Las Vegas Valley NPDES Municipal Stormwater Discharge Permit

Annual Report 2024-2025

November
2025

REGIONAL FLOOD CONTROL DISTRICT

CLARK COUNTY NEVADA

CITY OF LAS VEGAS NEVADA

CITY OF NORTH LAS VEGAS

HENDERSON

Brown AND Caldwell

HDR

2024-2025
Annual Report

Las Vegas Valley National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System Permit

Prepared for:

Las Vegas Valley
Stormwater Quality Management Committee (SQMC)

Clark County Regional Flood Control District
City of Henderson
City of Las Vegas
City of North Las Vegas
Clark County

Prepared by:

November, 2025

REGIONAL FLOOD CONTROL DISTRICT

November 1, 2025

Robert Zinkevich, Stormwater Supervisor
Bureau of Water Pollution Control
Nevada Division of Environmental Protection
375 E. Warms Springs Road, Suite 200
Las Vegas, NV 89119

RE: 2024-2025 Annual Report—Las Vegas Valley NPDES MS4 Permit

Dear Mr. Zinkevich,

Please find enclosed a copy of the 2024-2025 Annual Report for the Las Vegas Valley National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit (NV0021911). This report was prepared in cooperation with Brown and Caldwell and HDR, Inc. and is hereby submitted for your review. The Annual Report details compliance activities for the period from July 1, 2024, through June 30, 2025. These activities were performed in accordance with Permit No. NV0021911.

Because the Draft Stormwater Management Plan (SWMP) required by the 2024 MS4 Permit has not yet been approved, the Permittees are technically still implementing the previous SWMP, which NDEP approved in 2011. This 2024-2025 Annual Report, however, incorporates some concepts and formatting elements from the Draft SWMP. This effort shows that the Draft SWMP, although streamlined, produces an Annual Report that is substantively similar to past Annual Reports. The one significant difference is that programs conducted by non-Permittees have been collected and moved to Section 14.

If you should have any questions, please do not hesitate to call.

Sincerely,

John Tennert (Oct 29, 2025 18:13:53 MDT)

John R. Tennert, Ph.D.
Environmental Mitigation Manager

Enclosure

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LAS VEGAS VALLEY
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
MUNICIPAL SEPARATE STORM SEWER SYSTEM PERMIT

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Acronyms and Abbreviations

AB	Assembly Bill
BLM	Bureau of Land Management
BMP	Best Management Practice
BOD	Biochemical Oxygen Demand
CC	Clark County
CCPRO	Clark County Public Response Office
CCRFCD	Clark County Regional Flood Control District
CESQG	Conditionally Exempt Small Quantity Generators of Hazardous Waste
CFR	Code of Federal Regulations
CLV	City of Las Vegas
CNLV	City of North Las Vegas
COD	Chemical Oxygen Demand
COH	City of Henderson
CWA	Clean Water Act
DES	Clark County Department of Environment and Sustainability
E. Coli	*Escherichia coli*
EPA	Environmental Protection Agency
GIS	Geographic Information System
GPCD	Gallons per capita per day
HCDDM	Hydrologic Criteria and Drainage Manual
IC	Ion Chromatography
ICAP	Inductively Coupled Argon Plasma Spectroscopy
IR	Nevada 2024 Water Quality Integrated Report
lbs/day	pounds per day
LID	Low Impact Development
LVMC	Las Vegas Municipal Code
LVV	Las Vegas Valley
LVVWAC	Las Vegas Valley Watershed Advisory Committee
LVWCC	Las Vegas Wash Coordination Committee
MBAS	Methylene Blue Active Substance (Surfactants)
MEP	Maximum Extent Practicable
mg/L	milligrams per liter
µg/L	micrograms per liter
MPU	Master Plan Update
MS4	Municipal Separate Storm Sewer System
MWP	Maintenance Work Program
NA	Not Available / Not Analyzed
NAC	Nevada Administrative Code
NAICS	North American Industry Classification System
ND	Non-detect / Not Detected
NDEP	Nevada Division of Environmental Protection
NDOT	Nevada Department of Transportation

NDSR	New Development and Significant Redevelopment
N	Nitrogen
NOI	Notice of Intent
NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
NPS	Non-Point Source
NTU	Nephelometric Turbidity Units
P	Phosphorus
PDF	Permitted Disposal Facility
PE	Professional Engineer
Permittees	Las Vegas Valley Permittees
pH	Measure of acidity or alkalinity
PSA	Public Service Announcement
RCRA	Resource Conservation and Recovery Act
RTC	Regional Transportation Commission of Southern Nevada
SARA	Superfund Amendments and Reauthorization Act
SIC	Standard Industrial Classification
SNHD	Southern Nevada Health District
SNWA	Southern Nevada Water Authority
sq. ft.	square feet
SQMC	Stormwater Quality Management Committee
STEAM	Science, Technology, Engineering, Arts, and Mathematics
SVOC	Semivolatile Organic Compound
SWMP	Stormwater Management Plan
SWPPP	Stormwater Pollution Prevention Plan
TDS	Total Dissolved Solids
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load
TOC	Total Organic Carbon
TON	Total Organic Nitrogen
TRI	Toxic Release Inventory
TSS	Total Suspended Solids
UDB	Ultimate Development Boundary
USGS	United States Geological Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound
WLA	Wasteload Allocation
WQCV	Water Quality Capture Volume
WQS	Water Quality Standard

Section 1

Introduction

Section 1

Introduction

The United States Environmental Protection Agency (EPA) has adopted regulations to control pollutants entering the environment through storm drainage facilities associated with the Municipal Separate Storm Sewer System (MS4). In compliance with these regulations, on February 5, 2024, the Nevada Division of Environmental Protection (NDEP) issued National Pollutant Discharge Elimination System (NPDES) Permit No. NV0021911 jointly to the Clark County Regional Flood Control District (CCRFCD), the City of Las Vegas (CLV), the City of North Las Vegas (CNLV), the City of Henderson (COH), and Clark County (CC), collectively known as the Las Vegas Valley Permittees (Permittees). The permit authorizes the Permittees to discharge stormwater from the MS4. The permit was issued for a period of five years (2024-2029).

1.1 Annual Report Organization

This Annual Report was prepared to verify that the Permittees have complied with the permit requirements and measurable goals identified in the 2011 Stormwater Management Plan (SWMP) for the year from July 1, 2024 through June 30, 2025 Permit Year. The Permittees have submitted a revised Draft SWMP to NDEP for compliance with the 2024 MS4 Permit. The Annual Report is organized to address each of the main programs required by the NPDES MS4 Permit and associated SWMP for the Las Vegas Valley:

- Section 1.0 Introduction
- Section 2.0 Source Identification
- Section 3.0 Public Outreach and Education
- Section 4.0 MS4 Maintenance Activities
- Section 5.0 Post-Construction Program for New Development and Significant Redevelopment Projects
- Section 6.0 Illicit Discharge and Detection
- Section 7.0 Industrial Facility Monitoring and Control
- Section 8.0 Construction Site BMP Program
- Section 9.0 Staff and Resources
- Section 10.0 Reviewing and Updating Stormwater Management Programs
- Section 11.0 Responsibility for SWMP Implementation in New Areas
- Section 12.0 Legal Authority
- Section 13.0 Stormwater Monitoring
- Section 14.0 Additional Information for the 2011 SWMP
- Section 15.0 Conclusion

1.2 Permit Coordination

The CCRFCD has taken the lead for general administration of the permit conditions, preparation of reports, coordination among Permittees, and serving as the liaison with NDEP. In addition, the CCRFCD provides

funding for many of the regional permit compliance efforts. The CCRFCD also retained Brown and Caldwell and HDR to assist with preparation of information required to comply with the conditions of the permit.

Further permit coordination during the permit year was facilitated by the Stormwater Quality Management Committee (SQMC). The SQMC is comprised of representatives from each of the Permittees (Public Works Director or equivalent), who advise on topics for permit implementation. Public SQMC meetings were held four times, on August 13, 2024, November 12, 2024, February 12, 2025, and May 13, 2025.

SQMC meetings were regularly attended by other employees of the Permittees, employees of other local agencies, entities that have an interest in water quality issues (i.e., stakeholders), and members of the general public. Meeting agendas and meeting minutes were made available to the public and time was allowed in each meeting for public comments.

The SQMC Representatives as of June 30, 2025 are shown in Table 1-1.

Table 1-1. 2024-2025 Stormwater Quality Management Committee (SQMC) Representatives as of June 30, 2025

SQMC Representatives	Title	Permittee
Andrew Trelease, PE (Chair) [a]	General Manager/Chief Engineer	Clark County Regional Flood Control District
Lance Olson, PE	Director of Public Works	City of Henderson
Joey Paskey, PE	Director of Public Works	City of Las Vegas
Mike Hudgeons, PE	Director of Public Works	City of North Las Vegas
Denis Cederburg, PE	Director of Public Works	Clark County
SQMC Alternate Representatives	**Title**	**Permittee**
John Tennert, PE	Environmental Mitigation Manager	Clark County Regional Flood Control District
Steven Conner, PE	City Engineer	City of Henderson
Rosa Cortez, PE	City Engineer / Deputy Director	City of Las Vegas
Scott Jarvis, PE	Manager of Engineering	City of North Las Vegas
Jimmy Floyd, PE	Manager of Construction Management	Clark County

Notes:

[a] During the 2024-2025 permit year, Steve Parrish formally retired from service and was subsequently replaced by Andrew Trelease.

1.2.1 Regional Water Quality Planning

Regional water quality planning activities are performed by a variety of agencies and organizations including the Southern Nevada Water Authority (SNWA), the Las Vegas Valley Watershed Advisory Committee (LVVWAC), and the Las Vegas Wash Coordination Committee (LVWCC) outside the 2024 MS4 Permit. These regional coalitions allow for the coordination of activities designed to benefit stormwater quality throughout the Las Vegas Valley. The Permittees participate in these meetings. During the permit year, both the LVVWAC and the LVWCC held two meetings.

1.3 Las Vegas Valley Area Map

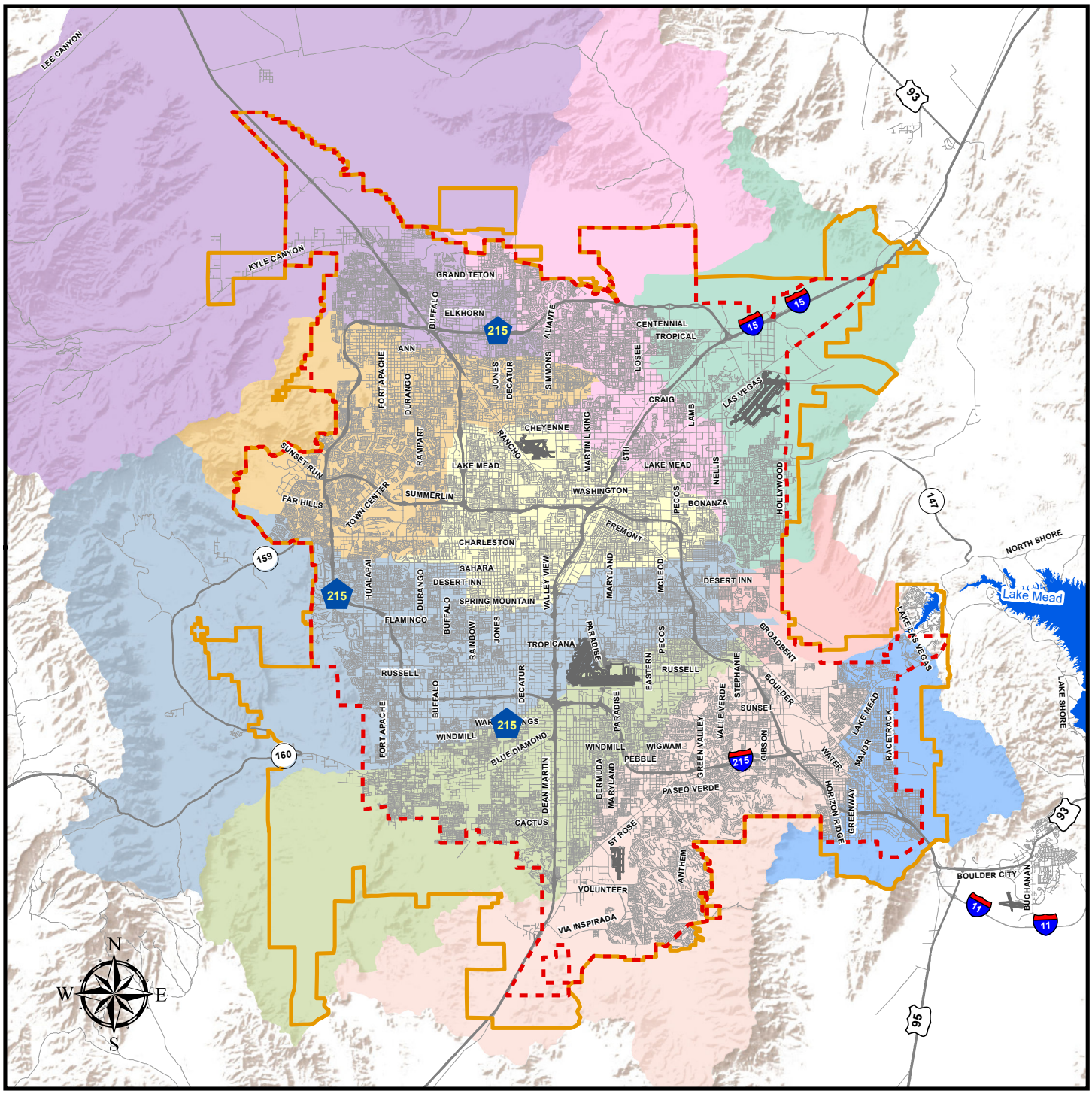
The Las Vegas Valley NPDES MS4 Permit applies to all the urbanized and urbanizing watershed areas that are naturally tributary to the Las Vegas Wash. The permit area of coverage includes the cities of Las Vegas, the majority of North Las Vegas, and the majority of Henderson, as well as the urbanized portions of unincorporated Clark County that lie within the Las Vegas Valley. The permit does not apply to federal or state-owned land in the Las Vegas Valley or to sites that have their own NPDES MS4 Permit (i.e., Nellis Air Force Base, Nevada Department of Transportation [NDOT] facilities).

With the revised 2023 Las Vegas Valley Flood Control Master Plan Update, the ultimate development boundary (UDB) was extended south by approximately 12 square miles to incorporate Eldorado Valley area annexed into the City of Henderson. The UDB assumes the full "build out" condition is reached and all available land within the Las Vegas Valley is fully developed. This condition is assumed to ensure that flood control facilities built today will have capacity for future run-off. The development of the UDB is based on the limits of where development is expected to occur in the Las Vegas Valley, using criteria such as location of protected lands and mountain terrain that surround the Valley. The Bureau of Land Management (BLM) manages a "disposal boundary" in the Las Vegas Valley, which designates federally managed lands that could eventually be privatized and potentially developed.

The permit area encompasses the urbanized and urbanizing area within the 2023 UDB area within the Las Vegas Valley (LVV) watershed that ultimately contributed to the Las Vegas Wash. The area of coverage for the 2024-2025 MS4 permit year is within the UDB 2023 – Updated for the Las Vegas Valley MS4 Program and the BLM Disposal Boundary, as shown in Figure 1-1.

The 2023 UDB extended boundary was based on the updated City of Henderson Zoning and Planning that incorporates the annexed Eldorado Valley area. However, with this hydrologic tributary area assessment, approximately 1.7 square miles of the incorporated Eldorado Valley should be considered as part of the C-1 watershed stormwater discharges into the receiving waters within the Las Vegas Valley (Figure 1-2, area 1). The remaining estimated 10.3 square miles are hydrologically associated with the Eldorado Valley watershed, which is outside the Las Vegas Valley and the permit area. Following a review of this area, the conditions outlined below are applicable to the 2024-2025 permit year:

- The 1.7 square miles area within the C-1 watershed is included in the UDB 2023 – Updated for the Las Vegas Valley MS4 program.
- The 10.3 square miles area within the Eldorado Valley watershed is not included in the UDB 2023 – Updated for the Las Vegas Valley MS4 program.



Legend

- Las Vegas Valley Disposal Boundary
- Ultimate Development Boundary Updated for the Las Vegas Valley MS4 Program (2023 MPU)
- Airport
- Street

Watersheds

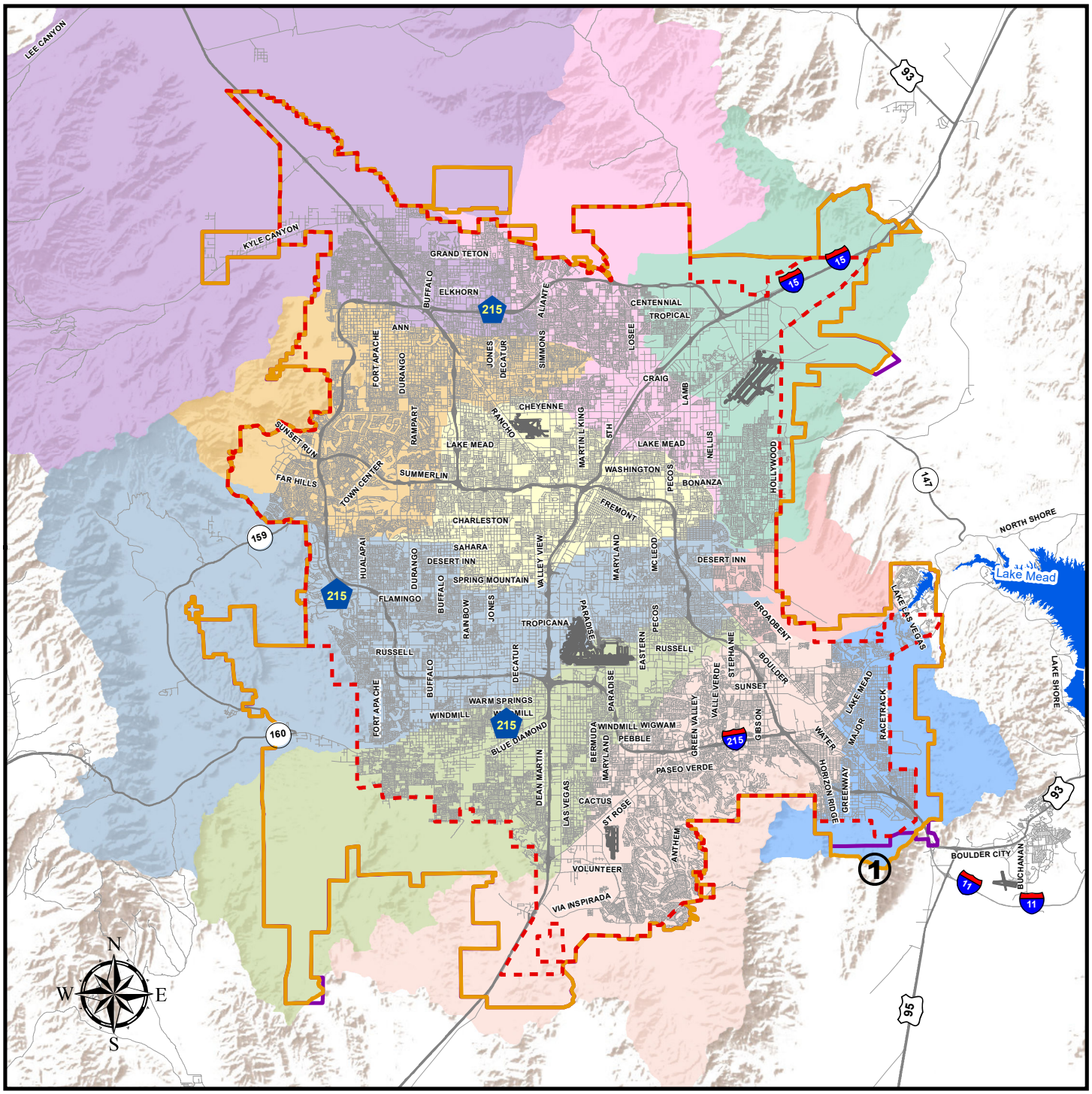
- C1
- CENTRAL
- DUCK CREEK
- FLAMINGO/TROPICANA
- GOWAN
- LOWER LAS VEGAS WASH
- LOWER NORTHERN
- PITTMAN
- RANGE WASH
- UPPER NORTHERN

0 2 4 8 12

Scale in Miles

Service Layer Credits: Sources: Esri, USGS, NOAA

Figure 1-1
Las Vegas Valley Area Map
2024-2025 Annual Report



Legend

- Las Vegas Valley Disposal Boundary
- Ultimate Development Boundary Updated for the Las Vegas Valley MS4 Program (2023 MPU)
- Ultimate Development Boundary Updated for the Las Vegas Valley MS4 Program (2018 MPU)
- Airport
- Street

Watersheds

- C1
- CENTRAL
- DUCK CREEK
- FLAMINGO/TROPICANA
- GOWAN
- LOWER LAS VEGAS WASH
- LOWER NORTHERN
- PITTMAN
- RANGE WASH
- UPPER NORTHERN
- ① Eldorado Valley Area

0 2 4 8 12

Scale in Miles

Service Layer Credits: Sources: Esri, USGS, NOAA

Figure 1-2
Comparison of the 2018 MPU and 2023 MPU UDB
2024-2025 Annual Report

Section 2

Source Identification

Section 2

Source Identification

Section B.5.2 of the 2024 MS4 Permit for the Las Vegas Valley requires the preparation of a map of the existing regional storm drain system to depict major stormwater outfalls in the area of coverage.

2.1 Permit Year Overview

During the permit year, the stormwater system map was updated to assist Permittees, regulatory agencies, and others in determining where potential stormwater quality problems may exist or originate. The map is based on existing computerized inventory information from the Permittees that defines the existing drainage and flood control system.

The Las Vegas Valley consists of the three incorporated cities and unincorporated Clark County. Each of the municipalities is responsible for stormwater management within their geographic boundaries, within the ultimate development boundary (UDB), and within the Las Vegas Valley watershed. This permit area does not apply to Nellis Air Force Base, NDOT MS4 jurisdiction within Las Vegas Valley, or to any areas outside Las Vegas Valley. The UDB is reviewed every five years and updated as necessary by CCRFCD and is documented in this section of the Annual Report.

The permit area of coverage encompasses the urbanized and urbanizing area within the 2023 UDB area (which expands beyond the extents of the disposal boundary) and within the LVV watershed that ultimately contribute to the Las Vegas Wash. The portions added to the 2023 UDB (previous coverage was utilized with the 2018 UDB) were analyzed to determine which areas contribute to the flow of the Las Vegas Wash. The area of coverage for the 2024 MS4 permit year includes the UDB 2023 – Updated for the Las Vegas Valley MS4 program and is presented in Section 1, Figure 1-1.

The following paragraphs provide an overview of the updates since the 2010 MS4 Permit. The CCRFCD established an UDB in the 2008 Las Vegas Valley Flood Control Master Plan Update (MPU), which was revised in 2018 and 2023. The 2023 UDB is the current version as per the date of the Draft SWMP. The UDB assumes the full “build out” condition is reached and all developable land within the Las Vegas Valley is fully developed. This condition assumes that flood control facilities built today will have capacity for future run-off. The development of the UDB is based on the limits of where development is expected to occur in the Las Vegas Valley, using criteria such as locations of protected lands and mountain terrains that surround the Valley. The Bureau of Land Management (BLM) manages a “disposal boundary” in the Las Vegas Valley, which designates federally managed lands that could eventually be privatized and potentially developed.

Several modifications have been made to the UDB since the 2010 MS4 Permit and are summarized as the following:

- An approximately 12-mile extension in the UDB northeast to incorporate the Apex area.
- The UDB was extended to account for zoning changes by the City of North Las Vegas (CNLV).
- The UDB was removed from Tule Springs Fossil Beds National Monument in the northwest part of the valley based on input from CLV.

- The UDB was aligned with CLV and Gypsum Mine Reclamation Project land use plans.
- The southwest area of the valley was adjusted based on Clark County land use plans.
- The Three Kids Mine annexation area was incorporated by the COH.
- The UDB was adjusted to align with BLM Areas of Critical Environmental Concern.
- The UDB was extended south by approximately 12 square miles to incorporate the Eldorado Valley area annexed into the COH.

The areas that drain stormwater run-off outside the Las Vegas Valley watershed (such as the Apex area for example) are removed from the UDB Updated for the Las Vegas Valley MS4 Program (2023 MPU).

The stormwater system map was prepared using regional information from the CCRFCD Geographic Information System (GIS), which was developed for the 2023 MPU, as well as GIS data available from the individual Permittees. The stormwater system map depicts changes resulting from new development and updates to the flood control infrastructure. Locations of regional detention basins (constructed and under construction), channels (lined and unlined), washes, and outfall locations for the Las Vegas Valley stormwater system are shown in Figure 2-1.

Although pipelines and potential outfalls are shown in Figure 2-1, in the Las Vegas Valley pipelines are not as significant as they may be in communities with more precipitation, where they may discharge into fishable—swimmable waters. In the Las Vegas Valley, most or all pipelines discharge into constructed open channels that are a part of the MS4. These open channels are often lined with concrete and are not classified for fishing or swimming. These open channels discharge into other open channels, ultimately leading to lower Las Vegas Wash, which is also not classified for fishing or swimming, but supports fish. The outfalls are identified as potential because they identify the daylighting end of pipelines at the tributary channels regardless of whether those pipelines discharge into a water of the United States.

To provide more detail, Figure 2-2 through Figure 2-5 depict sectional areas of the Las Vegas Valley (northwest, northeast, southwest, and southeast, respectively). The overall stormwater system map meets the permit requirements for source identification of major outfalls that discharge into waters of the United States.

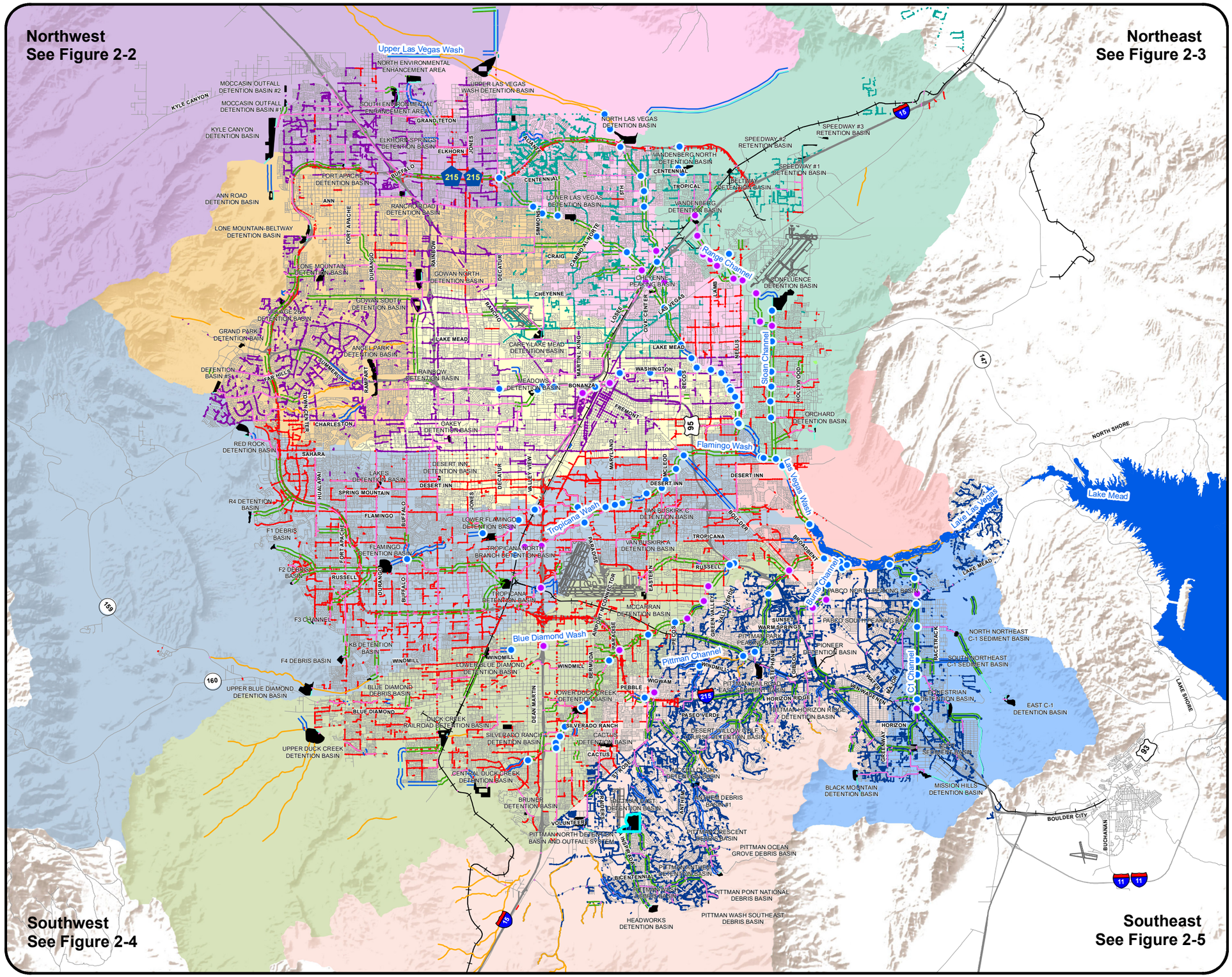
2.2 Permit Year Measurable Goals

The 2024-2025 measurable goal is provided in Table 2-1.

Table 2-1: Source Identification Measurable Goal

Measurable Goal	Permittee	Goal Completed	Description
Submit updated maps once each permit year as part of the Annual Report.	Clark County Regional Flood Control District	Yes	Maps are updated and included in the 2024-2025 Annual Report.

Figure 2-1
Las Vegas Valley Stormwater System: Overview



Legend

- Potential Outfall Location
- Potential Outfall Location in Industrial Area

Regional Facilities

- Natural Channels/Washes
- Unlined Stabilized Channels
- Concrete-Lined Channels
- Levee
- Storm Drains

Local Facilites

- Clark County Stormwater Infrastructure
- City of Las Vegas Stormwater Infrastructure
- City of North Las Vegas Stormwater Infrastructure
- City of Henderson Stormwater Infrastructure

Detention Basins

- Completed
- Under Construction
- Airports
- Streets
- Railroads

Watersheds

- C1
- CENTRAL
- DUCK CREEK
- FLAMINGO/TROPICANA
- GOWAN
- LOWER LAS VEGAS WASH
- LOWER NORTHERN
- PITTMAN
- RANGE WASH
- UPPER NORTHERN

N W E S

0 1 2 4 6

Scale in Miles

Service Layer Credits: Sources: Esri, USGS, NOAA

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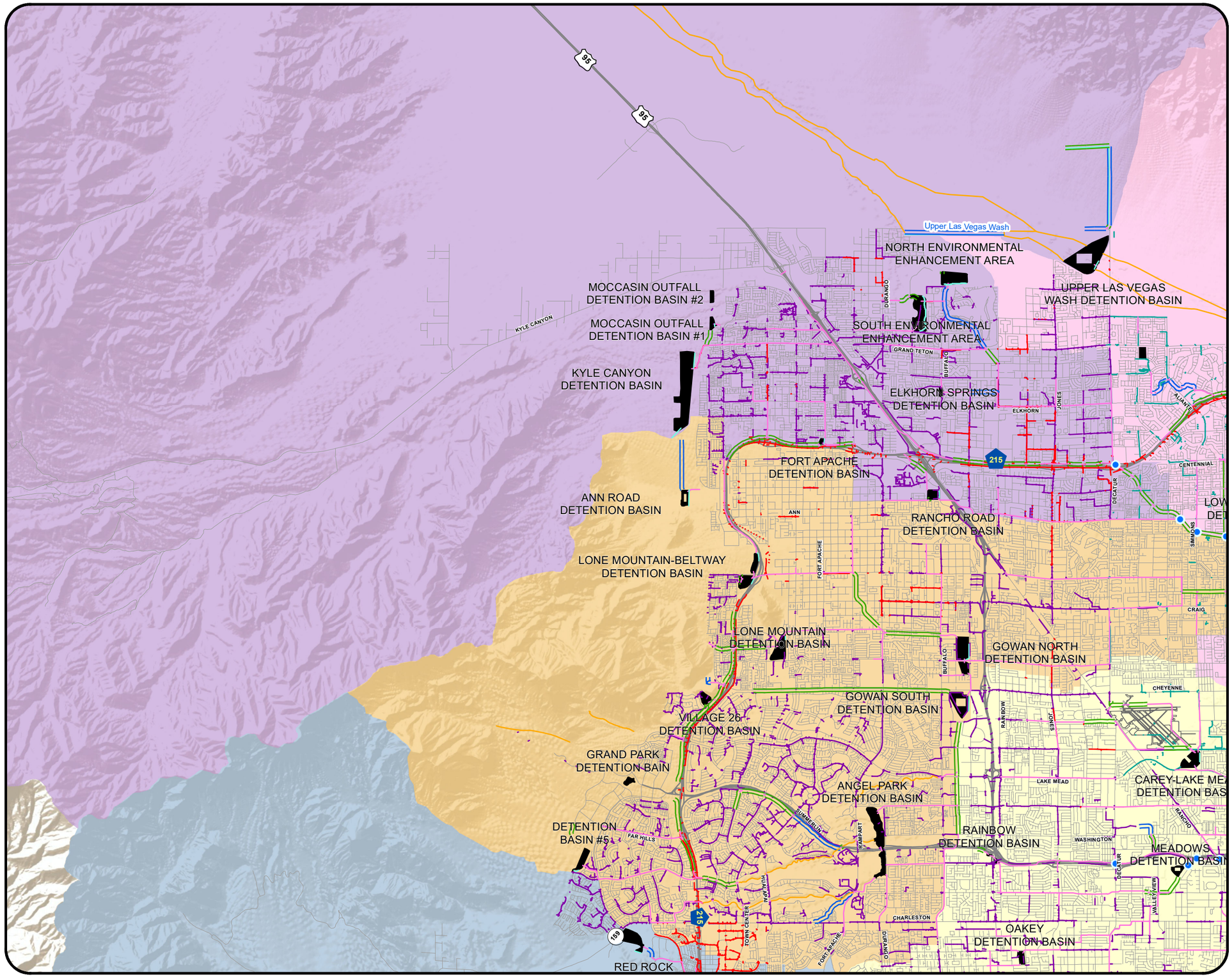
Figure 2-2
Las Vegas Valley Stormwater System: Northwest



Legend

- Potential Outfall Location
- Potential Outfall Location in Industrial Area

Regional Facilities

- Natural Channels/Washes
- Unlined Stabilized Channels
- Concrete-Lined Channels
- Levee
- Storm Drains

Local Facilites

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- City of Las Vegas Stormwater Infrastructure
- City of North Las Vegas Stormwater Infrastructure
- City of Henderson Stormwater Infrastructure

Detention Basins

- Completed
- Under Construction

- Airports
- Streets
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Scale in Miles

Service Layer Credits: Sources: Esri, USGS, NOAA

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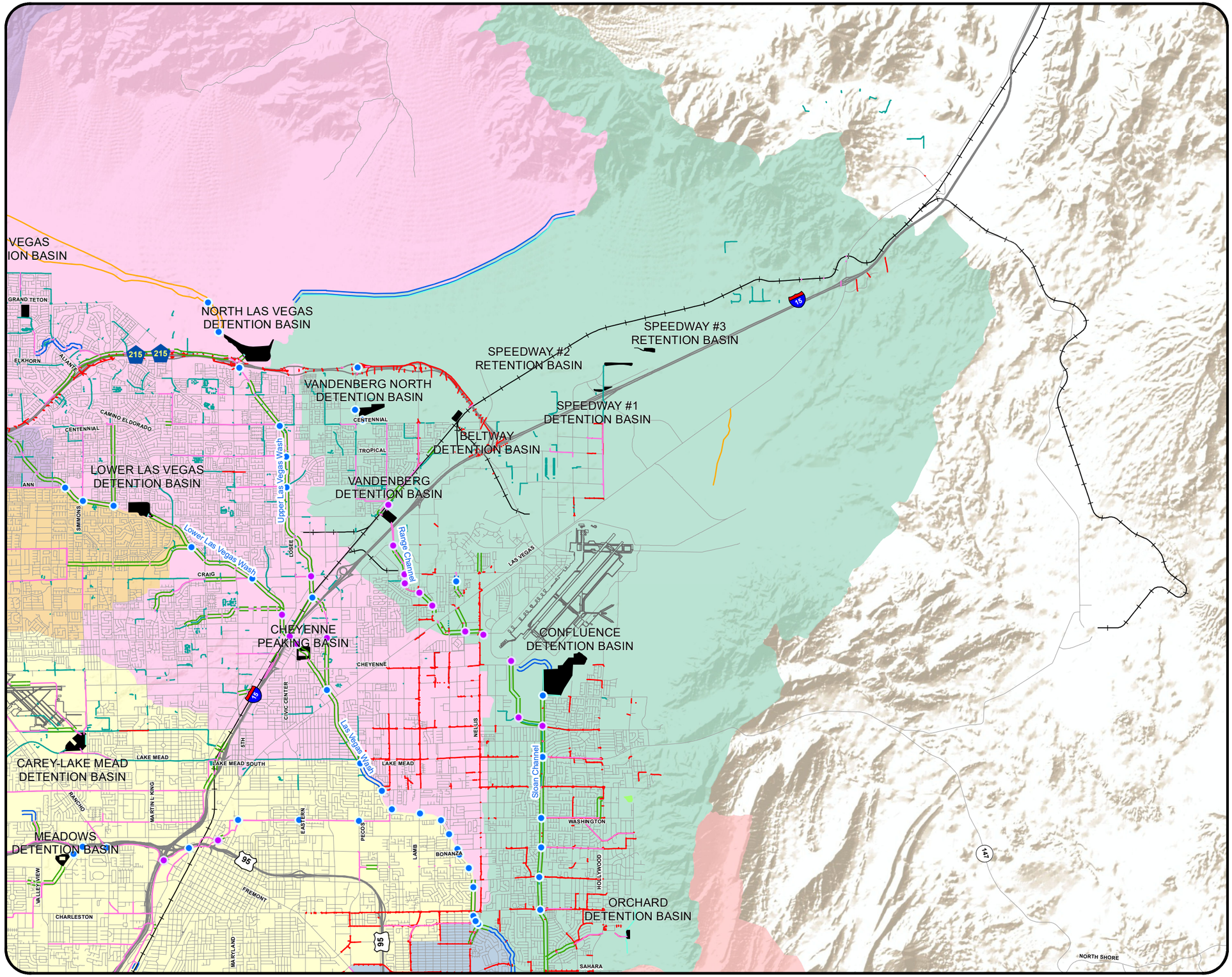
Figure 2-3
Las Vegas Valley Stormwater System: Northeast



Legend

- Potential Outfall Location
- Potential Outfall Location in Industrial Area

Regional Facilities

- Natural Channels/Washes
- Unlined Stabilized Channels
- Concrete-Lined Channels
- Levee
- Storm Drains

Local Facilites

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Detention Basins

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Scale in Miles

Service Layer Credits: Sources: Esri, USGS, NOAA

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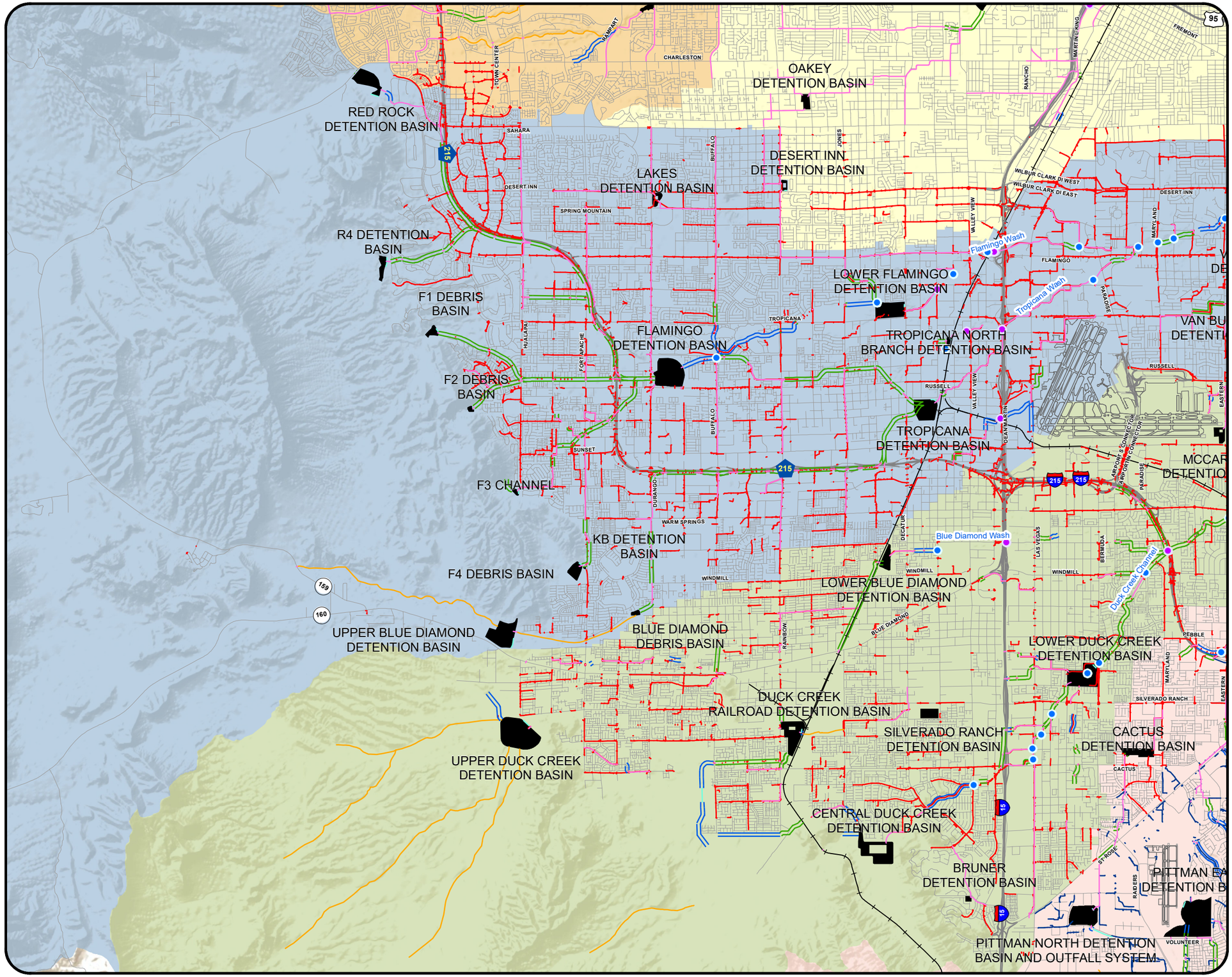
Figure 2-4
Las Vegas Valley Stormwater System: Southwest



Legend

- Potential Outfall Location
- Potential Outfall Location in Industrial Area

Regional Facilities

- Natural Channels/Washes
- Unlined Stabilized Channels
- Concrete-Lined Channels
- Levee
- Storm Drains

Local Facilites

- Clark County Stormwater Infrastructure
- City of Las Vegas Stormwater Infrastructure
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- City of Henderson Stormwater Infrastructure

Detention Basins

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Scale in Miles

Service Layer Credits: Sources: Esri, USGS, NOAA

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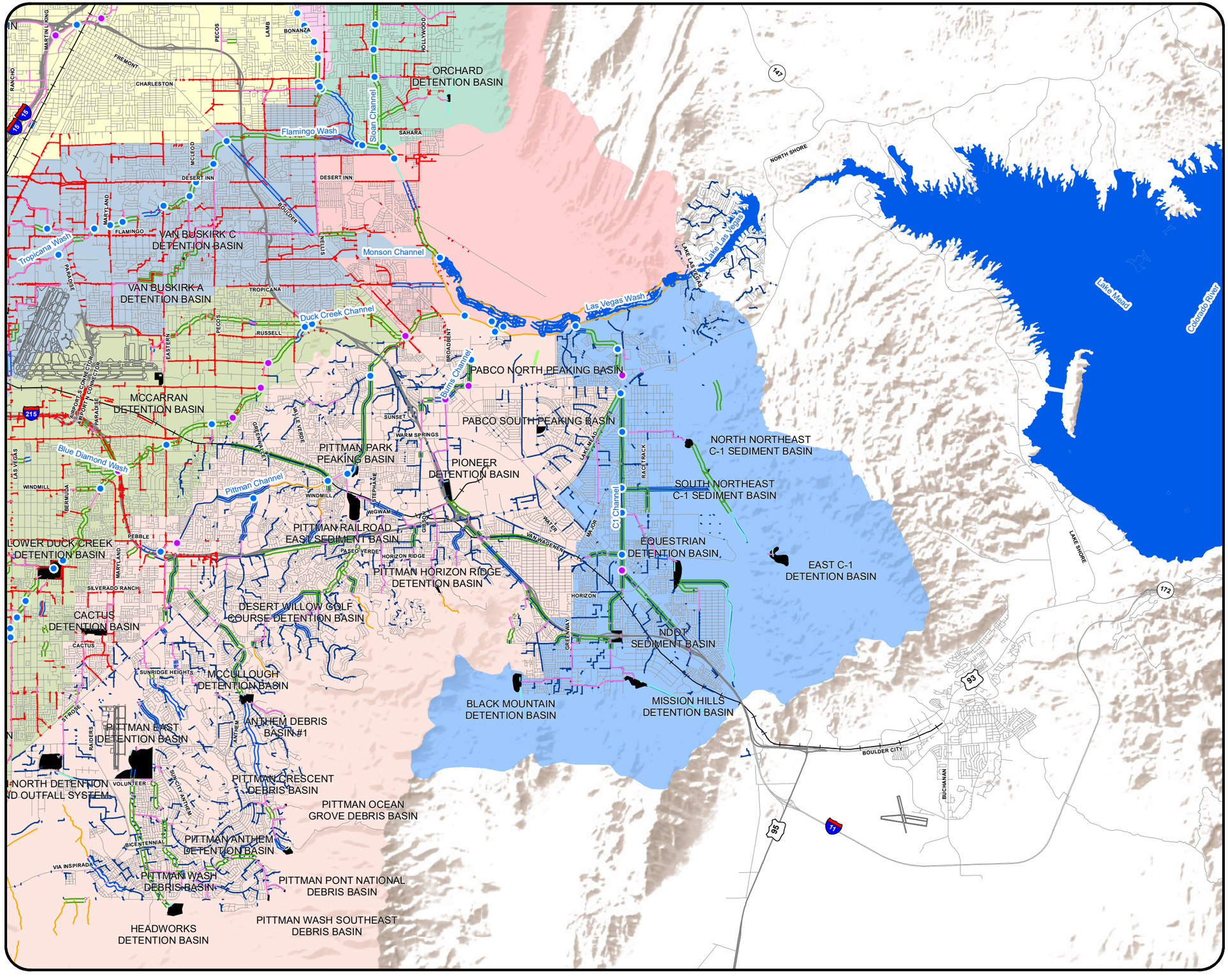
Figure 2-5
Las Vegas Valley Stormwater System: Southeast



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- Potential Outfall Location
- Potential Outfall Location in Industrial Area

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Scale in Miles

Service Layer Credits: Sources: Esri, USGS, NOAA

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Section 3

Public Outreach and Education Program

Section 3

Public Outreach and Education Program

Section B.5.4 of the 2024 MS4 Permit for the Las Vegas Valley includes requirements for a Public Outreach and Education Program.

3.1 Permit Year Overview

The Permittees have developed Public Outreach and Education Programs, which include the use of social media, websites, educational material, video material, labeling of drain inlets, tabling events, and live presentations.

There are three target audiences:

- Developers, architects, construction contractors, and other professionals and businesses
- The general public
- School-age children

The overall approach to educating the first target audience is to provide them with sufficient information so that they can comply with the regulatory requirements applicable to them.

The overall approach to educating the second target audience is to inform the general public in the Las Vegas Valley about important water quality issues related to stormwater runoff—in particular that stormwater does not go to wastewater treatment plants—and to influence behavior of the general public to reduce activities that may have a negative impact on stormwater runoff quality. Examples include discharging down storm drains and not cleaning up pet waste, and increase activities that may have a positive impact on stormwater runoff quality, such as proper disposal of pollutants.

The overall approach to educating the third target audience is to provide awareness of stormwater to influence their future behavior and for them to educate their family members on the issues identified for the second target audience. The primary pollutants include sediment for the first targeted audience and pet waste, trash and debris, yard waste, oils, solvents, and other household chemicals for the second and third targeted audiences. The Permittees evaluate the public's understanding of stormwater quality issues through a regularly conducted survey. The public outreach and education activities are provided in the subsequent paragraphs.

3.1.1 Public Outreach Events

During the permit year, the Permittees attended environmental fairs and community events to distribute educational materials on stormwater quality and respond to public questions or concerns. Some examples of the public outreach and education events attended by Permittees during the current permit year included the Dog Daze of Summer, Earth Day, and Nevada State University's STEAM summer day camp program.

3.1.2 Elementary School Presentations

During the 2024-2025 permit year, CCRFCD provided presentations to elementary school students on important stormwater concepts. The presentations were provided during normal school sessions and day camps for students. The presentations focused on stormwater quality and flood safety concerns.

3.1.3 Public Service Announcements / Flood Channel

In the Las Vegas Valley, additional communication methods were implemented to inform the public about stormwater topics. These included public service announcements (PSAs) and programming on the Flood Channel, sponsored by CCRFCD. Throughout the current permit period, the Permittees produced and aired multiple PSAs and created new Flood Channel segments. The content focused on proper disposal practices for pet waste and household chemicals and the importance of identifying and reporting clogged storm drains.

3.1.4 Storm Drain Marking Program

The storm drain marking program consisted of imprinting the curb at storm drain inlets in new developments and areas of significant redevelopment. The stamps were required for new drain inlets installed in the public right-of-way and were intended to educate the public on the connection between the storm drain system and their drinking water source (Lake Mead), as well as to discourage illegal dumping. During the permit year there were no new or revised standards for storm drain marking. The Permittees continued to educate their inspectors and contractors of this requirement, per the RTC standard and per the 2011 SWMP. Inspectors verified that this requirement was met for all new development. During the permit year, City of Henderson installed 185 plaques on curbs that predated Standard Drawing No. 421.

3.1.5 Pet Waste Management

Pet waste management was largely addressed through public outreach events and activities targeted to pet owners. Pet owners were encouraged to clean up waste left by their pets in yards, parks, and open spaces. Public service campaigns regarding pet waste management are provided at the www.LVstormwater.com website. In addition to providing educational materials, the Permittees also purchased pet waste disposal bags and dispensers and provided them at parks and open spaces. These measures can substantially reduce the potential for stormwater to pick up pathogens from pet waste in public and private areas.

3.1.6 Las Vegas Valley (LVV) Stormwater Quality Website

The Stormwater Quality Management Committee (SQMC) continued to host the LVV stormwater quality website, www.LVstormwater.com, on behalf of the Permittees. The website provides information about the storm drain system, Las Vegas Valley monitoring programs, the NPDES MS4 Permit Program, federal and state regulations, and more. Several guidance documents are available for the construction industry, homeowners, businesses, and other industries to educate the public and special interest groups about reducing pollutants and improving the quality of stormwater runoff.

In addition to the SQMC LVV stormwater quality website, the municipal Permittees continued to maintain stormwater information on their respective websites. During the permit year, the Permittees reviewed their respective websites and updated them as needed. The Permittee websites may include stormwater outreach materials, regulations, links for reporting illicit discharges or spills, and links to additional resources, including www.LVstormwater.com.

3.1.7 Public Outreach Events

During the permit year, the Permittees attended environmental fairs and community events to distribute educational materials on stormwater quality and respond to public questions or concerns.

3.2 Permit Year Measurable Goals

The measurable goals for the 2024-2025 Permit Year are provided in Table 3-1.

Table 3-1. Public Outreach and Education Measurable Goals

Measurable Goal	Permittee	Goal Completed	Description
CCRFCD to produce or update one new PSA every permit cycle.	Clark County Regional Flood Control District	Yes	Flood Channel Segment Series and Series of Paid Radio Spots: Local cable Channels 2 and 4 plus Boulder City—The Flood Channel. Local Channels 3, 5, 8, 13, and Telemundo--Stormwater Quality. Airs approximately 28 times a month
CCRFCD will attend 3 community events and 5 elementary school presentations each permit year.	Clark County Regional Flood Control District	Yes	47 school presentations – 4,100 students 2 summer camps – 170 students 24 employee presentations 11 community events, including: ○ Nevada State University's STEAM summer day camp program ○ Discovery Children's Museum Flood Awareness Day/Stormwater Quality ○ Dog Daze of Summer ○ Clark County Wellness & Health Fair ○ Earth Day, Springs Preserve ○ Enchanted Nevada ○ Las Vegas Science and Technology Event
	City of Las Vegas	N/A	3 community events
	City of Henderson	N/A	13 community events
Storm Drain Marking Program	City of Henderson City of Las Vegas City of North Las Vegas Clark County	Yes	Stamps were installed at 100% of new drop inlets in the Las Vegas Valley, per the RTC standards
Pet Waste Management	City of Henderson	Yes	2,160,000 bags
	City of Las Vegas	Yes	0 [a]
	City of North Las Vegas	Yes	120,000
	Clark County	Yes	1,100,000 bags
LVV Stormwater Quality Website	City of Henderson	Yes	450
	City of Las Vegas	Yes	500
	City of North Las Vegas	Yes	50
	Clark County	Yes	0 [a]
Hold contractor workshops once each permit year and notify contractors in advance.	All Permittees	Yes	Notification was sent out by CCRFCD in advance of the sessions. Attendees signed up for training sessions which are capped based on room size to 80 persons. 2 Trainings: June 30, 2025 83 total attendees

Table 3-1. Public Outreach and Education Measurable Goals

Measurable Goal	Permittee	Goal Completed	Description
Hold public meetings (such as at an SQMC meeting) at least once per year and maintain or update lvstormwater.com website.	Clark County Regional Flood Control District	Yes	4 SQMC meetings: August 13, 2024, November 12, 2024, February 12, 2025, and May 13, 2025 The lvstormwater.com website was updated
Review LVV Construction Site Best Management Practices Guidance Manual annually for need to update	Clark County Regional Flood Control District	Yes	CCRFCD reviewed the BMP manual and plans to start updates in the 2025-2026 permit year

[a] *The bulk order with new vendor was placed last fiscal/reporting cycle*

Section 4

MS4 Maintenance Activities

Section 4

MS4 Maintenance Activities

Section B.5.5 of the 2024 MS4 Permit for the Las Vegas Valley requires an MS4 Maintenance Program to reduce pollutants in stormwater runoff from commercial and residential areas.

4.1 Permit Year Overview

The Permittees have implemented structural and source control measures, including the following: regional detention basins, regional conveyance system, street sweeping, and training on the use of pesticides and herbicides. The Permittees maintain and inspect regional detention basins and the regional conveyance system, including drain inlets. During the 2024-2025 Permit year the Permittees inspected and maintained 85 detention basins and more than 30,000 storm drain inlets. The Permittees swept more than 9,000 miles of streets. The measurable goals highlight efforts such as the number of miles of streets swept, the amount of material removed, and the number of storm drains and detention basins cleaned. The maintenance activities process and overview are provided in the subsequent paragraphs.

4.1.1 Regional Detention Basins

Based on criteria developed by CCRFCD and adopted by all the Permittees, detention basins are designed to control the 100-year flood to discharges that can be safely conveyed in downstream channels. Sediment/debris basins are designed to catch sediment and debris, but are not necessarily sized for the 100-year flood event and/or other regional detention basin design criteria. References to detention basins generally include sediment/debris basins. The purpose of the detention basin maintenance program is to remove sediment and other pollutants from the detention basin. The Permittees' inspect and, as needed, remove sediment, debris and trash from detention basins that are part of the MS4 system. Maintenance activities are performed to preserve flood storage capacity, assure proper hydraulic performance, and remove potential sources of pollution. The Permittees will inspect regional detention basins on a semi-annual basis and after a major storm and will clean as appropriate.

The Permittees may also have installed local detention basins, which are smaller and are not tracked by CCRDCD's GIS system. The Permittees inspect and maintain local detention basins as well as regional detention basins.

4.1.2 Local Conveyance System

The Permittees inspect and, as needed, remove sediment, debris and trash from storm drain inlets in the public MS4 system. Routine maintenance is performed to assure proper hydraulic performance, prevent clogging and to remove potential sources of pollution. After large storms, additional inspections of facilities that historically have problems with debris accumulation and clogging are performed and the facilities are cleaned if necessary, in preparation for the next storm event. The Permittees inspect 20 percent of inlets a minimum of once per year and clean as appropriate.

4.1.3 Public Street Sweeping

The street sweeping program applies to paved public streets with curb and gutter under the jurisdiction of the Permittees. As new areas are developed, the Permittees expand their street sweeping programs to encompass the new public streets. State highway and freeway maintenance is the responsibility of the Nevada Department of Transportation, which has its own MS4 permit and its own street sweeping procedures and goals. Maintenance of private streets and parking lots is the responsibility of the private owner. Streets are swept on a regular basis to remove accumulated sediment, debris, trash, hydrocarbons, and other chemicals. The Permittees inspect the streets every 30 days and sweep on an as needed basis.

4.1.4 Pesticide and Herbicide Training

The Permittees' supervisors involved with pesticides and herbicides are trained about the application of pesticides and herbicides. Training courses are tracked during the permit year.

4.2 Permit Year Measurable Goals

The measurable goals for the 2024-2025 Permit Year are provided in Table 4-1.

Table 4-1. MS4 Maintenance Activities Measurable Goals

Measurable Goal	Permittee	Goal Completed	Description
Inspect regional detention basins twice per permit year (July 1 through June 30), for example fall and spring.	City of Henderson	Yes	25 detention basins were inspected twice during the permit year
	City of Las Vegas	Yes	35 detention basins were inspected twice during the permit year
	City of North Las Vegas	Yes	10 detention basins were inspected twice during the permit year
	Clark County	Yes	36 detention basins were inspected twice during the permit year
Monitor sediment and debris in regional detention basins as deemed warranted and report the estimated volume of material removed each permit year.	City of Henderson	Yes	28,883 CY [a]
	City of Las Vegas	Yes	43,059 CY
	City of North Las Vegas	Yes	1,206 CY
	Clark County	Yes	5,996 CY
Inspect 20% of the public storm drain inlets in the jurisdiction of each entity each permit year.	City of Henderson	Yes	1,175 inspections of 5,845 inlets (20%)
	City of Las Vegas	Yes	4,528 inspections of 9,104 inlets (49%)
	City of North Las Vegas	Yes	675 inspections of 2,927 inlets (23%)
	Clark County	Yes	6,142 inspections of 13,829 inlets (44%)

Table 4-1. MS4 Maintenance Activities Measurable Goals

Measurable Goal	Permittee	Goal Completed	Description
Monitor sediment and debris in public storm drain inlets when deemed warranted, and report on the estimated volume of material removed from the public storm drain inlets each permit year.	City of Henderson	Yes	5,546 CY removed [b]
	City of Las Vegas	Yes	136 CY removed
	City of North Las Vegas	Yes	3,036 CY removed
	Clark County	Yes	618 CY removed
Sweep curbed and paved public streets in urban areas monthly on average, and report on the compliance with the goal each permit year.	City of Henderson	Yes	70,369 miles
	City of Las Vegas	Yes	158,738 miles
	City of North Las Vegas	Yes	23,107 miles
	Clark County	Yes	67,400 miles
Review and report training each permit year for the application of pesticides and herbicides.	City of Henderson	Yes	100% of supervisors are trained
	City of Las Vegas	Yes	100% of supervisors are trained
	City of North Las Vegas	Yes	100% of supervisors are trained
	Clark County	Yes	100% of supervisors are trained

Notes:

[a] The volume reported includes channels

[b] Material removed is a total of street sweeping and drain inlet material removed

Section 5

Post Construction Program for New Development and Significant Redevelopment Projects

Section 5

Post-Construction Program for New Development and Significant Redevelopment Projects

Section B.5.6 of the 2024 MS4 Permit for the Las Vegas Valley includes requirements for a Post-Construction Program for New Development and Significant Redevelopment (NDSR).

5.1 Permit Year Overview

The purpose of the Post-Construction Program for NDSR is to utilize BMPs to address impacts to urban runoff water quality after construction activities have ceased. The Permittees' post-construction program consists of mapping areas of NDSR, regional detention basins, low-flow features, regional conveyance system channel linings, parking lot program, water quality impairment evaluation, and a selenium evaluation. Each of these are described in the following sections.

The objective of site design BMPs is to mitigate discharge of pollutants, prevent downstream exceedances of selenium water quality standards, support the protection of existing ambient water quality, and encourage stormwater reuse through return flow credits. In the Las Vegas Valley, these objectives are achieved by limiting groundwater infiltration, which can mitigate discharge of pollutants from groundwater and impacts from poor soil conditions, as two examples. This also reduces the mobilization of selenium in soils, while enhancing reuse by returning additional flow to Lake Mead and the Colorado River.

5.1.1 Areas of NDSR

Figure 5-1 presents a Valley-wide GIS map depicting approximate areas of NDSR in the Las Vegas Valley for the permit year. Figure 5-2 through Figure 5-5 provide a more detailed view of four Las Vegas Valley regions (northwest, northeast, southwest, and southeast, respectively). These maps were prepared based on stormwater infrastructure data provided by the Permittees and parcel level data from Clark County. Data were compiled only for development projects that were completed (e.g., have received Certificates of Occupancy, Certificates of Completion) during the permit year.

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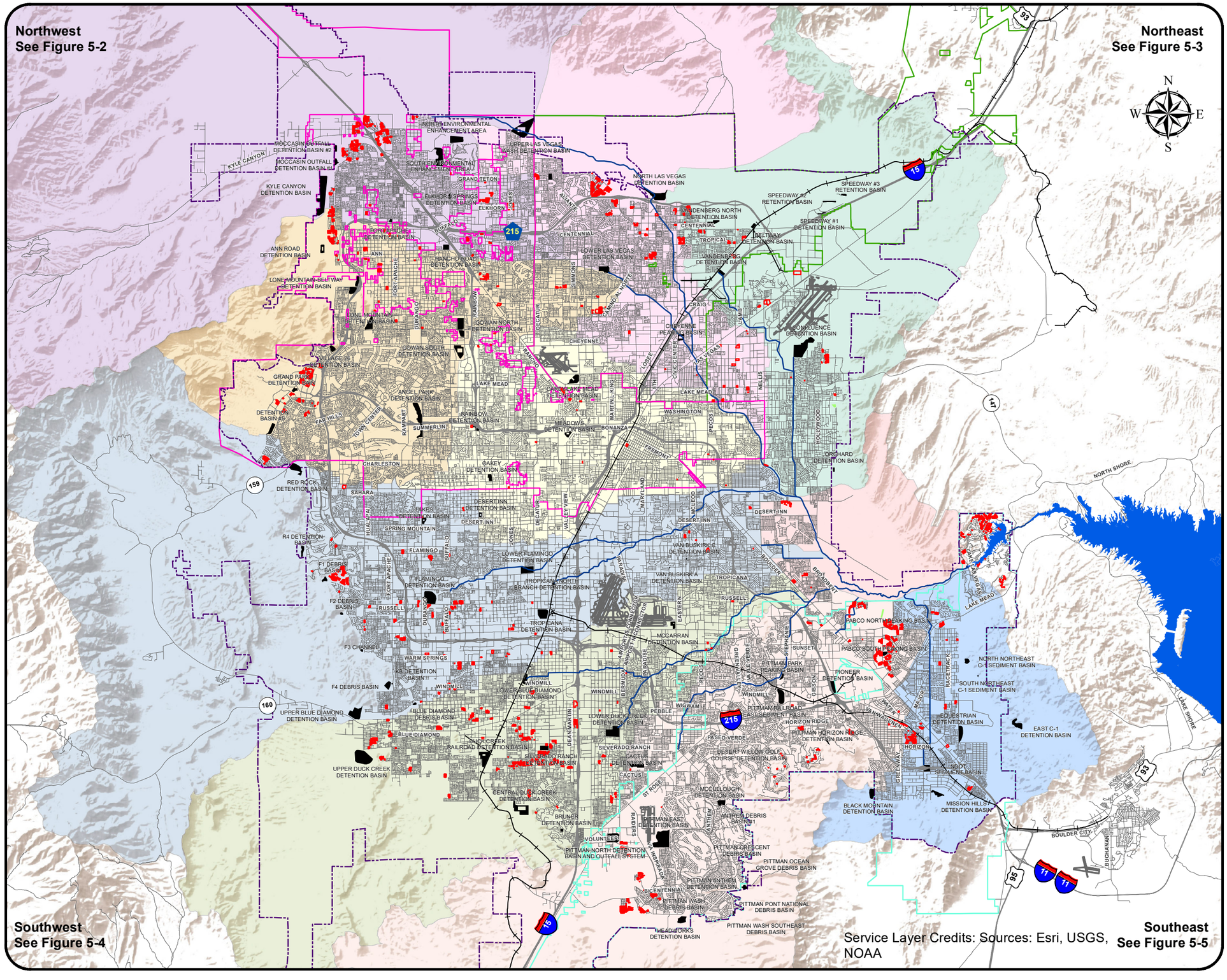
Figure 5-1
Las Vegas Valley
NDSR: Overview



Service Layer Credits: Sources: Esri, USGS, NOAA

Legend

- New Development and Significant Redevelopment from July 1, 2024 to June 30, 2025
- Major Washes

Detention Basins

- Completed
- Under Construction
- Ultimate Development Boundary Updated for the Las Vegas Valley MS4 Program (2023 MPU)

Jurisdictional Boundaries

- City of Henderson
- City of Las Vegas
- City of North Las Vegas
- Airports
- Streets
- Railroads

Watersheds

- C1
- CENTRAL
- DUCK CREEK
- FLAMINGO/TROPICANA
- GOWAN
- LOWER LAS VEGAS WASH
- LOWER NORTHERN
- PITTMAN
- RANGE WASH
- UPPER NORTHERN

0 1 2 4 6

Scale in Miles

2024-2025 Annual Report

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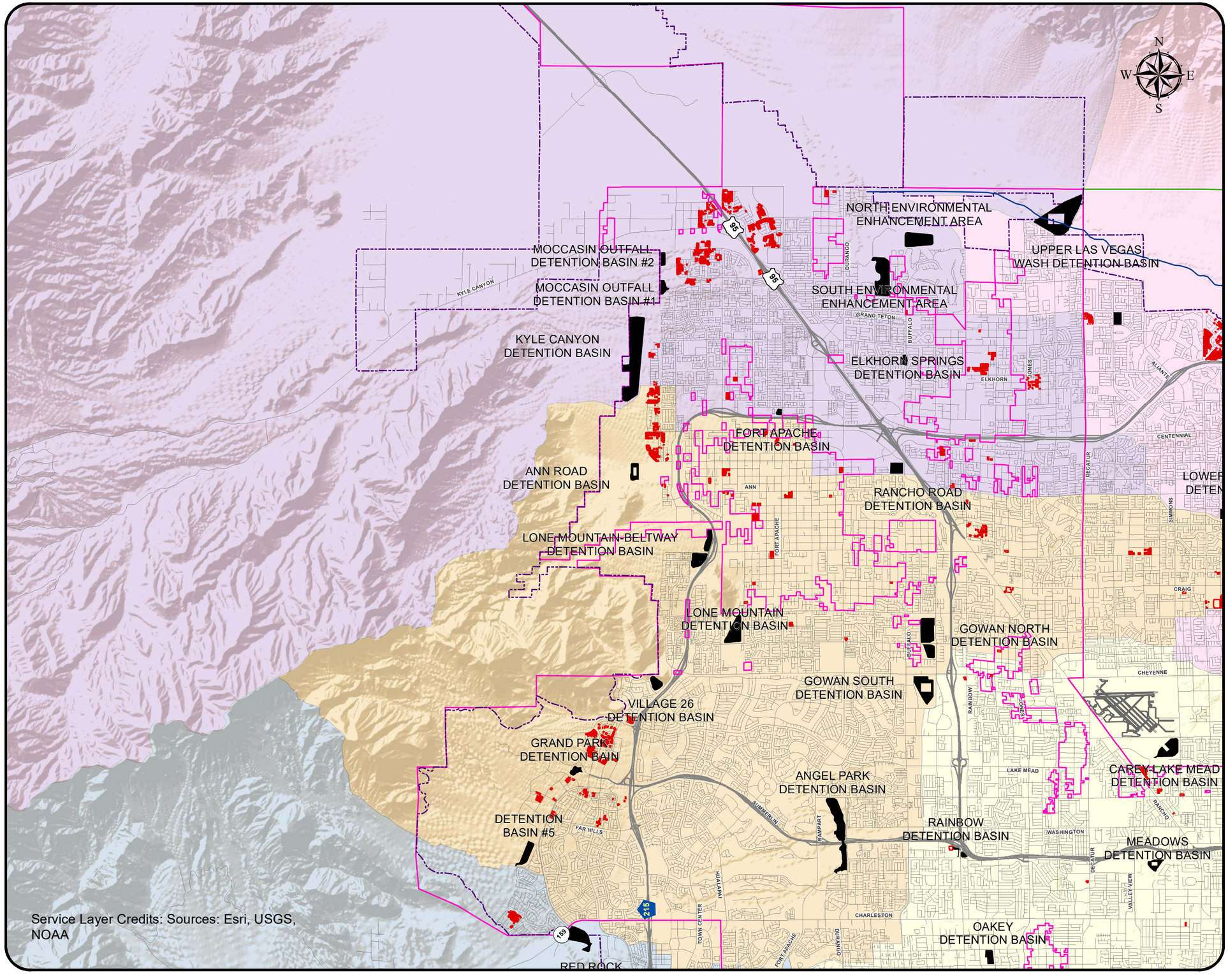
Figure 5-2
Las Vegas Valley
NDSR: Northwest



Service Layer Credits: Sources: Esri, USGS, NOAA

Legend

- New Development and Significant Redevelopment from July 1, 2024 to June 30, 2025
- Major Washes

Detention Basins

- Completed
- Under Construction
- Ultimate Development Boundary Updated for the Las Vegas Valley MS4 Program (2023 MPU)

Jurisdictional Boundaries

- City of Henderson
- City of Las Vegas
- City of North Las Vegas
- Airports
- Streets
- Railroads

Watersheds

- C1
- CENTRAL
- DUCK CREEK
- FLAMINGO/TROPICANA
- GOWAN
- LOWER LAS VEGAS WASH
- LOWER NORTHERN
- PITTMAN
- RANGE WASH
- UPPER NORTHERN

0 0.5 1 2 3

Scale in Miles

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Figure 5-3
Las Vegas Valley
NDSR: Northeast

Legend

- New Development and Significant Redevelopment from July 1, 2024 to June 30, 2025
- Major Washes

Detention Basins

- Completed
- Under Construction
- Ultimate Development Boundary Updated for the Las Vegas Valley MS4 Program (2023 MPU)

Jurisdictional Boundaries

- City of Henderson
- City of Las Vegas
- City of North Las Vegas
- Airports
- Streets
- Railroads

Watersheds

- C1
- CENTRAL
- DUCK CREEK
- FLAMINGO/TROPICANA
- GOWAN
- LOWER LAS VEGAS WASH
- LOWER NORTHERN
- PITTMAN
- RANGE WASH
- UPPER NORTHERN

0 0.5 1 2 3

Scale in Miles

2024-2025 Annual Report

NORTH LAS VEGAS DETENTION BASIN
SPEEDWAY #3 RETENTION BASIN
SPEEDWAY #2 RETENTION BASIN
VANDENBERG NORTH DETENTION BASIN
SPEEDWAY #1 DETENTION BASIN
BELTWAY DETENTION BASIN
LOWER LAS VEGAS DETENTION BASIN
VANDENBERG DETENTION BASIN
CHEYENNE PEAKING BASIN
CONFLUENCE DETENTION BASIN
ORCHARD DETENTION BASIN

Service Layer Credits: Sources: Esri, USGS, NOAA

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Figure 5-4
Las Vegas Valley NDSR: Southwest

Legend

- New Development and Significant Redevelopment from July 1, 2024 to June 30, 2025
- Major Washes

Detention Basins

- Completed
- Under Construction
- Ultimate Development Boundary Updated for the Las Vegas Valley MS4 Program (2023 MPU)

Jurisdictional Boundaries

- City of Henderson
- City of Las Vegas
- City of North Las Vegas
- Airports
- Streets
- Railroads

Watersheds

- C1
- CENTRAL
- DUCK CREEK
- FLAMINGO/TROPICANA
- GOWAN
- LOWER LAS VEGAS WASH
- LOWER NORTHERN
- PITTMAN
- RANGE WASH
- UPPER NORTHERN

0 0.5 1 2 3

Scale in Miles

RED ROCK DETENTION BASIN
R4 DETENTION BASIN
F1 DEBRIS BASIN
F2 DEBRIS BASIN
F3 CHANNEL
F4 DEBRIS BASIN
UPPER BLUE DIAMOND DETENTION BASIN
UPPER DUCK CREEK DETENTION BASIN
OAKEY DETENTION BASIN
LAKES DETENTION BASIN
DESERT INN DETENTION BASIN
FLAMINGO DETENTION BASIN
LOWER FLAMINGO DETENTION BASIN
TROPICANA NORTH BRANCH DETENTION BASIN
TROPICANA DETENTION BASIN
KB DETENTION BASIN
BLUE DIAMOND DEBRIS BASIN
DUCK CREEK RAILROAD DETENTION BASIN
LOWER BLUE DIAMOND DETENTION BASIN
SILVERADO RANCH DETENTION BASIN
CENTRAL DUCK CREEK DETENTION BASIN
BRUNER DETENTION BASIN
PITTMAN NORTH DETENTION BASIN AND OUTFALL SYSTEM
LOWER DUCK CREEK DETENTION BASIN
CACTUS DETENTION BASIN

Service Layer Credits: Sources: Esri, USGS, NOAA

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Figure 5-5
Las Vegas Valley
NDSR: Southeast

Legend

New Development and Significant Redevelopment from July 1, 2024 to June 30, 2025

Major Washes

Detention Basins

Completed

Under Construction

Ultimate Development Boundary Updated for the Las Vegas Valley MS4 Program (2023 MPU)

Jurisdictional Boundaries

City of Henderson

City of Las Vegas

City of North Las Vegas

Airports

Streets

Railroads

Watersheds

C1

CENTRAL

DUCK CREEK

FLAMINGO/TROPICANA

GOWAN

LOWER LAS VEGAS WASH

LOWER NORTHERN

PITTMAN

RANGE WASH

UPPER NORTHERN

0 0.5 1 2 3

Scale in Miles

2024-2025 Annual Report

ORCHARD DETENTION BASIN
VAN BUSKIRK C DETENTION BASIN
VAN BUSKIRK A DETENTION BASIN
MCCARRAN DETENTION BASIN
PABCO NORTH PEAKING BASIN
PABCO SOUTH PEAKING BASIN
PITTMAN PARK PEAKING BASIN
PIONEER DETENTION BASIN
NORTH NORTHEAST C-1 SEDIMENT BASIN
SOUTH NORTHEAST C-1 SEDIMENT BASIN
EQUESTRIAN DETENTION BASIN
EAST C-1 DETENTION BASIN
NDOT SEDIMENT BASIN
MISSION HILLS DETENTION BASIN
BLACK MOUNTAIN DETENTION BASIN
LOWER DUCK CREEK DETENTION BASIN
PITTMAN RAILROAD EAST SEDIMENT BASIN
PITTMAN HORIZON RIDGE DETENTION BASIN
DESERT WILLOW GOLF COURSE DETENTION BASIN
CACTUS DETENTION BASIN
MCCULLOUGH DETENTION BASIN
PITTMAN EAST DETENTION BASIN
ANTHEM DEBRIS BASIN #1
PITTMAN CRESCENT DEBRIS BASIN
PITTMAN OCEAN GROVE DEBRIS BASIN
PITTMAN ANTHEM DETENTION BASIN
PITTMAN WASH DEBRIS BASIN
PITTMAN PONT NATIONAL DEBRIS BASIN
PITTMAN WASH SOUTHEAST DEBRIS BASIN
HEADWORKS DETENTION BASIN
N NORTH DETENTION AND OUTFALL SYSTEM
Lake Mead
Service Layer Credits: Sources: Esri, USGS, NOAA

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5.1.2 Regional Detention Basins

Regional flood control detention basins are a key component of the NDSR Program. Due to the infrequency, localization, and variable magnitude of storm events in the Las Vegas Valley, the use of regional detention basins to capture and regulate runoff and associated pollutants is more efficient than the use of smaller scale facilities.

During the 2024-2025 permit year, the following six detention basins were under design:

- Duck Creek Larson
- Harry Reid Peaking basin (no low-flow feature planned)
- North Las Vegas (no low-flow feature planned)
- Pabco North Peaking Basin (no low-flow feature planned)
- Southeast Pittman
- Southwest Pittman

During the 2024-2025 permit year, the following two detention basins completed design:

- Meadows (no low-flow feature planned)
- Van Buskirk-Paradise

During the 2024-2025 permit year, the following detention basin was under construction:

- Jim McGaughey

5.1.3 Low-Flow Features

The Permittees have been installing low-flow features in regional detention basins to improve capture of sediment and other pollutants during lower flow events. The Permittees determine the amount of low-flow features to be added by first determining the area of NDSR and then estimating the flow generated by this area from the 85th percentile storm event, with the goal of constructing low-flow features sufficient to respond to this flow. Figure 5-6 shows the flow generated by the 85th percentile storm from data records of new development and compares it with the capacities of the low-flow features that have been installed since the program started in 2013. Figure 5-6 differs from previous figures in other Annual Reports. Initial evaluation was performed using estimated and empirical inputs. Moving forward, the required capture volume (RCV) will be computed using actual data: the stormwater quality event of the 85th percentile, landuse and area of actual development, and depth area adjustment based on the size of the large watersheds. The evaluation details are included in Appendix B of this Annual Report.

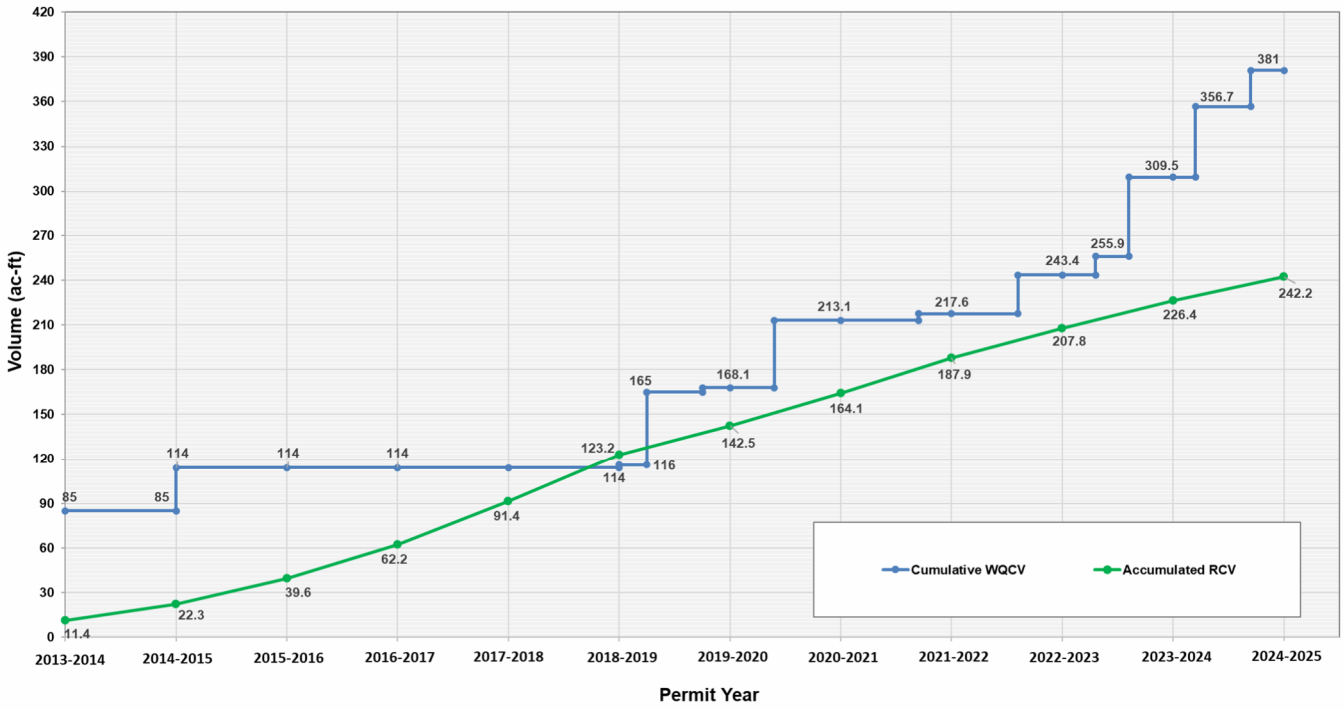


Figure 5-6: Total Volume Generated by NDSR Acreage vs. Total Low-Flow Feature Treatment Capacity (also known as Water Quality Capture Volume [WQCV])

During the permit year, two detention basins were upgraded to include a low-flow feature (Pittman East and Rancho).

Since 2013, low-flow features are operational in the following regional detention basins:

- Angel Park Detention Basin
- Equestrian Detention Basin
- Pioneer Detention Basin
- Horizon Ridge
- Pittman North
- Park Highlands West
- Vandenberg North
- Speedway 2
- Grand Park
- Silverado Ranch
- Gowan North
- Oakey
- Pittman East
- Rancho

5.1.4 Regional Channel Lining

In addition to improving hydraulic performance, channel lining eliminates channel erosion that would contribute to downstream sediment load, TSS, and turbidity. Slopes in the Las Vegas Valley are generally moderate-to-steep, flow velocities are high, and soils are erodible; therefore, most channels are stabilized using concrete lining. The CCRFCD prefers providing concrete lining for regional flood control channels. As a result, very few channels within the existing developed area are unlined. However, occasionally unlined channels are lined or otherwise armored. Table 5-1 provides a summary of regional channel lining projects completed during the current permit year.

Table 5-1: Miles of Regional Channel Stabilization for the Current Permit Year (2024-2025)

Metric	2024-2025
Miles of Regional Channel Stabilized (e.g., replacing an unlined channel with an armored channel or reinforced concrete box)	0

5.1.5 Low Impact Development

In order to get approval for construction plans, all new development, both public and private, must comply with the Hydrologic Criteria and Drainage Manual (HCDDM), which requires Low Impact Development (LID) measures such as swales or alternative measures for medium and large commercial and industrial parking lots. The Permittees maintain an inventory of these sites.

5.1.6 Selenium Evaluation

CCRFCD provides written evaluations whether the criteria developed as part of the post-construction program will tend to cause or contribute to elevated levels of selenium in surface waters within Las Vegas Valley and whether the criteria developed as part of the post-construction program will tend to reduce or degrade the contribution of stormwater to the water supplies provided by the Colorado River.

The Permittees have concluded that post-construction program criteria will not contribute to elevated levels of selenium in surface waters with the Las Vegas Valley and will not cause an exceedance of the water quality standards for selenium in identified waters. This conclusion depends primarily on the lack of measures that would cause stormwater to infiltrate into the ground. Infiltration in the Las Vegas Valley raises shallow groundwater levels and mobilizes naturally occurring selenium in the soils, which ultimately surfaces in surface channels.

5.2 Permit Year Measurable Goals

The 2024-2025 measurable goals are provided in Table 5-3.

Table 5-3: Post-Construction Program for NDSR Projects Measurable Goals

Measurable Goal	Permittee	Goal Completed	Description
Report on whether the inventory and tracking system has been updated each permit year in the Annual Report.	City of Henderson	Yes	The Permittees maintain inventories for the regional detention basins, low-flow features, and parking lot program and update these inventories each year.
	City of Las Vegas	Yes	
	City of North Las Vegas	Yes	
	Clark County	Yes	
Inspect all regional detention basins and low flow features each permit year. Inspect additional post-construction BMPs during construction or as appropriate. Each Permittee will review the program annually and make necessary changes.	City of Henderson	Yes	The Permittees inspected all 106 regional detention basins and 14 low flow features during the permit year. COH - 25 detention basins CLV - 35 detention basins CNLV - 10 detention basins CC - 36 detention basins
	City of Las Vegas	Yes	
	City of North Las Vegas	Yes	
	Clark County	Yes	
Provide NDEP with updated maps each permit year in the Annual Report.	Clark County Regional Flood Control District	Yes	Figure 5-1 presents a Valley-wide GIS map depicting areas, or approximate areas, of NDSR in the Las Vegas Valley for the permit year. Figure 5-2 through Figure 5-5 provide a more detailed view of four Las Vegas Valley regions.
Report on the number of contractor trainings conducted and flyers distributed each permit year in the Annual Report.	All Permittees	Yes	Number of trainings conducted: 2 (June 30, 2025) Estimated number of attendees: 83 Flyers distributed: 166 lvstormwater.com website updated
Provide written evaluations or updated evaluations each permit year in the Annual Report.	Clark County Regional Flood Control District	Yes	The Permittees have concluded that post-construction program criteria will not contribute to elevated levels of selenium in surface waters with the Las Vegas Valley and will not cause an exceedance of the water quality standards for selenium in identified waters. This conclusion depends primarily on the lack of LID measures that would cause stormwater to infiltrate into the ground. Infiltration in the Las Vegas Valley raises shallow groundwater levels and mobilizes naturally occurring selenium in the soils, which ultimately surfaces in surface channels.

Section 6

Illicit Discharge and Detection

Section 6

Illicit Discharge and Detection

Section B.5.7 of the 2024 MS4 Permit for the Las Vegas Valley outlines the Illicit Discharge Detection Program.

6.1 Permit Year Overview

This program aims to detect and eliminate illicit discharges and improper disposal into the Municipal Separate Storm Sewer System (MS4). The Permittees enforce municipal and County ordinances by conducting on-going field screening activities such as storm channel inspections, investigations of atypical dry weather flows as observed by the Permittees, or in response to complaints. The Permittees have developed educational programs and public information activities to facilitate the proper management and disposal of used oil and toxic materials.

In the Las Vegas Valley, the stormwater conveyance infrastructure is composed of extensive open-channel systems. As all stormwater outfalls ultimately discharge into these open channels, the Permittees can monitor and investigate atypical dry weather flows originating from subsurface stormwater facilities. The municipalities have staff and retain contractors who respond to spills of hazardous materials.

6.1.2 Storm Channel Inspections

Semi-annual inspections of regional open storm channels and detention basins include, but are not limited to, inspecting for evidence of illicit discharges and illegal dumping. MS4 facilities were inspected by the Permittees in Fall 2024 and Spring 2025. Inspections included visually inspecting exposed storm channels and detention basins to look for evidence of non-stormwater discharges. Emphasis was placed on those areas that had a reasonable potential for containing illicit discharges, exfiltration from the sanitary sewer system, or other sources of non-stormwater.

In general, dry weather flows in Las Vegas Valley MS4 channels were minor. Vegetation, trash, debris, and graffiti were commonly found in channels inspected by City of North Las Vegas, City of Henderson, and City of Las Vegas. Clark County commonly observed vegetation, gravel/silt, and debris during the inspections.

6.1.3 Spill Control Prevention Plan

Spill Control Prevention Plans are plans to prevent and contain spills of hazardous materials that would impact downstream water quality. The Permittees currently have spill prevention and response regulation programs in place through their fire departments and contracts with special emergency response contractors. These regulations and programs are authorized in response to other State requirements but provide benefits to the MS4 program.

6.1.4 Stormwater-Related Complaint Response

The Permittees provide several avenues by which the public can report potential illicit discharges to the MS4, including:

- Websites

  - The Permittees' collective SQMC website, www.LVstormwater.com, has a link for reporting illicit discharges. This link gives contact information for reporting illicit discharges and clogged storm drains.
  - Individual Permittee websites also include links for reporting illicit discharges or illegal dumping within their jurisdiction.
- Southern Nevada Health District (SNHD)
  - The SNHD has the authority to enforce ordinances prohibiting dumping of solid waste, semisolid waste, liquid waste, and sewage to the Las Vegas Valley MS4. The public can call SNHD and report problems directly or can submit a complaint form for reporting evidence of illegal dumping via their website: www.southernnevadahealthdistrict.org/solid-waste/illegal-dumping.php
- Clark County Public Response Office (CCPRO)
  - The CCPRO receives public complaints related to illegal dumping and other ordinance violations and is empowered to respond and address these problems via their website: http://www.clarkcountynv.gov/administrative-services/pro/Pages/default.aspx
- Direct Contact with Permittees
  - Each of the Permittees receives direct reports from citizens reporting dumping, illegal discharges of non-stormwater to the drainage system, maintenance problems, and other activities that may affect water quality. The CLV, CNLV, and COH follow up on these complaints within their jurisdiction; Clark County follows up on complaints in unincorporated Clark County. The CCRFCD also routinely receives reports through its citizen contact system, often in response to its PSAs. Complaints are directed to the appropriate jurisdiction for resolution.

6.2 Permit Year Measurable Goals

The 2024-2025 measurable goals are provided in Table 6-1.

Table 6-1. Illicit Discharge and Detection Measurable Goals

Measurable Goal	Permittee	Goal Completed	Description
Conduct field screening activities along with maintenance activities including inspections of channels and detention basins.	City of Henderson	Yes	Fall 2024 and Spring 2025 inspections completed
	City of Las Vegas	Yes	Fall 2024 and Spring 2025 inspections completed
	City of North Las Vegas	Yes	Fall 2024 and Spring 2025 inspections completed
	Clark County	Yes	Fall 2024 and Spring 2025 inspections completed
Report on the number of responses to complaints relating to illicit discharge and detection each permit year.	City of Henderson	Yes	426
	City of Las Vegas	Yes	58
	City of North Las Vegas	Yes	4
	Clark County	Yes	520

Section 7

Industrial Facility Monitoring and Control

Section 7

Industrial Facility Monitoring and Control

Section B.5.8 of the 2024 MS4 Permit describes methods to monitor and control industrial stormwater pollution.

7.1 Permit Year Overview

The Permittees' program to monitor and control pollutants in stormwater discharges to the MS4 from operating municipal landfills, hazardous waste treatment, disposal and recovery facilities, industrial facilities that are subject to Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), and industrial facilities that the Permittee determines are contributing a substantial pollutant loading to the MS4 within the area of coverage of the 2024 Permit.

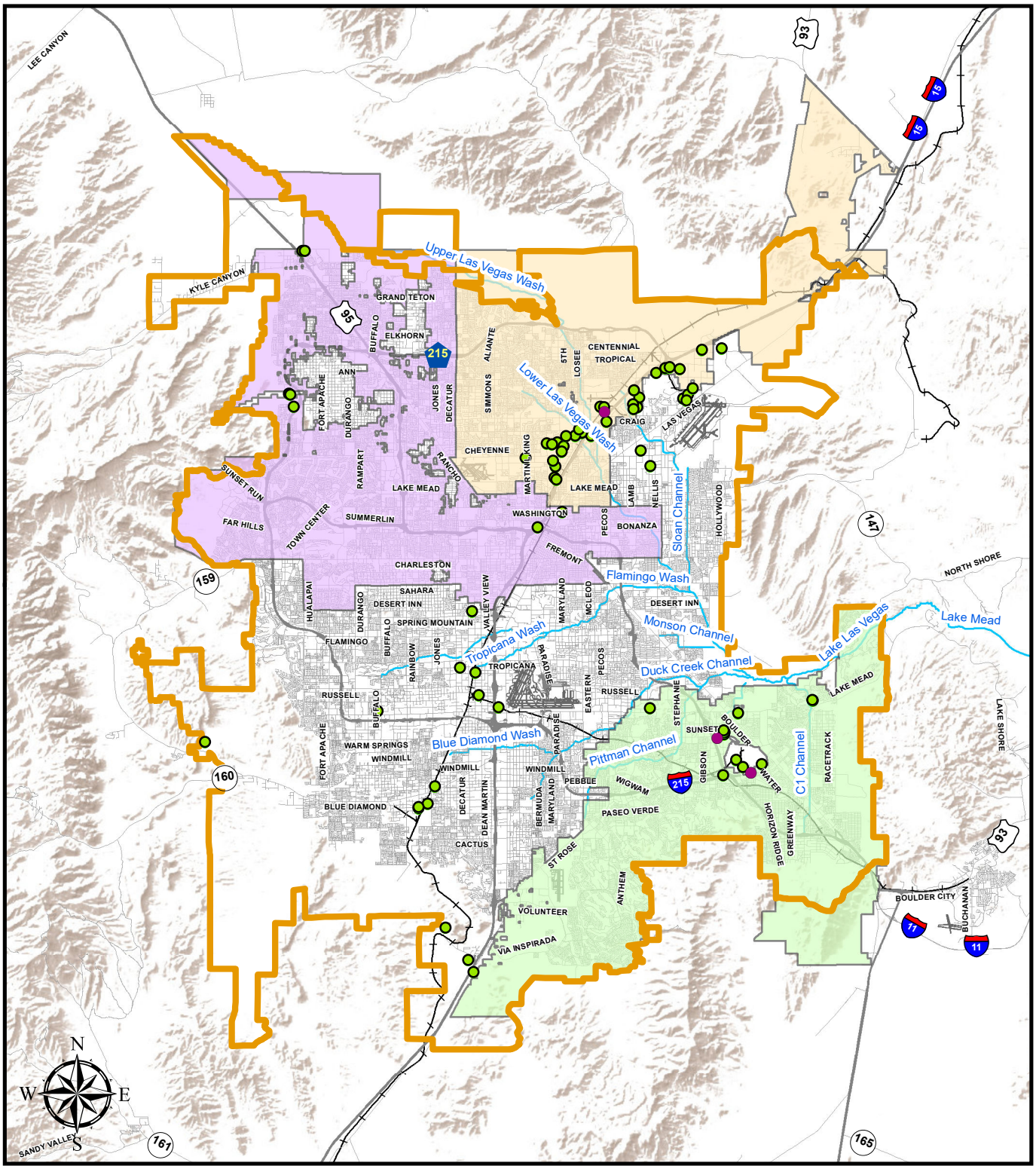
This program complements the Multi-Sector General Permit (Industrial Stormwater Permit), separately administered by NDEP.

The industrial facility processes are described for each municipal Permittee as follows:

- Clark County Water Quality staff perform the activities and measures for the industrial facility program. Clark County staff inspect the sites identified on the industrial facility inventory at least annually and perform follow-up as needed.
- CLV use their pretreatment program staff to conduct stormwater inspections during their regular site visits. All industrial sites in the pretreatment program are inspected. If issues pertaining to stormwater are discovered during normal inspections for compliance with discharges to the sanitary sewer, these are noted and addressed accordingly.
- CNLV use their pretreatment program staff to conduct stormwater inspections during their regular site visits. All industrial sites in the pretreatment program are inspected. If issues pertaining to stormwater are discovered during normal inspections for compliance with discharges to the sanitary sewer, these are noted and addressed accordingly.
- The COH Building and Fire Safety Division Fire Inspector II staff inspect sites identified on the industrial facility inventory at least annually and perform follow-up as needed.

7.1.1 Industrial Facility Stormwater Inventory

The inventory has four categories: 1) operating municipal landfills; 2) hazardous waste treatment, disposal and recovery facilities; 3) facilities that are subject to SARA Section 313; and 4) industrial facilities that the municipal permit applicant determines are contributing a substantial pollutant loading to the MS4. In the Las Vegas Valley, there are no operating municipal landfills. Facilities in Categories 2 and 3 are checked against the EPA website for accuracy, and are detailed in Sections 7.1.2 and 7.1.3, respectively. The Permittees tracked other industrial facilities to confirm they are not substantially contributing, even though they are not an MS4 permit mandated industrial category. During the 2024-2025 permit year, there were no industrial facilities that the Permittees determined are contributing a substantial pollutant loading to the MS4. Figure 7-1 shows the industrial facility locations for the 2024-2025 Annual Report.



Legend

- Ultimate Development Boundary Updated for the Las Vegas Valley MS4 Program (2023 MPU)
- Hazardous Waste Treatment Disposal and Recovery Facilities
- Industrial Facility Subject to Section 313
- Airports
- Streets
- Railroads

Jurisdictional Boundaries

- City of Henderson
- City of Las Vegas
- City of North Las Vegas
- Clark County

0 1.5 3 6 9

Scale in Miles

Service Layer Credits: Sources: Esri, USGS, NOAA

Figure 7-1
Industrial Facility Locations
2024-2025 Annual Report

7.1.2 Hazardous Waste Treatment, Disposal, and Recovery Facilities

The EPA keeps a list of hazardous waste treatment, disposal, and recovery facilities that are subject to the control of hazardous waste under the Resource Conservation and Recovery Act (RCRA). The EPA RCRA Info website (https://enviro.epa.gov/facts/rcrainfo/search.html) was searched to find hazardous waste treatment, disposal, and recovery facilities within the Las Vegas Valley. The facilities subject to RCRA within the Las Vegas Valley that require an industrial inspection are included in the Permittees' inventories and are also identified in Table 7-1.

Table 7-1. Hazardous Waste Treatment, Disposal, and Recovery Facilities in the Las Vegas Valley, According to EPA RCRA Info for the Current Permit Year (2024-2025)

Industrial Facility Name	Address	Inspected Annually By
Basic Remediation Company (BRC)	875 W Warm Springs Rd., Henderson, NV 89011	Clark County
Safety Kleen Systems, Inc	4582 Donovan Way, North Las Vegas, NV 89081	City of North Las Vegas
Tronox LLC (EMD Acquisitions LLC)	560 W Lake Mead Pkwy., Henderson, NV 89105	Clark County

The following facility was removed from the list, according to EPA RCRA Info Search for the current permit year:

- Pioneer Americas LLC D/B/A Olin Chlor Alkali Products (350 S Fourth St., Henderson, NV 89015)

7.1.3 SARA Title III Section 313

SARA Title III Section 313 requires certain classes of industrial facilities to submit reports to the EPA based on their potential for toxic chemical releases. The EPA regulates and maintains a list of these industrial facilities, as well as other facilities that release certain amounts of regulated chemicals into the environment. The EPA's website (https://enviro.epa.gov/envirofacts/tri/search) was used to identify all Toxics Release Inventory (TRI) facilities in the Las Vegas Valley. However, some inaccuracies in the EPA GIS data may be present. Section 313 facilities within the Las Vegas Valley that require an industrial inspection are included in the Permittees' inventories and are identified in Table 7-2.

Table 7-2. Industrial Facilities in the Las Vegas Valley Subject to SARA Title III Section 313, According to EPA TRI Search for the Current Permit Year (2024-2025)

Industrial Facility Name	Address	Inspected Annually By
Accurate Metal Solutions, Las Vegas, LLC [a]	3261 Builders Ave., Las Vegas, NV 89101	NA [d]
Aggregate Industries SWR Gown Asphalt	413 E Gowan Rd., North Las Vegas, NV 89030	City of North Las Vegas
Amazon.com Services LLC (LSA Development)	5801 Nicco Way, Las Vegas, NV 89115	City of North Las Vegas
Anderson Dairy	801 Searles Ave., Las Vegas, NV 89101	City of Las Vegas
Calportland Company Gary Plant (Desert Ready Mix)	6501 W Richmar Ave., Las Vegas, NV 89139	Clark County
Calportland Company Gowan Plant	143 W Gowan Rd., North Las Vegas, NV 89032	City of North Las Vegas
Calportland Company Henderson Plant (Silver State Materials)	450 Eastgate Rd., Henderson, NV 89014	City of Henderson
Calportland Company Range Ready Mix Plant	5910 Range Rd., North Las Vegas, NV 89115	City of North Las Vegas
Calportland Company Sloan Plant	5300 Sloan Rd., Sloan, NV 89124	Clark County
Capital Cabinet Corp [b]	3645 Losee Rd., North Las Vegas, NV 89030	NA [d]
Casino Ready Mix [b]	5355 N Beesley Dr., Las Vegas, NV 89115	NA [d]
Cemex Anthem Plant #1856 [b]	2403 Democracy Way, Henderson, NV 89044	NA [d]

Table 7-2. Industrial Facilities in the Las Vegas Valley Subject to SARA Title III Section 313, According to EPA TRI Search for the Current Permit Year (2024-2025)

Industrial Facility Name	Address	Inspected Annually By
Cemex - Block Plant	5030 N Lamb Blvd., Las Vegas, NV 89115	City of North Las Vegas
Cemex Blue Diamond Plant 1855 [b]	9325 S Jones Blvd., Las Vegas, NV 89119	NA [d]
Cemex Gowan Plant #1860	29 W Gowan., North Las Vegas, NV 89030	City of North Las Vegas
Cemex Kyle Canyon Plant #1866 (Sierra Ready Mix—East Batch Plant)	2645 Moccasin Rd., Las Vegas, NV 89143 [e]	City of Las Vegas
Cemex – Losee Plant	4001 Losee Rd., North Las Vegas, NV 89030 [f]	City of North Las Vegas
Cemex MGM City Center [b]	3790 S Las Vegas Blvd., Las Vegas, NV 89109	NA [d]
Cemex North Las Vegas Plant #1853	4001 N Losee Rd., North Las Vegas, NV 89030	City of North Las Vegas
Cemex – Sloan Plant	14998 S Las Vegas Blvd., Las Vegas, NV 89124	Clark County
Cemex Turnberry Plant #1859 [b]	2777 Paradise Rd., Las Vegas, NV 89109	NA [d]
Certain Teed Gypsum - Las Vegas Finishing Plant	3838 Civic Center Dr., North Las Vegas, NV 89030	City of North Las Vegas
Certain Teed Gypsum - Las Vegas Plant	13500 Blue Diamond Rd Las Vegas, NV 89161	Clark County
CMC Economy Steel	4265 W Tompkins Ave, Las Vegas, NV 89103 [f g]	Clark County
CMC Rebar Las Vegas	4485 E Colton Ave., Las Vegas, NV 89115	Clark County
Custom Building Products	3115 E. Lone Mountain Rd., Suite 1000, North Las Vegas, NV 89081	City of North Las Vegas
DFA Dairy Brands Fluid LLC DBA Meadow Gold Dairy	6350 E Centennial Pkwy., North Las Vegas, NV 89115	City of North Las Vegas
Ergon Asphalt & Emulsions Inc. - Las Vegas	3901 W Ponderosa Way, Las Vegas, NV 89118	Clark County
Ergon Asphalt & Emulsions Inc. - Las Vegas	6400 W Richmar Ave., Las Vegas, NV 89139	Clark County
Farm Fresh Foods	3840 Civic Center Dr., North Las Vegas, NV 89030	City of North Las Vegas
Firestone Building Products	4272 Corporate Center Dr., North Las Vegas, NV 89030	City of North Las Vegas
Grand Products Inc. (CES) [b]	751 Pilot Rd. Suite A, Las Vegas, NV 891119	Clark County
HD Supply Construction Supply LTD (Harris Real Estate Nevada LLC)	2437 1/2 Losee Rd., North Las Vegas, NV 89030	City of North Las Vegas
IGT [b]	6355 S Buffalo Dr., Las Vegas, NV 89113	Clark County [d]
Jensen Precast	3853 Losee Rd., North Las Vegas, NV 89030	City of North Las Vegas
Jensen Precast	3840 N Bruce St., North Las Vegas, NV 89030	City of North Las Vegas
Jensen Precast [b]	2750 Marion Dr., Las Vegas, NV 89115	NA [d]
Kalco Lighting LLC	6355 S Windy St. Suite 3, Las Vegas, NV 89119	Clark County
Ken's Foods Inc. Las Vegas	8925 Ken's Ct., Las Vegas, NV 89139	Clark County
Las Vegas Cultured Marble Inc. [b]	6875 Speedway Blvd. Building U-102, Las Vegas, NV 89115	NA [d]
Las Vegas Paving Corp	10846 W. Lone Mountain Rd., Las Vegas, NV 89129	City of Las Vegas
Las Vegas Paving Corp [b]	6600 Speedway Blvd., Las Vegas, NV 89115	City of North Las Vegas
Las Vegas Paving Corp	3400 N 5th St., North Las Vegas, NV 89030	City of North Las Vegas
Las Vegas Paving Corp	521 Cape Horn Dr., Henderson, NV 89011	City of Henderson
Las Vegas Paving Corp	9325 S Jones Blvd., Las Vegas, NV 89139	Clark County
Las Vegas Paving Corp [b]	0.75 Miles W of I-15 & 15 SW of US 95, Las Vegas, NV 89115	NA [d]

Table 7-2. Industrial Facilities in the Las Vegas Valley Subject to SARA Title III Section 313, According to EPA TRI Search for the Current Permit Year (2024-2025)

Industrial Facility Name	Address	Inspected Annually By
Las Vegas Paving Corp [b]	1.5 Miles N of Hollywood & Las Vegas Blvd., Las Vegas, NV 89115	NA [d]
Lighthouse VIP Products [b]	4601 E Cheyenne Ave., Las Vegas, NV 89115	NA [d]
Mars Chocolate NA	1 Sunset Way, Henderson, NV 89014	City of Henderson
May Manufacturing LLC (dba Artesian Spas)	4720 N Lamb Blvd., Las Vegas NV 89115	Clark County
MCC-Uniflex LLC [b]	1151 Grier Dr., Las Vegas, NV 89119	NA [d]
Nevada Ready Mix Arville	4301 W Hacienda Ave., Las Vegas, NV 89109	Clark County
Nevada Ready Mix [b]	2200 Bowes St., Henderson, NV 89044	NA [d]
Nevada Ready Mix Bonanza	601 W Bonanza Rd., Las Vegas, NV 89106	City of Las Vegas
Nevada Ready Mix Echelon [b]	2920 S Industrial Rd., Las Vegas, NV 89109	NA [d]
Nevada Ready Mix Le Reve [b]	Sands & S Las Vegas Blvd., Las Vegas, NV 89109	NA [d]
Nevada Ready Mix Lone Mountain	10811 W Washburn Ave., Las Vegas, NV 89129	Clark County
Nevada Ready Mix Plant 9 [b]	8755 W Sunset Rd., Las Vegas, NV 89123	NA [d]
Nitrex Inc.	201 E Mayflower Ave., North Las Vegas, NV 89030	City of North Las Vegas
Nucor Insulated Panel Group	4700 Engineers Way Suite 103, North Las Vegas, NV 89081	City of North Las Vegas
Ocean Spray Cranberries Inc. [c]	1301 American Pacific Dr., Henderson, NV 89014	NA [d]
Pacific Engineering & Production Co. of Nevada [b]	8291 Gibson Rd., Henderson, NV 89015	NA [d]
Pavestone – Las Vegas NV Plant	4720 Alto Ave. Las Vegas, NV 89115	Clark County
Pilot Thomas Logistics LLC (Thomas Petroleum LLC Sloan) [b]	4825 N Sloan Ln., Las Vegas NV 89115	Clark County
Pioneer Americas LLC D/B/A Olin Chlor Alkali Products	350 S Fourth St., Henderson, NV 89015	Clark County
PLI (CPI Card Group)	1220 Trade Drive, North Las Vegas, NV 89030	City of North Las Vegas
Poly-West [b]	251 Conestoga Way, Henderson, NV 89002	NA [d]
Pro Petroleum LLC.	4985 N Sloan Ln., Las Vegas, NV 89115	Clark County
Pro Terminal Operators LLC	4800 E El Campo Grande Ave., Las Vegas, NV 89115	City of North Las Vegas
Quikrete	112 W Brooks Ave North Las Vegas, NV 89030	City of North Las Vegas
Rebel Oil Co Inc.	5054 N Sloan Ln., Las Vegas, NV 89115	Clark County
Reladyne (New West Holdings LLC)	2420 Losee Rd., North Las Vegas, NV 89030	City of North Las Vegas
Rinker Las Vegas Pipe	1899 Burns Rd. Henderson, NV 89011	City of Henderson
Rinker Materials Blue Diamond [b]	9275 S Jones Blvd., Las Vegas, NV 89139	NA [d]
Rinker Materials Buffalo Main 1850 [b]	4511 S Buffalo Dr., Las Vegas, NV 89147	NA [d]
Rinker Materials Henderson 1854 [b]	750 Capehorn Dr., Henderson, NV 89015	NA [d]
Safety-Kleen Systems North Las Vegas (LVN)	4582 Donovan Way, North Las Vegas, NV 89081	City of North Las Vegas
Saguaro Power Company	435 S Fourth St., Henderson, NV 89015	Clark County
Service Rock Products (Robertson's Ready Mix)	8350 4th St Henderson, NV, 89015	Clark County

Table 7-2. Industrial Facilities in the Las Vegas Valley Subject to SARA Title III Section 313, According to EPA TRI Search for the Current Permit Year (2024-2025)

Industrial Facility Name	Address	Inspected Annually By
Service Rock Products Inc. Las Vegas [b]	800 Feet S of Intersection of Cactus Rd. & Polluck Dr., Las Vegas, NV 89102	NA [d]
Service Rock Products (Robertson's Ready Mix)	10815 W Washburn, Las Vegas, NV 89149	Clark County
Service Rock Products Inc - Sloan (Robertson's Ready Mix)	14575 Arville St., Las Vegas, NV 89124	Clark County
Service Rock Products Inc – Beesley (Robertson's Ready Mix)	5255 Beesley Dr., Las Vegas, NV 89115	Clark County
Sierra North Batch Plant	4150 Smiley Rd., North Las Vegas, NV 89081	City of North Las Vegas
Wells Cargo	10021 Moccasin Rd., Las Vegas, NV 89143	City of Las Vegas
Sofidel Las Vegas TAD LLC	3901 Donna St, North Las Vegas, NV 89030	City of North Las Vegas
Southern Nevada Paving Summerlin Asphalt Plant [b]	Summerlin Pkwy. & I-215, Las Vegas, NV 89145	NA [d]
Sparkletts Drinking Water Corp	4225 W Desert Inn Rd., Las Vegas, NV 89102	Clark County
Sparkletts Water System Aqua Vend [b]	3140 Polaris Ave. #10, Las Vegas, NV 89102	NA [d]
Spartan of Nevada, Inc. [b]	2441 W Desert Inn Rd., Las Vegas, NV 89109	NA [d]
Thatcher Co of Nevada	90 Business Center St., Henderson, NV 89014	City of Henderson
Thermo Fluids Inc. Antifreeze Services	4000 Arcata Way, North Las Vegas, NV 89030	City of North Las Vegas
Thomas Petroleum - Las Vegas Bonanza [b]	715 W Bonanza Rd., Las Vegas NV 89106	NA [d]
Titanium Metals Corp	181 N Water St., Henderson, NV 89015	Clark County
Transportation Systems Services Operations Inc.	5406 E El Campo Grande Ave., North Las Vegas, NV 89115	City of North Las Vegas
Tronox LLC (EMD Acquisitions LLC)	560 W Lake Mead Pkwy., Henderson NV, 89015	Clark County
Wells Enterprises Inc.	1001 Olsen St., Henderson, NV 89015	City of Henderson
Universal Urethane Inc.	4201 E Lone Mountain Rd., North Las Vegas, NV 89081	City of North Las Vegas
Washington Group International [b]	4610 N Grand Canyon Dr., Las Vegas, NV 89129	NA [d]
West District Oil #75 LAS	4581 Eaker St., North Las Vegas, NV 89081	City of North Las Vegas
Westlake Royal Roofing (formerly Boral Roofing, LLC)	430 Eastgate Rd., Henderson, NV 89011	City of Henderson
Young Electric Sign Co.	5119 S Cameron St., Las Vegas, NV 89118	Clark County

Notes:

[a] This business is not operational / does not have a business license in CLV

[b] Facility not operational or no longer exists

[c] Stormwater inspections not required, due to facility process change

[d] NA = Not Applicable; no inspection necessary

[e] Current address: 10025 Moccasin Rd., Las Vegas, NV 89143

[f] Site address update to show as two separate sites

[g] Current address: 4485 E Colton Ave. Las Vegas, NV 89103

The following facility was added to the list, according to EPA TRI Search for the current permit year:

- Sofidel Las Vegas TAD LLC

The following facility was removed from the list, according to EPA TRI Search for the current permit year:

- Las Vegas Paving Corp (3300 N 5th St., North Las Vegas, NV 89030)

The following facilities present a site address update to show as two separate sites, according to EPA TRI Search for the current permit year:

- CMC Economy Steel and CMC Rebar Las Vegas
- Cemex – Losee Plant and Cemex North Las Vegas Plant #1853

7.1.4 Industrial Facility Inventory

Table 7-3 lists the inventory of facilities and the frequency of inspection that will be inspected during the 2025-2026 MS4 permit year. This list is reviewed every year and submitted to NDEP as part of the Annual Report.

Table 7-3. Inventory of Facilities and Inspection Frequency for 2024-2025 Permit Year

Type of Industrial Facility	Facility Name	SIC Code(s)	NAICS Code(s)	Address	Jurisdiction	Minimum Inspection Frequency
Section 313 of SARA	Calportland Company Gary Plant (Desert Ready Mix)	3273	327320	6501 W Richmar Ave., Las Vegas, NV 89139	Clark County	Once Annually
	Calportland Company Sloan Plant	3273	327320	5300 Sloan Rd., Las Vegas, NV 89054		
	Cemex Sloan Plant	3273	327320	14998 S Las Vegas Blvd., Las Vegas, NV 89124		
	Certain Teed Gypsum - Las Vegas Plant	NA	212399	13500 Blue Diamond Rd Las Vegas, NV 89161		
	CMC Economy Steel	3441	332312	4485 E Colton Ave. Las Vegas, NV 89103		
	CMC Rebar Las Vegas	3441	332312	4485 E Colton Ave., Las Vegas, NV 89115		
	Creative Electronics and Software, Inc.	3672	334412	751 E Pilot Rd, Las Vegas, NV 89119		
	Ergon Asphalt & Emulsions Inc. - Las Vegas	2951	324121	3901 W Ponderosa Way, Las Vegas, NV 89118		
	Ergon Asphalt & Emulsions Inc. - Las Vegas	2951	324121	6400 W Richmar Ave., Las Vegas, NV 89139		
	IGT	3999	339999	6355 S Buffalo Dr., Las Vegas, NV 89113		
	Kalco Lighting LLC	3999	335122	6355 S Windy St. Suite 3, Las Vegas, NV 89119		
	Ken's Foods Inc. Las Vegas	2099	311941	8925 Ken's Ct., Las Vegas, NV 89139		

Table 7-3. Inventory of Facilities and Inspection Frequency for 2024-2025 Permit Year

Type of Industrial Facility	Facility Name	SIC Code(s)	NAICS Code(s)	Address	Jurisdiction	Minimum Inspection Frequency
Section 313 of SARA	Las Vegas Paving Corp	1081	324121	9325 S Jones Blvd., Las Vegas, NV 89139	Clark County	Once Annually
	May Manufacturing LLC (dba Artesian Spas)	3088	326191	4720 N Lamb Blvd., Las Vegas NV 89115		
	Nevada Ready Mix Arville	3273	327320	4301 W Hacienda Ave., Las Vegas, NV 89109		
	Nevada Ready Mix Lone Mountain	3273	327320	10811 W Washburn Ave., Las Vegas, NV 89129		
	Pavestone – Las Vegas NV Plant	3273	327331	4720 Alto Ave. Las Vegas, NV 89115		
	Pilot Thomas Logistics LLC (Thomas Petroleum LLC Sloan)	5171	424710	4825 N Sloan Ln., Las Vegas NV 89115		
	Pioneer Americas LLC D/B/A Olin Chlor Alkali Products	2812	325181 325188 32532 32512	350 S Fourth St., Henderson, NV 89015		
	Pro Petroleum Inc.	5171	424710	4985 N Sloan Ln., Las Vegas, NV 89115		
	Rebel Oil Co Inc.	5171	424710	5054 N Sloan Ln., Las Vegas, NV 89115		
	Saguaro Power Company	4939	221112	435 Fourth St., Henderson, NV 89015		
	Service Rock Products (Robertson's Ready Mix)	3273	327320	8350 4th St Henderson, NV, 89015		
	Service Rock Products (Robertson's Ready Mix)	3273	327320	10815 W Washburn Rd., Las Vegas, NV 89149		
	Service Rock Products Inc – Sloan (Robertson's Ready Mix)	3273	327320	14575 Arville St., Las Vegas, NV 89124		
	Service Rock Products Inc – Beesley (Robertson's Ready Mix)	3273	327320	5255 Beesley Dr., Las Vegas, NV 89115		
	Sparkletts Drinking Water Corp	5149	312112	4225 W Desert Inn Rd., Las Vegas, NV 89102		
	Titanium Metals Corp	3339	331419	181 N Water St., Henderson, NV 89015		
	Young Electric Sign Co.	3993	811121	5119 S Cameron St., Las Vegas, NV 89118		

Table 7-3. Inventory of Facilities and Inspection Frequency for 2024-2025 Permit Year

Type of Industrial Facility	Facility Name	SIC Code(s)	NAICS Code(s)	Address	Jurisdiction	Minimum Inspection Frequency
Section 313 of SARA	Anderson Dairy	2023, 2024, 2026	311511, 311514, 311520	801 Searles Ave., Las Vegas, NV 89101	City of Las Vegas	Once Annually
	Arteaga's Concrete Inc.	3273	327320	2550 Highland Dr., Las Vegas, NV 89109		
	Las Vegas Paving Corp.	3273	324121	10846 W. Lone Mountain Rd., Las Vegas, NV 89129		
	Mel Clark Inc. Lone Mountain Pit	1429	212319	10550 W Lone Mtn Rd., Las Vegas, NV 89129		
	Nevada Ready Mix Bonanza	3273	327320	601 W Bonanza Rd., Las Vegas, NV 89106		
	Sierra Ready Mix – Central Batch Plant	3273	327320	10051 Moccasin Rd., Las Vegas, NV 89143		
	Sierra Ready Mix—East Batch Plant	3273	327320	10025 Moccasin Rd., Las Vegas, NV 89143		
	Sierra Ready Mix—West Batch Plant	3273	327320	10021 Moccasin Rd., Las Vegas, NV 89143		
	Wells Cargo Inc. Lone Mountain Pit	1429	212319	11291 W. Washburn Rd., Las Vegas, NV 89145		
Section 313 of SARA	Aggregate Industries SWR Gown Asphalt	2951	23411, 23571, 324121	413 E Gowan Rd., North Las Vegas, NV 89030	City of North Las Vegas	Once Annually
	Amazon.com Services LLC (LSA Development)	5961	454110	5801 Nicco Way., Las Vegas, NV 89115		
	American Eagle	NA	NA	120 W Delhi Ave., North Las Vegas, NV 89030		
	Calportland Company Gowan Plant	NA	327320	143 W Gowan Rd., North Las Vegas, NV 89032		
	Calportland Company Range Ready Mix Plant	NA	327320	5910 Range Rd., North Las Vegas, NV 89115		
	Cemex - Block Plant	3251, 3273	327320, 327331	5030 N Lamb Blvd., Las Vegas, NV 89115		
	Cemex Gowan Plant #1860	3273	327320	29 W Gowan., North Las Vegas, NV 89030		
	Cemex – Losee Plant	3273	327320	4001 Losee Rd., North Las Vegas, NV 89030		
	Cemex North Las Vegas Plant #1853	3273	327320	4001 N Losee Rd., North Las Vegas, NV 89030		
	Certain Teed Gypsum - Las Vegas Finishing Plant	3275	327420	3838 Civic Center Dr., North Las Vegas, NV 89030		

Table 7-3. Inventory of Facilities and Inspection Frequency for 2024-2025 Permit Year

Type of Industrial Facility	Facility Name	SIC Code(s)	NAICS Code(s)	Address	Jurisdiction	Minimum Inspection Frequency
Section 313 of SARA	Core & Main	NA	NA	2829 Losee Rd., North Las Vegas, NV 89030	City of North Las Vegas	Once Annually
	Custom Building Products	3272	327999, 327390	3115 E. Lone Mountain Rd. Suite 1000, North Las Vegas, NV 89081		
	DFA Dairy Brands Fluid LLC DBA Meadow Gold Dairies	2026	311511, 311514, 424430	6350 E Centennial Pkwy., North Las Vegas, NV 89115		
	Farm Fresh Foods	5147	311991	3840 Civic Center Dr., North Las Vegas, NV 89030		
	Firestone Building Products	3081	326113	4272 Corporate Center Dr., North Las Vegas, NV 89030		
	Jensen Precast	3272	327390, 327331	3853 Losee Rd., North Las Vegas, NV 89030		
	Jensen Precast	3272	327390, 327331	3840 N Bruce St., North Las Vegas, NV 89030		
	HD Supply Construction Supply LTD (Harris Real Estate Nevada LLC)	1791	2381201	2437 1/2 Losee Rd., North Las Vegas, NV 89030		
	Las Vegas Paving Corp	2951	324121	6600 Speedway Blvd., Las Vegas, NV 89115		
	Las Vegas Paving Corp	NA	324121	3400 N 5th St., North Las Vegas, NV 89030		
	Nitrex Inc.	3398	332811	201 E Mayflower Ave., North Las Vegas, NV 89030		
	Nucor Insulated Panel Group	3448	332311	4700 Engineers Way Suite 103, North Las Vegas, NV 89081		
	PLI (CPI Card Group)	NA	326199, 323111,	1220 Trade Drive, North Las Vegas, NV 89030		
	Pro Terminal Operators LLC	5171	424710	4800 E El Campo Grande Ave., Las Vegas, NV 89115		
	Quikrete	3273	327320	112 W Brooks Ave North Las Vegas, NV 89030		
	Reladyne (New West Holdings LLC)	5171	424710	2420 Losee Rd., North Las Vegas, NV 89030		
	Sierra North Batch Plant	NA	327320	4150 Smiley Rd., North Las Vegas, NV 89081		
	Sofidel Las Vegas TAD LLC	2621	322120	3901 Donna St, North Las Vegas, NV 89030		
	Thermo Fluids Inc. Antifreeze Services	2899, 5093	325998, 423930	4000 Arcata Way, North Las Vegas, NV 89030		

Table 7-3. Inventory of Facilities and Inspection Frequency for 2024-2025 Permit Year

Type of Industrial Facility	Facility Name	SIC Code(s)	NAICS Code(s)	Address	Jurisdiction	Minimum Inspection Frequency
Section 313 of SARA	Transportation Systems Services Operations Inc.	3743	336510, 33651	5406 E El Campo Grande Ave., North Las Vegas, NV 89115	City of North Las Vegas	Once Annually
	Universal Urethane Inc.	3069, 3086, 3714	326150, 32615	4201 E Lone Mountain Rd., North Las Vegas, NV 89081		
	West District Oil #75 LAS	NA	424710	4581 Eaker St., North Las Vegas, NV 89081		
Section 313 of SARA	Calportland Company Henderson Plant (Silver State Materials)	3273	327320	450 Eastgate Rd., Henderson, NV 89014	City of Henderson	Once Annually
	Las Vegas Paving Corp	2951	324121	521 Cape Horn Dr., Henderson, NV 89011		
	Mars Chocolate NA	2066	311352, 445292	1 Sunset Way, Henderson, NV 89014		
	Rinker Las Vegas Pipe	3273	327320	1899 Burns Rd. Henderson, NV 89011		
	Thatcher Co of Nevada	0111, 9999	3251, 32512, 325180, 325188	90 Business Center St., Henderson, NV 89014		
	Wells Enterprises	2024	311520	1001 Olsen St., Henderson, NV 89015		
	Westlake Royal Roofing (formerly Boral Roofing, LLC)	3251	327390	430 Eastgate Rd., Henderson, NV 89011		
Hazardous Waste Treatment, Disposal, and Recovery	Tronox LLC (EMD Acquisitions LLC)	2819, 1799	32518, 325180, 325188	560 W Lake Mead Pkwy., Henderson NV, 89015	Clark County	Once Annually
	Basic Remediation Company (BRC)	2819	325188	875 W Warm Springs Rd., Henderson, NV 89011		
	Safety-Kleen Systems Inc.	7389, 4953	325998, 484220, 484230, 562112, 532490	4582 Donovan Way, North Las Vegas, NV 89031	City of North Las Vegas	Once Annually
Landfills	None in the Las Vegas Valley					
Other Facilities Contributing a Substantial Pollutant Load	None in the Las Vegas Valley					

The following facility was added to the industrial facilities inventory per the SIC codes and the inspections will initiate in the 2025-2026 permit year:

- Sofidel Las Vegas TAD LLC

The following facilities present a site address update to show as two separate sites, according to EPA TRI Search for the current permit year:

- CMC Economy Steel and CMC Rebar Las Vegas
- Cemex – Losee Plant and Cemex North Las Vegas Plant #1853

There is repetition for facilities added and updated between Table 7-2 and 7-3, due to the Tables being provided for different documentation purposes. Table 7-2 facility additions, removals, and updates are to indicate what has changed on EPA's website. The purpose of Table 7-3 is to indicate what is on the Permittees industrial inspection inventory for next permit year inspections. This permit year, the changes correlated similarly for additions and updates; however, some years changes in one table do result in changes to the other.

7.2 Permit Year Measurable Goals

The 2024-2025 measurable goals are provided in Table 7-4. Follow-up actions include follow-up inspections, correction orders, violation notices, enforcement meetings, and penalties. The Permittees track follow-up inspections as a whole and do not differentiate in the different kind of follow-ups in their systems.

Table 7-4. Industrial Facility Monitoring and Control Measurable Goals

Measurable Goal	Permittee	Goal Completed	Description
Inspect each facility required to be on the inventory once each permit year.	City of Henderson	Yes	106 inspections 10 follow-up actions
	City of Las Vegas	Yes	300 inspections 32 follow-up actions
	City of North Las Vegas	Yes	299 inspections 4 follow-up actions
	Clark County	Yes	189 inspections 172 follow-up actions
Train new inspectors and provide refresher training as needed	City of Henderson	Yes	2 Fire Inspectors I, 6 Fire Inspectors II, and 2 Senior Fire Inspectors received refresher training
	City of Las Vegas	Yes	1 new inspector trained 5 previously hired inspectors receiving refresher training
	City of North Las Vegas	Yes	1 new inspector onboarded
	Clark County	Yes	3 new inspectors trained 3 previously hired inspectors receiving refresher training
Update and submit inventory to NDEP once each permit year in the Annual Report. For Categories 1 and 2, the minimum inspection frequency is once per permit year. There are currently no facilities in Categories 3 and 4, but if they are added they will be inspected once per permit year. Facilities in Category 5 are not required under the Permit and will be inspected as determined by the Permittees.	City of Henderson	Yes	Table 7-3 contains the inventory required by the 2024 MS4 Permit
	City of Las Vegas	Yes	
	City of North Las Vegas	Yes	
	Clark County	Yes	

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Section 8

Construction Site BMP Program

Section 8

Construction Site BMP Program

Section B.5.9 of the 2024 MS4 Permit for the Las Vegas Valley includes requirements for a Construction Site Program to reduce pollutants in stormwater runoff from construction sites to the MS4. In addition, Section B.5.10 includes requirements for inspection of construction sites to verify compliance with local ordinances and permits, as well as requirements to identify the implementation and enforcement actions necessary to assure compliance.

8.1 Permit Year Overview

The activities performed by the Permittees include making the Construction Site BMP Guidance Manual available to the public, conducting outreach and training for contractors and inspectors, and performing construction site inspections. During the 2024–2025 permit year, the Permittees hosted two contractor training sessions, inspected over 5,900 construction sites, and completed necessary follow-up actions for sites requiring enforcement. The measurable goals reflect efforts such as BMP implementation, inspection frequency for high-risk sites, and the delivery of educational materials to site personnel. Further details on inspections, training, and measurable outcomes are provided in the following paragraphs.

8.1.1 Construction Site BMP Manual

In 2009, the Permittees produced the Las Vegas Valley Construction Site Best Management Practices Guidance Manual that describes the construction site runoff management program and provides non-structural and structural BMP implementation guidance for contractors, engineers, and other construction professionals. The manual provides guidance on selecting and designing construction site BMPs that are suitable to the unique environment and conditions in the Las Vegas Valley. The Las Vegas Valley Construction Site BMP Guidance Manual is available on the CCRFCD website and on the www.LVstormwater.com website. During the permit year the manual was reviewed and updates were initiated. Revisions to the manual are expected after the development of the updated SMWP.

The Las Vegas Valley MS4 Construction Site Program complements, but is independent of, the NDEP's State construction site permitting program. The Las Vegas Valley Construction Site BMP Guidance Manual includes information for developers, engineers, and operators about the requirements for complying with both the local and State construction site stormwater programs.

8.1.2 Construction Site Training Workshops

Collectively, as an SQMC-sponsored function, the Permittees host construction site training workshops that are open to Las Vegas area contractors, developers, and other interested stakeholders. These workshops included presentations from NDEP and Nevada Department of Transportation (NDOT) on their specific stormwater-related construction site requirements.

During the permit year, the Permittees updated the Stormwater Training for Construction Contractors workshop. Two training sessions were held for the construction industry on June 30, 2025 and included 83 participants.

8.1.3 Inspection of Construction Sites

Supported by local ordinances, construction sites in the Las Vegas Valley are inspected for active or potential discharges to the MS4, proper BMP implementation, waste management, and erosion control. Inspectors prioritize education and compliance, resolving minor issues through coordination with site operators. While inspectors have the authority to review the SWPPPs required by NDEP's Construction Stormwater General Permit if site conditions warrant, it is not a required aspect of every inspection.

The frequency of a site inspection is determined by the site's characteristics. All construction sites disturbing 100 acres or more, any site determined by the Permittees as "a significant threat to water quality," and all sites disturbing more than 1 acre that are tributary to an impaired waterbody (for sediment or turbidity), were inspected at least monthly. Further, all construction sites greater than 1 acre that were not identified as a "significant threat to water quality" were inspected at least twice during ground disturbing activities.

The Permittees' construction site inspections consist of the following activities:

- Assess compliance with Permittee stormwater ordinances
- Verify proper implementation and maintenance of BMPs
- Assess BMP effectiveness
- Conduct visual observations for non-stormwater discharges, potential illicit connections, and the potential to discharge pollutants to the MS4
- Provide education and outreach materials to site personnel on stormwater pollution prevention, the Permit, and NDEP construction permit processes, as needed
- Prepare a written or electronic inspection record

The Permittees used existing inspection staff or a third-party contractor to perform construction site inspections. A standard Construction Site Inspection Checklist was approved by NDEP in 2016 and is in use by the Permittees. Each Permittee customized the standard checklist slightly to meet its needs.

8.2 Permit Year Measurable Goals

Table 8-1 outlines the measurable goals for the Construction Site BMP program and Table 8-2 the Inspection of Construction Sites.

Table 8-1: Construction Site BMP Measurable Goals

Measurable Goal	Permittee	Goal Completed	Description
Report to NDEP once each permit year in the Annual Report whether the Permittees continue to provide to developers development checklists identifying the need for a stormwater permit for properties of one acre or more.	City of Henderson	Yes	A standard Construction Site Inspection Checklist was approved by NDEP in 2016 and is in use by the Permittees. Each Permittee customized the standard checklist slightly to meet its needs.
	City of Las Vegas	Yes	
	City of North Las Vegas	Yes	
	Clark County	Yes	
With the input and concurrence of the other Permittees, CCRFCD maintains the Las Vegas Valley Construction Site Best Management Practices Guidance Manual. Complete updates within two permit years after the SWMP is approved.	Clark County Regional Flood Control District	Yes	The Permittees produced the Las Vegas Valley Construction Site Best Management Practices Guidance Manual (2009) that describes the construction site runoff management program and provides non-structural and structural BMP implementation guidance. Available at: www.LVstormwater.com and www.regionalflood.org
Hold construction site operator workshops once each permit year and notify construction site operators in advance.	All Permittees	Yes	Number of trainings conducted: 2 (June 30, 2025) Estimated number of attendees: 83 Flyers distributed: 166

Table 8-2: Inspection of Construction Site Measurable Goals			
Measurable Goal	**Permittee**	**Goal Completed**	**Description**
Report on number of sites with monthly inspections and number of inspections performed each permit year in the Annual Report.	City of Henderson	Yes	1 site disturbing >100 acres; 1 site determined to be a "significant threat"; 0 sites disturbing more than 1 acre that are tributary to an impaired waterbody listed for sediment or turbidity. Number of Construction Site Inspections Conducted: 1,576
	City of Las Vegas	Yes	1 site disturbing >100 acres; 0 sites determined to be a "significant threat"; 0 site disturbing more than 1 acre that are tributary to an impaired waterbody listed for sediment or turbidity. Number of Construction Site Inspections Conducted: 1,990
	City of North Las Vegas	Yes	0 sites disturbing >100 acres; 0 sites determined to be a "significant threat"; 0 sites disturbing more than 1 acre that are tributary to an impaired waterbody listed for sediment or turbidity. Number of Construction Site Inspections Conducted: 575
	Clark County	Yes	1 site disturbing >100 acres; 22 sites determined to be a "significant threat"; 0 sites disturbing more than 1 acre that are tributary to an impaired waterbody listed for sediment or turbidity. Number of Construction Site Inspections Conducted: 1,814
Report on the number of follow-up actions each permit year in the Annual Report.	City of Henderson	Yes	Number of Follow-Up Actions: 106
	City of Las Vegas	Yes	Number of Follow-Up Actions: 168
	City of North Las Vegas	Yes	Number of Follow-Up Actions: 118
	Clark County	Yes	Number of Follow-Up Actions: 640

Section 9

Staff and Resources

Section 9

Staff and Resources

Section B.6.3.3.11 of the 2024 MS4 Permit for the Las Vegas Valley requires Permittees to provide information on annual expenditures for the reporting period, broken down by the major programs indicated in the SWMP.

9.1 Permit Year Overview

The CCRFCD will continue to fund its MS4 program responsibilities from revenue collected from the ¼ cent sales tax that provides funding for all CCRFCD functions. The other Permittees (CC, CLV, CNLV, and COH) will continue to fund their projects primarily from their respective general tax revenues. A portion of the construction program measures (e.g., inspections, design reviews) may also be financed through development permit fees.

Although Permittee personnel dedicated solely to the Las Vegas Valley MS4 Program are limited, staff from multiple departments are involved in program activities including: industrial site inspections, construction site inspections, responding to complaints, development submittals, and storm drain system maintenance activities.

9.2 Permit Year Measurable Goals

The summary of current expenditures and the anticipated budget for the next permit year are included in Table 9-1 and Table 9-2, respectively. The numbers below should not be compared entity to entity because the entities use different methods for categorizing and tracking their expenditures.

Table 9-1: Annual Las Vegas Valley MS4 Program Expenditures for the Current Permit Year (2024-2025)

Permit Element	Clark County Regional Flood Control District	City of Henderson	City of Las Vegas	City of North Las Vegas	Clark County
Public Outreach and Education Program	$273,185	$20,662	$1,961	$13,255	N/A
Stormwater Monitoring Program	$130,162	N/A	N/A	N/A	N/A
Source Control and MS4 Maintenance Program [a]	$0	$4,957,647	$28,875,303	$2,340,650	$13,847,566
Post-Construction Program for NDSR	$10,000	$1,341,155	$998,383	$14,875	$1,492,828
Illicit Discharge Detection and Elimination Program	$5,000	$845,772	$1,135,950	$2,313,870	$63,161,912
Industrial Facility Monitoring and Control Program	$0	$62,685	$120,225	$79,540	$1,951,629
Construction Site Program	$10,000	$137,931	$216,552	$62,525	$388,249

Table 9-1: Annual Las Vegas Valley MS4 Program Expenditures for the Current Permit Year (2024-2025)					
Permit Element	Clark County Regional Flood Control District	City of Henderson	City of Las Vegas	City of North Las Vegas	Clark County
Watershed Program	$55,182,883	$11,422,549	$4,858,116	Included in Source Control	$2,857,829
MS4 Program Management [b]	$363,594	$37,048	$195,652	$80,210	$246,951
TOTAL [c]	$55,974,824	$18,825,449	$36,402,142	$4,904,925	$83,946,964

Notes:

[a] Amount includes funding from CCRFCD. Amount from CCRFCD MWP is included in source control expenditures

[b] This category includes staff and consulting costs, management, and administrative costs, reporting, tracking, Permittee coordination, and other related costs

[c] There may be expenditures made by the Permittees, SNWA, SNHD, and others that are not captured in this estimate

Table 9-2: Anticipated Las Vegas Valley MS4 Program Budget for the Next Permit Year (2025-2026)					
Permit Element	Clark County Regional Flood Control District	City of Henderson	City of Las Vegas	City of North Las Vegas	Clark County
Public Outreach and Education Program	$117,207	$25,300	$24,198	$16,000	$61,738
Stormwater Monitoring Program	$179,932	N/A	N/A	N/A	N/A
Source Control and MS4 Maintenance Program [a]	$0	$5,877,411	$28,875,631	$2,285,000	$10,067,848
Post-Construction Program for NDSR	$10,000	$1,387,855	$1,028,334	$17,000	$1,629,410
Illicit Discharge Detection and Elimination Program	$5,000	$865,089	$1,153,407	$2,440,000	$112,237,544
Industrial Facility Monitoring and Control Program	$0	$67,926	$123,832	$85,000	$2,140,166
Construction Site Program	$10,000	$145,800	$223,048	$65,000	$405,325
Watershed Program	$62,202,800	$11,000,000	$4,917,034	Included in Source Control	$2,748,109
MS4 Program Management [b]	$532,153	$38,345	$218,520	$83,000	$258,149
TOTAL [c]	$63,057,092	$19,407,726	$36,564,004	$4,991,000	$129,548,289

Notes:

[a] Amount includes funding from CCRFCD. Amount from CCRFCD MWP is included in source control expenditures

[b] This category includes staff and consulting costs, management, and administrative costs, reporting, tracking, Permittee coordination, and other related costs

[c] There may be expenditures made by the Permittees, SNWA, SNHD, and others that are not captured in this estimate

Section 10

Reviewing and Updating Stormwater Management Programs (SWMP)

Section 10

Reviewing and Updating Stormwater Management Programs

Section B.5.12 of the 2024 MS4 Permit for the Las Vegas Valley requires an annual review of the SWMP in preparation of the Annual Report.

10.1 Permit Year Overview

An annual review of the SWMP was performed in conjunction with preparation of the 2024-2025 Annual Report and during development of the Draft SWMP and Draft Stormwater Monitoring Plan.

In response to informal NDEP comments, the Permittees submitted a revised Draft SWMP to NDEP.

10.2 Permit Year Measurable Goals

The measurable goal for reviewing and updating stormwater management programs is presented in Table 10-1.

Table 10-1: Reviewing and Updating Stormwater Management Programs

Measurable Goal	Municipal Permittee	Goal Completed	Description
Conduct annual review of SWMP and report results to NDEP once each permit year in the Annual Report.	All Permittees	Yes	With the input and concurrence of the Permittees, CCRFCD conducted an annual review of the SWMP.

Section 11

Responsibility for SWMP Implementation in New Areas

Section 11

Responsibility for SWMP Implementation in New Areas

Section B.5.13 of the 2024 MS4 Permit for the Las Vegas Valley requires the Permittees to implement the SWMP on all new areas added to the Permittees portion of the MS4 not later than one year from the addition of the new area.

11.1 Permit Year Overview

All portions of the MS4 are located within the jurisdictional boundaries of one or more of the Permittees, with the understanding that these boundaries may change over time. The MS4 does not include areas managed by other MS4 jurisdictions, as defined in Section A.1 of the 2024 MS4 Permit for the Las Vegas Valley. When jurisdiction over a new area within the MS4 is transferred to a Permittee, the transition of responsibilities, including updates to stormwater management programs, will be completed within one year of the transfer.

11.2 Permit Year Measurable Goals

The measurable goal related to the review and update of stormwater management programs following such jurisdictional changes are presented in Table 11-1.

Table 11-1: Responsibility for SWMP Implementation in New Areas

Measurable Goal	Municipal Permittee	Goal Completed	Description
Report changes to the boundaries once each permit year in the Annual Report.	Clark County Regional Flood Control District	Yes	UDB 2023 – Updated for the Las Vegas Valley MS4 program Refer to Sections 1 and 2 of the Annual Report for more detail.

Section 12

Legal Authority

Section 12

Legal Authority

Section B.5.15 of the 2024 MS4 Permit for the Las Vegas Valley requires each of the Permittees to have an ordinance in place to authorize or enable all requirements of the permit. Further, Section B.5.1.6 of the permit requires the Permittees to present a review of legal authority to implement the requirements of the permit and the SWMP and to identify additional ordinances or regulatory mechanisms to be adopted.

12.1 Permit Year Overview

The Cities and Clark County Permittees are supported by local ordinances that grant them the authority to implement the requirements of the 2024 MS4 Permit. When appropriate, modifications to ordinances were adopted.

Current stormwater ordinances for each municipal and Clark County Permittee are found by searching the municode library website by location (https://library.municode.com). The existing legal authority of the Permittees is adequate to prohibit illegal discharges to the MS4, to control spills, and to determine and require compliance with all current NPDES MS4 Permit program components.

12.1.1 Compliance and Enforcement

Each Permittee requires compliance with its stormwater ordinances and regulations, as it does with all local jurisdiction ordinances. The public and business communities are made aware of local stormwater regulations through a variety of outreach measures, including the Las Vegas Valley NPDES MS4 Permit Public Outreach and Education Program. Local ordinances were reviewed by each Permittee during the permit year. Members of the SQMC work together to coordinate cross-jurisdictional cooperation and compliance with all stormwater ordinances.

12.2 Permit Year Measurable Goals

Table 12-1 outlines the measurable goals for the Legal Authority program

Table 12-1: Legal Authority Measurable Goals

Measurable Goal	Municipal Permittee	Annual Review Performed	Local Stormwater Ordinance(s)	Revisions to Ordinances
Provide legal authority to NDEP once each permit year in the Annual Report.	City of Henderson	Yes	Chapter 13.04 of the City of Henderson Municipal Code: Stormwater Regulations; 19.8.4 COH Hillside Overlay District; 19.14.6 Drainage Design Adoption of the HCCDM; Title 14 Utility Services; Title 15.12 Property Maintenance Code; Title 15.32 International Fire Code.	None
	City of Las Vegas	Yes	LVMC 6.54 Mobile Car Wash/Auto Detail Business; LVMC 13.04 Use of Streets and Sidewalks; LVMC 14.08 Water Regulations; LVMC 14.11 Water Conservation; LVMC 14.17 Wastewater Collection and Treatment; LVMC 14.18 Stormwater and Stormwater Management; LVMC 20.04 Flood Control Channels Master Plan; LVMC 20.08 Flood Hazard Reduction; LVMC 20.10 Uniform Regulations for the Control of Drainage; Title 19.060.040(F) and Title 19.08.040(F) for Landscaping and Low Impact Development; Title 19.09.080 Open Space Standards; Title 19.10.140 Hillside Overlay; 2050 Master Plan (Land Use/Density/Rural Land Overlay); and Special Area Plans.	LVMC Wastewater Collection, Pretreatment, and Treatment was updated and approved by City Council on 11/6/2024 and USEPA on 12/19/24 which includes compliance with spills and BMPs including industrial facilities. Kyle Canyon Special Area Plan was approved by City Council on 4/16/25.
	City of North Las Vegas	Yes	Chapter 8.50 of the City of North Las Vegas Municipal Code (NLVMC): Stormwater Regulations.	None
	Clark County	Yes	Title 24, Chapter 24.40 Storm Sewer System Discharge / Other related ordinances include: Title 9 Public Health and Sanitation, 10.36 - Animals, noise, waste, restraint, sanitation & dead animals, 10.40 - Enforcement, 11 - Abatement and Nuisances, Title 22 – Building and Construction, 22.02.492 - Storm sewer system inspections, 25.10 – Building Water Conservation, 25.20 – The Energy Conservation Code, 30.04 Development Standards, 30.04.01 Landscaping, 30.04.01.A.4 Permanent Stormwater Control per Section 1500 of the Regional Flood Control District's, Hydrologic Criteria and Drainage Design Manual, 30.04.05 Site and Building Design, 30.04.05.K Hillside Development, 30.06.11.E Grading Permits, 30.04.08.B.1 Drainage Impact Analysis, and the Regional Flood Control District's Hydrologic Criteria and Drainage Design Manual.	None

Section 13

Stormwater Monitoring

Section 13

Stormwater Monitoring

Section B.6.1 of the 2024 MS4 Permit for the Las Vegas Valley describes the requirements for a monitoring program, which includes the evaluation of available water quality characterization data for the permit area. Sections B.6.3.3 and B.6.3.3.6 of the NPDES MS4 Permit include requirements for reporting on the monitoring program.

13.1 Permit Year Overview

This section of the Annual Report includes data collected from the Wet Weather (Stormwater) Monitoring Program, as required by the MS4 permit year 2024-2025. The Permittees compare previous and additional characterization data to determine the need for modification to improve stormwater discharges, effects of BMPs, or ambient water quality, and include it in the annual monitoring plan required in Section B.6.1 of the Permit. In the 2023-2024 Annual Report, an extensive data evaluation concluded that collection programs should not be modified as data continues to be consistent when compared with previous years.

13.2 Wet Weather Monitoring

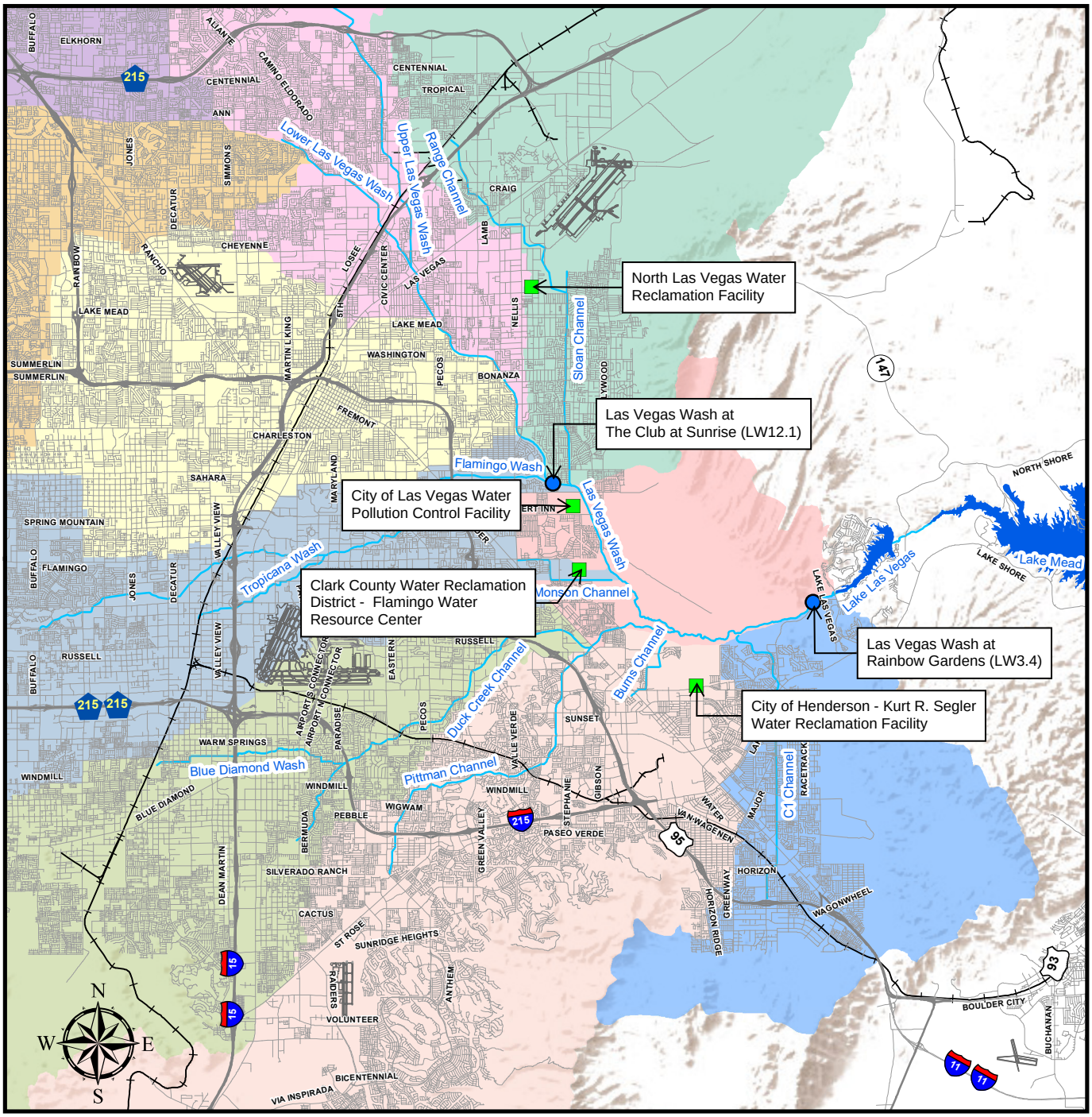
Wet weather monitoring for the Las Vegas Valley NPDES MS4 Permit is conducted to characterize the water quality of stormwater discharges and add to the baseline of wet weather surface water quality data, against which future changes can be measured which can be used to assess the appropriateness of existing BMPs.

13.2.1 Wet Weather Sampling Procedures

The wet weather monitoring program for MS4 permit year 2024-2025 followed the same protocols used in previous years. All samples were properly preserved and analyzed using approved methods in accordance with 40 CFR 136 and were analyzed within the maximum allowable holding times. Sampling is conducted at the following locations, as displayed in Figure 13-1:

- Las Vegas Wash at The Club at Sunrise (The Club at Sunrise)
- Las Vegas Wash at Rainbow Gardens (Rainbow Gardens)

The wet weather sampling procedure for the 2024-2025 MS4 permit year included collecting three samples per year, with a maximum of ten samples per year weather dependent, from each of the two sample sites during significant storm events. A significant storm event was defined as having a total rainfall depth of 0.16 inches at any rain gauge within the drainage area tributary to a monitoring station. To generate sufficient runoff for sampling, a storm depth of at least 0.16 inches was required, based on past experience. The sampling team used both the CCRFCD website (https://www.regionalflood.org) and the USGS website (http://waterdata.usgs.gov/nv/nwis/current/?type=flow) to view rainfall maps and stream gauge water levels in the Las Vegas Valley in real time. This data helped determine if the storm was likely to meet the stormwater sampling criteria. During the 2024-2025 MS4 permit year this level of rain event occurred one time at The Club at Sunrise site and the Rainbow Gardens site. Sampling crews were mobilized when available data indicated the potential for runoff producing storm events. Storm events of a significant size trigger the actuators, installed at both sampling sites, to collect samples.



Legend

- Wet Weather Sampling Point (USGS Site Number)
- Wastewater Treatment Plant
- Airports
- Streets
- Railroads
- Lakes
- Washes

Watersheds

- C1
- CENTRAL
- DUCK CREEK
- FLAMINGO/TROPICANA
- GOWAN
- LOWER LAS VEGAS WASH
- LOWER NORTHERN
- PITTMAN
- RANGE WASH
- UPPER NORTHERN

0 1 2 4 6

Scale in Miles

Service Layer Credits: Sources: Esri, USGS, NOAA

Figure 13-1
Wet Weather Monitoring Sites
2024-2025 Annual Report

The collected stormwater samples were brought back to the in-office laboratory for preparation. Composite samples were prepared for each site by combining approximately equal volumes from each bottle, where variable stormwater volumes were included in the composite sample. For each sample in the 2024-2025 MS4 permit year, composite samples were prepared, and volumes were individually extracted into laboratory sample bottles and preserved, according to laboratory/method requirements. Samples were then delivered to Silver State Analytical Laboratories, a laboratory certified by the State of Nevada for each constituent analyzed.

To do more evaluation of the correlation between turbidity and TSS, additional turbidity and TSS samples were collected. These samples were analyzed by ASSET Laboratory. In-situ turbidity samples were also analyzed to align with sampling duration, which is approximately every 3 minutes during a sampling event for the Club at Sunrise and 5 minutes at Rainbow Gardens.

13.2.2 Wet Weather Constituents

The wet weather program identified two separate suites of constituents for laboratory analysis – the "long list" and a condensed "short list". The "long list" of constituents included constituents that were analyzed in the original NPDES MS4 sampling program, as well as an expanded list of constituents that are also sampled by the SNWA for the dry weather monitoring program. The condensed, "short list" of constituents consisted of MS4 constituents of interest, most of which were the original MS4 constituents. The constituents for the 2024-2025 MS4 permit year are shown in Table 13-1. The "short list" of constituents is included in the table and are indicated in italicized text.

Table 13-1. Constituents and Analytical Methods in Wet Weather Samples for the Current MS4 Permit Year (2024-2025)

Analytical Method	Constituents Analyzed
8260B	2-chloroethyl vinyl ether
SM 2320B	Alkalinity, bicarbonate, carbonate
SM 4500NH3D	*Ammonia*
SM 5210B	*Biological Oxygen Demand (BOD)*
531 / 632	Carbamate pesticides
SM 5220D	*Chemical Oxygen Demand (COD)*
SM 4500CNE	Cyanide
SM 2510B	Electrical conductivity
SM 9223B	*E. Coli*
Colilert-18	*Fecal coliform*
Enterolert	*Fecal Streptococcus*
SM 2340B	Hardness
8151A	Herbicides
200.7	Magnesium, sodium, iron, aluminum
SM 5540C	*Methylene Blue Active Substances (MBAS) (Surfactants)*
245.2	*Mercury*
300	*Nitrate-N, nitrite-N*, bromide, sulfate, fluoride
1664A	*Oil and grease*
525.2, 531.2, 551.1, 556, 625, 8081A, 8082, 8270D	Organics

Table 13-1. Constituents and Analytical Methods in Wet Weather Samples for the Current MS4 Permit Year (2024-2025)	
Analytical Method	**Constituents Analyzed**
556	Pesticides, volatile organic compounds
SM 4500-HB	*pH*
200.8	*Selenium, selenium (dissolved),* antimony, barium, beryllium, *boron*, cadmium, chromium, *copper, copper (dissolved), lead, lead (dissolved),* arsenic, manganese, nickel, silver, thallium, *zinc, zinc (dissolved)*
SM 5540C, 425.1	Surfactants
SM 2540C	*TDS*
Thermal Analysis	*Temperature*
SM 5310C, 415.3	Total Organic Carbon (TOC)
Calculation	*Total Organic Nitrogen (TON)*
SM 4500NorgC	*Total Kjeldahl Nitrogen (TKN)*
SM 4500PE	*Total phosphorous-P, orthophosphate-P*
SM 2540D	*TSS*
SM 2130B	*Turbidity*

Notes:
Italicized text indicates a constituent that is also part of the "short list" of wet weather constituents

13.2.3 Wet Weather Monitoring Results

During the 2024-2025 MS4 permit year, one significant storm event occurred, leading to one sample collection from the sampling locations at The Club at Sunrise and Rainbow Gardens.

The laboratory analyzed the "long list" of constituents for the storm events of the MS4 permit year, as shown in Table 13-2. Wet weather sampling reports for the significant storm events and historic wet weather sampling data are included in Appendix A.

Table 13-2. Wet Weather Sampling Events for the Current MS4 Permit Year (2024-2025)	
Sampling Location	**"Long List" Constituents Analyzed**
The Club at Sunrise	02/13/2025
Rainbow Gardens	02/14/2025

Table 13-3 presents the additional turbidity and TSS wet weather monitoring data collected in the 2024-2025 MS4 permit year and the in-situ turbidity samples that were collected approximately every 3 minutes during the sampling event for the Club at Sunrise and 5 minutes at Rainbow Gardens.

Table 13-3. Additional Turbidity and TSS for the Current MS4 Permit Year (2024-2025)			
Sampling Location	**Turbidity (NTU)**		**TSS (mg/L)**
	Laboratory	**In-situ (Mean)**	**Laboratory**
The Club at Sunrise	680	673	720
Rainbow Gardens	330	411	610

Table 13-4 and Table 13-5 present wet weather monitoring data collected in the 2024-2025 MS4 permit year for both The Club at Sunrise and Rainbow Gardens sampling locations, respectively. Table 13-6 and Table 13-7 further identify the detections of organic compounds for the current MS4 permit year for The Club at Sunrise and Rainbow Gardens, in stormwater samples. Review of data collected for the Wet Weather

Monitoring Program in 2024-2025 does not show identifiable trends in wet weather constituent concentrations that would suggest a change in the nature of stormwater-related pollutants generated from the Las Vegas Valley watershed. Data was generally consistent with the previously collected wet weather characterization data.

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Table 13-4: The Club at Sunrise Wet Weather Monitoring Constituent Data for the Current MS4 Permit Year (2024-2025)

Parameter	Units	13-Feb-2025	Median 2024-2025 [a]	Historical Median 1997-2025	Historical Range 1997-2025		
NPDES Constituents [b]							
Oil and Grease - Gravimetric	mg/L	7.9	7.9	< 5	< 2.4	-	1,180
Total Dissolved Solids (TDS)	mg/L	200	200	525	93	-	2,500
Total Suspended Solids (TSS)	mg/L	1,130	1,130	864	18	-	8,350
Total Phosphorus-P	mg/L	1.52	1.52	1.20	0.17	-	3.9
Orthophosphate-P	mg/L	1.01	1.01	0.18	< 0.01	-	1.54
Nitrite, Nitrogen by IC	mg/L	0.036	0.036	< 0.10	0.036	-	6.5
Nitrate-N by IC	mg/L	0.65	0.65	1.30	< 0.1	-	165
Total Kjeldahl Nitrogen (TKN)	mg/L	6.70	6.70	4.60	< 0.2	-	28.0
Copper, Total, ICAP	mg/L	0.063	0.063	0.043	0.005	-	0.69
Lead, Total, ICAP	mg/L	0.024	0.024	0.023	< 0.0005	-	0.18
Zinc, Total, ICAP	mg/L	0.31	0.31	0.21	0.01	-	4.6
Copper, ICAP, Dissolved	mg/L	0.003	0.003	0.008	< 0.002	-	0.11
Lead, ICAP, Dissolved	mg/L	0.0004	0.0004	< 0.0005	0.0004	-	< 0.1
Zinc, ICAP, Dissolved	mg/L	0.0066	0.0066	< 0.02	<0.001	-	0.4
Boron, Total, ICAP	mg/L	0.11	0.11	0.21	< 0.02	-	0.84
Turbidity	NTU	1,280	1,280	485	28	-	5,200
Temperature	Thermal Analysis	11.0	11.0	17.5	11.0	-	27.3
Fecal Coliform Bacteria	MPN/100mL	5,630	5,630	58,100	130	-	160,000,000
Fecal Streptococci	MPN/100mL	23,100	23,100	23,820	< 1	-	3,300,000
E. Coli	MPN/100mL	7,710	7,710	32,600	7,710	-	172,000
Semivolatile Organic Compounds (SVOCs) [d]	No. of Detects	6	6	2	0	-	7
Volatile Organic Compounds (VOCs) [d]	No. of Detects	1	1	2	0	-	14
Pesticides [d]	No. of Detects	0	0	0	0	-	5
Herbicides [d]	No. of Detects	0	0	1	0	-	4
SNWA Expansion Constituents [c]							
Alkalinity as $CaCO_3$	mg/L	428	428	104	51	-	960
Aluminum, Total, ICAP	mg/L	13.1	13.1	5.18	0.0113	-	56
Antimony, Total, ICAP	mg/L	0.0035	0.0035	0.0037	< 0.001	-	0.1
Arsenic, Total, ICAP	mg/L	0.0095	0.0095	0.0080	0.0014	-	0.046
Barium, Total, ICAP	mg/L	0.28	0.28	0.220	0.058	-	1.8
Beryllium, Total, ICAP	mg/L	0.00065	0.00065	< 0.001	0.0007	-	< 0.01
Bicarbonate Alkalinity as HCO_3^-	mg/L	428	428	128	51	-	960
BOD	mg/L	42	42	34.7	< 2	-	263
Bromide	mg/L	0.025	0.025	0.05	< 0.005	-	0.53
Carbonate, Calculated	mg/L	< 5	< 5	< 2.00	< 0.028	-	< 10.0
Cadmium, Total, ICAP	µg/L	0.42	0.42	< 1.0	0.42	-	6.9
Chloride	mg/L	8.09	8.09	34.1	5.86	-	266
Chromium, Total, ICAP	mg/L	0.023	0.023	0.0150	< 0.0001	-	15.0
COD	mg/L	78	78	169	< 38.6	-	990
Fluoride	mg/L	0.23	0.23	0.298	0.076	-	1.08
Hardness as $CaCO_3$	mg/L	819	819	745	101	-	5,600
Hydroxide as OH^-, Calc	mg/L	< 5	< 5	< 2.00	0.001	-	13.0
Iron, Total, ICAP	mg/L	10.9	10.9	8.60	0.018	-	100
Magnesium, Total, ICAP	mg/L	53.6	53.6	47	6.2	-	490
Manganese, Total, ICAP	mg/L	0.30	0.30	0.27	0.03	-	2.4
Mercury	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-	0.00506
Nickel, Total, ICAP	mg/L	0.0160	0.0160	0.0190	0.0038	-	0.14
pH, Lab	Standard Units	7.17	7.17	7.57	5.92	-	8.57
Selenium, Total	mg/L	0.0016	0.0016	< 0.005	< 0.001	-	< 0.05
Selenium, Dissolved	mg/L	0.00082	0.00082	< 0.001	0.0005	-	< 0.0025
Silver, Total, ICAP	mg/L	0.00019	0.00019	< 0.0005	0.00019	-	< 0.005
Sodium, Total, ICAP	mg/L	10.7	10.7	34.0	6.5	-	1,020
Sulfate	mg/L	26.6	26.6	162	19	-	1,300
Surfactants	mg/L	0.174	0.174	0.31	< 0.05	-	2.18
Thallium Total, ICAP	mg/L	0.00022	0.00022	< 0.001	0.00022	-	< 0.01
Total Organic Carbon	mg/L	4.05	4.05	40	4.05	-	131

Notes:
ND = Non-detect / Not detected above laboratory method reporting limit
[a] Not a true median as there is only one sample, sample value is listed
[b] NPDES Constituents = Constituents originally analyzed under the Las Vegas Valley MS4 Wet Weather Sampling Program (Starting in 1991)
[c] SNWA Expansion Constituents = Constituents added to the list of analytes by SNWA as part of the Urban Tributary Water Quality Monitoring Program
[d] Refer to Table 13-10 for The Club at Sunrise Wet Weather Monitoring Detected Organics Data for the Current MS4 Permit Year (2024-2025) and Prior Three Permit Year

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Table 13-5: Rainbow Gardens Wet Weather Monitoring Constituent Data for the Current MS4 Permit Year (2024-2025)

Parameter	Units	14-Feb-2025	Median 2024-2025 [a]	Historical Median 1997-2025	Historical Range 1997-2025		
NPDES Constituents [b]							
Oil and Grease-Gravimetric	mg/L	< 5.0	< 5.0	< 5.0	1.4	-	10
Total Dissolved Solids (TDS)	mg/L	774	774	1,120	270	-	2,560
Total Suspended Solids (TSS)	mg/L	370	370	395	< 5	-	12,000
Total Phosphorus-P	mg/L	0.95	0.95	0.59	0.074	-	4.3
Orthophosphate-P	mg/L	0.86	0.86	0.13	< 0.01	-	3.0
Nitrite, Nitrogen by IC	mg/L	< 0.05	< 0.05	< 0.10	< 0.001	-	1.9
Nitrate-N by IC	mg/L	6.04	6.04	7.37	< 0.1	-	45
Total Kjeldahl Nitrogen (TKN)	mg/L	6.99	6.99	2.00	< 0.2	-	24.5
Copper, Total, ICAP	mg/L	0.03	0.03	0.026	0.0013	-	0.218
Lead, Total, ICAP	mg/L	0.0092	0.0092	0.0082	< 0.0005	-	0.151
Zinc, Total, ICAP	mg/L	0.15	0.15	0.08	0.029	-	0.62
Copper, ICAP, Dissolved	mg/L	0.0059	0.0059	0.010	< 0.001	-	0.0329
Lead, ICAP, Dissolved	mg/L	0.00043	0.00043	< 0.0005	< 0.00043	-	0.109
Zinc, ICAP, Dissolved	mg/L	0.029	0.029	0.024	< 0.005	-	0.109
Boron, Total, ICAP	mg/L	0.34	0.34	0.41	0.05	-	0.75
Turbidity	NTU	527	527	201	3	-	3,700
Temperature	Thermal Analysis	11.2	11.2	25.3	11.2		27.1
Fecal Coliform Bacteria	MPN/100mL	1,730	1,730	75,155	23	-	5,000,000
Fecal Streptococci	MPN/100mL	20,640	20,640	13,000	< 1	-	500,000
E. Coli	MPN/100mL	13,500	13,500	130,000	130,000	-	1,410,000
Semivolatile Organic Compounds (SVOCs) [d]	No. of Detects	4	4	1	0	-	5
Volatile Organic Compounds (VOCs) [d]	No. of Detects	1	1	4	0	-	12
Pesticides [d]	No. of Detects	0	0	0	0	-	3
Herbicides [d]	No. of Detects	0	0	0	0	-	4
SNWA Expansion Constituents [c]							
Alkalinity as $CaCO_3$	mg/L	164	164	120	65	-	420
Aluminum, Total, ICAP	mg/L	5.53	5.53	3.78	0.0096	-	69
Antimony, Total, ICAP	mg/L	0.004	0.004	< 0.002	< 0.001	-	0.02
Arsenic, Total, ICAP	mg/L	0.012	0.012	0.011	0.0048	-	0.099
Barium, Total, ICAP	mg/L	0.14	0.14	0.160	0.044	-	1.6
Beryllium, Total, ICAP	mg/L	0.00029	0.00029	< 0.001	0.00029	-	< 0.005
Bicarbonate Alkalinity as HCO_3^-	mg/L	164	164	140	79	-	420
BOD	mg/L	49	49	13	< 2	-	80
Bromide	mg/L	0.11	0.11	0.127	< 0.001	-	4.07
Carbonate, Calculated	mg/L	< 5.0	< 5.0	< 2.0	0.27	-	< 10
Cadmium, Total, ICAP	µg/L	0.062	0.062	< 1.0	0.062	-	610
Chloride	mg/L	150	150	181	56	-	369
Chromium, Total, ICAP	mg/L	0.0093	0.0093	0.0088	0.001	-	2.5
COD	mg/L	110	110	80	19.3	-	909
Fluoride	mg/L	0.56	0.56	0.55	< 0.1	-	1.0
Hardness as $CaCO_3$	mg/L	582	582	650	323	-	3,000
Hydroxide as OH^-, Calc	mg/L	< 5.0	< 5.0	< 2.00	0.005	-	< 5.0
Iron, Total, ICAP	mg/L	4.85	4.85	4.85	0.09	-	71
Magnesium, Total, ICAP	mg/L	51.4	51.4	62	29	-	200
Manganese, Total, ICAP	mg/L	0.43	0.43	0.32	0.012	-	3.6
Mercury	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0001	-	0.0019
Nickel, Total, ICAP	mg/L	0.0094	0.0094	0.0128	0.0014	-	0.14
pH, Lab	Standard Units	7.0	7.0	7.57	6.9	-	8.48
Selenium, Total	mg/L	0.0031	0.0031	< 0.0046	< 0.001	-	< 0.15
Selenium, Dissolved	mg/L	0.0021	0.0021	0.0019	0.0016		0.0027
Silver, Total, ICAP	mg/L	0.00013	0.00013	< 0.0005	0.00013	-	1.0
Sodium, Total, ICAP	mg/L	124	124	141	53	-	303
Sulfate	mg/L	274	274	417	156	-	1,100
Surfactants	mg/L	0.25	0.25	0.13	< 0.035	-	0.88
Thallium Total, ICAP	mg/L	< 0.0001	< 0.0001	< 0.001	< 0.001	-	< 0.005
Total Organic Carbon	mg/L	3.15	3.15	14.4	3.15	-	82.7

Notes:
ND = Non-detect / Not detected above laboratory method reporting limit
[a] Not a true median as there is only one sample, sample value is listed
[b] NPDES Constituents = Constituents originally analyzed under the Las Vegas Valley MS4 Wet Weather Sampling Program (Starting in 1991)
[c] SNWA Expansion Constituents = Constituents added to the list of analytes by SNWA as part of the Urban Tributary Water Quality Monitoring Program
[d] Refer to Table 13-11 for Rainbow Gardens Wet Weather Monitoring Detected Organics Data for the Current MS4 Permit Year (2024-2025) and Prior Three Permit Years

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Table 13-6. The Club at Sunrise Wet Weather Monitoring Detected Organics Data for the Current MS4 Permit Year (2024-2025)

Parameter		Detections 2024-2025	Historical Range of Detections 1997-2025		
Herbicide Detections	2,4-D		0	-	4
	Bentazon				
	Benzoic Acid				
	Dalapon				
	Dicamba				
	Picloram				
	Total No. of Detects:	0			
Pesticide Detections	Aldicarb Sulfone		0	-	5
	Alpha-BHC				
	Beta-BHC				
	Carbaryl				
	Total No. of Detects:	0			
SVOC Detections	4-Nitrophenol		0	-	7
	4-Methylphenol				
	Benzyl Alcohol	X			
	Bis(2-ethylhexyl)adipate				
	Bis(2-ethylhexyl)phthalate	X			
	Diethylphthalate	X			
	Dimethylphthalate	X			
	Di-n-Butylphthalate	X			
	Di-n-Octylphthalate				
	Phenol				
	Pyridine	X			
	Total No. of Detects:	6			
VOC Detections	2-Butanone		0	-	14
	Acetone	X			
	Acrylonitrile				
	Benzene				
	Bromodichloromethane				
	Carbon disufide				
	Chloroform				
	Chloromethane				
	Dibromomethane				
	Methyl ethyl ketone (MEK)				
	Naphthalene				
	Tetrachloroethene				
	Toluene				
	Total No. of Detects:	1			

Notes:
Cells marked with an "X" indicate that the constituent was detected in the sample

Table 13-7. Rainbow Gardens Wet Weather Monitoring Detected Organics Data for the Current MS4 Permit Year (2024-2025)

Parameter		Detections 2024-2025	Historical Range of Detections 2003-2025		
Herbicide Detections	2,4-D		0	-	4
	Bentazon				
	Benzoic Acid				
	Dalapon				
	Picloram				
	Total No. of Detects:	0			
Pesticide Detections	Aldicarb Sulfone		0	-	3
	Alpha-BHC				
	Beta- BHC				
	Carbaryl				
	Carbofuran				
	Total No. of Detects:	0			
SVOC Detections	4-Nitrophenol		0	-	5
	4-Methylphenol				
	Benzyl alcohol				
	Bis(2-ethylhexyl)phthalate	X			
	Di(2-ethylhexyl)phthalate				
	Di-n-Butylphthalate				
	Di-n-Octylphthalate				
	Diethylphthalate	X			
	Di-n-Butylphthalate	X			
	Phenol				
	Pyridine	X			
	Total No. of Detects:	4			
VOC Detections	2-Butanone		0	-	12
	Acetone	X			
	Acrylonitrile				
	Benzene				
	Carbon disulfide				
	Chloroform				
	Chloromethane				
	Dibromomethane				
	Methyl ethyl ketone (MEK)				
	Naphthalene				
	Tetrachloroethene				
	Toluene				
	Total No. of Detects:	1			

Notes:

Cells marked with an "X" indicate that the constituent was detected in the sample

13.2.4 Suspended Solids and Turbidity

A large part of the Permittees' stormwater management program is directed at the control of sediment, especially the retention of soil onsite. The wet weather monitoring program includes two parameters, TSS and turbidity, which measure sediment suspended in water. EPA and NDEP have repeatedly focused on the transport of sediments and constituents attached to sediments when evaluating stormwater management programs.

Because of concerns about the consistency of TSS and turbidity data, additional data were collected starting in the 2024-2025 permit year. Samples from the carboy were sent to two laboratories for turbidity and TSS analysis. Although samples from the same carboy are assumed to be identical, the particulate nature of suspended solids may make individual samples not identical. Table 13-8 presents the results from the two laboratories.

Table 13-8. Turbidity and TSS Data from Laboratories

Site	Laboratory	February 2025 Data	
		Turbidity (NTU)	TSS (mg/L)
The Club at Sunrise	ASSET Laboratories	680	720
	SGS	1,280	1,130
Rainbow Gardens	ASSET Laboratories	330	610
	SGS	527	370

The results were not consistent. For samples collected at the Club at Sunrise, SGS (formerly named Silver State Analytical Laboratories) produced a turbidity measurement that was almost twice as high as ASSET Laboratories' measurement, and the TSS measurement that was about 50 percent higher. For samples collected at Rainbow Gardens, SGS produced a turbidity measurement that was almost 50 percent higher than ASSET Laboratories' measurement, and the TSS measurement was about 40 percent lower. What these results show is that when standard sampling and analysis procedures are applied, the laboratory results can be dramatically different.

In addition, field crews collected onsite turbidity measurements from the actual water body as aliquots were being collected. Figure 13-2 provides the results for the Club at Sunrise, with the laboratory data superimposed.

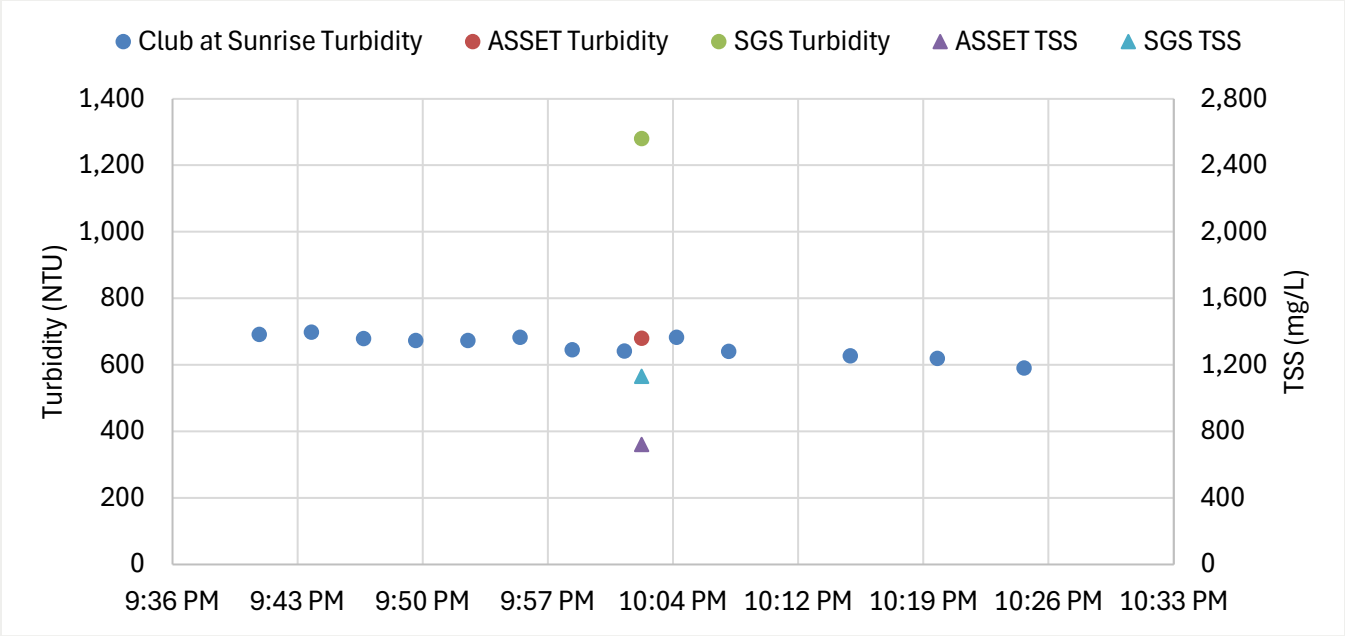


Figure 13-2. Club at Sunrise: Turbidity and TSS data for the February 2025 storm event

The TSS scale was set at twice the turbidity scale consistent with previous analyses showing that TSS is generally twice as high as turbidity in the Las Vegas Valley. The onsite turbidity data varied little from beginning to end. These data add support to the conclusion that sampling data are representative, because they tend to show that turbidity levels are consistent over time during a Las Vegas Valley stormwater runoff event. The onsite turbidity data were also consistent with the ASSET Laboratories' turbidity result and the SGS TSS result. However, the ASSET Laboratories' TSS result and the SGS turbidity result were noticeably lower and higher, respectively.

Figure 13-3 provides the results for Rainbow Gardens, with the laboratory data superimposed.

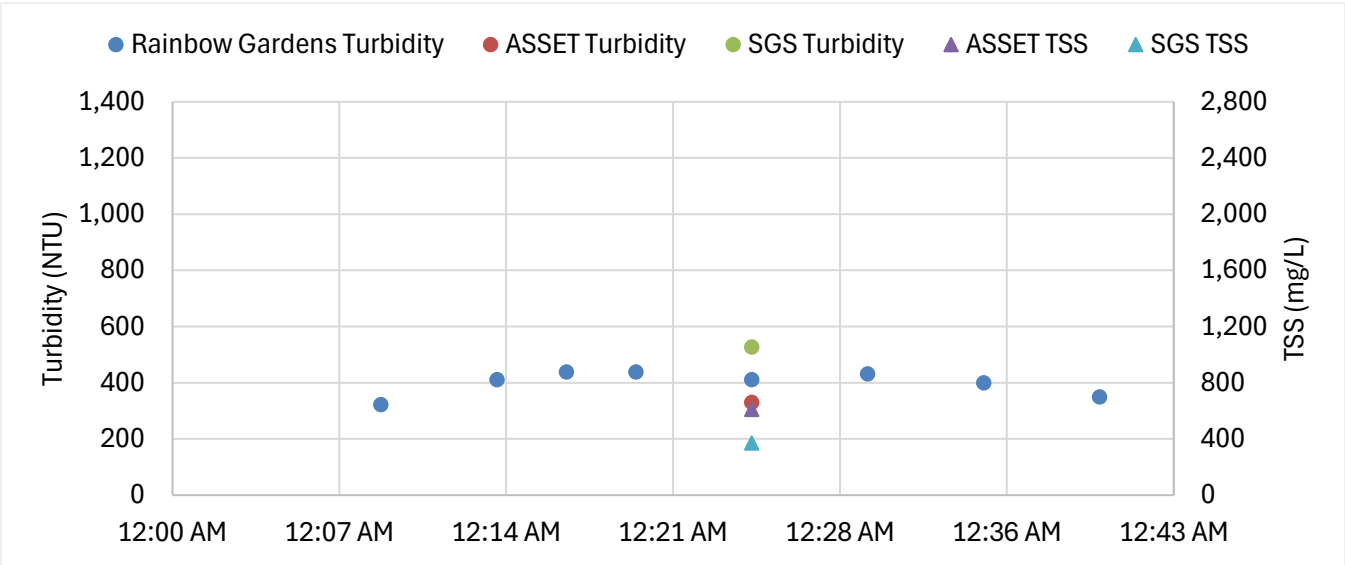


Figure 13-3. Rainbow Gardens: Turbidity and TSS data for the February 2025 storm event

Once again, the onsite turbidity data varied little from beginning to end. The SGS turbidity and ASSET turbidity were reasonably close to the onsite data. The TSS data from both laboratories, however, was

somewhat less than the onsite turbidity data. Consistent with the historical data, turbidity at Rainbow Gardens was much lower than turbidity at the Club at Sunrise. These data support previous conclusions that the erosion control structures and bank stabilization protect lower Las Vegas Wash.

These additional data from 2025 show that there continue to be differences between laboratory measured TSS and turbidity data. On the other hand, these data provide some reassurance that repeated measurements of turbidity during the sampling interval can provide consistent results. Additional data will be collected during the 2025-2026 permit year to ascertain whether additional data are helpful.

The main conclusions for the evaluation of suspended solids and turbidity data include:

- There is a tight relationship between TSS concentrations and turbidity levels in the majority of samples.
- TSS concentrations and turbidity levels do not increase with increased flows, apparently because of the extensive channel lining, regional detention basins, and erosion control structures in the Las Vegas Valley.
- No additional monitoring stations are needed for the Las Vegas Valley. The Club at Sunrise location effectively monitors stormwater conditions upstream of the wastewater treatment plants, and the Rainbow Gardens location effectively monitors stormwater conditions for the whole of the Las Vegas Valley.
- TSS concentrations and turbidity levels are not consistently higher on the rising arm of the hydrograph as compared with peak flow and the falling arm.
- TSS concentrations and turbidity levels do not substantially increase when there are long dry periods. The absence of an upwards trend may be explained either by the effectiveness of the Permittees' street sweeping program and debris cleanout, and/or because material buildup is not a significant source of solids in stormwater.
- The stormwater management program for the Las Vegas Valley is highly effective. Median TSS concentrations at Rainbow Gardens are 1/20th of the background concentrations for the Mojave Basin and Range.

TSS concentrations and turbidity levels from the Las Vegas Valley are not having a significant effect on lower Las Vegas Wash or Lake Mead.

13.2.5 Stormwater Monitoring Plan

In accordance with the 2024 MS4 Permit, the Draft Stormwater Monitoring Plan was submitted to NDEP by August 5, 2025. Following any comments from NDEP, the revised Stormwater Monitoring Plan will be issued for Public Comment. A final revised version will be prepared following that phase and will be submitted to NDEP. The final Stormwater Monitoring Plan, as approved by NDEP, will be reviewed annually for the Annual Report.

13.3 Impaired Waters and TMDLs

Sections B.4.1 and B.4.2 of the 2024 MS4 Permit for the Las Vegas Valley include requirements to evaluate whether stormwater discharges cause or contribute to the listing of waters identified in accordance with the requirements of Section 303(d) of the Clean Water Act (CWA).

Table 13-9 shows the segments of the Las Vegas Wash and tributary channels that were identified in the Nevada 2020-2022 Water Quality Integrated Report.

Table 13-9: 303(d) List of Impaired Waterbodies in the Las Vegas Valley (2022)		
Waterbody	**Location**	**Impairment Parameter**
Pittman Wash	From its origin to Duck Creek	Selenium
		Total Dissolved Solids (TDS)
Duck Creek	From its origin to the Las Vegas Wash	Boron
		Fluoride
		Selenium
		Total Dissolved Solids (TDS)
		Temperature
Flamingo Wash	From its origin to the Las Vegas Wash	Boron
		Iron
		Selenium
		Total Suspended Solids (TSS)
Las Vegas Creek	From its origin to the Las Vegas Wash	Selenium
Las Vegas Wash	Above treatment plants	Boron
		E. Coli
		Iron
		Selenium
		Total Dissolved Solids (TDS)
		Total Suspended Solids (TSS)
Sloan Channel	From North Las Vegas Blvd to the Las Vegas Wash	Boron
		Fluoride
		Selenium

Table 13-10 evaluates whether stormwater caused or contributed to the listing.

Table 13-10: Sources of Pollutants and Effects of MS4 Discharges on Impaired Waterbodies in the Las Vegas Valley		
Constituent	**Cause of Listing**	**Did Stormwater Cause or Contribute to the Listing?**
Boron	Flow through native sub-surface soils, Resurfacing shallow groundwater	No
E. Coli	Attributed to animals/wildlife	No
Fluoride	Flow through native sub-surface soils, Resurfacing shallow groundwater	No
Iron	Flow through native sub-surface soils, Resurfacing shallow groundwater	No
Selenium	Flow through native sub-surface soils, Resurfacing shallow groundwater	No
TDS	Flow through native sub-surface soils, Resurfacing shallow groundwater	No
Temperature	Weather conditions	No
TSS	Sediment transported in stream channels during dry weather	No

13.3.1 Permit Compliance for Constituents with a TMDL

The NPDES MS4 Permit requires the Permittees to comply with permit Section B.4.2.2 for constituents with established TMDLs. The NDEP has approved a TMDL for total phosphorus and total ammonia for Lake Mead. These approved TMDLs do not apply to stormwater discharges from the Permittees' MS4, and do not include a pollutant WLA or other performance requirements for stormwater discharge from the Permittees' MS4. They do not address a flow regime likely to occur during periods of stormwater discharge. Because they do not include WLAs, permit provisions related to WLAs are not applicable. No additional or modified stormwater controls are necessary.

13.4 Permit Year Measurable Goals

The Characterization Data measurable goal is outlined below in Table 13-11.

Table 13-11. Characterization Data Measurable Goals

Measurable Goal	Permittee	Goal Completed	Description
Submit required information in the stormwater monitoring plan and report updates in the Annual Report.	Clark County Regional Flood Control District	Yes	Information submitted. No updates needed.

Section 14

Additional Information for the 2011 SWMP

Section 14

Additional Information for the 2011 SWMP

Section 14 summarizes BMPs and activities originally developed under the 2011 SWMP. While these efforts supported stormwater pollution prevention and public awareness, they are not proposed to be detailed in the annual report for the revised SWMP developed in accordance with the 2024 MS4 Permit for the Las Vegas Valley.

These programs include activities such as storm drain marking, pet waste management, website-based outreach, printed educational materials, and other related efforts. While some of these programs may continue voluntarily or under other agency initiatives, they are not required components of the updated SWMP and are therefore presented here for documentation and transparency only.

Although no longer included in the formal SWMP framework, these efforts represent a continued regional commitment to improving stormwater quality through public engagement and non-structural BMPs that complement the regulatory requirements of the MS4 Permit.

14.1 FY2025 Clark County Water Quality Grant Funded Public Outreach

MS4 Permit requirements for public outreach and education are fulfilled by the Permittees. Grant funded public outreach and education provided by Clark County Water Quality are above and beyond that which is necessary to comply with the MS4 Permit. Items of note included:

- Clark County's educational stormwater website (StormwaterVegas.com) continues to engage the general public.
- Water Quality participated in the Discovery Day at Wetlands Park, Earth Day event at the Springs Preserve, and the Las Vegas Science and Technology Festival.
- Water Quality organized the second annual Stormwater Pollution Awareness Month. The event was hosted in collaboration with nine project partners, including the Clark County (CC) Water Reclamation District (WRD), CC Wetlands Park, CC Department of Aviation, CC Regional Flood Control District, Las Vegas Wash Coordination Committee (LVWCC), Southern Nevada Water Authority, City of Henderson, and the City of Las Vegas. The environmental outreach month included proclamations by the Clark County Commissioners and the Regional Flood Control District. Outreach activities included advertising on billboards and weekly social media posts.
- Water Quality installed a stormwater pollution awareness kiosk at the Clark County Wetlands Park.
- Water Quality worked with a graphic designer to develop a new Household Hazardous Waste Guide.
- Water Quality ran the billboard advertising at 30-billboards throughout the Las Vegas Valley in April and May.

14.2 Brochures and Printed Material

The Permittees have a variety of brochures and printed material available to educate the public, many of which are created by the SQMC. Currently brochures are available for construction site BMPs, information for residents, guidelines for businesses and homeowners, construction site supervision, industrial stormwater permits, industrial and commercial BMPs, and stormwater pollution prevention information for businesses and homeowners.

Clark County has also created over 30 different stormwater pollution prevention flyers and brochures, developed in both English and Spanish through Non-Point Source (NPS) grants. These include commercial/industrial, construction, and resident's flyers. Most of the brochures and flyers are available on their website (https://www.clarkcountynv.gov/government/departments/water_quality/index.php).

CCRFCD created and distributed Drainger Danger Activity books and Dog Poop flyers. City of Las Vegas has a water quality educational kiosk structure installed at the Harris-Marion Park facility, next to the Las Vegas Wash. City of North Las Vegas created and distributed a flash flood & flood safety information.

During the permit year, COH distributed pickup dog waste coloring sheets, dog bandanas, and general stormwater brochures at public outreach events. Public outreach events may include one of three Putt Putt greens to educate the public on stormwater pollutants (Putt Putt Themes: car wash, household pollutants, and pet waste), environmental jenga (which includes stormwater topics) or Trash or Storm Drain games.

Throughout the permit year, the Permittees routinely distributed information on stormwater quality and how it can be influenced by common behaviors, including the importance of proper pet waste disposal. In addition, the Permittees distributed materials in-person at environmental, community events, during construction inspections, industrial inspection and when responding to customer complaints. The progress made for these BMPs in the 2024-2025 permit year are displayed in Table 14-1.

Table 14-1. Permittee Activities for Public Outreach and Education

Best Management Practice	Municipal Permittee	2024-2025
Brochures and Printed Material	City of Henderson	450
	City of Las Vegas	500
	City of North Las Vegas	50
	Clark County	0 [a]

[a] *The Regional Flood Control District provided outreach and education to meet MS4 Permit Requirements*

14.3 Maintenance of Public Facilities

This measure is aimed at Permittee-owned sites with urban land uses such as parks, golf courses, parking lots, garages, vehicle wash areas, as well as vehicle storage and maintenance areas. The target goal is that public facility maintenance plans should be reviewed every other year, during odd permit years. The Permittees reviewed and modified public facility maintenance plans during the 2024-2025 MS4 permit year as follows:

- City of Henderson – Reviewed and updated information for Vactor Dump, and Park plans.
- City of Las Vegas – Reviewed and updated their information on all Fleet Facilities and Parks Maintenance.
- Clark County – Reviewed and updated the Public Facility Maintenance Plan.
- City of North Las Vegas - Reviewed and updated contact information for the Public Facility Plan.

14.4 Water Conservation (Drought) Ordinances

Each Permittee has a water conservation ordinance designed to reduce use of water outdoors. The water conservation ordinances adopted by the Permittees include restrictions on new turf areas, particularly in front yards, and requires the use of xeriscaping in new development. The local water conservation ordinances are the City of Henderson Municipal Code, Chapter 14.14, Conservation; the City of Las Vegas Municipal Code, Chapter 14.11, Drought Plan; the City of North Las Vegas, Chapter 13.08, Water Conservation; and the Clark County Code, Chapter 24.34, Water Use Restrictions. Minimizing outdoor water use reduces water waste and limits the amount of pollutants transported to the MS4 via overwatering.

In addition, the SNWA (2025 Water Resource Plan) has a regional water use goal of 86 total system gallons per capita per day (GPCD) by 2035. This goal addresses changing conditions and identifies that additional progress is needed to maximize available supplies. The total system GPCD is calculated by dividing all SNWA water sources diverted (excluding off-stream storage) less corresponding Colorado River return-flow credits by total SNWA resident population served per day.

The 2025 Water Resource Plan states that warmer and drier conditions will possibly increase local water demands. System age and climate change could increase this demand by 10 GPCD or more by 2035. Improving the efficiency of turf irrigation and cooling uses are some actions that can help to keep local supply in balance.

SNWA GPCD recognizes that not all water delivered by SNWA is consumed, as SNWA recycles nearly all indoor water use, either through return-flow credits or direct reuse, and also allows reporting to reflect actual weather conditions. Consumptive use for the 2024 calendar year was 95 GPCD.

14.5 Turf Conversion Program

One goal of the Source Control and MS4 Maintenance Program is to reduce runoff from irrigated urban areas. In combination with drought ordinances, turf removal can assist with this effort. The SNWA has a Water Smart Landscapes program (https://www.snwa.com/rebates/wsl/index.html) that offers a rebate to consumers for removal of existing turf. This program helps Southern Nevada conserve water and reduces the need to apply fertilizers and herbicides to the converted areas. The SNWA currently offers a Water Smart Landscape rebates to customers (business, homeowners associations, and multifamily properties) of $3.00 per square foot of grass that is removed and replaced with desert landscaping up to the first 10,000 square feet converted per property, per fiscal year. Beyond the first 10,000 square feet, SNWA will provide a rebate of $1.50 per square foot of turf conversion. The program has assisted the community upgrade more than 241 million square feet of lawn to water-efficient landscaping, saving more than 203 billion of gallons of water since the program began in 1999.

Additionally, as part of the Water Smart Landscape rebate program, the Tree Enhancement Program pays new applicants a bonus of $100 for every new tree installed. The list of qualifying trees is based on a combination of factors related to climate resiliency, water efficiency, pathogen resistance, drought tolerance, maintenance, diversity, and invasiveness (https://www.snwa.com/assets/pdf/wsl-tree-rebate-qualifying.pdf).

In June 2021, the Nevada Legislature passed Assembly Bill (AB) 356, which directed the SNWA Board of Directors to develop a plan for the removal of nonfunctional turf in the Las Vegas Valley. The legislation prohibits Southern Nevada's water supply from watering existing unused grass on properties that are not zoned exclusively for single-family residences after January 1, 2027. According to SNWA, removing this nonfunctional turf can save about 9.5 billion gallons of water per year.

The City of Henderson is supplementing the SNWA Water Smart Landscapes program with an additional rebate of $575 for Single-Family Residential homes. For the 2024-2025 permit year the City of Henderson rebate funding available was $500,000, the rebate actual expenditure was $233,547 for 359,170 sq ft of

turf converted for an estimated water saving of 20,041,686 gallons annually. Table 14-2 provides a summary of the Water Smart Landscapes Program during the current permit year.

Table 14-2. Water Conservation Activities	
SNWA Water Smart Landscapes Program Elements	2024
Rebate Funding Available	$56,300,000
Turf Converted (sq. ft.)	15,087,297
Estimated Water Savings (gallons)	841,871,173
Actual Funding Expenditure	$48,788,214

14.6 Household Hazardous Waste Collection

Many common household chemicals can cause significant water quality degradation when disposed of improperly and/or enter the MS4. These household chemicals are considered hazardous waste and may include paint thinners, solvents, paint removers, gasoline, diesel fuel, lighter fluid, waste oil, batteries, garden chemicals, pool chemicals, cleaning fluids, and aerosol cans. Republic Services (the Las Vegas Valley's recycling and waste disposal company) continues to provide household hazardous waste collection and recycled oil services for all residents in the Las Vegas Valley. Household hazardous waste is limited to 40 pounds dry or 15 gallons liquid per customer (gasoline restricted to 5 gallons). Republic Services provides two drop-off locations (South Valley: 560 Cape Horn Drive, Henderson and North Valley: 333 W. Gowan Road, North Las Vegas) that are open on rotating weeks, Wednesday through Saturday from 9 am to 1 pm. In addition, the South Valley location is open every Saturday. Table 14-3 provides a summary of the quantities of household hazardous waste received by Republic Services, and presumably spared from storm drains, for the current permit year.

Table 14-3. Republic Services Household Hazardous Waste Collection for the Current Permit Year	
Republic Services Program Elements	Pounds Collected
Acidic Liquids	2,378
Aerosols	13,469
Anti-Freeze	13,012
Caustic Liquids	1,188
Fertilizers	795
Flammable Liquids	21,625
Household Cylinders (Propane, Oxygen, Fire Extinguishers.)	459
Light tubes	412
Oil, used	6,448
Oily Water	6,246
Oxidizing Liquids (cleaners, pool chemicals, etc.)	228
Oxidizing Solids (pool chemicals, matches, cleaners etc.)	1,008

Table 14-3. Republic Services Household Hazardous Waste Collection for the Current Permit Year	
Republic Services Program Elements	**Pounds Collected**
Paint Related Materials	12,678
Pesticides, Herbicides, etc.	16,538
Total	96,484

14.7 Ordinances Prohibiting Non-Stormwater Discharges and Littering

All municipal Permittees have ordinances prohibiting discharges of non-stormwater (except as expressly permitted) to the MS4. Local ordinances give the entities the authority to take enforcement action against illegal and illicit discharges, illegal dumping, littering, and other practices that may adversely affect the quality of water in the MS4, including those actions that have the "potential to pollute". Violations may be reported by code enforcement officers, public agency staff, or by general citizens through hotlines and Permittee websites.

14.8 Desert Dumping Controls

The Permittees have ordinances prohibiting dumping of materials in the desert surrounding the developed areas of the Las Vegas Valley. In addition to being unsightly and posing threats to the local ecology and human health, illegally dumped materials could be sources of water pollution if they come in to contact with stormwater (e.g., old vehicles, household waste, commercial and industrial waste, construction waste, landscaping refuse). Depending on the type and location of the observation, reports of illegal dumping may be referred to the BLM (data not reported in this Annual Report), the Southern Nevada Health District (SNHD), or the Clark County Public Response Office (CCPRO) for investigation and enforcement.

Section 12.0 of this Annual Report identifies the relevant stormwater ordinance(s) for each municipal Permittee and discusses the review and revision actions taken by Permittees for the permit year. Under those ordinances, the Permittees are granted enforcement authority. Table 14-4 summarizes the non-stormwater discharge enforcement activity undertaken by each Permittee for the current permit year.

Table 14-4. MS4 Maintenance Additional Activities		
Best Management Practice	**Permittee**	**Description**
Enforcement of Non-Stormwater Discharges and Litter Complaints / Responses	City of Henderson	102 enforcement actions [a]
	City of Las Vegas	0 enforcement actions and 92 Biohazard ROW Cleanups
	City of North Las Vegas	4,995 enforcement actions
	Clark County	3,356 solid waste cases, 114 biohazard, 54 sewage, 5 chemical/fuel, 394 illegal dumping complaints, and 221 enforcement actions [b]

Table 14-4. MS4 Maintenance Additional Activities		
Best Management Practice	**Permittee**	**Description**
Enforcement of Desert Dumping Complaints / Responses	City of Henderson	5 enforcement actions [a]
	City of Las Vegas	0 enforcement actions [c]
	City of North Las Vegas	213 enforcement actions
	Clark County Public Response Office	3,356 solid waste cases and 394 illegal dumping complaints
	Southern Nevada Health District	934 complaints; 47 NOVs; 42 cases adjudicated; $57,103 in penalties

Notes:

[a] *City of Henderson enforcement actions do not include: verbal warnings; for Desert Dumping and Illicit Discharge complaints, they do include notice of violations, certified letters to abate, misdemeanor citations, and fines*

[b] *Enforcement actions include: verbal warning, corrective notice, Notice of Violation, Notice to Abate, Cease and Desist Orders, and judicial actions*

[c] *CLV is called by SNHD to clean up desert dumping on CLV public property; CLV defers to SNHD for enforcement actions on private properties*

14.9 Sanitary Sewer Lines

The Permittees inspect sanitary sewer lines as part of their program of compliance with wastewater discharge permits. Table 14-5 presents miles of sanitary sewer lines inspected and repaired or jetted. The miles inspected, repaired and number of manholes inspected are tracked and reported.

Table 14-5. Illicit Discharge and Detection Additional Activities		
Best Management Practice	**Municipal Permittee**	**2024-2025**
Miles of sanitary sewer line inspected, and miles of sanitary sewer line repaired or jetted.	City of Henderson	76 miles inspected and 7,036 manholes inspected
		266 miles repaired or jetted
	City of Las Vegas	154 miles inspected
		624 miles repaired or jetted and 145 sewer manhole collars raised and repaired
	City of North Las Vegas	99.5 miles inspected and 517 manholes inspected
		0 miles repaired or jetted
	Clark County	177 miles inspected and 40,750 manholes inspected
		682 miles repaired or jetted and 51 manholes repaired

14.10 Sand/Oil Separators

The purpose of sand/oil separators is to remove solids and floatables, including hydrocarbons from stormwater or wastewater. Progress and quantities for the sand/oil separator measurable goal is provided in Table 14-6.

Table 14-6. Grease Interceptor Program Additional Activities		
SWMP Target	Municipal Permittee	2024-2025
Install sand/oil separators.	City of Las Vegas	4 sand/oil separators installed
	Clark County	3 sand/oil separators installed

14.11 Grease Interceptor Program

Municipal Permittees have existing ordinances requiring proper removal and disposal of grease from grease interceptors in restaurants and industrial facilities. Clogged grease interceptors could allow wastewater to be directed to the MS4. BMPs are enforced consistently among each of the Permittees in the Las Vegas Valley. Progress and quantities for the grease interceptor program measurable goal is provided in Table 14-7.

Table 14-7. Grease Interceptor Program Additional Activities		
SWMP Target	Municipal Permittee	2024-2025
Inspect each facility required to be on the inventory: Grease Interceptor Program Inspection Quantity	City of Henderson	123 inspections
	City of Las Vegas	637 inspections
	City of North Las Vegas	652 inspections
	Clark County	3,036 inspections

14.12 Industrial Pretreatment Program

Permittees have industrial pretreatment programs associated with their wastewater NPDES permits. All new qualifying industrial facilities must comply with the industrial pretreatment program and are subject to periodic pretreatment inspections. Activities associated with this BMP are reported separately under individual NPDES discharge permits.

14.13 Southern Nevada Health District Inspections

The Southern Nevada Health District (SNHD) performs inspections of commercial and industrial facilities that are conditionally exempt small quantity generators of hazardous waste (CESQG). These are smaller facilities that do not fall under the State's hazardous materials regulations. In addition, the SNHD Solid Waste and Compliance Division inspected several underground storage tanks (UST) and permitted disposal facilities (PDF). SNHD sets policies and procedures to comply with the BMP. Progress and quantities for the measurable goal is provided in Table 14-8.

Table 14-8. Southern Nevada Health District Inspections Additional Activities		
SWMP Target	Municipal Permittee	2024-2025
Inspect each facility required to be on the inventory: SNHD Industrial Facility Inspection Quantity	Permitted Disposal Facilities	239
	Underground Storage Tank	855
	Waste Management Audit	3,178

Section 15

Conclusion

Section 15

Conclusion

The Permittees prepared this Annual Report for the 2024-2025 MS4 permit year to report to NDEP on the status of the MS4 program and to highlight compliance with the 2024 MS4 permit, the current SWMP, and the Draft SWMP. Annual Report requirements in the 2024 MS4 Permit were also satisfied as described below and all program BMP goals were achieved.

- B.6.3.3.1: Status of compliance with permit conditions – This is discussed in each Annual Report section. All permit conditions were met.
- B.6.3.3.2: Appropriateness of BMPs – Updates from previous assessments are noted within the Annual Report.
- B.6.3.3.3: Progress towards reducing discharges to the maximum extent practicable (MEP) – Continued implementation of current BMP programs is meeting the MEP goal given the unique conditions in the Las Vegas Valley.
- B.6.3.3.4: Achievement of measurable goals – This is discussed in each Annual Report section. All permit conditions were met.
- B.6.3.3.5: Results of information analysis – Wet weather water quality remained largely consistent with data collected historically.
- B.6.3.3.6: Summary of stormwater activities planned for next permit cycle – The Permittees intend to continue the BMP activities as described in the Annual Report, until the Final SWMP is in place.
- B.6.3.3.7: Changes to the SWMP – A revised Draft SWMP was submitted to NDEP and is under review.
- B.6.3.3.8: Reliance on another governmental agency to satisfy permit obligations – Permittees rely on other governmental agencies (e.g., SNWA, SNHD) to perform activities for specific BMPs, but not to satisfy overall permit obligations.
- B.6.3.3.9: Estimated reductions in loadings of pollutants to surface and ground water due to MS4 program – Permittees have not found a reliable, defensible method to quantify reductions in pollutant loadings attributable to the BMPs in their MS4 program. This is not currently being reported. However, data show that population and land development have increased dramatically in the Las Vegas Valley since the MS4 program inception in 1991, without a commensurate increase in stormwater pollutant concentrations. This suggests that BMPs in the MS4 program have been effective in offsetting pollutant loading increases that could have occurred due to development.
- B.6.3.3.10: Summary of inspections – More than 850 industrial facility inspections and more than 5,900 construction site inspections were completed by the Permittees during the permit year. Inspections are documented in Section 7 and Section 8 of this Annual Report.
- B.6.3.3.11: Annual expenditures and budget for the following year – This information is provided in Section 9 of this Annual Report. Annual program expenditures for the 2024-2025 MS4 permit year

were approximately $200 million for all Permittees combined. The budget for the 2025-2026 MS4 permit year is approximately $254 million.

- B.6.3.3.12.4: Information on all new annexed areas and any resulting updates required to the SWMP - The permit area of coverage for the 2024 MS4 permit added additional developable land from the 2018 MPU, 2023 UDB, and current disposal boundary to create the UDB Updated for the Las Vegas Valley MS4 Program (2023 MPU). The 2024 MS4 Permit area encompasses the area within the 2023 UDB area (which expands beyond the extents of the disposal boundary) and within the LVV watershed that ultimately contribute to the Las Vegas Wash.

Appendices

Appendix A1

Historic Wet Weather Data

Notes for Wet Weather Monitoring Data, 1992-2025

Refer to these notes for all set of databases

1) In computing median values, concentrations below detection limits were assumed to equal the detection limit.
2) In computing average values, concentrations less than the detection limit were assumed to be 1/2 the detection limit.
3) NA = Not Available
4) Total Nitrogen = TKN + NO_3 + NO_2. If TKN, NO_3, or NO_2 are below the detection limit, the concentration was assumed to be equal to the detection limit.
5) Insitu pH used for 3/25/94 Western Trib.
6) Phenol values are Lab measurements when both lab and in-situ measurements are available.

(a) VOC detected is Acetone
(b) VOC detected is 2-Butanone
(c) Pesticide detected is Atrazine
(d) VOC detected is Chloroform
(e) VOC detected is Trichloromethane
(f) Herbicide detected is MCCP
(g) SOC detected is Butylbenzylphthalate
(h) SOC detected is Caffeine
(i) SOC detected is Di-(2-Ethylhexyl)adipate
(j) SOC detected is Di-n-Butylphthalate
(k) SOC detected is Phenanthrene
(l) SOC detected is Pyrene
(m) SOC detected is Simazine
(n) SOC detected is Dimethylphthalate
(o) SOC detected is Diethylphthalate
(p) SOC detected is Alachlor
(q) SOC detected is Benzopyrene
(s) SOC detected is Metolalchlor
(t) SOC detected is Propachlor
(u) SOC detected is Benzo(g,h,I)Perylene
(v) SOC detected is Benzo(k)Fluoranthene
(w) Denotes grab sample taken from bottle X
(x) SOC detected is Di(2-Ethylhexyl)phthalate
(y) Denotes grab sample taken from flow stream while bottle X is filling
(z) SOC detected is Heptachlor
(aa) SOC detected is Lindane
(bb) SOC detected is Metribuzin
(cc) VOC detected is Chlorodibromomethane
(dd) VOC detected is Bromodichloromethane
(ee) VOC detected is Total THM
(ff) VOCs detected is Carbon Disulfide
(gg) Pesticides detected is Glyoxal

1992-2025
Wet Weather Data

(hh) Herbicide detected is 2,4-D
(ii) Pesticide detected is Chlorpyrifos (Dursban)
(jj) Pesticide detected is Metachlor
(kk) Pesticide detected is Malathion
(ll) Pesticide detected is Prometon
(nn) SOC detected is Fluoranthene
(oo) Pesticide detected is Dieldrin
(pp) VOC detected is Benzenaldehyde
(qq) VOC detected is Acetaldehyde
(ss) VOC detected is Butanal
(tt) VOC detected is Decanol
(uu) Herbicide detected is 2,4-DB
(vv) VOC detected is Formaldehyde
(ww) Pesticide detected is Diazinone
(xx) Pesticide detected is Dicamba
(yy) VOC detected is p-Dichloropropane
(zz) SOC detected is Methyl Glyoxal
(aaa) VOC detected is Octanal
(bbb) VOC detected is Propanal
(ccc) Herbicide detected is Pentachlorophenol
(ddd) VOC detected is Toluene
(eee) VOC detected is Dichloroacetonitrile
(fff) VOC detected is Dibromochloromethane
(ggg) VOC detected is Pentanal
(hhh) VOC Heptanal
(iii) VOC Hexanal
(jjj) VOC Dibromochloropropane
(kkk) Pesticide Duiron
(lll) Herbicide 2,4,5-T
(mmm) SOC Benzoic Acid
(nnn) VOC Naphthalene
(ooo) SOC Dimethylphenol
(ppp) VOC 2-methylphenol
(qqq) VOC 4-methylphenol
(rrr) Herbicide Picloram
(sss) SOC Benzene
(ttt) Pesticide Alpha-bhc
(uuu) Pesticide Beta-bhc
(vvv) Pesticide delta-bhc
(www) SOC Methyl isobutyl ketone
(xxx) Herbicide Bentazon
(yyy) VOC Cyclohexanone
(zzz) VOC Benzyl alcohol
(aaaa) Phenol
(bbbb) Benezene
(cccc) Herbicide Benzoic Acid
(dddd) Pesticide Methyl Glyoxal
(eeee) VOC Nonanal

1992-2025
Wet Weather Data

Location	Date	Q cfs	Temp Deg. C	Oil & Grease mg/L	TSS mg/L	TDS mg/L	Specific Conductance umho/cm	Lab pH units	Surfactants MBAS mg/L	Ortho-Phosphate mg/L	Total Phosphorous mg/L	NO3-N mg/L	NO-2 mg/L	NH3-N mg/L	TKN mg/L	Total Nitrogen mg/L
Las Vegas Wash @ The Club at Sunrise (Formerly known as Desert Rose Golf Course) (USGS)	04/02/97		12.6	< 3	480	1,060	1,549	7.1	0.63	0.55	0.91	3.30		1.30	8.50	11.80
	07/28/97		26.6	1,180	400	1,200	1,092	7.6	1.34	0.04	0.52	2.10		0.80	3.90	6.00
	02/04/98			< 3	2,590	980		7.7	0.60	0.17	1.97	0.63		0.70	7.30	7.93
	02/24/98		12.0		5,580	540		7.9	< 0.50	0.09	1.46	1.00		0.20	< 1.00	2.00
	04/24/99	112		4	1,240	1,000					0.93	2.80		0.50	7.45	10.25
	04/30/99	550		< 3	1,870	440					1.83	1.90		0.78	8.73	10.63
	02/21/00			5	1,910	100					2.10	0.64		0.18	3.20	3.84
	10/23/00	312		5	1,390	2,430					1.20	3.48		0.60	7.40	10.88
	02/26/01	400		< 3	2,940	1,250					1.70	2.64		0.40	4.90	7.54
	11/24/01	75		15	630	1,590					0.86	2.00		1.61	7.80	9.80
	09/11/02	83		< 3	110	1,300	1,570	7.1	2.18		0.49	3.90	< 2.50	1.13	5.40	11.80
	02/12/03	400		5	5,980	1,180	819	7.7	< 0.05	0.13	2.40	1.50	< 0.20		4.70	6.40
	02/25/03	775		8							0.44			0.38	3.00	3.00
	07/19/03				500	1,330			0.72			0.63	1.20		7.70	9.53
	02/21/04				340	660	274	7.5	0.48		0.42	1.80	< 0.20		2.90	4.90
	11/09/04			< 5		1,500	1,730	6.7	< 0.05		0.77	165	< 0.10		2.50	167.60
	01/04/05			< 5	1,730	290	428	7.9	< 0.05	0.22	1.20	0.70	< 0.10			0.80
	07/24/05			< 5	1,160	390	535	7.6	0.12	0.04	0.77	1.50	6.50		4.10	12.10
	10/05/06					298	446		0.09	0.19	0.75	1.10	< 0.20		2.00	3.30
	01/05/08				1,520	536	846	7.6	0.81	0.56	3.30	1.90	< 0.20		12.00	14.10
	08/07/08			7	5,810	1,450	1,890	7.4	0.19		3.90	< 5.00	< 5.00		26.00	36.00
	11/26/08			4	1,200	1,320	1,800	7.9	0.09	0.51	1.80	2.80	< 0.50		9.90	13.20
	12/17/08			7	26	294	439	7.4	0.19	0.41	0.41	0.76	0.10		2.00	2.86
	02/07/09			5	18	726	1,020	7.6	0.07	0.25	1.80	1.60	< 0.20		8.60	10.40
	07/22/09			14	500	1,300	1,700	7.4	0.74		1.60	< 0.50	< 0.25		14.00	14.75
	01/20/10			5	3,400	610	870	7.7	0.23	1.50	2.10	1.70	< 0.13		7.90	9.73
	02/06/10			6	620	230	340	7.9	0.09	0.09	0.59	0.82	0.09		2.50	3.41
	04/22/10			3	1,000	840			0.46	0.05	0.80	1.70			4.10	5.80
	10/17/10			< 5	230	1,100	1,500	7.3	1.00	0.05	0.67	< 0.25	< 0.25		7.40	7.90
	12/20/10			< 5	1,700	1,300	1,900	7.9	0.46	1.20	1.80	2.70	< 0.13		6.80	9.63
	12/22/10			< 5	1,600	130		8.2	0.09	0.37	0.74	0.54		0.09	1.60	2.14
	03/21/11			< 5	750	2,500	3,000	7.5	0.45	0.05	0.82	3.20	< 0.13		6.00	9.33
	09/11/11			< 5	7,600	1,100	1,300	7.4	< 0.05	< 0.01	3.00	1.40	1.10		9.30	11.80
	10/03/11			< 5	4,700	700	970	7.5	0.07	0.04	1.40	1.30	< 0.25		9.40	10.95
	03/17/12			5	1,600	1,100	1,500	7.4	< 0.16	0.19	1.20	< 0.25	0.51		7.30	8.06
	07/23/12			< 5	970	870	1,200	7.6	< 0.05	0.15	1.20	1.50	0.49		0.85	2.84
	07/31/12			< 5	1,400	440	600	7.8	< 0.05	0.05	0.90	1.20	< 0.25		< 0.20	1.65
	08/12/12			< 5	110	660	920	7.3	0.60	0.19	0.52	< 0.25	1.10		3.80	5.15
	08/18/12			< 5	4,500	470	NA	7.5	< 0.05	0.10	2.00	1.80	0.11		4.50	6.41
	08/30/12			< 5	4,100	920	NA	7.7	< 0.05	0.03	3.10	2.00	< 0.13		7.50	9.63
	01/26/13			< 5	1,900	360	NA	7.6	< 0.05	0.50	1.50	0.90	< 0.25		4.70	5.85
	07/19/13			< 5	8,350	590	763	7.5	0.63	0.16	0.64	< 0.10	< 0.10	0.65	22.10	21.50
	08/18/13			12	1,840	590	657	7.6	1.20	0.05	0.74	0.14	< 0.10	0.25	19.70	20.00
	08/25/13			< 5	4,090	NA	NA	7.9	NA	0.09	1.47	1.25	< 0.10	0.45	6.25	7.60
	11/21/13			< 5	555	105	698	7.9	0.76	0.21	1.32	1.30	< 0.10	1.55	2.08	3.63
	08/04/14															
	08/20/14	Samples not Taken due to Las Vegas Channel Improvements, Sloan Channel to Bonanza Road and Flamingo Wash below Nellis Boulevard Improvement Project														
	09/08/14															
	01/11/15			9	305	445	661	7.8	0.46	0.48	0.57	1.77	< 0.10	0.77	1.54	0.77
	01/30/15			6	165	265	NA	7.8	0.56	0.15	0.17	1.19	< 0.10	0.36	0.67	1.96
	03/02/15			5	175	375	567	7.3	0.50	0.11	0.33	1.25	< 0.10	0.36	0.91	0.55
	07/06/15			6	564	416	578	7.1	0.37	0.15	0.55	< 0.10	0.26	0.18	1.47	1.29
	10/05/15			< 5	7,450	450	NA	6.9	0.24	0.11	2.18	3.41	< 0.10	0.81	28.00	NA
	04/09/16			< 5	850	235	215	7.3	0.24	0.10	0.34	0.74	< 0.10	0.35	2.49	2.14
	04/28/16			6	1,360	525	NA	7.6	0.42	0.26	2.93	1.10	< 0.10	< 0.10	2.91	NA
	05/06/16			< 5	410	510	NA	7.4	0.10	0.24	1.37	1.52	< 0.10	0.55	3.81	NA
	08/04/16			5	360	165	NA	7.8	0.29	0.37	0.83	1.73	< 0.10	0.57	3.27	2.70
	08/23/16			< 5	4,340	455	NA	7.4	0.23	N/A	N/A	1.69	< 0.10	0.37	5.61	5.24
	12/22/16			< 5	310	1,820	NA	7.7	0.64	0.24	0.57	1.34	< 0.10	0.64	3.54	2.90
	01/20/17			< 5	522	230		8.6	0.89	0.25	0.60	0.57	< 0.10	0.25	2.04	
	02/18/17			< 5	248	1,260		6.8	0.21	0.14	0.39	10.20	< 0.10	< 0.10	< 1.00	
	07/17/17			6.6	444	765	N/A	7.06	1.40	0.10	0.93	0.14	< 0.10	0.38	5.22	4.84
	07/25/17			2.4	2,740	340	~	7.71	0.48	0.50	1.78	1.06	< 0.10	0.14	2.79	2.65
	01/09/18			7.1	665	255	~	7.87	< 0.07	0.24	0.91	1.01	< 0.10	1.28	2.43	1.15
	07/15/18			< 5.0	185	365	NA	7.20	< 0.10	< 0.05	0.45	1.36	< 0.10	0.62	2.80	2.18
	01/14/19			6.4	455	220	NA	7.26	0.60	0.09	3.58	0.61	< 0.10	1.10	2.68	1.58
	02/14/19			9.3	440	115	NA	7.59	0.30	< 0.05	0.47	0.40	< 0.10	0.48	3.11	2.63
	11/20/19			< 5.0	120	625	NA	7.40	0.85	0.38	1.66	1.56	< 0.10	0.99	6.10	5.11
	11/28/19			< 5.0	410	180	NA	5.92	0.28	0.48	0.58	0.58	< 0.10	0.90	2.30	1.40
	03/11/20			< 5.0	204	160	NA	7.83	0.36	0.25	0.42	0.41	< 0.10	0.34	1.55	1.21
	07/25/21		NA	< 5.0	2,800	485	NA	7.20	0.25	0.06	2.36	6.19	< 0.20	1.25	6.15	4.90
	07/25/22		NA	10.3	825	456	NA	7.41	1.53	0.18	1.57	< 0.10	< 0.10	1.74	6.99	5.25
	08/11/22		NA	7.3	860	230	NA	7.78	0.91	0.35	1.42	1.55	< 0.10	1.41	5.99	4.58
	06/16/23		22.3	3.6	560	250	NA	7.60	0.81	0.94	1.42	1.27	0.11	1.44	6.12	4.68
	09/01/23		27.3	10.0	867	93	NA	8.18	0.31	1.54	2.04	1.05	< 0.10	0.64	3.66	3.02
	02/13/25		11.0	7.9	1,130	200	NA	7.17	0.17	1.01	1.52	0.65	0.04	1.47	6.70	5.23
	Median	**356**	**17.5**	**< 5**	**864**	**525**	**870**	**7.57**	**0.31**	**0.18**	**1.20**	**1.30**	**< 0.10**	**0.60**	**4.60**	**5.24**
	Maximum	**775**	**27.3**	**1,180**	**8,350**	**2,500**	**3,000**	**8.57**	**2.18**	**1.54**	**3.90**	**165**	**6.50**	**1.74**	**28.0**	**168**
	Minimum	**75**	**11.0**	**< 2.4**	**18**	**93**	**215**	**5.92**	**< 0.05**	**< 0.01**	**0.17**	**< 0.10**	**0.036**	**0.09**	**< 0.20**	**0.55**

Location	Date	Copper mg/L	Dissolved Copper mg/L	Chromium mg/L	Lead mg/L	Dissolved Lead mg/L	Mercury mg/L	Cadmium mg/L	Zinc mg/L	Dissolved Zinc mg/L	Silver mg/L	Nickel mg/L	Selenium mg/L	Dissolved Selenium mg/L
Las Vegas Wash @ The Club at Sunrise (Formerly known as Desert Rose Golf Course) (USGS)	04/02/97	0.024			< 0.100				0.18					
	07/28/97	0.023			< 0.100				0.15					
	02/04/98	0.065			0.180				0.55					
	02/24/98	< 0.010			0.180				0.32					
	04/24/99	< 0.010	< 0.010		< 0.100	< 0.1000			0.28	< 0.02				
	04/30/99	0.130	< 0.010		< 0.100	< 0.1000			0.54	< 0.02				
	02/21/00	0.012	< 0.010		< 0.100	< 0.1000			0.83	< 0.02				
	10/23/00	0.090	< 0.010		< 0.100	< 0.1000			0.54	0.03				
	02/26/01	0.055	< 0.010		0.029	0.0006			0.28	0.04				
	11/24/01	0.012	< 0.010		< 0.100	< 0.1000			0.07	0.04				
	09/11/02	0.098	0.110	< 0.0100	0.010	< 0.1000	< 0.0002	0.0069	0.18	0.22	< 0.0005	0.019		
	02/12/03	0.110	< 0.010	0.0150	0.096	< 0.1000	< 0.0002	0.0028	0.39	< 0.02	< 0.0005	0.045	< 0.0500	
	02/25/03	0.390		0.0094	0.014			0.0006	0.19			0.012		
	07/19/03	0.075	0.020		0.020	< 0.1000			0.25	0.05				
	02/21/04	0.027	< 0.010	< 0.0100	0.077	< 0.0200	< 0.0002	< 0.0005	0.89	0.40	0.0006	< 0.050	< 0.0250	
	11/09/04	0.029		0.0180	0.031		< 0.0002	< 0.0006	0.36		< 0.0005	0.024	< 0.0500	
	01/04/05	0.019	< 0.010	< 0.0001	0.047	< 0.0200	< 0.0002	< 0.0050	2.70	0.04	< 0.0050	< 0.050	< 0.0500	
	07/24/05	0.110	0.022	0.0230	0.046	0.0460	< 0.0002	0.0008	4.60	0.38	< 0.0050	0.035	< 0.0100	
	10/05/06	0.690	0.013	15.000	0.016	< 0.0005	< 0.0002	< 0.0005	0.73	0.02		0.017		
	01/05/08	0.100	0.024	0.0170	0.017	< 0.0005	< 0.0002	0.0005	0.59	0.09	< 0.0005	0.012	< 0.0050	
	08/07/08	0.190		0.0470	0.071		< 0.0002	0.0016	0.74		0.0011	0.043	0.0160	
	11/26/08	0.120	0.018	0.0290	0.059	0.0006	< 0.0002	0.0013	0.13	0.03	< 0.0005	0.039	0.0110	
	12/17/08	0.050	0.008	0.0070	0.019	< 0.0005	< 0.0002	0.0005	0.24	0.24	< 0.0005	0.008	< 0.0050	
	02/07/09	0.094	0.004	0.0310	0.049	< 0.0005	< 0.0002	0.0016	0.70	< 0.02	< 0.0005	0.029	0.0070	
	07/22/09	0.087	0.004	0.0310	0.022	< 0.0005	< 0.0002	0.0008	0.39	0.03	< 0.0005	0.017	0.0055	
	01/20/10	0.100	0.006	0.0270	0.043	< 0.0005	< 0.0002	0.0011	0.41	< 0.02	< 0.0050	0.031	0.0063	
	02/06/10	0.038	0.006	0.0130	0.021	< 0.0005	< 0.0002	0.0005	0.18	< 0.02	< 0.0050	0.014	< 0.0050	
	04/22/10	0.088	0.013		0.012	< 0.0005			0.13	< 0.02				
	10/17/10	0.071	0.006	0.0057	0.009	< 0.0005	< 0.0002	< 0.0005	0.18	< 0.02	< 0.0005	0.012	0.0058	
	12/20/10	0.084	0.004	0.0310	0.050	< 0.0005	< 0.0002	0.0008	0.34	< 0.02	< 0.0005	0.040	0.0069	
	12/22/10	0.009	0.002		0.006	< 0.0005			0.04	< 0.02				
	03/21/11	0.048	0.002	0.0170	0.017	< 0.0005	< 0.0002	0.0006	0.19	< 0.02	< 0.0005	0.026	0.0150	
	09/11/11	0.220	< 0.002	0.1200	0.130	< 0.0005	0.0003	0.0038	0.92	< 0.02	< 0.0025	0.140	0.0110	
	10/03/11	0.092	0.005	0.0510	0.049	< 0.0005	< 0.0002	0.0011	0.30	< 0.02	< 0.0005	0.050	< 0.0100	
	03/17/12	0.060	0.004	0.0140	0.019	0.0006	< 0.0002	0.0007	0.22	0.03	< 0.0005	0.018	0.0064	
	07/23/12	0.082	0.008	0.0240	0.030	< 0.0005	< 0.0002	0.0008	0.26	< 0.02	< 0.0005	0.028	< 0.0050	
	07/31/12	0.033	0.008	0.0250	0.018	< 0.0005	< 0.0002	0.0006	0.11	< 0.02	< 0.0005	0.026	< 0.0050	
	08/12/12	0.025	0.009	0.0033	0.004	< 0.0005	< 0.0002	< 0.0005	0.07	0.03	< 0.0005	0.007	< 0.0050	
	08/18/12	0.060	0.005	NA	0.045	< 0.0005	NA	NA	0.21	< 0.02	NA	NA	< 0.0050	
	08/30/12	0.062	0.006	NA	0.056	< 0.0005	NA	NA	0.27	< 0.02	NA	NA	< 0.0050	
	01/26/13	0.042	< 0.002	NA	0.023	< 0.0005	NA	NA	0.18	< 0.02	NA	NA	< 0.0050	
	07/19/13	0.137	0.002	0.0684	0.089	< 0.0005	< 0.0002	0.0027	0.56	0.01	< 0.0005	0.054	< 0.0050	
	08/18/13	0.098	0.011	0.0382	0.040	< 0.0005	< 0.0002	0.0012	0.33	0.01	< 0.0005	0.031	0.0036	
	08/25/13	0.084	0.005	NA	0.055	< 0.0010	NA	NA	0.30	0.00	NA	NA	0.0137	
	11/21/13	0.079	0.002	0.0309	0.031	< 0.0005	< 0.0002	0.0014	0.29	0.01	< 0.0005	0.025	0.0030	
	08/04/14	Samples not Taken due to Las Vegas Channel Improvements, Sloan Channel to Bonanza Road and Flamingo Wash below Nellis Boulevard Improvement Project												
	08/20/14													
	09/08/14													
	01/11/15	0.043	0.022	0.0060	0.007	< 0.0005	0.0014	0.0009	0.11	0.05	< 0.0005	0.011	0.0030	
	01/30/15	0.031	0.014	NA	0.007	< 0.0005	NA	NA	0.10	0.05	NA	NA	< 0.0050	
	03/02/15	0.043	0.018	0.0060	0.007	< 0.0005	< 0.0002	< 0.0005	0.10	0.06	< 0.0005	0.008	0.0030	
	07/06/15	0.106	0.021	0.0070	0.029	0.0020	0.0011	< 0.0005	0.61	0.09	< 0.0005	0.015	0.0020	
	10/05/15	0.017	0.017	NA	0.004	0.0030	0.0015	NA	0.02	0.04	NA	NA	< 0.0050	
	04/09/16	0.029	0.017	0.0040	0.013	< 0.0005	< 0.0002	0.0009	0.06	< 0.001	< 0.0005	0.009	< 0.0050	
	04/28/16	0.033	0.010	NA	0.023	< 0.0005	< 0.0002	NA	0.13	0.05	NA	NA	< 0.0050	
	05/06/16	0.027	0.016	NA	0.012	< 0.0005	< 0.0002	NA	0.09	0.04	NA	NA	0.0030	
	08/04/16	0.033	0.028	0.0015	< 0.001	< 0.0005	0.0002	< 0.0005	0.04	0.01	< 0.0005	0.004	0.0011	
	08/23/16	0.005	0.004	0.0034	0.002	< 0.0005	< 0.0002	0.0015	0.04	0.03	< 0.0005	0.024	0.0026	
	12/22/16	0.051	0.022	0.0041	0.006	0.0005	< 0.0002	0.0005	0.11	0.11	< 0.0005	0.006	0.0012	
	01/20/17	0.023	0.009		0.009	0.0005			0.10	0.05			0.0015	
	02/18/17	0.012	0.007		0.004	< 0.0005			0.04	0.03			0.0041	
	07/17/17	0.026	0.013	NA	0.006	< 0.0005	< 0.0002	NA	0.13	0.02	NA	NA	0.0039	
	07/25/17	0.011	0.008	0.0199	0.001	< 0.0005	< 0.0003	< 0.00100	0.01	0.00	< 0.0010	0.023	0.0024	
	01/09/18	0.031	0.007	0.0058	0.015	0.0010	< 0.0002	< 0.00107	0.17	0.05	< 0.0010	0.014	0.0021	
	07/15/18	0.032	0.013	0.0050	0.008	0.0025	< 0.0002	< 0.00100	0.11	0.07	< 0.0005	0.0075	0.0018	
	01/14/19	0.037	0.007	0.0174	0.014	< 0.0005	< 0.0002	< 0.00100	0.14	0.04	< 0.0010	0.0194	0.0012	
	02/14/19	0.035	0.005	0.0118	0.014	0.0007	< 0.0002	< 0.00100	0.14	0.01	< 0.0010	0.0194	< 0.0010	
	11/20/19	0.088	0.009	0.0190	0.025	< 0.0020	< 0.0003	< 0.00200	0.37	0.07	< 0.0020	0.0540	< 0.0100	< 0.0100
	11/28/19	0.016	0.005	0.0031	0.007	< 0.0010	< 0.0003	< 0.00100	0.12	0.02	< 0.00100	0.0052	0.0013	< 0.0010
	03/11/20	0.035	0.006	0.0096	0.008	< 0.0005	< 0.0002	< 0.00100	0.12	0.02	< 0.00050	0.0120	< 0.0010	< 0.0005
	07/25/21	0.048	0.005	0.0278	0.034	< 0.0005	< 0.0003	0.00152	0.22	0.02	0.00148	0.0319	< 0.0020	< 0.0013
	07/25/22	0.039	0.006	0.0117	0.015	< 0.0012	< 0.0003	< 0.00125	0.16	0.10	< 0.00120	0.0159	< 0.0025	< 0.0025
	08/11/22	0.032	0.004	0.0102	0.024	< 0.0012	0.0051	< 0.00125	0.16	0.03	< 0.00120	0.0126	< 0.0012	< 0.0012
	06/16/23	0.038	0.006	0.0116	0.012	< 0.0010	< 0.0003	< 0.00100	0.24	0.05	< 0.00100	0.0101	< 0.0010	< 0.0010
	09/01/23	0.043	0.003	0.0242	0.028	< 0.0010	< 0.0003	< 0.00100	0.29	0.01	< 0.00100	0.0176	0.0011	< 0.0010
	02/13/25	0.063	0.003	0.0230	0.024	0.0004	< 0.0002	0.00042	0.31	0.01	0.00019	0.0160	0.0016	0.0008
	Median	**0.043**	**0.008**	**0.0150**	**0.023**	**< 0.0005**	**< 0.0002**	**< 0.0010**	**0.21**	**< 0.02**	**< 0.0005**	**0.0190**	**< 0.0050**	**< 0.0010**
	Maximum	**0.690**	**0.110**	**15.000**	**0.180**	**< 0.1000**	**0.0051**	**0.0069**	**4.60**	**0.40**	**< 0.0050**	**0.1400**	**< 0.0500**	**< 0.0025**
	Minimum	**0.005**	**< 0.002**	**< 0.0001**	**< 0.0005**	**0.0004**	**< 0.00016**	**0.0004**	**0.01**	**< 0.001**	**0.0002**	**0.0038**	**< 0.0010**	**< 0.0005**

Location	Date	Arsenic mg/L	Boron mg/L	Total Alkalinity as CaCO3 mg/L	Aluminum mg/L	Antimony mg/L	Barium mg/L	Beryllium mg/L	Bicarbonate Alkalinity as HCO3 mg/L	Bromide mg/L	Bromate mg/L	CO2 Free Calculated mg/L	Carbonate mg/L	Calcium mg/L	Chlorate mg/L	Chloride mg/L	Chlorite mg/L
Las Vegas Wash @ The Club at Sunrise (Formerly known as Desert Rose Golf Course) (USGS)	04/02/97		0.52														
	07/28/97		0.57														
	02/04/98		0.37	F													
	02/24/98		0.21														
	04/24/99		0.55														
	04/30/99		0.36														
	02/21/00		0.25														
	10/23/00		0.57														
	02/26/01		0.24														
	11/24/01		0.70														
	09/11/02	0.006	0.41	118	2.7	0.006	0.11	< 0.001	114	0.32	< 0.005	22.9	0.12	200	0.270	160	< 0.05
	02/12/03	0.034	< 0.05	106	3.1	0.005	0.41	< 0.001	129	0.11	< 0.005	5.2	0.42	89	0.031	43	< 0.04
	02/25/03	0.006	0.22														
	07/19/03		0.33	138	6.2	0.005	0.19	< 0.001	168	0.29	< 0.005	13.4	0.27	200	0.220	150	< 0.10
	02/21/04	0.005	0.24	105	2.5	0.003	0.08	< 0.001	128	0.07	< 0.005	8.2	0.27	120	0.170	80	< 0.04
	11/09/04	0.008	0.11	69	< 5.0	< 0.001	0.32	0.001	85	0.05	< 0.005	33.7	0.03	280	0.075	18	< 0.01
	01/04/05	< 0.020	0.10	55	< 2.5	< 0.100	0.41	< 0.010	67	0.03	< 0.005	1.7	0.35	410	0.035	13	< 0.01
	07/24/05	0.010	0.16	74	< 2.5	0.003	0.45	< 0.001	91	0.06	< 0.005	3.7	0.24	370	0.069	23	0.06
	10/05/06	0.006	0.12	87	7.9	0.002	0.17			0.06	< 0.005			170	0.116	21	< 0.01
	01/05/08	0.008	0.27	69	8.1	0.005	0.18	< 0.001	84	0.10	< 0.005	3.5	< 2.00	300	0.199	62	< 0.01
	08/07/08	0.023	0.57	153	24.8	0.004	0.69	0.001	187	0.27	< 0.005	12.0	< 2.00	510	0.567	140	< 0.01
	11/26/08	0.019	0.62	155	< 2.0	0.005	0.42	< 0.001	189	0.24	< 0.005	3.9	< 2.00	370	0.077	140	< 0.01
	12/17/08	0.004	0.10	141	2.4	0.002	0.12	< 0.001	172	0.05	< 0.005	11.0	< 2.00	150	0.115	23	< 0.01
	02/07/09	< 0.020	0.34	94	20.5	0.003	0.44	< 0.001	115	0.15	< 0.005	4.7	< 2.00	390	0.024	63	0.02
	07/22/09	0.018	0.46	150	15.7	0.005	0.45	< 0.002	183	0.23	< 0.005	12.0	< 2.00	420	0.370	130	< 0.05
	01/20/10	0.014	0.24	98	13.0	0.003	0.44	< 0.001	120	0.12	< 0.005	3.5	< 2.00	330	< 0.020	48	< 0.01
	02/06/10	0.007	0.11	92	7.6	0.002	0.21	< 0.001	112	0.05	< 0.005	2.3	< 2.00	150	0.019	15	< 0.01
	04/22/10																
	10/17/10	0.006	0.43	140	2.2	0.016	0.10	< 0.001	180	0.20	< 0.005	14.0	< 2.00	150	0.260	130	< 0.02
	12/20/10	0.016	0.37	130	2.9	< 0.001	0.37	< 0.001	160	0.24	< 0.005	3.5	< 2.00	370	0.280	200	< 0.01
	12/22/10																
	03/21/11	0.014	0.84	180	8.1	0.006	0.22	< 0.001	220	0.53	< 0.005	12.0	< 2.00	350	0.280	240	< 0.01
	09/11/11	0.046	0.44	100	56.0	< 0.005	1.80	0.003	130	0.15	< 0.005	7.2	< 2.00	1,400	< 0.010	70	< 0.01
	10/03/11	0.018	0.27	99	28.0	0.002	0.60	0.001	120	0.11	< 0.005	6.6	< 2.00	470	0.050	45	< 0.01
	03/17/12	0.010	0.41	140	7.0	0.004	0.18	< 0.001	170	0.27	< 0.005	< 2.0	< 2.00	190	< 0.020	100	0.01
	07/23/12	0.018	0.27	94	18.0	0.002	0.34	< 0.001	110	0.12	< 0.005	< 2.0	< 2.00	360	0.550	94	< 0.01
	07/31/12	0.015	0.19	190	15.0	< 0.001	0.23	< 0.001	230	0.09	< 0.005	< 2.0	< 2.00	260	0.110	30	< 0.01
	08/12/12	0.006	0.28	82	0.9	0.004	0.08	< 0.001	100	0.17	< 0.005	< 2.0		79	0.083	56	< 0.01
	08/18/12	NA	0.23	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	08/30/12	NA	0.29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	01/26/13	NA	0.15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	07/19/13	0.030	0.34	110	43.1	0.003	0.90	0.003	134	< 0.01	< 0.100	NA	< 10.00	886	< 0.100	54	< 0.10
	08/18/13	0.019	0.26	305	25.5	0.004	0.50	0.001	372	< 0.01	< 0.100	NA	< 10.00	425	< 0.100	34	< 0.10
	08/25/13	NA	0.21	NA	NA	NA	NA	NA	NA	< 0.01	NA	NA	NA	NA	NA	NA	NA
	11/21/13	0.012	0.18	155	17.7	0.005	0.36	0.001	189	< 0.01	< 0.005	NA	< 10.00	326	0.050	266	< 0.10
	08/04/14	Samples not Taken due to Las Vegas Channel Improvements, Sloan Channel to Bonanza Road and Flamingo Wash below Nellis Boulevard Improvement Project															
	08/20/14																
	09/08/14																
	01/11/15	0.003	0.28	65	3.2	0.004	0.08	< 0.001	79	< 0.01	< 0.005	NA	< 2.00	82	< 0.010	45	< 0.01
	01/30/15	NA	0.14	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	03/02/15	0.004	0.21	123	2.0	0.003	0.07	< 0.001	150	0.06	< 0.005	NA	< 2.00	69	< 0.010	41	< 0.01
	07/06/15	0.004	0.17	203	1.9	0.008	0.25	< 0.001	248	< 0.01	< 0.005	NA	< 2.00	145	< 0.010	38	< 0.01
	10/05/15	NA	0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	04/09/16	0.003	0.09	198	1.6	0.005	0.13	< 0.0010	242	< 0.01	< 0.005		< 2.00	226	< 0.010	7	< 0.01
	04/28/16	NA	0.22	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	05/06/16	NA	0.18	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	08/04/16	0.001	0.11	60	0.011	0.002	0.08	< 0.0010	73	< 0.01	< 0.005	NA	< 2.00	NA	< 0.010	20	< 0.01
	08/23/16	0.010	0.12	65	0.3	0.005	0.21	< 0.0010	79	< 0.01	NA	NA	< 2.00	NA	NA	36	NA
	12/22/16	0.003	0.14	75	0.7	0.003	0.06	< 0.001	92	0.03	NA	NA	< 2.00	NA	NA	25	NA
	01/20/17		0.10														
	02/18/17		0.34														
	07/17/17	NA	0.21	125	NA	NA	NA	NA	153	NA	NA		< 5.00	NA	NA	NA	NA
	07/25/17	0.0086	0.09	75	0.07	0.0019	0.14	< 0.0010	92	0.03	~		< 2.00	~	~	26	~
	01/09/18	0.0047	0.16	90	1.11	0.0047	0.09	< 0.0010	110	0.02	~		< 5.00	~	~	17	~
	07/15/18	0.0025	0.18	85	0.48	0.0058	0.08	< 0.0010	104	0.03	NA	NA	< 2.00	NA	NA	21	NA
	01/14/19	0.0037	0.13	62	7.58	0.0036	0.12	< 0.0010	76	0.13	NA	NA	< 5.00	NA	NA	13	NA
	02/14/19	0.0033	0.09	78	4.55	0.0036	0.17	< 0.0010	95	< 0.01	NA	NA	< 5.00	NA	NA	< 10	NA
	11/20/19	0.0080	0.17	84	2.71	0.0040	0.25	< 0.0020	84	< 0.05	NA	NA	< 5.00	NA	NA	24	NA
	11/28/19	0.0036	< 0.05	60	2.70	0.0024	0.08	< 0.0010	60	< 0.05	NA	NA	< 5.00	NA	NA	6	NA
	03/11/20	0.0041	0.02	51	5.52	0.0043	0.10	< 0.0010	51	0.02	NA	NA	< 5.00	NA	NA	6	NA
	07/25/21	0.0094	0.20	960	5.18	0.0020	0.51	< 0.0020	960	0.05	NA	NA	< 5.00	NA	NA	20	NA
	07/25/22	0.0071	0.18	102	10.10	0.0041	0.47	< 0.0012	102	0.07	NA	NA	< 5.00	NA	NA	28	NA
	08/11/22	0.0041	0.09	130	12.80	0.0036	0.34	< 0.0012	130	0.03	NA	NA	< 5.00	NA	NA	10	NA
	06/16/23	0.0058	0.11	204	5.47	0.0044	0.15	< 0.0010	204	0.03	NA	NA	< 5.00	NA	NA	13	NA
	09/01/23	0.0081	0.10	228	14.10	0.0036	0.27	< 0.0010	228	< 0.05	NA	NA	< 5.00	NA	NA	9	NA
	02/13/25	0.0095	0.11	428	13.10	0.0035	0.28	0.0007	428	0.03	NA	NA	< 5.00	NA	NA	8	NA
	Median	**0.0080**	**0.210**	**104**	**5.18**	**0.0037**	**0.220**	**< 0.0010**	**128**	**0.051**	**< 0.005**	**4.93**	**< 2.000**	**290**	**0.077**	**34.1**	**< 0.01**
	Maximum	**0.0460**	**0.84**	**960**	**56.0**	**0.1000**	**1.800**	**< 0.0100**	**960.0**	**0.530**	**< 0.10**	**33.7**	**< 10.00**	**1,400**	**0.57**	**266**	**< 0.10**
	Minimum	**0.0014**	**< 0.02**	**51.0**	**0.0113**	**< 0.0010**	**0.058**	**0.0007**	**51.0**	**< 0.005**	**< 0.005**	**1.68**	**< 0.028**	**69.400**	**< 0.010**	**5.86**	**< 0.01**

Location	Date	Diuron mg/L	Diquat mg/L	Paraquat mg/L	Endothall mg/L	Fluoride mg/L	Glyphosate mg/L	Hardness as CaCo3 mg/L	Hydroxide as OH mg/L	Iron mg/L	Langelier Index 25 degree None	Magnesium mg/L	Manganese mg/L	Potassium mg/L	Reactive Silica mg/L
Las Vegas Wash @ The Club at Sunrise (Formerly known as Desert Rose Golf Course) (USGS)	04/02/97														
	07/28/97														
	02/04/98														
	02/24/98														
	04/24/99														
	04/30/99														
	02/21/00														
	10/23/00														
	02/26/01														
	11/24/01														
	09/11/02				< 0.020	0.810	0.020		0.002	4	0.11	71	0.14	18.0	20
	02/12/03		< 0.0004	< 0.002	< 0.005	0.550	0.010	839	0.009	2	0.32	30	0.79	9.6	11
	02/25/03														
	07/19/03				< 0.020	0.620	0.014	775	0.004	7	0.48	67	0.23	15.0	
	02/21/04					0.530		481	0.005	3	0.25	44	0.08	12.0	14
	11/09/04					0.260	< 0.006	1,060	0.001	57	-0.29	87	0.49	23.0	
	01/04/05	< 0.0010	< 0.0004	< 0.002	< 0.005	0.220	< 0.006	1,440	0.010	24	0.89	100	0.58	11.0	160
	07/24/05	0.0087	< 0.0004	< 0.002	< 0.020	0.260	0.010	1,310	0.007	17	0.68	96	0.43	11.0	10
	10/05/06						0.007	610		9		44	0.22	7.6	12
	01/05/08					0.076	0.008	1,100	13.000	13	0.60	82	0.22	14.0	9
	08/07/08	0.0011	< 0.0040	< 0.002	< 0.020	0.480	0.020	2,060	< 2.000	34	0.90	190	1.00	28.0	18
	11/26/08	< 0.0010	< 0.0040	< 0.002	< 0.020	0.530	0.029	1,500	< 2.000	19	1.30	140	0.55	33.0	14
	12/17/08	< 0.0010	< 0.0040	< 0.002	< 0.020	0.230	0.008	552	< 2.000	9	0.40	43	0.16	7.2	5
	02/07/09	< 0.0080	< 0.0040	< 0.002	< 0.020	0.470	0.062	1,430	< 2.000	23	0.80	110	0.73	19.0	12
	07/22/09	< 0.0040	< 0.0016	< 0.008	< 0.020	0.540	0.075	1,600	< 2.000	20	0.83	140	0.51	27.0	15
	01/20/10	< 0.0010	< 0.0004	< 0.002	< 0.020	0.260	0.018	1,100	< 2.000	10	0.88	79	0.53	13.0	88
	02/06/10	< 0.0010	< 0.0004	< 0.002	< 0.005	0.180	< 0.006	570	< 2.000	8	0.69	44	0.23	6.3	81
	04/22/10														
	10/17/10	< 0.0010	< 0.0004	< 0.002	< 0.009	0.390	0.240	690	< 2.000	3	0.31	77	0.12	18.0	30
	12/20/10	< 0.0010	< 0.0004	< 0.002	< 0.009	0.280	< 0.006	1,500	< 2.000	30	1.20	140	0.95	24.0	110
	12/22/10														
	03/21/11	< 0.0020	< 0.0004	< 0.002	< 0.005	0.490	0.011	1,700	< 2.000	11	0.93	200	0.41	35.0	29
	09/11/11	< 0.0010	< 0.0004	< 0.002	< 0.020	0.330	0.024	5,600	< 2.000	100	1.30	490	2.40	46.0	150
	10/03/11	< 0.0010	< 0.0004	< 0.002	< 0.020	0.220	0.008	1,900	< 2.000	30	0.78	170	0.79	20.0	120
	03/17/12	< 0.0010	< 0.0004	< 0.002	< 0.020	0.410	0.070	890	< 2.000	9	0.45	100	0.38	23.0	75
	07/23/12					0.320	0.055	1,200	< 2.000	22	0.73	82	0.58	21.0	99
	07/31/12					0.280	< 0.006	970	< 2.000	20	1.10	75	0.40	15.0	150
	08/12/12					0.270	0.014	390	< 2.000	1	-0.24	47	0.08	12.0	13
	08/18/12					NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	08/30/12					NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	01/26/13					NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	07/19/13					< 0.100	NA	2,793	< 2.000	41	NA	141	2.06	34.7	119
	08/18/13					0.130	NA	1,530	< 2.000	23	NA	114	0.66	18.3	108
	08/25/13					NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/21/13					0.410	NA	1,155	< 2.000	17	NA	83	0.60	13.3	87
	08/04/14	Samples not Taken due to Las Vegas Channel Improvements, Sloan Channel to Bonanza Road and Flamingo Wash below Nellis Boulevard Improvement Project													
	08/20/14														
	09/08/14														
	01/11/15					0.420	NA	362	< 2.000	4	NA	38	0.10	15.6	22
	01/30/15					NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	03/02/15					< 0.100	NA	320	< 2.000	2	NA	36	0	10	21
	07/06/15					0.340	NA	500	< 2.000	2	NA	34	0.27	66.5	12
	10/05/15					NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	04/09/16					0.220		707	< 2.000	1	NA	35	0.23	4.8	6
	04/28/16					NA		NA	NA	NA	NA	NA	NA	NA	NA
	05/06/16					NA	N	NA	NA	NA	NA	NA	NA	NA	NA
	08/04/16					0.186	NA	101	< 2.000	0.305	NA	6	0.03	NA	NA
	08/23/16					0.315	NA	1,410	< 2.000	0.764	NA	44	0.53	NA	NA
	12/22/16					0.699	NA	243	< 2.000	0.689	NA	18	0.10	NA	NA
	01/20/17														
	02/18/17														
	07/17/17					NA	~	NA	< 5.000	NA	~	NA	NA	NA	NA
	07/25/17					0.136	~	653	< 2.000	0.02	~	18.5	0.21	~	~
	01/09/18					0.458	~	438	< 5.000	1.47	~	28.7	0.20	~	~
	07/15/18					0.362	NA	231	< 2.000	0.76	NA	16.2	0.06	NA	NA
	01/14/19					0.201	NA	392	< 5.000	6.68	NA	27.4	0.19	NA	NA
	02/14/19					0.162	NA	344	< 5.000	5.70	NA	25	0.14	NA	NA
	11/20/19					1.080	NA	622	< 5.000	3.01	NA	37.1	0.32	NA	NA
	11/28/19					< 0.100	NA	295	< 5.000	1.91	NA	19.2	0.09	NA	NA
	03/11/20					0.324	NA	203	< 5.000	0.71	NA	13.3	0.10	NA	NA
	07/25/21					0.464	NA	1,600	< 5.000	29.30	NA	100	0.50	NA	NA
	07/25/22					0.406	NA	629	< 5.000	9.24	NA	43.1	0.17	NA	NA
	08/11/22					0.178	NA	606	< 5.000	11.60	NA	41.1	0.19	NA	NA
	06/16/23					0.265	NA	390	< 5.000	5.14	NA	26.8	0.15	NA	NA
	09/01/23					< 0.100	NA	715	< 5.000	12.30	NA	45.7	0.31	NA	NA
	02/13/25					0.230	NA	819	< 5.000	10.90	NA	53.6	0.30	NA	NA
	Median	**< 0.001**	**< 0.0004**	**< 0.0020**	**< 0.0200**	**0.298**	**0.0125**	**745**	**< 2.000**	**8.60**	**0.71**	**47**	**0.270**	**16.80**	**22**
	Maximum	**< 0.009**	**< 0.004**	**< 0.008**	**< 0.020**	**1.080**	**0.240**	**5,600**	**13.00**	**100.0**	**1.30**	**490**	**2.400**	**66.5**	**160**
	Minimum	**< 0.001**	**< 0.0004**	**< 0.002**	**< 0.005**	**0.076**	**< 0.006**	**101**	**0.001**	**0.018**	**-0.290**	**6.2**	**0.030**	**4.8**	**5**

Location	Date	Sodium mg/L	Sulfate mg/L	Thallium mg/L	Organic Carbon mg/L	Cyanide mg/L	BOD mg/L	COD mg/L	Color ACU	Turbidity NTU	Phenol mg/L	Petroleum Hydrocarbons	TPH (diesel) MPN/100 mL	TPH (gasoline) MPN/100 mL	Total Chlorine mg/L
Las Vegas Wash @ The Club at Sunrise (Formerly known as Desert Rose Golf Course) (USGS)	04/02/97					0.015	77	290	150	230	0.010	4			
	07/28/97					0.007	35	240	180	220	< 0.010	< 1			< 0.10
	02/04/98					< 0.005	74	260	25	1,660	0.013				
	02/24/98					< 0.005	10	90	10	1,050	< 0.010	< 1			
	04/24/99														
	04/30/99														
	02/21/00														
	10/23/00														
	02/26/01														
	11/24/01														
	09/11/02	130	460	< 0.0010	116										
	02/12/03	43	230	< 0.0010	36										
	02/25/03														
	07/19/03	98	420	< 0.0010	66										
	02/21/04	64	280	< 0.0100											
	11/09/04	20	180	< 0.0010											
	01/04/05	15	130	< 0.0010	6										
	07/24/05	29	140	< 0.0010	34										
	10/05/06	23	110	< 0.0010	21										
	01/05/08	55	220	< 0.0010	55										
	08/07/08	120	660	< 0.0010	68										
	11/26/08	120	440	< 0.0010	54										
	12/17/08	439	97	< 0.0010	28										
	02/07/09	1,020	300	< 0.0010	26										
	07/22/09	110	530	< 0.0020	99										
	01/20/10	49	270	< 0.0010	28										
	02/06/10	16	64	< 0.0010	16										
	04/22/10														
	10/17/10	100	490	< 0.0010	66					28					
	12/20/10	150	580	< 0.0010	18					1,200					
	12/22/10									760					
	03/21/11	220	1,300	< 0.0010	38					210					
	09/11/11	75	500	< 0.0050	54					5,200					
	10/03/11	48	350	< 0.0010	29					1,100					
	03/17/12	95	520	< 0.0010	68					560	< 0.005				
	07/23/12	64	380	< 0.0010						700					
	07/31/12	34	150	< 0.0010						780					
	08/12/12	58	290	< 0.0010						43					
	08/18/12	NA	NA	NA			25			2,300					
	08/30/12	NA	NA	NA			18			2,600					
	01/26/13	NA	NA	NA			30			860					
	07/19/13	46	323	0.0012	47	< 0.050	36	189		193	0.810				
	08/18/13	38	162	< 0.0010	47	< 0.050	40	990		790	0.360				
	08/25/13	NA	NA	NA			< 2	566		368	NA				
	11/21/13	31	395	< 0.0010	46	< 0.050	47	160		746	0.360				
	08/04/14	Samples not Taken due to Las Vegas Channel Improvements, Sloan Channel to Bonanza Road and Flamingo Wash below Nellis Boulevard Improvement Project													
	08/20/14														
	09/08/14														
	01/11/15	39	185	< 0.0010	32	< 0.050	41	98		136	0.250				
	01/30/15	NA	NA	NA	NA	NA	22	76		147					
	03/02/15	116	167	< 0.0010	24	< 0.050	16	146		198	0.120				
	07/06/15	70	114	< 0.0010	37	< 0.050	41	275		340	0.460				
	10/05/15	NA	NA	NA	NA	NA	26	306		485	NA				
	04/09/16	11	44	< 0.0010	16	< 0.050	58	127		1,152	0.440				
	04/28/16	NA	NA	NA	NA	NA	263	243		939	NA				
	05/06/16	NA	NA	NA	NA	NA	17	232		628	NA				
	08/04/16	11	63	< 0.0010	41	< 0.050	179	103		340	0.170				
	08/23/16	30	173	< 0.0010	45	< 0.050	< 2	73		401	0.121				
	12/22/16	20	103	< 0.0010	51	< 0.050	75	522		292	0.358				
	01/20/17						15	< 39		164					
	02/18/17						29	< 39		271					
	07/17/17	NA	NA	NA	NA		42.3	130		355.0					
	07/25/17	27	111	< 0.001	131	< 0.050	23.8	< 39		2,190.0	0.38				
	01/09/18	18	55	< 0.001	64	< 0.050	44.5	269		326.0	0.13				
	07/15/18	22	76	< 0.001	39	< 0.050	< 2	95.9		160.0	0.13				
	01/14/19	11	39	< 0.001	44	< 0.010	93.0	178.0		328.0	0.07				
	02/14/19	11	21	< 0.001	15	< 0.005	< 2	45.0		278.0	0.13				
	11/20/19	21.3	72	< 0.001	64	< 0.005	54.8	282.0		495.0	0.44				
	11/28/19	6.5	20	< 0.001	15	< 0.010	5.7	98.6		62.9	0.12				
	03/11/20	6.8	19	< 0.001	16	< 0.005	25.5	76.1		169.0	0.75				
	07/25/21	23.5	99	< 0.001	56	< 0.050	35.7	102.0		1,060	< 0.05				
	07/25/22	26.2	113	< 0.001	59	< 0.050	52.8	202.0		526	0.08				
	08/11/22	9.2	40	< 0.001	22	< 0.050	27.8	256.0		666	1.29				
	06/16/23	12.9	48	< 0.001	103	< 0.050	34.7	231.0		353	0.12				
	09/01/23	9.7	42	< 0.001	19	< 0.050	< 20.0	251.0		731	3.54				
	02/13/25	10.7	27	0.0002	4	0.014	42.0	78.0		1,280	< 0.05				
	Median	**34.0**	**162**	**< 0.001**	**40**	**< 0.050**	**34.70**	**169**	**87.5**	**485.0**	**0.13**	**< 1**			**< 0.1**
	Maximum	**1,020**	**1,300**	**< 0.010**	**131**	**< 0.050**	**263**	**990**	**180**	**5,200**	**3.540**	**4**			**< 0.1**
	Minimum	**6.5**	**19**	**0.0002**	**4.05**	**< 0.005**	**< 2.0**	**< 38.6**	**10**	**28**	**< 0.005**	**< 1**			**< 0.1**

Location	Date	Fecal Coliform MPN/100 mL	Fecal* Coliform MPN/100 mL	Fecal** Coliform MPN/100 mL	Fecal Strep. MPN/100 mL	Fecal* Strep. MPN/100 mL	Fecal** Strep. MPN/100 mL	*E. Coli* MPN/100mL	Salmonella MPN/100 mL	VOC # of detects		Pesticides # of detects		SOC # of detects		Herbicides # of detects	
Las Vegas Wash @ The Club at Sunrise (Formerly known as Desert Rose Golf Course) (USGS)	04/02/97	7,500			90,000				< 2.0			1				4	
	07/28/97	1,600,000			1,600,000				< 2.2								
	02/04/98	8,000			28,000				< 2.2			2				1	
	02/24/98	2,400			8,000				< 2.2			1				1	
	04/24/99									1	a	0				1	hh
	04/30/99									2	a,ff	0				1	hh
	02/21/00									1	a					0	
	10/23/00											0				0	
	02/26/01	2,200			220,000					1	a	0				0	
	11/24/01									1	a	0				0	
	09/11/02	300,000			500,000												
	02/12/03	500,000			22,000					1	a	0		4	g,j,o,x	0	
	02/25/03	30,000			30,000					0		0					
	07/19/03									1		0		0		0	
	02/21/04	1,600			33,000					1	a	0		0		0	
	11/09/04	16,000			5,000					0							
	01/04/05	500			28,000					3	d,dd,ee	0		2	g,k	0	
	07/24/05	1,600,000			170,000					2	a,k	0		0		2	hh,uu
	10/05/06	300,000			50,000					14		1	c,m,ii,jj,kk,ll	0		1	
	01/05/08	3,000			28,000					14		0		1		0	
	08/07/08									7		2		1		1	
	11/26/08	130			900					5		0		2		2	
	12/17/08	14,000			90,000					6		0		7		1	
	02/07/09	17,000			9,000					10		2		2		1	
	07/22/09	160,000,000			700,000					0		1		1		0	
	01/20/10	28,000			8,000					6		0		2		0	
	02/06/10	70,000			90,000					6		0		1		0	
	04/22/10	> 16,000			30,000					0		0		0		0	
	10/17/10	16,000,000			600,000					11	a,b,pp,qq,rr,ss, tt,uu,vv,ww,xx,yy	1	gg	3	h,j,o	1	ccc
	12/20/10				50,000					5	d,ee,qq,vv,bbb	0		0		0	
	12/22/10	300,000			< 16,000												
	03/21/11	< 16,000			170					5	a, d, vv, qq, bbb	1	gg	1	o		
	09/11/11	2,100,000			900,000					7	a,b,qq,pp,tt,vv,zz	1	gg	0		0	
	10/03/11	330,000			70,000					10	a,b,c,pp,qq,vv,aaa,bbb	0		0		0	
	03/17/12	50,000			3,300,000					11	a,b,d,ff,gg,ss,vv,zz,aaa,bbb,ggg	0		0		0	
	07/23/12	2,200,000			230,000					6	b, ff, pp, qq, vv, bbb	2	gg, zz	1	x	1	lll
	07/31/12	790,000			NA					10	a, b, ff, qq, ss, vv, bbb, ggg, hhh, iii	1	gg	1	j	0	
	08/12/12	1,700,000			NA					8	a, b, ff, pp, qq, ss, vv, bbb	1	gg	2	h, j	0	
	08/18/12	130,000			540,000						NA		NA		NA		NA
	08/30/12	1,700,000			35,000						NA		NA		NA		NA
	01/26/13	17,000			260,000						NA		NA		NA		NA
	07/19/13	> 241,960			72,700					9	a, b, qq, vv, ddd, nnn, ooo, ppp, qqq	2	gg, zz	5	h,j,o,x, aaaa	1	mmm
	08/18/13	> 241,960			2,160					7	a, b, qq, vv, hhh, yyy, bbbb	2	gg, zz	2	h, aaaa	1	mmm
	08/25/13	> 241,960			200						NA		NA		NA		NA
	11/21/13	5,040			24,066					9	a, b, pp, qq, vv, bbb, ggg, hhh, iii,	5	gg, zz, ttt, uuu, vvv	6	h, j, o, x, www, aaaa	3	hh, rrr, xxx
	08/04/14	Samples not Taken due to Las Vegas Channel Improvements, Sloan Channel to Bonanza Road and Flamingo Wash below Nellis Boulevard Improvement Project															
	08/20/14																
	09/08/14																
	01/11/15	3,830			6,270					8	a, b, bbb, qq, vv, qqq, yyy, eeee	2	gg, dddd	6	h, i, j, o, www, aaaa	1	hh
	01/30/15	2,210			6,510					0		0		0		0	
	03/02/15	860			20,140					7	a, b, qq, ss, vv, bbb, iii	2	gg, dddd	6	h, j, n, o, x, www	3	hh, rrr, cccc
	07/06/15	> 241,960			92,080					4	a,b,qq,vv	1	gg	4	ssss, www, h,zz	1	hh
	10/05/15	120,330			113,700												
	04/09/16	123,400			16,160					6	a, b, zzz, qq, ss, bbb			2	o, h	1	hh
	04/28/16	92,080			6,630												
	05/06/16	298,700			8,200					6		2		2		1	
	08/04/16	198,630			15,531					2		0		1		1	
	08/23/16	1,299,700			30,000					3		0		1		1	
	12/22/16	59,600			29,800					1		0		2		2	
	01/20/17	241,960			< 1												
	02/18/17	23,600			530												
	07/17/17	> 2,419,600			12,030						NA		NA		NA		NA
	07/25/17	1,080			5,200					2	~	0	~	2	~	1	~
	01/09/18	7,710			2,590					2	~	0	~	5	~	0	~
	07/15/18	> 241,960			23,820					2		0		3		0	
	01/14/19	5,120			> 2,420					1		0		3		1	
	02/14/19	2,420			5,910					2		0		4		0	
	11/20/19	24,196			19,863					1		1		4		1	
	11/28/19	> 2,420			> 2,420					1		1		1		1	
	03/11/20	5,475			10,462					2		1		0		1	
	07/25/21	> 48,392			48,392					2		0		2		2	
	07/25/22	> 24,196			375					0		0		2		0	
	08/11/22	58,100			15,200					2		0		0		0	
	06/16/23	435,200			6,100			172,000		0		0		3		1	
	09/01/23	> 241,960			23,820			32,600		1		0		0		0	
	02/13/25	5,630			23,100			7,710		1		0		6		0	
	Median	**58,100**			**23,820**			**32,600**	**< 2.2**	**2**		**0**		**2**		**1**	
	Maximum	**160,000,000**			**3,300,000**			**172,000**	**< 2.2**	**14**		**5**		**7**		**4**	
	Minimum	**130**			**< 1**			**7,710**	**< 2.0**	**0**		**0**		**0**		**0**	

Location	Date	Q cfs	Temp Deg. C	Oil & Grease mg/L	TSS mg/L	TDS mg/L	Specific Conductance umho/cm	Lab pH units	Surfactants (MBAS) mg/L	Ortho-Phosphate mg/L	Total Phosphorous mg/L	NO3-N mg/L	NO-2 mg/L	NH3-N mg/L
Lake Las Vegas & Rainbow Gardens *LLV Ends 2009-2010 RG Starts 2010-2012	02/12/03	560			11,100	1,160	1,650	7.50	< 0.05	3.00	4.30	5.0	0.520	
	12/28/04			< 5.0	1,970	1,120	1,560	7.60	0.05	0.49	2.30	4.7	0.490	
	02/11/05			< 5.0	1,360	910	1,290	7.60	0.09	0.67	0.67	4.6	< 0.050	
	10/25/05				2,480	590				0.58	2.40		1.900	
	10/14/06				3,600	1,250	1,720	7.30	< 0.05	0.13	1.30	3.4	0.620	
	04/16/07				78	1,730	2,460	8.30	< 0.05	0.15	0.15	14.0	< 1.000	
	07/24/07			1.7	178	1,420	1,930	7.40	0.62	0.13	0.13	8.4	< 0.500	
	08/01/07			< 5.0	74	1,430	1,900	8.00	< 0.05	0.14	0.14	12.0	< 1.000	
	08/27/07			2.9	3,140	732	1,030	7.50	0.11	1.40	2.20	2.8	< 0.500	
	09/22/07			2.1	1,440	574	838	7.60	< 0.05	1.30	1.90	2.9	< 0.200	
	01/27/08			< 5.0	98	1,620	2,260	7.50	< 0.05	0.26	0.26	45.0	< 0.001	
	08/07/08			1.4	6,540	2,560	2,820	7.50	0.04	2.60	2.60	7.4	< 0.500	
	11/26/08			4.9	1,020	1,150	1,720	7.40	0.16	0.47	0.77	7.6	< 0.500	
	02/07/09			1.9	206	1,050	1,450	7.60	0.09	0.39	0.42	6.7	< 0.100	
	01/20/10			5.3	540	910	1,400	7.30	< 0.05	0.59	0.59	8.8	< 0.130	
	01/27/10			< 5.0	430	1,400	2,000	7.00	0.12	0.30	0.31	12.0	< 0.130	
	02/06/10			< 4.8	240	1,500	2,100	7.10	0.09	0.27	0.39	13.0	< 0.130	
	02/22/10			< 4.8	120	1,500				0.06	0.20	13.0		
	12/20/10			< 5.0	180	1,100	1,800	7.10	0.16	0.12	0.27	11.0	< 0.050	
	12/22/10			< 5.0	4,000	460		7.80	0.76	1.60	1.90	1.8		0.06
	07/03/11			< 5.0	3,800	2,200	2,600	7.40	< 0.05	0.14	2.70	4.2	1.500	
	09/13/11			< 5.0	630	1,000	1,400	7.60	0.07	0.08	0.84	3.7	< 0.250	
	10/03/11			< 5.0	420	1,200	1,800	7.60	0.13	0.10	0.52	8.0	< 0.250	
	07/16/12			< 4.9	150	980	1,400	7.40	0.09	0.09	0.57	7.6	< 0.250	
	07/31/12			5.2	150	1,400	NA	8.10	0.48	0.09	0.24	11.0	< 0.250	
	08/22/12			< 4.8	2,800	1,200	1,600	7.70	< 0.05	0.10	3.40	2.6	< 0.250	
	09/11/12			< 4.9	12,000	1,000	1,300	7.70	0.26	0.10	1.80	3.4	< 0.250	
	10/11/12			< 4.9	1,200	1,200	NA	7.60	< 0.05	0.05	1.20	8.9	< 0.130	
	01/26/13			5.1	370	1,300	NA	7.90	0.12	0.46	0.50	9.2	< 0.130	
	07/19/13			5.1	2,585	1,175	1,723	7.45	0.26	< 0.01	1.10	3.0	< 0.100	0.37
	08/18/13			5.1	153	1,330	1,784	8.01	< 0.20	0.10	0.51	7.0	< 0.100	< 0.10
	08/25/13			5.1	1,003	NA	NA	7.81	NA	0.11	0.74	6.6	< 0.100	< 0.10
	11/21/13			< 5.0	860	695	1,158	7.51	0.68	0.12	0.61	3.6	< 0.100	0.70
	08/04/14			5.7	548	1,140	1,766	7.97	0.14	0.10	0.55	10.8	< 0.100	< 0.10
	08/20/14			< 5.0	260	1,125	1,610	7.98	< 0.10	0.08	0.73	8.5	< 0.100	< 0.10
	09/08/14			6.7	850	915	1,375	7.13	0.30	0.08	1.20	7.4	< 0.100	< 0.10
	01/11/15			< 5.0	295	1,345	NA	7.84	0.18	0.37	0.48	9.9	< 0.100	0.27
	01/30/15			< 5.0	110	1,270	NA	7.90	< 0.10	0.06	0.09	10.8	< 0.100	< 0.10
	03/02/15			< 5.0	120	1,290	NA	7.80	0.11	0.07	0.07	11.0	< 0.100	0.14
	07/06/15			10.0	365	1,100	1,686	7.14	< 0.10	0.06	0.38	7.8	< 0.100	< 0.10
	10/05/15			< 5.0	725	1,260	NA	6.90	0.40	0.11	0.99	4.8	< 0.100	0.45
	01/31/16			< 5.0	45	1,260	2,010	7.86	0.32	0.09	0.48	10.3	< 0.100	0.28
	04/09/16			< 5.0	175	1,390		7.41	0.10	0.04	0.36	10.5	< 0.100	< 0.10
	04/28/16													
	08/04/16			5.0	155	980		7.66	0.26	0.24	0.36	9.4	< 0.100	0.12
	08/23/16			< 5.0	525	955		7.51	0.14	N/A	N/A	6.7	< 0.100	0.25
	12/22/16			< 5.0	92	1,090		7.73	0.24	0.12	0.20	10.3	< 0.100	0.15
	01/20/17			< 5.0	166	1,100		8.48	0.26	0.14	0.31	9.5	< 0.100	0.12
	02/18/17			9.7	492	270		7.33	0.57	0.15	0.60	1.2	< 0.100	0.28
	07/17/17			5.3	< 5.0	1,380	NA	7.56	0.23	0.10	0.16	7.4	< 0.1	< 0.10
	08/04/17			2.2	21	1,240	~	7.80	0.21	0.11	0.13	< 0.1	< 0.1	< 0.10
	01/09/18			< 5.0	775	1,020	~	7.70	< 0.069	0.15	0.97	7.2	< 0.1	0.74
	07/15/18			< 5.0	145	1,100	NA	7.57	< 0.10	< 0.05	0.28	8.65	< 0.100	0.19
	02/14/19			5.4	1,180	475	NA	7.23	0.10	0.08	0.79	2.38	< 0.100	0.60
	11/20/19			< 5.0	105	995	NA	7.35	0.55	0.24	0.77	5.79	< 0.100	0.55
	11/28/19			< 5.0	120	790	NA	7.33	0.19	0.26	0.40	5.32	< 0.100	0.80
	03/11/20			< 5.0	92	605	NA	7.49	0.37	0.23	0.31	4.47	< 0.100	0.17
	07/26/21		NA	< 5.0	2,600	1,020	NA	7.08	0.07	0.20	1.98	6.20	< 0.100	1.01
	07/25/22		NA	5.7	125	1,400	NA	7.91	0.29	< 0.05	0.35	9.78	< 0.100	0.33
	08/12/22		NA	6.8	786	690	NA	7.52	0.63	0.30	2.22	4.97	< 0.100	1.06
	06/16/23		25.3	< 5.0	268	940	NA	6.90	0.88	< 0.05	0.77	6.26	0.408	1.10
	09/01/23		27.1	7.6	680	335	NA	8.03	0.28	1.23	1.56	2.89	0.240	0.52
	02/14/25		11.2	< 5.0	370	774	NA	7.00	0.25	0.86	0.95	6.04	< 0.050	1.58
	Median	**560**	**25.3**	**< 5.0**	**395**	**1,120**	**1,720**	**7.57**	**0.130**	**0.130**	**0.59**	**7.37**	**< 0.100**	**0.22**
	Maximum	**560**	**27.1**	**10**	**12,000**	**2,560**	**2,820**	**8.48**	**0.88**	**3.0**	**4.30**	**45.0**	**1.900**	**1.58**
	Minimum	**560**	**11.2**	**1.4**	**< 5**	**270**	**838**	**6.90**	**< 0.035**	**< 0.010**	**0.074**	**< 0.10**	**< 0.001**	**0.06**

Location	Date	TKN mg/L	Total Nitrogen mg/L	Copper mg/L	Dissolved Copper mg/L	Chromium mg/L	Lead mg/L	Dissolved Lead mg/L	Mercury mg/L	Cadmium mg/L	Zinc mg/L	Dissolved Zinc mg/L
Lake Las Vegas & Rainbow Gardens *LLV Ends 2009-2010 RG Starts 2010-2012	02/12/03	9.6	15.14	0.082		0.0430	0.0920		< 0.0002	< 0.00250	0.35	
	12/28/04	5.5	10.60	< 0.010	< 0.010	0.0330	0.0500	< 0.0200	< 0.0002	< 0.00500	0.27	< 0.020
	02/11/05	2.3	6.90	0.041	< 0.010	0.0230	0.0310	< 0.0200	< 0.0002	0.61000	0.17	< 0.020
	10/25/05			0.056	0.014	0.0570		0.1090			0.21	0.109
	10/14/06	2.3		0.120	0.007	0.0700	0.1300	0.0005	< 0.0002	0.00120	0.45	< 0.005
	04/16/07	1.0		0.150	0.011	2.5000	0.0016	< 0.0005	< 0.0002	< 0.00050	0.09	0.030
	07/24/07	1.4		0.026	0.015	0.0031	0.0041	< 0.0005	< 0.0002	< 0.00050	0.08	0.025
	08/01/07	1.1		0.023	0.022	0.0025	0.0031	0.0029	< 0.0002	< 0.00050	0.06	0.054
	08/27/07	5.0		0.006	0.008	0.0240	< 0.0005	< 0.0005	< 0.0002	< 0.00050	0.17	< 0.005
	09/22/07	4.3		0.051	0.011	0.0280	0.0160	< 0.0005	< 0.0002	< 0.01000	0.17	< 0.005
	01/27/08	1.8		0.003	0.006	0.0027	0.0016	< 0.0005	< 0.0002	< 0.00050	0.05	0.027
	08/07/08	6.5		0.027	0.008	0.0140	0.0180	< 0.0005	< 0.0002	< 0.00100	0.12	< 0.005
	11/26/08	5.6		0.034	0.011	0.0067	0.0100	< 0.0005	< 0.0002	< 0.00050	0.05	0.037
	02/07/09	2.0		0.022	0.005	0.0047	0.0120	< 0.0005	< 0.0002	< 0.00052	0.21	< 0.020
	01/20/10	2.0	10.93	0.036	0.011	0.0081	0.0140	< 0.0005	< 0.0002	< 0.00050	0.11	< 0.020
	01/27/10	2.1	14.23	0.021	0.008	0.0083	0.0068	< 0.0005	< 0.0002	< 0.00050	0.07	< 0.020
	02/06/10	1.4	14.53	0.018	0.008	0.0051	0.0035	< 0.0005	< 0.0002	< 0.00050	0.06	0.024
	02/22/10	1.6	14.60	0.013	0.007	NA	0.0017	< 0.0005	NA	NA	0.06	0.030
	12/20/10	1.2	12.25	0.011	0.005	0.0038	0.0040	< 0.0005	< 0.0002	< 0.00050	0.04	< 0.020
	12/22/10	2.4	4.20	0.031	0.002	NA	0.0230	< 0.0005	NA	NA	0.12	< 0.020
	07/03/11	6.2	11.90	0.047	0.004	0.0330	0.0470	< 0.0005	< 0.0002	0.00006	0.17	< 0.020
	09/13/11	3.5	7.45	0.100	0.015	0.0190	0.0210	< 0.0005	< 0.0002	< 0.00050	0.12	< 0.020
	10/03/11	2.4	10.65	0.032	0.011	0.0092	0.0078	< 0.0005	< 0.0002	< 0.00050	0.08	< 0.020
	07/16/12	1.7	9.55	0.010	0.006	0.0033	0.0028	< 0.0005	< 0.0002	< 0.00050	0.03	< 0.020
	07/31/12	0.9	12.17	0.011	0.008	NA	0.0022	< 0.0005	NA	NA	0.04	< 0.020
	08/22/12	4.9		0.032	0.006	0.0250	0.0350	< 0.0005	< 0.0002	< 0.00050	0.10	0.026
	09/11/12	2.6		0.170	< 0.002	0.1100	0.1400	< 0.0005	< 0.0002	0.00240	0.62	< 0.020
	10/11/12	2.9		0.034	0.005	NA	0.0180	< 0.0005	NA	NA	0.14	< 0.020
	01/26/13	1.6		0.013	0.004	NA	0.0047	< 0.0005	NA	NA	0.07	< 0.020
	07/19/13	24.5	27.62	0.218	0.013	0.0542	0.0553	< 0.0005	< 0.0002	0.00176	0.43	0.013
	08/18/13	3.5	10.57	0.034	0.021	0.0041	0.0027	< 0.0005	< 0.0002	< 0.00100	0.05	0.016
	08/25/13	3.5	10.21	0.052	0.013	NA	0.0162	< 0.0010	NA	NA	0.15	0.012
	11/21/13	< 1.0	4.69	0.069	0.014	0.0207	0.0249	< 0.0005	< 0.0002	< 0.00100	0.17	0.013
	08/04/14	< 1.0	11.90	0.048	0.012	0.0137	0.0122	< 0.0005	< 0.0002	< 0.00100	0.12	0.016
	08/20/14	< 1.0	9.56	0.043	0.015	0.0085	0.0082	< 0.0005	< 0.0002	< 0.00100	0.07	0.012
	09/08/14	1.3	8.76	0.051	0.010	0.0173	0.0143	< 0.0005	< 0.0002	< 0.00100	0.13	0.012
	01/11/15	0.7	10.67	0.020	0.018	NA	0.0030	< 0.0005	NA	NA	0.06	0.050
	01/30/15	0.5	NA	0.014	0.009	NA	0.0020	< 0.0005	NA	NA	0.05	0.047
	03/02/15	1.2	NA	0.023	0.016	NA	0.0023	< 0.0005	NA	NA	0.06	0.051
	07/06/15	< 0.2	< 0.2	0.030	0.016	0.0020	0.0110	< 0.0005	0.0019	< 0.00050	0.20	0.066
	10/05/15	5.3	NA	0.019	0.016	NA	0.0150	0.0010	< 0.0002	NA	0.06	0.023
	01/31/16	1.5	1.19	0.021	0.019	0.0010	< 0.0005	< 0.0005	< 0.0002	< 0.00100	0.05	0.046
	04/09/16	1.3		0.001	0.011		0.0200	< 0.0005	< 0.0002		0.04	0.040
	04/28/16											
	08/04/16	1.9	1.82	0.032	0.033	0.0019	< 0.0005	< 0.0005	< 0.0001	< 0.00050	0.05	0.017
	08/23/16	2.2	1.97	0.022	0.013	0.0050	0.0104	< 0.0005	< 0.0002	0.00060	0.04	0.035
	12/22/16	1.5	1.38	0.025	0.021	0.0020	0.0021	< 0.0010	< 0.0002	< 0.00050	0.05	0.032
	01/20/17	1.1		0.013	0.010		0.0029	0.0005			0.04	0.033
	02/18/17	< 1.0		0.013	0.006		0.0080	< 0.0005			0.05	0.041
	07/17/17	< 1.0	< 0.10	0.029	0.022	NA	< 0.0005	< 0.0005	< 0.0003	NA	0.05	0.030
	08/04/17	1.13	1.13	0.014	0.014	0.0044	0.0010	< 0.0005	< 0.0003	< 0.00100	0.03	0.024
	01/09/18	1.49	0.75	0.020	0.006	0.0048	0.1510	0.0020	< 0.0002	< 0.00100	0.11	0.060
	07/15/18	1.68	1.49	0.008	0.004	0.0032	0.0044	0.0008	< 0.0002	< 0.00100	0.04	0.049
	02/14/19	2.39	1.79	0.027	< 0.001	0.0177	0.0199	< 0.0005	< 0.0002	0.00142	0.10	0.023
	11/20/19	4.00	3.45	0.025	0.012	0.0090	0.0070	0.0020	< 0.0003	< 0.00200	0.10	0.100
	11/28/19	2.50	1.70	0.008	0.007	0.0013	0.0026	< 0.0010	< 0.0003	< 0.0010	0.05	0.049
	03/11/20	1.57	1.40	0.023	0.003	0.0076	0.0044	0.0005	< 0.0002	< 0.0010	0.05	0.044
	07/26/21	6.79	5.78	0.037	< 0.001	0.0200	0.0467	< 0.0010	< 0.0003	< 0.0013	0.18	0.042
	07/25/22	2.89	2.56	0.006	0.002	0.0030	0.0066	< 0.0012	< 0.0003	< 0.0012	0.05	0.031
	08/12/22	9.32	8.26	0.029	0.003	0.0095	0.0203	< 0.0012	0.0008	< 0.0012	0.16	0.056
	06/16/23	5.75	4.65	0.019	< 0.001	0.0064	0.0072	< 0.0010	< 0.0003	< 0.0010	0.14	< 0.050
	09/01/23	3.66	3.02	0.027	0.005	0.0161	0.0163	< 0.0010	< 0.0003	< 0.0010	0.17	0.028
	02/14/25	6.99	5.41	0.030	0.006	0.0093	0.0092	0.0004	< 0.0002	0.0001	0.15	0.029
	Median	**2.00**	**6.90**	**0.0265**	**0.010**	**0.0088**	**0.0082**	**< 0.0005**	**< 0.0002**	**< 0.0010**	**0.08**	**0.0240**
	Maximum	**24.5**	**27.62**	**0.2180**	**0.033**	**2.500**	**0.151**	**0.1090**	**0.0019**	**0.6100**	**0.62**	**0.109**
	Minimum	**< 0.20**	**< 0.10**	**0.0013**	**< 0.001**	**0.001**	**< 0.0005**	**< 0.0004**	**< 0.0001**	**0.0001**	**0.029**	**< 0.005**

Location	Date	Silver mg/L	Nickel mg/L	Selenium mg/L	Dissolved Selenium mg/L	Arsenic mg/L	Boron mg/L	Alkalinity In CaCo3 mg/L	Aluminum mg/L	Antimony mg/L	Barium mg/L	Beryllium mg/L	Bicarbonate Alkalinity as HCO3 mg/L	Bromide mg/L	Bromate mg/L
Lake Las Vegas & Rainbow Gardens *LLV Ends 2009-2010 RG Starts 2010-2012	02/12/03	< 0.0025	0.0600					122	< 2.50	< 0.005	0.82	< 0.0050	149		
	12/28/04	< 0.0005	0.0560	< 0.1500		0.032	0.510	87	31.00	0.001	0.68	0.0016	106	0.15	< 0.005
	02/11/05	< 0.0005	0.0350	< 0.0100		0.017	0.330	93	15.00	0.001	0.34	< 0.0010	113	0.13	< 0.005
	10/25/05														
	10/14/06	1.0000	0.0940	< 0.0050		0.049	0.370	65	59.00	< 0.001	0.93	0.0033	79	0.09	< 0.005
	04/16/07	< 0.0005	0.0093	< 0.0050		0.009	0.700	132	0.14		0.05	< 0.0010	160	0.29	< 0.005
	07/24/07	< 0.0005	0.0100	< 0.0050		0.013	0.560	120	1.20	0.003	0.09	0.0002	150	0.18	< 0.005
	08/01/07	< 0.0005	0.0100	< 0.0050		0.009	0.580	127	0.97	< 0.001	0.08	< 0.0010	150	0.24	< 0.005
	08/27/07	< 0.0005	< 0.0050	< 0.0050		0.023	0.360	100	< 0.02	0.003	0.31	< 0.0010	120	0.07	< 0.005
	09/22/07	< 0.0100	0.0160	< 0.0010		0.017	0.260	110	12.70	< 0.020	0.22	< 0.0020	130	0.08	< 0.005
	01/27/08	< 0.0005	< 0.0050	< 0.0054		0.010	0.750	117	1.33	< 0.001	0.05	< 0.0020	140	0.26	< 0.005
	08/07/08	< 0.0005	0.0280	0.0110		0.039	0.480	257	8.84	< 0.002	0.27	< 0.0020	313	0.22	< 0.005
	11/26/08	< 0.0005	0.0150	0.0070		0.014	0.480	135	3.90	0.003	0.11	< 0.0010	165	0.19	< 0.005
	02/07/09	< 0.0005	0.0110	< 0.0050		0.015	0.410	87	2.30	0.002	0.11	< 0.0010	106	0.15	< 0.005
	01/20/10	< 0.0005	0.0140	< 0.0050		0.088	0.320	97	7.00	< 0.001	0.28	< 0.0010	120	0.14	< 0.005
	01/27/10	< 0.0005	0.0130	0.0058		0.013	0.490	120	4.60	0.003	0.15	< 0.0010	150	0.24	< 0.005
	02/06/10	< 0.0005	0.0100	< 0.0050		0.011	0.530	120	2.70	0.001	0.11	< 0.0010	120	0.23	< 0.005
	02/22/10	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/20/10	< 0.0005	0.0084	< 0.0050		0.007	0.430	130	3.50	< 0.001	0.75	< 0.0010	150	0.16	< 0.005
	12/22/10	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	07/03/11	< 0.0005	0.0440	< 0.0250		0.057	0.640	130	51.00	< 0.001	0.52	0.0011	150	0.20	< 0.005
	09/13/11	< 0.0005	0.0230	< 0.0050		0.020	0.410	91	13.00	0.002	0.25	< 0.0010	110	0.12	< 0.005
	10/03/11	< 0.0005	0.0140	< 0.0050		0.011	0.440	110	5.00	0.002	0.13	< 0.0010	130	0.17	< 0.005
	07/16/12	< 0.0005	0.0080	< 0.0050		0.009	0.360	120	2.30	< 0.001	0.09	< 0.0010	140	0.15	< 0.005
	07/31/12	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	08/22/12	< 0.0005	0.0380	0.0056		0.039	0.390	80	19.00	0.001	0.38	< 0.0010	98	0.10	< 0.005
	09/11/12	0.0019	0.1400	0.0075		0.099	0.380	80	69.00	< 0.001	1.60	0.0034	98	0.10	< 0.005
	10/11/12	NA	NA	< 0.0050		NA	0.460	NA	NA	NA	NA	NA	NA	NA	NA
	01/26/13	NA	NA	< 0.0050		NA	0.490	NA	NA	NA	NA	NA	NA	NA	NA
	07/19/13	< 0.0005	0.0450	< 0.0100		0.041	0.491	148	33.10	0.003	0.60	0.003	180	4.07	< 0.100
	08/18/13	< 0.0005	0.0051	0.0026		0.008	0.462	130	2.66	0.001	0.09	< 0.0010	159	< 0.10	< 0.100
	08/25/13	NA	NA	0.0077		NA	0.444	NA	NA	NA	NA	NA	NA	NA	NA
	11/21/13	< 0.0005	0.0192	0.0034		0.017	0.265	115	13.00	0.003	0.28	< 0.0010	140	< 0.01	< 0.005
	08/04/14	< 0.0005	0.0163	< 0.0010		0.012	0.413	127	9.57	0.002	0.18	< 0.0010	155	< 0.01	< 0.005
	08/20/14	< 0.0005	0.0096	0.0018		0.009	0.319	185	7.81	0.001	0.21	< 0.0010	226	< 0.01	< 0.005
	09/08/14	< 0.0005	0.0149	0.0022		0.012	0.251	346	11.60	0.003	0.18	< 0.0010	346	< 0.01	< 0.005
	01/11/15	NA	NA	0.0050		NA	0.277	NA	NA	NA	NA	NA	NA	NA	NA
	01/30/15	NA	NA	0.0040		NA	0.530	NA	NA	NA	NA	NA	NA	NA	NA
	03/02/15	NA	NA	< 0.0050		NA	0.474	NA	NA	NA	NA	NA	NA	NA	NA
	07/06/15	< 0.0005	0.0100	0.0020		0.009	0.350	213	1.08	0.003	0.15	< 0.0010	260	0.14	< 0.005
	10/05/15	NA	NA	0.0020		NA	0.560	NA	NA	NA	NA	NA	NA	NA	NA
	01/31/16	< 0.0005	0.0080	0.0030		0.005	0.190	138	2.12	0.001	0.60	< 0.0010	168	0.13	< 0.005
	04/09/16			< 0.0050			0.500								
	04/28/16														
	08/04/16	< 0.0005	0.0076	0.0029		0.005	0.347	115	0.01	0.002	0.08	< 0.0010	140	< 0.01	< 0.005
	08/23/16	< 0.0005	0.0014	0.0025		0.008	0.516	95	1.62	0.001	0.10	< 0.0010	116	< 0.01	
	12/22/16	< 0.0005	0.0067	0.0042		0.008	0.394	115	0.34	0.002	0.05	< 0.0010	140	0.13	
	01/20/17			0.0042			0.372								
	02/18/17			< 0.0010			0.052								
	07/17/17	NA	NA	0.0040		NA	0.420	130	NA	NA	NA	NA	159	NA	NA
	08/04/17	< 0.0010	0.0072	0.0040		0.009	< 0.500	130	0.19	0.001	0.06	< 0.001	159	< 0.001	~
	01/09/18	< 0.0010	0.0176	0.0030		0.031	0.398	110	1.78	0.003	0.16	< 0.001	134	< 0.20	~
	07/15/18	< 0.0005	0.0084	0.0042		0.007	0.444	110	0.45	< 0.001	0.07	< 0.0010	134	0.06	NA
	02/14/19	< 0.0010	0.0308	< 0.0010		0.011	0.267	81	8.88	0.001	0.22	< 0.0010	99	0.02	NA
	11/20/19	< 0.0020	0.0350	< 0.0100	< 0.0100	0.011	0.362	100	1.51	0.003	0.11	< 0.0020	100	0.11	NA
	11/28/19	< 0.0010	0.0052	0.00302	0.0027	0.007	0.303	98	1.69	0.002	0.04	< 0.0010	98	0.08	NA
	03/11/20	< 0.0005	0.0114	0.00185	0.0018	0.006	0.242	88	5.02	0.004	0.10	< 0.0010	88	0.14	NA
	07/26/21	< 0.0013	0.0234	< 0.00200	0.0019	0.017	0.411	420	3.78	< 0.001	0.52	< 0.0020	420	0.05	NA
	07/25/22	< 0.0012	0.0105	0.00308	0.0021	0.007	0.434	136	1.75	< 0.001	0.10	< 0.0012	136	0.17	NA
	08/12/22	< 0.0012	0.0140	< 0.0025	< 0.0020	0.007	0.258	94	13.10	0.003	0.24	< 0.0012	94	0.08	NA
	06/16/23	< 0.0010	0.0081	0.0025	0.0019	0.010	0.388	164	3.11	0.003	0.12	< 0.0010	164	0.12	NA
	09/01/23	< 0.0010	0.0128	0.0019	0.0016	0.009	0.213	256	9.86	0.003	0.19	< 0.0010	256	0.05	NA
	02/14/25	0.0001	0.0094	0.0031	0.0021	0.012	0.340	164	5.53	0.004	0.14	0.0003	164	0.11	NA
	Median	**< 0.0005**	**0.0128**	**< 0.0046**	**0.0019**	**0.011**	**0.410**	**120**	**3.78**	**< 0.002**	**0.160**	**< 0.0010**	**140**	**0.127**	**< 0.005**
	Maximum	**1.0000**	**0.1400**	**< 0.1500**	**0.0027**	**0.099**	**0.750**	**420**	**69.0**	**0.020**	**1.600**	**< 0.0050**	**420**	**4.07**	**< 0.100**
	Minimum	**< 0.0001**	**0.0014**	**< 0.0010**	**0.0016**	**0.0048**	**0.052**	**65**	**0.0096**	**< 0.001**	**0.044**	**< 0.0002**	**79.0**	**< 0.001**	**< 0.005**

Location	Date	CO2 Free Calculated mg/L	Carbonate mg/L	Calcium mg/L	Chlorate mg/L	Chloride mg/L	Chlorite mg/L	Diuron mg/L	Diquat mg/L	Paraquat mg/L	Endothall mg/L	Fluoride mg/L
Lake Las Vegas & Rainbow Gardens *LLV Ends 2009-2010 RG Starts 2010-2012	02/12/03	9.42	0.31	120		160						0.64
	12/28/04	5.33	0.27	480	0.07	140	< 0.010	0.005	< 0.0040	< 0.002	< 0.020	0.58
	02/11/05	5.68	0.29	240	0.08	120	< 0.040	0.003	< 0.0040	< 0.002	< 0.020	0.55
	10/25/05											
	10/14/06	6.50	< 2.00	510	0.05	97	< 0.010				< 0.020	0.42
	04/16/07	< 2.00	2.10	150	0.39	350	< 0.010				< 0.020	1.00
	07/24/07	9.80	< 2.00	180	0.15	230	< 0.020	0.007			< 0.020	0.80
	08/01/07	2.50	< 2.00	140	0.28	280	< 0.010	0.003			< 0.020	0.86
	08/27/07	6.20	< 2.00	450	0.06	66	< 0.010	0.161			< 0.020	0.39
	09/22/07	5.40	< 2.00	230	0.06	68	0.012				< 0.020	0.39
	01/27/08	7.30	< 2.00	160	0.11	251	0.117				< 0.020	0.79
	08/07/08	16.00	< 2.00	660	0.06	290	< 0.010	0.003	< 0.0040	< 0.002	< 0.020	0.58
	11/26/08	11.00	< 2.00	180	0.14	190	< 0.010	0.002	< 0.0040	< 0.002	< 0.020	0.62
	02/07/09	4.40	< 2.00	260	0.14	67	< 0.010	0.007	< 0.0040	< 0.002	< 0.020	0.55
	01/20/10	2.80	< 2.00	120	0.18	180	< 0.010	0.001	< 0.0004	< 0.002	< 0.020	0.51
	01/27/10	2.80	< 2.00	170	0.28	240	< 0.010	< 0.001	< 0.0004	< 0.002	< 0.009	0.70
	02/06/10	< 2.00	< 2.00	150	0.39	260	< 0.010	< 0.001	< 0.0004	< 0.002	< 0.020	0.74
	02/22/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/20/10	2.30	< 2.00	130	0.36	230	< 0.010	< 0.001	< 0.0004	< 0.002	< 0.005	0.64
	12/22/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	07/03/11	10.00	< 2.00	650	0.06	230	< 0.010	< 0.001	< 0.0004	< 0.002	< 0.005	0.69
	09/13/11	4.70	< 2.00	220	0.09	130	< 0.010	< 0.001	< 0.0004	< 0.002	< 0.020	0.36
	10/03/11	6.20	< 2.00	170	0.24	190	< 0.010	< 0.001	< 0.0004	< 0.002	< 0.020	0.70
	07/16/12	< 2.00	< 2.00	130	0.30	170	< 0.010	NA	NA	NA	NA	0.32
	07/31/12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	08/22/12	< 2.00	< 2.00	460	0.11	93	< 0.010	0.001	NA	NA	NA	0.34
	09/11/12	< 2.00	< 2.00	900	0.05	84	< 0.010	< 0.001	NA	NA	NA	0.35
	10/11/12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	01/26/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	07/19/13	NA	< 10.00	558	< 0.1	201	< 0.100	NA	NA	NA	NA	0.86
	08/18/13	NA	< 10.00	144	< 0.1	199	< 0.100	NA	NA	NA	NA	0.60
	08/25/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/21/13	NA	< 10	225	< 0.01	173	< 0.0100	NA	NA	NA	NA	0.34
	08/04/14	NA	< 2	210	< 0.01	266	< 0.0050	NA	NA	NA	NA	0.36
	08/20/14	NA	< 2	149	< 0.01	181	< 0.0050	NA	NA	NA	NA	0.47
	09/08/14	NA	< 2	223	< 0.01	369	< 0.0050	NA	NA	NA	NA	0.42
	01/11/15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	01/30/15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	03/02/15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	07/06/15	NA	< 2.00	159	< 0.01	229	< 0.010	NA	NA	NA	NA	0.25
	10/05/15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	01/31/16	NA	< 2.00	116	0.09	266	< 0.010					0.82
	04/09/16											
	04/28/16											
	08/04/16		< 2.00		< 0.01	203	< 0.010					0.46
	08/23/16		< 2.00			181						0.45
	12/22/16		< 2.00			264						0.76
	01/20/17											
	02/18/17											
	07/17/17		< 5.00	NA	NA	NA	NA					NA
	08/04/17		< 5.00	~	~	215	~					< 0.10
	01/09/18		< 5.00	~	~	171	~					0.71
	07/15/18	NA	< 2.00	NA	NA	202	NA	NA	NA	NA	NA	0.46
	02/14/19	NA	< 5.00	NA	NA	59	NA	NA	NA	NA	NA	0.32
	11/20/19	NA	< 5.00	NA	NA	192	NA	NA	NA	NA	NA	0.87
	11/28/19	NA	< 5.00	NA	NA	125	NA	NA	NA	NA	NA	< 0.10
	03/11/20	NA	< 5.00	NA	NA	95	NA	NA	NA	NA	NA	0.52
	07/26/21	NA	< 5.00	NA	NA	152	NA	NA	NA	NA	NA	0.55
	07/25/22	NA	< 5.00	NA	NA	259	NA	NA	NA	NA	NA	0.63
	08/12/22	NA	< 5.00	NA	NA	98	NA	NA	NA	NA	NA	0.32
	06/16/23	NA	< 5.00	NA	NA	159	NA	NA	NA	NA	NA	0.99
	09/01/23	NA	< 5.00	NA	NA	56	NA	NA	NA	NA	NA	0.44
	02/14/25	NA	< 5.00	NA	NA	150	NA	NA	NA	NA	NA	0.56
	Median	**5.330**	**< 2.00**	**180**	**< 0.09**	**181**	**< 0.010**	**< 0.0014**	**< 0.0004**	**< 0.002**	**< 0.020**	**0.55**
	Maximum	**16.00**	**< 10.00**	**900**	**0.390**	**369**	**0.117**	**0.161**	**< 0.004**	**< 0.002**	**0.020**	**1.00**
	Minimum	**< 2.00**	**0.27**	**116**	**0.005**	**56**	**< 0.005**	**< 0.001**	**< 0.0004**	**< 0.002**	**< 0.005**	**< 0.100**

Location	Date	Glyphosate mg/L	Hardness as CaCO3 mg/L	Hydroxide as OH mg/L	Iron mg/L	Langelier Index 25 degree None	Magnesium mg/L	Manganese mg/L	Potassium mg/L	Reactive Silica mg/L	Sodium mg/L	Sulfate mg/L	Thallium mg/L	Organic Carbon mg/L
Lake Las Vegas & Rainbow Gardens *LLV Ends 2009-2010 RG Starts 2010-2012	02/12/03		1,980	0.005	56.00	0.95	33	2.80	14		75	490	< 0.005	
	12/28/04	< 0.006	1,600	0.007	26.00	0.84	120	1.30	26	150	120	520	< 0.001	29
	02/11/05	< 0.006	908	0.007	11.00	0.59	75	0.54	16	14	110	370	< 0.001	14
	10/25/05													
	10/14/06	< 0.006	1,600	< 2.000	16.00	0.50	71	2.60	22	130	82	700	< 0.001	14
	04/16/07	< 0.006	690	< 2.000	0.31	1.20	76	0.06	28	20	290	650	< 0.001	6
	07/24/07	0.009	730	< 2.000	0.67	0.40	68	0.22	26	17	190	540	< 0.001	12
	08/01/07	< 0.006	620	< 2.000	0.40	0.90	66	0.21	22	20	240	240	< 0.001	8
	08/27/07	0.013	1,400	< 2.000	11.00	0.80	64	0.93	19	9	64	320	< 0.001	31
	09/22/07	< 0.006	830	< 2.000	12.00	0.60	61	0.64	17	15	64	210	< 0.001	21
	01/27/08	< 0.006	720	< 2.000	0.67	0.40	79	0.15	25	23	210	650	< 0.001	12
	08/07/08	0.016	2,140	< 2.000	2.10	1.40	120	1.21	37	17	210	1,100	< 0.002	29
	11/26/08	0.026	738	< 2.000	6.90	0.40	70	0.66	26	15	160	440	< 0.001	38
	02/07/09	0.011	913	< 2.000	1.40	0.60	64	0.75	19	12	130	380	< 0.001	15
	01/20/10	< 0.006	510	< 2.000	7.70	0.56	49	0.41	19	77	150	320	< 0.001	9
	01/27/10	< 0.006	740	< 2.000	5.10	0.89	74	0.27	21	61	200	530	< 0.001	8
	02/06/10	< 0.006	650	< 2.000	2.60	1.00	68	0.18	22	41	220	510	< 0.001	7
	02/22/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	12/20/10	< 0.006	560	< 2.000	3.40	0.91	56	0.15	21	37	190	410	< 0.001	8
	12/22/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	07/03/11	< 0.006	2,200	< 2.000	45.00	0.94	140	1.30	45	88	170	1,100	< 0.001	24
	09/13/11	0.012	800	< 2.000	10.00	0.52	64		21	91	100	420	< 0.001	27
	10/03/11	< 0.006	630	< 2.000	4.90	0.46	65	0.29	20	59	160	440	< 0.001	15
	07/16/12	< 0.006	530	< 2.000	2.00	0.21	48	0.01	19	34	140	370	< 0.001	
	07/31/12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	08/22/12	< 0.006	1,400	< 2.000	17.00	0.93	73	1.20	24	120	98	540	< 0.001	
	09/11/12	< 0.006	3,000	< 2.000	71.00	1.20	200	3.60	37	150	83	520	< 0.002	
	10/11/12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	01/26/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	07/19/13	NA	1,999	< 2.000	33.20	NA	147	1.68	45	106	172	497	0.004	21
	08/18/13	NA	616	< 2.000	2.35	NA	62	0.16	22	33	183	369	< 0.001	8
	08/25/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/21/13	NA	564	< 2.000	12.40	NA	64	0.56	16	72	89	273	< 0.001	27
	08/04/14	NA	835	< 2.000	8.90	NA	75	0.44	34	67	143	395	< 0.001	11
	08/20/14	NA	612	< 2.000	6.48	NA	58	0.30	29	55	129	342	< 0.001	6
	09/08/14	NA	843	< 2.000	10.70	NA	69	0.52	30	79	120	729	< 0.001	14
	01/11/15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	01/30/15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	03/02/15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	07/06/15	NA	598	< 2.000	0.80	NA	49	0.42	32	15	293	420	< 0.001	14
	10/05/15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	01/31/16		459	< 2.000	0.09		41	0.05	31	16	303	299	< 0.001	6
	04/09/16													
	04/28/16													
	08/04/16		384	< 2.000	0.14		33	0.07			303	421	< 0.001	40
	08/23/16		616	< 2.000	0.74		36	0.28			94	466	< 0.001	68
	12/22/16		437	< 2.000	0.31		39	0.14			163	599	< 0.001	36
	01/20/17													
	02/18/17													
	07/17/17		NA	< 5.000	NA		NA	NA	NA	NA	NA	NA	NA	NA
	08/04/17		520	< 5.000	0.16		43	0.07	~	~	167	457	< 0.001	42
	01/09/18		675	< 5.000	1.66		52	1.36	~	~	172	417	< 0.001	52
	07/15/18	NA	441	< 2.000	0.56	NA	40	0.12	NA	NA	207	410	< 0.001	8.22
	02/14/19	NA	628	< 2.000	12.90	NA	48	0.33	NA	NA	74	165	< 0.001	11.10
	11/20/19	NA	534	< 5.000	1.41	NA	48	0.31	NA	NA	141	394	< 0.001	41.90
	11/28/19	NA	394	< 5.000	0.72	NA	35	0.09	NA	NA	119	273	< 0.001	13.30
	03/11/20	NA	323	< 5.000	0.58	NA	29	0.16	NA	NA	84	208	< 0.001	12.50
	07/26/21	NA	957	< 5.000	24.90	NA	73	0.98	NA	NA	120	334	< 0.001	16.90
	07/25/22	NA	514	< 5.000	1.32	NA	48	0.24	NA	NA	201	440	< 0.001	8.88
	08/12/22	NA	678	< 5.000	12.00	NA	49	0.51	NA	NA	81	233	< 0.001	17.40
	06/16/23	NA	539	< 5.000	2.95	NA	48	0.32	NA	NA	133	350	< 0.001	82.70
	09/01/23	NA	570	< 5.000	8.67	NA	38	0.29	NA	NA	53	156	< 0.001	15.70
	02/14/25	NA	582	< 5.000	4.85	NA	51	0.43	NA	NA	124	274	< 0.0001	3.15
	Median	**< 0.006**	**650**	**< 2.000**	**4.85**	**0.8**	**62**	**0.326**	**22**	**39**	**141**	**417**	**< 0.001**	**14.4**
	Maximum	**0.026**	**3,000**	**< 5.000**	**71.0**	**1.40**	**200**	**3.60**	**45**	**150**	**303**	**1,100**	**< 0.005**	**82.7**
	Minimum	**< 0.006**	**323**	**0.005**	**0.090**	**0.210**	**29.0**	**0.012**	**14**	**9**	**53**	**156**	**< 0.0001**	**3.2**

Location	Date	Cyanide mg/L	BOD mg/L	COD mg/L	Color ACU	Turbidity NTU	Phenol mg/L	Petroleum Hydrocarbons	TPH (diesel) MPN/100 mL	TPH (gasoline) MPN/100 mL	Total Chlorine mg/L	Fecal Coliform MPN/100 mL	Fecal* Coliform MPN/100 mL
Lake Las Vegas & Rainbow Gardens *LLV Ends 2009-2010 RG Starts 2010-2012	02/12/03											1,600,000	
	12/28/04											7,000	
	02/11/05											50,000	
	10/25/05					2,140						220,000	
	10/14/06											220,000	
	04/16/07											23	
	07/24/07											> 1,600,000	
	08/01/07											5,000	
	08/27/07											900,000	
	09/22/07											1,600,000	
	01/27/08											11,000	
	08/07/08											24,000	
	11/26/08											900,000	
	02/07/09											22,000	
	01/20/10					320						170,000	
	01/27/10					200						3,000	
	02/06/10					48						2,200	
	02/22/10					61						2,000	
	12/20/10					100						NA	
	12/22/10											30,000	
	07/03/11					260						5,000,000	
	09/13/11					240						2,600,000	
	10/03/11					110						300,000	
	07/16/12					170						230,000	
	07/31/12		3			83						14,000	
	08/22/12					2,100						790,000	
	09/11/12					3,700						330,000	
	10/11/12		10			720						680,000	
	01/26/13		9			170						11,000	
	07/19/13	< 0.050	20	176		203	1.08					> 241,960	
	08/18/13	< 0.050	5	909		133	0.06					> 241,960	
	08/25/13	NA	4	804		906	NA					> 241,960	
	11/21/13	< 0.050	24	128		734	0.66					25,820	
	08/04/14	< 0.050	36	302		473	< 0.05					68,670	
	08/20/14	< 0.050	4	48		305	0.25					5,780	
	09/08/14	< 0.050	13	80		658	0.13					86,640	
	01/11/15	NA	26	67		183						2,130	
	01/30/15	NA	4	36		54						310	
	03/02/15	NA	< 2	34		112						2,420	
	07/06/15	< 0.050	13	42		324	0.3					173,250	
	10/05/15	NA	15	222		813	NA					209,800	
	01/31/16	< 0.050	< 2	51		25	< 0.05					81,640	
	04/09/16		< 2	72		111						155,300	
	04/28/16												
	08/04/16	< 0.050	< 2	26		157	0.089					241,960	
	08/23/16	< 0.050	< 2	89		730	0.113					980,400	
	12/22/16	< 0.050	63	108		80	0.392					40,000	
	01/20/17		9	64		308						196,630	
	02/18/17		77	184		152						20,870	
	07/17/17		27	39		3						~	
	08/04/17	< 0.050	< 2	55		10	0.101					32,550	
	01/09/18	< 0.050	42	184		512	0.101					12,500	
	07/15/18	< 0.050	< 2	19		137	0.184					> 241,960	
	02/14/19	< 0.005	9	28		605	0.128					2,099	
	11/20/19	< 0.005	44	161		190	0.283					> 24,196	
	11/28/19	< 0.010	56	62		47	0.497					> 2,420	
	03/11/20	< 0.005	< 50	48		52	0.522					19,863	
	07/26/21	< 0.050	13	232		1,000	0.05					> 48,392	
	07/25/22	< 0.050	16	40		45	0.262					> 24,196	
	08/12/22	< 0.050	19	186		564	< 0.05					648,800	
	06/16/23	< 0.050	80	182		202	0.208					2,419,600	
	09/01/23	< 0.050	< 20	174		581	2.24					198,630	
	02/14/25	< 0.050	49	110		527	< 0.05					1,730	
	Median	**< 0.050**	**13**	**80**		**201**	**0.16**					**75,155**	
	Maximum	**< 0.050**	**80**	**909**		**3,700**	**2.24**					**5,000,000**	
	Minimum	**< 0.005**	**< 2**	**19.3**		**3**	**< 0.05**					**23**	

Location	Date	Fecal** Coliform MPN/100 mL	Fecal Strep. MPN/100 mL	Fecal* Strep. MPN/100 mL	Fecal** Strep. MPN/100 mL	*E. Coli* MPN/100 mL	Salmonella MPN/100 mL	VOC # of detects		Pesticides # of detects		SOC # of detects		Herbicides # of detects	
Lake Las Vegas & Rainbow Gardens *LLV Ends 2009-2010 RG Starts 2010-2012	02/12/03		300,000												
	12/28/04		17,000					4	x,o,d,ee	0		2	o,g	1	uu
	02/11/05		50,000					3	a,d,ee	1	oo	0		0	
	10/25/05		5,000												
	10/14/06		50,000					12		0		0		1	
	04/16/07		110					5		0		1		0	
	07/24/07		500,000					9		0		2		2	
	08/01/07		16,000					5		0		1		0	
	08/27/07		110,000					4		0		0		4	
	09/22/07		110,000					3		0		1		0	
	01/27/08		17,000					7		0		1		0	
	08/07/08		30,000					9		1		0		1	
	11/26/08		160,000					10		2		2		1	
	02/07/09		16,000					5		1		1		1	
	01/20/10		9,000					5		1		0		1	
	01/27/10		2,200					5		0		0		0	
	02/06/10		1,100					11		1		0		0	
	02/22/10		300					0		0		0		0	
	12/20/10		5,000					8	d, e, cc, dd, ee, ddd, eee, fff	0		0		0	
	12/22/10		50,000												
	07/03/11		30,000												
	09/13/11		16,000					4	d,ff,vv,bbb	1	gg	2	x,i	0	
	10/03/11		> 1,600					7	d,e,dd,ee,qq,vv,bbb	0		1	x	0	
	07/16/12		13,000					8	d, e, dd, ee, qq, vv, bbb, ddd	0		2	x, j	0	
	07/31/12		16,000						NA		NA		NA		NA
	08/22/12		28,000					3	ff, qq, vv	0		1	x	1	kkk
	09/11/12		54,000					5	a, ff, qq, vv, jjj	0		0		0	
	10/11/12		170						NA		NA		NA		NA
	01/26/13		22,000						NA		NA		NA		NA
	07/19/13		11,000					7	a, b,d,qq,vv,ddd, qqq	2	gg,zz	5	h,j,o,x, aaaa	0	
	08/18/13		100					3	a,vv, yyy	2	gg,zz	3	j,x, aaaa	0	
	08/25/13		100						NA		NA		NA		NA
	11/21/13		20,924					9	a,b,d,qq,vv,bbb,ggg,iii,zzz	3	gg,zz, uuu	5	h,j,o,x, aaaa	3	hh,rrr,xxx
	08/04/14		6,830					3	a, d, qq	2	gg, dddd	3	h, j, x	0	
	08/20/14		1,080					3	a, d, vv	0		3	j, x, aaaa	0	
	09/08/14		2,560					5	a, b, d, qq, vv	2	gg, dddd	2	x, aaaa	1	hh
	01/11/15		1,105					0		0		0		0	
	01/30/15		310					0		0		0		0	
	03/02/15		1,850					0		0		0		0	
	07/06/15		11,780					4	qq, vv, b, a, d,	1	gg	3	zz, j, o	1	hh
	10/05/15		15,760						NA		NA		NA		NA
	01/31/16		14,670					2	qq, vv,	1	gg	3	o, j, zz	0	
	04/09/16		1,460					2		2		4		0	
	04/28/16														
	08/04/16		17,329					4		0		3		1	
	08/23/16		41,400					4		0		1		2	
	12/22/16		10,000					4		0		1		1	
	01/20/17		< 1												
	02/18/17		83												
	07/17/17		~						NA	NA		NA		NA	
	08/04/17		410					2	~	0		3		0	
	01/09/18		3,950					3	~	0		2		0	
	07/15/18		2,380					0		0		1		0	
	02/14/19		3,873					1		0		0		0	
	11/20/19		> 24,196					1		1		1		2	
	11/28/19		> 2,420					1		1		0		2	
	03/11/20		9,804					3		0		1		1	
	07/26/21		48,392					1		0		1		0	
	07/25/22		> 24,196					0		0		0		0	
	08/12/22		21,600					3		0		0		0	
	06/16/23		7,300			1,410,000		0		0		2		1	
	09/01/23		13,330			130,000		1		0		0		0	
	02/14/25		20,640			13,500		1		0		4		0	
	Median		**13,000**			**130,000**		**4**		**0**		**1**		**0**	
	Maximum		**500,000**			**1,410,000**		**12**		**3**		**5**		**4**	
	Minimum		**< 1**			**13,500**		**0**		**0**		**0**		**0**	

Location	Date	Q cfs	Temp Deg. C	Oil & Grease mg/L	TSS mg/L	TDS mg/L	Specific Conductance umho/cm	Lab pH units	Surfactants (MBAS) mg/L	Ortho-Phosphate mg/L	Total Phosphorous mg/L
Western Tributary at Civic Center	08/30/92		26.3	4	92	1,110		7.2	2.67	< 0.05	0.29
	10/24/92		17.3	3	66	760		7.3	1.02	0.18	0.50
	02/08/93		12.0	3	950	300		7.9	0.24	0.26	0.55
	05/14/93	839	26.4	4	110	600		7.2	1.64	0.19	0.51
	08/04/93	211	26.0	3	840	980		7.6	1.13	0.06	0.88
	02/04/94	181	8.2	6	3,720	400	465	7.5	0.44	2.34	2.10
	03/25/94	353	12.9	10	2,800	520	2,530		0.73	0.75	1.40
	07/19/94		23.6	< 3	81	400	535	7.8	1.49	0.11	0.23
	08/09/94	4	29.5	< 3	5,550	370	525	7.9	0.35	0.18	0.87
	01/24/95	624	9.7	< 3	880	5,210	187	8.0	0.24	0.06	
	05/24/95		19.7	6	125	300	488	7.5	1.35	0.08	0.32
	08/12/95	583	27.5	4	450	690	633	7.2	1.50	0.09	0.83
	03/13/96			4	510	780		7.5		0.45	0.97
	11/21/96	163	15.6	< 3	2,500	290	498	7.8	< 0.05	0.59	2.80
	07/28/97		25.7	6	890	380	588	7.7	1.84	0.11	0.30
	09/01/97			4	290	580		7.5	1.75	< 0.01	0.33
	Median	**282**	**21.7**	**4**	**675**	**550**	**525**	**7.5**	**1.13**	**0.15**	**0.55**
	Maximum	**839**	**29.5**	**10**	**5,550**	**5,210**	**2,530**	**8.0**	**2.67**	**2.34**	**2.80**
	Minimum	**4**	**8.2**	**< 3**	**66**	**290**	**187**	**7.2**	**< 0.05**	**< 0.01**	**0.23**

Location	Date	NO3-N mg/L	NO-2 mg/L	NH3-N mg/L	TKN mg/L	Total Nitrogen mg/L	Copper mg/L	Dissolved Copper mg/L	Chromium mg/L	Lead mg/L	Dissolved Lead mg/L	Mercury mg/L
Western Tributary at Civic Center	08/30/92	3.9		0.66	9.8	13.7	0.024		< 0.010	< 0.010		< 0.0002
	10/24/92	2.9		0.73	6.2	9.1	0.017		< 0.010	< 0.010		< 0.0002
	02/08/93	1.1		0.30	1.1	2.2	0.018		0.024	0.018		< 0.0002
	05/14/93	2.4		1.30	5.5	7.9	0.015		< 0.010	0.009		< 0.0002
	08/04/93	2.1		1.40	6.6	8.7	0.033		0.027	0.022		< 0.0002
	02/04/94	1.1		1.10	16.0	17.1	0.092		0.050	0.150		0.0008
	03/25/94	1.2		1.10	6.7	7.9	0.058		0.033	0.076		< 0.0002
	07/19/94	1.4		0.47	< 1.0	2.4	0.016		< 0.010	0.006		< 0.0002
	08/09/94	1.4		0.47	2.7	4.1	0.052		0.035	0.140		< 0.0002
	01/24/95	4.5		< 0.05	< 1.0	5.5	0.012		< 0.010	< 0.100		< 0.0002
	05/24/95	1.2		0.60	4.9	6.1	0.023		< 0.010	0.020		< 0.0002
	08/12/95	0.9		0.60	7.2	8.1	0.042		0.013	0.025		< 0.0002
	03/13/96	1.7		0.90	6.2	2.6	0.041					
	11/21/96	1.7		0.80	11.0	12.7	0.038			< 0.100		
	07/28/97	1.6		1.20	4.8	6.4	0.100			0.170		
	09/01/97	1.0		0.90	7.2	8.2	0.044			< 0.100		
	Median	**1.5**		**0.77**	**6.2**	**7.9**	**0.04**		**0.012**	**0.03**		**< 0.0002**
	Maximum	**4.5**		**1.40**	**16.0**	**17.1**	**0.10**		**0.050**	**0.17**		**0.0008**
	Minimum	**0.9**		**< 0.05**	**< 1.0**	**2.2**	**0.01**		**< 0.010**	**< 0.01**		**< 0.0002**

Location	Date	Cadmium mg/L	Zinc mg/L	Dissolved Zinc mg/L	Silver mg/L	Nickel mg/L	Selenium mg/L	Arsenic mg/L	Boron mg/L	Cyanide mg/L	BOD mg/L
Western Tributary at Civic Center	08/30/92	< 0.005	0.06		< 0.01	< 0.040		< 0.025	0.42	0.029	85
	10/24/92	< 0.005	0.07		< 0.01	< 0.040		< 0.025	0.25	0.009	31
	02/08/93	< 0.005	0.27		< 0.01	< 0.040	< 0.005	0.010	0.14	< 0.005	25
	05/14/93	< 0.005	0.08		< 0.01	< 0.040	< 0.005	0.005	0.27	0.010	63
	08/04/93	< 0.005	0.18		< 0.01	0.021	< 0.005	0.011	0.05	0.008	83
	02/04/94	< 0.005	0.44		< 0.01	0.023	< 0.020	0.027	0.23	< 0.005	57
	03/25/94	< 0.005	0.32		< 0.01	0.020	< 0.005	0.016	0.17	< 0.005	59
	07/19/94	< 0.005	0.05		< 0.01	0.011	< 0.005	< 0.005	0.16	0.009	110
	08/09/94	< 0.005	0.24		< 0.01	0.025	< 0.005	0.050	0.19	< 0.005	19
	01/24/95	< 0.005	0.06		< 0.01	< 0.010	< 0.005		2.40	0.007	< 6
	05/24/95	< 0.005	0.09		< 0.01	0.011	< 0.005	< 0.005	0.18	0.010	35
	08/12/95	< 0.005	0.20		< 0.01	0.020	< 0.005	0.007	0.28	0.030	77
	03/13/96		0.12						0.27	0.009	52
	11/21/96		0.24						0.19	< 0.005	45
	07/28/97		0.63						0.21	< 0.005	36
	09/01/97		0.16						0.25	0.052	38
	Median	**< 0.005**	**0.17**		**< 0.01**	**0.022**	**< 0.005**	**0.011**	**0.22**	**0.009**	**49**
	Maximum	**< 0.005**	**0.63**		**< 0.01**	**0.040**	**< 0.020**	**0.050**	**2.40**	**0.052**	**110**
	Minimum	**< 0.005**	**0.05**		**< 0.01**	**< 0.010**	**< 0.005**	**< 0.005**	**0.05**	**< 0.005**	**< 6**

Location	Date	COD mg/L	Color ACU	Turbidity NTU	Phenol mg/L	Petroleum Hydrocarbons	TPH (diesel) MPN/100 mL	TPH (gasoline) MPN/100 mL	Total Chlorine mg/L
Western Tributary at Civic Center	08/30/92	559	313	60	0.09				< 0.10
	10/24/92	210	90	45	0.04				< 0.10
	02/08/93	98	25	750	0.10				< 0.10
	05/14/93	220	200	70	0.10				< 0.10
	08/04/93	390	400	130	0.20				< 0.10
	02/04/94	475	750	950	0.10				< 0.10
	03/25/94	310	1,000	1,200	0.04				< 0.10
	07/19/94	215	150	44	0.08				0.10
	08/09/94	300	75	7	< 0.01				0.10
	01/24/95	23	10	100	0.10		< 1	< 1	< 0.01
	05/24/95	215	40	68	0.02	< 1			< 0.01
	08/12/95	345	250	11	< 0.10		< 2	< 2	< 0.01
	03/13/96	250	100	32					0.05
	11/21/96	400	80	5,600	< 0.01	< 1			< 0.01
	07/28/97	930	110	600	< 0.01	< 1			< 0.10
	09/01/97	160	128	160	0.02				
	Median	**275**	**119**	**85**	**0.08**	**< 1**	**< 2**	**< 2**	**< 0.1**
	Maximum	**930**	**1,000**	**5,600**	**0.20**	**< 1**	**< 2**	**< 2**	**0.1**
	Minimum	**23**	**10**	**7**	**< 0.01**	**< 1**	**< 1**	**< 1**	**< 0.01**

Location	Date	Fecal Coliform MPN/100 mL	Fecal* Coliform MPN/100 mL	Fecal** Coliform MPN/100 mL	Fecal Strep. MPN/100 mL	Fecal* Strep. MPN/100 mL	Fecal** Strep. MPN/100 mL	Salmonella MPN/100 mL
Western Tributary at Civic Center	08/30/92	< 160,000			> 16			
	10/24/92	130,000			300,000			
	02/08/93	30,000	5,000		22,000	30,000		
	05/14/93	5,000,000	240,000	13,000	1,700,000	160,000	50,000	
	08/04/93	30,000	110,000	500,000	160,000	500,000	700,000	
	02/04/94	3,000	500		90,000	28,000		
	03/25/94	< 2	8,000	8,000	50,000	230,000	90,000	< 2.0
	07/19/94		> 160,000	1,600,000		50,000	140,000	8.0
	08/09/94		80,000	2,300		130,000	50,000	< 2.0
	01/24/95			5,000			22,000	< 2.0
	05/24/95			> 160,000			> 160,000	2.0
	08/12/95						> 1,600	6.0
	03/13/96	5,000			11,000			< 2.2
	11/21/96	40,000			50,000			< 2.2
	07/28/97	160,000			90,000			5.1
	09/01/97	160,000			90,000			< 2.2
	Median	**40,000**	**80,000**	**13,000**	**90,000**	**130,000**	**70,000**	**< 2.2**
	Maximum	**5,000,000**	**240,000**	**1,600,000**	**1,700,000**	**500,000**	**700,000**	**8.0**
	Minimum	**< 2**	**500**	**2300**	**16**	**28,000**	**1,600**	**< 2.0**

Location	Date	VOC # of detects	Pesticides # of detects	SOC # of detects	Herbicides # of detects
Western Tributary at Civic Center	08/30/92				
	10/24/92				
	02/08/93				
	05/14/93				
	08/04/93				
	02/04/94				
	03/25/94				
	07/19/94				
	08/09/94				
	01/24/95				
	05/24/95				
	08/12/95				
	03/13/96				
	11/21/96		0		1 hh
	07/28/97		0		1
	09/01/97		0		1
	Median				
	Maximum				
	Minimum				

Location	Date	Q cfs	Temp Deg. C	Oil & Grease mg/L	TSS mg/L	TDS mg/L	Specific Conductance umho/cm	Lab pH units
Las Vegas Creek at Pecos or Lena	08/30/92	75	27.1	4	550	830		7.2
	10/24/92	204	17.5	4	500	530		7.3
	10/28/92	76	18.1	< 3	460	440		7.4
	02/08/93	454	11.1	64	300	190		7.8
	05/14/93	138	26.9	7	220	490		7.1
	08/04/93	34	30.7	< 3	560	1,070		7.1
	02/04/94	114	8.2	5	1,050	320	984	7.6
	09/19/94		22.0	5	230	880	950	7.3
	03/11/95	23	13.4	4	93	150	1,150	7.6
	05/24/95	24	26.5	12	330	270	680	7.5
	08/20/95	4	26.7	4	42	520	883	7.3
	05/24/96		17.8	15	490	500	500	7.0
	07/15/96	148	27.0	23	480	470		7.4
	02/24/98		12.0	< 3	200	100		8.0
	03/26/98		15.2	< 3	1,390	200	570	8.2
	09/22/99			4	950	100		
	02/12/03			< 3	110	130	200	7.4
	07/25/03				880	580		
	08/16/03				1,570	580		
	08/16/04			< 5	3,020	340	401	7.6
	01/03/05			5	51	120	177	7.7
	Median	**76**	**18.1**	**4**	**480**	**440**	**625**	**7.4**
	Maximum	**454**	**30.7**	**64**	**3,020**	**1,070**	**1,150**	**8.2**
	Minimum	**4**	**8.2**	**< 3**	**42**	**100**	**177**	**7.0**

Location	Date	Surfactants (MBAS) mg/L	Ortho-Phosphate mg/L	Total Phosphorous mg/L	NO3-N mg/L	NO-2 mg/L	NH3-N mg/L	TKN mg/L	Total Nitrogen mg/L
Las Vegas Creek at Pecos or Lena	08/30/92	3.10	0.06	1.10	1.80		0.42	9.5	11.3
	10/24/92	1.89	0.55	< 0.05	1.80		1.20	8.8	10.6
	10/28/92	1.12	0.18	0.51	1.40		0.33	3.7	5.1
	02/08/93	0.17	0.25	0.55	0.70		0.22	1.1	1.8
	05/14/93	1.34	0.36	1.00	0.10		2.30	6.5	6.6
	08/04/93	1.41	0.12	0.96	1.50		2.40	10.0	11.5
	02/04/94	0.83	0.87	1.50	1.30		0.92	5.3	6.6
	09/19/94	1.00	0.78	1.50	4.30		1.70	13.0	17.3
	03/11/95	0.25	0.21	0.36	0.40		0.20	1.6	2.0
	05/24/95	0.87	0.21	1.15	1.40		0.70	7.2	8.6
	08/20/95	1.55	0.20	0.55	1.10		0.30	5.0	6.1
	05/24/96	4.74	6.50	7.00	3.40		1.90	10.0	11.9
	07/15/96		0.68	0.94			1.20	8.5	8.7
	02/24/98	< 0.50	0.20	0.46	0.58		0.30	< 1.0	0.6
	03/26/98	0.73	0.54	0.85	0.56		0.23	3.2	3.8
	09/22/99			0.61	0.68		0.32	2.9	3.6
	02/12/03	0.36			0.71	< 0.10		1.9	2.6
	07/25/03				2.70	0.23		18.0	20.9
	08/16/03		0.29	2.40	1.40	0.13		10.0	11.5
	08/16/04	0.22	0.15	1.70	2.40	< 0.50		8.9	11.3
	01/03/05	0.41	0.10	0.20	0.50	< 0.10		1.0	1.5
	Median	**0.87**	**0.23**	**0.94**	**1.35**	**0.13**	**0.56**	**6.5**	**6.6**
	Maximum	**4.74**	**6.50**	**7.00**	**4.30**	**0.50**	**2.40**	**18.0**	**20.9**
	Minimum	**0.17**	**0.06**	**< 0.05**	**0.10**	**< 0.10**	**0.20**	**< 1.0**	**0.6**

Location	Date	Copper mg/L	Dissolved Copper mg/L	Chromium mg/L	Lead mg/L	Dissolved Lead mg/L	Mercury mg/L	Cadmium mg/L	Zinc mg/L	Dissolved Zinc mg/L	Silver mg/L
Las Vegas Creek at Pecos or Lena	08/30/92	0.010		0.019	0.072		< 0.0002	< 0.0050	0.32		< 0.0100
	10/24/92	0.190		0.057	0.280		0.0060	< 0.0050	0.96		< 0.0100
	10/28/92	0.055		0.019	0.071		< 0.0002	< 0.0050	0.28		< 0.0100
	02/08/93	0.019		< 0.010	0.036		< 0.0002	< 0.0050	0.29		< 0.0100
	05/14/93	0.027		< 0.010	0.026		< 0.0002	< 0.0050	0.15		< 0.0100
	08/04/93	0.078		0.021	0.078		< 0.0002	< 0.0050	0.38		< 0.0100
	02/04/94	0.047		0.018	0.057		0.0003	< 0.0050	0.23		< 0.0100
	09/19/94	0.057		0.015	0.053		< 0.0002	< 0.0050	0.30		< 0.0100
	03/11/95	< 0.010		< 0.010	0.017		< 0.0002	< 0.0050	0.08		< 0.0100
	05/24/95	0.098		0.023	0.140		< 0.0002	< 0.0050	0.59		< 0.0100
	08/20/95	0.024		< 0.010	0.008		< 0.0002	< 0.0050	0.12		< 0.0100
	05/24/96	0.070							0.43		
	07/15/96	0.091			< 0.100				0.35		
	02/24/98	0.013			< 0.100				0.07		
	03/26/98	0.012			< 0.100				0.11		
	09/22/99	0.049	< 0.010		< 0.100	< 0.10			0.29	< 0.200	
	02/12/03	0.020	< 0.010	0.004	0.008	< 0.10	< 0.0002	0.0011	0.09	< 0.200	< 0.0005
	07/25/03	0.066	< 0.010		0.043	< 0.10			0.45	0.042	
	08/16/03	0.220	< 0.010		0.120	< 0.10			1.00	0.020	
	08/16/04	0.170	< 0.010	0.004	0.099	< 0.02	0.0002	< 0.0025	0.85	0.021	< 0.0025
	01/03/05	0.020	< 0.010	0.004	0.006	< 0.02	< 0.0002	< 0.0005	0.07	< 0.020	< 0.0005
	Median	**0.049**	**< 0.010**	**0.013**	**0.072**	**< 0.10**	**< 0.0002**	**< 0.005**	**0.290**	**0.032**	**< 0.010**
	Maximum	**0.220**	**< 0.010**	**0.057**	**0.280**	**< 0.10**	**0.006**	**< 0.005**	**1.0**	**0.2**	**0.010**
	Minimum	**< 0.010**	**< 0.010**	**0.004**	**0.006**	**< 0.02**	**< 0.0002**	**< 0.001**	**0.070**	**< 0.02**	**< 0.001**

Location	Date	Nickel mg/L	Selenium mg/L	Arsenic mg/L	Boron mg/L	Cyanide mg/L	BOD mg/L	COD mg/L	Color ACU	Turbidity NTU	Phenol mg/L
Las Vegas Creek at Pecos or Lena	08/30/92	< 0.040		< 0.025	0.43	0.032	80	760	300	275	0.10
	10/24/92	< 0.040		< 0.025	0.26	0.024	69	500	120	340	0.10
	10/28/92	< 0.040		< 0.025	0.22	0.015	35	195	5	300	0.03
	02/08/93	< 0.040	< 0.005	< 0.005	0.08	< 0.005	27	230	15	180	0.10
	05/14/93	< 0.020	< 0.005	< 0.005	0.27	0.011	86	400	320	90	0.20
	08/04/93	0.020	0.017	0.015	0.30	0.011	115	690	560	65	0.10
	02/04/94	< 0.020	< 0.010	0.008	0.15	0.006	57	360	100	350	0.10
	09/19/94	0.026	< 0.005	0.008	0.40	0.016	99	720	500	20	0.06
	03/11/95	< 0.010	< 0.005	< 0.005	0.10	< 0.005	10	85	50	62	< 0.10
	05/24/95	0.016	< 0.005	0.007	0.13	0.005	34	295	30	270	0.02
	08/20/95	0.011	< 0.005	0.007	0.19	< 0.005	29	245	200		0.10
	05/24/96				0.30	0.010	265	550	175	8	0.09
	07/15/96				0.19	< 0.005	58	380	300	190	< 0.01
	02/24/98				0.06	< 0.005	17	100	15	132	< 0.01
	03/26/98				0.08	< 0.005	27	130	30	720	< 0.01
	09/22/99				0.06						
	02/12/03	< 0.005	< 0.005	< 0.002	< 0.05						
	07/25/03				0.22						
	08/16/03				0.15						
	08/16/04	0.036	< 0.025	0.015	0.14						
	01/03/05	< 0.005	< 0.010	< 0.002	0.06						
	Median	**< 0.020**	**< 0.005**	**0.008**	**0.15**	**0.006**	**57**	**360**	**120**	**185**	**< 0.10**
	Maximum	**< 0.040**	**< 0.025**	**0.025**	**0.43**	**0.032**	**265**	**760**	**560**	**720**	**0.20**
	Minimum	**< 0.005**	**< 0.005**	**< 0.002**	**< 0.05**	**< 0.005**	**10**	**85**	**5**	**8**	**< 0.01**

Location	Date	Petroleum Hydrocarbon	TPH (diesel) MPN/100 mL	TPH (gasoline) MPN/100 mL	Total Chlorine mg/L	Fecal Coliform MPN/100 mL	Fecal* Coliform MPN/100 mL	Fecal** Coliform MPN/100 mL	Fecal Strep. MPN/100 mL	Fecal* Strep. MPN/100 mL
Las Vegas Creek at Pecos or Lena	08/30/92				< 0.10	160,000			> 16	
	10/24/92				< 0.10	700,000			500,000	
	10/28/92				< 0.10	80,000			500,000	
	02/08/93				< 0.10	17,000	8,000	13,000	160,000	30,000
	05/14/93				< 0.10	5,000,000	1,700,000	300,000	6,000,000	1,300,000
	08/04/93				< 0.10	5,000,000	300,000	1,300,000	160,000	1,700,000
	02/04/94				< 0.10	2,200	2,400		35,000	1,300
	09/19/94				< 0.01			900,000		
	03/11/95		< 1	< 1	< 0.01			24,000		
	05/24/95	< 1			< 0.01			160,000		
	08/20/95		< 1	< 1	0.20			28,000		
	05/24/96					11,000			> 16,000	
	07/15/96				< 0.01	3,000,000			80,000	
	02/24/98	< 1			0.10	5,000			13,000	
	03/26/98	< 1			< 0.10	160,000			90,000	
	09/22/99					8,000			170,000	
	02/12/03					5,000			90,000	
	07/25/03					900,000			500,000	
	08/16/03					1,600,000			240,000	
	08/16/04					> 1,600,000			220,000	
	01/03/05					1,300			11,000	
	Median	**< 1**	**< 1**	**< 1**	**< 0.10**	**160,000**	**154,000**	**160,000**	**160,000**	**665,000**
	Maximum	**< 1**	**< 1**	**< 1**	**0.20**	**5,000,000**	**1,700,000**	**1,300,000**	**6,000,000**	**1,700,000**
	Minimum	**< 1**	**< 1**	**< 1**	**< 0.01**	**1,300**	**2,400**	**13,000**	**16**	**1,300**

Location	Date	Fecal** Strep. MPN/100 mL	Salmonella MPN/100 mL	VOC # of detects	Pesticides # of detects	SOC # of detects	Herbicides # of detects
Las Vegas Creek at Pecos or Lena	08/30/92						
	10/24/92						
	10/28/92						
	02/08/93	5,000					
	05/14/93	3,000,000					
	08/04/93	3,000,000					
	02/04/94						
	09/19/94	160,000	< 2				
	03/11/95	160,000	22				
	05/24/95	> 160,000	< 2				
	08/20/95	90,000	7				
	05/24/96		160		1		
	07/15/96		9		0		0
	02/24/98		< 2		0		1
	03/26/98		< 2		1		4
	09/22/99			1 e			0
	02/12/03			1 a	0	4 g,k,n,x	0
	07/25/03			1 k	4	7	2
	08/16/03			2 k,l	0	7	0
	08/16/04			1 a	0	5 x,h,o,l	3 y,uu,xx
	01/03/05			0	0	8 x,o,i, nn,g,l.k	3 hh,uu.xx
	Median	**160,000**	**5**				
	Maximum	**3,000,000**	**160**				
	Minimum	**5,000**	**< 2**				

Location	Date	Q cfs	Temp Deg. C	Oil & Grease mg/L	TSS mg/L	TDS mg/L	Specific Conductance umho/cm	Lab pH units	Surfactants (MBAS) mg/L	Ortho-Phosphate mg/L
Duck Creek at Boulder Highway	08/30/92	30	27.1	< 3	120	4,590		7.8	0.64	< 0.05
	10/24/92	73	17.7	< 3	130	4,670		7.6	0.62	0.06
	02/08/93	43	11.5	< 3	23	4,700		8.1	< 0.10	< 0.05
	08/04/93	15	27.5	< 3	150	5,150		7.3	0.54	< 0.05
	02/04/94	22	9.0	< 3	4,430	3,360	7,380	7.5	0.15	2.26
	03/25/94	22	17.3	< 3	240	3,990	17,480	7.7	0.23	0.11
	07/19/94	38	23.0	< 3	280	3,350	4,930	7.3	2.25	0.07
	01/24/95	21	9.4	3	360	230	2,520	8.0	0.30	0.11
	02/20/96			4	2,170	2,910		7.4		0.33
	07/14/96	177	29.1	3	1,270	2,450	2,900	7.1		0.65
	04/02/97		12.3	< 3	170	1,660	2,050	7.2	0.77	< 0.05
	07/22/97		24.8	375	6,540	2,960	389	7.5		0.04
	02/03/98		12.0	< 3	2,020	2,290	290	7.5	< 0.50	0.09
	09/08/98	171		< 3	5,720	1,520				
	06/02/99	10		< 3	50	1,100				
	09/22/99			< 3	210	870				
	02/16/00			< 3	1,920	1,240				
	08/30/00	108		< 3	4,360	1,300				
	07/06/01	242		< 3	8,420	1,610				
	02/12/03	489		< 3	2,580	1,270	1,580	7.4	0.23	0.08
	07/24/03				1,080	3,290				
	08/16/04			5	3,960	1,920	2,320	7.2	0.28	0.09
	09/09/04			< 5	26,300	2,040	2,080	7.7	0.22	0.04
	Median	**41**	**18**	**< 3**	**1,270**	**2,290**	**2,320**	**7.5**	**0.30**	**0.08**
	Maximum	**489**	**29**	**375**	**26,300**	**5,150**	**17,480**	**8.1**	**2.25**	**2.26**
	Minimum	**10**	**9**	**< 3**	**23**	**230**	**290**	**7.1**	**< 0.10**	**0.04**

Location	Date	Total Phosphorous mg/L	NO3-N mg/L	NO-2 mg/L	NH3-N mg/L	TKN mg/L	Total Nitrogen mg/L	Copper mg/L	Dissolved Copper mg/L
Duck Creek at Boulder Highway	08/30/92	0.12	3.5		0.06	2.6	4.5	< 0.010	
	10/24/92	0.16	3.8		0.42	3.7	7.5	< 0.010	
	02/08/93	0.06	4.6		< 0.10	< 1.0	5.6	< 0.010	
	08/04/93	0.13	4.1		0.68	3.1	7.2	< 0.010	
	02/04/94	1.30	4.5		0.69	4.3	8.8	0.044	
	03/25/94	0.20	< 2.0		0.40	3.4	5.4	0.016	
	07/19/94	0.37	4.1		2.30	5.5	9.6	0.025	
	01/24/95		1.0		0.20	1.5	2.5	0.022	
	02/20/96	1.00	3.6		1.00	8.1	9.1	0.062	
	07/14/96	5.60	2.3		1.20	11.0	13.3	0.046	
	04/02/97	0.38	3.2		1.00	5.2	8.4	0.016	
	07/22/97	0.41	< 1.0		0.60	6.8	7.8	0.140	
	02/03/98	1.34	3.8		0.60	5.2	9.0	< 0.010	
	09/08/98	1.20	2.2		0.44	13.0	2.3	0.240	0.02
	06/02/99	0.58	2.4		0.79	4.7	7.1	0.040	< 0.01
	09/22/99	0.44	1.9		0.40	2.5	4.3	< 0.010	< 0.01
	02/16/00	2.29	3.0		0.89	6.9	9.9	0.150	< 0.01
	08/30/00	3.60	1.8		0.26	4.9	6.7	0.240	< 0.01
	07/06/01	7.50	2.0		< 0.05	11.0	13.0	0.240	< 0.01
	02/12/03	2.70	1.3	< 0.5		9.7	11.0	0.094	< 0.01
	07/24/03		2.8	1.8		6.2	10.8	< 0.200	< 0.02
	08/16/04	1.70	3.6	2.6		11.0	17.2	0.280	0.53
	09/09/04	2.40	2.4	< 0.4		8.9	11.3	0.094	< 0.01
	Median	**1.00**	**2.80**	**1.15**	**0.60**	**5.20**	**8.40**	**0.04**	**< 0.01**
	Maximum	**7.50**	**4.60**	**2.60**	**2.30**	**13.00**	**17.20**	**0.28**	**0.53**
	Minimum	**0.06**	**< 1.00**	**< 0.40**	**< 0.05**	**< 1.00**	**2.33**	**< 0.01**	**< 0.01**

Location	Date	Chromium mg/L	Lead mg/L	Dissolved Lead mg/L	Mercury mg/L	Cadmium mg/L	Zinc mg/L	Dissolved Zinc mg/L	Silver mg/L
Duck Creek at Boulder Highway	08/30/92	< 0.0100	< 5.000		< 0.0002	< 0.0050	0.053		< 0.010
	10/24/92	< 0.0100	< 0.010		< 0.0002	< 0.0050	0.038		< 0.010
	02/08/93	< 0.0100	< 0.004		< 0.0002	< 0.0050	0.097		< 0.010
	08/04/93	< 0.0100	< 0.004		< 0.0002	< 0.0050	0.035		< 0.010
	02/04/94	0.0450	0.031		0.0002	< 0.0050	0.200		< 0.010
	03/25/94	0.0100	0.006		< 0.0002	< 0.0050	0.053		< 0.010
	07/19/94	0.0100	0.007		< 0.0002	< 0.0050	0.073		< 0.010
	01/24/95	< 0.0100	< 0.100		0.0002	< 0.0050	0.110		< 0.010
	02/20/96						0.160		
	07/14/96		< 0.100				0.210		
	04/02/97		< 0.100				0.083		
	07/22/97		< 0.100				0.190		
	02/03/98		0.120				0.340		
	09/08/98		0.220	< 0.100			0.730	< 0.020	
	06/02/99		< 0.100	< 0.100			0.130	< 0.020	
	09/22/99		< 0.100	< 0.100			0.079	< 0.020	
	02/16/00		< 0.100	< 0.100			0.500	< 0.020	
	08/30/00		< 0.100	< 0.100			0.910	< 0.020	
	07/06/01		0.150	< 0.100			0.850	0.029	
	02/12/03	0.0091	0.040	< 0.100	< 0.0002	0.0011	0.270	< 0.020	< 0.001
	07/24/03		0.019	< 0.200			0.140	< 0.040	
	08/16/04	0.0450	0.046	< 0.020	< 0.0002	0.0030	0.530	0.025	< 0.003
	09/09/04	0.0670	0.077	0.020	< 0.0002	0.0016	0.480	< 0.020	0.013
	Median	**< 0.0100**	**< 0.100**	**< 0.1000**	**< 0.0002**	**< 0.0050**	**0.160**	**< 0.020**	**< 0.010**
	Maximum	**0.0670**	**< 5.000**	**< 0.2000**	**0.0002**	**< 0.0050**	**0.910**	**0.040**	**0.013**
	Minimum	**0.0091**	**< 0.004**	**< 0.0200**	**< 0.0002**	**0.0011**	**0.035**	**< 0.020**	**< 0.001**

Location	Date	Nickel mg/L	Selenium mg/L	Arsenic mg/L	Boron mg/L	Cyanide mg/L	BOD mg/L	COD mg/L	Color ACU
Duck Creek at Boulder Highway	08/30/92	< 0.04		0.060	2.70	0.013	19	99	100
	10/24/92	< 0.04		0.038	2.50	0.007	21	125	225
	02/08/93	< 0.04	< 0.025	0.042	2.30	< 0.005	< 6	30	25
	08/04/93	< 0.02		0.037	3.00	< 0.005	77	230	200
	02/04/94	0.03	< 0.020	0.100	1.50	< 0.005	28	175	225
	03/25/94	< 0.01	0.019	0.046	1.80	< 0.005	15	89	60
	07/19/94	0.01	< 0.010	0.034	1.60	0.011	67	445	60
	01/24/95	< 0.01	< 0.005		0.08	0.009	12	90	30
	02/20/96				1.20	0.030	50	245	30
	07/14/96				1.60	< 0.005	110	780	200
	04/02/97				0.79	0.006	40	280	150
	07/22/97				1.60	0.022	20	170	150
	02/03/98				1.20	< 0.005	48	190	75
	09/08/98				0.72				
	06/02/99				0.77				
	09/22/99				0.46				
	02/16/00				0.77				
	08/30/00				0.56				
	07/06/01				0.79				
	02/12/03	0.03	< 0.050	0.089	0.33				
	07/24/03				1.30				
	08/16/04	0.05	< 0.025	0.063	0.70				
	09/09/04	0.12	< 0.025	0.190	0.84				
	Median	**< 0.03**	**< 0.023**	**0.053**	**1.20**	**< 0.006**	**28**	**175**	**100**
	Maximum	**0.12**	**< 0.050**	**0.190**	**3.00**	**0.030**	**110**	**780**	**225**
	Minimum	**< 0.01**	**< 0.005**	**0.034**	**0.08**	**< 0.005**	**< 6**	**30**	**25**

Location	Date	Turbidity NTU	Phenol mg/L	Petroleum Hydrocarbons	TPH (diesel) MPN/100 mL	TPH (gasoline) MPN/100 mL	Total Chlorine mg/L	Fecal Coliform MPN/100 mL	Fecal* Coliform MPN/100 mL	Fecal** Coliform MPN/100 mL
Duck Creek at Boulder Highway	08/30/92	55	0.02				< 0.10	50,000		
	10/24/92	55	0.50				< 0.10	50,000		
	02/08/93	14	0.10				< 0.10	400	800	
	08/04/93	34	0.02				< 0.10	1,700,000	1,400,000	1,300,000
	02/04/94	650	0.10				< 0.10	1,100	2,300	220
	03/25/94	70	< 0.01				< 0.10	3,000		3,000
	07/19/94	45					< 0.10	900,000	300,000	500,000
	01/24/95	120	< 0.10		< 1	< 1	< 0.01			5,000
	02/20/96	14	< 0.01	< 1				3,000		
	07/14/96	3,800	< 0.01				< 0.01	5,000,000		
	04/02/97	72	< 0.01	< 1				7,000		
	07/22/97	2,300	< 0.01	< 1			0.40	22,000		
	02/03/98	370	< 0.01	< 1			< 0.10	1,100		
	09/08/98							17,000		
	06/02/99							7,900		
	09/22/99							160,000		
	02/16/00							8,000		
	08/30/00							110,000		
	07/06/01							900,000		
	02/12/03							30,000		
	07/24/03							1,600,000		
	08/16/04							900		
	09/09/04							900,000		
	Median	**70**	**< 0.02**	**< 1**	**< 1**	**< 1**	**< 0.10**	**26,000**	**151,150**	**5,000**
	Maximum	**3800**	**0.50**	**< 1**	**< 1**	**< 1**	**0.40**	**5,000,000**	**1,400,000**	**1,300,000**
	Minimum	**14**	**< 0.01**	**< 1**	**< 1**	**< 1**	**< 0.01**	**400**	**800**	**220**

Location	Date	Fecal Strep. MPN/100 mL	Fecal* Strep. MPN/100 mL	Fecal** Strep. MPN/100 mL	Salmonella MPN/100 mL	VOC # of detects	Pesticides # of detects	SOC # of detects	Herbicides # of detects
Duck Creek at Boulder Highway	08/30/92	> 16							
	10/24/92	30,000							
	02/08/93	3,000	13,000						
	08/04/93	160,000	160,000	3,000,000					
	02/04/94	8,000	2,300	230					
	03/25/94	13,000		30,000	< 2.0				
	07/19/94	240,000	240,000	240,000	2.0				
	01/24/95			17,000	< 2.0				
	02/20/96	13,000			5.0				
	07/14/96	500,000			2.2		0		0
	04/02/97	90,000			4.0		0		3
	07/22/97	17,000			9.2		0		1
	02/03/98	50,000			< 2.2		0		1
	09/08/98	24,000			< 2.2	0	0		0
	06/02/99	130,000				1 a	0		0
	09/22/99	35,000				1 a	0		0
	02/16/00	80,000				1 a	0		0
	08/30/00	90,000				0	0		0
	07/06/01	300,000				2 a,b	0		2 f
	02/12/03	160,000				1 a	0	3 g,m,x	0
	07/24/03	80,000				1	0	7	0
	08/16/04	70,000				1 a	0	2 x,o	0 y,hh
	09/09/04	> 160,000				1 a	0	2 o,g	1 uu
	Median	**75,000**	**86,500**	**30,000**	**< 2.2**				
	Maximum	**500,000**	**240,000**	**3,000,000**	**9.2**				
	Minimum	**16**	**2,300**	**230**	**< 2.0**				

Location	Date	Q cfs	Temp Deg. C	Oil & Grease mg/L	TSS mg/L	TDS mg/L	Specific Conductance umho/cm	Lab pH units	Surfactants (MBAS) mg/L	Ortho-Phosphate mg/L	Total Phosphorous mg/L
Flamingo Wash at Nellis	10/24/92	115	18.0	< 3.0	1,710	1,270		7.4	1.51	0.18	1.20
	02/08/93	160	12.3	< 3.0	1,130	130		8.2	< 0.05	0.46	0.66
	06/05/93	41	17.7	3.9	1,420	1,520		7.5	1.84	0.44	0.82
	08/05/93	57	26.1	< 3.0	5,910	2,290		7.6	1.18	0.06	1.20
	02/04/94	45	9.0	5.3	620	1,180	2,300	7.4	0.69	0.61	0.68
	03/25/94	79	17.4	6.5	3,860	1,140	7,570	7.4	0.78	0.84	1.80
	07/19/94		24.4	7.0	6,710	1,200	1,501	7.4	3.49	0.19	2.10
	08/19/94	37	26.0	3.8	4,750	1,060	2,080	7.7	0.05	< 0.05	1.00
	01/24/95	125	9.3	4.5	1,960	600	389	7.9	0.22	0.08	
	05/24/95	30	18.3	< 3.0	255	1,160	1,302	7.5	0.71	0.06	0.32
	08/12/95	335	26.4	7.2	1,050	1,010	1,003	7.2	1.70	0.14	1.50
	01/31/96			18.0	560	1,920		7.0	1.99	0.44	1.30
	11/21/96	184	17.3	< 3.0	2,620	440	3,830	7.8	< 0.05	0.15	1.50
	09/25/97		19.7	< 3.0	324	580	710	7.3	1.75	0.57	0.66
	02/04/98		11.2	5.2	1,800	680	240	7.6	0.92	0.22	2.94
	02/24/98		12.0	< 3.0	660	380		7.8	< 0.50	0.08	0.88
	02/12/03	538		< 3.0	1,900	260	415	7.6	0.33	0.15	1.05
	04/14/03	411			3,410	505	650	7.4	< 0.05		
	07/24/03	120			2,230	790					
	08/16/03	366			19,200	810				0.34	1.00
	08/13/04			< 5.0	18,800	940	1,020	7.2	0.06	0.11	5.00
	08/16/04			< 5.0	5,760	1,040	1,210	7.3	0.59	0.09	3.20
	Median	**120**	**17.7**	**< 4**	**1,930**	**975**	**1,115**	**7.5**	**0.70**	**0.17**	**1.20**
	Maximum	**538**	**26.4**	**18**	**19,200**	**2,290**	**7,570**	**8.2**	**3.49**	**0.84**	**5.00**
	Minimum	**30**	**9.0**	**< 3**	**255**	**130**	**240**	**7.0**	**< 0.05**	**< 0.05**	**0.32**

Location	Date	NO3-N mg/L	NO-2 mg/L	NH3-N mg/L	TKN mg/L	Total Nitrogen mg/L	Copper mg/L	Dissolved Copper mg/L	Chromium mg/L	Lead mg/L
Flamingo Wash at Nellis	10/24/92	2.30		1.40	7.6	9.9	0.100		0.038	0.079
	02/08/93	0.40		0.13	< 1.0	1.4	0.020		0.031	0.019
	06/05/93	3.20		1.10	4.9	8.1	0.059		0.031	0.051
	08/05/93	4.30		1.90	6.6	10.9	0.067		0.040	0.086
	02/04/94	2.60		1.00	3.7	6.3	0.046		0.011	0.014
	03/25/94	< 0.50		0.80	7.1	7.6	0.094		0.048	0.100
	07/19/94	3.00		2.50	6.1	9.1	0.130		0.050	0.130
	08/19/94	2.00		0.82	9.1	11.1	0.094		0.043	0.125
	01/24/95	1.30		0.30	2.6	3.9	0.061		0.028	< 0.100
	05/24/95	2.10		0.40	3.1	5.2	0.027		< 0.010	0.018
	08/12/95	< 0.30		1.00	9.3	9.6	0.069		0.017	0.049
	01/31/96	5.10		2.50	13.0	18.1	0.070			0.130
	11/21/96	1.00		0.60	3.8	4.8	0.057			< 0.100
	09/25/97	0.50		0.30	2.7	3.2	0.026			< 0.100
	02/04/98	1.70		0.80	19.0	20.7	0.065			0.120
	02/24/98	0.98		0.30	2.2	3.2	0.020			< 0.100
	02/12/03	0.97	< 0.10		3.2	4.2	0.039	< 0.010	0.006	0.030
	04/14/03	1.23	0.13		7.6	9.0	0.100	< 0.010	34.000	0.047
	07/24/03	1.80	< 0.50		6.6	8.4	0.170	< 0.010		0.074
	08/16/03	2.00	< 0.20		5.4	7.4	0.320	< 0.010		0.120
	08/13/04	2.20	< 0.20		16.0	2.2	0.270	< 0.020	< 0.100	0.410
	08/16/04	2.60	0.09		11.0	14.5	0.220	< 0.010	0.066	0.220
	Median	**1.90**	**0.17**	**0.81**	**6.4**	**7.9**	**0.068**	**< 0.010**	**0.038**	**0.100**
	Maximum	**5.10**	**0.50**	**2.50**	**19.0**	**20.7**	**0.320**	**0.020**	**34.000**	**0.410**
	Minimum	**< 0.30**	**0.09**	**0.13**	**< 1.0**	**1.4**	**0.020**	**< 0.010**	**0.006**	**0.014**

Location	Date	Dissolved Lead mg/L	Mercury mg/L	Cadmium mg/L	Zinc mg/L	Dissolved Zinc mg/L	Silver mg/L	Nickel mg/L	Selenium mg/L	Arsenic mg/L
Flamingo Wash at Nellis	10/24/92		0.0002	< 0.0050	0.43		< 0.010	< 0.040		< 0.0250
	02/08/93		< 0.2000	< 0.0050	0.18		< 0.010	< 0.040	< 0.025	0.0150
	06/05/93		0.0002	< 0.0050	0.26		< 0.010	< 0.020	< 0.015	0.0160
	08/05/93		< 0.0002	< 0.0050	0.27		< 0.010	0.030		0.0270
	02/04/94		< 0.0002	< 0.0050	0.09		< 0.010	< 0.020	< 0.010	0.0080
	03/25/94		0.0004	< 0.0050	0.37		< 0.010	0.032	< 0.015	0.0310
	07/19/94		0.0004	< 0.0050	0.55		< 0.010	0.054	< 0.010	0.0320
	08/19/94		0.0002	< 0.0050	0.44		< 0.010	0.026	< 0.005	0.0310
	01/24/95		< 0.0002	< 0.0050	0.26		< 0.010	0.016	< 0.005	
	05/24/95		< 0.0002	< 0.0050	0.09		< 0.010	0.011	0.007	< 0.0050
	08/12/95		< 0.0002	< 0.0050	0.37		< 0.010	0.027	< 0.005	0.0090
	01/31/96				0.86					
	11/21/96				0.28					
	09/25/97				0.13					
	02/04/98				0.36					
	02/24/98				0.15					
	02/12/03	< 0.100	< 0.0002	0.0007	0.17	0.100	< 0.050	0.015	< 0.050	0.0120
	04/14/03	< 0.100	< 0.0002	< 0.0025	0.45	< 0.020	0.006	0.038	< 0.040	0.0140
	07/24/03	< 0.100			1.10	0.023				
	08/16/03	< 0.100			1.50	< 0.020				
	08/13/04	< 0.020	0.0003	< 0.0500	< 0.01	1.900	< 0.005	0.500	< 0.025	< 0.0120
	08/16/04	< 0.020	0.0026	0.0030	1.10	0.026	< 0.003	0.062	< 0.025	0.0270
	Median	**< 0.100**	**< 0.0002**	**< 0.0050**	**0.32**	**0.025**	**< 0.010**	**0.030**	**< 0.015**	**0.016**
	Maximum	**< 0.100**	**0.2000**	**< 0.0500**	**1.50**	**1.900**	**0.050**	**0.500**	**< 0.050**	**0.032**
	Minimum	**< 0.020**	**< 0.0002**	**0.0007**	**< 0.01**	**< 0.020**	**< 0.003**	**0.011**	**< 0.005**	**< 0.005**

Location	Date	Boron mg/L	Cyanide mg/L	BOD mg/L	COD mg/L	Color ACU	Turbidity NTU	Phenol mg/L	Petroleum Hydrocarbons	TPH (diesel) MPN/100 mL
Flamingo Wash at Nellis	10/24/92	0.49	0.008	54	555	175	750.0	0.020		
	02/08/93	0.09	< 0.005	< 6	57	15	700.0	0.100		
	06/05/93	0.58	< 0.005	56	375	320	390.0	< 0.010		
	08/05/93	0.97	0.008	85	415	320	200.0	0.020		
	02/04/94	0.41	< 0.005	37	185	100	190.0	0.100		
	03/25/94	0.37	0.008	55	395	1,000	1,400.0	0.010		
	07/19/94	0.44	0.013	22	630	150	0.2	0.130		
	08/19/94	0.35	< 0.005	40	465	150	950.0	< 0.100		
	01/24/95	0.18	< 0.005	33	155	25	510.0	0.100		< 1
	05/24/95	0.50	0.007	19	115	35	180.0	0.010	< 1.00	
	08/12/95	0.34	< 0.005	78	450	250	8.0	< 0.100		< 1
	01/31/96	0.71	0.030	116	660	230	520.0	0.020	< 1.00	
	11/21/96	0.12	< 0.005	18	220	30	3,300.0	< 0.010	< 1.00	
	09/25/97	0.30	< 0.005	42	160	60	280.0	< 0.010	1.50	
	02/04/98	0.22	< 0.005	63	570	75	2,200.0	< 0.010	< 1.00	
	02/24/98	0.13	< 0.005	13	98	15	740.0	< 0.010	< 1.00	
	02/12/03	< 0.05								
	04/14/03	0.18								
	07/24/03	0.24								
	08/16/03	0.27								
	08/13/04	0.56								
	08/16/04	0.28								
	Median	**0.32**	**< 0.005**	**41**	**385**	**125**	**515**	**0.020**	**< 1.00**	**< 1**
	Maximum	**0.97**	**0.030**	**116**	**660**	**1,000**	**3,300**	**0.130**	**1.50**	**< 1**
	Minimum	**< 0.05**	**< 0.005**	**< 6**	**57**	**15**	**0.2**	**< 0.010**	**< 1.00**	**< 1**

Location	Date	TPH (gasoline) MPN/100 mL	Total Chlorine mg/L	Fecal Coliform MPN/100 mL	Fecal* Coliform MPN/100 mL	Fecal** Coliform MPN/100 mL	Fecal Strep. MPN/100 mL	Fecal* Strep. MPN/100 mL	Fecal** Strep. MPN/100 mL	Salmonella MPN/100 mL
Flamingo Wash at Nellis	10/24/92		< 0.10	80,000			80,000			
	02/08/93		< 0.10	1,700	3,000		90,000	30,000		
	06/05/93		< 0.10	8,000	28,000	5,000	50,000	160,000	90,000	
	08/05/93		< 0.10	300,000	500,000	50,000	90,000	160,000	90,000	
	02/04/94		< 0.10	1,300	500	2,300	22,000	1,300	500	
	03/25/94		< 0.10	24,000	30,000	30,000	160,000	160,000	90,000	< 2
	07/19/94		< 0.10		1,600,000	500,000		500,000	170,000	13
	08/19/94		< 0.10	170,000	80,000	140,000	300,000	130,000	130,000	8
	01/24/95	< 1	< 0.01			3,000			22,000	8
	05/24/95		< 0.01			160,000			90,000	2
	08/12/95	< 1	< 0.01			> 160,000			> 1,600	2
	01/31/96			13,000			3,000			< 2
	11/21/96		< 0.01	240			738			< 2
	09/25/97			90,000			160,000			< 2
	02/04/98		0.10	5,000			50,000			< 2
	02/24/98		0.20	13,000			17,000			< 2
	02/12/03			7,000			17,000			
	04/14/03			130,000			70,000			
	07/24/03			1,600,000			170,000			
	08/16/03			300,000			10,000			0
	08/13/04			> 1,600,000			170,000			
	08/16/04			> 1,600,000			900,000			
	Median	**< 1**	**< 0.10**	**52,000**	**30,000**	**50,000**	**75,000**	**160,000**	**90,000**	**< 2**
	Maximum	**< 1**	**0.20**	**1,600,000**	**1,600,000**	**500,000**	**900,000**	**500,000**	**170,000**	**13**
	Minimum	**< 1**	**< 0.01**	**240**	**500**	**2300**	**738**	**1,300**	**500**	**0**

Location	Date	VOC # of detects	Pesticides # of detects	SOC # of detects	Herbicides # of detects
Flamingo Wash at Nellis	10/24/92				
	02/08/93				
	06/05/93				
	08/05/93				
	02/04/94				
	03/25/94				
	07/19/94				
	08/19/94				
	01/24/95				
	05/24/95				
	08/12/95				
	01/31/96		0		0
	11/21/96		0		0
	09/25/97		0		0
	02/04/98		2		1
	02/24/98		1		1
	02/12/03	1 a	0	9 g,h,j,o,q,s,t,u,x	0
	04/14/03	1 d		8 g,h,k,o,x,z,aa,bb	0
	07/24/03	2	0	3	0
	08/16/03	1	0	0	0
	08/13/04	2 k,l	0	2 x,o	0
	08/16/04	1 a	0	3 x,o,g	2 y,uu
	Median				
	Maximum				
	Minimum				

Location	Date	Q cfs	Temp Deg. C	Oil & Grease mg/L	TSS mg/L	TDS mg/L	Specific Conductance umho/cm	Lab pH units	Surfactants (MBAS) mg/L	Ortho-Phosphate mg/L	Total Phosphorous mg/L
C-1 Channel at Warm Springs	08/30/92	500	24.5	< 3	17,800	230		8.0	0.26	< 0.05	2.20
	02/08/93	181	11.1	< 3	3,670	140		8.3	< 0.05	1.50	3.90
	07/19/94		24.1	3	77	290	486	7.5	1.81	0.41	0.42
	09/19/94		22.7	3	120	930	888	7.6	2.60	1.20	2.70
	01/24/95	5	9.5	< 3	1,190	210	274	8.2	0.14	0.41	
	11/21/96	30	17.0	< 3	1,980	150	575	8.2	< 0.05	0.52	1.90
	08/10/97		17.5	< 3	4,800	260		8.5	0.60	0.37	1.48
	02/24/98		12.0	< 3	1,460	88		8.4	< 0.50	0.61	6.04
	02/16/00			< 3	610	62					2.15
	08/16/00	76		5	1,170	380					1.50
	02/25/03	9		< 3	187	100	139	7.7	0.19		
	09/04/03	29			3,850	440					6.80
	11/12/03	156			110	150				0.26	0.38
	11/07/04			< 5	810	80	93	8.4	0.05	1.40	1.50
	Median	**53**	**17.3**	**< 3**	**1,180**	**180**	**380**	**8.2**	**0.22**	**0.47**	**2.03**
	Maximum	**500**	**25**	**5**	**17,800**	**930**	**888**	**9**	**3**	**2**	**7**
	Minimum	**5**	**9.5**	**< 3**	**77**	**62**	**93**	**7.5**	**< 0.05**	**< 0.05**	**0.38**

Location	Date	NO3-N mg/L	NO-2 mg/L	NH3-N mg/L	TKN mg/L	Total Nitrogen mg/L	Copper mg/L	Dissolved Copper mg/L	Chromium mg/L	Lead mg/L
C-1 Channel at Warm Springs	08/30/92	1.60		0.07	8.3	9.9	0.27		0.1900	0.2200
	02/08/93	0.30		0.11	< 1.0	1.3	0.09		0.0630	0.0600
	07/19/94	0.80		0.97	2.8	3.6	0.02		< 0.0100	0.0100
	09/19/94	5.20		1.60	4.1	9.3	0.03		0.0140	0.0220
	01/24/95	0.80		0.06	< 1.0	1.8	0.04		0.0190	< 0.1000
	11/21/96	0.80		0.30	2.1	2.9	0.03			< 0.1000
	08/10/97	2.00		0.20	5.2	7.2	0.03			< 0.1000
	02/24/98	0.59		0.20	1.7	2.3	< 0.01			< 0.1000
	02/16/00	0.49		0.36	1.9	2.4	0.07	< 0.010		< 0.1000
	08/16/00	4.12		1.13	6.1	10.2	0.15	0.034		< 0.1000
	02/25/03	0.44	< 0.10		0.9	1.4	0.03	< 0.010	0.0089	0.0055
	09/04/03	1.70	< 0.10		10.0	11.5	< 0.20	< 0.010		0.0900
	11/12/03	0.61	< 0.10		2.4	3.0	0.02	0.038		0.0045
	11/07/04	0.20	< 0.10		1.4	1.6	0.04	< 0.010	0.0160	0.0170
	Median	**0.80**	**< 0.10**	**0.25**	**2.3**	**3.0**	**0.03**	**< 0.010**	**0.0160**	**< 0.1000**
	Maximum	**5**	**< 0.10**	**2**	**10**	**12**	**0.27**	**0.038**	**0.1900**	**0.2200**
	Minimum	**0.20**	**< 0.10**	**0.06**	**0.9**	**1.3**	**0.01**	**< 0.010**	**0.0089**	**0.0045**

Location	Date	Dissolved Lead mg/L	Mercury mg/L	Cadmium mg/L	Zinc mg/L	Dissolved Zinc mg/L	Silver mg/L	Nickel mg/L	Selenium mg/L	Arsenic mg/L
C-1 Channel at Warm Springs	08/30/92		0.0014	< 0.0050	0.89		< 0.0100	0.210		0.120
	02/08/93		< 0.0002	< 0.0050	0.37		< 0.0100	0.077	< 0.0250	0.021
	07/19/94		< 0.0002	< 0.0050	0.08		< 0.0100	0.017	< 0.0050	< 0.005
	09/19/94		< 0.0002	< 0.0050	0.20		< 0.0100	0.022	< 0.0050	0.008
	01/24/95		0.0002	< 0.0050	0.18		< 0.0100	0.068	< 0.0050	
	11/21/96				0.23					
	08/10/97				0.20					
	02/24/98				0.17					
	02/16/00	< 0.10			0.32	< 0.20				
	08/16/00	< 0.10			0.49	< 0.02				
	02/25/03	< 0.10	< 0.0002	< 0.0005	0.08	0.10	< 0.0005	0.007	< 0.0050	0.003
	09/04/03	< 0.10			0.45	< 0.02				
	11/12/03	< 0.02			0.08	0.08				
	11/07/04	< 0.02	< 0.0002	< 0.0005	0.15	< 0.02	< 0.0005	0.020	< 0.0100	0.006
	Median	**< 0.10**	**< 0.0002**	**< 0.0050**	**0.20**	**< 0.05**	**< 0.0100**	**0.022**	**< 0.005**	**0.007**
	Maximum	**< 0.10**	**0.0014**	**< 0.0050**	**0.89**	**< 0.20**	**< 0.0100**	**0.210**	**< 0.025**	**0.120**
	Minimum	**< 0.02**	**< 0.0002**	**< 0.0005**	**0.08**	**< 0.02**	**< 0.0005**	**0.007**	**< 0.005**	**0.003**

Location	Date	Boron mg/L	Cyanide mg/L	BOD mg/L	COD mg/L	Color ACU	Turbidity NTU	Phenol mg/L	Petroleum Hydrocarbons	TPH (diesel) MPN/100 mL
C-1 Channel at Warm Springs	08/30/92	0.27	0.015	13	88	30	8,500	0.02		
	02/08/93	0.09	< 0.005	< 6	81	30	1,900	0.10		
	07/19/94	0.10	0.006	27	190	200	26	0.08		
	09/19/94	0.23	0.009	105	560	400	18	0.02		
	01/24/95	0.06	0.007	7	60	25	380	0.10		< 1
	11/21/96	0.07	< 0.005	< 6	58	32	840	< 0.01	< 1	
	08/10/97	0.15	< 0.005	8	230	< 3	4,400	< 0.01		
	02/24/98	0.09	< 0.005	13	120	20	850	< 0.01	< 1	
	02/16/00									
	08/16/00	0.12								
	02/25/03	< 0.05								
	09/04/03	0.11								
	11/12/03	< 0.05								
	11/07/04	< 0.05								
	Median	**0.09**	**0.006**	**11**	**104**	**30**	**845**	**0.02**	**< 1**	**< 1**
	Maximum	**0.27**	**0.015**	**105**	**560**	**400**	**8,500**	**0.10**	**< 1**	**< 1**
	Minimum	**< 0.05**	**< 0.005**	**< 6**	**58**	**3**	**18**	**< 0.01**	**< 1**	**< 1**

Location	Date	TPH (gasoline) MPN/100 mL	Total Chlorine mg/L	Fecal Coliform MPN/100 mL	Fecal* Coliform MPN/100 mL	Fecal** Coliform MPN/100 mL	Fecal Strep. MPN/100 mL	Fecal* Strep. MPN/100 mL	Fecal** Strep. MPN/100 mL	Salmonella MPN/100 mL
C-1 Channel at Warm Springs	08/30/92		< 0.100	90,000			> 16			
	02/08/93		< 0.100	3,000			30,000			
	07/19/94		< 0.100		11,000	30,000		80,000	300,000	4.0
	09/19/94		< 0.010			30,000			90,000	8.0
	01/24/95	< 1	< 0.010			1,700			13,000	< 2.0
	11/21/96		< 0.010	240			1,230			< 2.2
	08/10/97		< 0.100	3,000			50,000			9.2
	02/24/98		0.100	5,000			24,000			< 2.2
	02/16/00			13,000			30,000			
	08/16/00			30,000			90,000			
	02/25/03			8,000			2,400			
	09/04/03			17,000			30,000			
	11/12/03			24,000			16,000			
	11/07/04			5,000			17,000			
	Median	**< 1**	**< 0.100**	**8,000**	**11,000**	**30,000**	**24,000**	**80,000**	**90,000**	**3.1**
	Maximum	**< 1**	**0.100**	**90,000**	**11,000**	**30,000**	**90,000**	**80,000**	**300,000**	**9.2**
	Minimum	**< 1**	**< 0.010**	**240**	**11,000**	**1,700**	**> 16**	**80,000**	**13,000**	**< 2.0**

Location	Date	VOC # of detects	Pesticides # of detects	SOC # of detects	Herbicides # of detects
C-1 Channel at Warm Springs	08/30/92				
	02/08/93				
	07/19/94				
	09/19/94				
	01/24/95				
	11/21/96		0		1 hh
	08/10/97		0		1
	02/24/98		0		2
	02/16/00	1 d	0		0
	08/16/00	1 a	1 ww		1 hh
	02/25/03	0	0	5 g,h,l,o,x	0
	09/04/03	0	0	0	0
	11/12/03	4	0	4	0
	11/07/04	0	0	1 x	0
	Median				
	Maximum				
	Minimum				

Location	Date	Q cfs	Temp Deg. C	Oil & Grease mg/L	TSS mg/L	TDS mg/L	Specific Conductance umho/cm	Lab pH units	Surfactants (MBAS) mg/L	Ortho-Phosphate mg/L	Total Phosphorous mg/L
Sloan Channel (Range Wash) at Charleston	10/24/92	32	17.8	< 3	280	100		7.9	0.21	0.41	0.4
	02/08/93	56	10.5	< 3	830	130		8.2	< 0.10	0.64	4.7
	07/19/94	24	23.4		6,540	430	611	7.3	0.61	0.09	2.1
	08/09/94	5	24.1	< 3	16,200	440	598	7.9	0.31	0.09	2.0
	08/19/94	2	23.1	< 3	4,010	390	626	8.0	< 0.05	< 0.05	0.8
	01/24/95		10.0	< 3	3,540	230	3	8.1	0.22	0.08	
	08/12/95	5	27.3	3	3,390	510	620	7.4	0.75	0.24	3.1
	11/21/96	63	16.9	< 3	5,230	240	413	8.0	< 0.05	0.51	1.7
	07/22/97		27.0	1,060	230	200	297	8.1		0.44	0.1
	08/08/97			4	1,500	240		7.9	1.53	0.08	0.5
	08/14/98	30		< 3	4,060	330					1.0
	02/16/00			< 3	1,970	200					1.7
	02/26/01			< 3	220	110					0.3
	02/12/03	99		< 3	79	110	172	7.2	0.31	0.18	0.3
	10/20/04			< 5	270	180	263	7.9	0.56	0.30	0.5
	Median	**30**	**23.1**	**< 3**	**1,970**	**230**	**413**	**7.9**	**< 0.31**	**0.21**	**0.9**
	Maximum	**99**	**27.3**	**1,060**	**16,200**	**510**	**626**	**8.2**	**1.53**	**0.64**	**4.7**
	Minimum	**2**	**10.0**	**< 3**	**79**	**100**	**3**	**7.2**	**< 0.05**	**< 0.05**	**0.1**

Location	Date	NO3-N mg/L	NO-2 mg/L	NH3-N mg/L	TKN mg/L	Total Nitrogen mg/L	Copper mg/L	Dissolved Copper mg/L	Chromium mg/L	Lead mg/L
Sloan Channel (Range Wash) at Charleston	10/24/92	0.50		0.20	1.1	1.6	0.028		0.019	0.020
	02/08/93	0.40		0.14	< 1.0	1.4	0.017		0.021	0.018
	07/19/94	2.30		1.20	1.7	4.0	0.068		0.057	0.063
	08/09/94	1.30		0.14	2.7	4.0	0.049		0.031	0.086
	08/19/94	2.00		0.37	3.1	5.1	0.040		0.035	0.037
	01/24/95	8.70		0.70	2.5	11.2	0.064		0.058	< 0.100
	08/12/95	< 0.20		0.40	8.0	8.2	0.056		0.035	0.029
	11/21/96	1.10		0.50	3.7	4.8	0.033			< 0.100
	07/22/97	0.90		1.00	2.5	3.4	0.029			< 0.100
	08/08/97	2.00		2.50	6.1	8.1	0.150			0.210
	08/14/98	2.50		0.66	5.8	8.3	0.110	0.011		< 0.100
	02/16/00	1.74		0.49	3.9	5.6	0.012	< 0.010		< 0.100
	02/26/01	0.64		0.28	1.3	1.9	0.029	< 0.010		0.011
	02/12/03	0.73	< 0.1		2.0	2.7	0.018	< 0.010	0.004	0.006
	10/20/04	0.90	< 0.1		2.6	3.5	0.028	0.013		0.010
	Median	**1.10**	**< 0.1**	**0.49**	**2.6**	**4.0**	**0.033**	**0.010**	**0.033**	**0.063**
	Maximum	**8.70**	**< 0.1**	**2.50**	**8.0**	**11.2**	**0.150**	**0.013**	**0.058**	**0.210**
	Minimum	**< 0.20**	**< 0.1**	**0.14**	**< 1.0**	**1.4**	**0.012**	**< 0.010**	**0.004**	**0.006**

Location	Date	Dissolved Lead mg/L	Mercury mg/L	Cadmium mg/L	Zinc mg/L	Dissolved Zinc mg/L	Silver mg/L	Nickel mg/L	Selenium mg/L	Arsenic mg/L
Sloan Channel (Range Wash) at Charleston	10/24/92		< 0.0002	< 0.005	0.17		< 0.010	< 0.040		< 0.025
	02/08/93		< 0.0002	< 0.005	0.11		< 0.010	< 0.040	< 0.005	0.010
	07/19/94		< 0.0002	< 0.005	0.31		< 0.010	0.046	< 0.010	0.049
	08/09/94		0.0002	< 0.005	0.17		< 0.010	0.028	< 0.005	0.061
	08/19/94		< 0.0002	< 0.005	0.15		< 0.010	0.026	0.027	0.027
	01/24/95		< 0.0002	< 0.005	0.29		< 0.010	0.044	< 0.005	
	08/12/95		< 0.0002	< 0.005	0.30		< 0.010	0.030	< 0.005	0.018
	11/21/96				0.20					
	07/22/97				0.26					
	08/08/97				0.62					
	08/14/98	< 0.1000			0.44	< 0.02				
	02/16/00	< 0.1000			0.05	< 0.02				
	02/26/01	< 0.0005			0.12	< 0.02				
	02/12/03	< 0.1000	< 0.0002	< 0.001	0.08	< 0.02	< 0.001	< 0.001	< 0.050	0.003
	10/20/04	< 0.0200	0.0002	< 0.005			< 0.001	0.009	< 0.010	0.005
	Median	**< 0.1000**	**< 0.0002**	**< 0.005**	**0.19**	**< 0.02**	**< 0.010**	**0.030**	**< 0.008**	**0.022**
	Maximum	**< 0.1000**	**0.0002**	**< 0.005**	**0.62**	**< 0.02**	**< 0.010**	**0.046**	**< 0.050**	**0.061**
	Minimum	**< 0.0005**	**< 0.0002**	**< 0.001**	**0.05**	**< 0.02**	**< 0.001**	**< 0.001**	**< 0.005**	**0.003**

Location	Date	Boron mg/L	Cyanide mg/L	BOD mg/L	COD mg/L	Color ACU	Turbidity NTU	Phenol mg/L	Petroleum Hydrocarbons	TPH (diesel) MPN/100 mL
Sloan Channel (Range Wash) at Charleston	10/24/92	0.08	0.005	12	74	10.0	0	< 0.01		
	02/08/93	0.08	< 0.005	< 6	46	15.0	600	0.20		
	07/19/94	0.24	0.007	28	135	100.0	3	0.04		
	08/09/94	0.93	< 0.005	15	295	75.0	1	< 0.01		
	08/19/94	0.24	< 0.005	10	115	150.0	1,350	< 0.01		
	01/24/95	0.11	0.010	14	97	15.0	1,100	0.10		< 1
	08/12/95	0.20	< 0.005	59	375	250.0	63	0.10		< 1
	11/21/96	0.15	< 0.005	17	140	37.0	1,600	< 0.01	< 1	
	07/22/97	0.12	< 0.005	26	130	200.0	240	< 0.01	< 1	
	08/08/97	0.18	0.330	41	310	150.0	600	0.01		
	08/14/98	0.24								
	02/16/00	0.10								
	02/26/01									
	02/12/03	< 0.05								
	10/20/04	0.10								
	Median	**0.14**	**< 0.005**	**16**	**133**	**87.5**	**420**	**< 0.01**	**< 1**	**< 1**
	Maximum	**0.93**	**0.330**	**59**	**375**	**250.0**	**1,600**	**0.20**	**< 1**	**< 1**
	Minimum	**< 0.05**	**< 0.005**	**< 6**	**46**	**10.0**	**0.170**	**< 0.01**	**< 1**	**< 1**

Location	Date	TPH (gasoline) MPN/100 mL	Total Chlorine mg/L	Fecal Coliform MPN/100 mL	Fecal* Coliform MPN/100 mL	Fecal** Coliform MPN/100 mL	Fecal Strep. MPN/100 mL	Fecal* Strep. MPN/100 mL	Fecal** Strep. MPN/100 mL	Salmonella MPN/100 mL
Sloan Channel (Range Wash) at Charleston	10/24/92		< 0.10	5,000			130,000			
	02/08/93		< 0.10	1,300		1,400	24,000		50,000	
	07/19/94		< 0.10	28,000	23,000	23,000	22,000	30,000	30,000	12.0
	08/09/94		< 0.10		170,000	30,000		70,000	23,000	< 2.0
	08/19/94		< 0.10	30,000	80,000	130,000	23,000	35,000	9,000	170.0
	01/24/95	< 1	< 0.01			3,000			17,000	4.0
	08/12/95	< 1	< 0.01			> 160,000			> 1,600	< 14.0
	11/21/96		< 0.01	240			9,300			< 2.2
	07/22/97		< 0.10	90,000			90,000			< 2.2
	08/08/97			5,000			160,000			< 2.2
	08/14/98			3,000			160,000			< 2.2
	02/16/00			11,000			30,000			
	02/26/01			5,000			50,000			
	02/12/03			5,000			80,000			
	10/20/04			17,000			30,000			
	Median	**< 1**	**< 0.10**	**5,000**	**80,000**	**26,500**	**40,000**	**35,000**	**20,000**	**< 2.2**
	Maximum	**< 1**	**< 0.10**	**90,000**	**170,000**	**160,000**	**160,000**	**70,000**	**50,000**	**170.0**
	Minimum	**< 1**	**< 0.01**	**240**	**23,000**	**1,400**	**9,300**	**30,000**	**> 1,600**	**< 2.0**

Location	Date	VOC # of detects	Pesticides # of detects	SOC # of detects	Herbicides # of detects
Sloan Channel (Range Wash) at Charleston	10/24/92				
	02/08/93				
	07/19/94				
	08/09/94				
	08/19/94				
	01/24/95				
	08/12/95				
	11/21/96		1 c,m,ii,jj,kk,ll		1 hh
	07/22/97		0		1
	08/08/97		0		0
	08/14/98	1 a	0		1 hh
	02/16/00	1 a	0		0
	02/26/01	1 a	0		0
	02/12/03	1 a	0	9 g,h,i,j,k,l,u,v,x	
	10/20/04	1 a	0	4 x,h,g,k	1 uu
	Median				
	Maximum				
	Minimum				

Appendix A2

Storm and Wet Weather Reports (2024-2025)

NPDES Storm Write Up and Wet Weather Sample Collection Form

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT | LAS VEGAS VALLEY MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PROJECT

Sample Location:	Las Vegas Wash at The Club at Sunrise		
Date:	Thursday, February 13, 2025		
Samplers' Name:	Alisson Boeing, Vanessa Aumiller		
Sample Collection Information			
Time of 1st Sample Collected:	9:38 PM		
Time of Grab Sample Collected:	10:03 PM		
Time of 24th Sample Collected:	10:27 PM		
Sample Intervals:	2 minutes		
Air Temperature (°F):	49	**Water Temperature (°F):**	51.8
Relative Humidity (%RH):	84	**Conductivity (mS/cm):**	-
5-minute Precipitation (inches):	-	**Discharge (cfs):**	-
Turbidity (NTU):	-	**Photos:**	Attached
Sampling Notes:	All 24 bottled samples were combined into one composite sample. The sample time on the Chain of Custody (COC) form was 9:38 PM and the sample identification name was FW-100-CS.		

Weather Conditions

(Temperature, storm location, etc.)

On Thursday, February 13, 2025, thunderstorms covered the Las Vegas Valley. Rain depths increased through the afternoon. Rain gages reported between 0.12 – 0.83 inches before sampling. Throughout the Las Vegas Valley, temperatures were between 47°F and 50°F. Wind speeds ranged from 5 mph to 12 mph (Southwest). Relative humidity ranged between 65% and 93%.

Site Status

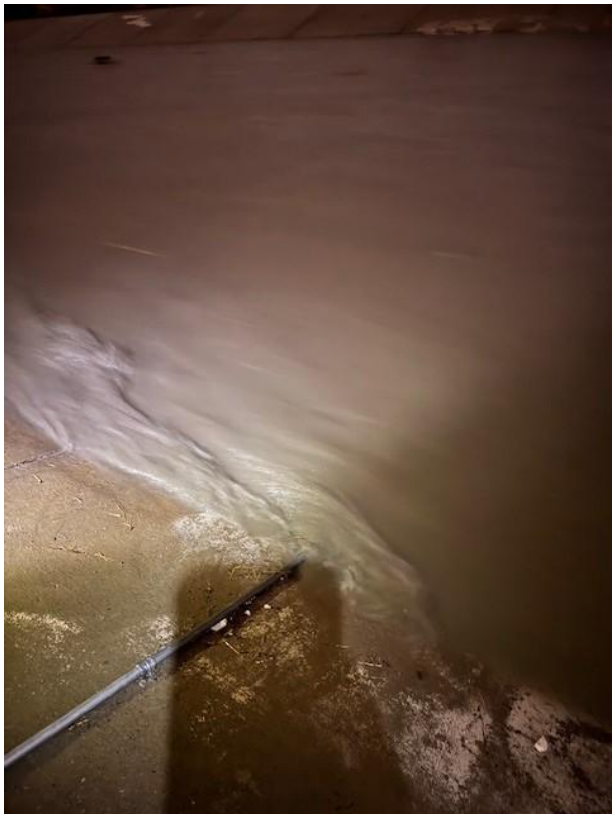
(Any maintenance required? Any equipment missing or damaged?)

Sampling box was vandalized, and it needs repairs.

Additional Information

No additional information at this time.

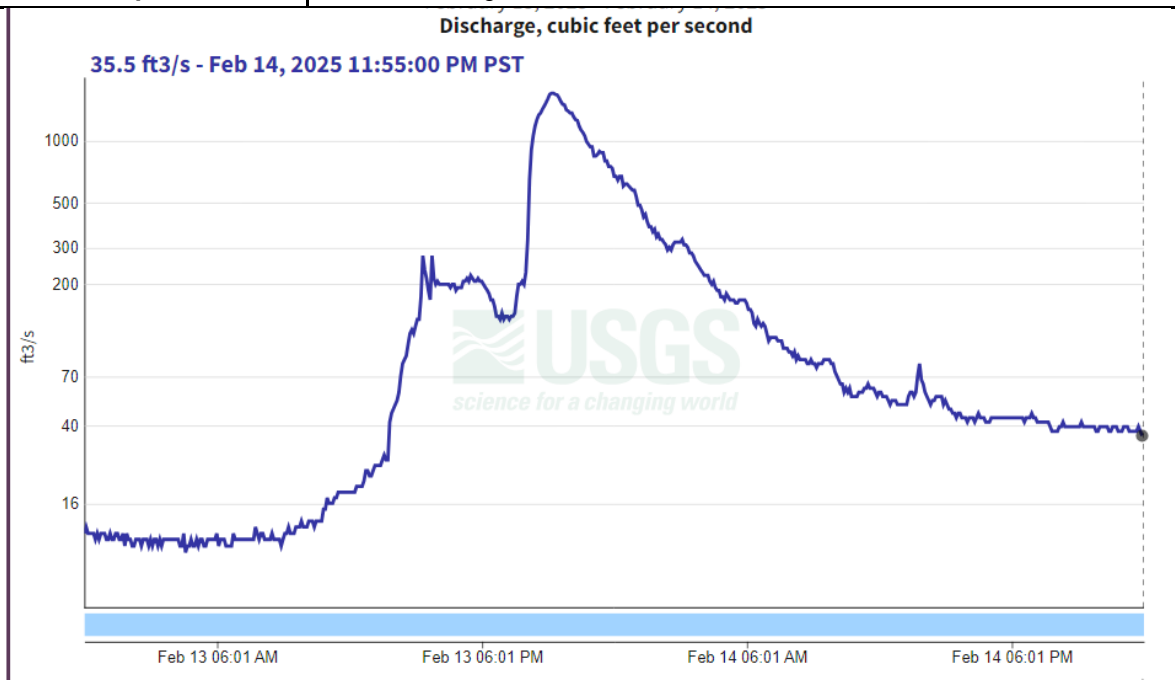
Photos (02/13/2025, 9:38 PM)

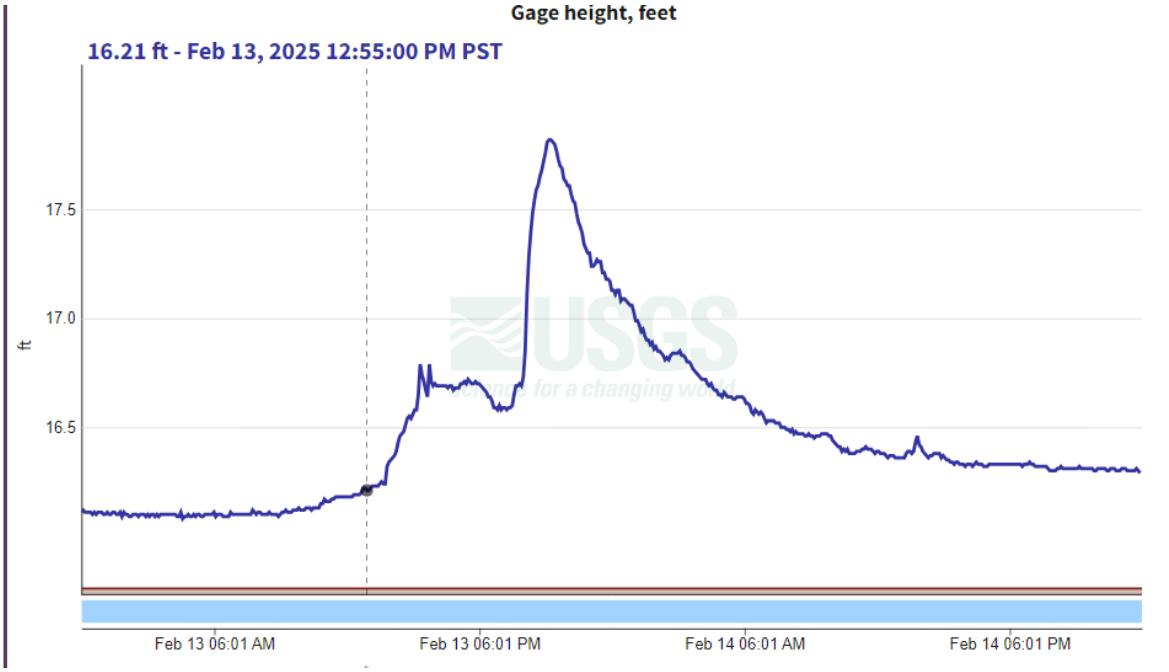


NPDES Storm Write Up and Wet Weather Sample Summary

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT| LAS VEGAS VALLEY MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PROJECT

Sample Location:	Las Vegas Wash at The Club at Sunrise
Date:	Thursday, February 13, 2025
Samplers' Name:	Alisson Boeing, Vanessa Aumiller





NPDES Storm Write Up and Wet Weather Sample Summary

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT| LAS VEGAS VALLEY MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PROJECT

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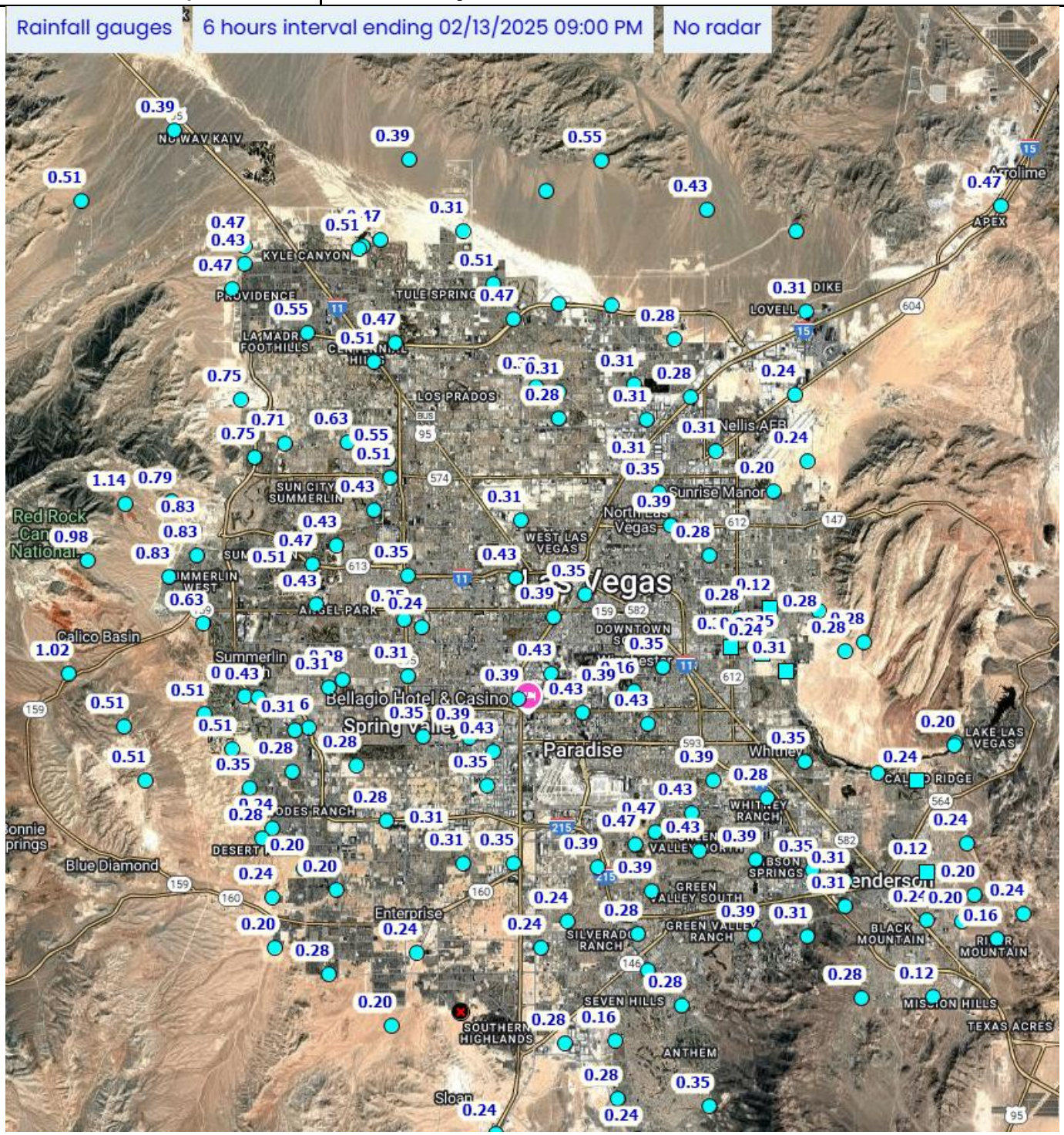
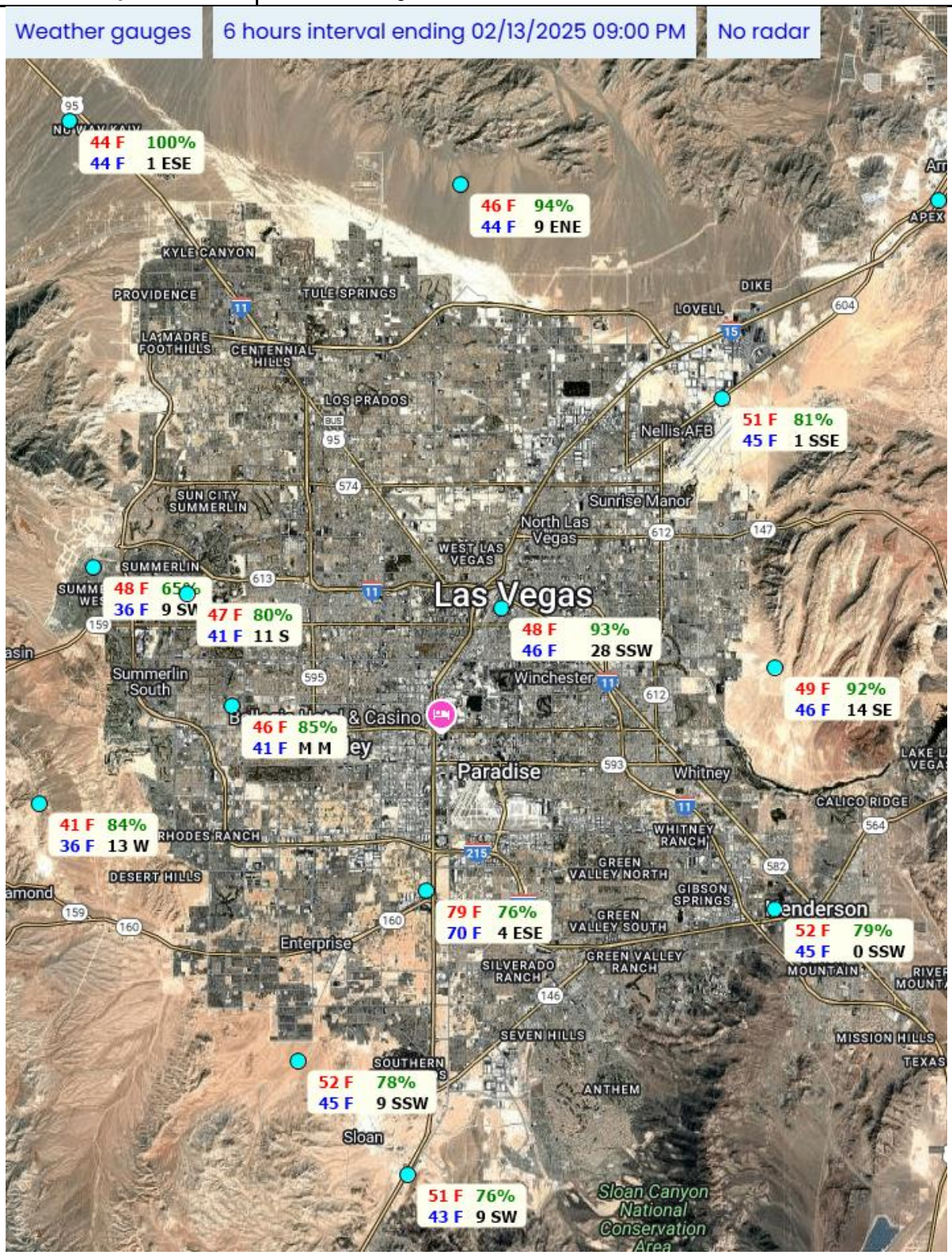


NPDES Storm Write Up and Wet Weather Sample Summary

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT| LAS VEGAS VALLEY MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PROJECT

Sample Location:	Las Vegas Wash at The Club at Sunrise
Date:	Thursday, February 13, 2025
Samplers' Name:	Alisson Boeing, Vanessa Aumiller



NPDES Storm Write Up and Wet Weather Sample Collection Form

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT | LAS VEGAS VALLEY MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PROJECT

Sample Location:	Las Vegas Wash at Rainbow Gardens		
Date:	Friday, February 14, 2025		
Samplers' Name:	Josh Coffey, John Michael Gonzales		
Sample Collection Information			
Time of 1st Sample Collected:	12:09 AM		
Time of Grab Sample Collected:	12:45 AM		
Time of 24th Sample Collected:	01:25 AM		
Sample Intervals:	3 minutes		
Air Temperature (°F):	50	**Water Temperature (°F):**	52
Relative Humidity (%RH):	76	**Conductivity (mS/cm):**	-
5-minute Precipitation (inches):	-	**Discharge (cfs):**	-
Turbidity (NTU):	-	**Photos:**	Attached
Sampling Notes:	All 24 bottled samples were combined into one composite sample. The sample time on the Chain of Custody (COC) form was 12:09 AM and the sample identification name was SW-100-RG.		

Weather Conditions

(Temperature, storm location, etc.)

On Thursday, February 13, 2025, thunderstorms covered the Las Vegas Valley. Rain depths increased through the afternoon. Rain gages reported between 0.12 – 0.83 inches before sampling. Throughout the Las Vegas Valley, temperatures were between 47°F and 50°F. Wind speeds ranged from 5 mph to 12 mph (Southwest). Relative humidity ranged between 65% and 93%.

Site Status

(Any maintenance required? Any equipment missing or damaged?)

No new updates.

Additional Information

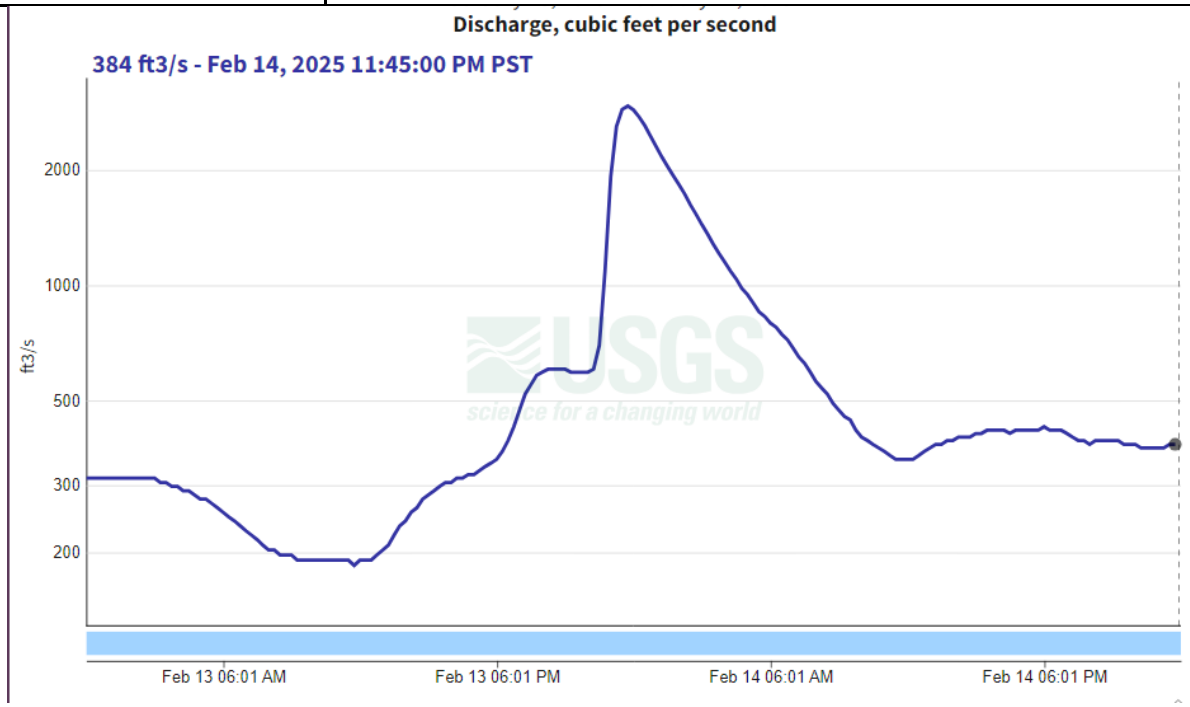
No further information.

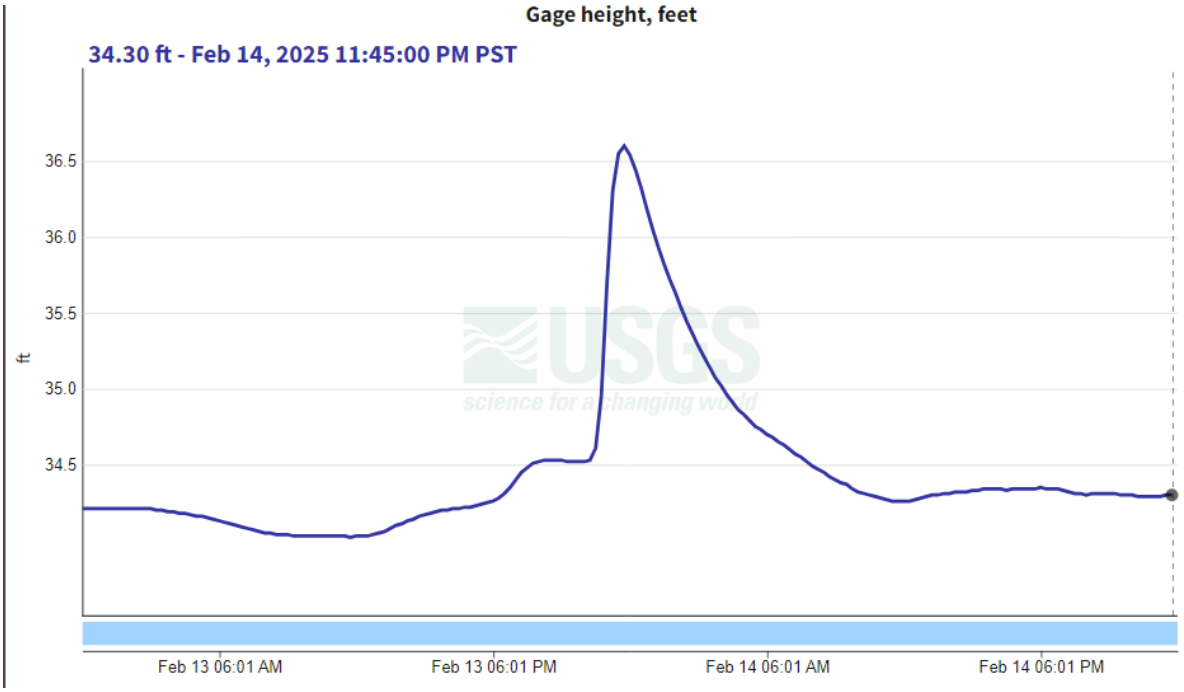
Photos (02/13/2025, 7:36 PM)

NPDES Storm Write Up and Wet Weather Sample Summary

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT| LAS VEGAS VALLEY MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PROJECT

Sample Location:	Las Vegas Wash at Rainbow Gardens
Date:	Friday, February 14, 2025
Samplers' Name:	Josh Coffey, John Michael Gonzales





NPDES Storm Write Up and Wet Weather Sample Summary

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT| LAS VEGAS VALLEY MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PROJECT

Sample Location:	Las Vegas Wash at Rainbow Gardens
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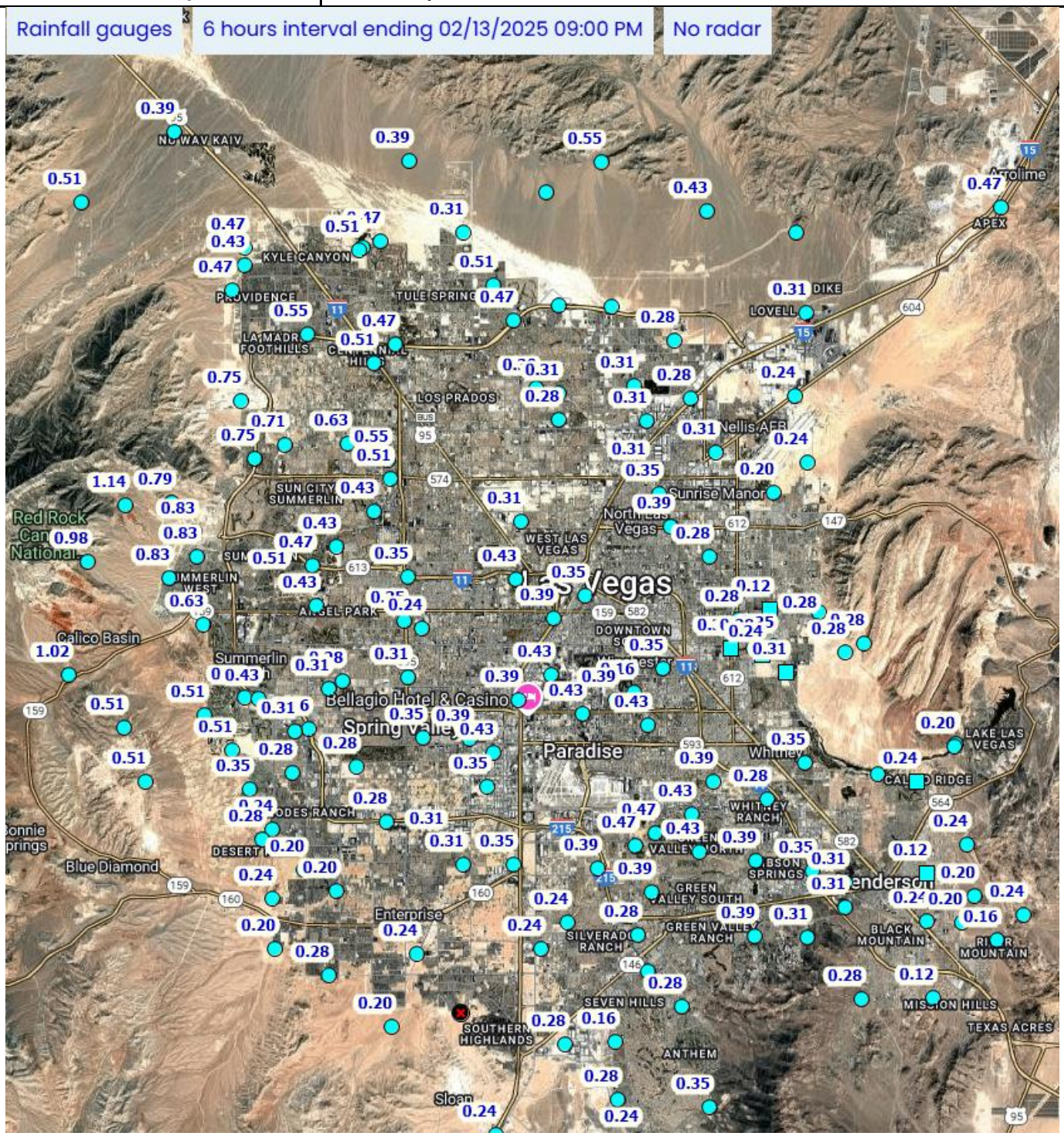
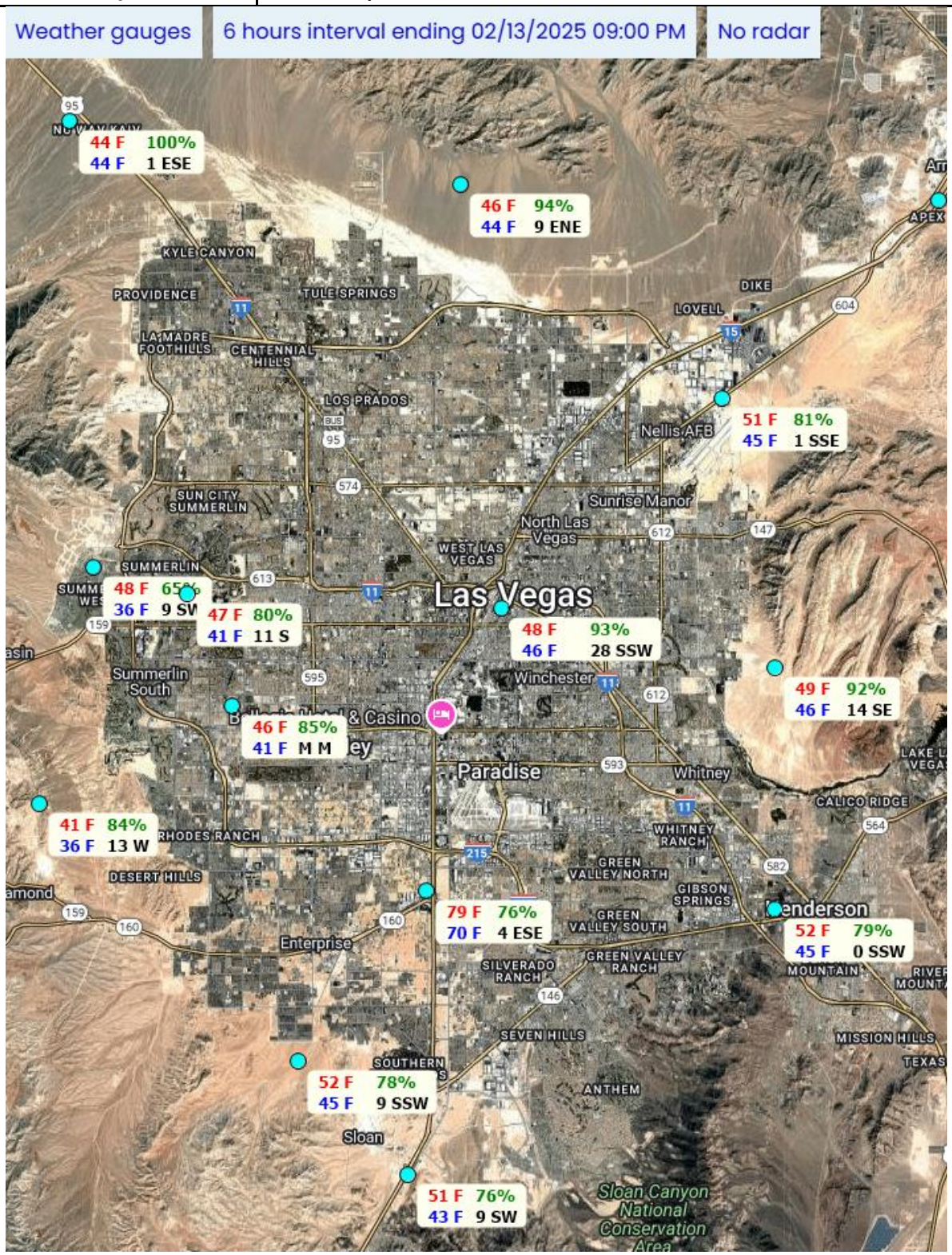


NPDES Storm Write Up and Wet Weather Sample Summary

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT| LAS VEGAS VALLEY MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PROJECT

Sample Location:	Las Vegas Wash at Rainbow Gardens
Date:	Friday, February 14, 2025
Samplers' Name:	Josh Coffey, John Michael Gonzales



Appendix B

Low-Flow Features Within the Las Vegas Valley

Brown AND Caldwell

201 North Civic Drive, Suite 300
Walnut Creek, CA 94596

T: 925-937-9010
F: 925-937-9026

Technical Memorandum

Prepared for: Clark County Regional Flood Control District

Project Title: Las Vegas Valley Municipal Separate Storm Sewer System (MS4) Discharge Permit

Project No.: 203573.001

Technical Memorandum

Subject: Low-flow Features within the Las Vegas Valley

Date: October 30, 2025

To: John Tennert, PhD

From: Angela MacKinnon, PE, PMP, CPSWQ

Copy to: File

Table of Contents

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List of Abbreviations

AF	acre-feet
CCRFCD	Clark County Regional Flood Control District
DAAF	depth-area adjustment factor
DARF	depth-area reduction factor
DCIA	directly connected impervious area
EPA	Environmental Protection Agency
ft	foot/feet
GIS	Geographic Information System
HCDDM	Hydrologic Criteria and Drainage Design Manual
LID	Low Impact Development
LVV	Las Vegas Valley
MPU	Master Plan Update
MS4	Municipal Separate Storm Sewer System
NDEP	Nevada Division of Environmental Protection
NDSR	New Development and Significant Redevelopment
NOAA	National Ocean and Atmospheric Administration
RCV	Required capture volume
SWMP	Stormwater Management Plan
TM	Technical Memorandum
UDB	ultimate development boundary
WEF	Water Environment Federation
WQCV	Water quality capture volume

Section 1: Introduction

The Nevada Division of Environmental Protection (NDEP) has issued National Pollutant Discharge Elimination System Permit No. NV0021911 jointly to Clark County Regional Flood Control District (CCRFCD), the City of Las Vegas, the City of North Las Vegas, the City of Henderson, and Clark County (Permittees). This Permit, which was originally issued on December 13, 1990, authorized discharges from the Municipal Separate Storm Sewer System (MS4) in the Las Vegas Valley (LVV). The Nevada Department of Transportation was included in the original permit and subsequently received its own MS4 Permit from NDEP in 2004. The Permit has been renewed and revised multiple times with the most current Permit being issued on February 5, 2024. The Permittees have submitted a Draft SWMP to NDEP for compliance with the 2024 MS4 Permit.

CCRFCD provides funding to the four municipalities for design, construction, operation, and maintenance of concrete channel lining, other kinds of channel protection, regional detention basins, low-flow features, and other flood control facilities. Regional detention basins are designed to manage runoff from the 100-year storm occurring under full build-out conditions in the watershed, with no assumption of onsite peak or volume reductions in new development. Runoff management is primarily accomplished using large regional detention basins that capture runoff from large watershed areas in the LVV. Regional detention basins capture flood flows and release them at a smaller discharge rate. These regional detention basins capture sediment and associated parameters, which fall out as detained stormwater loses velocity. Regional detention basins are routinely inspected and sediment is removed. For example, sediment may be removed from a detention basin when it accumulates a thickness of 1 to 2 feet (ft). Some detention basins, such as those at the edge of development, fill up relatively quickly with dirt from the surrounding desert and are cleaned out frequently. Other detention basins need very little sediment removal. Some of these large regional detention basins have low-flow features that detain lower flows that would otherwise pass through. An example of these facilities is shown in Figure 1. Low-flow features settle out sediment from smaller storms. This Technical Memorandum (TM) is focused on the low-flow features within regional detention basins.

Figure 1. Low-flow feature at Oakey Detention Basin

This TM provides background on the development of the program for low-flow features within regional detention basins, review of available data and inputs since the program implementation in 2013, and recommendations for moving forward. The low flow feature planning was developed using empirical and estimated inputs, until actual data was available on how new development would occur in the LVV. These approximations have been used since 2013, to compute water quality capture volume (WQCV) within regional detention basins and required capture volume (RCV) from new development. Actual data on new development from 12 years of record are utilized with updated inputs, to track progress based on how development has occurred. The updated inputs are:

- Land-use based imperviousness
- Event rainfall depth for the 85th percentile event
- Depth-area adjustment factor (DAAF) to align with the large watershed areas

Results from using the planning assumptions are compared with the results from using the actual data. The goal of this TM is to provide recommendations moving forward to confirm volume needs, monitoring, and tracking low-features in regional detention basins.

Section 2: Detention Basin Program Background

The current Stormwater Management Plan (SWMP), effective 2011, includes TMs in the appendices that provide detailed content on how detention basins were selected as candidates for installation of low-flow features. This is available on CCRFCD's website. This TM provides a summary of the computations for volume sizing low-flow features and method for confirming how much run-off is to be addressed from new development in LVV. This TM is to be the first source of reference moving forward, as it provides the most current data and information and in a summarized format for management and tracking of low-features in the LVV.

2.1 Stormwater Volume from New Development

Two key elements are computed for low-flow feature program management:

- The volume of stormwater run-off from new development in the LVV. This is referred to as required capture volume (RCV), as it is the new development as part of the Post Construction Program in the MS4 Permit.
- The volume of stormwater within individual low-features. This is referred to as WQCV, an industry term for volume managed or treated within stormwater features.

Integrating these two together, the planning involved estimated stormwater runoff from new development and showing how this volume could be incorporated through installation of low-flow features within existing and future detention basins. The basis of what comprises new development is:

- New development starting July 1, 2013, when the program was officially implemented
- Land within the MS4 Permit Boundary, as described in the Draft SWMP. This can be generally described as the land within ultimate development boundary (UDB) the LVV watershed.

To estimate the RCV, the methodology from the Water Environment Federation (WEF) Manual of Practice No. 23, Urban Runoff Quality Management (1998) was utilized. This was one of the standard approaches at the time, as it provided options for inputs of empirical data or actual data, depending on what was available. It also did not require significant modeling, which would be cumbersome for these large tributary areas and using the more frequent storm event inputs (i.e. smaller events).

The following equations were used to calculate the RCV. The first step is to first compute the volume in inches per tributary watershed area (P_0), which is termed the maximized detention volume. The equation takes into account a constant based on drain time (selected as 24 hours – mid-range value), a runoff coefficient based on percent impervious of the watershed, and the average rainfall depth with 6-hour event separation time (P_6).

During the planning phase and early in the evaluation there was not a definition of what qualifies as a stormwater quality event (2 year event, 85th percentile event, etc). Thus, the empirical value recommended for the LVV area of 0.37 inches was utilized. Since then, there has been the establishment of an 85th percentile value as the stormwater quality event within the LVV, with historical records to show this is 0.32 inches.

The next input that was developed was the percent impervious. For the new development, percent impervious was utilized from the Master Plan Update (MPU) land use planning level information for the tributary area for new development upstream of the detention basins. On a macro level, 50 percent impervious was the average across all existing LVV development, this was a computed metric to get a sense of the level of imperviousness within the 2008 UDB. This percent impervious was considered the existing condition of the LVV when the low-flow feature program started implementation in 2013. This 50% impervious was the starting percent impervious that would be used in future years, until actual records were available on actual imperviousness of the new development after program implementation.

The next step is computing the RCV based on the watershed area that is considered. The watershed area is the development that could occur upstream in the tributary area, bounded by the UDB.

$$P_0 = (a \times C) \times P_6$$

$$C = 0.858i^3 - 0.78i^2 + 0.774i + 0.04$$

$$RCV = P_0 \times A_{NDSR}$$

Details:

Po = maximized detention volume (inches/tributary watershed)

a = constant, for event maximization, drain time of 24 hours (1.299)

C = runoff coefficient

i = percent impervious

P_6 = average rainfall depth with a 6-hour event separation time

A_{NDSR} = NDSR land area (acre)

These computations were performed for individual detention basins and then summed for the overall LVV. All 10 watersheds within the LVV MS4 permit boundary were evaluated to sum the WQCV, as displayed in Figure 2. The watersheds are C-1, Central, Duck Creek, Flamingo/Tropicana, Gowan, Lower Las Vegas Wash, Lower Northern, Pittman, Range, and Upper Northern. The RCV from development after July 1, 2013 and within the MS4 Permit Boundary at that time was estimated to be 1,439 acre-feet (AF).

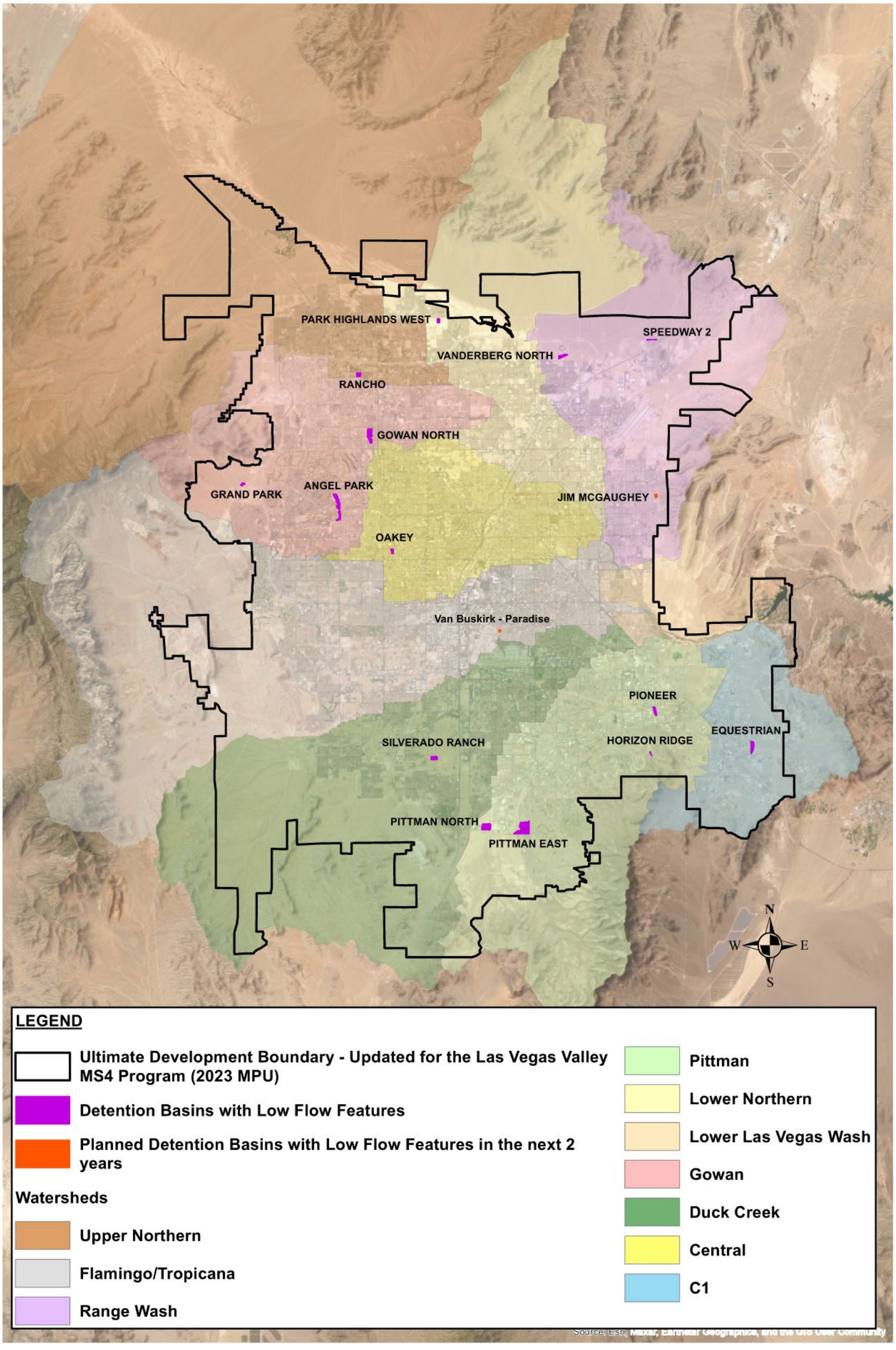

Figure 2. Location of low-flow features in regional detention basins

The individual detention basins that were identified for low-flow feature installations were evaluated for amount of volume that could be allocated for WQCV. This involved elements such as the detention basin layout and upstream tributary area. In certain situations:

- the WQCV was capped for low-flow features to not exceed the total of upstream RCV plus the area of existing development.
- the WQCV was less than the RCV.

It is these situations that provide the basis for pollutant trading -- where stormwater quality runoff from new development cannot be managed fully in the watershed's downstream detention basin (such as due to site constraints). Instead, that excess RCV can be managed in another detention basin, as long as that volume does not exceed the volume from that detention basins combined volume from both existing development and new development. Totaling up the volume of identified regional detention basins that could have low-flow features, the total watershed volume of potential WQCV is estimated to be 1,568 AF.

Table 1 displays:

- The estimated total RCV from New Development in each watershed.
- The sum of Potential WQCV from Low-flow Features within the Watershed.
- The current WQCV in current low-flow features that have been installed (as of June 30, 2025).
- The current WQCV in current low-flow features that have been installed and are in construction (as of June 30, 2025).

Table 1 Total Required and Planned WQCV in Major Watersheds

Watershed	Estimated Total RCV (AF)	Sum of Potential WQCV from Low-flow Features within the Watershed (WQCV AF)	Low-Flow Feature Installations (WQCV AF)	Low-Flow Feature Installations and in Construction (WQCV AF)
Upper Northern Wash	222	131	24.3	24.3
Lower Northern Wash	144	195	3.1	3.1
Range Wash	146	303	49.5	51.7
Gowan Basin	122	272	147.6	147.6
Central Basin	10	81	12.5	12.5
Flamingo/Tropicana Washes	168	87	0	0
Lower Las Vegas Wash	44	0	0	0
Duck Creek Wash	250	333	16.8	16.8
Pittman Wash	255	150	110.2	110.2
C-1 Wash	78	16	17	17
Total	1,439	1,568	381	383.2

As a summary for the LVV:

- The RCV is estimated to be 1,439 AF
- The WQCV is estimated to be 1,568 AF (129 AF greater than the RCV)
- From a programmatic level, there is sufficient capability to address new runoff in the planned low-flow features.

2.1.1 Status of Low-Flow Feature Installations

Since 2013, 14 low-flow features are operational in regional detention basins. Table 2 shows the detention basins that are installed and the amount of WQCV. The total WQCV installed within all low-flow features is 381 AF.

Table 2. Detention Basin WQCV Status

Detention Basin	Status	WQCV
Angel Park	Installed	85.0
Pioneer	Installed	12.0
Pittman North	Installed	49.0
Horizon Ridge	Installed	2.0
Equestrian	Installed	17.0
Park Highlands West	Installed	3.1
Vandenberg North	Installed	45
Pittman East	Installed	47.2
Speedway 2	Installed	4.5
Grand Park	Installed	9.0
Silverado Ranch	Installed	16.8
Gowan North	Installed	53.6
Oakey	Installed	12.5
Rancho	Installed	24.3
	Total Installed	381.0

During the 2024-2025 permit year, the following detention basins with low-flow features were in design, design was completed, or under construction:

- Southeast Pittman 22.9 AF In Design
- Southwest Pittman 43.7 AF In Design
- Duck Creek Larson 100.4 AF In Design
- Van Buskirk-Paradise 8.8 AF Design Completed
- Jim McGaughey 2.2 AF In Construction

Figure 2shows the locations of existing low-features and the Jim McGaughey Detention that is in construction, which will be in operational in the near future. The inventory is tracked and reported in the MS4 Permit Annual Reports. An inventory of features in design and in construction is maintained for a future view of the next 2-3 years, for perspective with ability to keep pace as new development occurs.

Section 3: Actual Data Inputs for the Detention Basin Program

Incorporating actual data better represents stormwater runoff amount from the new development that has occurred in the LVV, since program implementation of low-flow features. This section provides details on updating the percent impervious with better data, event rainfall depth for a stormwater quality event, and using a depth-area adjustment factor based on large scale development spread that aligns with flood control practices and modeling.

3.1 Percent Imperviousness of Developed Area Evaluation

The percent impervious was re-visited and based on:

- The land use categories provided in the LVV Flood Control 2023 MPU (2023, MPU) based on directly connected impervious area (DCIA).
- The development parcels Geographic Information System (GIS) data provided by Clark County each permit year since low-flow feature program inception.

The land use categories were checked for percent impervious and open space distribution during the development of the 2023 MPU. These percent impervious values provided by the 2023 MPU are the most accurate representation of the imperviousness of new development areas. These calculations considered the percent impervious based on the DCIA. By using the impervious values from the 2023 MPU, the Program is consistent with other local design criteria. Each land use category is cross-referenced with the 2023 MPU and is assigned the associated percent imperviousness as shown in Table 3.

Table 3. Land Use Categories

Land Use Description	Impervious (%)
Undeveloped Land, Open Desert	0
Parks, Golf Courses	5
Rural, 40,000 sq ft lots	20
Low-Density Residential, 20,000 sq ft lots	25
Medium-Density Residential, 14,000 sq ft lots	30
High-Density Residential, 7000 - 10,000 sq ft lots (avg.)	53
Apartments/Condos	72
Townhouses/6,000 sq ft lots	69
Commercial, Retail, Casino, High Rise Condominiums & Less than 6000 sq ft lots	85
Light Industrial, Churches, and Public Facility	72
Heavy Industrial	85
Schools	50
Lakes	0
Solar Manufacturing on Bare Ground	5
Right-Of-Way	85

Source: 2023 LVV Flood Control Master Plan Update, 2023

3.1.1 New Development Imperviousness

The imperviousness of the new development for each permit year (following implementation in 2013) was computed by applying the land use category information to the parcels developed within the permit year. With the pollutant trading approach in mind, parcels that meet the 2024 MS4 Permit new development were included, even if they were downstream or not draining to a low-flow feature. The 2024 MS4 Permit outlines the new development criteria for the Post-Construction Program for New Development and Significant Redevelopment (NDSR) Projects program in Section B.5.6.3.1.1:

> *Describe how the Permittees will develop, implement, and enforce a program, that includes educational outreach to address post-construction urban runoff from NDSR projects that disturb areas greater than or equal to 1 acre, including projects less than 1 acre that are part of a larger common plan of development, that discharge into the MS4 by ensuring that NDSR projects are complying to the MEP with the requirements of this program;*

New development (or referred to as NDSR in the 2024 MS4 Permit) is considered development meeting this criteria constructed after July 1, 2013. Sites that are 1 acre or greater, grouped adjacent parcels that summed to be greater than 1 acre, or small sites that are part of a larger new development area were all included in the new development areas. Parcels that are less than an acre and are not part of a common plan of development were removed from the computations in each permit year. This methodology will continue and will be performed manually using GIS data.

In addition, parcels greater than 5 acres were individually evaluated and manually updated based on the amount of actual development shown through GIS aerials. Some of the larger parcels appear to be fully developed and consistent with the associated land use category. For those where only a portion of the parcel is developed per the land use code, that percent impervious is used for the developed area of the parcel only, with the remainder calculated as undeveloped. Checking the larger parcels for the type and level of development is important since they can considerably change the amount of RCV.

This activity resulted in the reduction of acreage from developed areas. A total of 477.7 acres within the total developed area are not required to be addressed by the 2024 MS4 Permit requirements. The acreage that was removed with this process is shown by permit year in Table 4.

Table 4. New Development Area Adjustments

Permit Year	Parcel Areas 1 Acre or Less Removed (acres)	Analysis of Parcels > 5 Acres with Undeveloped Areas Removed (acres)	Total Area Removed (acres)
2013-2014	6.7	8.5	15.2
2014-2015	13.6	15.3	28.9
2015-2016	13.8	7.1	20.8
2016-2017	21.6	28.1	49.8
2017-2018	23.7	13.8	37.5
2018-2019	11.5	47.9	59.4
2019-2020	8.8	0	8.8
2020-2021	16.0	40.93	56.9
2021-2022	12.0	11.7	23.7
2022-2023	14.0	7.3	21.3
2023-2024	9.0	121.9	130.9
2024-2025	14.0	10.5	24.5
Total	164.7	313	477.7

Table 5 presents the area and imperviousness of new development by permit year calculated by using the actual land use. The final column is important, to compare with 50% impervious that was used in annual reporting (based on existing development percent impervious). Actual data analysis showed an overall increase in the percent of impervious area each permit year. The 2018-2019 permit year had the highest impervious areas of new development of 1,589 acres. The imperviousness from 2013-2024 ranged from 50 percent to 64.4 percent. The average percent impervious is approximately 60.9 percent from July 2013 to June 2025. This change from the early program implementation estimation shows the importance in using parcel investigation. New development using the methodology of removing the undeveloped large parcel area and using land use inputs yield a higher percent impervious and is more representative on what was developed. Figure 3 displays the new development by permit year, within the MS4 permit area and jurisdiction.

Table 5. Imperviousness of New Development by Permit Year

Permit Year	Annual New Development (acres)		Calculated Impervious Area based on Land Use (acres)		Variation Between Annual New Development and Calculated Impervious area (acres)	Permit Year New Development Impervious %
	Annual	Cumulative	Annual	Cumulative		
2013 - 2014	943	943	584	583	359	61.9
2014 - 2015	1,105	2,048	553	1,167	552	50.0
2015 - 2016	1,435	3,483	864	1,720	571	60.2
2016 - 2017	1,876	5,359	1,107	2,584	769	59.0
2017 - 2018	2,426	7,785	1,515	3,691	911	62.4
2018 - 2019	2,642	10,427	1,589	5,206	1053	60.1
2019 - 2020	1,509	11,936	952	6,795	557	63.1
2020 - 2021	1,802	13,738	1,131	7,747	671	62.8
2021 - 2022	1,866	15,604	1,197	8,878	669	64.1
2022 – 2023	1,561	17,165	1,006	10,075	555	64.4
2023 - 2024	1,540	18,705	918	11,081	622	59.6
2024 - 2025	1,314	20,019	822	11,999	492	62.6
Total	20,019	127,212	12,238	71,526	7,781	60.9

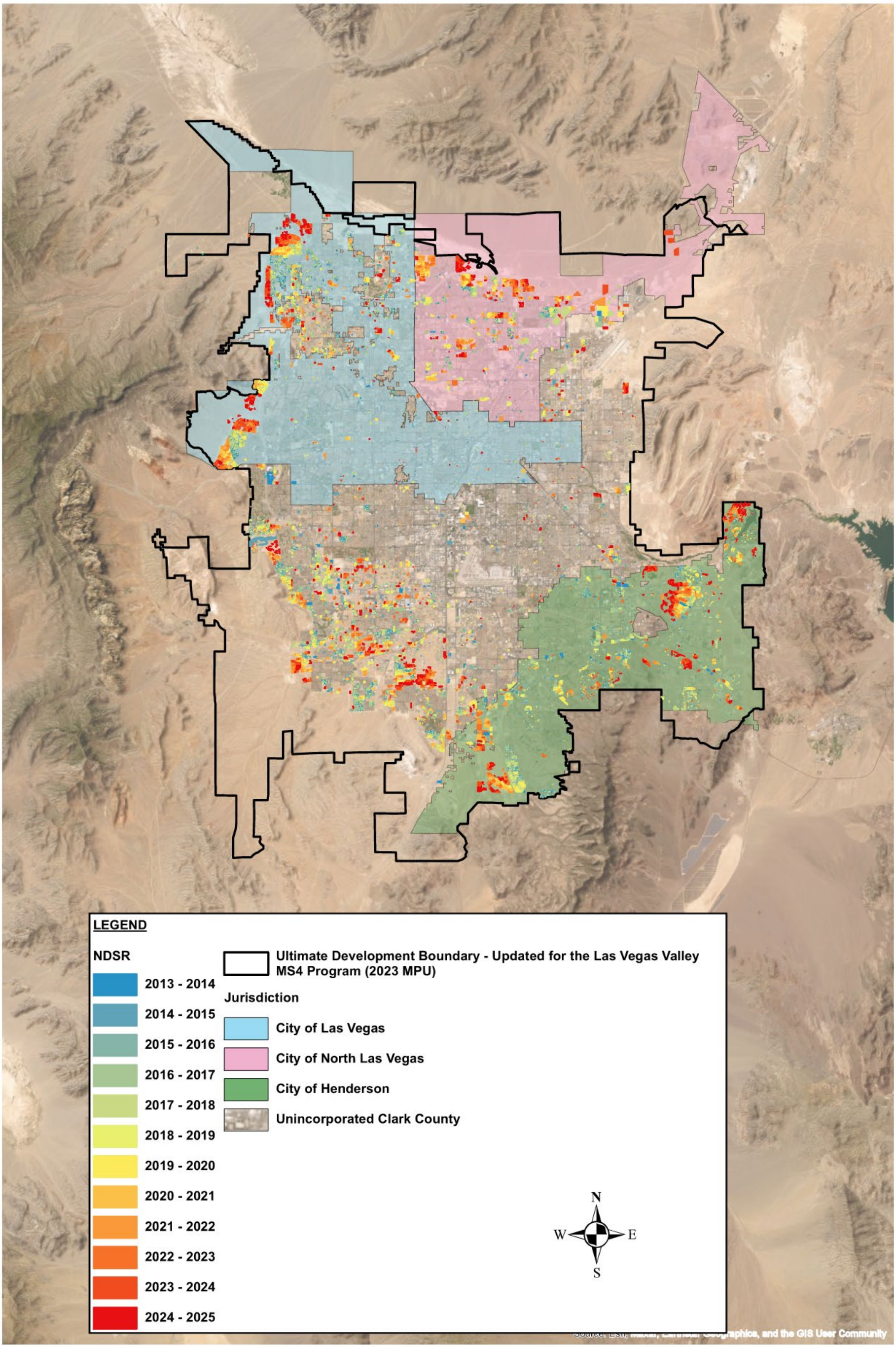

Figure 3. New development by permit year and jurisdiction

3.2 Event Rainfall Depth Evaluation

The Environmental Protection Agency (EPA) annual average rainfall depth of 0.37 inches for Las Vegas was originally used for planning computations for the low-flow features. This approach is recommended by the WEF manual in areas where long-term rain gauge data is not available to analyze. If rain gauge data is available, the WEF manual indicates that the 85 th percentile rainfall depth (the rainfall depth when 85 percent of the total amount of events has been reached) can be evaluated and used. The 85th percentile design storm is the depth at which 85 percent of the 24-hour storms on record are equal to or smaller. In addition, this is the value recommended to be used in the empirical equation as part of WEF Manual of Practice No. 23.

By examining the continuous rainfall record for the LVV, Figure 4 shows the distribution of the rainfall event-depths observed in the Las Vegas area from 1937 to 2007 and the 85 th percentile rainfall depth is 0.32 inches. This is similar in value to the EPA's guidance value of 0.37 inches (a decrease of about 15%).

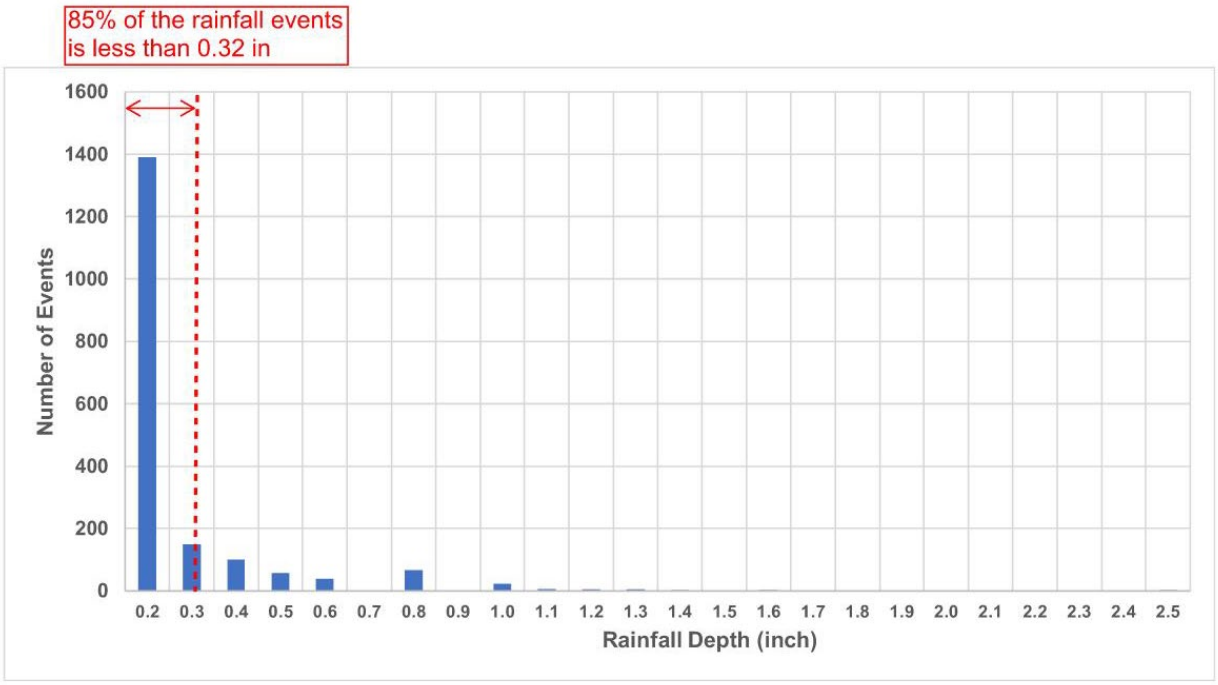

Figure 4. LVV rainfall event-depth distribution (1937-2007)

Source: Storm Water Quality Control Volume for Southwest Region of USA, 2010

Furthermore, other guidance prior to more widespread adoption of low impact development (LID) used a 2-year storm event with 6-hour duration for stormwater quality features. For the LVV, this value could exceed the 0.37 inches, such as 0.72 inches at Harry Reid Airport. At the time planning, the 0.37 inches was used to be more conservative than the 85th percentile and less than the 2-year storm event. Since program implementation in 2013, the Hydrologic Criteria and Drainage Design Manual (HCDDM) was updated to include the 85th percentile and the HCDDM is undergoing the next update that will continue with the 85th percentile as the stormwater quality event rainfall depth.

With the WEF Manual recommendation to use this rainfall depth for calculating WQCV when available and validation with flood control engineering practice within the LVV, the value moving forward will be 0.32 inches for the stormwater quality event for the low-flow features.

3.3 Depth-Area Adjustment Factor Application

As described in the HCDDM, the National Ocean and Atmospheric Administration (NOAA) precipitation depths are related to rainfall frequency at an isolated point. Storm events that occur in the LVV cause rainfall to occur over extensive areas simultaneously, with more intense rainfall typically occurring near the center of the storm. Standard precipitation analysis methods require adjusting point precipitation depths downward in order to estimate the average depth of rainfall over the entire storm area, which could be isolated in a small portion of the valley or more widespread. This computation is normally performed using depth-area reduction factors (DARF) relating to a point precipitation reduction factor to storm area and duration.

Flood control planning within the Las Vegas utilizes a DARF, which can be found in the HCDDM. To better correlate the calculation of WQCV, new development areas for the stormwater volume required by new development will use a similar approach, which is designated as a DAAF. These values are similar to the DARF table values within the HCDDM, with only a few area ranges, as more refinement is not needed based on this being a watershed approach and not individual detention basins.

This DAAF allows for consistency between watershed level stormwater quality and the local hydrologic practices for larger areas. Table 6 shows the DAAFs.

Table 6. Depth-Area Adjustment Factor

Developed Area (square-miles)	Developed Area (acres)	DAAF
0 – <1	0 – <640	1.00
1 – <10	640 – <6,400	0.85
10 – <40	6,400 – <25,600	0.75
40 and greater	25,600 and greater	0.65

Section 4: Computations using Actual Data for Required Capture Volume

This section presents a comparison of RCV using the planning and empirical values compared to the actual data values presented in prior sections. The planning and empirical values are what have been provided within the Annual Reports starting in permit year 2013-2014.

4.1 Required Capture Volume from New Development

As a summary from prior sections, the actual data inputs for RCV include the following:

- Imperviousness based on the actual land use, with larger parcels being verified for removal of large portions of underdeveloped areas, and removal of areas not within the requirements of the 2024 MS4 Permit.
- Applying the 85th percentile rainfall depth of 0.32 inches.
- Applying the DAAF.

In considering which DAAF to use, it is better that the DAAF be applied on a watershed tributary area basis and not the total sum of NDSR. The amount of new development to date does not exceed 10 square miles in any of the watersheds. This is the reason why using a DAAF of 0.85 is more appropriate than the next range of 10 - <40 square miles. Table 7 presents a comparison of accumulated RCV using planning and empirical values (as reported in the MS4 Permit Annual Reports) to the actual data from new development.

Table 7. Accumulated Required Capture Volume at end of Permit Year (2013 to 2025)

Permit Year End (starting in 2013-2014 Permit Year)	Accumulated RCV	
	Rainfall Depth = 0.37 inches 50% Impervious No DAAF (AF)	Rainfall Depth = 0.32 inches Land use Based Percent Impervious DAAF = 0.85 (AF)
2013-2014	16.9	11.4
2014-2015	57.3	22.3
2015-2016	74.5	39.6
2016-2017	91.5	62.2
2017-2018	114.6	91.4
2018-2019	137.3	123.2
2019-2020	157.4	142.5
2020-2021	180.8	164.1
2021-2022	205.8	187.9
2022-2023	226.8	207.8
2023-2024	247.7	226.4
2024-2025	265	242.2

The RCV using both methods are compared to the amount of WQCV within the low-flow features. The reported cumulative constructed WQCV within the regional detention basins is 381 AF. Figure 5 displays the RCVs from Table 7 (using planning and empirical values and using actual data) compared to the WQCV installed within all low-flow features in the LVV.

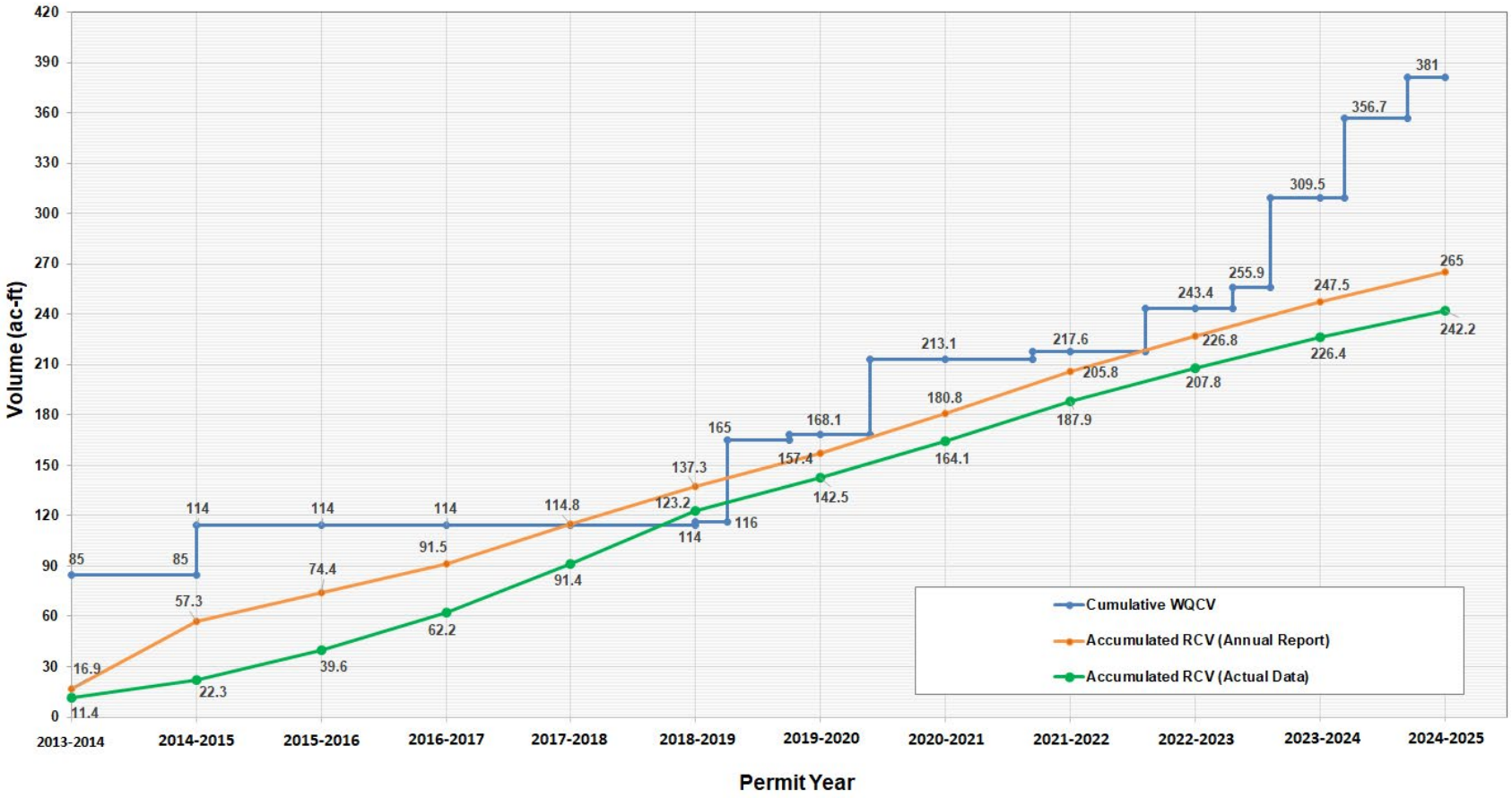

Figure 5. RCV comparison to WQCV in Low-flow Features (2013 to 2025)

4.2 Projecting Cumulative WQCV vs Required Capture Volume from New Development

For the 2024-2025 Annual Report, the Permittees provided an update on low-flow features that are in design, where design is completed, and those that are in construction. This serves as a basis to develop to develop projections for potential WQCV over the next few years. For the low-flow features currently in design, the amount of WQCV could change as the design proceeds. These values are an approximation at this time and will be updated as more details and reviews are done during the design development. In addition, schedules for construction and completion could range from being complete in 2026 to 2 or more years, as it is dependent of funding and needs. A potential range of construction completion and operations of the low flow features is preliminary and for planning purposes at this time and will be updated by the Permittees as part of the Annual Reporting process. Table 8 presents the WQCV currently in design planning for these future features.

Table 8. Projected Detention Basin WQCV

Detention Basin	WQCV Currently in Design (AF)	Potential Range of Construction Completion Date
Jim McGaughey	2.2	2026
Southeast Pittman	22.9	2027-2030+
Southwest Pittman	43.7	2027-2030+
Duck Creek Larson	100.4	2027-2030+
Van Buskirk-Paradise	8.8	2027-2030+

Figure 6 shows RCVs and WQCV from Figure 5, with projections for the next 2 years to get a view of what is needed to keep pace with as development occurs. An assumption is that the current trend of development growth will be at the same rate, as it has been fairly consistent, even though slight increases and decreases are noted. The WQCV is projected with Jim McGaughey being functioning in permit 2025-2026, without other low-flow features being installed. The schedule is revisited and monitored at minimum annually, with next projection being done in the 2025-2026 permit year. This shows that the WQCV within the low-flow features is projected to be sufficient in volume to address a consistent trend of new development for the next few years.

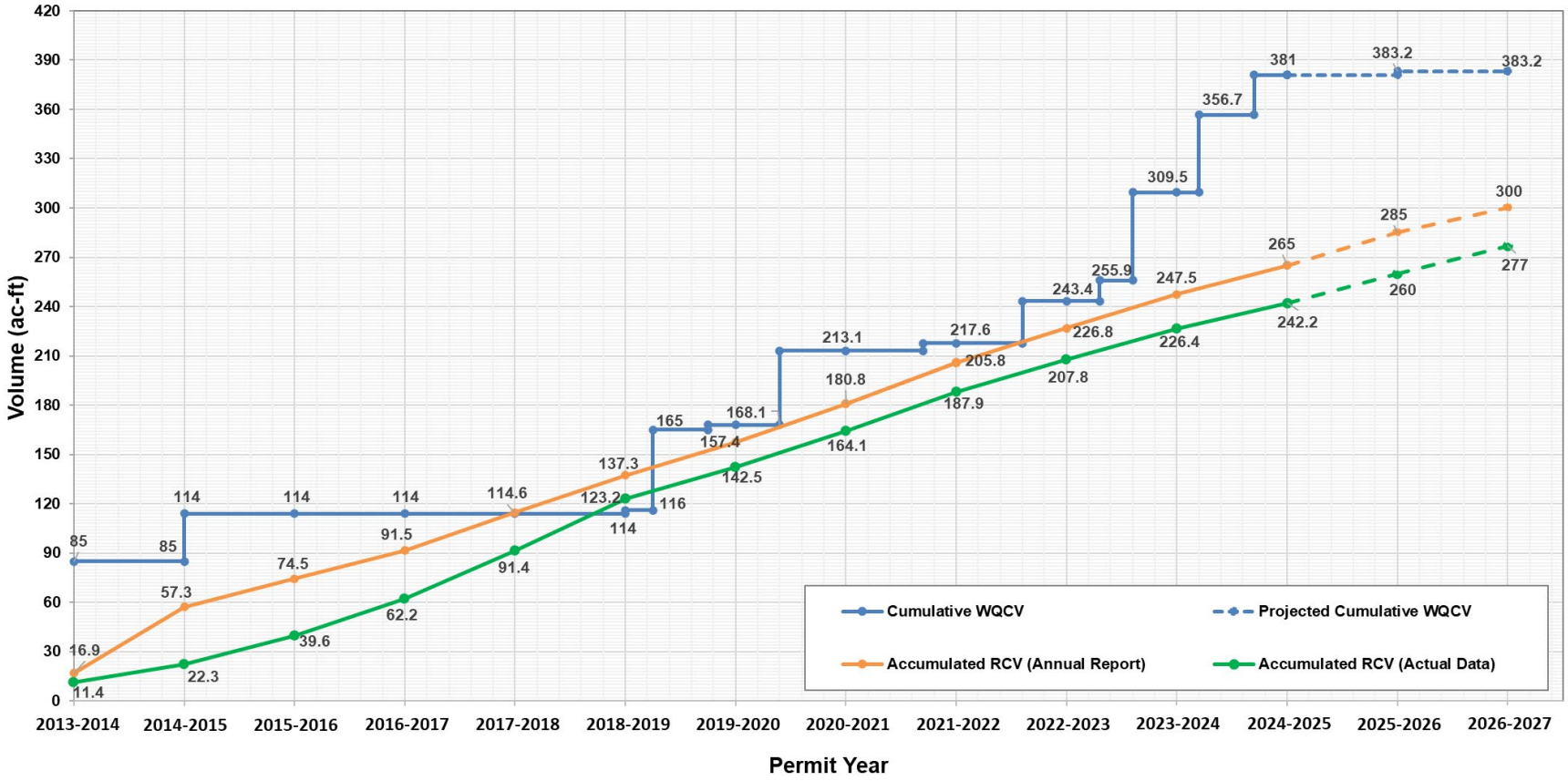

Figure 6. RCV comparison with 2-year projections to WQCV in Low-flow Features (2013 to 2027)

Section 5: Summary and Recommendations

Based on the evaluations within this TM, the following is a summary and recommendation for the low-flow features monitoring and tracking:

- New development percent impervious to be based on actual land use categories and Clark County GIS data:.
  - All parcels greater than 5 acres will be individually evaluated and manually updated every year. This will be based on the amount of impervious surfaces from actual development shown through GIS aerials, with large areas on undeveloped land to be removed from the area.
  - Parcels less than 1 acre that are not adjacent to other areas of development and not part of a master planned area will be removed from the computations. This will be confirmed manually using GIS layers from all permit years.
- The use of the 85th percentile storm event of 0.32-inch rainfall depth.
- A DAAF will be applied to the RCV on a watershed level basis and not total RCV for the LVV. This is currently a factor of 0.85 and will likely remain at that rate for the next few years, to be revisited annually as part of the permit year Annual Report process.
- As a summary, moving forward the RCV will be reported based on:
  - Land use Based Percent Impervious
  - Rainfall Depth = 0.32 inches
  - DAAF of 0.85
- Tracking of the low-flow features will include an inventory of what is in design, where design is completed, and in construction low-flow features based on input from the Permittees on schedule and design of the water quality features. While schedules can change, it will be for planning purposes only.
- Figure 7 displays the tracking graphic for accumulated RCV versus cumulative WQCV. This is the graphic that is included in the Annual Report for Permit Year 2024-2025. This shows that the WQCV within the low-flow features is greater than that RCV for new development.

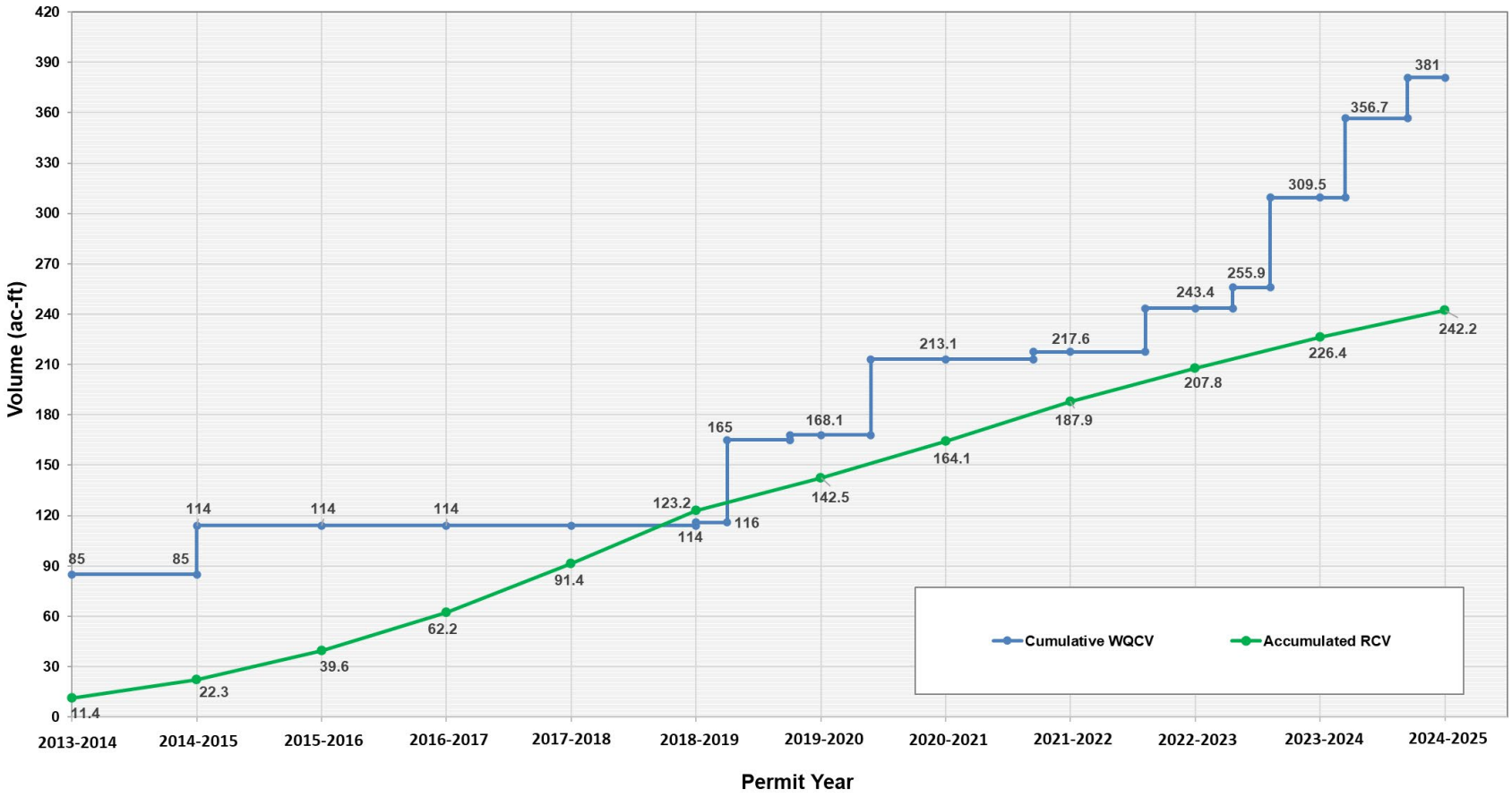

Figure 7. WQCV vs stormwater volume from new development (2013 to 2025)