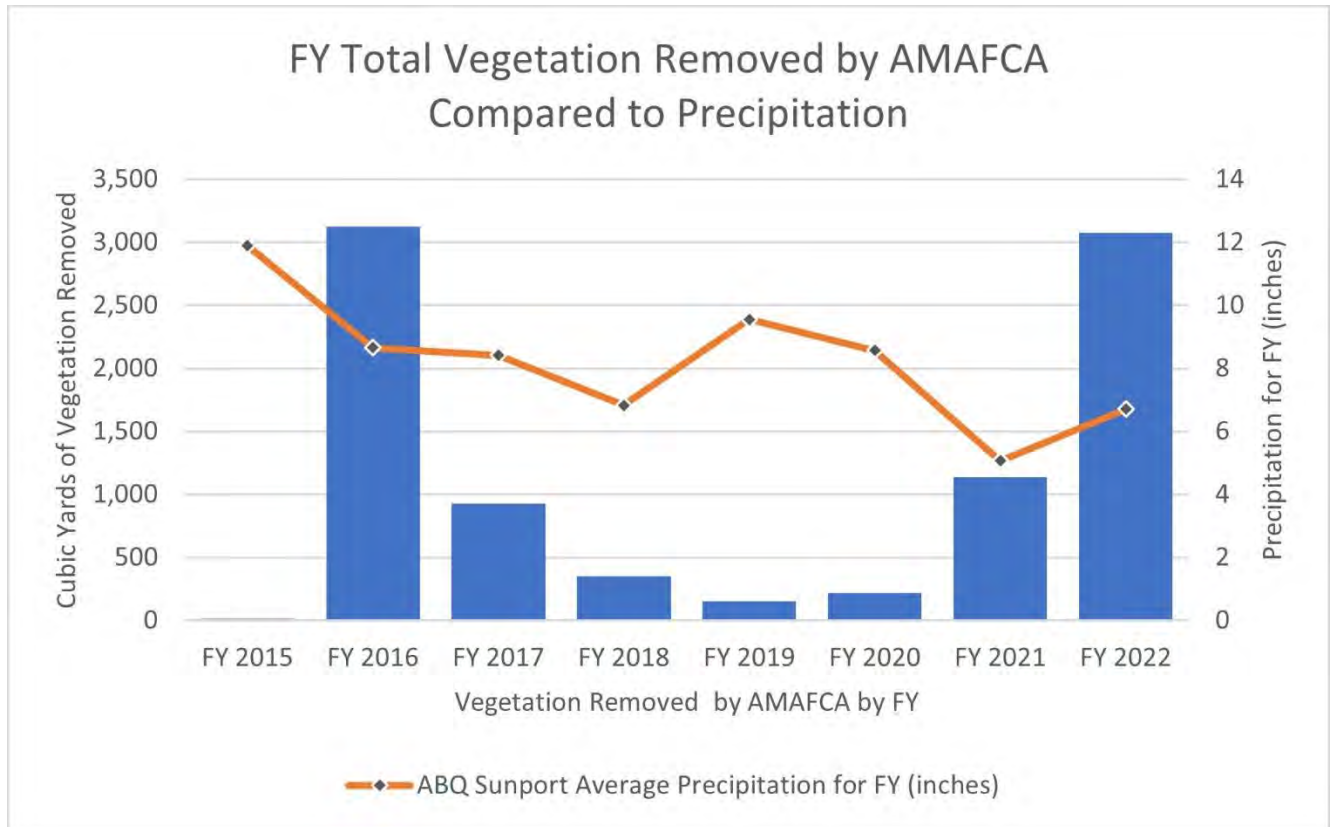




*Graph Highlighting the Watershed Wide Trash Removed by AMAFCA Operations.*



*Graph Highlighting the Sediment Removed by AMAFCA Operations.*

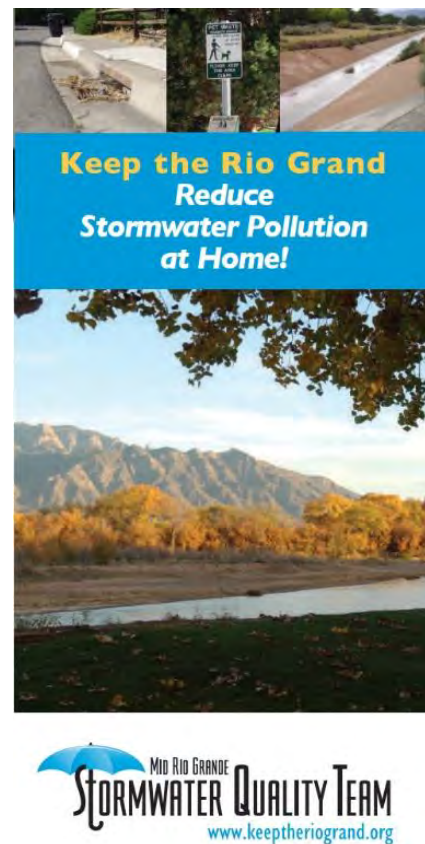


*Graph Highlighting the Vegetation Removed by AMAFCA Operations.*



*AMAFCA Vegetation Removal Activities – Including Use of Local Tumbleweeds to Create the Famous Annual AMAFCA Snowman*

The Pollution Prevention/Good Housekeeping Program & Control of Floatables Program require a litter source control program, including a public awareness campaign and employee training. AMAFCA is a member of the Mid Rio Grande Stormwater Quality Team (MRGSQT – <https://keeptheriogrand.org/>), which has grown to 12 organizations who leverage their resources to ensure MS4 Permit public education and outreach requirements are met with the goal of preventing and reducing stormwater pollution throughout the watershed from reaching the Rio Grande. AMAFCA will continue to collaborate with the MRGSQT and MS4 permittees for the existing litter source control program, including a targeted public awareness campaign as well as coordinated training programs



*MRGSQT Outreach Examples – Kiosk and Brochure*

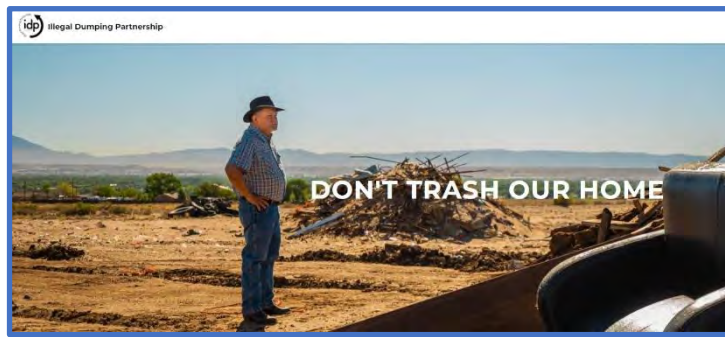


AMAFCA is also a partner in the watershed's Illegal Dumping Partnership (IDP), a multi-agency task force founded to help combat illegal dumping (<https://www.ihavetrash.com/> and <https://www.bernco.gov/planning/let-s-talk-trash-.aspx>). The table below provides a summary of the outreach and activity completed by the IDP Awareness Campaign in FY 2022.

**Summary of FY 2022 Illegal Dumping Awareness Campaign**

<b>Activity</b>	<b>Measurement</b>
I Have Trash.com website views	3,967
YouTube videos – views - Spanish views: - English views:	92,690 186,521
Digital advertising via mobile geofencing in English and Spanish	1,458,800 estimated audience
Advertising videos in select movie theaters	584,000 estimated audience
TV video commercials in English and Spanish	2,255,000 estimated audience
Billboards (14 outdoor poster billboards)	1,658,600 estimated audience
Illegal dump sites cleaned up by the County	333 sites
Community area cleanups – 14 events	307.06 tons of trash collected
Bernalillo County Public Works contributions for community cleanups and outreach	\$10,000
NM Clean & Beautiful grants	\$16,100
Bernalillo County Planning & Development contributions for outreach & media	\$76,400
In-kind donations from Albuquerque Public Schools (printing) and County Waste Management & Southwest Landfill (roll-offs for community cleanups)	\$59,380





## OUR PARTNERS



## CONTACT US

Name  Email

Choose an option

Type your message here...



**ILLEGAL DUMPING  
PARTNERSHIP**

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**SOCIAL MEDIA**



*Screen Shots from IDP Website*



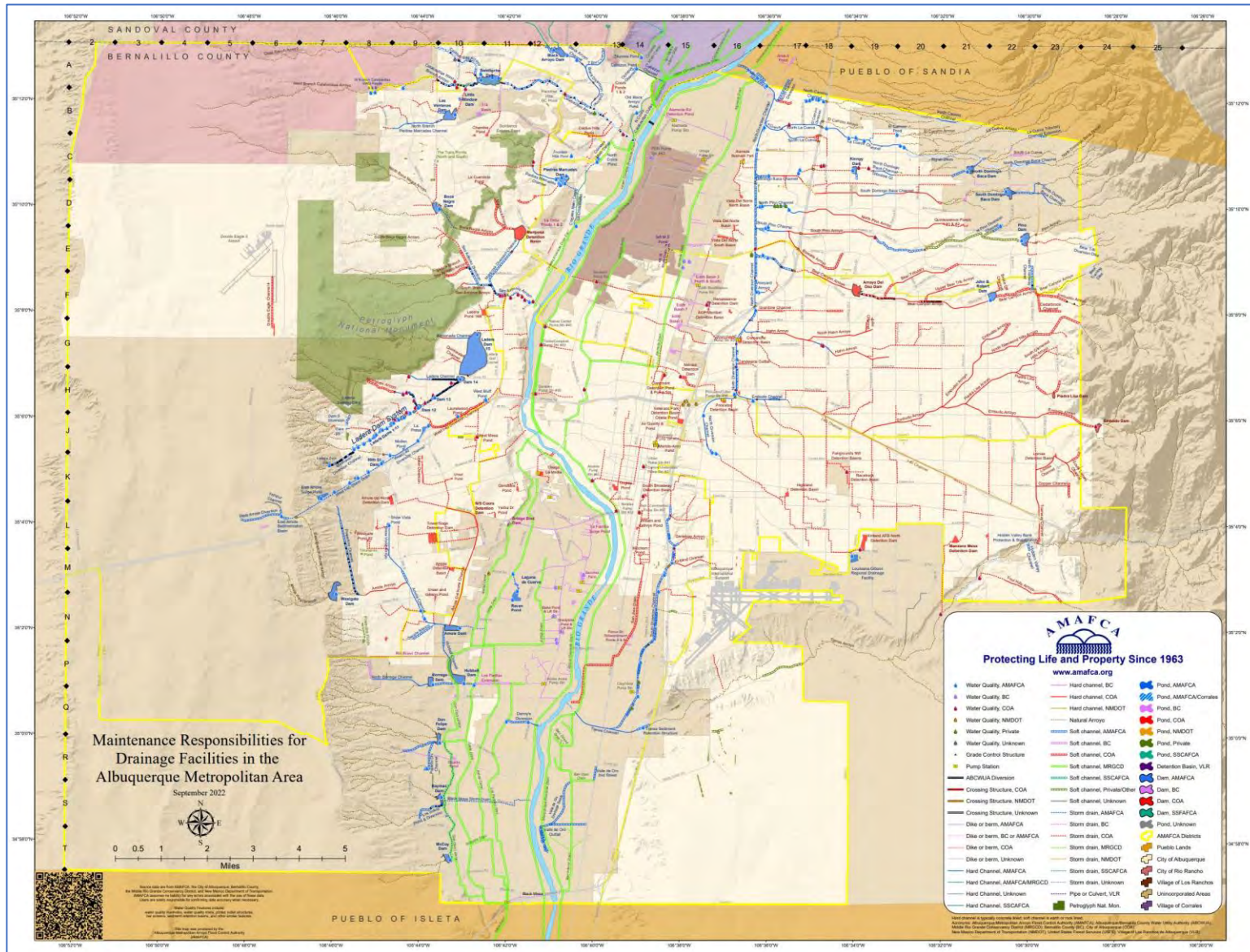
**Summary of AMAFCA's MS4  
Illicit Discharges and Improper Disposal Program  
FY 2022 (July 1, 2021 – June 30, 2022)**

NPDES Permit No. NMR04A000

Part I.D.5.e - Illicit Discharge and Improper Disposal

AMAFCA's successful Illicit Discharge and Improper Disposal Control Program depends on strong collaborative programs and community relationships, as well as AMAFCA's commitment to addressing illicit discharges. AMAFCA has teamed with the City of Albuquerque on its 311 Community Contact Center hotline (includes website and phone app) for reporting illicit discharges. All AMAFCA staff are trained to address illicit discharge reports. AMAFCA has created forms and procedures for this program, as well as provided staff education. In accordance with AMAFCA's SWMP, AMAFCA has and will continue to follow its procedures and practices to detect and eliminate illicit discharges.

This program uses GIS to track illicit discharge reports and identify areas of concern where additional public outreach and education may be needed. AMAFCA is the leader in the watershed for its Maintenance Responsibilities for Drainage Facilities in the Albuquerque Metropolitan Area. The map below represents facilities throughout the Albuquerque Metropolitan Area for multiple agencies and is essential for ensuring that proper organizations are contacted and involved in any illicit discharge reports, assessment, removal, and/or enforcement.



AMAFCA's Maintenance Responsibilities for Drainage Facilities in the Albuquerque Metropolitan Area Map  
[https://amafca.org/documents/Maintenance\\_Map.pdf](https://amafca.org/documents/Maintenance_Map.pdf)

AMAFCA also continuously looks for opportunities to add dry weather screening to assist with identifying potential illicit discharges to its numerous projects, leveraging opportunities where staff or consultants are already out in the field. AMAFCA has the added benefit of professional on-staff maintenance crew members who are working throughout their jurisdiction and are equipped and educated to detect illicit discharges.

As an example, AMAFCA's Levellogger flow monitoring in arroyos contributing stormwater runoff to the North Diversion Channel also includes an illicit discharge monthly screening component. The graphics below highlight the Levellogger locations and program visual screening tracking, locations, and photos.




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

AMAFCA/City of Albuquerque Facility - Levellogger 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

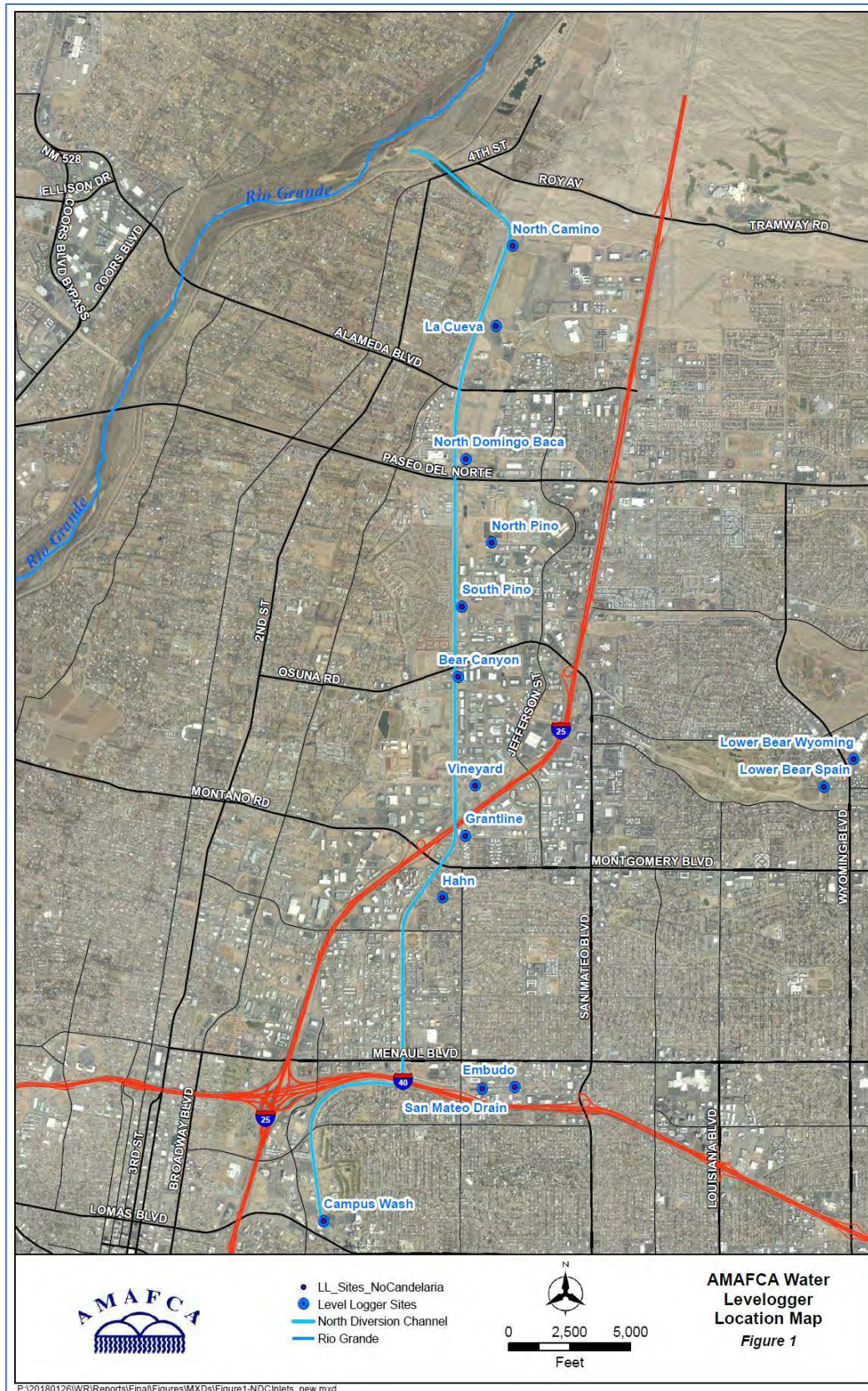
Months associated with site visits to collect the Levellogger data summarized in this report. Site visits retrieve data for the prior month – for example, the April 2022 site visit retrieved the March 2022 Levellogger data.

*Levellogger Program Visual Screening Tracking Table for FY 2022*

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	

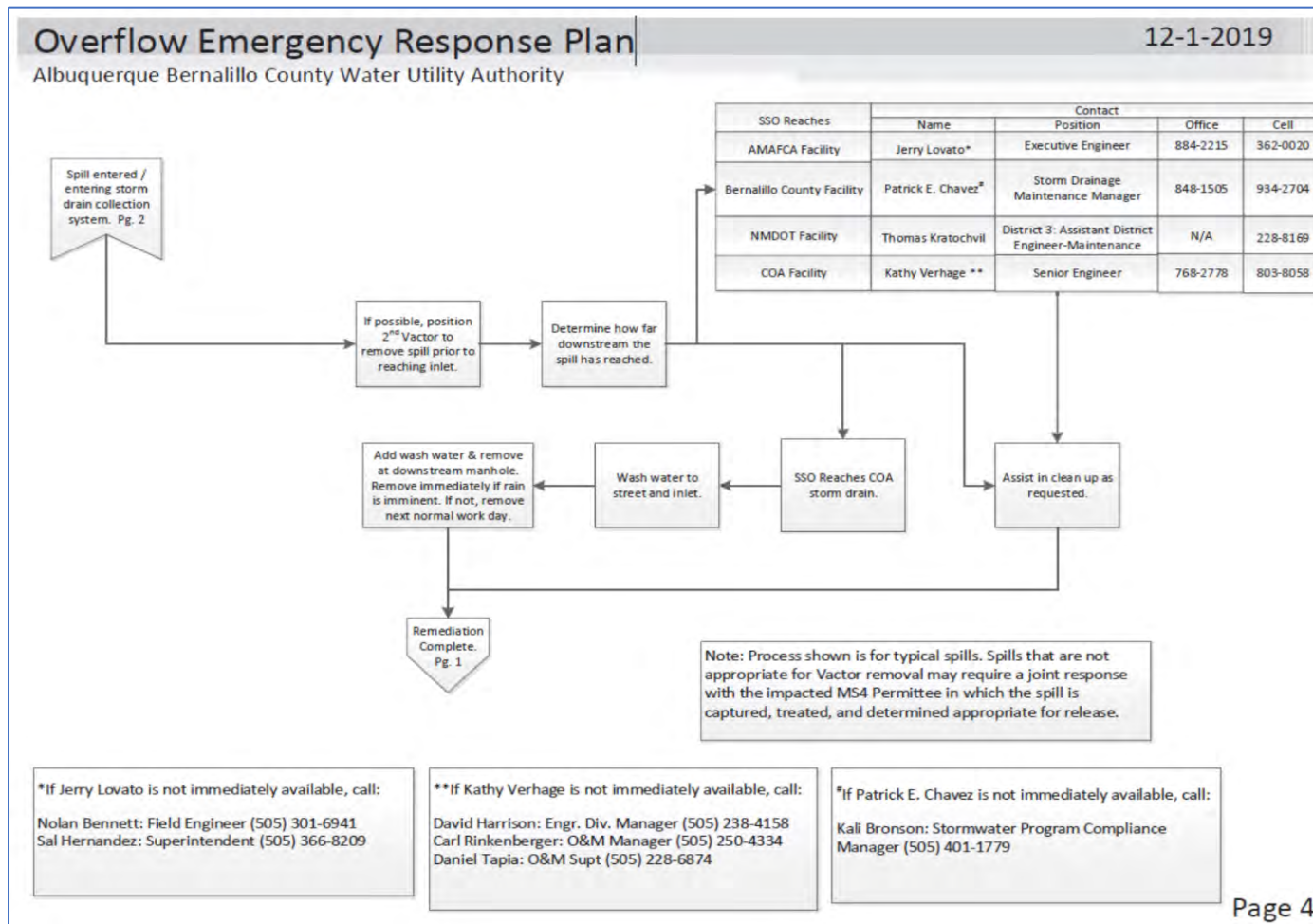
*Levellogger Program Visual Screening Photo Documentation – Example from La Cueva Arroyo*





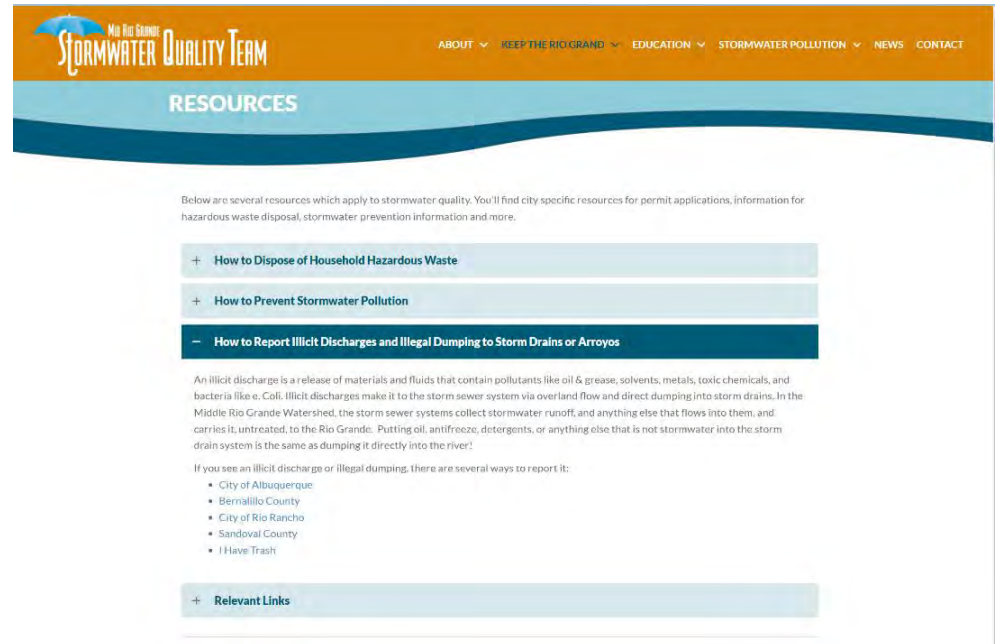
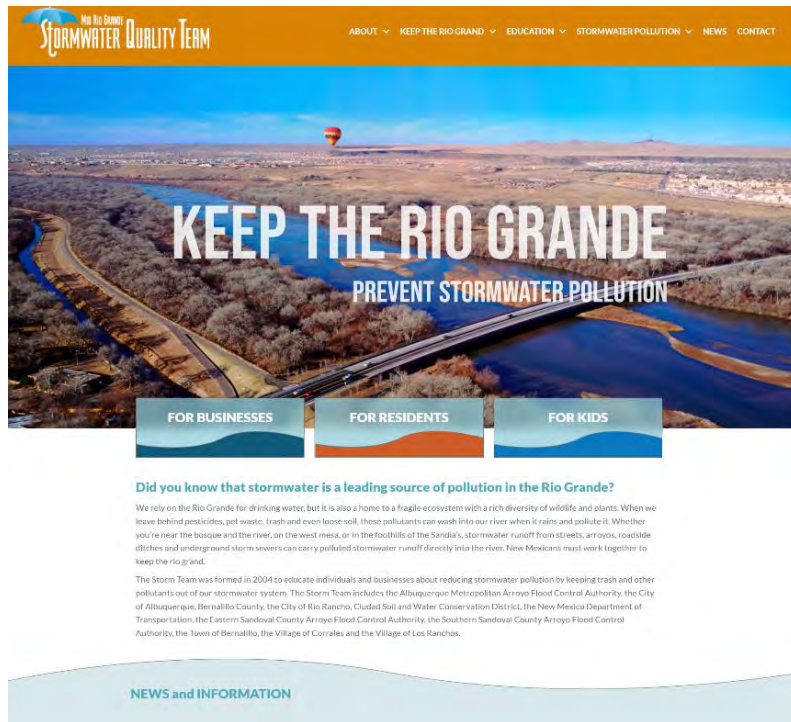
Levellogger Program – Locations of Levelloggers in NDC

Related to collaborative programs and community relationships, AMAFCA coordinates closely with the Albuquerque Bernalillo County Water Utility Authority (ABCWUA) as well as other area agencies, as shown in the ABCWUA's Collection System Overflow Emergency Response Plan (one page included below – full plan available on-line: <https://www.abcwua.org/sewer-system-overview/>). This plan helps ensure that the community responds to and cleans up spills that enter the storm drain collection system.





In addition, AMAFCA is a member in the cooperative Municipal Separate Storm Sewer System (MS4) Technical Advisory Group (MS4 TAG) which facilitates cooperation and coordination with other MS4s in the Middle Rio Grande related to the illicit discharge and improper disposal control program. AMAFCA is also a member of the Mid Rio Grande Stormwater Quality Team (MRGSQT – <https://keeptheriogrand.org/>), which has grown to 12 organizations who leverage their resources to ensure MS4 Permit public education and outreach requirements are met with the goal of preventing and reducing stormwater pollution throughout the watershed from reaching the Rio Grande. The MRGSQT provides educational information regarding stormwater quality to the community, including information that facilitates public reporting of illicit connections or discharges and educational programs that inform the public of hazards associated with illicit discharges and improper waste disposal, as well as proper ways to dispose of hazardous wastes.



*Web View of Links Related to Illicit Discharge and Improper Disposal  
on the MRGSQT's Keep The Rio Grande! Website*





**Summary of AMAFCA's MS4  
Public Education, Outreach, Involvement, and Participation Program  
FY 2022 (July 1, 2021 - June 30, 2022)**

NPDES Permit No. NMR04A000  
Part I.D.5.g - Public Education and Outreach on Stormwater Impacts and  
Part I.D.5.h - Public Involvement and Participation

# Outcome Report for Fiscal Year 2021–2022 (July 1, 2021 to June 30, 2022)



Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA) • City of Albuquerque • Bernalillo County • Town of Bernalillo • Village of Corrales • Ciudad Soil and Water Conservation District • Eastern Sandoval County Arroyo Flood Control Authority (ESCAFCA) • Village of Los Ranchos de Albuquerque • Department of Transportation (NMDOT) • City of Rio Rancho • Sandoval County • Southern Sandoval County Arroyo Flood Control Authority (SSCAFCA)

PRESENTED BY

# SUNNY505

# Introduction

The outcomes report is designed to illustrate the collective successes of the Middle Rio Grande Stormwater Quality team. In fiscal year 2022, the Storm Team reached over 100,000 individuals in the Albuquerque Metro area through special events, educational efforts, as well as digital promotions via various social media and the website.

The Storm Team is a collaborative organization made of of the following: The Albuquerque Metropolitan Arroyo Flood Control Authority, the City of Albuquerque, Bernalillo County, the City of Rio Rancho, Ciudad Soil and Water Conservation District, the New Mexico Department of Transportation, the Southern Sandoval County Arroyo Flood Control Authority, the Town of Bernalillo, the Village of Corrales and the Village of Los Ranchos.



Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA) • City of Albuquerque • Bernalillo County • Town of Bernalillo • Village of Corrales • Ciudad Soil and Water Conservation District • Eastern Sandoval County Arroyo Flood Control Authority (ESCAFCA) • Village of Los Ranchos de Albuquerque • Department of Transportation (NMDOT) • City of Rio Rancho • Sandoval County • Southern Sandoval County Arroyo Flood Control Authority (SSCAFCA)



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# Bernalillo County

## Public Outreach and Education Tracking

FY2022: July 1, 2021 – June 30, 2022

Date	Location	Event Topic	Description of Education/Outreach Event Program/Materials	Participants	Source for Participant Count
8/11/2021	Bosque	Illegal dumping cleanup	BernCo and Amazon Illegal Dumping Partnership Clean Up in the Bosque. Illegal Dumping Partnership 1,250 tons of junk and rubbish cleaned up on annual basis.	80	BernCo News Release
9/9/2021	505Outside monthly landscaping newsletter	Learn How to Harvest Rainwater in Your Yard article	Provided article promoting video training series on how to design, construct, and maintain residential rainwater harvesting features. See <a href="https://www.505outside.com/2021/09/01/learn-how-to-harvest-rainwater-in-your-yard/">https://www.505outside.com/2021/09/01/learn-how-to-harvest-rainwater-in-your-yard/</a>	1098 visits to article	cbustos@abcwua.org jillbrown@brown greenandmore.com
9/26/2021	Los Vecinos Community Center (478 NM-333, Tijeras, NM 87059)	East Mountain Celebration	Natural Resources Services table in Bernalillo County tent. Provided information to educate County residents on stormwater quality, water conservation methods and incentive programs, and groundwater monitoring program.  In addition, the County worked working in collaboration with Knowaste Services to provide a litter free event. East Mt. Celebration resulted in Compost 168.0 lbs., Recycle 29.0 lbs., Landfill 155.5 lbs., Cardboard 33.5 lb., Glass 4.5 lbs., Film 1.0 lbs., total weight managed 391.5 lbs., total weight diverted 236.0 lbs. with a diversion rate of 60.3%	2500	Bernco Office of Community Engagement and Outreach email - Cathy Lopez
9/27/2021 and 10/1/2021	Virtual and Gutierrez Hubbell House (6029 Isleta Blvd SW, Albuquerque, NM 87105)	Waterwise Landscaping training for ABC Tree Stewards Program	This workshop for the ABC Tree Stewards Program addressed principles of Waterwise Landscapes including native and arid-adapted plants, mulch, efficient irrigation, and rainwater harvesting. Day Two of the training was a tour of the Rainwater Harvesting Learning Landscape at the Gutierrez-Hubbell House.	11	2021 Tree Stewards cohort

2/11/2022	All Nations Wellness & Healing Center (6416 Zuni Rd SE, Albuquerque, NM 87108)	EJ in Action: Water-Wise Workshop	This class addressed waterwise landscaping principles including efficient irrigation, native and arid-adapted plants, and rainwater harvesting.	16	Head count at event
3/2/2022–3/4/2022	Virtual and in-person conference at Indian Pueblo Cultural Center (2401 12th St NW, Albuquerque, NM 87104)	New Mexico Land and Water Summit conference	Conference theme was “From Concept to Completion: Lessons Learned” and addressed GSI/LID projects through all stages of development including planning and design, implementation, public acceptance, and maintenance. Conference also included full-day tour of GSI/LID projects in Santa Fe. Attendees included engineers, architects, landscape architects, planners, and water resources professionals. Served on Planning Committee, provided \$5,000 sponsorship, and presented “Bernalillo County GSI/LID Standards”.	272	Land and Water Summit Whova virtual conference platform report
3/19/2022	Loma Linda Community Center (1700 Yale Ave SE, Albuquerque, NM 87106)	Work day at Loma Linda Community Center Community Garden	Provided demonstration on how to convert an IBC Tote to a rain barrel	22	Head count at event
4/7/2022	Our Land: New Mexico’s Environmental News/ NM In Focus	LIVE NOW: Plastic Bags & Stormwater Risks	Interview on how the repeal of Albuquerque’s plastic bag ban could affect water quality in Rio Grande. <a href="https://www.newmexicopbs.org/productions/newmexicoinfofocus/assessing-the-impact-of-tax-rebate-checks-recreational-cannabis-legalization-spring-runoff-forecast/">https://www.newmexicopbs.org/productions/newmexicoinfofocus/assessing-the-impact-of-tax-rebate-checks-recreational-cannabis-legalization-spring-runoff-forecast/</a>	65,000-70,000 viewers in Central & Northern NM	KNME Communications Director Michael Privet
4/19/2022	Gutierrez Hubbell House (6029 Isleta Blvd SW, Albuquerque, NM 87105)	Waterwise Landscaping training for ABC Tree Stewards Program	This workshop for the ABC Tree Stewards Program addressed principles of Waterwise Landscapes including native and arid-adapted plants, mulch, efficient irrigation, and rainwater harvesting, and included a tour of the Rainwater Harvesting Learning Landscape at the Gutierrez-Hubbell House.	18	2022 Tree Stewards cohort
4/24/2022	Westside Community Center (1250 Isleta Blvd SW, Albuquerque, NM 87105)	South Valley Pride Day	Natural Resources Services table in Bernalillo County tent. Provided information to educate County residents on stormwater quality, water conservation methods and incentive programs, and groundwater monitoring program.	4000	Bernco Office of Community Engagement and Outreach email - Cathy Lopez
4/29/2022	ABQ BioPark (2601 Central Ave NW, Albuquerque, NM 87104)	Maintenance of Green Stormwater Infrastructure features	This class provided an introduction to GSI, descriptions of GSI features (permeable pavement, stormwater harvesting basins, infiltration conveyances, plants, and mulch), and maintenance requirements for GSI features.	20	Registration list from ABCWUA Water Conservation Program
5/14/2022	Le Jardin Verde (540 Utah St NE, Albuquerque, NM, 87108)	Spanish Waterwise Workshop	This Spanish-language workshop addressed waterwise landscaping principles including native and arid-adapted plants and rainwater harvesting.	18	Head count at event
5/19–20 2022	Virtual Conference	Next Generation Water Summit	Conference theme was “Growth in a Time of Drought.” Attendees included the building and development community, water reuse professionals, water policymakers, and the general public. Provided sponsorship of \$1,500. Sponsorship included free registration for Bernalillo County staff and customers of the Bernalillo County Water Conservation Program (i.e. private well owners and customers of small water systems in Bernalillo County).	364	Next Generation Water Summit Planning Committee email (Doug Pushard at doug@kuelwater.org)

6/9/2022	Virtual workshop	Rainwater or Graywater: Which is Right for You? Workshop	This workshop provided an overview of residential rainwater harvesting and graywater systems that can supply water for use indoors and outdoors.	53	Bernco Cervis Event Registration System report
6/11/2022	Virtual workshop	Rainwater or Graywater: Which is Right for You? Workshop	This workshop provided an overview of residential rainwater harvesting and graywater systems that can supply water for use indoors and outdoors.	26	Bernco Cervis Event Registration System report
6/23/2022	Gutierrez Hubbell House (6029 Isleta Blvd SW, Albuquerque, NM 87105)	Residential Rainwater Harvesting: Q&A with Local Experts Workshop	In this workshop, local rainwater harvesting experts discussed passive water harvesting best practices and took questions from the audience.	73	Bernco Cervis Event Registration System report
6/25/2022	Gutierrez Hubbell House (6029 Isleta Blvd SW, Albuquerque, NM 87105)	Selecting Plants for Rainwater Harvesting Basins Workshop	This workshop addressed how to select plants for rainwater harvesting basins in the Middle Rio Grande.	22	Headcount at event. 35 registered per Bernco Cervis Event Registration System report.
8/24/21, 9/28/21, 3/16/22, 5/6/22	Water Conservation Program News Bulletin	Water Conservation Program News Bulletin	Water conservation articles, news, and events for Bernalillo County residents	1300	GovDelivery subscriptions
7/20/21, 10/26/21	Stormwater Quality and Watershed Protection News Bulletin	Stormwater Quality and Watershed Protection News Bulletin	Stormwater quality and watershed health-related articles, news, and events for Bernalillo County residents	800	GovDelivery subscriptions
9 events (7/10/21-6/25/22)	Multiple	HHW collection events	HHW weekend collection events	333	HHW Annual Report
FY2022	Homes and businesses in unincorporated Bernalillo County	Water efficiency consultations	Conducted water efficiency consultations at homes and businesses to educate Bernalillo County residents on water conservation best practices. Consultations address water-efficient plumbing fixtures and appliances, landscaping, irrigation systems and scheduling, rainwater harvesting, graywater, and leaks.	94	WaterWays database





FY2022	Homes and businesses in Bernalillo County	Rain barrels	Provided rain barrels to Bernalillo County residents encourage rainwater harvesting through Bernalillo County Rainwater Harvesting incentive program	147	WaterWays database
FY2022	BernCo Website	Website Views	Public interaction with the “How Can Public Works Help You?” Webpages	4656	BernCo analytics
FY2022	Multiple	BEMP	BEMP direct student interactions	8549	BEMP Education Report
FY2022	Multiple	BEMP	BEMP Social Media interactions	88973	BEMP Education Report
FY2022	Multiple		River Xchange	866	River Xchange mid year report
FY2022	Multiple	Trail restoration and planting/ invasive special removal	Youth Corps, including Talking Talons, Rocky Mountain, Ancestral Lands Conservation Corps, and Valle de Oro National Wildlife Refuge. 43 volunteers worked 3428 hours.	43	BernCo tracking Youth Corps Engagement
FY2022			WW Permits Processed	1183	
FY2022		Septic permitting and outreach	Bernalillo County contacted system owners through the “unpermitted and aging wastewater system campaigns” in FY 2022 and an estimated 293 properties were resolved.	293	
FY2022	BernCo Open Space		Master Naturalist – 750 hours	17	
FY2022		IDDE	Employee Training	21	Training spreadsheet
FY2022		Stormwater Quality	Employee Training	14	Training spreadsheet
FY2022		Illegal Dumping Awareness Campaign	Online resources, digital advertising and billboard public outreach for the illegal dumping awareness campaign. Number includes repeats.	6,239,578	

# ONE ALBUQUE RQUE

city of albuquerque





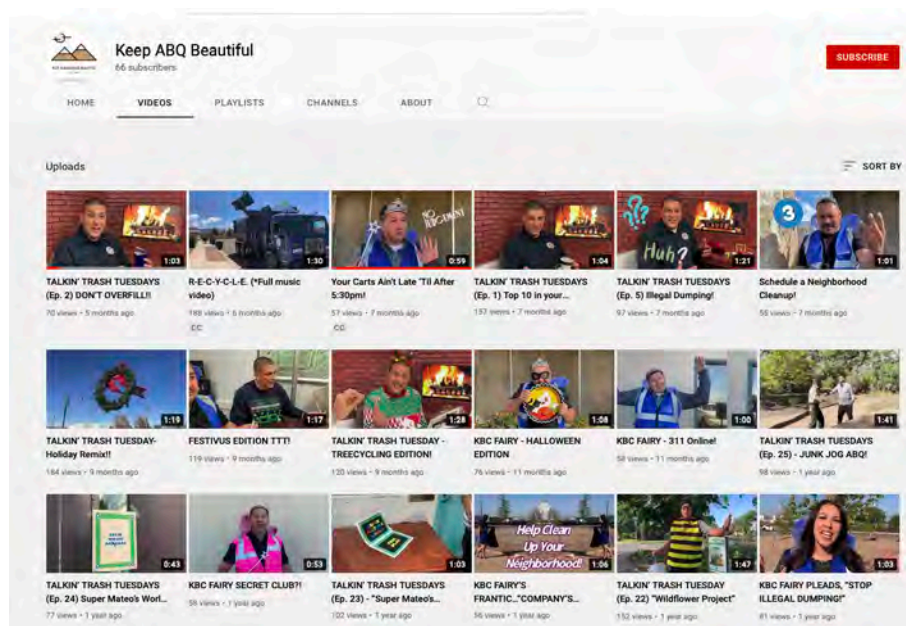
# City of Albuquerque

## Public Participation Numbers

In 2021 the City of Albuquerque's Solid Waste's Keep ABQ Beautiful Program garnered 867 views of their YouTube channel, encouraging the public to pick up and recycle trash.

<https://www.youtube.com/channel/UCEjJlI8yYk-IEv3Lpi6Bw3w/videos>

WATCH OUR YOUTUBE CHANNEL



Additionally, the City of Albuquerque hosted clean up events from July 1, 2021 through June 30, 2022, with the following successes:

### Company's Comin' Cleanup

- 9/25/21 – 9am to 12pm
- 699 Volunteers/Participants
- 3 hours
- 7.54 tons/15,080 lbs of trash collected

### Junk Jog on the Bosque – Plogging

- 10/23/21 – 9a to 12p
- 20 Volunteers
- 98 Participants
- 3 hours
- .97 tons/1,940 lbs of trash collected

### Household Hazardous Waste Collection Event

- 11/13/21 – 10am to 3pm
- 585 Participants
- 5 hours
- 24.19 tons/48,373 lbs of HHW collected

### One ABQ Cleanup Month

- 4/9/22, 4/16/22, 4/23/22 & 4/30/22 – 9am to 12pm
- 895 Volunteers/Participants
- 3 hours each day x 4
- 38.32 tons/76,640 lbs of trash collected



# Planting Numbers for 2021–2022

## River Exchange

## Other

Date	School	Adults	Kids	Cotton	Willows	Date	Group	Adults	Youth	Cotton	Willows
2.11.22	Valle Vista	4	34	27		2.10.22	Holy Ghost	2	27	50	
2.16.22	7 Bar	4	50	35		2.19.22	Peace Corps	31	11	65	25
2.17.22	7 Bar	3	22	37		2.23.22	Holy Ghost	2	36	53	
2.18.22	Manzano Mesa	2	40	27		2.26.22	Multi Agency Community Day	42	8	50	100
2.25.22	Manzano Mesa	2	18	18		3.4.22	Cottonwood Classical	4	15	48	
3.2.22	La Mesa	5	36	36		3.19.22	Peace Corps	39	7	75	25
3.9.22	La Mesa	5	46	40	10	<b>TOTALS</b>		<b>120</b>	<b>104</b>	<b>341</b>	<b>150</b>
3.10.22	Monte Vista	9	48	11	57						
3.11.22	John Baker	6	18	11	15						
3.16.22	John Baker	7	43	14	47						
3.30.22	Cochiti	6	27	20	40						
4.1.22	Valle Vista	3	35	21	29						
<b>TOTALS</b>		<b>56</b>	<b>417</b>	<b>297</b>	<b>198</b>						



# Total Waste Diverted

FY22 Total HHW (lbs) Diverted from Landfill

		FY22 Total HHW (lbs) Diverted from Landfill																
Calendar Year	Month	Recycled Waste																
		Reuse Center	RC0014 Waste Oil	RC5056 Motor Fluids	RC0016 Lead Acid Batteries	RC6006 Mercury	ACT15687 Household Paint, xylene, toluene etc	RC0011 Aerosols	RC7485 Alkaline Batteries	RC7486 Lithium Batteries	RC6254 NiCad Batteries	ACT46232 Compact Bulbs, CFL	ACT46233 HID Lamps	ACT46235 4 Foot Lamps	RC7658 8 Foot Lamps	ACT50491 Non PCB Ballast	ACT58121 Fire Extinguisher	ACT58246 Fertilizer
2021	Jul	1,902		28,874	1,034			3,265	1,382	371	603	385		87	34	347		
	Aug	1,806		19,817	133	5		2,930	956	84	256	310		88	81			
	Sep	2,334		22,986	1,145			921	796	190	227	317		18		137		
	Oct	2,730		13,854		766		6,418	883			114		40	32	300		
	Nov	2,850		22,039	1,241			1,319	444		1,576	222		62	51			
	Dec	3,066		12,811				1,000	479			378						
MID YEAR		14,688	0	120,381	3,553	771	0	15,853	4,940	645	2,662	1,726	0	295	198	784	0	0
2022	Jan	2,130		9,286				884	923			582		62	59			
	Feb	1,668		7,716										61	32		247	
	Mar	1,530		9,176				1,472	443			242		14				
	Apr	1,806		10,544	1,234			1,575	1,247			214		38	20			
	May	1,662		19,007				1,716	863			432		80	61			
	Jun	2,532		17,152	1,131			2,330	1,242	209		229		102	2,029			
TOTAL (lbs)		26,016	0	193,262	5,918	771	0	23,830	9,658	854	2,662	3,425	0	652	2,399	784	247	0

\* Misc = Compact Bulbs, 4 ft lamps, Ballast, PCB Capacitors, Carbides, Phosphides, Fertilizers, CO2 Cylinders, etc...

TOTAL	345,872
TOTAL Recycled Waste	225,967
% Recycled	65.3%

PO Amount:	\$1,000,500.00
Paid Amount:	\$954,466.81
Amount left on PO:	\$46,033.19

PO# DSW0016901  
PO# DSW0022306

\* Information on this report is gathered from the Reuse forms sent by mail from ACT and the breakdown of items processed list sent by email monthly by Nicole Gwash

Sent for Destruction								
RC0012 Acids	RC0013 Bases	RC0015 Flamables Incinerated	RC6002 Toxic-Solid (Poisons)	RC7129 Compressed Gas	RC7182 Oxidizers	ACT145226 Pesticides Liquid Toxic	Misc*	TOTAL
1,684	1,354	2,689	2,886	749	299			47,945
895	1,290	861	1,510	169			917	32,108
1,006	981		930	135	78		1,601	33,802
610	518			458			1,330	28,053
805	540	120	1,248			2,352		34,869
588	3,483		682			1,594		24,081
5,588	8,166	3,670	7,256		377		3,848	200,858
472	569		580	100	177	1,823		17,647
848	5,003		175			442		16,192
1,987	4,366		858		837	1,008		21,933
802	822		767			971		20,040
1,383	2,632		1,155			2,357		31,348
2,599	5,264		1,396			1,639		37,854
13,679	26,822	3,670	12,187		1,391		3,848	345,872

	Total Pounds Recycled	Tons Recycled	Total Destroyed	Amount Paid
July	38,284	19.14	4.83	\$105,924.00
August	26,466	13.23	2.82	\$91,903.31
September	29,071	14.54	2.37	\$86,831.00
October	25,137	12.57	1.46	\$85,161.75
November	29,804	14.90	2.53	\$72,841.00
December	17,734	8.87	3.17	\$59,653.00
January	13,926	6.96	1.86	\$66,513.25
February	9,724	4.86	3.23	\$47,311.00
March	12,877	6.44	4.53	\$64,536.25
April	16,678	8.34	1.68	\$83,559.75
May	23,821	11.91	3.76	\$86,074.75
June	26,956	13.48	5.45	\$104,157.75
	270,478	135.24	30.80	\$954,466.81

# City of Albuquerque and Bernalillo County: Public Participation Numbers

Household Hazardous Waste Collection Participation											
July 2019- June 2020											
Month	Participants w/Unknown Location or Not Enough Info to Geocode	Total	Orphaned waste at facility	City Participants (City + No Match or Not Enough Info)	County Participants	Out of County	Out of County Breakdown	County Percentage	Monthly Cost	Light Bulbs (included in monthly cost)	Total Cumulative Cost
Jul-19		1550		1329	206	15	Sandoval- 13, SF-1, Valencia-1	13.3%	\$102,037.50	\$1,287.50	\$102,037.50
Aug-19		1500		1273	216	11	Sandoval- 7, SF-2, Valencia-2	14.4%	\$97,977.00	\$477.00	\$97,977.00
Sep-19	44	1227		1042	175	10	Sandoval - 8, SF-1, Taos-1	14.3%	\$80,771.25	\$1,016.25	\$80,771.25
Oct-19	50	1190		962	222	6	Sandoval - 4, Valencia - 2	18.7%	\$78,985.00	\$1,635.00	\$78,985.00
Nov-19	44	939		758	168	13	Sandoval- 9, Socorro-1, Valencia-3	17.9%	\$62,614.25	\$1,579.25	\$62,614.25
Dec-19	32	715		602	110	3	Sandoval - 2, SF-1	15.4%	\$47,934.50	\$1,459.50	\$47,934.50
Jul-Dec 2019	170	7121	0	5,966	1,097	58		15.4%	\$ 470,319.50	\$7,454.50	\$470,319.50
Jan-20	53	990		831	154	5	Sandoval County-4, Valencia County-1	15.6%	\$66,612.00	\$2,262	\$66,612.00
Feb-20	65	834		713	111	10	Sandoval County-8, Valencia County-2	13.3%	\$56,121.00	\$1,911	\$56,121.00
Mar-20	51	928		754	165	9	Sandoval County-8, Torrance County-1	17.8%	\$61,742.75	\$1,423	\$61,742.75
Apr-20	67	1031		864	152	15	Sandoval County-10, SF-2, Valencia-3	14.7%	\$67,646.25	\$631	\$67,646.25
May-20	47	1535		1270	233	32	Udalla-1, Sandoval-24, Santa Fe-3, Torrance-1, Valencia-3	15.2%	\$101,687.75	\$1,913	\$101,687.75
Jun-20	113	1829		1,523	284	22	Sandoval -14, SF-6, Valencia-2	15.5%	\$120,614.00	\$685	\$120,614.00
Jan-Jun 2020	396	7,147	0	5,955	1,099	93		15.4%	\$474,423.75	\$8,825	\$474,423.75
FY20 Total	566	14,268	0	11,921	2,196	151		15.4%	\$944,743.25	\$16,279	\$944,743.25
Participant Total (other than orphaned)						14,268				\$16,279	

Monthly Average **1189**

Participant Fee \$ 65.00

FY20 Budget \$ 540,000.00  
Remaining Balance \$ (404,743.25)

	Participants	Percentage	Cost
BERNCO Participation to date	2,196	15.4%	\$142,740
Unknown or Not Enough Info to Geocode (costs absorbed by COA)	566	3.97%	\$36,790

Email Daniele Berardelli, Jake Daugherty, Debra Kelley and Steve Falk if we need to adjust POR amount before the end of the fiscal year.

\* All information in this report comes from ACT - Nichole Gwash (NGwash@ACTEnviro.com) by email. She will send an invoice, a list of residents (which must then be sent to Ben Sanborn for geocoding), a list of items processed, and any logs for drums and light bulbs & tubes.

Use the invoice from ACT emailed by Nicole Gwash to fill in the Monthly Costs and Light Bulbs section. Use the geocoded (by Ben Sanborn) resident list to fill in the participant information. Ben will add a sheet with totals, but go back and search for the "abandoned" items to add to the report. add the number of residents that did not have enough information to the COA total but also list them separate so we can track them.

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# City of Albuquerque and Bernalillo County: Public Participation Numbers

Household Hazardous Waste Collection Participation											
July 2020- June 2021											
Month	Participants w/Unknown Location or Not Enough Info to Geocode	Total	Orphaned waste at facility	City Participants (City + No Match or Not Enough Info)	County Participants	Out of County	Out of County Breakdown	County Percentage	Monthly Cost	Light Bulbs (included in monthly cost)	Total Cumulative Cost
Jul-20	78	1624		1329	280	15	Sandoval-10, SF-5	17.2%	\$106,809.00	\$490.00	\$106,809.00
Aug-20	142	1799		1526	246	27	Sandoval-18, SF-8, Valencia-1	13.7%	\$119,039.25	\$789.00	\$119,039.25
Sep-20	119	1419		1190	224	5	Sandoval-5	15.8%	\$94,591.00	\$931.00	\$94,591.00
Oct-20	78	1374		1162	202	10	Sandoval-5, SF-4, Valencia-1	14.7%	\$90,951.25	\$622.00	\$90,951.25
Nov-20	39	892		755	133	4	Sandoval-1, SF-3	14.9%	\$59,205.00	\$463.00	\$59,205.00
Dec-20	42	830		716	113	1	Sandoval-1	13.6%	\$55,716.00	\$665.00	\$55,716.00
Jul-Dec 2020	498	7938	0	6,678	1,198	62		15.1%	\$ 526,311.50	\$3,960.00	\$526,311.50
Jan-21	44	992		842	150	0	0	15.1%	\$66,322.75	\$715	\$66,322.75
Feb-21	60	885		745	140	0	0	15.8%	\$59,791.25	\$859	\$59,791.25
Mar-21	41	1248		1078	169	1	Valencia-1	13.5%	\$83,046.50	\$758	\$83,046.50
Apr-21	60	1396		1187	209	0	0	15.0%	\$91,927.25	\$529	\$91,927.25
May-21	70	1426		1237	188	1	Sandoval-1	13.2%	\$95,211.75	\$998	\$95,211.75
Jun-21	59	1636		1,399	237	0	0	14.5%	\$108,494.75	\$874	\$108,494.75
Jan-Jun 2021	334	7,583	0	6,488	1,093	2		14.4%	\$504,794.25	\$4,733	\$504,794.25
<b>FY20 Total</b>	<b>832</b>	<b>15,521</b>	<b>0</b>	<b>13,166</b>	<b>2,291</b>	<b>64</b>		<b>14.8%</b>	<b>\$1,031,105.75</b>	<b>\$8,693</b>	<b>\$1,031,105.75</b>
Participant Total (other than orphaned)						15,521				\$8,693	

Monthly Average 1293.416667

Participant Fee \$ 65.00

FY21 Budget \$ 540,000.00  
Remaining Balance \$ (491,105.75)

BERNCO Participation to date			
Participants	2,291	Percentage	14.8%
Cost			\$148,915
Unknown or Not Enough Info to Geocode 832 5.36% \$54,080 (costs absorbed by COA)			

Email Daniele Berardelli, Jake Daugherty, Debra Kelley and Steve Falk if we need to adjust POR amount before the end of the fiscal year.

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Use the invoice from ACT emailed by Nicole Gwash to fill in the Monthly Costs and Light Bulbs section. Use the geocoded (by Ben Sanborn) resident list to fill in the participant information. Ben will add a sheet with totals, but go back and search for the "abandoned" items to add to the report. add the number of residents that did not have enough information to the COA total but also list them separate so we can track them.





ACT Environmental Services  
208 Murray Road SE  
Albuquerque, NM 87105  
(505) 445-9400 ext. 410 Office  
E-mail: [mthornton@ACTEnviro.com](mailto:mthornton@ACTEnviro.com)

### HHW Chemical Waste Inventory:

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Project Name: Albuquerque/Bernalillo County Household Hazardous Waste Collection Event  
5000 Balloon Fiesta Parkway  
Albuquerque, NM 87113  
Job Date: November 13, 2021  
Client: City of Albuquerque/Bernalillo County  
Report Date: January 25, 2022  
Author: Melanie Thornton / Martin Aranda  
Site Contact(s): Jake Daugherty

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On November 13, 2021, ACT Environmental Services, and the City of Albuquerque/Bernalillo County, in a joint effort collected, segregated, packaged, labeled, transported, and disposed of 48,373 pounds of Household Hazardous Waste, and 10,380 pounds of Non-Regulated Solid Waste from 585 residents from residents within the Albuquerque/Bernalillo County at an average of 100.43 pounds of waste per customer.

This work was performed per the Scope of Work given to ACT by the City of Albuquerque/Bernalillo County. A copy of each HHW Chemical Waste Manifest/Bill of Ladings was provided to the City Representative at the time of collection.



DOT Hazard Class	Subsidiary Risk	Types of Chemicals	Total Gross Weight	Number of Drums X Size of Drums	Treatment Technology
Non-Haz		Used motor oil & Antifreeze	8,262 lbs.	4 X 275 Portable Totes	Recycle
Non-RCRA/Non-DOT Regulated Material Solid		Solid waste, empty containers, trash	10,380 lbs.	4 X 40 Yard Bins	Landfill
Non-RCRA/Non-DOT Regulated Material Liquid		Latex Paint	27,280 lbs.	1 X 20 Yard Bin 1 x 30 Yard Bin	Landfill
2.1 – Flammable Gas		Aerosol Spray Cans	1,686 lbs.	3 X 275 Cubic Yard Box	Energy Recovery / Fuel Blending
3 – Flammable Liquid		Paint Related Material	3,511 lbs.	10 X 55 Gallon Metal Drum	Energy Recovery / Fuel Blending
3 – Flammable/Toxic Liquid	6.1 - Toxic	Captan, Diazinon	2,887 lbs.	16 X 55 Gallon Poly Drum	Energy Recovery / Fuel Blending
5.1 – Oxidizing Solids		Potassium Nitrate/Sodium Hypochlorite	12 lbs.	1 X 05 Gallon Poly Drum	Incineration
6.1 – Toxic Solid		Captan, Diazinon	944 lbs.	6 X 55 Gallon Poly Drum	Energy Recovery/Fuel Blending
8 – Corrosive (Acids)		Hydrochloric Acid, Sulfuric Acid	342 lbs.	2 X 55 Gallon Poly Drum	Stabilization / Landfill
8 – Corrosive (Basic)		Sodium Hydroxide, Potassium Hydroxide	1,491 lbs.	8 X 55 Gallon Poly Drum	Stabilization / Landfill
8 – Corrosive (Batteries)		Automotive Lead Batteries, NiCad, Lithium Ion, Alkaline	1,340 lbs.	1 x Wooden Pallet, 2 x 30 Gallon Poly Drum, 5 x 5 Gallon Poly Drums	Recycle
8 – Mercury		Mercury	5 lbs.	1 X 5 Gallon Poly Drum	Recycle
9 – Environmentally Hazardous		Fluorescent Light Bulbs	613 lbs.	9 x Cylinder Box & 1 x 55 Gallon Poly Drum	Recycle



# Albuquerque/Bernalillo County Household Hazardous Waste Collection Event at Balloon Fiesta Park

Treatment Technology	Weight
Recycle	10,220 lbs.
Energy Recovery / Fuel Blending	9,028 lbs.
Incineration	12 lbs.
Landfill	39,493 lbs.

Waste Total	Cost	Cost/lbs.
58,753 lbs.	\$40,663.75	\$1.44/lbs.

585 – Albuquerque/Bernalillo County Participants

We are committed to working with you in fulfilling the environmental needs of our communities.

Melanie Thornton  
ACTEnviro Office Manager - ABQ



## 2022 Foothills Spring Cleanup Results (1 of 2)

2022 Foothills Spring Cleanup Results										
Location	Volunteers	Dog Poop (in Lbs.)	Trash (bags)	Trash * (cubic yards)	Mixed Recycling (bags)	Glass (5 gal buckets)	Aluminum (bags)	New Trail Built (miles)	Trail maintained (miles)	Notes:
Rt 66	29			14.5	6	4	2	0.1		Large items included numerous tires and a mattress, 2 trail crews completed the a reroute
Copper	51	40	5	0.9	1	1	0.33		0.5	4 trail crews did maintenance on .5 miles of trail. One cactus crew closed off several social trails
Indian School	43	25	1	0.2	1	0.5	0		0.45	4 trail crews did maintenance on about .45 miles of trail. Two cactus crews planted hundreds of cactus cuttings to block social trails.
Menaul	55	35	3	0.5	1	2.5	1		0.4	four trail crews did maintenance on about .4 miles of trail. Three cactus planting crews planted hundreds of cuttings to block off social trails
Piedra Lisa	39	25	0.5	0.1	0.5	2	0.5		0.25	1 trail crew built 27 drain dips on .25 miles of trail. 2 rock crews built steps on the Canyon Trail, 1 cactus planting crew planted hundreds of cactus cuttings on a variety of short cuts, and 1 graffiti crew scrubbed graffiti off a rock outcrop.
Embudo	31	20	1	0.2	1	0.33	0.25		0.2	1 trail crew built 20 drain dips and did general maintenance on .2 miles of trail, 1 rock crew reinforced several rock ramps on Trail 365, and 2 Cactus planting crews planted hundreds of cactus cuttings on several social trails adding up to .15 miles of trail closure.
*trash bags converted to cubic yards and added to cubic yard total										
2022 River Cleanup										
	102			15	10	6	2			Filled a dump trailer, plus 4 pickup trucks. Large items: 12 tires, 5 shopping carts, and a vinyl kiddie pool
2022 National Trails Day										
	100							0.04	1.4	4 crews planted cactus on short cuts and social trails 6 crews did maintenance on approximately 1.4 miles of trail 2 crews built rock retaining walls 1 crew built a trail reroute (about 190 feet) to replace several social trails several volunteers cleaning up dog poop and trash

## 2022 Foothills Spring Cleanup Results (2 of 2)

		Volunteers	Dog Poop ( in Lbs.)	Trash (bags)	Trash (cubic yards)	Mixed Recycling (bags)	Glass (5 gal buckets)	Aluminum (bags)	New Trail Built (miles)	Trail maintained (miles)
Totals		450	145	10.5	31.4	20.5	16.33	6.08	0.14	3.2
Dia del Rio										
Make a Diff Day										
Grand Total		652	145	10.5		30.5	22.33	8.08		







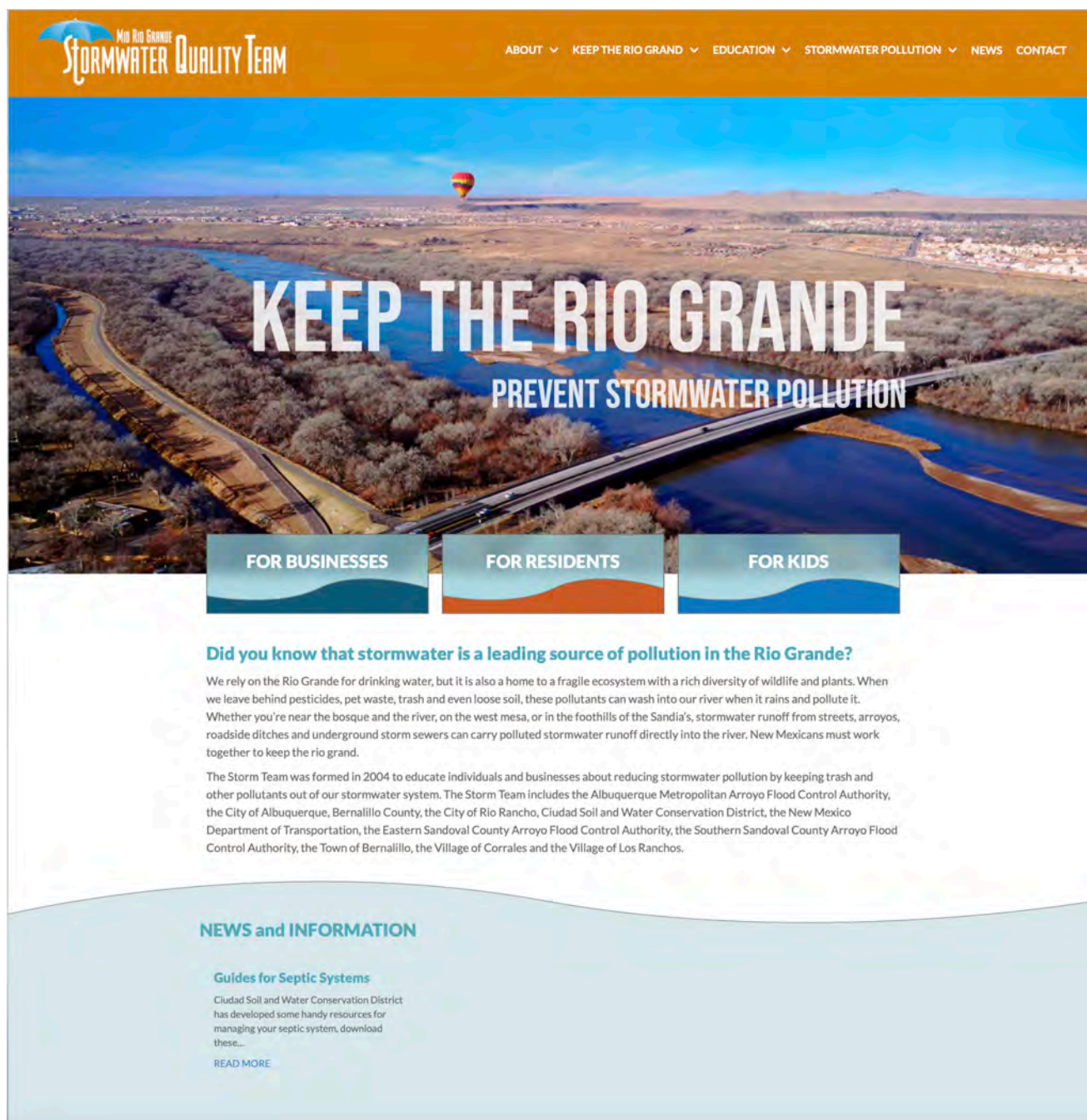
### Poop Fairy Signs

During FY22 we distributed 276 Poop Fairy signs to local residents. We also gave 250 to Parks and Open Space for posting.

# Mid Rio Grande Stormwater Quality Team

In FY2022 the MRGSQT developed a brand new website.

<https://keeptheriogrand.org>





# Village of Corrales

The Village of Corrales does not have a municipal storm sewer system. To handle stormwater flows from development, engineered grading and drainage (G & D) plans are required of all new residential construction (anything roofed or paved areas on sloped areas) that disturb more than 1,000 square feet. Engineers may use retention ponding, berms and other aspects that

keep the impervious surface stormwater flows on the subject property and not running into streets or adjacent properties. In the Commercial zone, retention areas must be built into Site Development Plans.

During the past year, 18 residential G&D's were processed through the Planning and Zoning Department.

# Village of Los Ranchos

Similar to the Village of Corrales, Los Ranchos does not have a municipal storm sewer system. Grading and drainage plans are required for most residential and commercial construction within the Village, and Site Development Plans are additionally required for major subdivisions and new commercial construction. Permeable pavement elements have been incorporated throughout the Fourth Street redevelopment area in Los Ranchos (as shown on page 13), which provide multiple benefits such as reducing flooding and erosion and

enhancing groundwater recharge. The next phase of the Fourth Street Project, from Pueblo Solano Rd NW to Ortega Rd NW, will include elements that address stormwater and drainage concerns within that phase. This year, staff participated in educational outreach activities as part of the Stormwater Quality Team, including distributing materials at the Los Ranchos Farmer's Market and posting and distributing poop fairy signs throughout the irrigation system in Los Ranchos.





## Ciudad Soil & Water Conservation District

# Ciudad Soil & Water Conservation District

## Stormwater Presentations 2022

Date	Times	RR or ES	Event	Presenter(s)	Visitors
4.23.2022	9:00am–12:00pm	RR	RiverXchange Community Day	Erin, Steve, Salema	10
6.4.2022	9:00am–12:00pm	RR	BernCo Master Naturalist Presentation	Steve, Erin	25
6.11.2022	9:00am–12:00pm	RR	GHH	BernCo OSD	12
6.13.2022	9:00am–12:00pm	RR	Shady Lakes	Erin, Steve, Jaren (Nature Ninos)	45
6.18.2022	9:00am–12:00pm	RR	Phil Chacon Park	COA OSD – Nature in Your Neighborhood	did not attend
6.13.2022	10:00am–1:00pm	RR	Shady Lakes: Nature Ninos Summer Camp	Steve, Jaren, Saleema (Nature Ninos)	40
6.23&25.2022	6:00–7:30pm 9:00–11:00am		Residential Rainwater Harvesting 2.0 (Online & In-person at GHH)	Erin, Judith, Hunter, Tess, Jim	45
6.30.2022	10:00am–1:00pm	RR	Shady Lakes: Nature Ninos Summer Camp	Steve, Jaren, Saleema	75







# MIDDLE RIO GRANDE Green Stormwater Infrastructure **MAINTENANCE MANUAL**

Prepared by Arid Low Impact Development Coalition  
June 2022







# The Arid Low Impact Development (LID) Coalition

is a multi-disciplinary group representing an array of perspectives, skills, and organizations who share a common vision to foster public awareness of stormwater as an asset instead of a liability and to increase literacy around effective, arid-adapted **green stormwater infrastructure (GSI) and low impact development (LID)** strategies. The many benefits of these strategies include improving water quality, watershed stewardship, and well-being for all inhabitants in the Rio Grande Watershed.

The Coalition works to provide technical resources and education needed to design GSI and LID interventions in our high desert environment, facilitate communication and collaboration, and support high-quality demonstration and research projects. For more information please visit [www.aridlidcoalition.org](http://www.aridlidcoalition.org).

This document was developed by the Arid LID Coalition in conjunction with partners Ciudad Soil and Water Conservation District, The Nature Conservancy, Bernalillo County, Sites Southwest, New Mexico Department of Transportation, MRWM Landscape Architects, Water Authority, and the Urban Waters Federal Partnership.



Special thanks to Sunny 505 and MRWM for providing graphics.



# Document Overview

This manual provides an introduction to GSI (Module 1), followed by descriptions of GSI techniques (permeable pavement, stormwater harvesting basins, infiltration conveyances, plants, and mulch) and maintenance requirements for these GSI features (Modules 2 through 6).



**MODULE 1** Green Stormwater Infrastructure: Introduction **p.1**

**MODULE 2** Permeable Pavement **p.9**

**MODULE 3** Stormwater Harvesting Basins **p.17**

**MODULE 4** Infiltration Conveyance **p.26**

**MODULE 5** Plant Identification and Maintenance **p.34**

**MODULE 6** Mulch Maintenance **p.41**

Click on the green box  
to go to the page.







# MODULE 1

## Introduction to Green Stormwater Infrastructure & Maintenance





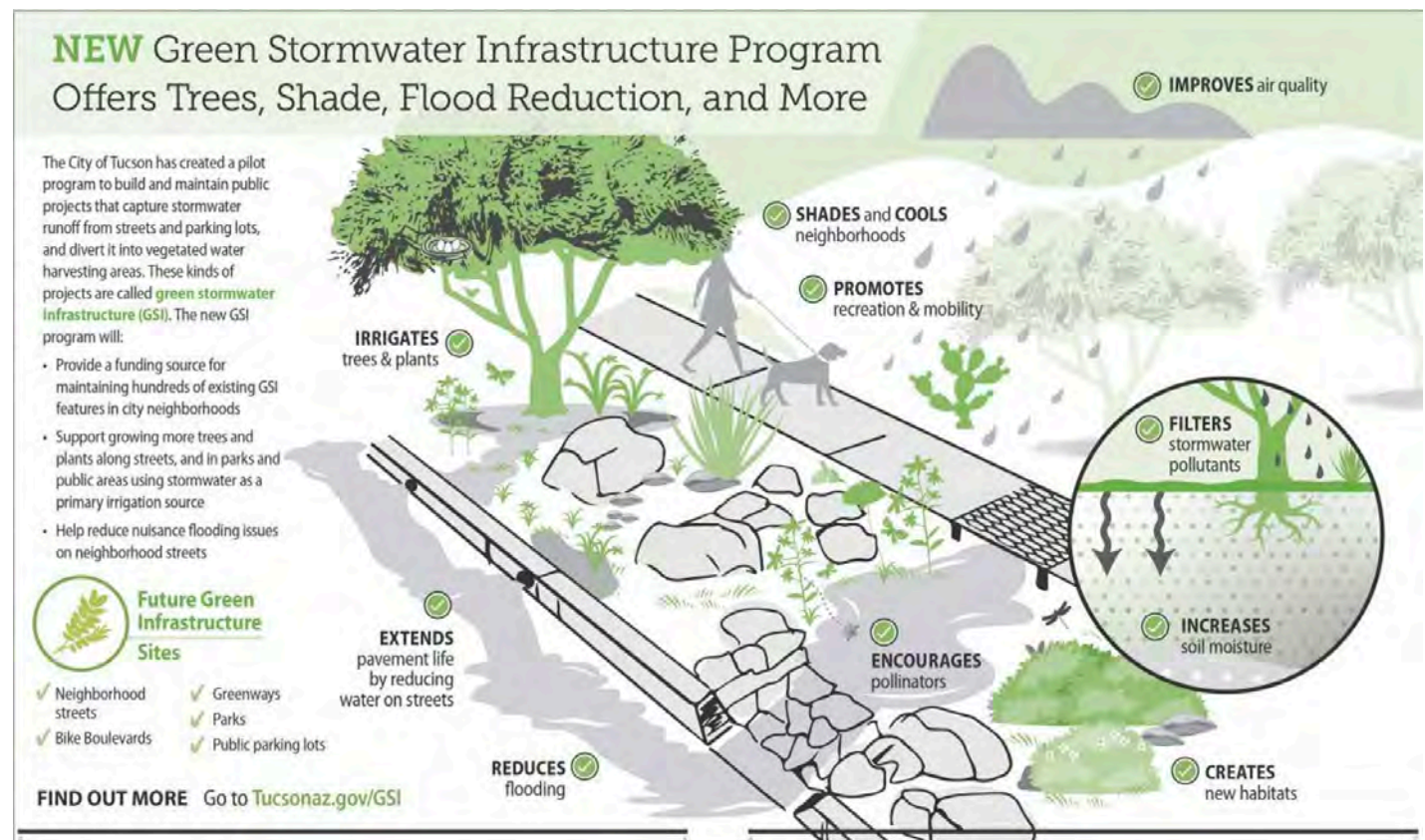
# Green Stormwater Infrastructure & Maintenance

When rain falls in natural, undeveloped areas, the water soaks into the ground and is filtered by soil and plants. But in an urban environment, when rain falls on impervious surfaces (roofs, streets, and parking lots), the water can no longer soak into the ground. Stormwater that runs off these impervious surfaces in urban areas results in higher flows in drains, gutters, storm sewers, and other gray stormwater

systems, eventually discharging into arroyos, streams, and rivers. Stormwater runoff carries trash, bacteria, heavy metals, and other pollutants that pose a threat to human health and the environment. Higher flows resulting from heavy rains also can cause flooding and property damage as well as erosion and flooding in streams, damaging habitat, property, and infrastructure.

Green stormwater infrastructure (GSI) is an approach to stormwater management that mimics natural processes to provide nature's benefits, such as:

- ☂ Reducing flooding
- ☂ Conserving water
- ☂ Improving water quality
- ☂ Improving air quality
- ☂ Carbon sequestration (capturing and storing carbon dioxide)
- ☂ Reducing heat island effects
- ☂ Providing shade
- ☂ Creating wildlife habitat
- ☂ Calming traffic
- ☂ Improving livability
- ☂ Promoting walkability in neighborhoods



From: [Tucsonaz.gov/gsi](http://Tucsonaz.gov/gsi)



# Why GSI?

Traditional gray stormwater infrastructure includes gutters, pipes, culverts, and detention ponds and is designed to move stormwater runoff from the built environment to water bodies like streams and rivers as quickly as possible.

GSI helps keep rainwater where it falls, provides natural benefits, is less expensive to build than traditional gray infrastructure, requires less maintenance over time, and is less resource intensive.

## What is GSI?

GSI includes a variety of measures—stormwater harvesting basins, infiltration conveyances like swales and trenches, permeable pavement—to store, treat, infiltrate, evaporate, or transpire (water use in plants) stormwater and reduce flows to stormwater sewer systems and surface waters. GSI is intended to be used alongside gray infrastructure, not replace it, and in some cases actually reduces the need for costly expansions of gray infrastructure improvements as networks of pipes are undersized in many cities with increased development or density of buildings.

## Gray Stormwater Infrastructure

Concrete, metal, pipes and drains



Storm Drain Inlet, Albuquerque, NM (photo by Tess Houle)



Culvert under Interstate 25, Albuquerque, NM (photo by Tess Houle)



North Diversion Channel, Albuquerque, NM (photo by Tess Houle)



# What GSI is NOT

GSI is not “zero-scaping”—it does not mean rockscapes with little or no plants. It is not a dirt hole in the ground that solely captures water without treatment or other benefits. GSI installations should include native and arid-adapted plants in order to function properly.

TOP: GSI with limited function: This stormwater harvesting basin does not support vegetation or properly treat pollutants; it instead uses heat-trapping rock mulch and cobble, and does not take advantage of the stormwater to irrigate the plants in this landscape.



BOTTOM: GSI with stacked functions: This stormwater harvesting basin captures street runoff that supports native trail-side shrubs and grasses; treats pollutants; balances organic and inorganic mulches; and overflows into subsequent basins further downstream to reduce in-street flooding during heavy storm events.

(Location: Alameda Drain Trial)

GSI is not meant to solve major flooding issues, but it does reduce localized flooding. Also, like any landscape feature, GSI does not take care of itself—it requires regular inspection, care and maintenance!



Photos by: Mario Nuño-Whelan



# Benefits of GSI

Implementing GSI practices in the middle Rio Grande region has many benefits for our watershed. The fundamental goal is to reduce the amount of stormwater runoff and pollution reaching surface waters and adversely impacting our watershed. Benefits of GSI include:

- ☂ Reducing air and water pollution by including trees and vegetation, which act as a natural filter.
- ☂ Providing traffic-calming benefits with trees and plants adjacent to roadways.
- ☂ Reducing heat-related impacts to people and natural landscapes.
- ☂ Replicating native environments and providing wildlife habitat in the urban environment.
- ☂ Providing opportunities for physical activity for residents, while also improving mental health outcomes by reducing stress and promoting cognition.
- ☂ Addressing social equity and environmental justice when used in communities that don't have access to quality outdoor spaces. Environmental justice means all people, regardless of race, color, national origin, or income, are entitled to equal protection from environmental risks.



# Maintenance

For green stormwater infrastructure to function properly and allow water to soak into the ground over time, maintenance is needed. Healthy plant root systems help water soak in, and removing sediment and debris prevents clogging and overflowing of the systems.

Modules 2 through 6 in this GSI Maintenance Manual will cover maintenance needs for the most common types of GSI features, including permeable pavement, stormwater harvesting basins, and infiltration conveyances, as well as routine and seasonal plant maintenance and mulch maintenance. Some routine maintenance tasks that generally apply to most GSI installations include:

- ☂ Visiting stormwater infrastructure during rainstorms to see stormwater flows in action. Green stormwater systems are designed to harvest rainwater and stormwater, so managing water flow is essential.
- ☂ Inspecting and maintaining irrigation systems.
- ☂ Managing vegetation that supports natural filtering, but doesn't block the flow of water.
- ☂ Removing sediment and trash and clearing inlets and outlets of debris and vegetation.
- ☂ Maintaining and refreshing mulch.
- ☂ Repairing erosion and human-caused damage.
- ☂ Adjusting schedules over time as issues arise and landscapes mature.. Frequencies of inspection and maintenance depend on drainage area, land use, activities in the watershed, and rainfall magnitude and intensity.

Some common problems to look for when doing maintenance inspections are:

- ☂ Is water backing up or not making it to the basins and tanks? Look for leaking gutters, clogged curb cuts, or clogged pipes.
- ☂ Has the capacity been reduced due to sediment and debris build-up?
- ☂ Is there enough capacity to capture sufficient rain?
- ☂ Are overflows and outlets working like they should? Look for water overflowing away from outlet or signs of erosion like rivers of dirt on sidewalks.
- ☂ Is there standing water for more than a few hours after a storm? If standing water is still present 24 hours after the storm, maintenance is likely needed.

## Tools and Specialized Equipment

Routine maintenance and best management practices on vegetated green infrastructure are similar to general landscape maintenance: removing trash and debris; keeping plants healthy; and cleaning out accumulated sediment and pollutants. These tasks can be completed using the following tools:

- ☂ Trash, debris, and sediment can be removed with rakes, shovels, and trash grabbers. Leaf and plant trimmings can be added to the basin bottoms to replenish mulch and provide a nutrient source for plants and healthy soils except for noxious and invasive weeds. They should be bagged and removed from site.
- ☂ Flat-blade shovels are especially useful for scraping accumulated sediment from inlets and along curbs and gutters or upstream of inlets.
- ☂ Vegetation can be pruned for safety, visibility, and plant health using pruning shears and weed pullers. Power shearing equipment should be used sparingly or not at all.
- ☂ Properly clean shears before and after use to eliminate the spread of diseases.
- ☂ Watering during the plant establishment period and in extended droughts can be done with a hose, bucket or irrigation system.
- ☂ Permeable pavement is best maintained using a vacuum-powered street sweeper, and replacement pavers are sometimes needed for repairs (See Module 2).
- ☂ Heavy equipment, such as backhoes and front-end loaders, may be needed infrequently if the facilities need to be replaced or if large amounts of sediment have accumulated. If using heavy equipment, care should be taken to avoid compacting soil at the bottom of GSI installations.



# Equipment Needed



**Site map/site plan/as-built**

**Trash grabbers**

**Trash bags**

**Gloves**

**Bucket/other sediment/  
trash removal container**

**Broom and dust pan**

**Tarps (for stockpiling  
plant materials removed)**

**Wheelbarrow**



**Push broom**

**Digging shovel**

**Square-nosed (or flat-bladed) shovel**

**Spade/trowel**

**Rake—leaf, shrub, row, and/or hand**

**Wire or stiff plastic brush**

**Pruning shears/clippers**





# Maintenance Objectives:

## Health and Safety

Health and safety plans and precautions should be provided by employer/site owner; below are a few considerations for health and safety during maintenance of GSI facilities:

- ☂ Appropriate Level D personal protective equipment (PPE), including a minimum of a safety vest, steel-toed boots, and safety glasses, should be worn during maintenance activities; hard hats and hearing protection should be used around heavy equipment.
- ☂ Equipment operations and procedures must meet Occupational Safety and Health Administration (OSHA) guidelines and standards.
- ☂ To protect the health, safety and welfare of the community, put into practice integrated pest management strategies that provide the least toxic methods to control pests, including noxious and invasive weeds.
- ☂ Cones, barricades, and/or other protective and warning devices for vehicles and pedestrians to ensure safety of workers and pedestrians.
- ☂ Sun protection including clothing, hats and minimum SPF30 sunscreen.
- ☂ Stay cool.
- ☂ Know the signs of heat stress and heat stroke and proper actions to take.
- ☂ Have a first aid kit and ensure that it is well stocked.
- ☂ Know where the nearest emergency room and/or urgent care facility is located.







# MODULE

2

## Permeable Pavement





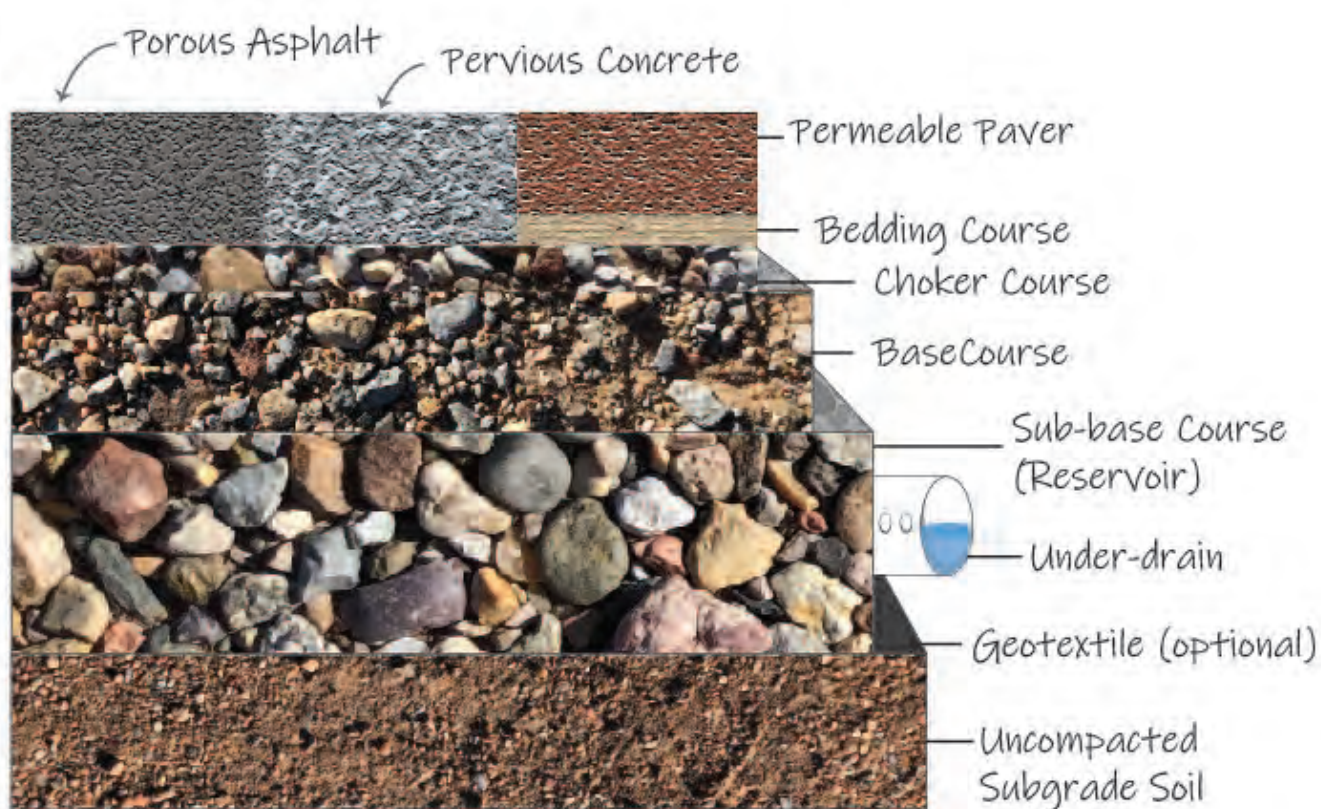
# Permeable Pavement

Permeable pavement is a constructed system that allows water to pass through the pavement to the underlying native soil or a constructed infiltration bed below the pavement. Permeable pavement systems can vary, but are generally made up of five layers:

- ☛ **Pavement:** A surface pavement layer that is permeable (for example: pervious asphalt, pervious concrete, permeable interlocking pavers).
- ☛ **Bedding course:** A thin bedding layer, approximately 2 inches thick, made of 3/8-inch to 1/2-inch diameter stone to stabilize the pavement.
- ☛ **Choker course:** An underlying crushed stone reservoir layer, a minimum of 6 inches thick, made of 1-inch- to 2.5-inch diameter stone.
- ☛ **Base course or subbase layer:** A combined layer of aggregate stones, ranging in size from 2 to 3 inches, for storing water and distributing the pavement load. A geotextile filter fabric is sometimes added below the subbase level.
- ☛ **Under-drain:** An under-drain is sometimes used to move water to additional storage capacity to prevent prolonged saturation.
- ☛ **Uncompacted soil subgrade:** (i.e., local soils).

Regular maintenance of permeable pavements ensures they remain functional, allowing water to soak into the ground quickly, reducing flooding during storm events and allowing water stored underground to be used by nearby trees and plants.

Types of permeable pavement may include porous concrete, pervious asphalt, or various types of interlocking pavers. In addition, plastic grid systems (also called reinforced turf pavement) can be used in areas with limited vehicular traffic (such as infrequent parking areas or emergency vehicle or fire access lanes). Permeable pavements can also be paired with other engineered structures like Silva cells that create a supported, but suspended surface. This allows for uncompacted soils underneath that make space for tree and plant roots or additional stormwater storage.





# Benefits of Permeable Pavement

- ☛ Permeable pavement reduces flooding, prevents erosion and property damage, reduces pollutants carried into streams and rivers, and can enhance groundwater recharge by allowing stormwater to soak into the ground quickly instead of being carried away in roadways, sidewalks, or gutters.
- ☛ Permeable pavement can melt snow and ice faster during winter storms, dries faster than traditional impervious pavement, minimizing slips and falls, and reduces the need for deicing chemicals and costly snow removal services.
- ☛ Permeable pavement allows tree roots to access air and water easily, unlike traditional concrete. Trees along streets have been shown to substantially reduce nitrogen and other pollution loads in stormwater by acting as a natural filter and provide traffic-calming benefits.



Wheelchair accessible permeable pavement

Regular inspection of permeable pavers is needed to make sure they remain level with a smooth, ensuring compliance with the Americans with Disabilities Act (ADA) specifications.





System with multiple permeable pavement types



# Maintenance

Key maintenance issues for permeable pavement include:

- ☔ **Clogging.** To work effectively, permeable pavement needs to drain without clogging. Permeable pavement should NOT be located adjacent to areas with exposed soil that can clog these features.
- ☔ **Exposed soils.** Any nearby exposed soil should be separated from permeable pavement by barriers such as vegetated areas, and those barriers should be maintained to capture sediment before runoff reaches the permeable pavement.
- ☔ **Organic debris.** Organic debris, such as leaf litter and grass clippings, should NOT be deposited on or allowed to sit on permeable pavement, as debris can cause clogging and lifting. Leaves and plant material should be regularly collected from permeable pavements for composting.
- ☔ **Maintenance.** Ask landscape maintenance personnel to help maintain permeability by not dumping materials or sediment onto permeable pavement.
- ☔ **Drainage.** The permeable pavement system must be allowed to dry (de-water) between rainfall events. Too much water retention in the base course layers can prevent the absorption of additional rainfall and result in runoff. There should be an observation well that allows inspectors to determine if excessive water is being held within the system.
- ☔ **Site maps.** Show areas of permeable pavement and inspection wells on maintenance site maps.



4th Street permeable pavers curb detail, Photo by Sites SW



4th Street permeable pavers, Photo by Sites SW





4th Street Permeable Pavers, Photo by Sites SW



# Maintenance Tasks and Schedules

**NOTE:** Areas with a lot of vehicle traffic may require maintenance more frequently than those with less traffic or only pedestrian traffic.

- ☂ Keep sediment or areas with bare soil from draining onto permeable pavement and maintain vegetated areas that provide a buffer between pavement and bare soil.
- ☂ Inspect at least twice a year (at the end of winter and in the fall, when leaves drop) and remove any clogging material from permeable pavements to prevent safety issues (separation and lifting).
- ☂ Inspect after rain events of 0.25-inches or greater and remove any material that may clog permeable pavers/pavement.
- ☂ Vacuum porous asphalt or permeable concrete at least twice a year with standard street-cleaning equipment with a vacuum device. After vacuuming permeable pavers, stone between pavers may need to be replaced. Some types of permeable pavers do not require vacuuming (The third picture on the right is one example.).
- ☂ Inspect bricks for shifting, cracking, lifting, and/or clogging after freeze thaw cycles and after major storm events. Adjust bricks to maintain a smooth and level surface. This is important for trip hazards as well as ADA compliance.
- ☂ Observe performance during rainstorms. When water begins to pond during typical rainfall events, you may need to vacuum the pavement.
- ☂ DO NOT apply sand and/or fine aggregate to enhance snowmelt or winter condition

traction, as these materials will quickly clog permeable pavement causing water to pool on the surface instead of draining quickly.

- ☂ Sweep and remove any snowmelt products like salt as soon as it is no longer needed. Salts will effect water quality and plant health.
- ☂ DO NOT resurface or seal the permeable pavement, as you normally would with a traditional pavement. This will block the permeability of the pavement.
- ☂ Clean areas that are stained by grease or oils with a biodegradable grease and oil cleaner such as liquid dish soap or OxiClean.
- ☂ Repair or clean all damaged areas or areas that are not draining as soon as the issue is observed to prevent further damage.

## Tools and Specialized Equipment

See general tool list in Module 1.

Specialized equipment includes: street sweeper with vacuum attachment, brooms, trash-grabbers



Photos by: Mario Nuno-Whelan

# MAINTENANCE INSPECTION CHECKLIST & SCHEDULE

## Permeable Pavement

Location:

Weather: Rainfall over last 2–3 days?

Inspector:

Site conditions:

Pavement Type: ☐ asphalt ☐ concrete ☐ interlocking pavers ☐ grid pavers

Date:

Time:

MAINTENANCE NEEDED	ACTION	COMMENTS
<b>Pavement Surface</b>	<i>Frequency—Monthly</i>	
1. Are there signs of clogging? <input type="checkbox"/> YES <input type="checkbox"/> NO 2. Is there build-up of debris (sediment, trash)? <input type="checkbox"/> YES <input type="checkbox"/> NO 3. Is there standing water on the permeable pavement? <input type="checkbox"/> YES <input type="checkbox"/> NO	1. Schedule cleaning with street sweeper/vacuum. 2. Remove debris from surface of pavement. 3. Check inspection wells (if present) to see if there is water that has not infiltrated. If not, schedule a cleaning with street sweeper/vacuum.	
<b>Adjacent Areas</b>	<i>Frequency: Biannually or 2x per year</i>	
1. Is there erosion from or around underdrain, if present? <input type="checkbox"/> YES <input type="checkbox"/> NO 2. Are areas where soil is exposed discharging soil/sediment onto the permeable pavement? <input type="checkbox"/> YES <input type="checkbox"/> NO 3. Is the permeable pavement negatively impacted by an adjacent site feature? <input type="checkbox"/> YES <input type="checkbox"/> NO	1. Determine cause of erosion and mitigate by adjusting flow, using rip-rap, or other appropriate method. 2. Install a barrier, such as vegetation, rip-rap, curb, wall or fence with windscreen to stop the bare soil area from discharging sediment onto the permeable pavement. 3. Look for a way to reduce the impact. Discuss impacts and options with supervisor.	
<b>Outlets and Overflow</b>	<i>Frequency: Annually, after major storms (storms with 0.25" of rain or more)</i>	
1. If there is an outlet or overflow to a storm sewer system, is it free from debris and functioning? <input type="checkbox"/> YES <input type="checkbox"/> NO	1. If there is blockage, remove debris/sediment/trash.	
<b>Other</b>	<i>Frequency: Annually</i>	
1. Have there been complaints from residents? <input type="checkbox"/> YES <input type="checkbox"/> NO 2. Do you notice any hazards to the public? <input type="checkbox"/> YES <input type="checkbox"/> NO 3. Are there any other issue or problems? <input type="checkbox"/> YES <input type="checkbox"/> NO	1. Address complaints and/or discuss with supervisor. 2. If a hazard is observed, look for a way to fix the issue and discuss with supervisor. 3. If yes, describe in comments and discuss with supervisor.	

Inspector's signature: \_\_\_\_\_



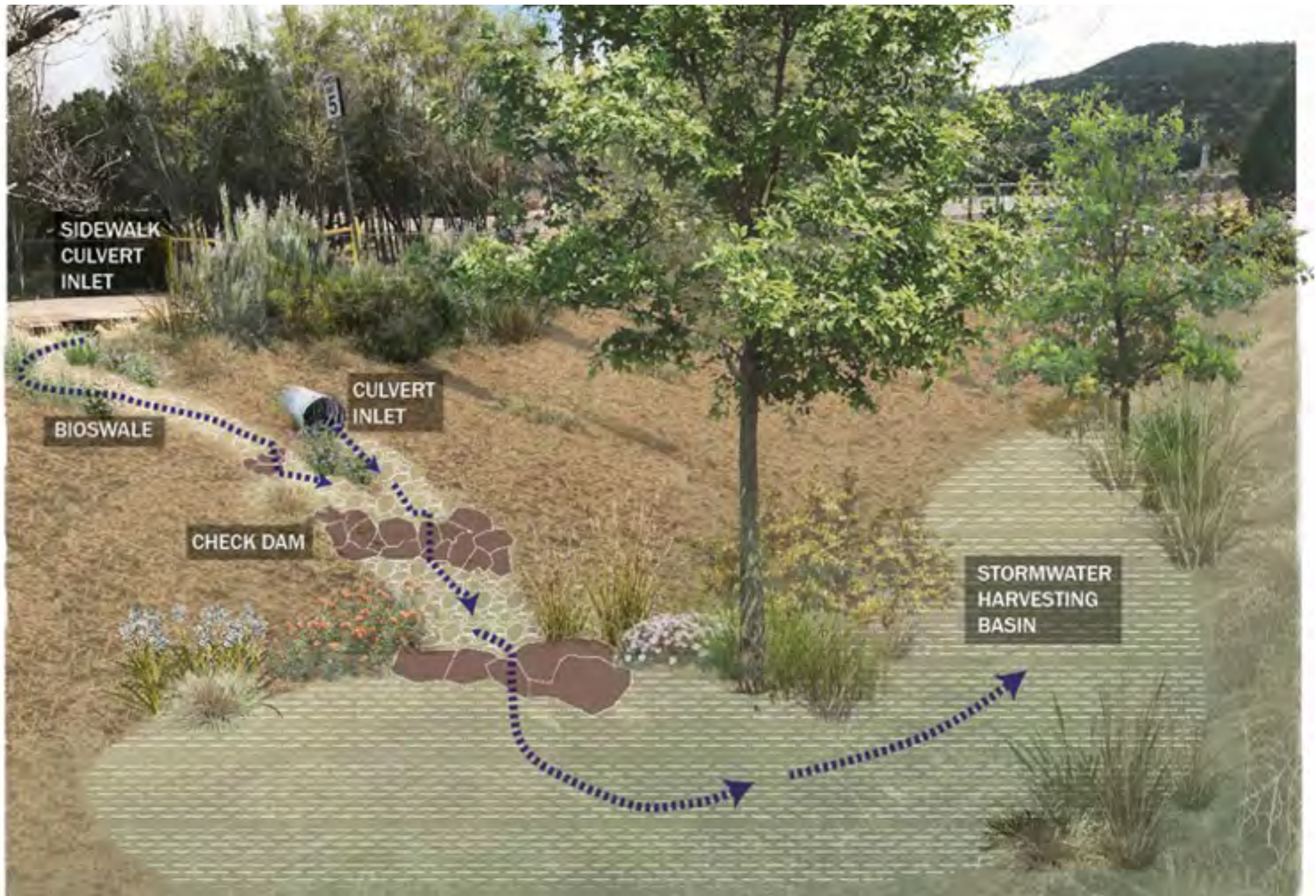


# MODULE 3

## Stormwater Harvesting Basins







Stormwater harvesting basin components



# Maintenance for Stormwater Harvesting Basins

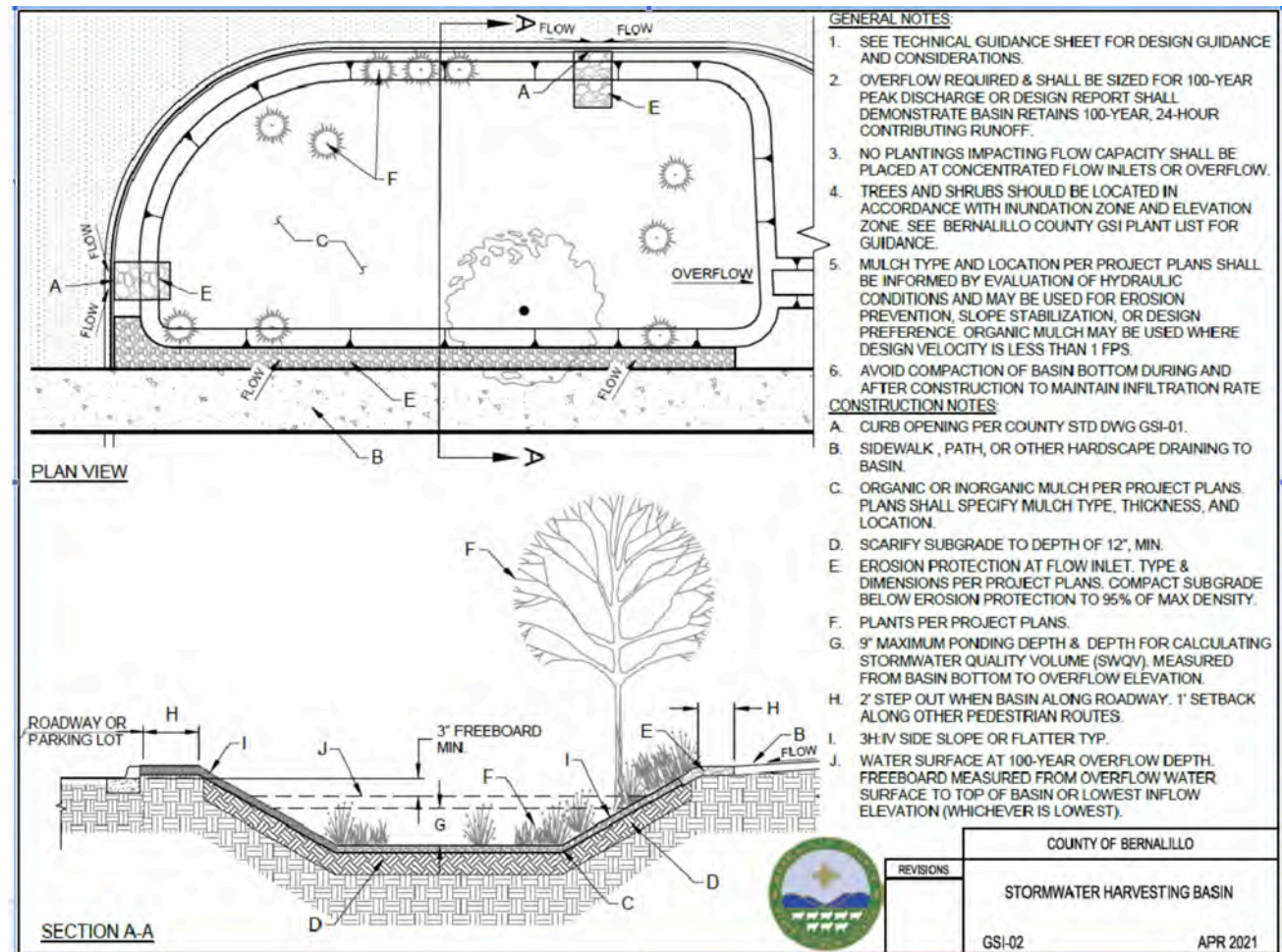
Stormwater harvesting basins are purposely vegetated depressions in the ground that collect stormwater runoff and allow that runoff to infiltrate the soil. The bottom of the basin should not be compacted because it will slow or even stop infiltration.

Stormwater harvesting basins help to control flooding and prevent pollutants from entering arroyos and rivers. The collected water supports trees and other vegetation, cooling our city and making it more livable.

Components of stormwater harvesting basins that need inspection and maintenance include:

- ☔ Inflow and outflow structures
- ☔ Sediment traps
- ☔ Infiltration rates (the rate water soaks into the ground)
- ☔ Erosion control/repair
- ☔ Plants/weeds management or removal
- ☔ Inundation zones within the basin (areas soaked with water after a storm)
- ☔ Irrigation system (if present)
- ☔ Mulch
- ☔ Access ramps/features

Careful maintenance is important to (1) ensure that stormwater harvesting basins capture runoff and allow it to infiltrate into the ground below and (2) prevent pollutants from running into surface waterways like arroyos, streams, and rivers. This protects our drinking water supply and makes our rivers swimmable and fishable.

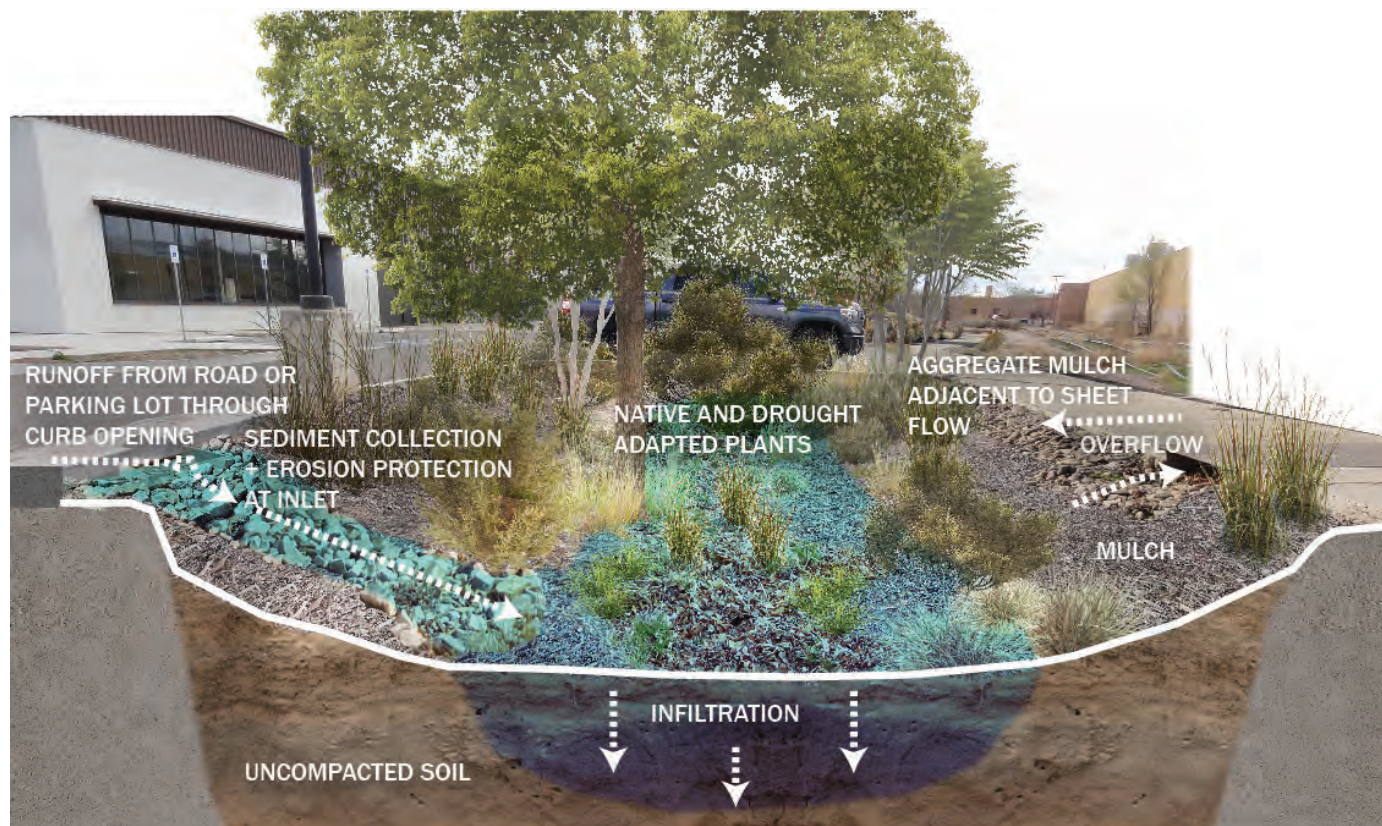


Bernalillo County standard design for a stormwater harvesting basin

# Maintenance for Infiltration

To control flooding and pollutants, stormwater harvesting basins must allow water to infiltrate into the soil. If water is standing in the basin for more than 24 hours you may need to drain small to medium sized basins using a pump in to prevent mosquitoes or make repairs. The following maintenance tasks are needed to improve infiltration:

- ☔ Remove built-up sediment within the basin by scraping/shoveling to prevent clogging from fine particles.
- ☔ Look for any movement of mulch to find pooling zones (areas where water collects). If stormwater runoff isn't spreading throughout the basin evenly, re-grade to direct runoff to the entire basin.
- ☔ Make sure you have at least 3 inches of organic mulch in basins. See Module 6, Mulch, for more information on mulch maintenance.
- ☔ The roots of grasses and shrubs that can survive in areas inundated with water will improve the soil and help infiltrate water. See Module 5 Plant Maintenance for more information.
- ☔ Install soil sponges (mulched vertical infiltration drains) to move water more quickly down into the soil. (See diagram on page 22)
- ☔ If there is caliche (a hard clay layer common in the desert) or other confining layer (a layer of soil that allows little if any infiltration) in or under the basin, you may need to use a digging bar or pick to punch through the confining layer in some areas. This is also a good application for a soil sponge or french drain.
- ☔ Make the basin wider if there is space available. Spreading the water over a larger area will help it soak in.



Stormwater harvesting basin schematic



# Maintenance for Erosion

It is important to check for and repair erosion (washed out or displaced soil or rock mulch) because it can impact the function of the basin by causing clogging from increased sediment. When inspecting a basin, look for places where water is flowing around the inlet/outlet feature and causing erosion. Additional modifications to inlet height may be needed to redirect flow to inlet.

- ☔ Fill eroded areas with soil material similar to the existing material in place.
- ☔ Grade filled material with a rake, hoe, or other hand tool so that it matches the grade of the surfaces around it.
- ☔ If planting seeds, use an appropriate native seed mix.
- ☔ If erosion is happening due to a lot of water entering the basin too fast, consider installing a check dam, Zuni bowl, erosion blanket, or rip/rap. This will help slow the water down and minimize the amount of sediment washed into the bottom of the basin, which can cause clogging and additional maintenance.



Signs of soil erosion



Left: Stormwater harvesting basin at CNM

Zuni Bowl

A Zuni bowl is an erosion control feature. It generally consists of rock-lined steps and basins used to prevent headcuts or rills from forming. They work by slowing down and removing energy from the flowing water.



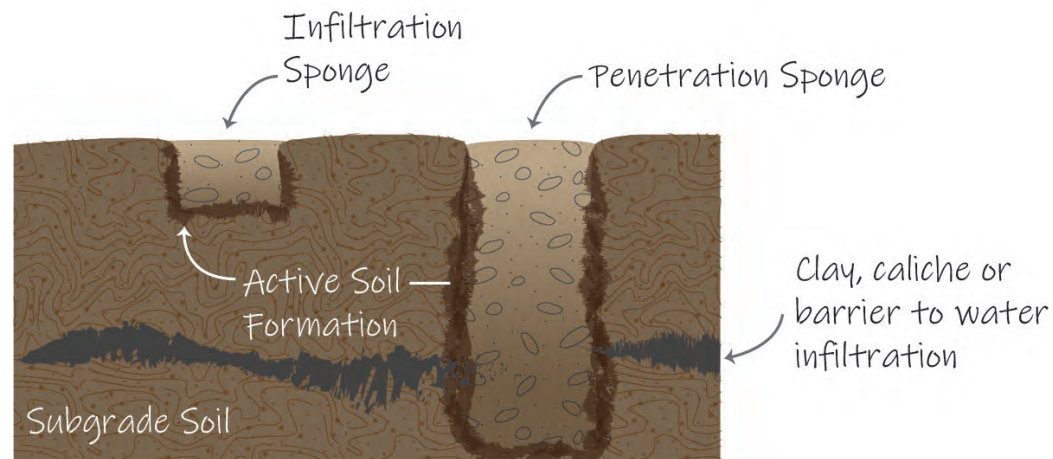
## Maintenance to Prevent Clogging:

Use hand tools, such as shovels, rakes and push brooms, to remove sediment, trash, and plant material from:

- ☔ Sidewalk/paved areas adjacent to curb cuts/grates
- ☔ In and around inlets and outlets
- ☔ Sediment traps (plant material can be left in the bottom of basins)
- ☔ Basin
- ☔ Structure grates
- ☔ Pipe/structure openings
- ☔ Screens

## Maintenance for Plants, Inundation Zones, and Mulch:

- ☔ Regular maintenance of plants is needed to keep stormwater harvesting basins functional. Please see the Plants Maintenance Guidelines in Module 5 for more detail.
- ☔ Mulch maintenance is also needed to keep stormwater harvesting basins functional. Please see the Mulch Maintenance Guidelines in Module 6 for more detail.



## Maintenance for Access Ramps/Features:

- ☔ Inspect the hard infrastructure (storm drain inlets, curb inlets, etc.) to ensure that they are not damaged or cracked and are not being undermined by higher-velocity water flows.
- ☔ Keep access ramps open and free of vegetation to allow access for maintenance activities.

# Tools and Specialized Equipment

Removal of sediment/organic debris/trash by mechanized equipment may be necessary. However, use of heavy equipment may seriously damage the basin. To reduce impacts during maintenance activities:

- ☔ Include a provision in maintenance contract to quickly replace vegetation that is damaged or removed.
- ☔ Do not stage or drive heavy/mechanized equipment on or across infiltration areas to avoid compaction of soil/media.
- ☔ For soil sponge installation, an auger or post-hole digger will be needed.

See also the general tool list in Module 1.



Runoff captured in stormwater harvesting basin at CNM

# MAINTENANCE INSPECTION CHECKLIST & SCHEDULE

## Stormwater Harvesting Basins and and Bioswales (Conveyence)

Location:

Weather: Rainfall over last 2–3 days?

Inspector:

Precipitation amount:

Date:

Time:

MAINTENANCE NEEDED	ACTION	COMMENTS
<b>Frequency—Monthly</b>		
1. Are there plants growing in inlets or outlets, blocking flow? <input type="checkbox"/> YES <input type="checkbox"/> NO	Remove plants that are blocking flow. If the plant is a good plant (i.e. not invasive), you may be able to move it to another part of the basin/swale. If it is an unwanted plant, remove and dispose.	
2. Are there unwanted plants, such as invasive plants or weeds? <input type="checkbox"/> YES <input type="checkbox"/> NO	Remove unwanted plants manually, which may include desirable plants growing in areas where they are not wanted (i.e. a tree seedling growing in an inlet).	
3. Are there diseased or dead plants? <input type="checkbox"/> YES <input type="checkbox"/> NO	Replace diseased or dead plants with similar native species.	
4. Have new plants been added? <input type="checkbox"/> YES <input type="checkbox"/> NO	Make sure young plants get the irrigation they need.	
5. Are weeds growing in mulch (if present)? <input type="checkbox"/> YES <input type="checkbox"/> NO	Manually remove mulch and add additional mulch to refresh.	
6. Is organic mulch (if present) at least 3 inches thick? <input type="checkbox"/> YES <input type="checkbox"/> NO	If mulch is less than 3 inches thick, add additional mulch.	
<b>Frequency—Quarterly, after major storms (storms with 0.25" of rain or more)</b>		
1. Is there standing water 24 hours after storm events? <input type="checkbox"/> YES <input type="checkbox"/> NO	If there is clogging or poor drainage, remove the accumulated sediment/discholored material/debris. Till or rake the remaining soil as needed.	
2. Is there sediment, plant material, trash/debris blocking inlets or outlets? <input type="checkbox"/> YES <input type="checkbox"/> NO	Remove sediment/plant material. These materials can be placed in another part of the basin/swale. Remove trash/debris and dispose.	
3. Are any plants diseased, impacted by pests, or have other issues affecting their health? <input type="checkbox"/> YES <input type="checkbox"/> NO	Replace diseased or dead plants with similar native species.	
4. Is irrigation system functioning correctly? <input type="checkbox"/> YES <input type="checkbox"/> NO	Fix any issues with irrigation system and adjust irrigation as needed based on season and plant needs.	



MAINTENANCE NEEDED	ACTION	COMMENTS
5. Do trees or shrubs have dead or damaged branches? <input type="checkbox"/> YES <input type="checkbox"/> NO	Remove any dead or damaged branches.	
6. Has mulch shifted or moved after storms? <input type="checkbox"/> YES <input type="checkbox"/> NO	Add additional mulch to refresh areas where much as been displaced.	
7. Is there erosion in any areas with organic mulch? <input type="checkbox"/> YES <input type="checkbox"/> NO	Inorganic (rock) mulch or riprap may be needed where erosion is occurring.	
<b><i>Frequency—Quarterly in the beginning, then biannually (adjust frequency as needed after 3 inspections)</i></b>		
1. Is there erosion? Impacts from animal burrows? <input type="checkbox"/> YES <input type="checkbox"/> NO	Repair soil erosion and repair the cause of erosion (i.e. is trash, debris, volunteer plant blocking the flow path?). Fill holes with lightly compacted soil.	
2. Is there more than 2 inches of accumulated material, like sediment, debris, and/or trash, in the bottom of the basin/swale (inundation zone) ? <input type="checkbox"/> YES <input type="checkbox"/> NO	If accumulated material is reducing infiltration, remove unwanted sediment/debris/trash. Add mulch or additional soil, if needed.	
3. Do plants look distressed? <input type="checkbox"/> YES <input type="checkbox"/> NO	During drought (longer periods without rain), adjust/increase irrigation as needed. Plants should be watered regularly until established (1–2 years for perennials, 3–5 years for shrubs, 7–10 years for trees) and as needed thereafter.	
4. Are inlets and outlets in good working condition? <input type="checkbox"/> YES <input type="checkbox"/> NO	Repair or replace any damaged structural parts of the inlets, outlets, sidewalls. Remove any sediment, debris, or volunteer plants blocking the inlet or outlet.	
<b><i>Frequency—Annually</i></b>		
1. Do plants need any pruning? <input type="checkbox"/> YES <input type="checkbox"/> NO	Prune plants ONLY AS NEEDED for clearance or health (dead, diseased, or damaged branches). Plants DO NOT need to be shaped or kept to size.	
2. Is there good plant coverage throughout the basin/swale? <input type="checkbox"/> YES <input type="checkbox"/> NO	Replace any dead or dying plants with similar native species.	
3. Are there complaints from residents? <input type="checkbox"/> YES <input type="checkbox"/> NO	Address complaints and/or discuss with supervisor	
4. Do you notice any hazards to the public? <input type="checkbox"/> YES <input type="checkbox"/> NO	If a hazard is observed, look for a way to fix the issue and discuss with supervisor.	
5. Are there any other issue or problems? <input type="checkbox"/> YES <input type="checkbox"/> NO	If yes, describe in comments and discuss with supervisor.	

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# MODULE 4

## Infiltration Conveyance





# Infiltration Conveyance

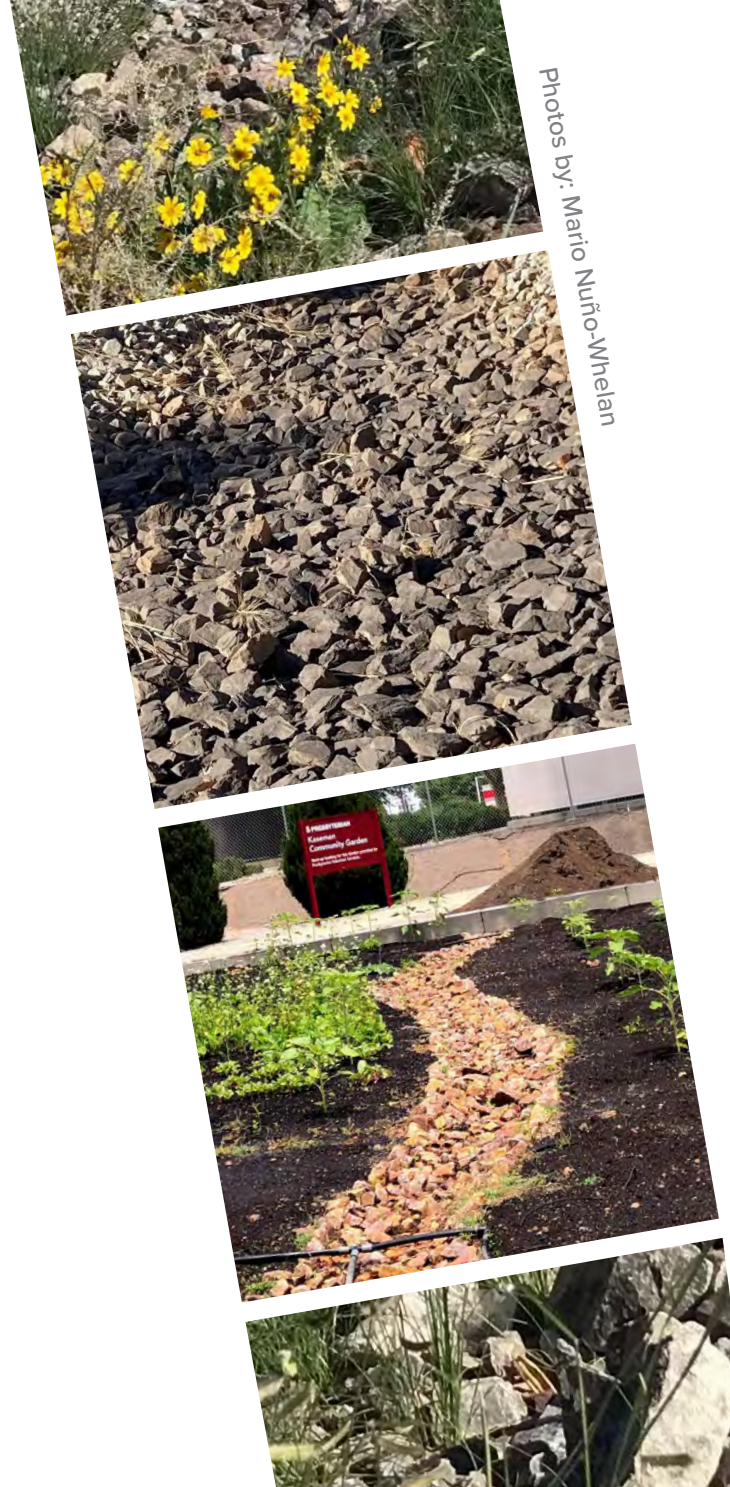
Infiltration conveyances are wide ditches that slow water velocity, direct stormwater flow, create temporary surface and subsurface storage of stormwater, and enhance the capacity of the ground to absorb stormwater, promoting groundwater recharge. Infiltration conveyances also aid in removing sediment and pollutants out of stormwater runoff.

Infiltration trenches are generally linear, stone-filled trenches that collect and infiltrate runoff and do not include plants.

Bioswales, another type of conveyance, are shallow, linear, or curved linear features that include organic (wood/plant material) or inorganic (rock) mulch and plants (preferably native). They are designed to improve water quality by carrying (conveying), slowing, and treating stormwater runoff. Bioswales allow pollutants to settle out and promote infiltration.

Infiltration conveyances should slow the water enough to allow it to infiltrate and should have regular inspection and maintenance to keep them functioning properly. Components of infiltration conveyances that need inspection and maintenance include:

- |                                       |                                  |
|---------------------------------------|----------------------------------|
| ☂ Inflow and outflow structures       | ☂ Plants/weeds                   |
| ☂ Sediment traps                      | ☂ Irrigation system (if present) |
| ☂ Infiltration rates (see ASTM D3385) | ☂ Mulch                          |
| ☂ Erosion control and repair          |                                  |



Photos by: Mario Nuño-Whelan





Stormwater Bumpout with Infiltration Conveyance



# Infiltration Maintenance

To control flooding and reduce pollutants carried to our rivers, infiltration conveyances should slow down velocity (how fast the water flows), allow water to soak into the ground, and support vegetation when present (bioswales). Maintenance tasks include:

- ☔ Remove accumulated sediment, debris, and trash within the channel and at inlets and outlets. Organic debris, such as leaves and plant material, can be left in place if it is not causing blockage. Use manual tools instead of a power blower or trimmer to remove sediment, debris, noxious weeds, and trash.
- ☔ Inspect engineered elements for undercutting or clogging.
  - Stormwater moving around concrete or other hard surfaces may erode surrounding soils.
  - Look for and remove any material clogging vertical overflow pipes, honeycomb grates, or other outflow structures.
  - Look for significant changes in channel depth following storm events that might affect how stormwater moves through the feature.
- ☔ Where organic mulch (wood and plant material) is used, maintain and refresh as needed (see Module 6 for more information on mulch maintenance).
- ☔ If water is standing for more than 96 hours, remove clogging material or increase infiltration in bioswales by installing soil sponges (see Module 3 for more detail) to move water more quickly down into the soil.
- ☔ Replace rocks that were dislodged during storm events making sure no bare soil is exposed.



Photo: Bernalillo County, Sarah Osterman

Infiltration trench in parking lot

# Maintenance: Plant Care

- ☔ Inspect the bioswale for areas that are receiving more or less stormwater by observing soil moisture, dry areas with stressed or dying vegetation, and areas where vegetation is thriving. Determine if regrading is needed to evenly distribute water throughout the channel.
- ☔ Infiltration trenches DO NOT include vegetation; remove any vegetation within the trench. Plant roots present in these conveyances reduce infiltration.
- ☔ Remove vegetation that is blocking or inhibiting flow in the inlet, outlet, and graveled central channel. Dense vegetation in these locations may cause backup and overflow in undesired areas.
- ☔ See Module 5 for detailed plant maintenance information.

## Visual inspection of the channel grade

- ☔ Check for any movement of sediment that changes the channel grade.
- ☔ If the channel grade is steep and water is flowing too fast, consider installing a check dam, Zuni bowl, erosion blanket, or other structure to help slow the flow of water. This may require renovation and is not part of regular maintenance.
- ☔ Remove and relocate sediment to maintain the channel grade and re-establish designed flow of water into appropriate areas. A flat shovel works well for this. A steel mesh screen placed over a wheelbarrow can help remove sediment from cobble or gravel.

## Erosion control repair

- ☔ Fill eroded areas with soil material similar to the existing material in place.
- ☔ Use a flat shovel or similar tool to relocate eroded sediment or material (i.e., rocks) to areas where they are needed, or to areas where they were formerly located.
- ☔ If planting seeds to reduce erosion, use an appropriate native seed mix.



Bioswale along Second St, Mountain View Neighborhood, South Valley, Albuquerque



# Maintenance:

## Soil amendments and mulch

- ☔ Do not use salt, fertilizers or pesticides in the stormwater management area.
- ☔ Add mulch to a minimum depth of 3 inches. See Module 6 for more details on mulch maintenance.
- ☔ If there are high flow rates into the basin and the organic mulch (wood/plant material) is regularly washed away, consider adding a check dam or Zuni bowl or changing to inorganic (rock) mulch on just the water flow path, retaining organic mulch on more upland areas.
- ☔ See Module 5 for detailed plant maintenance information.

## Tools and Specialized Equipment

Sediment/organic debris/trash should be removed most often by hand equipment. Only use heavy equipment as a last resort or when regrading and refreshing the entire site (no more frequently than every 5 years). The use of mechanized equipment may damage the system. To minimize impacts during maintenance activities:

- ☔ Have new plants and a native seed mix available to quickly re-establish vegetation where it has been damaged or removed.
- ☔ Do not stage or drive heavy/mechanized equipment on or across infiltration areas to avoid compaction of soil/media. If mechanized equipment is required, use wheeled rather than tracked equipment where possible.
- ☔ See the general tool list in Module 1.



Urban agriculture infiltration conveyance including a conveyance trench and soil sponges.

# MAINTENANCE INSPECTION CHECKLIST & SCHEDULE

## Stormwater Harvesting Basins and Conveyances

Location:

Weather: Rainfall over last 2–3 days?

Inspector:

Precipitation amount:

Date:

Time:

MAINTENANCE NEEDED	ACTION	COMMENTS
<b>Frequency—Monthly</b>		
1. Are there plants growing in inlets or outlets, blocking flow? <input type="checkbox"/> YES <input type="checkbox"/> NO	Remove plants that are blocking flow. If the plant is a good plant (i.e. not invasive, non-native), you may be able to move it to another part of the basin/swale. If it is an unwanted plant, remove and dispose.	
2. Are there unwanted plants, such as invasive plants or weeds? <input type="checkbox"/> YES <input type="checkbox"/> NO	Remove unwanted plants manually, which may include desirable plants growing in areas where they are not wanted (i.e. a tree seedling growing in an inlet).	
3. Are there diseased or dead plants? <input type="checkbox"/> YES <input type="checkbox"/> NO	Replace diseased or dead plants with similar native species.	
4. Have new plants been added? <input type="checkbox"/> YES <input type="checkbox"/> NO	Make sure young plants get the irrigation they need.	
5. Are weeds growing in mulch (if present)? <input type="checkbox"/> YES <input type="checkbox"/> NO	Manually remove mulch and add additional mulch to refresh.	
6. Is organic mulch (if present) at least 3 inches thick? <input type="checkbox"/> YES <input type="checkbox"/> NO	If mulch is less than 3 inches thick, add additional mulch.	
<b>Frequency—Quarterly, after major storms (storms with 0.25" of rain or more)</b>		
1. Is there standing water 24 hours after storm events? <input type="checkbox"/> YES <input type="checkbox"/> NO	If there is clogging or poor drainage, remove the accumulated sediment/dischored material/debris. Till or rake the remaining soil as needed.	
2. Is there sediment, plant material, trash/debris blocking inlets or outlets? <input type="checkbox"/> YES <input type="checkbox"/> NO	Remove sediment/plant material. These materials can be placed in another part of the basin/swale. Remove trash/debris and dispose.	
3. Are any plants diseased, impacted by pests, or have other issues affecting their health? <input type="checkbox"/> YES <input type="checkbox"/> NO	Replace diseased or dead plants with similar native species.	
4. Is irrigation system functioning correctly? <input type="checkbox"/> YES <input type="checkbox"/> NO	Fix any issues with irrigation system and adjust irrigation as needed based on season and plant needs.	

MAINTENANCE NEEDED	ACTION	COMMENTS
5. Do trees or shrubs have dead or damaged branches? <input type="checkbox"/> YES <input type="checkbox"/> NO	Remove any dead or damaged branches.	
6. Has mulch shifted or moved after storms? <input type="checkbox"/> YES <input type="checkbox"/> NO	Add additional mulch to refresh areas where much as been displaced.	
7. Is there erosion in any areas with organic mulch? <input type="checkbox"/> YES <input type="checkbox"/> NO	Inorganic (rock) mulch or riprap may be needed where erosion is occurring.	
8. Are there noticeable differences in channel grade? <input type="checkbox"/> YES <input type="checkbox"/> NO	If channel grade is too steep in some areas, adjust the grade or add a check dam or riprap to slow the flow of water.	
<b>Frequency—Quarterly in the beginning, then biannually (adjust frequency as needed after 3 inspections)</b>		
1. Is there erosion? Impacts from animal burrows? <input type="checkbox"/> YES <input type="checkbox"/> NO	Repair soil erosion and repair the cause of erosion (i.e. is trash, debris, volunteer plant blocking the flow path?). Fill holes with lightly compacted soil.	
2. Is there more than 2 inches of accumulated material, like sediment, debris, and/or trash, in the bottom of the basin/swale (inundation zone) ? <input type="checkbox"/> YES <input type="checkbox"/> NO	If accumulated material is reducing infiltration, remove unwanted sediment/debris/trash. Add mulch or additional soil, if needed.	
3. Do plants look distressed? <input type="checkbox"/> YES <input type="checkbox"/> NO	During drought (longer periods without rain), adjust/increase irrigation as needed. Plants should be watered regularly until established (1–2 years for perennials, 3–5 years for shrubs, 7–10 years for trees) and as needed thereafter.	
4. Are inlets and outlets in good working condition? <input type="checkbox"/> YES <input type="checkbox"/> NO	Repair or replace any damaged structural parts of the inlets, outlets, sidewalls. Remove any sediment, debris, or volunteer plants blocking the inlet or outlet.	
<b>Frequency—Annually</b>		
1. Do plants need any pruning? <input type="checkbox"/> YES <input type="checkbox"/> NO	Prune plants ONLY AS NEEDED for clearance or health (dead, diseased, or damaged branches). Plants DO NOT need to be shaped.	
2. Is there good plant coverage throughout the basin/swale? <input type="checkbox"/> YES <input type="checkbox"/> NO	Replace any dead or dying plants with similar native species.	
3. Are there complaints from residents? <input type="checkbox"/> YES <input type="checkbox"/> NO	Address complaints and/or discuss with supervisor	
4. Do you notice any hazards to the public? <input type="checkbox"/> YES <input type="checkbox"/> NO	If a hazard is observed, look for a way to fix the issue and discuss with supervisor.	
5. Are there any other issue or problems? <input type="checkbox"/> YES <input type="checkbox"/> NO	If yes, describe in comments and discuss with supervisor.	

Inspector's signature: \_\_\_\_\_



The background of the slide is a photograph. The top half shows a dense patch of tall, thin, yellowish-green grass. Below the grass is a horizontal band of orange color containing the text. The bottom half of the image shows a paved surface, likely asphalt, with a concrete curb and a row of dark, rectangular paving stones. Long, dark shadows of trees or bushes are cast across the pavement from the right side.

## MODULE

# 5

## Plant Identification and Maintenance



# Plant Maintenance

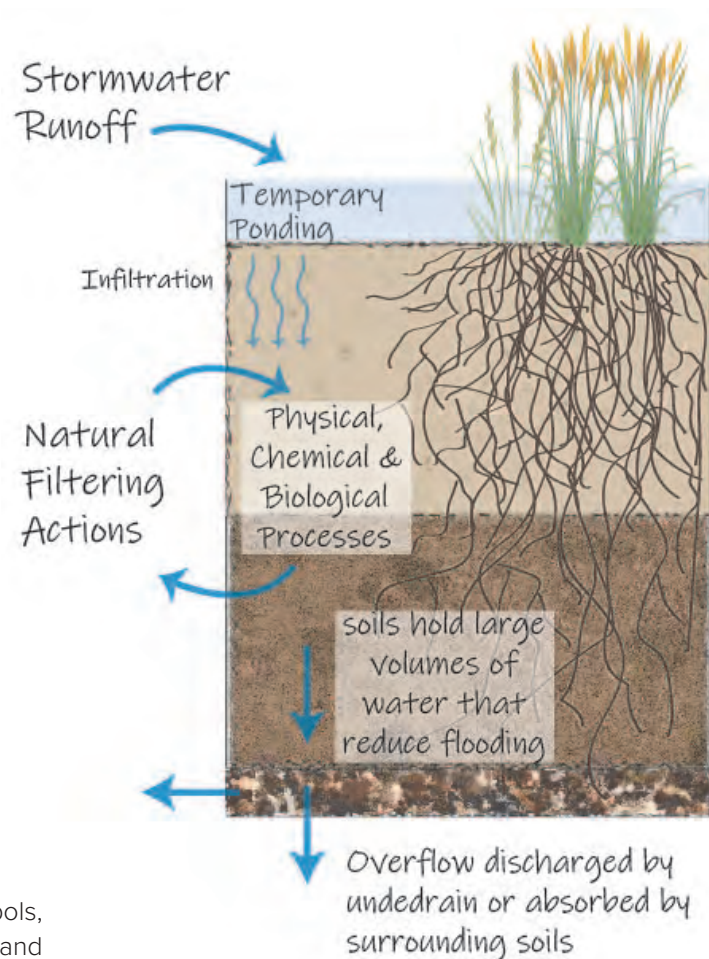
Plants are an important component of green stormwater infrastructure systems. When polluted stormwater passes through a biologically active filter (biofilter) or a plant community (referred to as a bioretention system), pollutants are reduced, and water quality improves. Plants and organic ground cover (e.g., mulch) are the most visible parts of a biofilter but much or most of the filtering happens below ground in healthy soils.

Healthy, native plant systems can:

- ☂ Reduce overall runoff volumes
- ☂ Reduce peak flows (preventing flooding)
- ☂ Increase and maintain infiltration rates
- ☂ Cool the soil surface (reducing heat islands)
- ☂ Reduce noxious weed establishment

Image Credit: Sarah Hurteau, TNC; IAN Symbols, University of Maryland

Schematic of plants serving as a biofilter



Photos by: Mario Nuño-Whelan

# Why are Plants Important?

Healthy plants are a vital component of green stormwater infrastructure to help:

- ☂ Control erosion
- ☂ Keep soils healthy — including soil fungi and microbes
- ☂ Promote natural filtering and breaking down of pollutants through biological and chemical processes
- ☂ Protect water quality by providing filtration and treatment for pollutants in stormwater runoff
- ☂ Provide habitat for wildlife
- ☂ Improve the urban environment for people
- ☂ Increase infiltration rates as water follows roots systems deeper into the soil

Plant maintenance can affect the optimal performance of green stormwater infrastructure in many ways:

- ☂ When vegetation dies and is not replaced, green stormwater systems lose the pollutant and water uptake benefits provided by the plants. Plant replacement is an important maintenance activity and will reduce/eliminate future renovation costs.
- ☂ Healthy soil microbes and bacteria that help break down pollutants die without healthy plants.
- ☂ Without vegetation, the soil holds less water, which in turn increases runoff.
- ☂ Clogged soil media prevents infiltration and can lead to a complete failure of a system, requiring replacement of the soil.

Bioretention systems are stressful environments for plant growth due to periods of flooding and pollutant loading, followed by long dry periods. Certain plant species are more capable of thriving in these extremes than others and can help to minimize the amount of maintenance needed due to plant die-off.

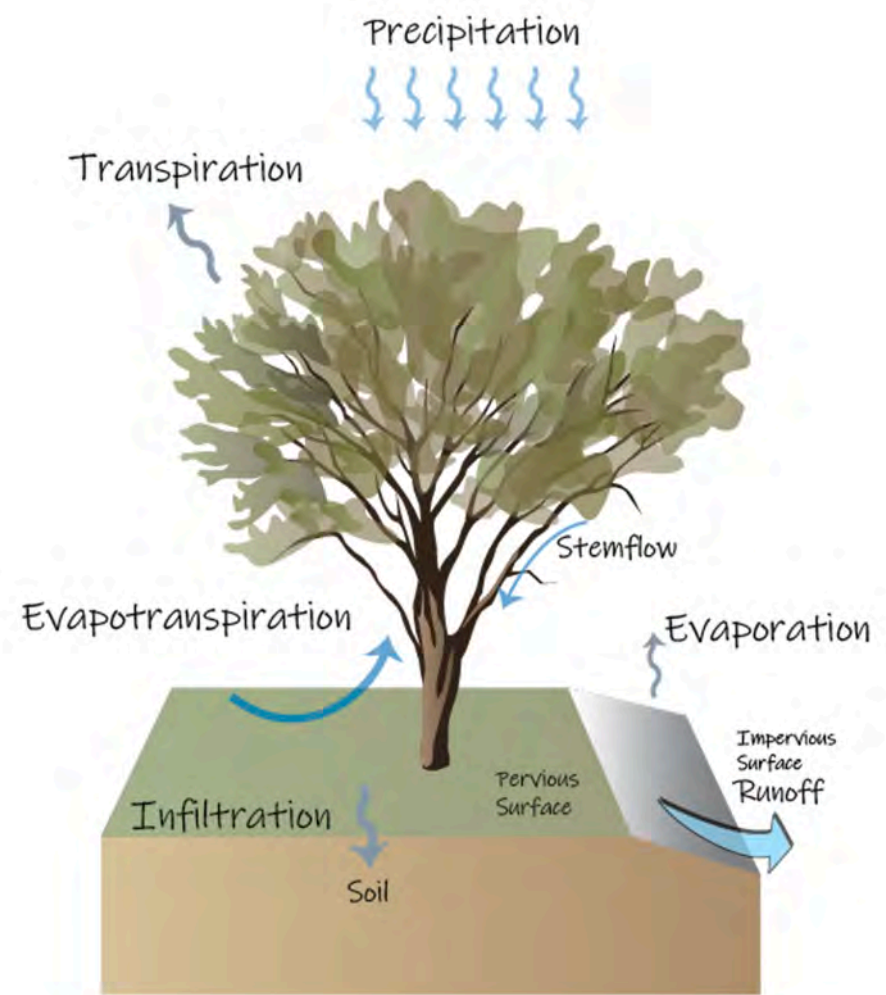


Image Credit: Sarah Hurteau, TNC; IAN Symbols, University of Maryland



# Different Plants Live in Different Soil Water Zones

Each planting zone will have a different community of plants that will do best under these really different soil water conditions.

- ☔ Inundation zones (where water accumulates on the surface) will require plants that can be submerged in water for up to 48 hours.
- ☔ Transition zones (slopes on the edges of the trench or basin) will function best with plants that like extra water and may be occasionally submerged.
- ☔ High ground/uplands (areas bordering the trench or basin) require plants that are drought tolerant and require less water overall.

For more information of which plants do best in our native systems, please visit:  
[www.bernco.gov/plantlist](http://www.bernco.gov/plantlist).



Image Credit: Tess Houle **MRWM**  
LANDSCAPE ARCHITECTS

# Maintenance

- ☛ Check the design plan, if possible, so you know what plants should be there, and how the feature is supposed to function. If plants fail repeatedly, consult native plant list for appropriate substitute: [bernco.gov/plantlist](http://bernco.gov/plantlist)
- ☛ Inspect plants at the beginning of each season (quarterly) and after storm events, checking for healthy plants and pests/disease.
- ☛ Some plants may need to be removed so the feature can maintain function.
- ☛ Prune plants only as needed. Many plants, especially native plants, need little to no pruning. Many native plants, including grasses, need little or no pruning. Native grasses do not need mowing.
- ☛ Don't over-prune trees or shrubs; prune trees and shrubs only if they interfere with human pathways and to maintain sightlines for vehicles in features adjacent to roadways and intersections. Only trim for clearance, not to "shape" the plants!
- ☛ Prune trees for health. Pruning trees for health means:
  - Removing any broken limbs or branches.
  - Removing dead, diseased, and damaged branches.
  - Removing a branch if it is rubbing on another branch (crossing branches) or unwanted multiple leaders.
  - Trimming back one of the limbs when two limbs grow closely together, making a "V" in the branch union. This narrow angle makes for a weak branch attachment that could damage the tree later as the limbs grow larger.

For more information on pruning, please visit the Arid LID website for links to short video tutorials.  
<https://aridlidcoalition.org>



## Native Plant Roots Strengthen and Stabilize the Soil

**Some native plants have roots that extend as deep as 15 feet underground. These plants promote infiltration and reduce erosion.**

**Sod has a shallow root system and does not provide many ecological benefits.**

# Maintenance (cont.)

- ☂ Only remove major tree limbs in winter when the sap is NOT flowing. Deadwood can be removed anytime.
- ☂ DO NOT mound organic or inorganic (rock) mulch around tree trunks like a volcano. Make sure mulch is at least 4 inches away from the tree trunk. The root crown is beautiful and should be seen!
- ☂ Remove any unwanted plants, such as weeds and invasives, as needed and at least monthly and prior to seed set.
- ☂ Check for dead plants and replace them with similar plant types and prioritize the use of native species as they are better adapted to our desert climate.
- ☂ Increase irrigation for new plantings to help them get established. For native plants, establishment periods are 5 years for trees, 3 years for shrubs, and 1 to 2 years for perennials/herbs/forbs. For non-native plants, establishment periods will be longer.
- ☂ Adjust irrigation seasonally. Pay attention to monsoon and/or drought conditions and adjust irrigation frequency and duration as needed (more during hot/dry seasons and less during cool/wet seasons). Non-native plants usually require some winter irrigation.
- ☂ Gradually shift irrigation to less frequent and deeper watering, to maintain soil moisture.
- ☂ If replacing a tree, check the Climate Ready Tree List for an appropriate selection. Visit the Arid LID website for a link to this resource. <https://aridlidcoalition.org>
- ☂ Keep leaf litter and trimmings in place or in the basin bottom instead of removing if not causing blockages. This is free mulch and organic material that supports soil and plant health!
- ☂ Remove invasive weeds using species-specific guidelines (time of year, technique, etc.); for example, control silver nightshade where unwanted but leave in other areas for native pollinators.
- ☂ Weed less by using more organic (wood/plant material) mulch to reduce weed seed germination.
- ☂ Don't spray chemical herbicides; hand pull weeds when they pop up.
  - Pull weeds when they are small and after rain. Weeds are easiest to pull when roots haven't grown too deep yet and the soil is soft.
  - Remove weeds before they set seed to reduce future spreading.
  - Remove unwanted volunteer tree seedlings when they are young.
  - Pull or dig out the entire plant including the root system. If you just cut off the top, the plant will likely continue to re-sprout from the base. A trowel, hoe, or shovel should be sufficient to do the job.

## Tools and Specialized Equipment

Have new plants available to quickly re-establish vegetation in case plants are damaged or removed.

See the general tool list in Module 1



# MAINTENANCE INSPECTION CHECKLIST

## Plant Maintenance

Location:

Weather: Rainfall over last 2–3 days?

Inspector:

Site conditions:

Date:

Time:

### MAINTENANCE NEEDED

#### Frequency—Monthly

1. Check for and remove unwanted plants, such as weeds and invasive plants.  
☐ YES ☐ NO
2. Check for diseased or dead plants and replace them with similar native species.  
☐ YES ☐ NO
3. Check for and manually remove weeds and invasives. ☐ YES ☐ NO
4. Irrigate young plants. ☐ YES ☐ NO

*Comments:*

#### Frequency—Quarterly; after major storms

1. Inspect plants, checking for healthy plants, pests/disease, or other issues.  
☐ YES ☐ NO
2. Inspect irrigation system and adjust as needed.  
☐ YES ☐ NO
3. Remove any dead or damaged branches from trees and shrubs. ☐ YES ☐ NO

*Comments:*

#### Annually

1. Prune plants only as needed for clearance or health (dead, diseased, or damaged branches). ☐ YES ☐ NO

*Comments:*

Inspector's signature: \_\_\_\_\_



# MODULE 6

## Mulch Maintenance

# What is Mulch?

Mulch is a layer of porous material applied to the ground surface that helps to stabilize and reduce water loss from the soil by evaporation. It is an important part of green stormwater infrastructure. Mulch can be applied in stormwater harvesting basins, conveyance channels, or any area where retaining soil moisture, preventing erosion, and promoting healthy plant growth is desired.

Types of mulch include:

- ☛ **Organic mulch** is generally composed of chipped and/or shredded wood and plant materials. Organic mulch is appropriate for almost all applications.
- ☛ **Inorganic mulch** consists of gravel, crushed rock, lava rock, or pebbles and may be appropriate for areas where there are high stormwater flow rates, steep slopes, or where there is heavy foot traffic.

**Organic mulch** is preferable for most applications as it helps to suppress weed growth and contributes to pollutant treatment and healthy soils. Partially composted, shredded woody mulch is ideal because it locks together, making it more resistant to floating or blowing away. Mulch that is partially composted brings good bacteria and fungi that improve soil and plant health.



## Different Types of Mulch





## Organic mulch helps:

- ☂️ retain soil moisture
- ☂️ control weed growth
- ☂️ limit big temperature swings in the soil
- ☂️ prevent erosion
- ☂️ support a healthy microbiome (a community of microbes, such as bacteria and fungi)
- ☂️ treat pollutants through filtration

Organic mulch decomposes over time (which is good for the soil and microbiome) acting as a natural fertilizer for both soil and plants and consequently requires periodic refreshing. When using organic mulch within a GSI installation, use the following best practices (adapted from the DRAFT Bernalillo County Green Stormwater Infrastructure Low Impact Design Standards):

- ☂️ Leaf litter does not need to be removed from the surface of areas with organic mulch.
- ☂️ Avoid organic mulch products containing bark chips or products that are likely to blow or float away, such as pecan shells. Bark chips are naturally water repellant and resist decomposition.



Healthy fungi “gluing” mulch and soil together.

Source: <https://edibleoasisidaho.blogspot.com/2014/10/mold-in-my-lungs-is-good-thing.html>

- ☂️ Keep all mulch at least 4 inches away from the base of trees and plants.
- ☂️ Spread (or re-spread) mulch evenly across the site, especially when mulch has moved during storm events.
- ☂️ Use wood chips, natural material erosion control blankets, or small rock mulch over drill seeded or hand broadcast seeded areas.



# Inorganic Mulch

Inorganic mulch (gravel, rocks) is not preferred, although it may be useful in some circumstances. It does not contribute to the treatment of runoff or to the biological health of soil and plants. It also stores and releases heat. Inorganic mulch is best used on steep slopes where stormwater runoff velocities may be high or where there is a lot of foot traffic, as it provides added stability, and may be paired with landscape fabric to help prevent erosion. If inorganic mulch is necessary, use the following best practices (adapted from the DRAFT Bernalillo County Green Stormwater Infrastructure Low Impact Design Standards):

- ☂ In depressed basins or swales, install a 3-inch depth of chipped wood mulch below a single layer of inorganic mulch of aggregate size of 1" to 2" or large. Chipped (non-composted) wood mulch is recommended to be used under rocks and inorganic mulch materials as it will degrade more slowly than shredded, partially composted wood mulch. OR install landscape fabric in place of chipped wood mulch.
- ☂ Use rock and inorganic mulch where there are high flow velocities (greater than 1 foot/second) to slow down the water and prevent erosion.
- ☂ Rock and inorganic mulch containing fine grains can create additional sediment accumulation and clogging and therefore should not be used.
- ☂ If rock and/or other inorganic mulch is used, plan for maintenance to remove sediment and debris from the mulch; weeds will grow in sediment that accumulates in the rock and inorganic mulch.
- ☂ Dark-colored rock and inorganic mulch materials, such as basalt, are preferred for areas that will be stained by urban runoff. Light-colored rock and inorganic mulch materials are preferred for other areas because they retain less heat than dark colored materials.

Landscape fabrics for weed control are not recommended for use in GSI installations. These fabrics generally prevent stormwater runoff from reaching the soil and plant roots and are only permeable when they are fully saturated. Permeability declines as sediment accumulates on the top of the fabric layer, and can't be corrected without digging up the overlying mulch. Weedblock fabric placed under organic or inorganic mulch collects sediment where weeds will grow, creating additional maintenance needs. Organic mulch, when applied appropriately, is much more effective at preventing weed growth.



TOP: Native mulch  
BOTTOM: Forest floor mulch  
Photos from Soilutions

# Maintenance for Organic Mulch

- ☔ Check for an even layer of mulch. If the mulch is piled up in some areas, move it around so that the depth is consistent.
- ☔ Organic mulch 3-inches in depth should last at least 3 years; mulch may be top-dressed annually to freshen the appearance. If the GSI facility receives frequent or high-volume flows, mulch may need to be refreshed more frequently.
- ☔ Leaf litter does not need to be removed from the surface of areas with organic mulch.
- ☔ If flow rates of runoff into the basin are high and the organic mulch is regularly washed away, consider installing inorganic mulch or riprap at the inlet to slow down the flow of water.

## Tools and Specialized Equipment

Replacement mulch (see discussion above for appropriate mulch)

See the general tool list in Module 1.



# Maintenance for Inorganic Mulch

- ☔ Sediment and debris will accumulate in inorganic mulch over time; remove sediment and debris as necessary.
- ☔ Weeds will grow in the accumulated sediment; manually remove weeds when present.



# Reference Materials

**Climate Ready Trees List, now available statewide:** <https://www.nature.org/content/dam/tnc/nature/en/documents/Climate-Ready-Trees-Report-Nov2020.pdf>

**Noxious and Troublesome Weeds of New Mexico:** [https://aces.nmsu.edu/pubs/\\_circulars/CR698.pdf](https://aces.nmsu.edu/pubs/_circulars/CR698.pdf)

**Native Plant List:** <https://www.bernco.gov/plantlist>

**Irrigation Quick Reference:** <https://www.youtube.com/watch?v=WWnwg1DpEsU>

**Tree Care Quick Tips:** <https://www.youtube.com/watch?v=hRs3EmjVw9U&list=PL-o5jtJniuba3Pk9sWN94LgHYCIPCaUro&index=2&t=4s>

**How to Plant a Tree:** <https://www.youtube.com/watch?v=sJmi99gxnfQ&list=PL-o5jtJniuba3Pk9sWN94LgHYCIPCaUro&index=4>

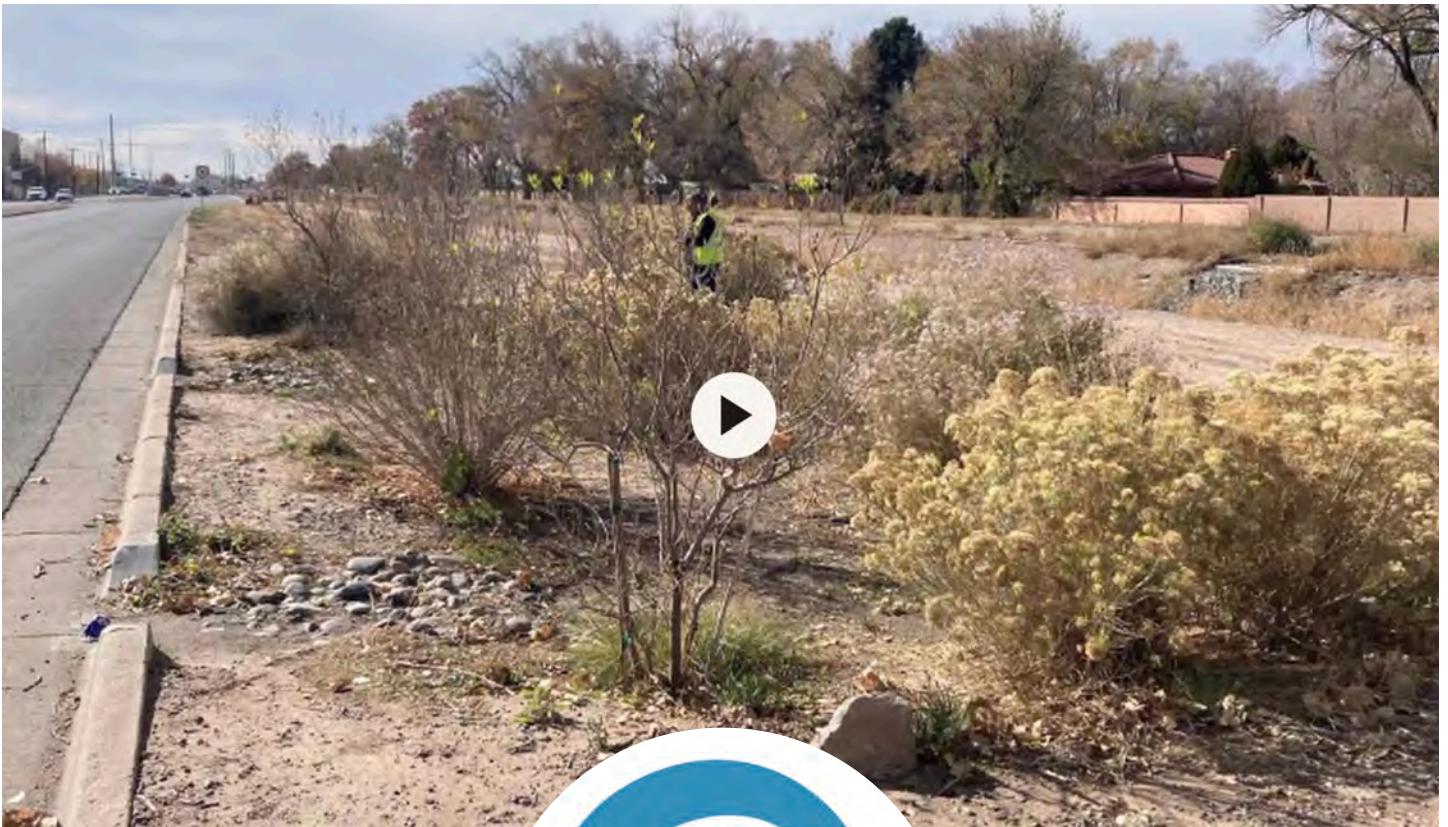
**Tree Pruning Intro:** <https://www.youtube.com/watch?v=tR1EUMzuFP8&list=PL-o5jtJniuba3Pk9sWN94LgHYCIPCaUro&index=5>

**Arid LID website** for short video tutorials on pruning: <https://aridlidcoalition.org>









## MIDDLE RIO GRANDE Green Stormwater Infrastructure Maintenance Videos

[\*\*WATCH TRAINING VIDEOS\*\*](#)





**Making Meaningful Connections by  
Integrating Water Resources Topics  
with Language Arts & Science**

***2022 Report***

Presented by  
Ciudad Soil & Water Conservation District  
Erin Blaz, Education Manager  
Saleema Robinson, Assistant Education Coordinator

**June 2022**

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## **SUMMARY**

This year, funding enabled 39 NM classes (866 students and 41 teachers) to participate in a combination of *virtual and in-person programming* RiverXchange® program. 38 classes were funded for the program, but 39 were placed in the program considering the likelihood that not all bus and substitute funding was going to be used due to the uncertainty of field trip approval and substitute availability. Eight of the fourteen schools we served were Title 1. All program costs and coordination are provided free of charge to teachers. The program required \$56,218.89 in cash and generated a total match valued at \$67,351.11 in the form of in-kind contributions including teacher workshop attendance, presenter time and preparation for virtual presentations, as well as volunteer time from students and adults on the field trips to plant 495 trees in the bosque. Student Capstone Projects reached a total of 3,090 community members about stormwater and watershed health related topics.

RiverXchange® continued to have a successful year, even in light of the on-going global pandemic. One of the challenges this year was managing diverse policies for presentations and field trips across schools and presenter preferences and capacity. The result of these variations meant that students experienced varying levels of contact with the program. For example Rio Rancho schools primarily had video presentations and virtual field trips with live presenters, while one Rio Rancho school actually went on a field trip to Candelaria Nature Preserve. APS students primarily had virtual presentations with a live presenter and almost all APS schools did pole planting. However, in evaluating the program metrics both districts demonstrated knowledge gains and improvements in positive water conservation behaviors and attitudes.

Another significant change to the program this year was the evolution from blogging to the Capstone Project. With the inundation of technology and virtual learning in schools as a result of the global pandemic, it was time to rethink the goals of the blogging component and determine if they really support making meaningful connections for students in water resource education. The goal of the Capstone Project was to pilot a language arts component that would support making meaningful connections with students' immediate community- such as the larger school community or neighborhood. Results from the Capstone Project are shared further on in this report. In summary, much of the work we see is similar to the work that was posted on the blog, except many of the teachers that were able to integrate the Capstone Project challenged their classes to share their work with other classes at the school or even the school administration. This meant the work wasn't going into a digital void where only RiverXchange® staff would view it, but that it rippled out to more local students and adults!

In addition last year RiverXchange®, Bosque Ecological Monitoring Program and Valencia SWCD staff met monthly to discuss watershed and stormwater education collaboration opportunities, such as program continuity across grades and program assessment strategies. This effort continues to help support and improve core aspects of our programs and outreach.

RiverXchange® has demonstrated that its collaborative efforts with partner agencies to bring effective presentations to schools, funding structure to support teacher professional development and field



trips, and management by the Ciudad Soil and Water Conservation District, has allowed it to be not only resilient during times of uncertainty but a valuable resources for teacher and students alike. In fact, RiverXchange® has emerged as a strengthened program that will continue to evolve for years to come and improve how it engages our local community with watershed health and stewardship.

## **PROGRAM DESCRIPTION**

### **Mission**

The mission of RiverXchange is to deepen students' and teachers' understanding and appreciation for their local river ecosystem, motivate participants to protect local water resources by conserving water and keeping their source water clean, and to provide a high quality, high impact outreach opportunity for funders and in-kind contributors.

### **The Big Water Questions**

The optional curriculum frames program outcomes as “guiding questions,” known as *Big Water Questions*. A long term goal of RiverXchange is that students understand these questions and can formulate logical, fact-based answers by the time they finish elementary school. We believe that students who can synthesize water facts to understand larger water issues will have the proper critical thinking skills and foundation for further discussion in middle and high school so that they will become informed citizens and voters on water issues.

#### *Understanding a Watershed*

- Is every place in the world part of a watershed?
- Where does your community's stormwater go?
- How can surface water become polluted?
- How does the water cycle relate to weather?
- How are groundwater and surface water connected?
- How can groundwater become polluted?
- What actions can all of us take to keep water clean?

#### *Water in Our Society*

- In what ways does our society use water?
- Where does your community's drinking water come from?
- Does everyone have the right to use as much water as they want?
- Where does your community's wastewater go?

- What actions can all of us take to conserve water?

### *River Ecosystem*

- How does water affect living things in an ecosystem?
- What role do forests play in a watershed?
- What role do wetlands play in a watershed?
- What are some of the ways scientists can determine the health of a river, lake, bay or ocean?
- What actions can all of us take to improve the health of our ecosystem?

## **Background**

As producers of children's water festivals and other grade K12 water resources outreach in NM since 2007, the RiverXchange program creators observed early on that NM elementary teachers rarely incorporated water concepts in the classroom beyond what is required by the state (e.g., water cycle), and that most elementary teachers considered "water" strictly as a science topic. While teachers personally acknowledged the importance of conserving water and keeping source water clean, they continued to find that upper elementary students had little or no understanding of major water resources topics unless the teacher specifically integrated a wide range of water topics into the curriculum. For this reason, as well as successful festival work with upper elementary students, this age level was selected as the focus for the RiverXchange program.

RiverXchange was created to provide a free program that is fun, interesting, and easy to integrate into the normal curriculum. The hope was to motivate participants to explore water resources topics in depth. The program was originally designed to be carried out over eight months so that students spend more time developing a sense of pride and personal connection to their own river ecosystem, as well as a personal connection to a distant river ecosystem and the students who live near it. Today RiverXchange runs over the course of 3-4 months, as a response to the challenges of implementing a year-long curriculum with the ongoing demands on teachers and students time and requirements for testing and other curriculum.

RiverXchange began in 2007 as a pilot project of Experiential EE, LLC (under a services agreement with the New Mexico Water Conservation Alliance) and the National Great Rivers Research and Education Center, featuring partnerships between two fourth grade classes in Albuquerque, NM, and two fifth grade classes in Godfrey, IL. A curriculum was developed, a field trip to the river was coordinated, and partner classes "met" three times during the year via video tele-conferencing to present what they had learned.

After the pilot project, RiverXchange transitioned to a web-based technology called a wiki. This enabled the program to overcome limitations such as the high cost, availability, and time zone logistical issues associated with video teleconferencing – and easily involve more classes. The curriculum was updated to incorporate the writing component and classroom guest speakers were introduced to reduce teacher workload and bring up-to-date technical information into the classroom. In 2017, the program switched to a blogging platform called Kidblog and in 2021 Kidblog rebranded to Fanschool. Due to the inundation of technology from virtual learning in the global pandemic and the continued barriers to connecting classes on Kidblog/Fanschool, RiverXchange piloted integrating a Capstone Project into the

program instead of the blog in 2021-2022.

In 2012, ownership of RiverXchange transferred to Amy White of Orilla Consulting, LLC, who managed the program through July 2015. In August 2015, RiverXchange became part of the Ciudad Soil & Water Conservation District. In 2020, ownership and the trademark registration of RiverXchange® was transferred fully to Ciudad Soil and Water Conservation.

Since 2007, we have served over 20,166 students!

This year, the program featured the following components:

- Optional standards-based curriculum including hands on science, math, and social studies lessons, as well as writing assignments
- Teacher training on curriculum and Capstone Project implementation
- Ongoing motivational support and Capstone Project monitoring
- End of year teacher survey
- Pre and post student surveys
- Coordination of at least four guest speakers into the classroom
- Coordination of a virtual field trip or in person field trip to the local river or important watershed feature
- Field trip leadership and activity planning

## **2021-2022 PROGRAM OVERVIEW**

### **I. Program Management and Financial Support**

The program timeframe was July 1, 2020 through June 30, 2021. All components including fundraising, design, planning, implementation, and analysis were carried out by employees and contractors of Ciudad Soil & Water Conservation District, including:

Erin Blaz  
Jenny Lloyd-Strovas  
Astrid Hueglin  
Saleema Robinson

### **SPONSORS**

- Southern Sandoval County Arroyo and Flood Control Authority (SSCAFCA)
- Middle Rio Grande Stormwater Quality Team (MRGSQT)

**Sponsors provided a total of \$56,218.89 in cash.**

**MRGSQT - \$38,532.98 | SSCAFCA - \$17,683.04**

Program expenses included:



- Technology services
- Office and educational supplies
- Teacher workshop materials and food
- Coordination services (planning, implementing and assessing all program components)
- Bus funding
- Substitute funding

## **IN-KIND PARTNERS**

- Albuquerque Water Utility Authority
- City of Albuquerque – Open Space Division
- City of Rio Rancho – Environmental Programs Office
- City of Rio Rancho — Parks, Recreation and Community Services Department
- Sandia Labs
- Sandoval County Cooperative Extension
- Bernalillo County Cooperative Extension
- Rio Grande Return

### **In-Kind contributions totaled \$67,351.11**

In-kind contributions included virtual guest speaker coordination, prep and presentation time. The City of Albuquerque significantly increased their match this year by including a pre-lesson kit and/presentation to classrooms. Additionally, in-kind match was able to return to a pre-2020 range due to the allowance of pole planting field trips, where student and adult time and trees are counted as match through volunteer time and materials.

## **PARTICIPANT SELECTION**

All 39 participating NM classes were fifth grade classes, distributed as follows:

<b>FUNDER</b>	<b>MRGSQT</b>		<b>SSCAFCA</b>	
	<b>SCHOOL - Number of classes</b>	<b>Number of Students</b>	<b>SCHOOL - Number of classes</b>	<b>Number of Students</b>

*Title 1 school	La Mesa* - 4	92	Colinas del Norte* - 5	109
	Valle Vista* - 3	53	MLK* - 4	98
	Duranes* - 1	19	Sandia Vista - 4	92
	Seven Bar - 3	79		
	John Baker- 3	67		
	Zia- 2	40		
	Monte Vista - 2	52		
	Cochiti* - 2	27		
	North Valley Academy - 2	52		
	Manzano Mesa* - 3	61		
	Maggie Cordova* - 1	25		
<b>TOTALS</b>	<b>26 classes</b>	<b>567</b>	<b>13 classes</b>	<b>299</b>
<b>RX Total Classes</b>	<b>39 classes</b>	<b>RX Total Students</b>	<b>866 students</b>	

## **PRESENTATION TOTALS**

Program presentations were completed as follows:

Agriculture: 39/39

Stormwater: 39/39

Wastewater: 39/39

Drinking Water: 39/39

Landfill Presentation: 14/14 (Rio Rancho only)

## Field Trips

Virtual: 14/14

Pole Planting: 21/21

Candelaria Nature Preserve: 4/4

## **I. Program Components**

The core curriculum of RiverXchange® is delivered through a series of in-class presentations provided by our partner agencies that are guided by the “Big Water Questions” that aim to build an understanding of watershed health. Additionally the field trip, in partnership with City of Albuquerque Open Space, has remained a core component of our program by offering students the opportunity to participate directly in a restoration project to understand the value of action and stewardship as a community effort. The field trip also offers an opportunity for participating students, who come from diverse backgrounds and have varied relationships with the outdoors, a chance to connect with an important, local watershed feature and build a connection to their local river. Furthermore, beyond the core components of RiverXchange®, the program also supports a more robust understanding of watershed health through teacher facilitation of the Capstone Projects and other additional lessons that are demonstrated at the teacher workshop. Extensive resources can be found on the RiverXchange® website but we have found teachers are at their capacity often don’t utilize those resources. Each year we continue working on developing a more streamlined program.

A review of this year’s program components follows.

## **PARTNER AGENCY PRESENTATIONS**

### **APS**

The Water Utility Authority has a new presenter, Rhea Trotman, who is replacing Theresa Dunn - the long time WUA educator for RiverXchange. Ms. Trotman provided the drinking water and wastewater presentations. Brittany Johnson at Bernalillo County Coop Ext. provided the virtual agriculture presentation. The stormwater presentation will continue to be offered via a video recording from Sandia Labs.

### **RRPS**

The city of Rio Rancho offered pre-recorded videos of their drinking water, wastewater and landfill presentations as this year's presentations. Students will also receive the stormwater video from Sandia Labs. The agriculture presentation will be offered virtually by Steve Lucero and Nicole Lujan from the Sandoval County Coop Ext.



### **Field Trip Pre-lesson**

City of Albuquerque Open Space Division Educator Ellie Althoff provided significant support to students understanding the “why” behind planting cottonwoods and willows in the Bosque by offering a River of Change Kit (a model and lesson derived from the Bosque Education Guide). This kit and lesson was provided to classes for their own use or as an in-person presentation with Ellie to explore the first two segments of the lesson - Rio Bravo and Rio Manso - which discuss the pre-settlement ecology of the Middle Rio Grande and flood control impacts due colonization and non-native settlement of the Middle Rio Grande Valley. The final segment of this lesson called Rio Nuevo, where students are prompted to consider the possible restoration and mitigation strategies for flood control impacts on the ecosystem, was completed either on site at the field trip or during the virtual field trip presentation.

## **FIELD TRIPS**

### **POLE PLANTING**

A total of 417 students and 56 adults attended pole planting field trips from APS schools. With the support of Albuquerque Open Space, 495 total trees were planted in an area of the Bosque just north of I-40 on the east side of the Rio Grande. Images of students pole planting are in Appendix XXXX.

### **VIRTUAL FIELD TRIPS**

This year we continued to offer virtual field trips for schools that were not allowed to go on in-person field trips. City of Albuquerque Open Space generously contributed another educator, Ellie Althoff to join Erin Blaz in facilitating these field trips. The virtual field trip spanned 1.45 hours and explored evidence of the flora and fauna in the existing riparian ecosystem, identification of invasive species, strategies for managing forest health and the Rio Nuevo activity.

### **CANDELARIA NATURE PRESERVE (CNP)**

In March, Martin Luther King Elementary School notified RiverXchange® staff that they were just approved for in-person field trips. Pole planting does not have demonstrated success rates into the warming spring months, so we had to come up with field trip location and activities that would work in April. As Ciudad SWCD is now the land manager of Candelaria Nature Preserve in partnership with COA OSD and Rio Grande Return, we collaborated to deliver two field trip dates to serve four classes at this site. Students were able to contribute some hands-on work by mulching berms alongside basins created for nucleated habitats, as well as nature journaling to envision the future of CNP as an agricultural land converted to wildlife habitat, and the Rio Nuevo activity. Wildlife Biologist Kyle Faig also gave a wildlife talk to students. The event was a great success!



Top row: Ellie Althoff and Kyle Bality from Open Space teaching students to pole plant properly. Middle rows - students from various schools planting in varying weather. Bottom 3 pictures: Field trips to Candelaria Nature Preserve



## **CAPSTONE PROJECT**

This year RiverXchange piloted a new approach to maintain the language arts component that has been meaningful to teachers across the years and to strive to achieve a new kind of meaningful connection between RiverXchange students and their community. The coordination budget that has been used in the past for blog support and evaluation went to supporting teachers in the process of completing this capstone project and acquiring documentation of their class projects. The criteria for the capstone project are:

- (1) Students create something new that teaches other about what they learned in RiverXchange
- (2) Students communicate what they learned beyond their classroom in their community (i.e. other classes at school, your neighborhood or city)
- (3) Students design a stewardship project of their own that includes aspects of conservation and sustainability in their community.

Teachers were asked to update staff on their projects in December and March and to share the context of the project as well as who the project would reach and impact. In April teachers submitted their projects via email to staff and 6 classes were awarded with pizza parties to celebrate their project completion. In total, student capstone projects reached 3,090 community members about stormwater and watershed health topics.

## **RIVERXCHANGE COMMUNITY DAY**

As a strategy to both motivate and celebrate the Capstone Projects, staff offered a Community Day at the end of the year where the class projects were highlighted. The event was held on April 23 in conjunction with the Earth Day Celebration at Agri-nature Center in Los Ranchos. The event was publicized to all RiverXchange® classes and families were encouraged to attend.

## **TEACHER WORKSHOP**

Teacher workshops were held Sept 24, 2021 and October 1st, 2021 at the Open Space Visitor Center with RiverXchange facilitators Jenny Lloyd-Strovas and Erin Blaz. The teacher workshops were highly successful, with 19 participants on the 9/24 and 15 participants on 10/1. We found that there were a lot of new teachers this year, not only new to RiverXchange but also new to the field of teaching. The RiverXchange program was introduced and reviewed, with many returning teachers expressing their appreciation for and confidence in the program. The capstone project was introduced, was well-received, and teachers spent time working in groups to plan their projects. We ran through a few teaching strategies for lessons about the watershed using a 3-D model of the Middle Rio Grande Watershed for integrating geographical mapping and layering of life zones, historical development, biological features, etc, with the final layer demonstrating pollution on our watershed model. City of Albuquerque Open Space education staff ran through activities that supported the field trip learning objectives and reviewed the field trip experience and pre-lesson. Dyane Sonier of Rio Rancho Parks, Rec and Community Service introduced



resources and materials available to teachers on the Rio Rancho workshop date (Oct 1). Teachers enjoyed lunch overlooking migrating birds and explored the visitor center. Everyone left with swag-bags!



Teachers from Valle Vista, MLK, Colinas del Norte and Maggie Cordova map the middle Rio Grande Watershed. (top left and center). Dyane Sonier presents CoRR education programs (top right). Teachers rain on their polluted watershed model of the MRG (middle left). Teachers share their capstone project ideas (middle center). Teachers from Duranes and Zia brainstorm capstone projects together (middle left).

## II. EVALUATION

### TEACHER FEEDBACK

Teacher feedback is an invaluable resource for program evaluation and it continues to help us understand what teachers value and where we can improve. This year's feedback continues to reinforce that RiverXchange® remains relevant and impactful in curriculum and content. Feedback demonstrates the RiverXchange program is highly valued by teachers for its ability to provide hands-on and experiential activities that expose students to local watershed issues, reconnect them to the natural world, and demonstrate career opportunities in the science and conservation fields. RiverXchange continues to be a valuable curriculum that teachers use to stimulate the personal and collective growth of their students by encouraging them to use teamwork, adaptability, and communication skills to engage in and build an understanding in complex and new topics. In addition, the capstone project has provided an additional opportunity for teachers and students to engage their greater school community in project based learning that occurs in the program through education, research, and community service. Feedback also demonstrates the RiverXchange continues to be valued for its ability to bring hands-on science in the classroom and teach about water resources issues, while addressing both Common Core English Language Arts Standards and Next Generation Science Standards.

Additionally, when asked to share what successes teachers and the students had with integrating the capstone project, teachers reported that students really enjoyed using the capstone to engage with RiverXchange by creating deeper connections to water issues through direct action and demonstration. Teachers described how their students used the project to educate others about environmental issues,

organize campus-wide clean-ups, and build interactive models to demonstrate key watershed science concepts.

Lastly, when asked how RiverXchange could be improved to support teachers in future years, teachers reported difficulty with virtual programming due to COVID and a desire to return to more in person presentations and field trips next year. Teachers also indicated that more physical supplies for hands-on learning and greater support for the capstone project would help them with supporting their students in meeting program objectives.

Below are a few highlights from the teachers:

**What are the greatest learning outcomes for your class as participants in RiverXchange?**

The exposure to the environmental issues and understanding the environmental issues in the state of New Mexico. - Detrick, Colinas Del Norte

Seeing career opportunities outside of what they know. Giving them the chance to interact with environments that they may not have. - Shafer, Maggie Cordova

Understanding the science of conservation and the importance of valuing life. - Hodges, MLK

My students are more aware of how their behaviors impact the environment.- Granstrom, Seven Bar

I think the hands-on learning approach is the greatest learning outcome. -Filkins, MLK

**Please share any feedback you have concerning your experience with the program this year.**

RiverXchange was extremely successful because my students were enthusiastic to learn about several ways to take care of our natural resources. Example: fixing water leaks, conserving energy by turning off lights and technology, picking up their animal's waste. - Sanchez, Duranes

This has been a wonderful and helpful way to teach about our local water system. It makes a difference if students can see the river itself and know they have a part to play in keeping the Rio Grande! - Beer, Cochiti

We love the program and would like to continue participating in it, hopefully doing it entirely in person for the following school year. - Ceballos, La Mesa

I would like to see a more streamlined, organized program. Having the presentations in person would be best as well. - Marquez, John Baker

Each year, it seems the program continues to improve. The resources and activities were invaluable.- Turrietta, MLK

Great job and thank you for everything you did for us RiverXchange! - Hornbecker, Colinas Del Norte

## **CAPSTONE PROJECT**

In RiverXchange, our goal is that students not only understand their local watershed but that they use their voice to advocate for conservation and proper management of our watershed in their community. This year we integrated the capstone projects to provide a fun and engaging opportunity for students to learn about and advocate for their watershed.

To provide a variety of opportunities for teachers to meet the capstone project requirements, teachers selected from 3 different capstone project levels, each with its own set of criteria. Each level is tied to a particular level of engagement achieved by each class's capstone project. The different levels are described below.

Level 1: In RiverXchange, we want students to be as aware of their local watershed as they are about other environmental issues like climate change. Through creating hands-on projects, students are able to demonstrate what they learn in a fun and tangible way.

- Criteria: Create something new that teaches others about what you learned

Level 2: RiverXchange was founded on the idea that learning is more powerful when students make meaningful connections between their local ecosystem and themselves and then communicate what they learn with others.

- Criteria: Create something new that teaches others about what you learned, Communicate what you learned with your community

Level 3: What sets RiverXchange Excellence projects apart from the others is that they have a stewardship component along with a communication component. We want to support and celebrate classrooms that take education outdoors and convert what they learn into a hands-on, community-based project.

- Criteria: Create something new that teaches others about what you learned, Communicate what you learned with your community, Design a stewardship project that includes aspects of conservation and sustainability in your local community

## **Engagement**

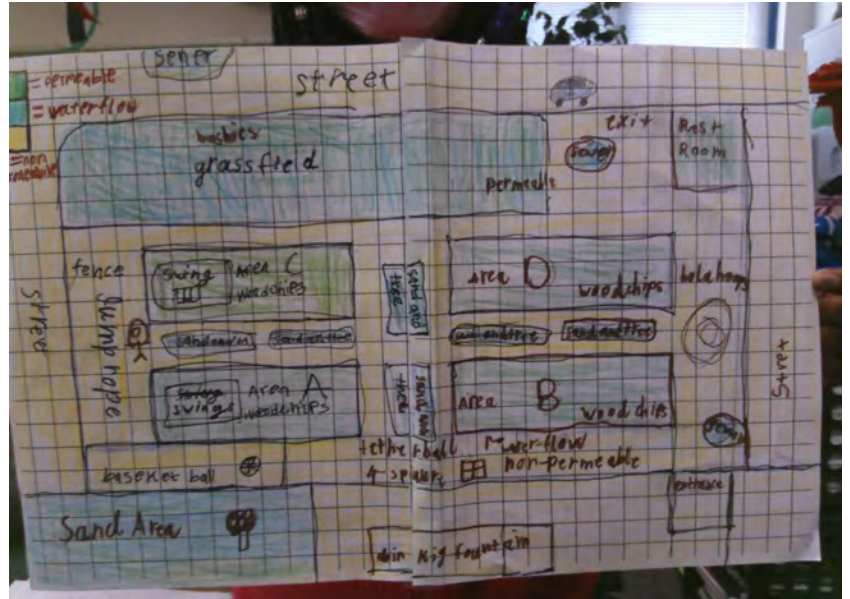
Of the teachers that completed the capstone, most projects addressed criteria 1&2, while only a few extended to criteria 3. Being that this was the first year of integrating capstone projects, staff understood the need to create a ladder system of capstone project engagement for the teachers and students. Having multiple levels of engagement facilitated various kinds of participation based on teacher and student interest and capacity- from presentations and posters to campus-wide clean ups. Some teachers used the capstone project to assess if students achieved the NM Stem Ready/Next Generation Science Standards. Students were engaged by the different capstone projects offered by their teachers, practicing skills in leadership, stewardship, and teamwork. One teacher expressed how the capstone project gave the students the chance to use their talents in new ways.



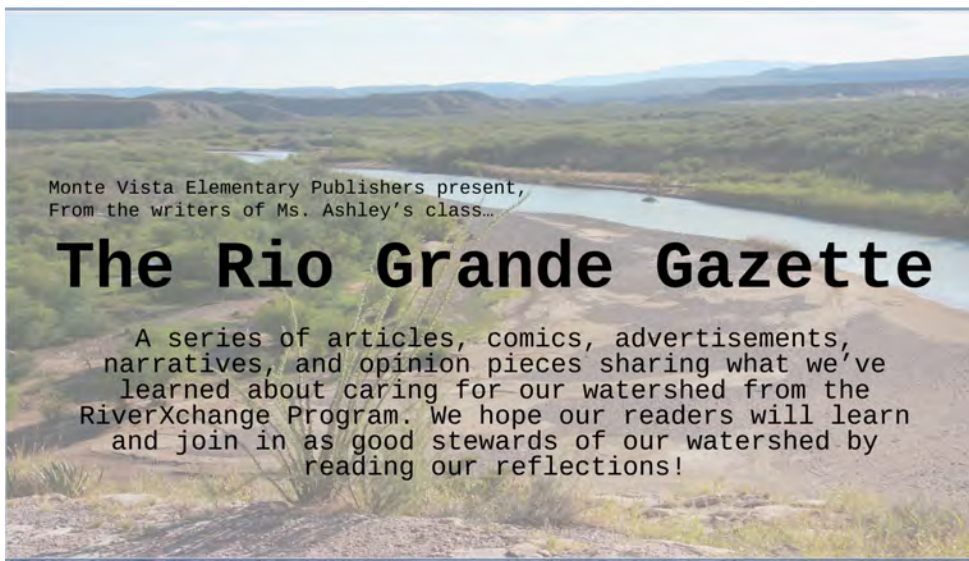




Green City Design- Chacon, Zia



Watershed mapping - Ackerman, La Mesa



The Rio Grande Gazette,  
Whole team, Monte Vista

Plantings using recycled plastic bottles- Gold, La Mesa





## **STUDENT SURVEYS**

A key component of RiverXchange is its measurable goals relating to student performance. We collected quantitative data on student performance by way of a pre and post survey and qualitative data by observing the work submitted via the Capstone Projects. The survey includes questions that relate to environmental attitudes and behaviors as well as knowledge gained relating to our learning objectives.

### **Pre/Post Behavior Survey**

In order to quantify the learning outcomes achieved through RiverXchange, we ask our teachers to have their students fill out a survey prior to and upon completion of the program. Below, you will find a series of graphs used to illustrate the perfect change in responses between the pre and post surveys, as well as some breakout pie charts for further clarification on important topics. This year, 673 students completed the pre-survey, while 669 completed the post-survey. We continue to refine the survey and our programming year after year based on teacher feedback and metrics gathered from these surveys. To view this year's survey questions, use the following hyperlink: [RX 21-22 Survey](#).

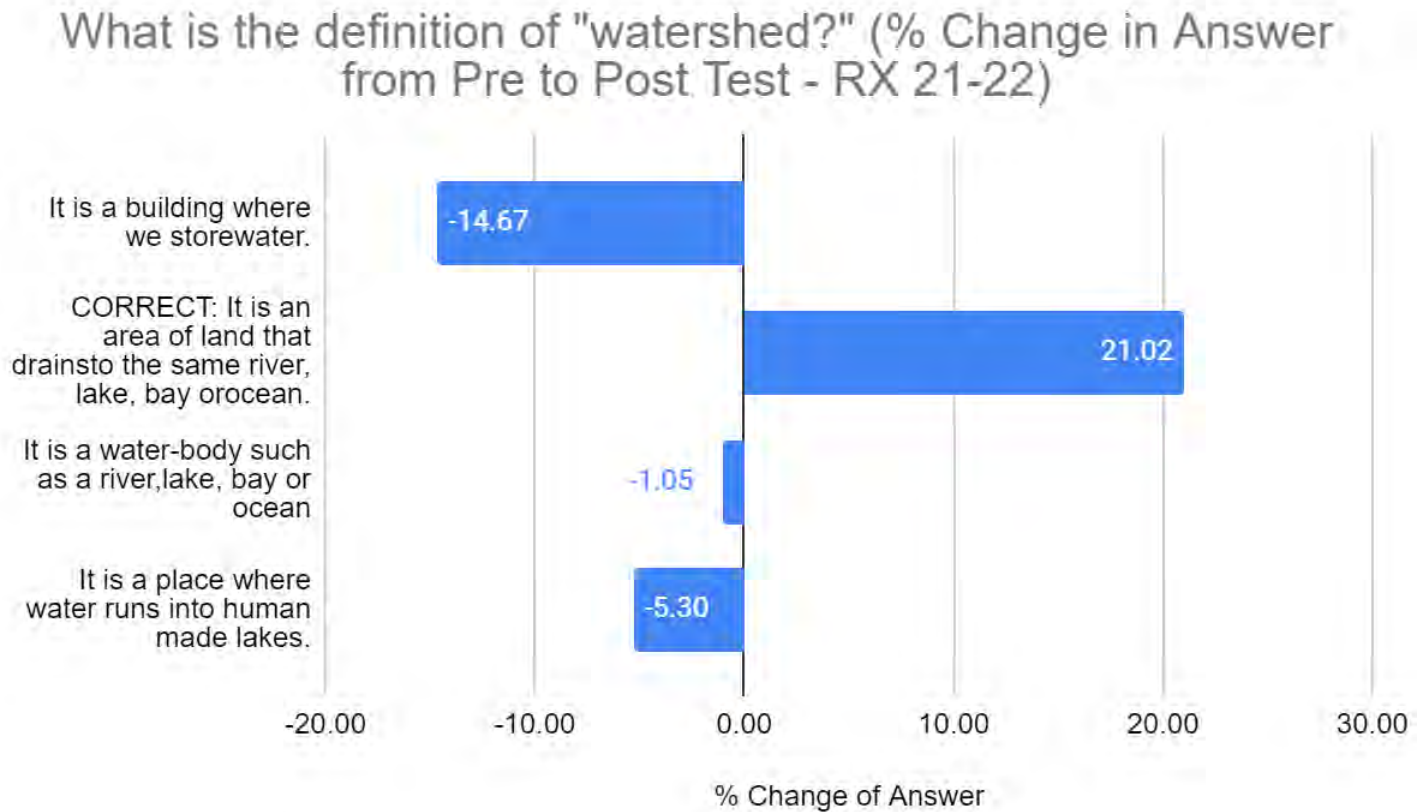
This year, we reframed the survey questions using a likert scale (with varying responses) with the hopes of demonstrating more range in growth across knowledge, attitudes and behaviors. In viewing other similar watershed program surveys, like the Watershed Project from the Bay Area in California, we hoped to look beyond our learning objectives and explore what kind of beliefs students had around water conservation behaviors. For example, in the question that asks how important/impactful are the following actions in protecting and conserving water, we were hoping to see increases from some or mild importance to high importance. Since the questions students had to respond to were all individual actions they could take, this movement to high importance, in theory, would demonstrate that they would feel more conviction to take those actions since they find them important and impactful.

As discussed with the MRGSQT general public survey, beyond collecting general knowledge about stormwater issues or watershed health, surveys can be educational tools as well. For example, asking students to select the positive water conservation behaviors they do “often” suggests that both these behaviors are important and desired. So even if students are answering how they think they should behave versus their action behaviors, this is still an effective tool to increase knowledge about behaviors that are positive for water conservation and watershed health.



## RiverXchange Percent Change Graphs for Pre-Post Surveys for 2021-2022

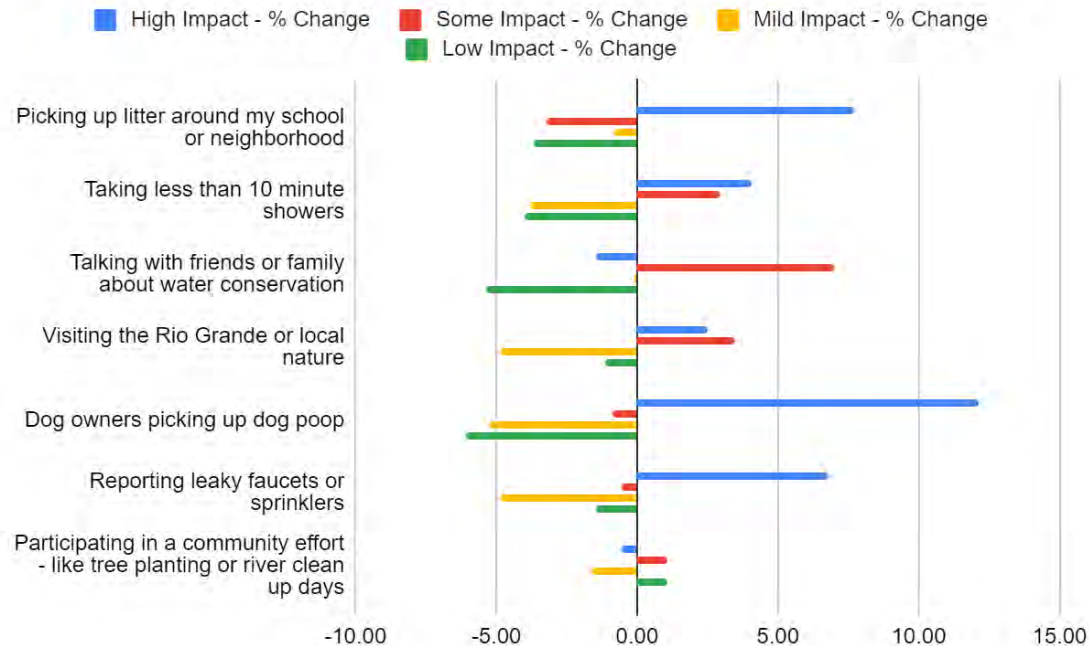
### Watershed Definition



**Results:** We see over a 20% increase of correct answers for a watershed.

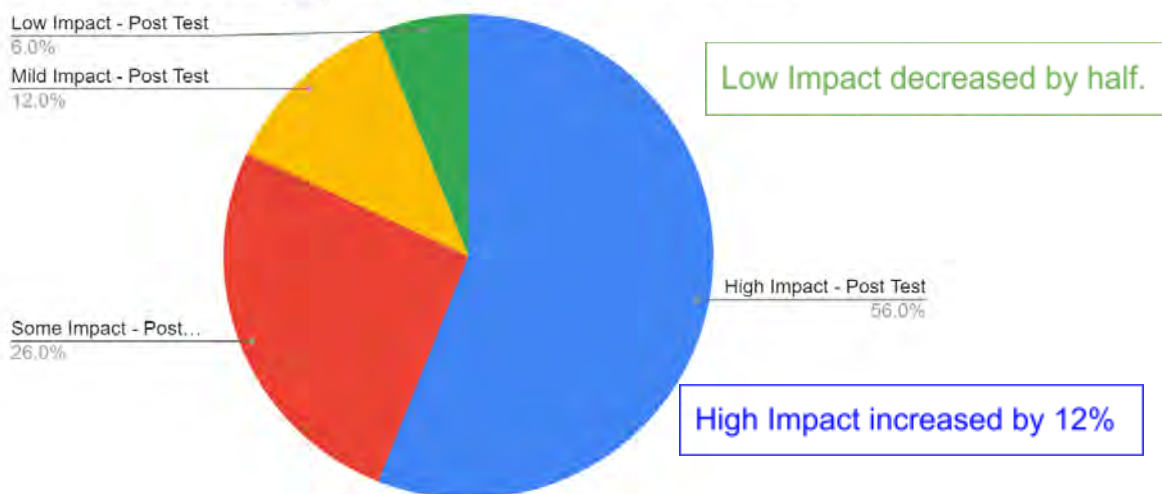
## RX Stormwater & Pollution

How important/impactful are the following actions in helping to conserve and protect our water (choose the level of importance/impact that applies for each statement): (RX 21-22)

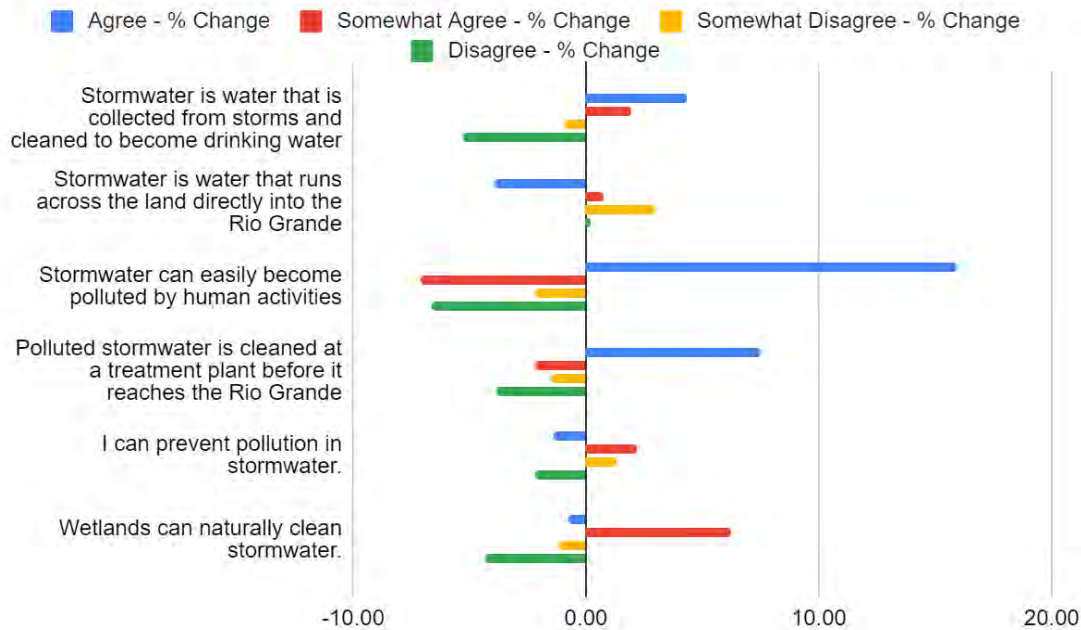


**Results:** Positive attitudes about picking up litter, taking shorter showers, picking up dog waste and reporting leaky faucets all increased after the program. There was also an increase in the belief that talking with friends and family can have some impact in water conservation. Breakout pie chart: In total over 90% of students believe picking up dog poop is impactful in helping protect water.

Dog owners picking up dog poop (Post-Test RX 21-22)



Please select whether you agree, somewhat agree, somewhat disagree or disagree with following statements about stormwater: (RX 21-22)



**Results:** Over the past few years, students seem to struggle with understanding the definition of Stormwater. However, more students agreed that stormwater can be polluted by human activities after the program and over 85% of students agree in total.

Stormwater can easily become polluted by human activities (RX 21-22)

Disagree - Post Test  
3.7%

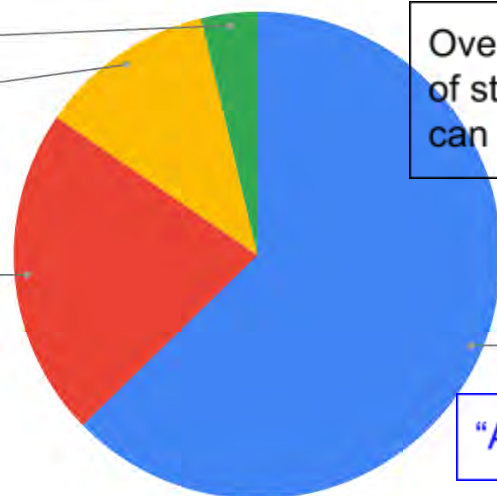
Somewhat Disagree - ...  
11.7%

Somewhat Agree - Po...  
21.9%

Agree - Post Test  
62.7%

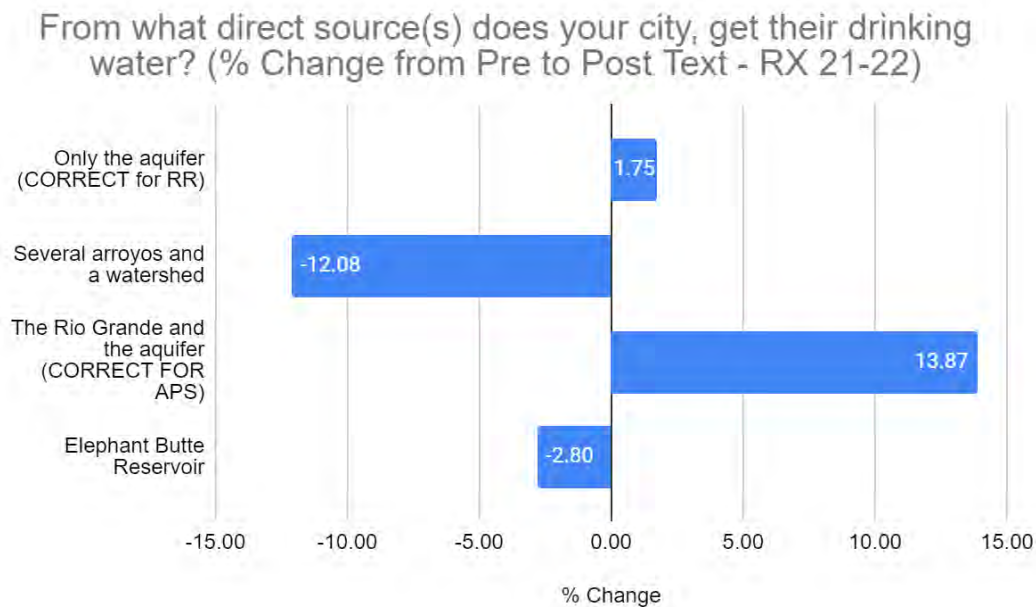
Overall, after Riverxchange 85% of students agree that stormwater can be polluted by human actions

"Agree" increased by 16%

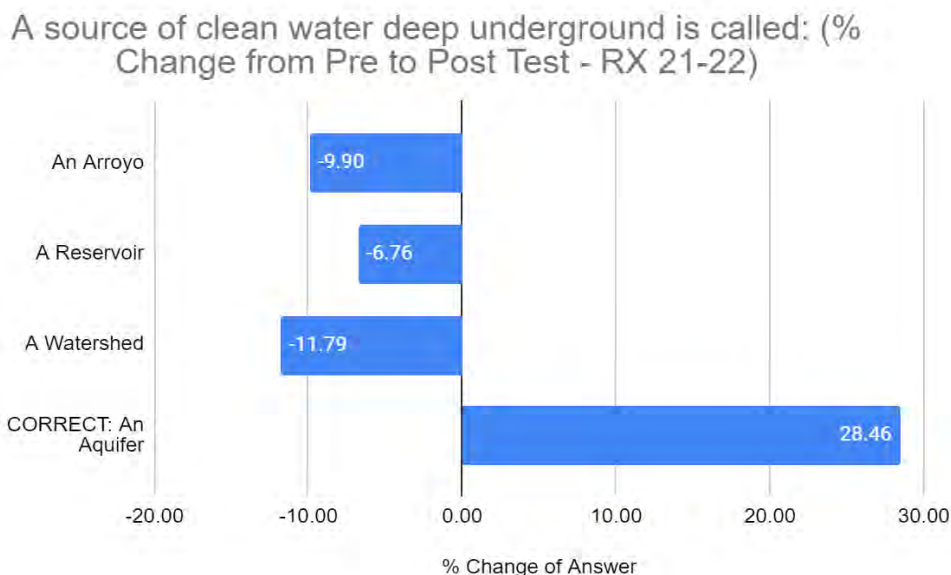




### RX Watersource

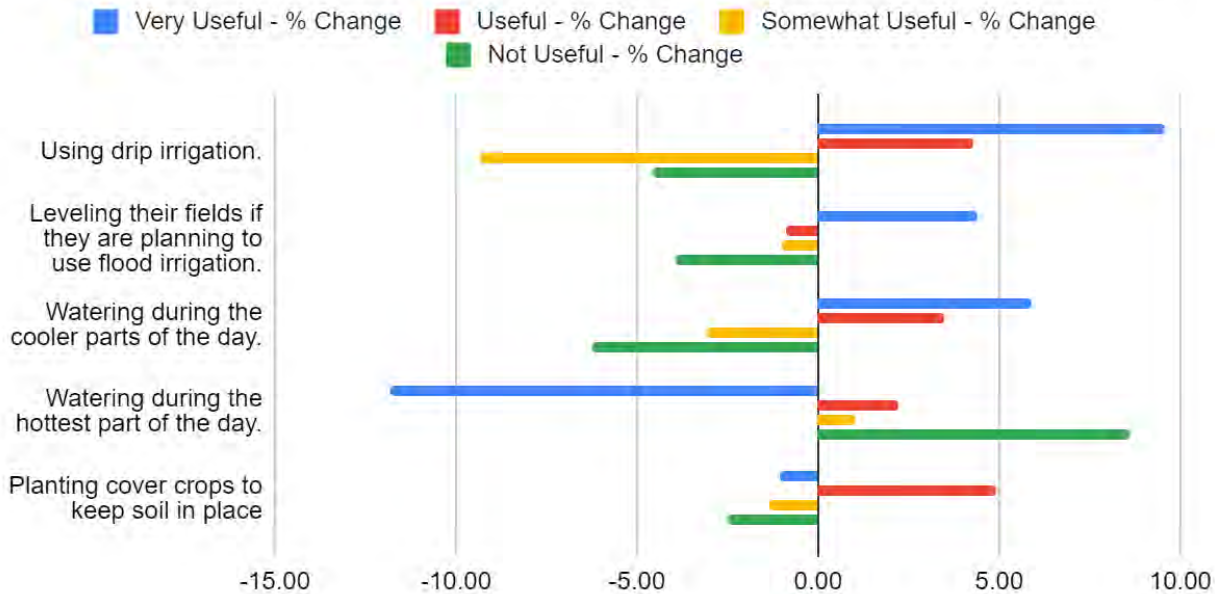


**Results:** In looking at the totals separate by school district, APS overwhelmingly answered the drinking water question correctly. RRPS did not do as well selecting only the aquifer, this could possibly be because this isn't reinforced as much as it is in APS with other programs like The Water Utility Authority Rio Field Trip, and could also be because this lesson was in a pre-recorded video format. However, over 75% of students correctly answered the definition of an aquifer, with a 28% increase post-program.



## RX Farmers

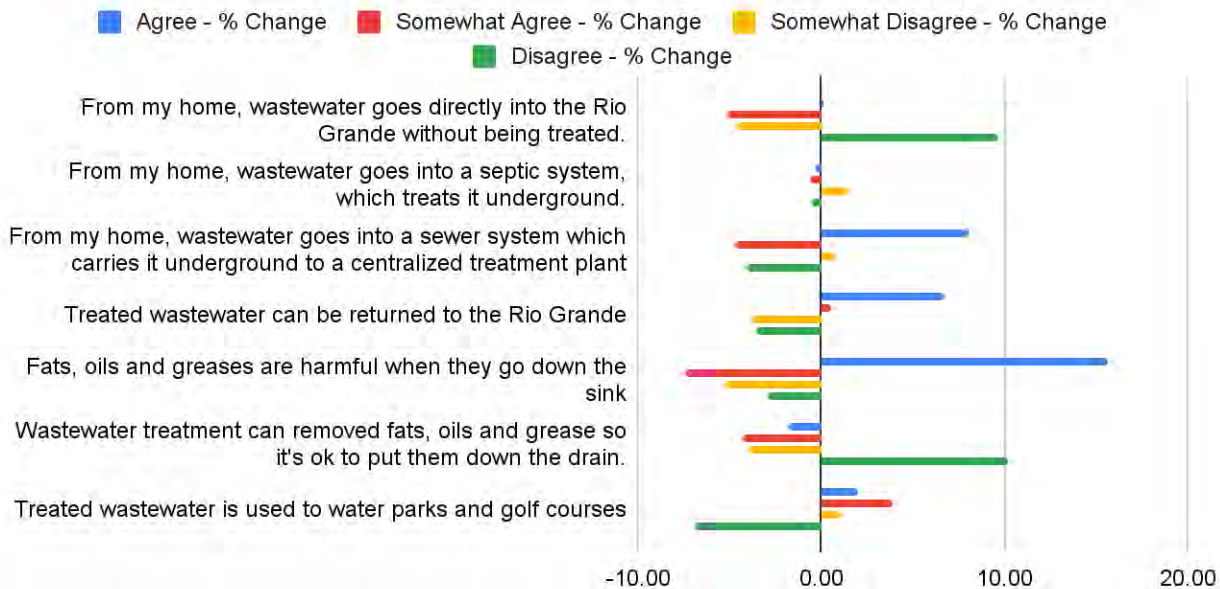
Please select which methods are very useful, useful, somewhat useful, or not useful for farmers to conserve water (RX 21-22)



**Results:** Generally speaking students demonstrate an increase in selecting water conservation strategies in agriculture as “very useful” or “useful” post-program. They also increased the choices of not useful and decreased their choice of highly useful for watering during the hottest part of the day. The agriculture presentations may have touched briefly on the use of cover crops for soil health as a water conservation topic, so while selections of “very useful” decreased, “useful” increased more students may have been considering the topic in the moment, relying on previous knowledge to answer that question.

## RX Wastewater

Select all if you agree, somewhat agree, somewhat disagree or disagree with the following statements about wastewater: (RX 21-22)

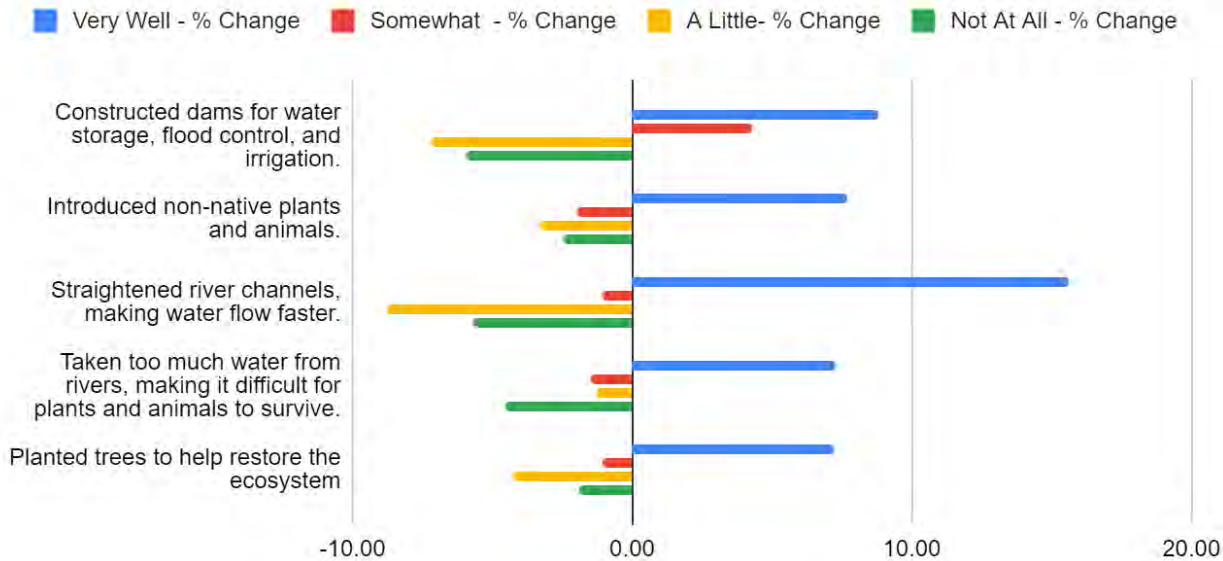


**Results:** Positive growth is demonstrated across all questions except the septic question which may just be confusing because it doesn't apply to every student.



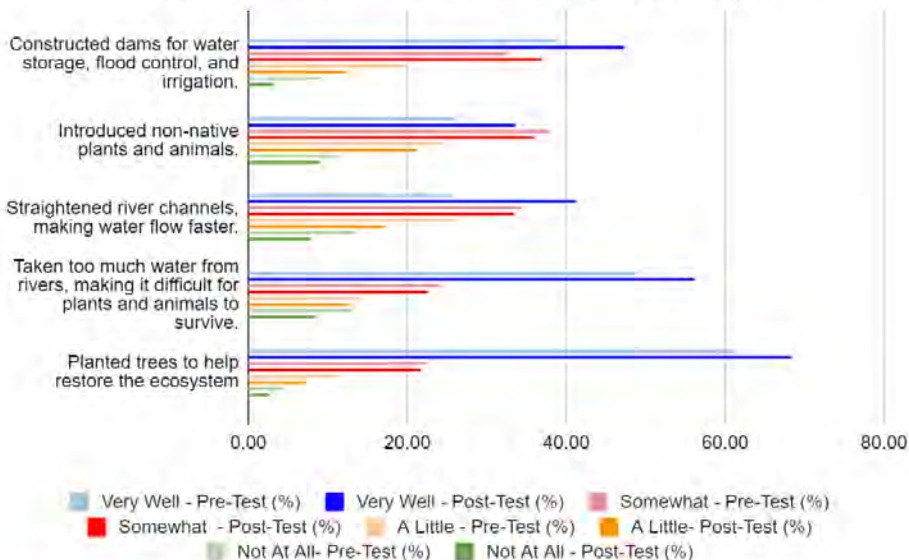
## RX Confidence

Humans have changed our local ecosystem quite a lot. Do you understand the impact of the following changes very well, somewhat, a little or not at all. (RX 21-22)

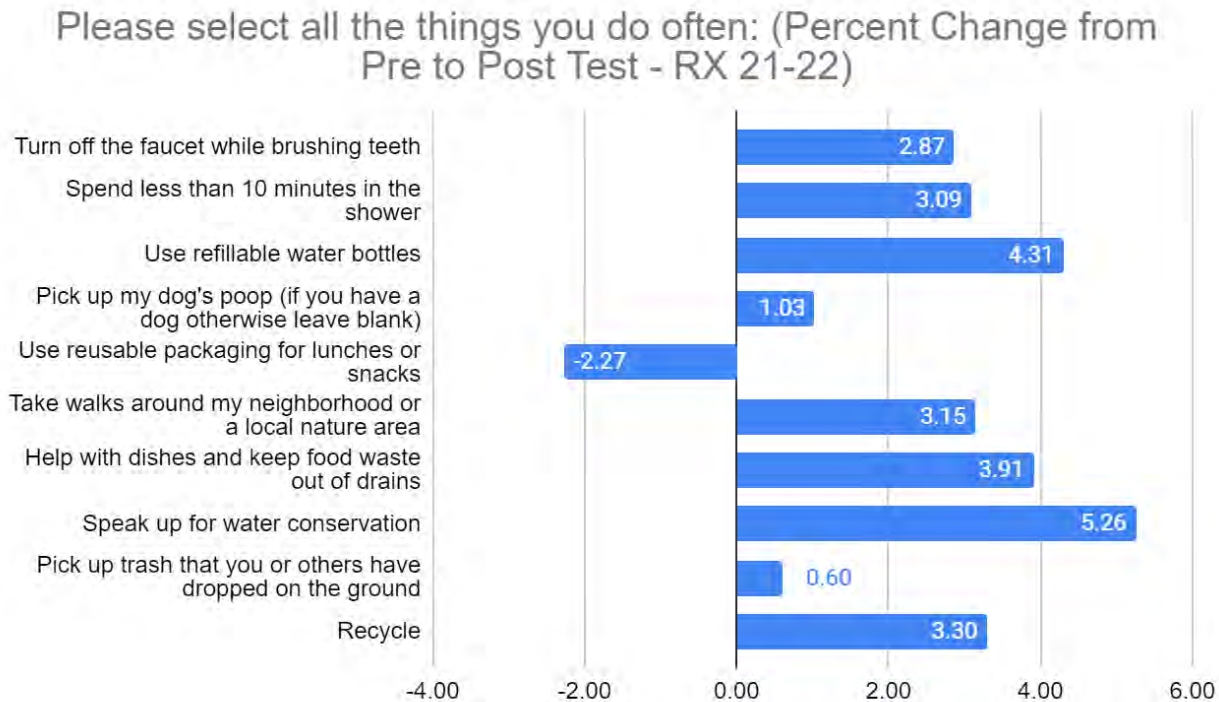


**Results:** The goal of this question was to determine student confidence in RiverXchange learning outcomes. When you look at the percentage of total responses below a lot of students seemed pretty confident that they understood these concepts before the program - which is great! It is also great that after the program in general students increased their confidence and decreased their lack of confidence across all topics. This demonstrates they found the program helpful in supporting their understanding of human impacts on our ecosystem.

Humans have changed our local ecosystem quite a lot. Do you understand the impact of the following changes very well, somewhat, a little or not at all. (RX 21-22)



## RX Behaviors



**Results:** Seeing around 5% change in behaviors from pre to post surveys has been consistent with past years findings. As a fifth grader you might not be changing your behaviors significantly due to family and community behaviors and culture. However, it is exciting to see that the largest percent change was in students speaking up more for water conservation. At this age, this has the potential to shift family and community behaviors more than other behaviors due to the rippling effects of more people taking other actions to conserve and protect water.

The decrease in using reusable packaging could be due to students' increased awareness of food packaging in the cafeteria or home packed lunches or an increased use of single use plastics due to covid concerns.

## Appendix A

### RiverXchange Virtual Field Trip 2021-2022

#### 1. What are we trying to teach students in this activity?

Essential questions:

- What is a floodplain and why is it important? (Rio Bravo)
- How has the Rio Grande floodplain been changed by humans? (Rio Manso)
- What efforts are being made to conserve the Rio Grande Floodplain? (Rio Nuevo)

#### 2. How can we tie this activity to our teaching goals:

Learning Objectives	Methods
The riparian ecosystem of the Rio Grande is shaped by natural flooding.	Observation and finding evidence of: <ul style="list-style-type: none"> <li>● riparian habitat - plants and animals that depend on the ecosystem.</li> <li>● the role of the Cottonwood tree as a keystone species and its dependence on flooding for its life cycle.</li> </ul>
Human impacts have reduced or eliminated flooding.	Observation and finding evidence of: <ul style="list-style-type: none"> <li>● Human impacts</li> <li>● Reduced flooding</li> </ul>
Conservation efforts are now being made to rehabilitate and strengthen the riparian ecosystem	<ul style="list-style-type: none"> <li>● What monitoring methods can be used to determine the health of the ecosystem?</li> <li>● What is being done to restore this ecosystem?</li> </ul>

#### 3. How can we tie this activity to standards?

Using the NGSS framework to explore **Phenomena** and support **Claims** based on **Evidence** and **Reasoning**.

Performance Expectations	DCIs
5-LS2-1 Develop a model to describe the movement of matter among plants, animals, decomposers and the environment	LS2.A Interdependent Relationships in Ecosystems
5-ESS2-1 Develop a model using an example to describe ways in which the geosphere, biosphere, hydrosphere, and/or atmosphere interact.	ESS2.A Earth Materials and Systems ESS2.C The Roles of Water in Earth's Surface Processes
5-ESS3-1 Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment	ESS3.C Human Impacts on Earth Systems

#### 4. How should this lesson be organized?



## I. Introduction

- a. First, the presenters should introduce themselves by name, position, and organization.
- b. A presenter will take the students through the agenda.
  - i. Ask students what they have already done in class—this should be the Rio Bravo and Rio Manso activities. Today, we will be taking them through the timeline again, reviewing and demonstrating aspects of both models that are still present in the Bosque still today. Then, we will be introducing a new concept—Rio Nuevo and doing the model with the river as it is today!
- c. Pan the camera around, can students identify where we are? It is the Bosque!
  - i. Give the students a brief history of the Open Space Division and its connection to the Bosque and other public lands.
  - ii. Describe the importance of understanding and connection to the land. The land needs us just as much as we need it. Part of understanding the land is making observations and questioning the world around us. This will lead directly into the next activity “I notice, I wonder, it reminds me of”

## II. “I notice, I wonder, It reminds me of”

- a. This activity is meant to engage students' observational and thinking skills - to turn on their “nature” brains!
  - i. Let students know you will describe the activity first and then bring the camera to focus on a smaller, up-close frame of our object to be observed.
  - ii. Walk students through each prompt. Describe how these prompts relate to the scientific method (observation, questioning, hypothesis)
  - iii. I notice (the foundation of an observation): shape, size, texture, color, location, etc. These are simply what we see, without labeling their function or what we assume is the function. ) Ex: “I notice a long, thin shaped object that is bumpy, brown colored with small lines on it.”
  - iv. I wonder (the foundation of questioning): Take any statement that we think applies to our object and turn it into a question. “I wonder if something was eating this object that caused the lines? I wonder if this is a plant? I wonder if it is alive? I wonder if it is dormant?”
  - v. It reminds me of: (the foundation of a hypothesis): Making connections to what we already know or can remember helps us make an educated guess to answer our questions. For the purpose of this exercise, we are simply practicing making connections. “It reminds me of a spiral. It reminds me of the colors of sunsets in Albuquerque.”
  - vi. Complete the activity, prompting and modeling as you go.

## III. Rio Bravo

- a. Discussion: Students will have been taken through the Rio Bravo exercise. RX presenter will ask:

- i. Do you remember what Rio Bravo means?
- ii. How was the river shaped?
- iii. What did you place down in and around the river?
  1. Yes! You placed down animals and plants in and around the river. We can still find evidence of the wild river today even though it has changed. Can you name some of the plants or animals that you placed in the Rio Bravo?
- b. Activity: What evidence can we find of the Rio Bravo and ecosystem in the floodplain? (A floodplain is a riparian ecosystem so what we are looking for is evidence of a variety of plants and animals that depend on the river).
  - i. Plant #1 - Coyote Willow (walk around and “see” your first plant)
    1. “Look at this plant! Wow, it’s everywhere here in the Bosque. It’s here... over here... and even over there! (point camera.) Let’s get a closer look. It has long skinny leaves and smooth bark on the branches.
    2. What do you think it is? Vote with your card or write the name on a paper and hold it up.
    3. You’re right! It’s a coyote willow! The way you can tell is that it’s a shrub that always grows next to water, it’s short, and it has long skinny leaves. It’s one of the most common shrubs around water (riparian ecosystems) in New Mexico. Beavers LOVE to eat its branches, but it’s also eaten by porcupines, deer, and rabbits.
  - ii. Animal #1- Beaver (walk to an old beaver chew)
    1. “What do you think has been here?” It looks like something has used long incisors to chew horizontally through the bark. It is a beaver!
    2. Introduce the beaver skull and discuss other adaptations that beavers have that allow them to live in this riparian ecosystem.
      - a. Castor oil that they use to waterproof their fur
      - b. Ear flaps that close so they don’t get water in their ears
      - c. Extra eyelid to see underwater
    3. Could you live in a riparian ecosystem? What adaptations do you have?
    4. Coyote Willow is not the only plant that beavers will rely on!
  - iii. Plant #2- Cottonwood
    1. “If the porcupine is living and eating this tree, we should probably know what it is. Let’s look at the leaves and see if we can figure it out. The leaves aren’t on the tree right now because it’s winter, so let’s find one on the ground. (get leaf). Okay, here it is - it has a heart-shaped (or triangular shaped) leaf with a flat stem that’s also called a petiole. And if I look around, I see them everywhere in the Bosque. I can even see them on the other side of the river! (Span the Bosque then point camera to other side of river.)”
    2. “What do you think it is? Vote with your card or write the name on a paper and hold it up.”
    3. “You’re right! It’s a cottonwood. And not just any cottonwood, but a Rio Grande cottonwood. These trees are a very important species in the Bosque. They provide food for many animals, like the porcupine, beaver, deer, rabbits, and insects. Birds eat the insects that feed on the cottonwood. PLUS, many animals use them for their homes! Porcupines sleep in them, and so do great horned owls. Birds make their nest in them. Squirrels live in them. They are a

very important part of a healthy Bosque ecosystem. And the way you identify them is by looking for their heart shaped leaves.”

iv. Animal #2- Porcupine

1. Look up in the cottonwood tree: do you see anything there?
  - a. Option 1: I see a porcupine! It is just a small bundle of quills that is resting in the nook between two branches!
  - b. Option 2: I see a bunch of branches without bark on them. Who did that? It was a porcupine!
2. Porcupines live in the canopies of cottonwood trees because that is where their food is! Porcupines eat the same thing as beavers, which is the cambium, or inner layer, of the tree behind the bark. Beavers are chunky and unable to climb, so they cut down trees to get to their food, whereas porcupines are able to climb trees.
3. Can we find any evidence of porcupines on the ground?
  - a. Option 1: I found a track! This track has a bunch of texture on its paw pad. Do you have socks that have texture on the bottom? That helps you stick to the floor and not slide. I bet the texture on its paw pad will help it climb!
  - b. Option 2: I found some scat! How do I know that it came from the porcupine? It's located in the middle of the trail, which is right under a big branch of the cottonwood tree. We can also distinguish scat by its shape, size, and color!

c. Conclusion

- i. Even though the river might not be as wild as it used to be in Rio Bravo, we still have an interconnected system of animals and plants that still live here today! Let's investigate how humans have altered this system in our next section, Rio Manso.

IV. Rio Manso

- a. Discussion: Students will have been taken through the Rio Bravo exercise. RX presenter will ask:
  - i. Do you remember what Rio Manso means?
  - ii. How did humans alter this ecosystem?
    1. Yes! They used jetty jacks, added homes, dams, acequias, and invasive species.
  - iii. What happened to the river?
    1. Yes! The river was channelized and no longer was the braided, meandering river that we once knew.
- b. Activity: What evidence can we find of the Rio Manso in the Bosque today?
  - i. Plant #3- Ravennae grass. Ravennae grass is an invasive species that was brought to New Mexico from Africa as an ornamental and also for soil stabilization. Ravennae is drought tolerant, deer tolerant, and frost tolerant so it thrives in New Mexico. Although it doesn't allow other plants to thrive alongside it. It does such a good job, it outcompetes our native grasses.
    1. Can you name some ways in which invasive species can travel?



- a. Underneath boats/aircraft, hikers' shoes, bringing them on purpose (ornamental, biological control, soil stabilization)
  - b. So many more invasive species have made their way to the Middle Rio Grande, but most came on purpose. We just didn't know at the time how problematic they would be.
- ii. What happened in the Rio Manso activity that allowed for the invasive species to move in? Yes, they took away vegetation like the cottonwood trees and native shrubs to make room for the expanded population and their homes! Let's take a closer look at the cottonwood trees here.
  - 1. Cottonwood trees are a keystone species, which means this ecosystem largely depends on their existence and their removal would be catastrophic.
  - 2. To understand better how our cottonwood trees are doing I want to measure their height. Height in a cottonwood tree doesn't necessarily determine its age, but rather how many resources are available to it.
    - a. Explain to students how we use a tangent gauge in order to measure a tree's height. All staff to measure distance to a tree, have students guess the presenter's heights, and then have the students add the measurements to get a calculation.
    - b. Trees that are between 60-70 feet are full grown cottonwoods, but with limited resources. Those old cottonwoods that were close to the water will reach up to 90 feet tall! We can't determine if the whole forest has insufficient resources by just one tree. Let's measure the height of another!
      - i. Proceed with the same process with another nearby tree.
    - c. See how those two trees have a very similar height? Look around at the canopy, what do you notice about the height of all of these trees? Yes, they are mostly the same! We have a very uniform canopy in the Rio Grande Bosque. What resource do you think the trees are not getting enough of? Yes, water! Let's take a look at why these cottonwoods are not getting enough water.
- iii. Do you remember what the impact of jetty jacks, levees, and dams did to the Rio Grande in the Rio Manso activity? Yes! They channelized the river or made it straight.
  - 1. One reason that these cottonwood trees are not getting enough water anymore is because the river does not flood as it would have naturally done before construction.
  - 2. I need your help to run a little science experiment! I want to see whether a meandering river or a channelized river goes faster.
    - a. I want you to form a hypothesis, can you share what you predict will be the answer?
    - b. Now, I am going to run two different tests. One in which I will walk in a curved line and one in which I walk in a straight line, both the same length. When I say go, begin counting with [presenter #2]

- c. Was your hypothesis correct? The meandering river does run slower! When our river is allowed to meander in cycles slowly and then quickly throughout any given year, the outside to those curves it allows for sand to be deposited and then for cottonwood seedlings to grow. But without those sandbars and moist soil in the floodplain, what happens to our cottonwoods? The seeds cannot grow!

c. Conclusion

- i. Humans have fundamentally altered the Middle Rio Grande, but all it not lost! Humans have also begun to take measures to support a new relationship between our lives and the river. This next section, we have not discussed yet and it is called Rio Nuevo or new river.

V. Rio Nuevo

- a. In the last two models, we were describing what had happened in the past. Rio Nuevo is happening right now and you will ultimately be the ones that get to decide what our river looks like in the future. I want you to be the engineer for me. What would you do to restore the river and make it look more like Rio Bravo?
  - i. As the students submit their answers, we will go one by one and explain how that would alter the model. The model will have been already set up as Rio Manso prior to the field trip starting.
  - ii. Overbank flooding: during years with high winter snowpack there will be lots of water melting and flowing down into the watershed. Engineers could decide to allow for overbank flooding, which would give the Rio Grande cottonwood seedlings a chance to grow! It would also allow for a better cycling of nutrients so that native species have a better chance of competing with the invasive ones.
  - iii. Pole plantings: one way to counteract the decreasing number of cottonwoods is by cutting a long, young branch of an existing cottonwood tree and planting it directly into the ground so that it touches the water table. This branch will then grow roots and form its own, independent tree without the need to grow the trees from seeds.
  - iv. Wetland construction: land managers can create new ponds and wetlands that support the variety of wildlife that used to have a home in the Bosque. Some of these are created by allotting space, constructing the ditch with big machines, and providing water as has been done at the Open Space Visitor Center.
  - v. Fuel-wood reduction: in earlier years, the overbank flooding that would occur would saturate the branches and leaves that had fallen on the ground and allow them to decompose. It would also act as fire suppression. We now need to manually need to stop these fires because the Bosque is dry and has a lot of fuel. One way to stop these fires is by cleaning the area of downed trees and branches, reducing the fuel.
  - vi. Creation of secondary channel: the river used to have many channels as it flowed down the valley. In areas in which a bank may be too high, land managers can remove the excess bank and create a side channel that has enough flow to allow cottonwoods

- to germinate and establish themselves. Sediment from these banks can be replaced in the river to provide for sandbars, which is habitat for certain species (silvery minnow).
- vii. Removal of exotic species: Many different groups have taken to removing a number of invasive species such as saltcedar, Russian olive, Siberian elm, and others. The Open Space Division hosts spring cleanups every Saturday from April through mid-May in which families are welcomed to come out and help remove invasive species. This is something you can learn how to do!
  - viii. Water conservation: the amount of water that people use along the river has a large impact on the health of the Bosque and river life. Pumping more water than is being replenished each year has caused the water table to drop and has made it more difficult for native species to survive. Planting low-water use landscaping, installing rain barrels, low-flow toilets, turning off the water while brushing teeth, and taking shorter showers are things that we can do personally. We can also ask businesses and other entities to self-impose water-use limits so that we are all working together.
  - ix. Jetty Jack Removal: Today, the riverbanks and levees are quite stable. The jetty jacks are seen as a danger to emergency vehicles moving through fires, eye sores, and ultimately the channelization of the river does not benefit the Bosque. Land managers can try to remove the jetty jacks, although it is difficult to do given their size, weight, and difficult access.
  - x. Monitoring: an important part of managing the Bosque is to understand what is happening to the plants, animals, water table, and other ecological functions. Monitoring is the process of collecting, compiling, and analyzing that information. There are many organizations that will do monitoring throughout Albuquerque in order to ensure that what we do going forward will only benefit the Bosque. So many of our previous actions had unintended consequences and monitoring is one way of making sure that we do not repeat mistakes.

## VI. Conclusion



## **RiverXchange Virtual Field Trip Synopsis 2021-2022**

- I. Introduction (Ellie: 10 minutes)
- II. “I notice, I wonder, It reminds me of” (Erin: 10 minutes)
- III. Rio Bravo
  - a. Discussion: (Ellie)
  - b. Activity
    - i. Plant #1 - Coyote Willow (Ellie: 5-7 minutes)
    - ii. Animal #1- Beaver (Ellie: 5-7 minutes)
    - iii. Plant #2- Cottonwood (Erin: 5-7 minutes)
    - iv. Animal #2- Porcupine (Erin: 5-7 minutes)
  - c. Conclusion (Erin)
- IV. Rio Manso
  - a. Discussion (Ellie)
  - b. Activity:
    - i. Plant #3- Ravennae grass. (Ellie: 5-7 minutes)
    - ii. Plant #4- Cottonwood tree / Tangent gauge (Erin: 7-10 minutes)
    - iii. Model of river shape- (Erin: 5-7 minutes)
  - c. Conclusion (Ellie)
- V. Rio Nuevo (Ellie- 30 minutes)
- VI. Conclusion (Erin)



## Southern Sandoval County Arroyo Flood Control Authority



Poop fairy signage placed throughout SSCAFCA flood channels.

# Arroyo Classroom

## 2021-2022 final report

submitted by  
Erin Blaz, CSWCD  
June 2022

### SUMMARY

The Arroyo Classroom program utilizes our natural arroyos as outdoor classrooms and brings local animals into the classroom to motivate 3<sup>rd</sup> graders to respect the arroyos as important wildlife habitat. Orilla Consulting, LLC developed the program in 2012 and initially implemented the program for 7 classes at Maggie Cordova Elementary in Rio Rancho. In 2013, the program grew to serve 20 classes. On July 1<sup>st</sup>, 2015, Orilla Consulting, LLC transferred the program to Ciudad Soil and Water Conservation District as part of the larger education and outreach efforts we are involved in throughout Bernalillo and Sandoval Counties. In the 2021-2022 school year, we served 31 classes within Rio Rancho Public Schools, reaching approximately 32 teachers and 638 students. Funding was provided for 35 classes, however one school did not follow through on the registration process. Communication was made until December of 2021, but it was clear there were significant obstacles to getting the school onboard. Beyond that, Arroyo Classroom had a successful year and continued to bring important watershed education to local schools.

### Participating Schools

<b>SCHOOL</b> * Title 1 school	<b>Number of classes</b>	<b>Number of Students</b>
Enchanted Hills Elem.	5	122
Martin Luther King Elem.*	5	114
Sandia Vista Elem.	6	134
Maggie Cordova Elem.*	5	106
Puesta del Sol Elem.*	5	89
Colinas del Norte*	5	73
<b>TOTALS</b>	<b>31</b>	<b>638</b>



## **Sponsor**

- Southern Sandoval County Arroyo and Flood Control Authority (SSCAFCA)

**Sponsor provided a total of \$19,300.63 in cash.**

## **Deliverables:**

*All presentations were offered virtually or in-person and completed.*

- Watershed Presentations: 31:31
- Arroyo Walk: 30:31
- Bird Presentation: 31:31
- Reptile Presentations: 31:31

## **Program Description**

***Essential Questions:*** What is a watershed and how does water move across it? What important functions do arroyos provide for humans and other creatures? In what ways can we enjoy arroyos safely and learn new things?

- Students characterize arroyos as ecosystems as well as drains
- Students identify arroyo features that support wildlife
- Students describe the plants, animals, birds and insects that depend on the arroyo ecosystem
- Students explain the ways in which arroyos receive water and the dangers of arroyos
- Students recite the rules for arroyo safety

The program consists of a four-part series of lessons, based on grade-level science standards and addressing areas of interest to SSCAFCA, such as bats, burrowing owls, ATV use, pet waste, and arroyo safety. Erin Blaz delivered two of the lessons – an introductory lesson about watersheds, and either an in person arroyo walk or a virtual arroyo walk that tours an arroyo via Google Earth. Hawks Aloft, Inc. provided the virtual bird presentations as they were prepared to and experienced in delivering virtual presentations with live birds. All lessons were adapted for the virtual setting.

This year the virtual watershed lesson expounded on the water cycle and aimed for students to recognize how water moves across hard (impermeable) or soft (permeable) surfaces. Students made predictions about how water sprayed on a sponge and a stone tile (both at an angle) would move differently to represent the function of a watershed. Then we added more to the stone tile to elaborate on the built environment, including buildings, cars and dogs. Finally, we added “pollution” using similar materials to the enviroscape to create oil, dog poop, pesticide and construction waste. In summary, this lesson introduced the concept of a watershed to students, demonstrated how surface water becomes polluted through various human impacts, and discussed the importance of keeping our arroyos clean.

The virtual arroyo walk this year began with a google earth tour of an arroyo to observe its pathway through Rio Rancho, any visible human impacts and demonstrate the draining power of arroyos into the Rio Grande. We also observed tire tracks in the arroyos and talked about not using motorized vehicles in arroyos, as they are not permitted or allowed in the arroyos, and discussed the impacts of illegal use of arroyos. We observed where the mouth of the arroyo meets the Rio Grande and observed that there was not any kind of infrastructure to clean the water as it enters the river on this particular arroyo. All classrooms received a link to SSCAFCA's [Arroyo Safety video](#) as a follow-up to the final presentation.

The in-person Arroyo Walk was approved and completed with 17 total classes. This lesson is about the unique adaptations of arroyo animals and plants, incorporates a walk out to a nearby arroyo from the school and extensive discussion about arroyo safety. The walk starts with a safety discussion about the difference between concrete-lined channels and sandy-bottomed arroyos, and emphasizes that it is never safe to go into concrete-lined channels, while sandy-bottomed arroyos can be visited when there are no clouds in the sky. Students searched for evidence of animals living in the arroyo banks, learned about how lizards and other cold-blooded animals are adapted to the desert environment by moving about to regulate their temperature. They also looked for certain adaptations of desert plants to minimize water loss in the desert. This year, students were extremely excited to go on the walking field trip, as many schools only approved the field trips in spring. A few classes even had a gray fox sighting in a stand of Elms in a drainage area used for the walking field trip.



Top left- Gray fox in Elm spotted by students at Puerta del Sol. Middle top and bottom: Students from Puerta read thermometers to learn about reptile adaptations. Right top and bottom: Students from Colinas look for wildlife evidence on Arroyo.

## Evaluation

Teacher feedback for 2021-2022 was collected from 18 participating teachers. Teachers overwhelmingly say they choose to participate in Arroyo Classroom to teach about local ecology and conservation issues, incorporate more science in the classroom, to offer experiential learning opportunities and to offer learning opportunities that connect to the community. They find the presentations to be uniquely engaging and meaningful for their students, however, across the board, teachers requested for the return to in-person learning. Teachers find that Arroyo Classroom is complementary to other 3rd grade units of study such as life cycles and animal and plant adaptations. Teachers cite that the program is particularly helpful in achieving or developing the following skills: critical thinking and problem solving, communication, assessing and analyzing information, and curiosity/imagination.

### Highlights from teacher feedback:

#### What are the greatest learning outcomes for your class as participants in Arroyo Classroom?

- “That students can take what they learned and apply it to their daily lives.”
- “Students truly enjoy learning about their environment, animals and how to actively educate others.”
- “My class really seemed to learn the most about how the water system within Albuquerque worked.”
- “My class has become more aware of how humans can impact wildlife. They remember the animals we have learned about and are determined to keep the environment clean for them.”
- “They learned a lot about their local area from habitats for rivers to arroyos.”
- “Most of my students could share that the arroyos were important animal and plant habitats and that they had a responsibility to keep them clean, free of pollution and that it wasn't an area for off roading.”
- “My students are more aware of their environment and are more knowledgeable.”
- “They learn about arroyo safety and also about the local animals. They grow their understanding in conservation as well.”
- “That they learn about the environment around them and are more aware of how to take care of it.”
- “Students understand their place in protecting our arroyos.”
- “Learning about the environment in which my students live. Being able to take what they learn and see it around their houses and school.”

## Survey Summary

This is the third year that we've administered the pre and post surveys for Arroyo Classroom. Due to some changes in the program content for this year's virtual program, such as the availability of certain species and specimens offered by our presenters for their virtual presentations, we made some adjustments to the pre and post survey to reflect the content of the program. The survey questions were slightly more generalized and used a “check all the apply” format to address different learning



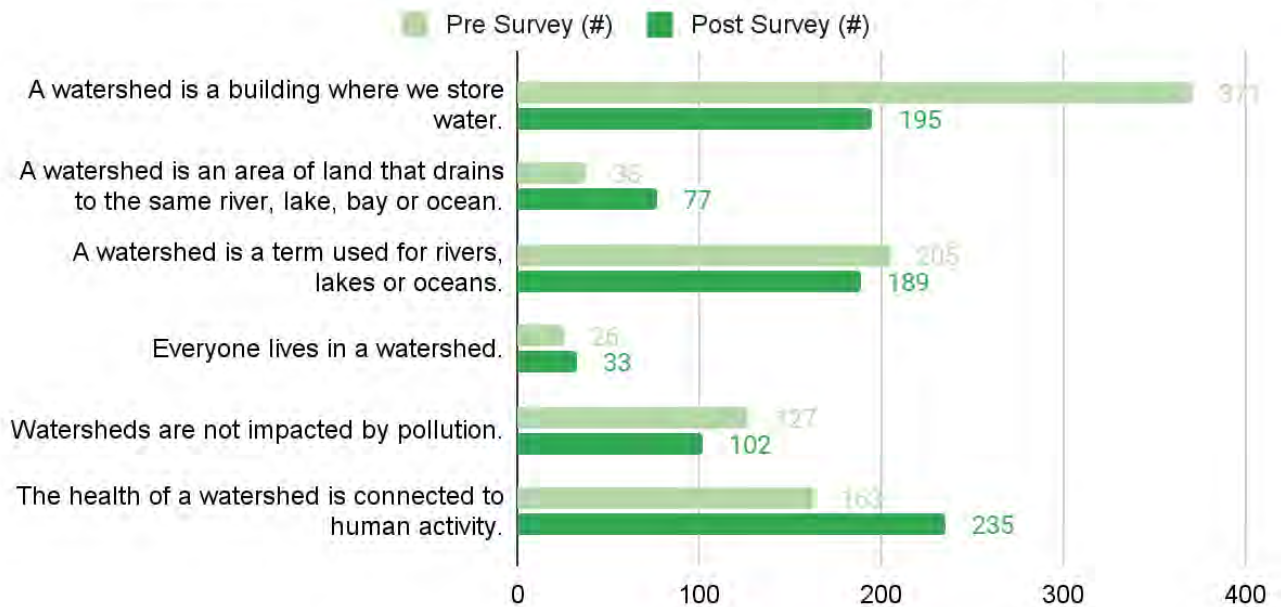
objectives.

This year we had 605 pre-survey responses and 492 post-survey responses. This we formatted the survey responses by total number of responses, rather than percentages.

## Survey Metrics:

### Item 1 Watersheds

#### Select all that is true about a Watershed. (AC 21-22)

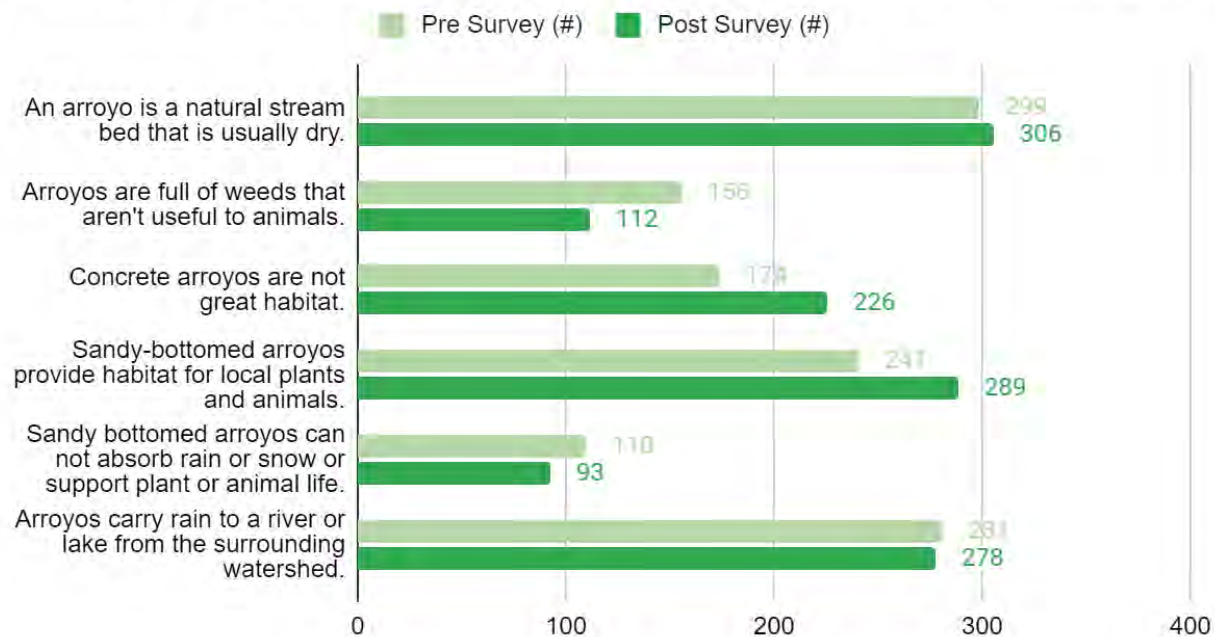


### Comments

This year we do see an increase in correctly defining a watershed (an area of land that drains to the same waterbody) and a decrease in the wrong answer (a building that stores water) but not a lot of students choose the correct definition of a watershed. More students seem to understand that watershed health is connected to human activity, with almost 50% of students choosing this response. This is an important success as ultimately we want them to see themselves as a part of the watershed and that their actions matter.

## Item 2 Arroyo Function and Environment

Select all that is true about the arroyo environment. (AC 21-22)

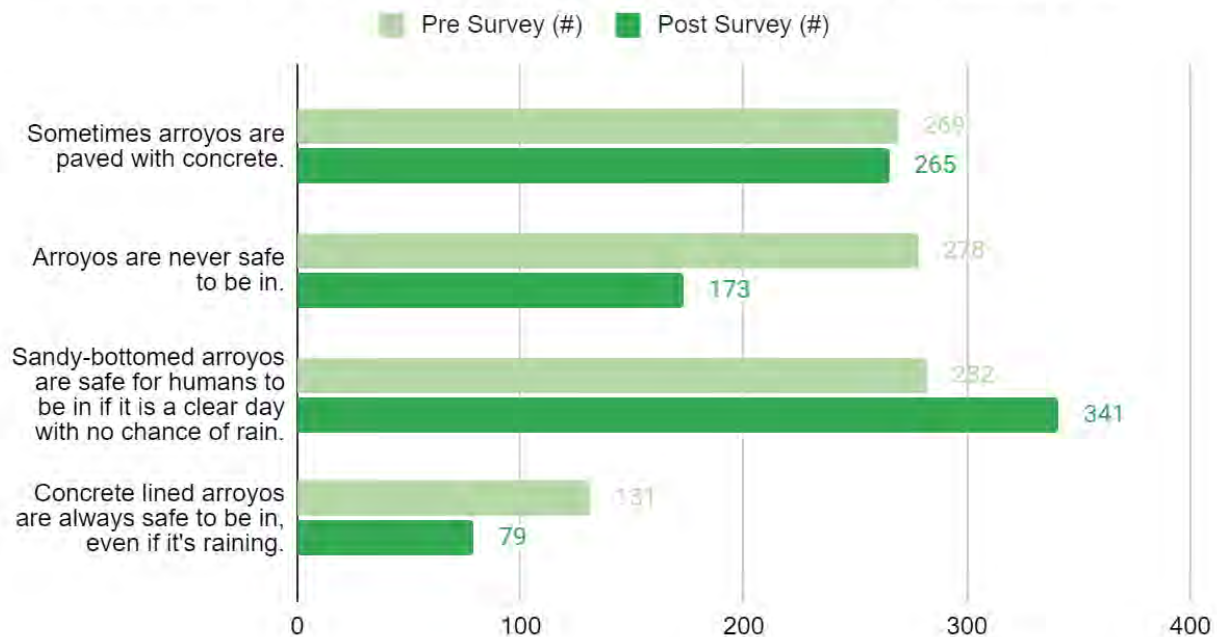


### Comments

Based on pre and post answers, it looks like the students already know what arroyos are or can easily assume based on “natural stream bed” and “carry rain” responses. There wasn’t much movement from pre to post test. However, with an increase in responses about habitat and concrete arroyos not being beneficial to animals, along with a decrease in the question about weeds, students did demonstrate more knowledge about arroyos post program.

### Item 3 Arroyo Safety

Select all that is true about arroyos and safety. (AC 21-22)



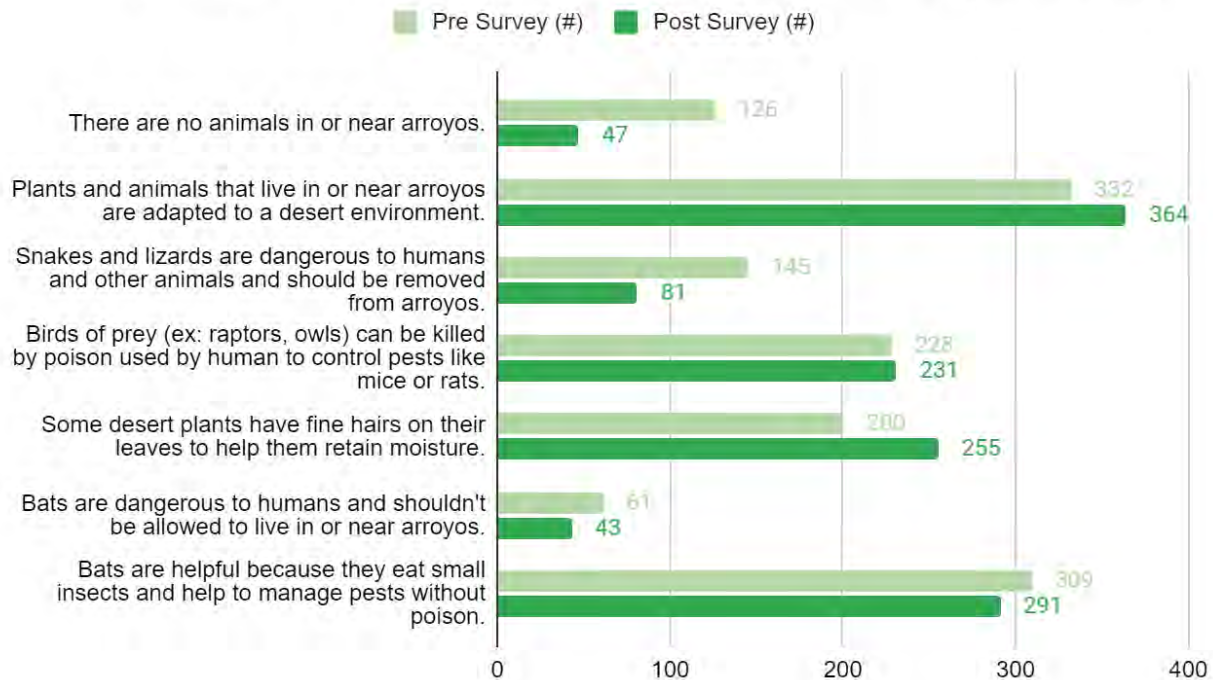
#### Comments

Positive outcomes of this graph are that more students understand the specifics of arroyo safety, demonstrated by a decrease in answers “arroyos are never safe” and an increase in “arroyos can be safe when there is no chance of rain.” However, cultural beliefs and folklore may continue the narrative that arroyos or ditches are never safe to be in, as La Llorona might come for you!



#### Item 4

Select all that is true about local plants and animals. (AC 21-22)

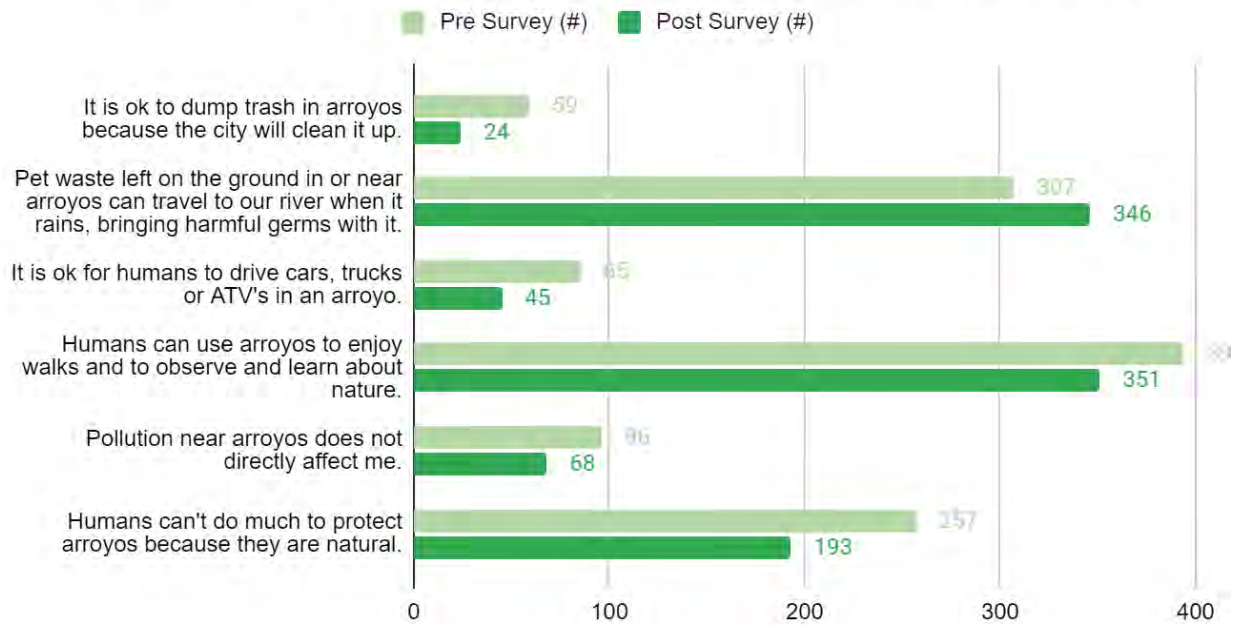


#### Comments

Generally positive outcomes are displayed from these results. Possibly since the 3rd grade curriculum covers adaptations and habitats students are already primed to answer correctly on the pre-survey.

## Item 5 Arroyos and Human Use

Select all that is true about arroyos and human use. (AC 21-22)



## Comments

Positive outcomes for this question sequence are that there was an increase in students answering more correctly about pet waste as a river contaminant.

## Appendix A

### Lesson Plans (Ciudad SWCD delivered lessons)

#### ***Activity Guide for 3<sup>rd</sup> Grade – Building a Watershed***

##### **1. What are we trying to teach students in this activity?**

A watershed is an area of land where all the water flows (or sheds) into a common body of water. We live in the Middle Rio Grande watershed. A natural watershed has many permeable surfaces that help to clean water. Human's build a lot of hard-scapes. As water moves downhill, it carries sediments and other materials to the river. Water is a precious resource and we can help improve the quality of the river by picking up after our pets and not littering or throwing trash on the ground.

##### **2. How can we tie this activity to our teaching goals:**

<b>Learning Objectives</b>	<b>Methods</b>
We all live in a watershed. A healthy watershed keeps water clean.	Using models to demonstrate: <ul style="list-style-type: none"><li>● elements of a “watershed” and how natural watersheds help to clean water and move water around.</li><li>● Humans have impacts on the watershed (i.e. Hardscapes, Pollution)</li></ul>
The amount of permeable and impermeable surfaces in an area impact the watershed.	We observe and make claims about: <ul style="list-style-type: none"><li>● What happens as water moves across “Hard” vs “Soft” surfaces</li><li>● The proportion of hard and soft surfaces around us.</li><li>● How this may impact our watershed.</li></ul>
Pollution increases in human environments. What we can do about it.	Using models we aim to demonstrate: <ul style="list-style-type: none"><li>● Water can be polluted in human areas and is harder to clean with impermeable surfaces. All this polluted water flows to the river.</li></ul> Through discussion we: <ul style="list-style-type: none"><li>● Talk about the importance of being responsible and how caring for the watershed in this way not only protects the water, but also helps the people and plants and animals that depend on the water as well.</li><li>● Picking up after our pets and minimizing our trash, and the trash on the ground helps keep our river clean</li></ul>

##### **3. How can we tie this activity to standards?**

<b>Performance Expectation</b>	
<b>5-ESS2 Earth's Systems</b>	<b>Disciplinary Core Ideas</b>



<b>3-ESS2-1</b> Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season. <b>3-ESS2-2</b> Obtain and combine information to describe climates in different regions of the world.	<b>ESS2.C:</b> The roles of water in Earth's surface processes <b>ESS2.D:</b> Weather and climate
<b>5-ESS3 Earth and Human Activity</b>	
<b>3-ESS3-1</b> Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.	<b>ESS3.A:</b> Natural resources <b>ESS3.B:</b> Natural hazards <b>ESS3.C:</b> Human impact on Earth systems

<b>What we do (Science and Engineering Practices)</b>	<b>How we think (Crosscutting Concepts)</b>
Developing and Using Models Analysing and Interpreting Data Using Mathematics and Computational Thinking Constructing Explanations Engaging in Argument from Evidence	Patterns Cause and Effect Scale, Proportion and Quantity Structure and Function Systems and Systems Models Stability and Change

#### 4. How should this activity be organized?

##### Supplies:

- Large Sponge
- Baking tray
- Filter model (2 liter bottle, upside down with cotton ball, sand, rocks, leaf litter)
- Spray bottle with colored water
- hard surface (flat piece of tile, stone, concrete)
- Slideshow

**I. Introduction (5 minutes):** Hi everyone, I'm ----- and I'm here from a program called **Arroyo Classroom** - a program where you get to learn about your local environment. We are going to learn about your local environment and what you can do to protect and conserve it (Define conservation). You can ask what kids do to help the environment as an ice-breaker.

## **Open Presentation**

**1. Ask if they know what an Arroyo is. Picture on 1st slide.**

An **Arroyo** is a dry stream bed. We don't get a lot of rain here, but water can flow here when it rains. Arroyos flow to the Rio Grande. Arroyo's are a part of the watershed, but we will define that shortly.

**2. First, let's get a discussion going:**

- How many of you used water before you came to school? How did you use it? Where do you think all this water comes from?
- Where do you get your water? How is it cleaned? (Rio Rancho = Aquifer)
- Can we all agree it is important to have clean water for all (including plants and animals)?

## **II. What is a Watershed? What role does it play in the water cycle? (20 min)**

Part A: (5 minutes) We are going to learn about how the land around us helps to clean water.

**1. Review the Water Cycle - precipitation, evaporation, condensation (water cycle dance video)**

- **Important to remember water can't be created or destroyed. We are drinking the same water dinosaurs used. We have to keep what we have clean.**

Part B: (5 minutes)

**2. Introduce the Watershed**

- **What is Watershed video**
- Anywhere water falls on land is a watershed. What isn't absorbed will continue to run or shed downhill until it collects in a body of water. A watershed is an area of land that drains to the same body of water.
- Watershed has different names based on the body of water water ends up in. We live in the **Middle Rio Grande Watershed**. Write down the name of our watershed.

## **STOP PRESENTATION**

Part C: (10 minutes)

- 3. Natural Watershed Helps to Clean Water. Ask students, before each demo what they think will happen and why? What evidence or prior experiences inform them?**
- Absorbs- permeable surfaces (spray water on sponge)

- Moves and Collects Water- (saturation of sponge) Arroyos, Wetlands, Rivers
  - Wetlands attract water loving plants that help filter and clean the water
- What happens to water that soaks in the ground- Filter demonstration - connect it to the aquifer.

**Learning Objective: Permeable surfaces are important for filtering and cleaning water, and slowing it down.**

- **Human impacts** - less natural features in watersheds, more impermeable surfaces, density of pollution
  - Demonstrate water sprayed on hard surface
  - Water doesn't absorb and it moves faster.

4. Compare water in a concrete arroyo and sand-bottomed arroyo, which moves faster?

**Learning Objective:** Concrete Arroyos are never safe. Sandy bottomed arroyos are ok to go in if no chance of rain.

**III. Activity: What is the proportion of permeable to impermeable surfaces outside our home or school? (10 minutes)**

1. **Observe outside** - look at the ground. How much is covered by surfaces that can absorb water like soil, sand, dirt, grass, small rocks, etc. How much is covered by hard surfaces- pavement (driveways, streets, etc). Talk about compacted soils.
2. **Guess the percentage of hard vs soft based on observations.** Students create their own pie chart- labeled Hard and Soft.
3. **What claims can we make about our watershed? What evidence supports our claims**

**IV. What's In the Water?**

*(10 minutes)*

1. **Discuss pollutants. Discuss what happens to polluted water.**

*Experiment with how "pollutants" might travel through their watersheds.*

- What is pollution?
- What forms of pollution exist in our city? Discuss each pollutant:
  - Plastic
  - Factories
  - Motor Oil (suggest a tray under or cat litter to clean it up)
  - Fertilizers (use recommended amount) - eutrophication
  - Herbicides or Pesticides (use recommended amount)
  - Dog Waste
  - Construction Erosion/Sediment



**Learning Objective: With more hard surfaces** - water moves faster, picks up pollutants and heads to Rio Grande without being cleaned.

## **V. Conclusion (10min)**

- What do you think this means for our watershed - the Middle Rio Grande?

*The water we drink comes from our watershed. Animals and plants also depend on this water. That's why it's important that we try not to pollute either the water or the land. Anything that pollutes the land will eventually wind up in the water.*

- What might be ways we could reduce pollution in our watershed?

*By picking up trash and picking up dog poop if we have dogs.*

## **Activity Guide for 3<sup>rd</sup> Grade – Virtual Arroyo Walk**

### **1. What are we trying to teach students in this activity?**

Arroyos function as an important flood control measure and are essential landforms in the upland desert of Rio Rancho. Arroyos are also habitat to plants that have specific adaptations for living in a desert environment that experiences infrequent flooding. We can protect arroyos as habitat and take care of them so they help with flood control.

### **2. How can we tie this activity to our teaching goals:**

<b>Learning Objectives (Students will be able to:)</b>	<b>Methods</b>
Describe arroyos function as flood control.	Using visual models (google earth and drone fly-overs) to demonstrate: <ul style="list-style-type: none"><li>• Arroyos are caused by water flows from precipitation.</li><li>• Arroyos are dry when there is no precipitation.</li><li>• Arroyos lead to a larger water source- the Rio Grande</li></ul>
Describe who arroyos are habitat for.	Using their experience from previous Arroyo Classroom presentations: <ul style="list-style-type: none"><li>• Student recall animals that live in or near arroyos</li></ul> Using models of different climates: <ul style="list-style-type: none"><li>• Students can state plant needs in an arid climate</li></ul>
Desert plants have adaptations that allow them to survive in a climate with a great temperature range, high solar impact and little precipitation. Name a local plant species	Using models we aim to demonstrate: <ul style="list-style-type: none"><li>• Various plant adaptations such as deep vs wide roots, small leaves, fine hairs and spines.</li></ul> Through discussion we: <ul style="list-style-type: none"><li>• Explore how plants can survive in the desert climate, unique traits of cactus, name a specific native plant- Four Wing Saltbush and some ways to identify and find it.</li></ul>

### **3. How can we tie this activity to standards?**

<b>Performance Expectation</b>	
<b>5-ESS2 Earth's Systems</b>	<b>Disciplinary Core Ideas</b>
<b>3-ESS2-1</b> Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season. <b>3-ESS2-2</b> Obtain and combine information to describe climates in different regions of the	<b>ESS2.C:</b> The roles of water in Earth's surface processes <b>ESS2.D:</b> Weather and climate

world.	
<b>5-ESS3 Earth and Human Activity</b>	
<b>3-ESS3-1</b> Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.	<b>ESS3.A:</b> Natural resources <b>ESS3.B:</b> Natural hazards <b>ESS3.C:</b> Human impact on Earth systems

<b>What we do (Science and Engineering Practices)</b>	<b>How we think (Crosscutting Concepts)</b>
Developing and Using Models Analysing and Interpreting Data Using Mathematics and Computational Thinking Constructing Explanations Engaging in Argument from Evidence	Patterns Cause and Effect Scale, Proportion and Quantity Structure and Function Systems and Systems Models Stability and Change

#### 4. How should this activity be organized?

##### Materials:

- [Google Earth maps slideshow](#) of arroyo in Rio Rancho
- [Native Plant and Desert Adaptation slideshow](#)

I. **Introduction:** This is our final presentation for Arroyo Classroom. Today we are going to learn more about the geography of arroyos and native plants that live in arroyos. Icebreaker: What have you learned so far?

##### II. Google Earth Arroyo Tour

- Introduce map and landmarks (Albuquerque, Rio Rancho, Sandia Mountains, Have students recall the name of our river)
- Review Watershed: discuss where the water flows to from different points in the land, begin to draw attention to arroyos on the map.
- Upper Watershed: Discuss how the arroyos are converging from smaller arroyos, note the area around the arroyo has roads but isn't developed yet. Remind students how



important our voices can be to help share what we've learned in Arroyo Classroom so everyone who lives here and might eventually live here can do their part in caring for our environment.

- D. Middle Watershed: Point out that there is more housing, development and hard (impermeable) surfaces at this point in the watershed. Bring their attention to the tire tracks in the arroyo.
  - What are these tracks from?
  - What might the impact be from driving motorized vehicles in the arroyos?
  - Share that it is illegal and why. Discuss other options for those kinds of activities where it is legal.
- E. Lower Watershed: Show the mouth of the arroyo meeting the Rio Grande
  - Ask: Do you see anything in place that would remove garbage?
  - Poll students: 1. Who has seen trash in an arroyo? 2. Who has seen trash larger than a television or microwave? 3. Who has seen trash larger than a couch?
  - What can we do to help keep our arroyos clean and safe for all?

### **III. Adaptations of native and drought-tolerant plants**

- A. Introduce desert plants, share some fun facts about Yucca - state flower, edible roots - yucca fries.
- B. Compare climates - show side-by-side of a tropical climate (dense vegetation, cloudy, waterfall) vs. arid climate (sparse vegetation, sunny, no water). Talk about how plant's needs are different in these climates.
- C. Plant Adaptations
  - i. Dormancy
  - ii. Root systems (tap root or surface)
  - iii. Small leaves
  - iv. Fine hairs on plants
- D. Cactus
  - i. True or False Game
  - ii. Why do Cacti have spines video
  - iii. Photosynthesis and stomata
- E. Four Wing Saltbush
  - i. Adaptations and traditional uses of fourwing saltbush.

# Arroyo Classroom Scavenger Hunt



**Draw or describe each finding**, such as size, color, shapes, texture, smells, location and more. You can even write questions you have about what you found! Please respect the wildlife and take an adult. Good luck!

☐ Wild animals tracks

☐ A plant without leaves

☐ A rock that feels warm or cold

☐ Cactus

☐ A plant with a color other than brown or green. What color?

☐ A wild animal on the ground

☐ A narrow leaf on a plant

☐ A hole in the ground made by an animal

☐ A bird in the sky

Arroyo Classroom 2020-2021

## Appendix B Supplemental Materials

### -SSCAFCA Activity Book and Educational Videos:



### -SSCAFCA handouts:



## Did you know?



SSCAFCA protects our community from flooding and erosion caused by big rain storms, and works to keep **stormwater** clean. Stormwater flows down **arroyos** into the **Rio Grande**.

Bugs like to live in **stagnant water** that collects in ponds and low places in the arroyos. Insects like mosquitoes can carry diseases that make us sick.

Brought to you by:

Almost all U.S. bats feed exclusively on bugs, and 1 bat can eat between 600 and 1,000 mosquitoes and other insect pests in just one hour. One bat can eat its own weight in insects in a single night!

**SSCAFCA**

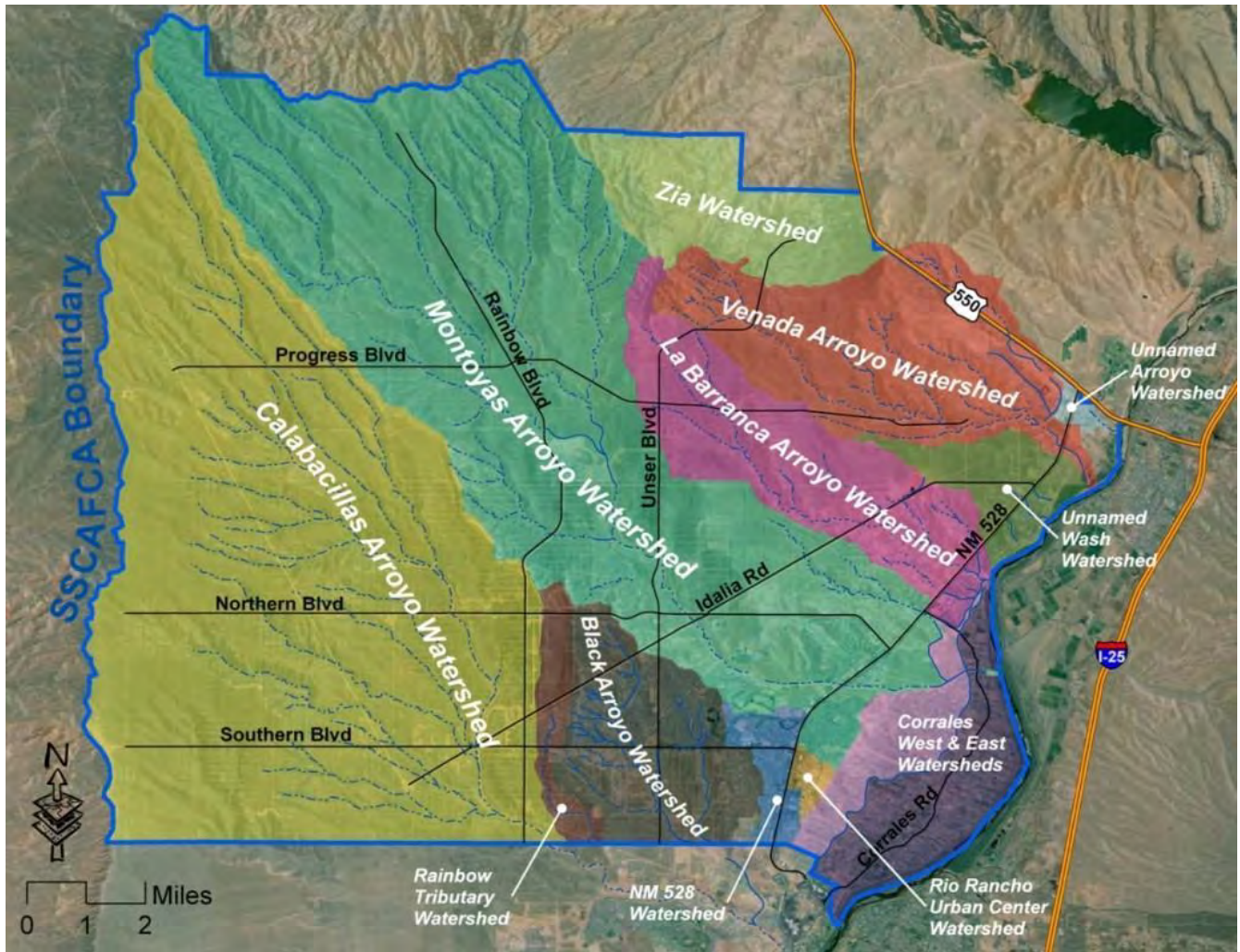
SSCAFCA provides **bat houses** to encourage bats to make their homes near our arroyos, and especially near **detention ponds** where stormwater runoff is captured and allowed to slowly drain.



The more we help bats, the more pests they eat, so we don't have to spray pesticide that could wash down to the Rio Grande and **pollute** it.



## SSCAFCA watershed map:



Arroyo Safety Video:



Water Authority distributed educational bill stuffers, ran radio ads and television advertising.



See the Water Authority television advertising at <https://youtu.be/AJojsyJfnK4>.





# Town of Bernalillo

"The City of Coronado"

Stormwater tips are printed and distributed in the town's water bills throughout the year.  
This includes 3,500 copies each month.



Town of

## BERNALILLO

SEPTEMBER 2022

"The City of Coronado"

MAYOR  
JACK TORRES

COUNCILMEMBERS  
DALE PRAIRIE  
SHARON TORRES-QUIJANA  
PHILLIP VALVERDE  
VINCENT MONTOYA

Town of Bernalillo Recreation Department Presents:

### BERNALILLO YOUTH

#### BASKETBALL PROGRAM 2022-2023

Registration begins Monday, September 12, 2022  
Last Day to Register: Friday, September 30, 2022  
PROGRAM OPEN TO BOYS & GIRLS AGES 5-13 YEARS OLD  
Participants must be 5 years old by October 1, 2022.

Participants turning 14 before  
January 1, 2023 will not be eligible.  
PREVIOUS BASKETBALL EXPERIENCE IS NOT REQUIRED.  
No late registration applicants will be accepted.

#### PROGRAM FEES:

\$60.00 per participant (Due at Registration)

#### SEASON DURATION:

10 game regular season

#### DIVISIONS:

Peewee Division - Ages 5 & 6  
Junior Division - Ages 7 & 8  
Minor Division - Ages 9 & 10  
Senior Division - Ages 11-13

#### Register at:

THE TOWN OF BERNALILLO  
RECREATION CENTER  
370 Rotary Park Road  
Call for more information:  
(505) 771-2078 or  
(505) 771-1262



Town of Bernalillo's Annual

### SCHOOL SUPPLY DRIVE

Accepting school supply donations for the young students of Bernalillo. Supplies are given to students at La Escuelita, Carroll Elementary, and Bernalillo Elementary.

Drop off supplies at Town Hall.

ALL BRAND NEW SUPPLIES SUCH AS: BACKPACKS, COLORED PENCILS, CRAYONS, MARKERS, PAPER, GLUE STICKS, AND SO MUCH MORE IS NEEDED! CALL 867-3311 FOR MORE INFO

### BERNALILLO KIDS COAT DRIVE

We are collecting new coats for the youth of Bernalillo.  
Please drop off donations at Town Hall now through November 18<sup>th</sup>

All child sizes are needed!  
If your child needs a coat, please contact 867-3311 or stop by Town Hall at 829 Camino del Pueblo, Monday-Friday, 8am-5pm.

SHARE THE WARMTH!



### -NOTICE - ROAD RUNNER WASTE - TRASH SERVICE FEE INCREASE

There will be a service fee increase of for trash services for each resident in the Town.

This is due to fee increase in several areas:

- Cost of fuel per gallon
- Disposal at landfill
- Disposal for recyclables

The new price for residential cart fee is \$18.42.

**THIS WILL GO INTO EFFECT ON SEPTEMBER 1, 2022 & WILL BE REFLECTED IN THE BILL PROVIDED IN OCTOBER 2022.**



### YOU MIGHT SEE A CREDIT ON YOUR WATER BILL!

The Town's Utility Billing Department has been hard at work auditing our history files and making sure our customers are being charged correctly on their billing statements. This audit process has indicated that *some* customers will be receiving a credit to their account. If you are one of the customers who will receive a water credit, you will see that reflected beginning in the statement for this month! The Utility Billing Department will not be issuing checks or cash for these credits, we will be applying them directly to the account - which is why your bill may be a little lower than you expected. Any further inquiries about this can be made in writing to [joshua.lujan@tobnm.gov](mailto:joshua.lujan@tobnm.gov), you must include your utility billing account number, name, contact information, and inquiry request. Disclaimer: not every utility billing customer will be receiving this credit.

### KEEP IT CLEAN BERNALILLO

Did you know that fats, oils and grease are draining our drains and sewers? Avoid pouring FOG (Fats, Oil, Grease) down the drain!

Fats, Oils, and Grease are bad for the community. When FOG is washed down pipes, it sticks and hardens. Water in the sewer slows down and starts to produce a foul odor. The FOG can block up the entire pipe, causing sewer backups which are dangerous and cost you a lot of money. Follow these simple steps:

- Pour all greasy/oily waste from pots/pans/fryers into a grease waste container (like a recycled coffee tin can).
- Scrape all food wastes into the trash
- Clean spills with towels and absorbent materials, then throw into trash
- Get on a schedule for regular grease cleaning.

Fats, Oils, and Grease (FOG) can:

- Congeal in underground pipes, cause blockages, and possibly damages pipes and cause sewage to contaminate the area.

For more info contact Public Works Department at 505-771-4832





Middle Rio Grande Stormwater Quality Team  
Final Report prepared by the Bosque Ecosystem  
Monitoring Program

JULY 30, 2022

## 1.1 COMPREHENSIVE OVERVIEW

Historically, culturally, ecologically - the Rio Grande is the heart of our region and the primary resource by which New Mexico's young people familiarize themselves with water. Utilizing its ecosystem as "classroom", BEMP's stormwater science outreach education program aims to teach young people how the health of the Rio Grande is directly related to the health of the surrounding watershed and how they can be stewards in helping to keep the Rio "Grand".

To this end, **7,840 students** throughout Bernalillo and Sandoval counties connected with their local watershed through participation in BEMP activities throughout the 2021-2022 school year. 845 contacts of this total were engaged through purely stormwater science specific lessons.

Due to ongoing pandemic restrictions in the 2021-22 school year, our curriculum shifted to virtual and physical formats to make our activities more equitable and accessible, including adaptations to our stormwater science curriculum to best fit the ongoing COVID-19 scenario. However, as in-person programming became more possible in the 2021-22 school year, in-person visitation to school campuses and the bosque once again became a successful venue for stormwater science education.

In consideration of the implications of COVID-19 on our communities, BEMP's stormwater science program featured synchronous and asynchronous learning resources, as well as in-person programming opportunities. Synchronous resources are remote, live, lessons that include stormwater science concepts and/or projects. Asynchronous curricular components are self-led, virtual lessons that represent a version of the regular stormwater science class and 1-page summer activities; BEMP currently offers five different, 30-minute asynchronous lessons.

Throughout the pandemic, BEMP has continued to support students with accessible, equitable education, including community disseminated educational materials that are actively featured on BEMP's website and social media platforms (See sections 2.2 and 3.0 of this document for more



detailed information). Successful adaptation of BEMP annual events into virtual formats was again necessary to ensure the safety of its participants (Luquillo-Sevilleta Virtual Symposium and Crawford Symposium; see section 2.3). All activities and materials, virtual and printable, are available in English and Spanish to better support inclusion and accessibility to STEM resources for New Mexico's diverse communities.

### 1.1.1 *Delivery of BEMP Annual Report*

The Bosque Ecosystem Monitoring Program (BEMP) mailed out the BEMP 2021 Annual Report on June 11, 2022. This provides a comprehensive overview of the work done during the performance period up through December 31, 2021. The key sections of that report for MRGSQT include:

Pg. 60            Total outreach numbers and list of schools served

Pg. 61            Community Events and Student Presentation Outreach

## 2

### 2.1 STORMWATER SCIENCE EDUCATION AND CURRICULUM

#### 2.1.1 *In-person and synchronous learning.*

#### **3,117 students served**

In response to the COVID-19 pandemic, BEMP education continues to pivot to better support the diverse needs of New Mexico's students, teachers and families by offering a multi-level educational pathway to engage with BEMP programming.

For students able to access the field, classes returned to monthly monitoring whereby lessons were taught in data collection procedures, phenological changes, and stewardship initiatives. Additionally, lessons focused on the geographical origins of the Rio Grande and our local drinking water, watershed

dynamics, and the stability of the Rio Grande's water composition throughout the year. Water input fluctuation was discussed in relation to pollution impacts and other bioindicators of watershed health.

For students who were restricted in ability to leave campus, listening to the needs of its audiences, BEMP education re-envisioned in-person classroom sessions to in-person, outdoor lessons on students' campuses. This was done in conjunction with remote lessons that leverage learning and connection within a student's own place-based residence. For example, for students unable to attend monthly data collections onsite in the bosque, a modified version was established to engage students in precipitation, litterfall and arthropod data collections on their own school campuses. Via exposure to data collection in their own neighborhoods, students gain first hand scientific experience while broadening their awareness of the ecosystem all around them rather than as something distant. Other curriculum development examples include a modified stormwater science activity for elementary ages to invent an arthropod while highlighting the connectivity of macroinvertebrate communities to water health, and an asynchronous series analyzing multiple years of groundwater monitoring data in the Rio Grande Valley to discuss the relationship of resource depletion and potential pollution influences.

Additionally, through this multi-level pathway, stormwater science curriculum was offered during the 2021-22 school year paired as an in-person school visit alongside a remote classroom lesson series. Students engaging in these lessons investigate how storms impact river health by looking at a watershed model, varying community sizes, and the pollutants each one produces. Students then utilize data analysis and data visualization components to learn about permeable and impermeable surfaces to better understand how storms impact the overall water quality of the Rio Grande. Through a cumulative in-person activity, students test water quality samples and macroinvertebrate populations hands-on while learning about environmental justice and water health in downstream communities.

Previous in-person lessons that were re-envisioned to become remote, multi-part, synchronous lessons (Exploring the Outdoors and Bosque Data Jam) remained a success. Both lessons focus on water quality and storm impacts, phenological observation, ecosystem monitoring, climate change, scientific processes, graphing and data analysis, encouraging a deeper understanding of nature in students' backyards while developing career-based skills in the sciences, public-speaking and presentation delivery. As in previous years, at the end of their educational process, students come up with a creative piece to represent the results of their scientific projects that are then presented at one or both of our annual events, BEMP Crawford Symposium (April-May) and/or the Luquillo-Sevilleta Virtual Symposium (April-May - presentations in Spanish). This year, College Career High School focused their research

projects on water quality/storm impact topics where students collected and analyzed their own data as a way to better understand first hand the impacts of storms in their own neighborhoods. Through their projects, students broadened community awareness about this topic with the hope of empowering future generations to make a more positive impact.

Throughout the 2021-2022 school year, BEMP served 3,117 students in 32 different schools and community organizations within Bernalillo and Sandoval counties through these lessons.

Funds that would have covered partial costs for some BEMP educational outreach events (Student Congress or Otter Day) were reallocated for the development and execution of new educational resources, printing and other materials, additional translation efforts to support accessible and equitable education, and staff time in order to continue to support the stormwater science program.

### *2.1.2 Asynchronous learning.*

#### **4,209 students served, 88,973 indirect interactions**

Asynchronous curricular components continue to be designed to meet the diverse needs of students and teachers that otherwise cannot interact with BEMP directly due to timing, scheduling, or pandemic restrictions. As self-led, virtual or printable lessons, BEMP's asynchronous lessons cover a broader array of water quality concepts through various means.

Throughout the 2021-2022 school year, BEMP served 4,209 students within Bernalillo and Sandoval counties through these lessons.

*Virtual Lessons* **233 students** This year, BEMP educators have been expanding on previous remote stormwater science lessons to include groundwater datasets, including what it is, how it is measured and why it is important. Through use of an aquifer model, students look at several years of data to discuss the relationship between groundwater and river health. Additional lesson concepts include watershed model before and after storm events, environmental justice in downstream communities and stewardship components. These lessons are remote, multi-part, asynchronous lessons offered through Edpuzzle, an interactive video lesson platform.



*Self-directed Printable Activities* **3,976 downloads** BEMP has been creating and distributing self-led, printable activities to help students and their families become engaged outside and explore their yards, neighborhoods and public lands while also collecting their own data. Subject examples include stormwater pollution sources and watershed health via the observation of trash accumulation. All activities created have been translated in both English and Spanish and have been uploaded to our website for increased accessibility. Educational resources can be found [here](#).

*Social media* **88,403 interactions** In maintaining initiatives to make educational materials more accessible to members of our community, BEMP has increased its presence on social media channels and continues to grow. Every day of the week, BEMP staff highlight ecological findings, time in the field, educational activities, and resources from partners. Stormwater science related concepts are consistently presented in Water Wednesday posts including topics such as educational resources from RiverXchange, evidence of water pollution and its effect on wildlife, aquatic invertebrate populations and water health, and stewardship opportunities to reduce impacts on water quality and consumption habits. All materials are provided in English and Spanish.

*YouTube channel activity videos* **570 views** BEMP's YouTube channel contains videos of our events as well as instructional videos that supplement activities to help guide students through their lessons. Those videos can be found on our YouTube channel, [BEMP \(Bosque Ecosystem Monitoring Program\)](#).

### 2.1.3 Events

#### **281 students served**

Providing the community with an opportunity to learn how important student-collected data are for informing the management of our urban riparian system, BEMP's annual community events were successfully adapted for another year to include both virtual and in-person components. Featuring a culmination of student presentations that relied heavily on student collected data and employed their professional development and presentation skills, both the Luquillo-Sevilleta Virtual Symposium and Crawford Symposium were a success in emphasizing the importance of water quality and Stormwater Science concepts.

Additionally, BEMP participated in several other community events and educational festivals to spread community awareness of watershed health, monitoring efforts, and inspire stewardship therein. Some examples include participation in Environmental Justice Week with Valle De Oro, tabling events at Jefferson Middle School, and Valencia Soil and Water Conservation District's Earth Day Science Fiesta.

#### *2.1.4 Watershed Education Collaboration Group*

Ongoing collaboration with the Ciudad Soil and Water Conservation District and the Valencia Soil and Water Conservation District as part of the Watershed Education Collaborative Group continues. Mutual collaboration rests on the goal of increasing student awareness about water, watersheds and other related components (historical, present and future) related to stormwater in New Mexico.

Of particular note, two separate activities were developed to support student learning throughout Outdoor Learning Week 2021, Environmental Justice Day with Valle De Oro, and Valencia Soil and Water Conservation District's Earth Day Science Fiesta. These lessons encouraged students' awareness of the water cycle, emphasizing the journey of raindrops and the various point and nonpoint pollution sources encountered on their way to the river. Students also participated in a scavenger hunt to become familiar with stormwater control structures, evidence of erosion, and potential sources of water waste.

Moving forward, we would like to continue building a K-12+ water curriculum that scaffolds student learning about stormwater and water related concepts by age group. In utilizing our partnership, we will collectively discern where each of our organizations educational programming best fit within student's experience and build from those strengths while attending to any gaps in student learning we discover. Our collective aim is to offer continuous exposure to stormwater and water quality subjects throughout each grade level while improving New Mexican youth's accessibility to these subjects.

#### *2.1.5 Assessment tool - IRB update*

This addresses section 2.1.10 in previous reports: Assessment tool of overall effectiveness. BEMP continues to pursue IRB certification so as to officially assess our educational programming and its effectiveness amongst student populations. It is currently being edited to more narrowly refine

questions asked of participants and will again be submitted for review by the IRB governing board; we anticipate its successful acceptance.

# 3

## 3.1 OUTREACH NUMBERS

### 3.1.1 Table(s) of Educational and Indirect outreach numbers for FY 21-22

#### Education and Curriculum

	<b>Synchronous</b>	<b>Asynchronous</b>		<b>Events</b>	<b>Total</b>
		<b>Virtual Lessons</b>	<b>1-page Activities</b>		
Students	3,117	233	3,976	281	<b>7,607</b>
Adults**	859	N/A	N/A	83	<b>942**</b>
Total (Including Adult Contacts)	3,976	233	3,976	364	<b>8,549**</b>

\*\* Adult contacts not included in total contacts reported

#### Social Media

	<b>Reaches</b>	<b>Engagements</b>	<b>Views</b>	<b>Total</b>
Instagram	43,697	7,574	N/A	51,271
Facebook	33,925	3,207	N/A	37,132
Youtube	N/A	N/A	570	570
Total	77,622	10,781	570	<b>88,973</b>





Albuquerque Metropolitan Arroyo Flood Control Authority

# Middle Rio Grande Watershed-Based MS4 Permit General Permit Requirements

## Special Conditions

- Compliance with water quality standards ([Download PDF](#))
- Discharges to impaired waters with and without TMDLs ([Download PDF](#))

## Monitoring and Assessment

### SWMP Minimum Control Measures

- Construction site stormwater runoff control ([Download PDF](#))
- Post-construction stormwater management in new development and redevelopment ([Download PDF](#))
- Illicit discharges and improper disposal ([Download PDF](#))
- Control of floatables discharges ([Download PDF](#))
- Public education and outreach ([Download PDF](#))
- Public involvement and participation ([Download PDF](#))

# Watershed Stewards

## 2021-2022 Final Report

Submitted by  
Erin Blaz, Ciudad SWCD  
June 2022

### SUMMARY

The overall intent of this program is to educate the public on the all-encompassing importance of watershed health, SSCAFCA's role in local watershed management, and to encourage personal commitment to watershed stewardship. This year's program focused on delivering watershed stewards in partnership with activity coordinators at the Meadowlark Senior Center in Rio Rancho and Del Webb Alegria Community in Bernalillo. The program consisted of lecture-style presentations and field trips to local open spaces and other sites of interest, and also included an outreach activity for Pollinator Day at Meadowlark Senior Center in the spring.

The program required funding in the amount of \$10,249.05 generated \$599.00 in-kind match, and reached 135 senior citizens, significantly more than our original target of 25 seniors. A few of the participants returned for multiple events. There were 17 presentations/field trips that lasted from 1-2 hours for participants, reaching beyond our target of offering 25 hours of program this year.

#### **2021-2022 Themes and Locations**

The theme of this year's fall program centered on Green Stormwater Infrastructure (GSI) and included educational presentations and field trips that were specific and relevant to the concepts of GSI and the role of GSI in watershed health. The theme of spring's program was "Walks and Talks" which focused on local wildlife, native and medicinal plants, and brought participants to Arroyo and Riparian areas located within Rio Rancho Open Spaces. All presentations were able to integrate and connect watershed stewards learning objectives to the content, such as stormwater pollution prevention and local habitat protection.

We also offered two events at the Rio Rancho WaterWise Garden, which is an excellent demonstration space for a range of topics. In the fall, the Master Gardeners gave a tour of the garden with a focus on water conservation, plant selection for drought tolerance with a preference on native species and green stormwater infrastructure. In addition to the tour, Sandoval County presented the Rolling River, and discussed the importance of residential and municipal GSI in watershed health. In the spring, Dara Saville of the Yerba Mansa Project completed a very well received talk and tour at the Waterwise garden about native and medicinal plants.

In addition to our normal programming, we also celebrated pollinators at the Meadowlark with a talk about honey bees and a presentation by ABQ Backyard Refuge. During this time we also made bee hotels with participants and passerby's out front of Meadowlark.

## **Building Partnerships**

This year we increased partner support from Sandoval County Master Gardeners and Cooperative Extension office, Dyane Sonier of City of Rio Rancho Parks, Recreation and Community Services and Dave Gatterman of SSCAFCA, which generated some in-kind match to support the program. Discussions with Dyane Sonier focused on taking a reciprocal approach to engaging the local community in areas where our different programs align. There was hope to invite watershed stewards to help plant the new pollinator garden at the WaterWise Garden, but timing did not allow for this event to include Watershed Steward participants this fiscal year.

## **Stewardship Opportunities**

One of the goals of the Watershed Stewards Program is to encourage personal commitment to watershed stewardship, and while the presentations and field trips offered build knowledge around stewardship strategies, program staff continue to seek out ways to engage our participants in hands-on projects that support watershed health.

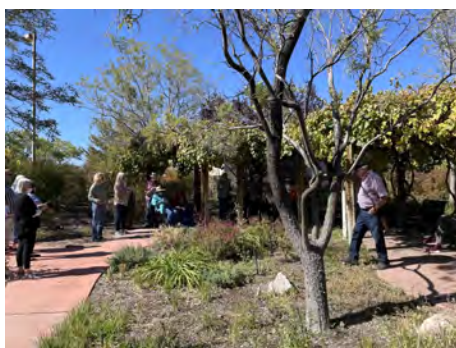
This year one participant was interested in applying some GSI techniques to an erosion problem behind his house. Dave Gatterman and Erin Blaz met with this participant and Mr. Gatterman was even able to get City of Rio Rancho approval to apply some mitigation and restoration strategies. This was an exciting opportunity to engage participants in a project, however during the process of planning the city applied an erosion treatment to the hillside and it was determined best to wait and see the results of that effort.

During the pollinator day, we also hosted ABQ Backyard Refuge at Del Webb Alegria. This was a very interesting and fruitful conversation. 11 community members participated from Alegria and discussed the need for support in some of their open spaces within the Del Webb development. There was high interest in creating wildlife refuges in these spaces, but they cited challenges within their own HOA and community perceptions - like a desire for lawns and manicured spaces.

## **Evaluation**

Considering we were able to bring in-person programming back safely to this community after a year of virtual programming due to the pandemic, this year's program reached a larger than expected audience and offered more hours of program than anticipated. However, there are certainly ways to improve. Watershed Stewards will benefit from continued support or partnership with other local entities in Rio Rancho and Town of Bernalillo so that we can collectively reach more people with a wider range of content. Watershed Stewards would also benefit from tracking participant contacts across all programs by Ciudad to be able to maintain correspondence, build community around action and stewardship, and survey folks to increase our understanding of our audience and impacts. In response to this FY22 funding was used to purchase a tablet that can be used in the field to track participant signs-in and survey participants. Additionally, finding ways that are of interest and well-suited to the senior community to engage with hands-on projects will need to continue through relationship and rapport building within the community and local partners.

## **Program Pictures**







Prior page: WWG program with tour and rolling river. Top this page: Mikal Deese with a local bird. 2nd row: Justin shows bats & scat comparisons. 3rd row: Justin does Bosque and Arroyo Habitat walks. Bottom row: Dara Saville at WWG and Bee Hive for Pollinator Day.





**Summary of AMAFCA's MS4  
Dry Weather Discharge Screening Program  
FY 2022 (July 1, 2021 - June 30, 2022)**

NPDES Permit No. NMR04A000  
Part III.A.2 - Dry Weather Discharge Screening of MS4

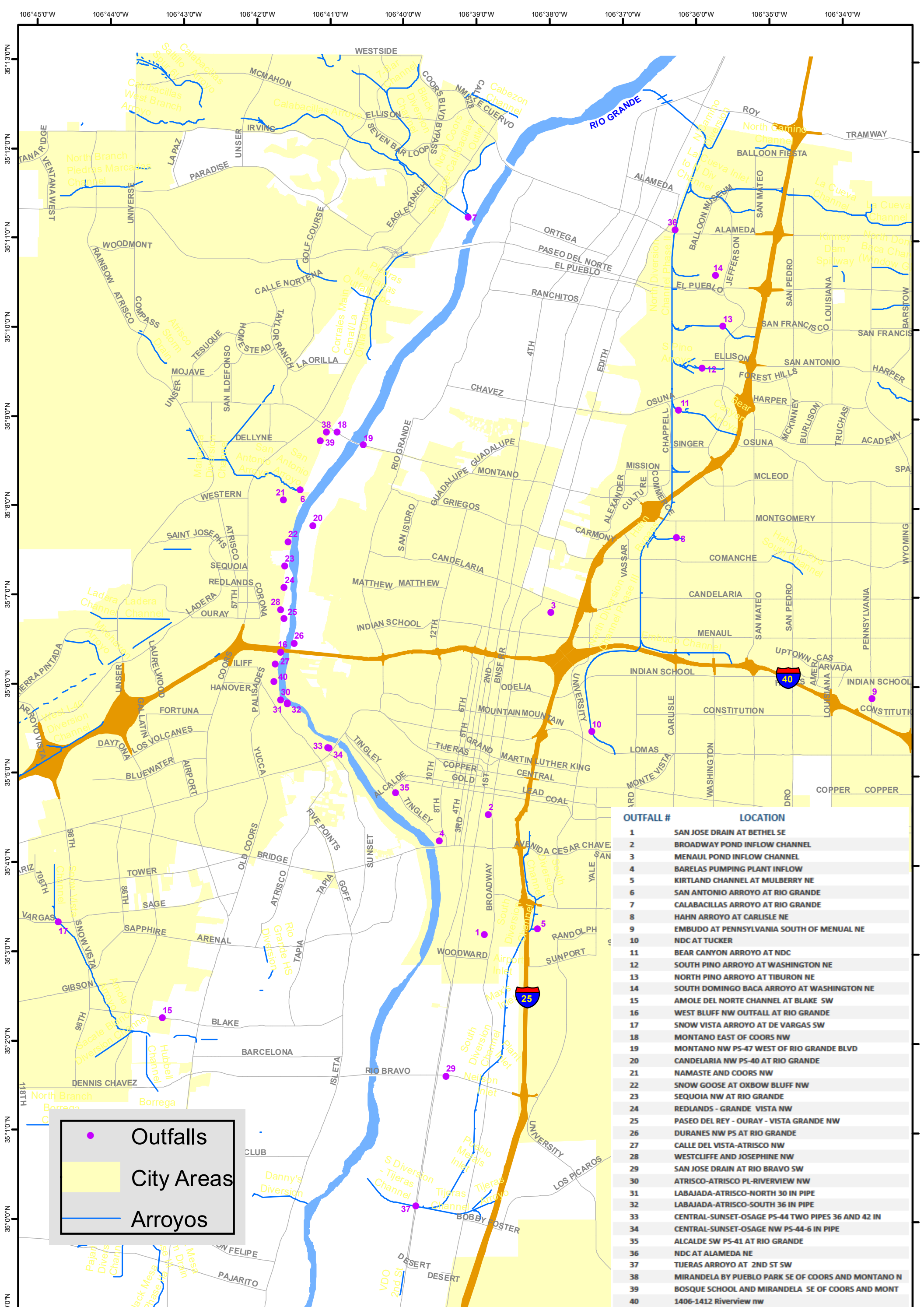
**Dry Weather Screening  
of Outfalls  
2022**

# DRY WEATHER OUTFALLS SCREENING 2022

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1	SAN JOSE DRAIN AT BETHEL SE	SE	M-14	1
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3	MENAU POND INFLOW CHANNEL	NE	H-15	3
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9	EMBUDO AT PENNSYLVANIA SOUTH OF MENUAL NE	NE	J-19	9
10	NDC AT TUCKER	NE	J-16	10
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19	MONTANO NW PS-47 WEST OF RIO GRANDE BLVD	NW	F-12	19
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35	ALCALDE SW PS-41 AT RIO GRANDE	SW	K-13	35
36	NDC AT ALAMEDA NE	NE	C-17	36
37	TIJERAS ARROYO AT 2ND ST SW	SW	Q-12	37
38	MIRANDELA BY PUEBLO PARK SE OF COORS AND MONTANO N	NW	E-12	38
39	BOSQUE SCHOOL AND MIRANDELA SE OF COORS AND MONT	NW	E-12	39
40	1406-1412 Riverview nw	NW	J-11	40





# Dry Weather Screening of Outfalls-2022

LOCATION	SAN JOSE DRAIN AT BETHEL SE						
OUTFALL_NO	1	QUAD	SE	GRID	M-14	SAMPLED	<input type="checkbox"/>
DATE_INSP	2/28/2022	TIME	12:13	Inspected by		MM	
WEATHER	SUNNY	flow	NO FLOW	FLOW_GPM		0	
APPEARANCE	na		GROSS POLLUTANT		na		
Source of Flow	na						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\1-M14-SE-San Jose D>

AIR_TEMP_F	51	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Fluoride_mg/l		Chlorine_mg/l	



LOCATION	<b>BROADWAY POND INFLOW CHANNEL</b>						
OUTFALL_NO	2	QUAD	SE	GRID	K-14	SAMPLED	<input checked="" type="checkbox"/>
DATE_INSP	3/16/2022	TIME	10:00	Inspected by	MM		
WEATHER	CLOUDY	flow	YES	FLOW_GPM	1		
APPEARANCE	clear	GROSS POLLUTANT	No odor, no observable particulates, no sheen				
Source of Flow	Irrigation, carwash, Water Hydrant flushing,						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\2-K14-SE-Hazeldine-j>

AIR_TEMP_F	48	Lab	HALL ENVIRONMENTAL	
WATER_TEMP_F	41	Lab_Report	2203901	
pH	8.0	E_coli_Coliform_mpn/100ml	1553.1	
CONDUCTIVITY_Umos/cm	760	Ammonia_mg/l	<1	
BOD_mg/l	20.0	Nitrite_NO2_mg/l	<0.5	
COD_mg/l	42	Nitrate_NO3_mg/l	0.82	
TSS_mg/l	<4	TKN_Tot_Kjeld_N_mg/l	<1	
TDS_mg/l	464	Phosphorus_total_mg/l_P	0.26	
N-Hexane Extractable-(Oil_Grease)_mg/l	<9.12	Hardness_mg/l_CaCO3	170	
Fluoride_mg/l	0.97	Chlorine_mg/l	<0.05	





LOCATION	<b>MENAU POND INFLOW CHANNEL</b>						
OUTFALL_NO	3	QUAD	NE	GRID	H-15	SAMPLED	<input type="checkbox"/>
DATE_INSP	3/28/2022	TIME	10:10	Inspected by		MM	
WEATHER	PARTLY CLOUDY	flow	NO FLOW	FLOW_GPM		0	
APPEARANCE	na		GROSS POLLUTANT		na		
Source of Flow	na						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\3-H15-NE Menaul Po>

AIR_TEMP_F	59	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Floride_mg/l		Chlorine_mg/l	



LOCATION	<b>BARELAS PUMPING PLANT INFLOW</b>						
OUTFALL_NO	4	QUAD	SW	GRID	L-13	SAMPLED	<input checked="" type="checkbox"/>
DATE_INSP	4/29/2022	TIME	12:10	Inspected by	MM-LM		
WEATHER	SUNNY	flow	YES	FLOW_GPM	20		
APPEARANCE	clear	GROSS POLLUTANT	No odor, no particulates, no sheen				
Source of Flow	groundwater						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\4-L13-SW-Barelas PS>

AIR_TEMP_F	74	Lab	HALL ENVIRONMENTAL	
WATER_TEMP_F	59	Lab_Report	22004D38	
pH	8.23	E_coli_Coliform_mpn/100ml	>2419.6	
CONDUCTIVITY_Umos/cm	790	Ammonia_mg/l	<1.0	
BOD_mg/l	6.1	Nitrite_NO2_mg/l	<0.5	
COD_mg/l	26.3	Nitrate_NO3_mg/l	<0.5	
TSS_mg/l	<4	TKN_Tot_Kjeld_N_mg/l	1.1	
TDS_mg/l	534	Phosphorus_total_mg/l_P	0.21	
N-Hexane Extractable-(Oil_Grease)_mg/l	<9.35	Hardness_mg/l_CaCO3	270	
Fluoride_mg/l	<0.5	Chlorine_mg/l	<0.05	



LOCATION	<b>KIRTLAND CHANNEL AT MULBERRY NE</b>						
OUTFALL_NO	5	QUAD	SE	GRID	M-15	SAMPLED	<input type="checkbox"/>
DATE_INSP	3/28/2022	TIME	11:05	Inspected by		MM	
WEATHER	PARTLY CLOUDY	flow	NO FLOW	FLOW_GPM		0	
APPEARANCE	na		GROSS POLLUTANT		na		
Source of Flow	na						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\5-M15-SE Kirtland C>

AIR_TEMP_F	67	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Fluoride_mg/l		Chlorine_mg/l	





LOCATION	<b>SAN ANTONIO ARROYO AT RIO GRANDE</b>						
OUTFALL_NO	6	QUAD	NW	GRID	F-12	SAMPLED	<input type="checkbox"/>
DATE_INSP	3/29/2022	TIME	9:00	Inspected by		MM	
WEATHER	SUNNY	flow	NO FLOW	FLOW_GPM		0	
APPEARANCE	na		GROSS POLLUTANT		na		
Source of Flow	na						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\6-F12-NW-SanAnton>

AIR_TEMP_F	52	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Fluoride_mg/l		Chlorine_mg/l	



LOCATION	<b>CALABACILLAS ARROYO AT RIO GRANDE</b>						
OUTFALL_NO	7	QUAD	NW	GRID	C-14	SAMPLED	<input type="checkbox"/>
DATE_INSP	3/7/2022	TIME	7:47	Inspected by		MM	
WEATHER	PARTLY CLOUDY	flow	NO FLOW	FLOW_GPM		0	
APPEARANCE	na		GROSS POLLUTANT		na		
Source of Flow	na						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\7-C14-NW Calabacill>

AIR_TEMP_F	26	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Floride_mg/l		Chlorine_mg/l	



link	<a href="X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\8-G16-NE-Hahn arro">X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\8-G16-NE-Hahn arro</a>
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LOCATION	<b>EMBUDO AT PENNSYLVANIA SOUTH OF MANUAL NE</b>						
OUTFALL_NO	9	QUAD	NE	GRID	J-19	SAMPLED	<input type="checkbox"/>
DATE_INSP	3/3/2022	TIME	9:54	Inspected by		MM	
WEATHER	SUNNY	flow	NO FLOW	FLOW_GPM		0	
APPEARANCE	na		GROSS POLLUTANT		na		
Source of Flow	na						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\9-J19-NE Embudo Ar>

AIR_TEMP_F	48	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Fluoride_mg/l		Chlorine_mg/l	



LOCATION	NDC AT TUCKER						
OUTFALL_NO	10	QUAD	NE	GRID	J-16	SAMPLED	<input type="checkbox"/>
DATE_INSP	3/25/2022	TIME	3:00	Inspected by		MM	
WEATHER	SUNNY	flow	NO FLOW	FLOW_GPM		0	
APPEARANCE	na		GROSS POLLUTANT		na		
Source of Flow	na						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\10-J15-NE-NDC at Tu>

AIR_TEMP_F	73	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Fluoride_mg/l		Chlorine_mg/l	



LOCATION	<b>BEAR CANYON ARROYO AT NDC</b>						
OUTFALL_NO	<b>11</b>	QUAD	NE	GRID	G-16	SAMPLED	<input type="checkbox"/>
DATE_INSP	3/18/2022	TIME	9:56	Inspected by		MM	
WEATHER	SUNNY	flow	NO FLOW	FLOW_GPM		0	
APPEARANCE	na		GROSS POLLUTANT		na		
Source of Flow	na						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\11-G16-NE-Bear arro>

AIR_TEMP_F	40	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Fluoride_mg/l		Chlorine_mg/l	





LOCATION	<b>SOUTH PINO ARROYO AT WASHINGTON NE</b>						
OUTFALL_NO	<b>12</b>	QUAD	NE	GRID	D-17	SAMPLED	<input type="checkbox"/>
DATE_INSP	3/18/2022	TIME	9:48	Inspected by		MM	
WEATHER	SUNNY	flow	NO FLOW	FLOW_GPM		0	
APPEARANCE	na		GROSS POLLUTANT		na		
Source of Flow	na						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\12-E17-NE-South Pin>

AIR_TEMP_F	39	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Fluoride_mg/l		Chlorine_mg/l	



LOCATION	<b>NORTH PINO ARROYO AT TIBURON NE</b>						
OUTFALL_NO	<b>13</b>	QUAD	NE	GRID	D-17	SAMPLED	<input type="checkbox"/>
DATE_INSP	3/18/2022	TIME	9:23	Inspected by		MM	
WEATHER	SUNNY	flow	NO FLOW	FLOW_GPM		0	
APPEARANCE	na		GROSS POLLUTANT		na		
Source of Flow	na						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\13-D17-NE-north pin>

AIR_TEMP_F	36	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Fluoride_mg/l		Chlorine_mg/l	



LOCATION	<b>SOUTH DOMINGO BACA ARROYO AT WASHINGTON NE</b>						
OUTFALL_NO	14	QUAD	NE	GRID	C-17	SAMPLED	<input type="checkbox"/>
DATE_INSP	3/18/2022	TIME	9:32	Inspected by		MM	
WEATHER	SUNNY	flow	NO FLOW	FLOW_GPM		0	
APPEARANCE	na		GROSS POLLUTANT		na		
Source of Flow	na						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\14-C17-NE-South Do>

AIR_TEMP_F	37	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Fluoride_mg/l		Chlorine_mg/l	



LOCATION	<b>AMOLE DEL NORTE CHANNEL AT BLAKE SW</b>						
OUTFALL_NO	<b>15</b>	QUAD	SW	GRID	N-10	SAMPLED	<input type="checkbox"/>
DATE_INSP	3/17/2022	TIME	3:37	Inspected by		MM	
WEATHER	CLOUDY	flow	NO FLOW	FLOW_GPM		0	
APPEARANCE	na		GROSS POLLUTANT		na		
Source of Flow	na						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\15-L10-SW-Amole d>

AIR_TEMP_F	57	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Fluoride_mg/l		Chlorine_mg/l	





LOCATION	<b>WEST BLUFF NW OUTFALL AT RIO GRANDE</b>						
OUTFALL_NO	<b>16</b>	QUAD	NW	GRID	H-11	SAMPLED	<input type="checkbox"/>
DATE_INSP	3/28/2022	TIME	12:32	Inspected by		MM	
WEATHER	PARTLY CLOUDY	flow	NO FLOW	FLOW_GPM		0	
APPEARANCE	na		GROSS POLLUTANT		na		
Source of Flow	na						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\16 H11-NW West Bl>

AIR_TEMP_F	73	Lab	
WATER_TEMP_F	0	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Fluoride_mg/l		Chlorine_mg/l	



LOCATION	SNOW VISTA ARROYO AT DE VARGAS SW						
OUTFALL_NO	17	QUAD	SW	GRID	M-09	SAMPLED	<input type="checkbox"/>
DATE_INSP	3/18/2022	TIME	11:20	Inspected by		MM	
WEATHER	SUNNY	flow	NO FLOW	FLOW_GPM		0	
APPEARANCE	na		GROSS POLLUTANT		na		
Source of Flow	na						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\17-M9-SW-snow vist>

AIR_TEMP_F	44	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Floride_mg/l		Chlorine_mg/l	



LOCATION	<b>MONTANO EAST OF COORS NW</b>						
OUTFALL_NO	<b>18</b>	QUAD	NW	GRID	E-12	SAMPLED	<input type="checkbox"/>
DATE_INSP	4/5/2022	TIME	1:00	Inspected by		MM-LM	
WEATHER	SUNNY	flow	NO FLOW	FLOW_GPM		0	
APPEARANCE	na		GROSS POLLUTANT		na		
Source of Flow	na						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\18-E12-NW Montan>

AIR_TEMP_F	77	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Floride_mg/l		Chlorine_mg/l	



LOCATION	<b>MONTANO NW PS-47 WEST OF RIO GRANDE BLVD</b>						
OUTFALL_NO	<b>19</b>	QUAD	NW	GRID	F-12	SAMPLED	<input checked="" type="checkbox"/>
DATE_INSP	4/6/2022	TIME	9:34	Inspected by		MM-LM	
WEATHER	SUNNY	flow	YES	FLOW_GPM		1	
APPEARANCE	cloudy	GROSS POLLUTANT		Musty odor, small particulates, no sheens			
Source of Flow	groundwater Infiltration						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\19-F12-NW-Montan>

AIR_TEMP_F	54	Lab	HALL ENVIRONMENTAL
WATER_TEMP_F	46	Lab_Report	2204257
pH	7.10	E_coli_Coliform_mpn/100ml	677
CONDUCTIVITY_Umos/cm	450	Ammonia_mg/l	<1
BOD_mg/l	39	Nitrite_NO2_mg/l	<0.5
COD_mg/l	104	Nitrate_NO3_mg/l	<0.5
TSS_mg/l	<4	TKN_Tot_Kjeld_N_mg/l	1.4
TDS_mg/l	335	Phosphorus_total_mg/l_P	0.27
N-Hexane Extractable-(Oil_Grease)_mg/l	<9.56	Hardness_mg/l_CaCO3	140
Fluoride_mg/l	1.0	Chlorine_mg/l	<0.05





LOCATION	<b>CANDELARIA NW PS-40 AT RIO GRANDE</b>						
OUTFALL_NO	<b>20</b>	QUAD	NW	GRID	G-12	SAMPLED	<input checked="" type="checkbox"/>
DATE_INSP	4/6/2022	TIME	10:32	Inspected by	MM-LM		
WEATHER	SUNNY	flow	YES	FLOW_GPM	1		
APPEARANCE	clear	GROSS POLLUTANT	No odor, fine particulates, no sheen				
Source of Flow	well wash water						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\20-G12-NW-Candela>

AIR_TEMP_F	59	Lab	HALL ENVIRONMENTAL
WATER_TEMP_F	55	Lab_Report	2204257
pH	7.89	E_coli_Coliform_mpn/100ml	56.5
CONDUCTIVITY_Umos/cm	420	Ammonia_mg/l	<1
BOD_mg/l	30	Nitrite_NO2_mg/l	<0.1
COD_mg/l	<20	Nitrate_NO3_mg/l	<0.1
TSS_mg/l	<4	TKN_Tot_Kjeld_N_mg/l	<1
TDS_mg/l	285	Phosphorus_total_mg/l_P	0.063
N-Hexane Extractable-(Oil_Grease)_mg/l	<9.46	Hardness_mg/l_CaCO3	150
Fluoride_mg/l	0.34	Chlorine_mg/l	<0.05



LOCATION	NAMASTE AND COORS NW						
OUTFALL_NO	21	QUAD	NW	GRID	F-11	SAMPLED	<input type="checkbox"/>
DATE_INSP	3/29/2022	TIME	9:20	Inspected by		MM	
WEATHER	SUNNY	flow	NO FLOW	FLOW_GPM		0	
APPEARANCE	na		GROSS POLLUTANT		na		
Source of Flow	na						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\21-F12-NW-Namast>

AIR_TEMP_F	54	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Fluoride_mg/l		Chlorine_mg/l	



LOCATION	SNOW GOOSE AT OXBOW BLUFF NW		
OUTFALL_NO	22	QUAD	NW
		GRID	G-11
SAMPLED	<input type="checkbox"/>		
DATE_INSP	3/29/2022	TIME	11:18
Inspected by	MM		
WEATHER	PARTLY CLOUDY	flow	NO FLOW
FLOW_GPM	0		
APPEARANCE	na		
GROSS POLLUTANT	na		
Source of Flow	na		
link	<a href="X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\22-G11-NW - Snow">X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\22-G11-NW - Snow</a>		
AIR_TEMP_F	57	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Fluoride_mg/l		Chlorine_mg/l	



LOCATION	SEQUOIA NW AT RIO GRANDE						
OUTFALL_NO	23	QUAD	NW	GRID	G-11	SAMPLED	<input type="checkbox"/>
DATE_INSP	3/28/2022	TIME	2:24	Inspected by	MM		
WEATHER	PARTLY CLOUDY	flow	NO FLOW	FLOW_GPM	0		
APPEARANCE	na	GROSS POLLUTANT	na				
Source of Flow	na						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\23-G11-NW -Sequoi>

AIR_TEMP_F	74	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Floride_mg/l		Chlorine_mg/l	





LOCATION	REDLANDS - GRANDE VISTA NW						
OUTFALL_NO	24	QUAD	NW	GRID	G-12	SAMPLED	<input type="checkbox"/>
DATE_INSP	3/29/2022	TIME	10:39	Inspected by	MM		
WEATHER	SUNNY	flow	NO FLOW	FLOW_GPM	0		
APPEARANCE	na	GROSS POLLUTANT	na				
Source of Flow	na						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\24-G11-NW-Grande>

AIR_TEMP_F	57	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Fluoride_mg/l		Chlorine_mg/l	



LOCATION	<b>PASEO DEL REY - OURAY - VISTA GRANDE NW</b>						
OUTFALL_NO	<b>25</b>	QUAD	NW	GRID	H-11	SAMPLED	<input type="checkbox"/>
DATE_INSP	3/28/2022	TIME	2:10	Inspected by		MM	
WEATHER	PARTLY CLOUDY	flow	NO FLOW	FLOW_GPM		0	
APPEARANCE	na		GROSS POLLUTANT		na		
Source of Flow	na						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\25-H11-NW - S of Ou>

AIR_TEMP_F	73	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Fluoride_mg/l		Chlorine_mg/l	



LOCATION	<b>DURANES NW PS AT RIO GRANDE</b>						
OUTFALL_NO	26	QUAD	NW	GRID	H-12	SAMPLED	<input checked="" type="checkbox"/>
DATE_INSP	4/8/2022	TIME	1:44	Inspected by		MM	
WEATHER	SUNNY	flow	YES	FLOW_GPM		5	
APPEARANCE	clear	GROSS POLLUTANT		No Odor, minimal Particulates, No Sheen			
Source of Flow	well wash water						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\26-H12-NW-Durance>

AIR_TEMP_F	69	Lab	HALL ENVIRONMENTAL
WATER_TEMP_F	55	Lab_Report	2204419
pH	8.09	E_coli_Coliform_mpn/100ml	488.4
CONDUCTIVITY_Umos/cm	520	Ammonia_mg/l	<1
BOD_mg/l	2.0	Nitrite_NO2_mg/l	<0.5
COD_mg/l	<400	Nitrate_NO3_mg/l	<0.5
TSS_mg/l	<4	TKN_Tot_Kjeld_N_mg/l	<1
TDS_mg/l	371	Phosphorus_total_mg/l_P	0.056
N-Hexane Extractable-(Oil_Grease)_mg/l	<9.93	Hardness_mg/l_CaCO3	180
Fluoride_mg/l	<0.5	Chlorine_mg/l	<0.05



LOCATION	<b>CALLE DEL VISTA-ATRISCO NW</b>						
OUTFALL_NO	<b>27</b>	QUAD	NW	GRID	H-11	SAMPLED	<input type="checkbox"/>
DATE_INSP	3/28/2022	TIME	12:42	Inspected by		MM	
WEATHER	PARTLY CLOUDY	flow	NO FLOW	FLOW_GPM		0	
APPEARANCE	na		GROSS POLLUTANT		na		
Source of Flow	na						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\27-H11-NW 1800 Cal>

AIR_TEMP_F	73	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Fluoride_mg/l		Chlorine_mg/l	





LOCATION	<b>WESTCLIFFE AND JOSEPHINE NW</b>						
OUTFALL_NO	<b>28</b>	QUAD	NW	GRID	H-12	SAMPLED	<input type="checkbox"/>
DATE_INSP	3/28/2022	TIME	2:00	Inspected by		MM	
WEATHER	PARTLY CLOUDY	flow	NO FLOW	FLOW_GPM		0	
APPEARANCE	na	GROSS POLLUTANT		na			
Source of Flow	na						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\28-H11-NW - Westcli>

AIR_TEMP_F	73	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Floride_mg/l		Chlorine_mg/l	



LOCATION	<b>SAN JOSE DRAIN AT RIO BRAVO SW</b>						
OUTFALL_NO	<b>29</b>	QUAD	SW	GRID	P-13	SAMPLED	<input type="checkbox"/>
DATE_INSP	3/18/2022	TIME	10:30	Inspected by		MM	
WEATHER	SUNNY	flow	NO FLOW	FLOW_GPM		0	
APPEARANCE	na		GROSS POLLUTANT		na		
Source of Flow	na						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\29-P14-SE-San Jose>

AIR_TEMP_F	44	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Fluoride_mg/l		Chlorine_mg/l	



LOCATION	ATRISCO-ATRISCO PL-RIVERVIEW NW						
OUTFALL_NO	30	QUAD	NW	GRID	J-11	SAMPLED	<input type="checkbox"/>
DATE_INSP	1/18/2022	TIME	9:17	Inspected by		MM	
WEATHER	SUNNY	flow	NO FLOW	FLOW_GPM		0	
APPEARANCE	na		GROSS POLLUTANT		na		
Source of Flow	na						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\30-J11-NW - Riversid>

AIR_TEMP_F	41	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Fluoride_mg/l		Chlorine_mg/l	



LOCATION	LABAJADA-ATRISCO-NORTH 30 IN PIPE						
OUTFALL_NO	31	QUAD	NW	GRID	J-11	SAMPLED	<input checked="" type="checkbox"/>
DATE_INSP	4/7/2022	TIME	1:20	Inspected by		MM-LM	
WEATHER	SUNNY	flow	YES	FLOW_GPM		1	
APPEARANCE	clear	GROSS POLLUTANT		No odor, fine particulates, no sheen			
Source of Flow	groundwater and irrigation						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\31-J11-NW - Atrisco>

AIR_TEMP_F	63	Lab	HALL ENVIRONMENTAL
WATER_TEMP_F	69	Lab_Report	2204360
pH	7.53	E_coli_Coliform_mpn/100ml	5.2
CONDUCTIVITY_Umos/cm	590	Ammonia_mg/l	<1
BOD_mg/l	5.6	Nitrite_NO2_mg/l	<0.5
COD_mg/l	43	Nitrate_NO3_mg/l	<0.5
TSS_mg/l	54	TKN_Tot_Kjeld_N_mg/l	1.3
TDS_mg/l	378	Phosphorus_total_mg/l_P	0.32
N-Hexane Extractable-(Oil_Grease)_mg/l	<9.64	Hardness_mg/l_CaCO3	170
Fluoride_mg/l	0.67	Chlorine_mg/l	<0.05





LOCATION	LABAJADA-ATRISCO-SOUTH 36 IN PIPE						
OUTFALL_NO	32	QUAD	NW	GRID	J-11	SAMPLED	<input type="checkbox"/>
DATE_INSP	4/7/2022	TIME	1:20	Inspected by	MM-LM		
WEATHER	SUNNY	flow	NO FLOW	FLOW_GPM	0		
APPEARANCE	na	GROSS POLLUTANT	na				
Source of Flow	na						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\32 J11 NW - Atrisco>

AIR_TEMP_F	63	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Floride_mg/l		Chlorine_mg/l	



LOCATION	<b>CENTRAL-SUNSET-OSAGE PS-44 TWO PIPES 36 AND 42 IN</b>						
OUTFALL_NO	<b>33</b>	QUAD	NW	GRID	J-12	SAMPLED	<input checked="" type="checkbox"/>
DATE_INSP	4/7/2022	TIME	2:13	Inspected by		MM - LM	
WEATHER	SUNNY	flow	YES	FLOW_GPM		2	
APPEARANCE	clear	GROSS POLLUTANT No odor, fine particulates, no sheen					
Source of Flow	groundwater						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\33-J12-NW-Central-S>

AIR_TEMP_F	63	Lab	HALL ENVIRONMENTAL
WATER_TEMP_F	69	Lab_Report	2204360
pH	8.16	E_coli_Coliform_mpn/100ml	4.1
CONDUCTIVITY_Umos/cm	590	Ammonia_mg/l	<1
BOD_mg/l	<2	Nitrite_NO2_mg/l	<0.5
COD_mg/l	<20	Nitrate_NO3_mg/l	<0.5
TSS_mg/l	4	TKN_Tot_Kjeld_N_mg/l	<1
TDS_mg/l	398	Phosphorus_total_mg/l_P	0.11
N-Hexane Extractable-(Oil_Grease)_mg/l	<9.69	Hardness_mg/l_CaCO3	210
Fluoride_mg/l	0.68	Chlorine_mg/l	<0.05



LOCATION	<b>CENTRAL-SUNSET-OSAGE NW PS-44-6 IN PIPE</b>						
OUTFALL_NO	<b>34</b>	QUAD	NW	GRID	J-12	SAMPLED	<input type="checkbox"/>
DATE_INSP	3/28/2022	TIME	12:10	Inspected by		MM	
WEATHER	PARTLY CLOUDY	flow	NO FLOW	FLOW_GPM		0	
APPEARANCE	na		GROSS POLLUTANT		na		
Source of Flow	na						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\34-J12-NW-Central-S>

AIR_TEMP_F	71	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Fluoride_mg/l		Chlorine_mg/l	



LOCATION	<b>ALCALDE SW PS-41 AT RIO GRANDE</b>						
OUTFALL_NO	<b>35</b>	QUAD	SW	GRID	K-13	SAMPLED	<input type="checkbox"/>
DATE_INSP	3/28/2022	TIME	12:10	Inspected by		MM	
WEATHER	PARTLY CLOUDY	flow	NO FLOW	FLOW_GPM		0	
APPEARANCE	na		GROSS POLLUTANT		na		
Source of Flow	na						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\35-K13-SW Alcalde a>

AIR_TEMP_F	71	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Floride_mg/l		Chlorine_mg/l	





LOCATION	NDC AT ALAMEDA NE									
OUTFALL_NO	36	QUAD	NE	GRID	C-17	SAMPLED	<input checked="" type="checkbox"/>			
DATE_INSP	3/8/2022	TIME	3:00	Inspected by		MM				
WEATHER	SUNNY	flow	YES	FLOW_GPM		10				
APPEARANCE	CLEAR	GROSS POLLUTANT No Odor, No Sheen, Heavy Particulates								
Source of Flow	well wash water, irrigation, water hydrant flushing and broken waterlines									
link	<a href="X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\36-C17-NE-NDC at Al">X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\36-C17-NE-NDC at Al</a>									
AIR_TEMP_F	78	Lab	HALL ENVIRONMENTAL							
WATER_TEMP_F	70	Lab_Report	2204419							
pH	9.98	E_coli_Coliform_mpn/100ml	18.9							
CONDUCTIVITY_Umos/cm	1100	Ammonia_mg/l	<1							
BOD_mg/l	6.1	Nitrite_NO2_mg/l	<0.5							
COD_mg/l	62.2	Nitrate_NO3_mg/l	<0.5							
TSS_mg/l	<4	TKN_Tot_Kjeld_N_mg/l	1.8							
TDS_mg/l	726	Phosphorus_total_mg/l_P	0.074							
N-Hexane Extractable-(Oil_Grease)_mg/l	<9.76	Hardness_mg/l_CaCO3	190							
Fluoride_mg/l	1.4	Chlorine_mg/l	<0.05							



LOCATION	<b>TIJERAS ARROYO AT 2ND ST SW</b>						
OUTFALL_NO	<b>37</b>	QUAD	SW	GRID	Q-12	SAMPLED	<input type="checkbox"/>
DATE_INSP	3/18/2022	TIME	11:36	Inspected by	MM		
WEATHER	SUNNY	flow	NO FLOW	FLOW_GPM	0		
APPEARANCE	na	GROSS POLLUTANT	na				
Source of Flow	na						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\37-Q13-SE-Tijeras Ch>

AIR_TEMP_F	44	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Fluoride_mg/l		Chlorine_mg/l	



LOCATION	<b>MIRANDELA BY PUEBLO PARK SE OF COORS AND MONTANO NW</b>						
OUTFALL_NO	<b>38</b>	QUAD	NW	GRID	E-12	SAMPLED	<input type="checkbox"/>
DATE_INSP	2/7/2022	TIME	8:26	Inspected by		MM	
WEATHER	PARTLY CLOUDY	flow	NO FLOW	FLOW_GPM		0	
APPEARANCE	na		GROSS POLLUTANT		na		
Source of Flow	na						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\38 and 39-E12-NW-P>

AIR_TEMP_F	33	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Fluoride_mg/l		Chlorine_mg/l	



LOCATION	BOSQUE SCHOOL AND MIRANDELA SE OF COORS AND MONTANO NW						
OUTFALL_NO	39	QUAD	NW	GRID	E-12	SAMPLED	<input type="checkbox"/>
DATE_INSP	2/7/2022	TIME	8:26	Inspected by	MM		
WEATHER	PARTLY CLOUDY	flow	NO FLOW	FLOW_GPM	0		
APPEARANCE	na	GROSS POLLUTANT	na				
Source of Flow	na						

link <X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\38 and 39-E12-NW-P>

AIR_TEMP_F	33	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Fluoride_mg/l		Chlorine_mg/l	





LOCATION	1406-1412 RIVERVIEW NW		
OUTFALL_NO	40	QUAD	NW
GRID	J-11	SAMPLED	<input type="checkbox"/>
DATE_INSP	3/28/2022	TIME	12:54
Inspected by			
WEATHER	PARTLY CLOUDY	flow	NO FLOW
FLOW_GPM	0		
APPEARANCE	na	GROSS POLLUTANT	na
Source of Flow	na		
link	<a href="X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\40-J11-NW-Rivervie">X:\MD\SHARE\MD-Storm\7 NPDES\311 SWQ Complaints\2022\2 - DW Screening\40-J11-NW-Rivervie</a>		
AIR_TEMP_F	73	Lab	
WATER_TEMP_F	na	Lab_Report	
pH		E_coli_Coliform_mpn/100ml	
CONDUCTIVITY_Umos/cm		Ammonia_mg/l	
BOD_mg/l		Nitrite_NO2_mg/l	
COD_mg/l		Nitrate_NO3_mg/l	
TSS_mg/l		TKN_Tot_Kjeld_N_mg/l	
TDS_mg/l		Phosphorus_total_mg/l_P	
N-Hexane Extractable-(Oil_Grease)_mg/l		Hardness_mg/l_CaCO3	
Fluoride_mg/l		Chlorine_mg/l	

