Lake Havasu City Stormwater Management Plan

Revised September 2024

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1.0 Purpose

Lake Havasu City has completed 2024 Storm water Management Program (SWMP) to establish a more useful and up-to-date guide for the future of stormwater management activities throughout the City. This report focuses on Low Impact Development methods as discussed with Leslie Davidson of Arizona Department of Environmental Quality (ADEQ) in an e-mail dated June 28, 2024. The program specifically considers the six Minimum Control Measures (MCMs) outlined in the ADEQ General Permit AZG2021-002 for Small Municipal Storm Sewer Systems (MS4).

The Best Management Practices (BMP's) & LID's presented here have been proposed because they address the MCM's and are appropriate for Lake Havasu City's stormwater system. These MCM's are measurable, anticipated to make significant improvements in the City's stormwater quality and are achievable. For each BMP, achievable and appropriate goals are delineated along with a schedule indicating frequency of action items, objectives, and a date by which the BMP or LID shall be implemented and established.

The goal of this program is to protect the water resources so many of our current and future residents can enjoy such as: fishing, boating, the beautiful aquatic and wildlife that calls this area home. By implementation and compliance with federal and state regulations, the community can control the adverse impact pollution can have on the receiving waters of Lake Havasu.

The SWMP describes the policies and procedures the City will implement to reduce, to the maximum extent practicable (MEP), pollutant discharges to and from the small municipal separate storm sewer system (MS4). The overall goal of the program is to ensure to the MEP that discharges from the MS4 do not cause or contribute to exceedances of surface water quality standards.

As required by the Permit, the SWMP addresses the six minimum control measures (MCMs):

- Public Education and Outreach
- Public Involvement and Participation
- Illicit Discharge Detection and Elimination Program
- Construction Activity Stormwater Runoff Control
- Post-Construction Stormwater Management in New Development and Redevelopment
- Pollution Prevention and Good Housekeeping for Municipal Operations

The SWMP is designed to be a comprehensive program document outlining how the stormwater program is implemented and maintained. The SWMP reflects the needs and constraints of the City.

Outreach and enforcement materials are located on the City Website at https://www.lhcaz.gov/public-works/storm-water-management

The City uses the following documents to administer the MS4.

- Authority for enforcing the program is contained within City Code. Links to the City Code can be found at: https://codelibrary.amlegal.com/codes/lakehavasucity/latest/overview
- The City Council adopted Health and Safety for Lake Havasu City - Stormwater which details how enforcement is administered. https://www.lhcaz.gov/public-works/storm-water-management

- Construction design and requirements for an erosion control manual are contained in the Stormwater Management Design Manual, which can be found at: https://www.lhcaz.gov/public-works/storm-water-management
- The City utilizes a Low Impact Development design for Post Construction. The LID manual can be found at: https://www.lhcaz.gov/public-works/storm-water-management & Appendix J.
- The Illicit Discharge Detection and Elimination (IDDE) Plan is contained in Appendix C. Illicit Discharge reporting can be found in Appendix G.

2.0 Permit Coverage Area

The City of Lake Havasu City is located in Mohave County in the Colorado River Watershed. Lake Havasu is a part of this watershed making Lake Havasu City one of the largest populated developments in this watershed. There are 6 sub basins with 3 divided among the southern region of the watershed around Lake Havasu City and 3 split up evenly up the Mohave valley. In this watershed the Colorado River travels south through the Mohave Valley. This valley is made up of the El Dorado Mountains and the Black Mountains which also are the borders of the divisions of watersheds. The outlet for the watershed is also the Colorado River. This river travels right through the watershed making it the source as well as the outlet.

The incorporated City limit encompasses approximately 46.4 square miles. The SWMP covers discharges within the City of Lake Havasu City Industrialized boundaries but is focused on the urbanized area. Figure 1 below shows the City boundaries. The blue dashed line marks the City Limits and purple are the receiving waters of Lake Havasu.

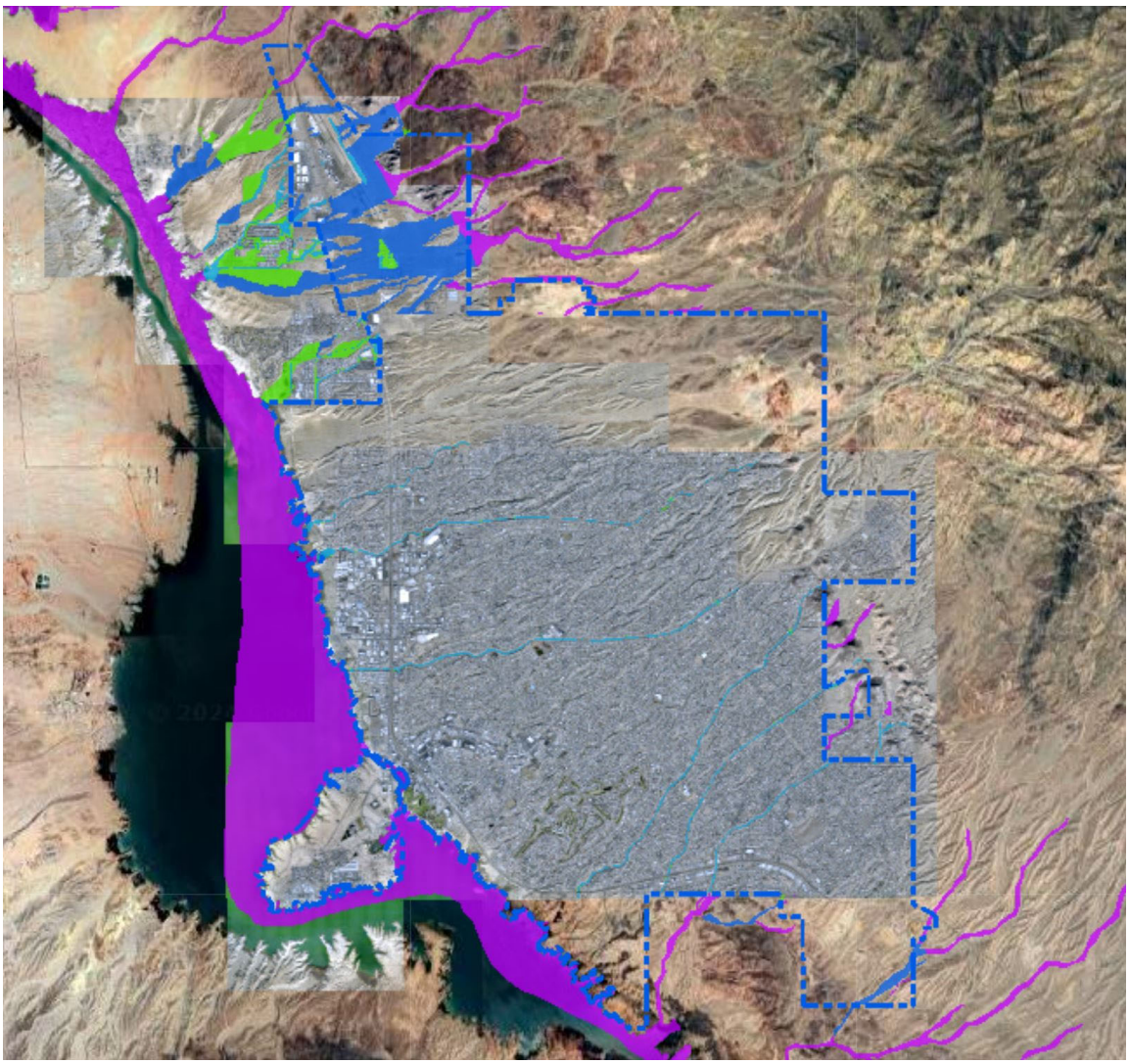


Figure 1 – City boundary and Urbanized boundary

3.0 Receiving Waters

Stormwater runoff is transported via streets, open channels, and other conveyances. The main use of conveyance are though Lake Havasu City's 9 washes listed section 7, Analytical Monitoring. All 9 outfall locations convey stormwater to the Water of the United States. Currently we have a selenium impairment which we test for in the stormwater characterization reports. In last 2023 stormwater characterization no selenium was detected in the cities run off.

4.0 Storm Sewer System Mapping

The City has an up-to-date map of the municipal separate storm sewer system. Mapping is completed as now construction and infrastructure is developed. The City mapping includes:

- Storm sewer system (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains that are owned or operated by the permittee and convey stormwater to Waters of the U.S.),
- Location of all outfalls
- Name and location of all Waters of the U.S. that receive discharges from outfalls.

5.0 Listing of Discharges

The City maintains a record of discharges that may contribute to the exceedance of an applicable surface water quality standard. Since there are no impaired or outstanding waters in the Lake Havasu City Urbanized area, the only standards that apply are the narrative water quality standards. The record is available on request.

6.0 Minimum Control Measures (MCM's)

The City has evaluated the permit requirements for the six MCM's specified in Part 6.0 of the general permit. Based on that review, the City has selected BMPs for each MCM that the City believes will accomplish the goal of minimizing pollution from stormwater runoff to the MEP. Each BMP is then broken down into measurable goals to accomplish the BMP. For this permit cycle, the City has maintained many of the same best management practices as the previous permit cycle and is enhancing or modifying them as necessary to meet the requirements of this new permit.

For each BMP that has been established, the City has identified the following:

- Start date for implementation of the BMP
- Responsible Department / Position
- Measurable goals for tracking the effectiveness of each BMP
- Methods for assessing the overall effectiveness of each BMP

6.1 Public Education and Outreach

6.1.1 The City shall provide public education, outreach to at least one target group, which includes General Public, Residential Community, Homeowners, and Schools. The outreach will focus on conveying relevant messages using one or more appropriate topics listed below during each year of the permit term.

a. Post-construction ordinances and long-term maintenance requirements for permanent stormwater controls;
b. Stormwater runoff issues and residential stormwater management practices;
c. Potential water quality impacts of application of pesticides, herbicides and fertilizer and control measures to minimize runoff of pollutants in stormwater;
d. Potential impacts of animal waste on water quality and the need to clean up and properly dispose of pet waste to minimize runoff of pollutants in stormwater;
e. Illicit discharges and illegal dumping, proper management of non-stormwater discharges, and to provide information on reporting spills, dumping, and illicit discharges;
f. Spill prevention, proper handling and disposal of toxic and hazardous materials, and measures to contain and minimize discharges to the storm sewer system;
g. Installation of catch basin markers or stenciling of storm sewer inlets to minimize illicit discharges and illegal dumping to storm sewer system;
h. Proper management and disposal of used oil; or
i. Community activities (monitoring programs, environmental protection organization activities, etc.).

6.1.2 The City shall provide public education, outreach to at least one target group, which includes Development, Community/Homeowner Association, Construction Site Operators, Targeted Sources or Types of Businesses (industrial or commercial). The outreach will focus on conveying relevant messages using one or more appropriate topics listed below during each year of the permit term.

a. Planning ordinances and grading and drainage design standards for stormwater management in new developments and significant redevelopments
b. Post-construction ordinances and long-term maintenance requirements for permanent stormwater controls;
c. Municipal stormwater requirements and stormwater management practices for construction sites;
d. Illicit discharges and proper management of non-stormwater discharges;
e. Spill prevention, proper handling of toxic and hazardous materials, and measures to contain and minimize discharges to the storm sewer system;
f. Proper management and disposal of used oil and other hazardous or toxic materials, including practices to minimize exposure of materials/wastes to rainfall and minimize contamination of stormwater runoff;
g. Stormwater management practices, pollution prevention plans, and facility maintenance procedures; or
h. Water quality impacts associated with land development (including new construction and redevelopment).

6.1.3 The program shall focus on messages for specific audiences as well as show progress toward the defined educational goals of the program. The permittee shall identify methods that it will use to evaluate the effectiveness of the educational messages and the overall education program. Any methods used to evaluate the effectiveness of the program shall be tied to the defined goals of the program and the overall objective of changes in behavior and knowledge.

6.1.4. The City shall modify any ineffective messages and report in the annual report.

6.2 Public Involvement and Participation

6.2.1 The SWMP and all annual reports shall be available to the public. The current SWMP and annual report in subsequent years shall be posted no later than 30-days of the due date of the annual report.

6.2.2. The permittee shall annually provide the public an opportunity to participate in the review, revisions, updates, and implementation of the SWMP.

6.2.3. The permittee shall create opportunities for citizens to participate in the implementation of stormwater controls, for example, but not limited to:

a. Stream clean-ups
b. Storm drain stenciling;
c. Volunteer monitoring;
d. Disposal of household hazardous waste;
e. Educational activities; and
f. Facilitation of Household Hazardous Waste Dump Day, Continue Havasu Beautiful Clean Up, River/Wash Clean Up Day.

6.2.4. The permittee shall provide and publicize a reporting system to facilitate and track public reporting of spills, discharges and/or dumping to the MS4 on a continuous basis.

6.2.5. Details of the public involvement and participation program in the SWMP.

6.3 Illicit Discharge Detection and Elimination (IDDE) Programs

The City developed an IDDE program to detect and eliminate illicit discharges into the MS4. The IDDE program is included as Appendix C. Additionally, the City maintains the following:

6.3.1. Storm Sewer Map

The City maintains up-to-date map of the MS4 to identify and isolate illicit discharges. The map includes:

i. drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man—made channels, or storm drains that are owned or operated by the City to convey stormwater to a protected surface water.
ii. The location of all outfalls; and
iii. The name and location of all protected surface waters that receive discharges from outfalls.

6.3.2. Enforcement Procedures

The City prohibits non-stormwater discharges into the storm sewer system by Lake Havasu City City Code, Ordinance 14-1105. § 1.12.020 DUTY TO ENFORCE THE CODE & § 1.12.040 VIOLATION A CIVIL INFRACTION—PENALTY. For all stormwater related codes please refer to §8.28, specifically § 8.28.160 ENFORCEMENT.

A. A violation of this chapter shall be enforced as described in Chapter 1.12 of this code. The City Engineer or designee is authorized to enforce the provisions of this chapter.

6.3.3 Statement of IDDE Program Responsibilities

The city includes the lead municipal agency or department responsible for implementing the IDDE Program as well as any other agencies or departments that may have responsibilities for aspects of the program.

6.3.4. Illicit Discharge Detection and Elimination Reporting

The city will include a summary of IDDE activities in the annual report.

6.3.5. Illicit discharges to the MS4 are eliminated when discovered, as outlined in the Enforcement Response Plan.

6.3.7. Visual Monitoring

The city has a visual dry weather and wet weather monitoring program to identify, monitor, and eliminate illicit discharges; and to ensure compliance with effluent limitations. The dry and wet weather programs are included as Appendix C. The City shall visually monitor at least 20% of all outfalls each year. Follow-up screening is also included in Appendix C.

6.4.9. Staff Training

The City will provide annual training to employees involved in the IDDE program (e.g., street workers, inspectors, solid waste personnel, etc.). The training shall include the IDDE program components and how to recognize illicit discharges. The training may be provided virtually. For Staff Training Materials and Employee Attendance are included in Appendix H.

6.4.10. AZPDES Non-Filers

The City will report suspected non-filers, as identified in the attached AZPDES Non-Files program in Appendix C to ADEQ at AZPDES@azdeq.gov on a monthly basis ONLY when there are non-filers to report. The report will include, the facility name and location of the suspected non-filer. The email subject line will include "Non-filer – MS4 Permittee Name."

6.4 Construction Activity Stormwater Runoff Control

The City has a stormwater runoff control program to minimize or eliminate pollutant discharges to the MS4s from construction activities that will disturb one (1) or more acres of land, including sites less than one (1) acre that are part of a common plan of development or sale.

6.4.1. Construction Activity Stormwater Runoff Implementation

The City has shall assess existing legal authority, codes, and other relevant mechanisms and adopt, and implement measures to ensure compliance with construction activity runoff timeframe(s) specified in Part 3.1.

6.4.2. Construction Activity Stormwater Runoff Program Components

The City requires use of sediment and erosion control plan, pursuant to Lake Havasu City City Code Chapter 13-17 and the City Stormwater Management Design Manual.

The City's Stormwater Section maintains an inventory of all construction activities that disturb or will disturb one or more acres within the permitted area, including those that are less than one acre but are part of a larger common plan of development or sale if the larger common plan will ultimately disturb greater than one acre.

The City Stormwater Section is responsible for site inspections and enforcement of sediment and erosion control measures and maintains written procedures for site plan review. Procedures include the following:

a. A review of the site design;
b. The planned operations at the location of the construction activity;
c. Planned stormwater controls during each construction phase; and
d. The planned controls to be used to manage runoff created after development. (see 6.5)

The City Stormwater Section is responsible for site inspections and has written procedures for site inspections and enforcement of sediment and erosion control measures. A minimum of 80% of the site will be inspected.

Based on construction activity inspection findings, the City shall take all necessary follow-up actions (i.e., re-inspection, enforcement) to ensure compliance in accordance with the City's enforcement response plan.

Construction site operators must follow the erosion and sediment control plan to implement BMPs appropriate for the conditions at the construction site.

Construction site operators must control wastes, including but not limited to: discarded building materials, paints, fertilizers, concrete washout, chemicals, litter, equipment leaks, and sanitary wastes.

City staff who conduct activities related to implementing the construction stormwater program must have the knowledge, skills, and abilities to proficiently carryout their assigned duties.

The City shall continue to provide information, such as sample erosion and sediment plans, to operators to assure adequate control BMP requirements has been developed and implemented.

6.5 Post-Construction Stormwater Management in New Development and Redevelopment

The City has a program to address post-construction stormwater runoff from new development and redevelopment projects that disturb one (1) or more acres of land (or less than one (1) acre if part of a common plan of development) that discharge into the permittee's MS4.

6.5.2. The City utilizes a Low Impact Development (LID) design for Post Construction. The LID manual in required in City ordinance for new construction and specifies design, installation, and maintenance of post-construction stormwater controls to reduce or eliminate the discharge of pollutants from the site after construction activities are completed. Please visit Appendix J, For Low Impact Development Plan for Lake Havasu City.

6.5.3. Site Plan Review

The City requires a site plan review process to evaluate and approve post-construction stormwater controls.

6.5.4. Post-Construction Stormwater Control Inventory

The City maintains an inventory system of all post-construction structural stormwater control measures on the City GIS system. The inventory is searchable by property location.

6.5.5. Operation and Maintenance of Post-Construction BMPs

The City inspects post-construction BMPs to ensure the long-term operation and maintenance on an as-needed basis. Inspections can be complaint based or as a result of a routine inspection.

6.6 Pollution Prevention and Good Housekeeping for Municipal Operations

The City has an operations and maintenance program that includes training to prevent or reduce pollutant runoff to protect water quality from municipal facilities and activities. Each facility is responsible for maintaining its own program. Water Services provides training to City staff.

6.6.2 An inventory of all municipally-owned and operated facilities that discharge has been developed and is included in Appendix A. The highest priority facility is the Mulberry treatment Plant, followed by the City yard and City Parks. The PWMF Lake Havasu City and the City Airport are covered under a separate Multi Sector General Permit. Annual training for City facilities is provided by Water Services. Maintenance activities, schedules, and long-term inspection procedures for structural and non-structural stormwater controls to reduce floatables, trash, and other pollutants discharged from the MS4 are the responsibility of each City facility.

The six MCM BMPs are included as Appendix A:

7.0 Analytical Monitoring

Analytical stormwater characterization monitoring will be conducted within the first 30 months of the permit term. Test methods will be in accordance with the Arizona Administrative Code (A.A.C.) R18-9-A905 (B). Testing will be thru existing City approved laboratories using approved test methods. SOPs used to collect wastewater samples will be utilized to collect the characterization samples. The City has a selenium impairment which has been referenced in section Sites were selected based on area collected and distributed throughout town.

7.1.2 The City has selected three outfalls for analytical stormwater characterization monitoring. These locations are as follows:

a. Outfall 1, Daytona Wash = Latitude – 34.458869, Longitude – -114.333751
b. Outfall 2, Pima Wash Latitude – 34.463463, Longitude – -114.355319
c. Outfall 3, Willow Wash Latitude – 34.476926, Longitude – -114.355319
d. Outfall 4, El Dorado Wash Latitude – 34.488505, Longitude – -114.358466
e. Outfall 5, Industrial Drain Latitude – 34.49866, Longitude – -114.361985
f. Outfall 6, Kiowa Drain Latitude – 34.501049, Longitude – -114.363337
g. Outfall 7, Havasupai Wash Latitude – 34.504014, Longitude – -114.34103
h. Outfall 8, Neptune Wash Latitude – 34.511447, Longitude – -114.366699
i. Outfall 9, Felicidad Wash Latitude – 34.524565, Longitude – -114.333751

For a Map of the Outfall Locations can be found in Appendix F.

7.2.2 Characterization monitoring shall be conducted after a "qualifying" storm event. A "qualifying" storm event is at least 0.1 inches of rain received within 24 hours and discharge occurs. Sampling shall be collected within 30 minutes of a discharge to the maximum extent possible.

7.2.3 The following information shall be collected in a sampling event:
a. Date of event
b. Amount of rainfall (in inches)
c. Indication if a sample was collected or if the event was a "no discharge".

7.2.6 Samples for analytical monitoring shall be analyzed for the constituents listed in Appendix D.

7.3 The City has a Selenium Impairment which we believe is contributed to upstream cities. The city has monitored these outfalls and the results can be found in the discharge monitoring report Appendix E.

7.6 Sample results will be included in the DMR reporting in Appendix E.

8.0 Program Assessment and Reporting

To comply with the permit (Permit Section 8.3 Annual Report), the City submits an annual report each year of the permit term to ADEQ.

The annual report will include all the information required in ADEQ's MyDEQ online reporting system.

9.0 SWMP Implementation

Overall responsibility for administrating the Permit and SWMP rests with the Engineering Division and Stormwater Manager. Implementing the SWMP requires participation from multiple departments throughout the City. Key supporting departments include Public Works, Engineering, Park & Recreation, Facilities & Fleet, and Development Services.

The responsibilities for each department are detailed in Appendix B. This document is meant to be a living document and as departments, responsibilities, personnel or any other procedures/practices change within the City, this information will be updated accordingly.

Appendix A - Minimum Control Measures

STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY		
MCM 1: Public Education and Outreach		
For MCM 1- Public Education and Outreach, use the pull down menu to indicate the BMP Category (column 1). You may override the selection and type in your own BMP. Include a brief description of the BMP (column 2) including the personnel position or department(s) responsible. Describe the Measurable Goals (column 3) for each BMP, including the targeted audience such as commercial, construction, industrial or residential for MCM 1. Column 3 should include milestones, timeframes and frequencies. Insert the month and year (MM/YY) in the Start Date (column 4) to indicate the date the BMP was initiated or enter your own text to override the selection.		
BMP Category (enter your own text to override the drop down menu)	BMP Description (include personnel position or department responsible)	Measurable Goals (include milestones, timeframes and frequencies) and include the Targeted Audience
Outreach	Provide brochures on minimizing automotive, pet wastes and other pollutants from entering The City storm drains.	Brochures will be available at City Hall, displayed on the City website. Numbers will be tracked.
Outreach	Provide Public Events for public to participate in community events	Numbers will be tracked.
Special Event	The City will coordinate with MCC to provide outreach to students and other venues.	City staff will coordinate with County and MCC staff to be represented at various outreach venues. Track number of venues and visitors.
Local PSAs	Air PSAs on local radio stations	Track number of ads, and listenership
Video	Develop a series of videos to post on social media.	Track number of views.
Webpage	Establish stormwater page on City's webpage. Provide outreach material and SWMP on webpage.	The City will track the number of views to evaluate use and provide updates with the annual report.
Annual Training	City staff will train various City employees on illicit discharges and good Housekeeping practices.	Attendance at training events will be tracked, See Appendix H.
Article	Staff will publish articles in the Facebook, a triannual publication sent To all City residents.	Provide annual record of articles published.

MCM 1: Public Education and Outreach

Use this space to add any additional information for MCM1:

Lake Havasu City, as part of its public education and outreach activities, will maintain and add stormwater program information to the City's website. This will be a cost-effective and practicable way for the City to provide stormwater information to the general public.

Permit Requirement Citation: Part V, Section B.1.a

Activity: Implement, maintain, and update as necessary stormwater educational materials via Lake Havasu City's website. Links to other appropriate web pages (examples: ADEQ and EPA) and contact information for the City's contact personnel.

Objectives: To provide a web base informational section on Lake Havasu City's website to discuss the City's SWMP and local storm water issues.

Interim Steps and Schedule:

Research/Develop Materials	June 23, 2023 Completed
Public Information added to Website	November 13, 2023 Completed
Update Website Materials	Ongoing- Annually

Measurable Goals: To provide useful information on local stormwater issues, including a copy of the SWMP and links to other resources. Lake Havasu City will also track the number of hits during the period of operation, as well as updating the information to keep current with the Arizona Pollutant Discharge Elimination System (AZPDES) general permit.

MCM 2: Public Involvement and Participation		
For MCM 2- Public Involvement and Participation, use the pull down menu to indicate the BMP Category (column 1). You may override the selection and type in your own BMP. Include a brief description of the BMP (column 2) including the personnel position or department(s) responsible. Describe the Measurable Goals (column 3) for each BMP. Column 3 should include milestones, timeframes and frequencies. Insert the month and year (MM/YY) in the Start Date (column 4) to indicate the date The BMP was initiated or enter your own text to override the selection.		
BMP Category (enter your own text to override the drop down menu)	BMP Description (include personnel position or department responsible)	Measurable Goals (include milestones, timeframes and frequencies)
Public Involvement	Staff will participate in a Keep Havasu Beautiful Clean Up.	Meeting minutes and agenda are recorded for the meeting. City staff prepares annual reports.
Public Participation	Staff will participate in the Lake Havasu City Area Household Hazardous Waste Dump Day.	Attendance and activities will be recorded and reported in the annual report.
Public Participation	Staff will participate in River & Wash Volunteer Clean Up Day.	Attendance and activities will be recorded and reported in the annual report.
Public Participation	City will help sponsor Make a Coffee With the Mayor.	Annual events will be recorded in the annual report
Public Involvement	The City will make the SWMP and annual report available on the City's Stormwater web page.	The number of visits and downloads will be reported in the annual report. Choose an item.

MCM 3: Illicit Discharge Detection and Elimination (IDDE) Program		
For MCM 3- Illicit Discharge Detection and Elimination (IDDE) Program, use the pull down menu to indicate the BMP Category (column 1). You may override the selection and type in your own BMP. Include a brief description of the BMP (column 2) including the personnel position or department(s) responsible. Describe the Measurable Goals (column 3) for each BMP. Column 3 should include milestones, timeframes and frequencies. Insert the month and year (MM/YY) in the Start Date (Column 4) to indicate the date the BMP was initiated or enter your own text to override the selection.		
BMP Category (enter your own text to override the drop down menu)	BMP Description (include personnel position or department responsible)	Measurable Goals (include milestones, timeframes and frequencies)
Stormwater Sewer Mapping	Staff will continue to map the City stormwater system. The system is approximately 70% Complete.	Mapping will continue and progress will be reported in the annual report.
Written IDDE Procedures	The City will continue to update and modify current IDDE procedures as Needed.	Updated IDDE procedures will be included with the annual report.
Outfall Inventory	The City will continue to update and revise the outfall inventory as Needed.	Outfall inspections and locations will be recorded in the annual report.
Dry Weather Screening	A minimum of 20% of outfalls will be inspected on an annual basis. 100% of outfalls will be inspected within the 5 year Permit term.	Results and locations of outfall inspections will be recorded in the annual report.
Wet Weather Monitoring	Identify five outfalls for wet weather visual monitoring. The City will identify outfalls to be easily accessible by staff during normal business Hours.	Two monitoring events will be conducted during each wet season (Summer and Winter). Results of monitoring events will be recorded in the annual report.
Implement IDDE Program	City staff will establish a direct phone line to the Stormwater Section for receipt of input from the Public, 24 hours a day.	Receive and investigate complaints concerning illicit discharges and dumping and record the resolution of complaints and concerns in the Annual report.
Training	The City will continue to train employees in the detection, collection, and identification of illicit Discharges. Training will	Record attendance and content of training in the annual report.

	specifically target staff that regularly drive on City streets	
Implement IDDE Program	Direct residents to dispose of household hazardous waste to the City Hazardous Products Center (HPC).	Include link to the HPC on the City Stormwater web page.
Implement IDDE Program	City staff will keep record of commercial and industrial facilities that may require coverage under the multi sector General permit (MSGP).	List of facilities will be submitted to ADEQ each year separate of the annual report.

MCM 3: Illicit Discharge Detection and Elimination (IDDE) Program

Use this space to add any additional information about MCM3:

Community activities (monitoring programs, environmental protection organization activities, etc.) Illicit discharges and illegal dumping, proper management of non-stormwater discharges, and to provide information on reporting spills, dumping, and illicit discharges Installation of catch basin markers or stenciling of storm sewer inlets to minimize illicit discharges and illegal dumping to storm sewer system.

Post-construction ordinances and long-term maintenance requirements for permanent stormwater controls.

Potential impacts of animal waste on water quality and the need to clean up and properly dispose of pet waste to minimize runoff of pollutants in stormwater.

Potential water quality impacts of application of pesticides, herbicides and fertilizer and control measures to minimize runoff of pollutants in stormwater.

Proper management and disposal of used oil, spill prevention, proper handling and disposal of toxic and hazardous materials, and measures to contain and minimize discharges to the storm sewer system.

Stormwater runoff issues and residential stormwater management practices

Describe how the message was conveyed to the target group.

We hold quarterly public meetings where we communicate with the public in regard to concerns of illegal dumping in local washes that drain to the lake and take corrective actions when required. On earth day we hold a park clean up event to pick up trash, debris and general waste with parks and recreation staff and volunteers. We conduct regular meetings with industrial waste facilities to communicate spill prevention and proper handling of common chemical and industrial waste products. We coordinate with the public in regards to illicit discharge complaints via our website at LHCAZ.GOV under the storm water management tab. Mike Wolfe, P.E. is our lead stormwater contact at 928-680-5460 ext. 4330

Describe measures/methods used to assess the effectiveness of the message conveyed to the target group.

We have a slide show depicting several different types of Illicit Discharges. Pamphlets to our Illicit Discharge Program with a list of contacts can be found on our city website https://www.lhcaz.gov/public-works/storm-water-management. We generally will explain different types of illicit discharges by using images found on these documents. We also have a video that we share on illicit discharges for teaching staff for training purposes.

MCM 4: Construction Activity Stormwater Runoff Control		
For MCM 4- Construction Activity Stormwater Runoff Control, use the pull down menu to indicate the BMP Category (column 1). You may override the selection and type in your own BMP. Include a brief description of the BMP (column 2) including the personnel position or department(s) responsible. Describe the Measurable Goals (column 3) for each BMP. Column 3 should include milestones, timeframes and frequencies. Insert the month and year (MM/YY) in the Start Date (column 4) to indicate The date the BMP was initiated or enter your own text to override the selection.		
BMP Category (enter your own text to override the drop down menu)	BMP Description (include personnel position or department responsible)	Measurable Goals (include milestones, timeframes and frequencies)
Written Procedures	The City will use policy, as necessary, to enforce erosion and sediment control during the plan Review process.	Any changes will be reported annually.
Erosion Control Ordinance	The City will develop an ordinance that requires sediment and erosion Control practices.	Progress toward an ordinance and any ordinance developed to meet this goal will be recorded in the annual Report.
Enforcement	The City will continue to require BMPs and SWPPPs, required under ADEQ's CGP, to be submitted with plan review to control stormwater runoff from Construction activities.	Enforcement will be evaluated and any changes will be recorded in the annual report.
Training	Continue to develop technical guidance materials and training for the design and maintenance of erosion and sediment control measures as well as other strategies to address Construction site wastes.	City staff will continue to update as needed and record any changes in the annual report.
Inventory	The City will use Inspires, an internal tracking database to track the number of inspections and Re-inspections annually.	Number of enforcement actions will be recorded in the annual report.

MCM 4: Construction Activity Stormwater Runoff Control

Use this space to add any additional information about MCM4:

The City does not have a specific sediment or erosion control ordinance, but does have the following authority under the building code:

1. Contractor shall submit to the Arizona Department of Environmental Quality a Notice of Intent (NOI) and a Notice of Termination (NOT) pursuant to the requirements of ARS Title 49, Chapter 2, and Article 3.1. A copy of the submitted NOI and the NOT shall be provided to the City of Lake Havasu City Stormwater Section. The NOI shall be submitted prior to issuance of any City of Lake Havasu City grading or offsite permits. The NOT shall be submitted prior to final acceptance of off-site improvements and the certificate of occupancy.

2. An Arizona certified or Registered Civil Engineer shall prepare and submit for review and approval a Storm water Pollution Prevention Plan (SWPPP) in accordance with the Arizona Department of

3. Transportation (ADOT) Best Management Practices (BMP) Manual (or other BMP's as may be approved by the Storm water Manager). Submittal shall be made concurrent with the Civil Plan submittal and attached to the Civil Plan set. Review timeframes shall be the same as other civil reviews.

4. Prior to commencement of Grading Activities, the SWPPP' shall be in place and the City of Lake Havasu City contacted for inspection. The grading permit shall be issued upon City of Lake Havasu City approval of the implementation of the approved SWPPP.

5. During construction, the SWPPP shall remain in place, and shall be maintained until project completion as witnessed by a Final Grading Certification and the filing of a NOT. Failure to maintain structural controls may result in a Stop Work Order.

6. In accordance with the provisions of this section, the City of Lake Havasu City may withhold permits, occupancy or enforce by other remedy in order to ensure compliance.

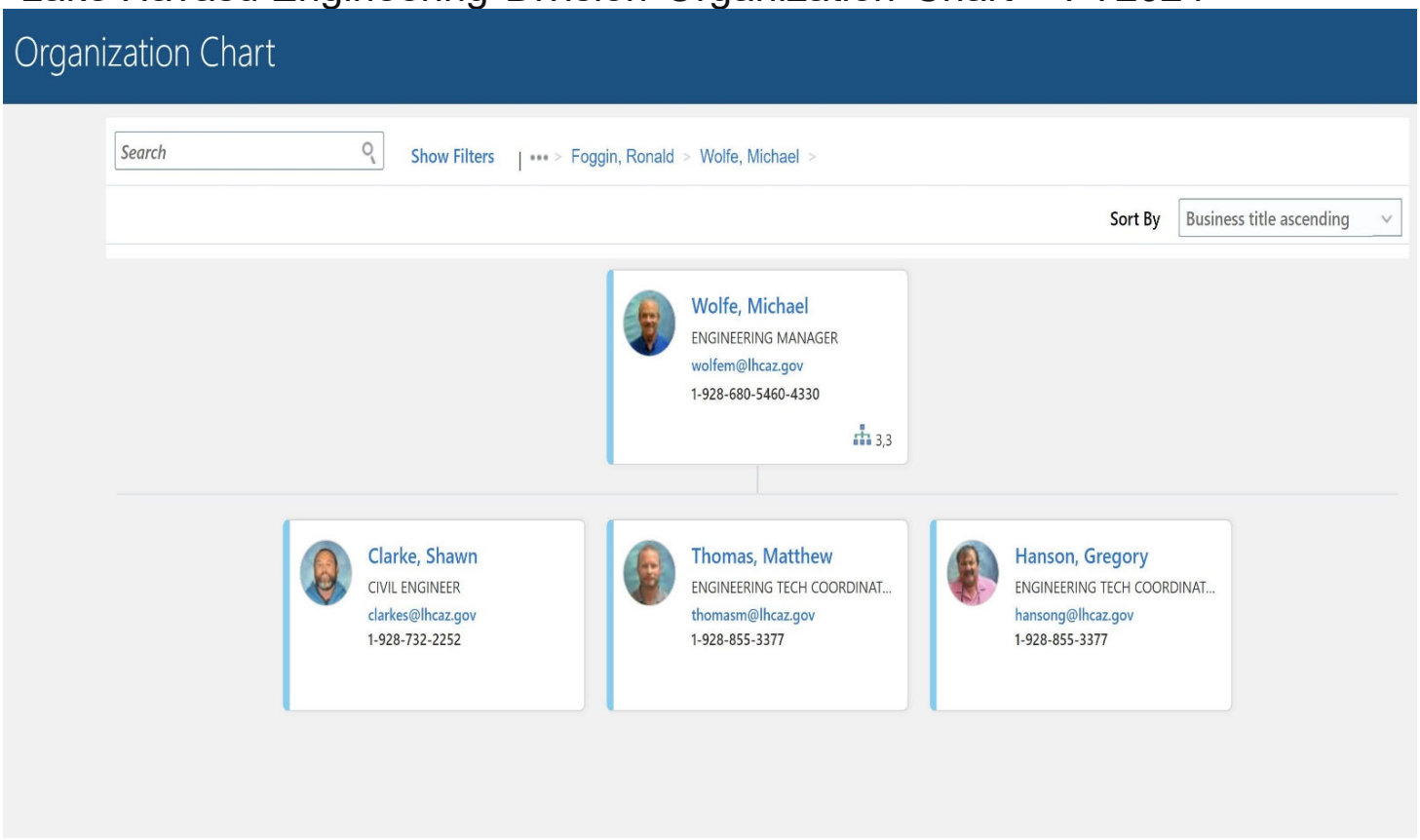
MCM 5: Post-Construction Stormwater Management in New Development and Redevelopment		
For MCM 5- Post-Construction Stormwater Management in New Development and Redevelopment, use the pull down menu to indicate the BMP Category (column 1). You may override the selection and type in your own BMP. Include a brief description of the BMP (column 2) including the personnel position or department(s) responsible. Describe the Measurable Goals (column 3) For each BMP. Column 3 should include milestones, timeframes and frequencies. Insert the month and year (MM/YY) in the Start Date (column 4) to indicate the date the BMP was initiated or enter your own text to override the selection.		
BMP Category (enter your own text to override the drop down menu)	BMP Description (include personnel position or department responsible)	Measurable Goals (include milestones, timeframes and frequencies)
Inspections	City will conduct post Construction site inspections.	Inspections will tracked, recorded and reported annually.
Green Infrastructure	The City has a Low Impact Development program for new development and redevelopment to retain stormwater on-site from Impervious surfaces.	The City will continue to review and make changes to the program as necessary.
Inventory	The City will develop an Inventory system for post construction activities.	Inventory will be digital and searchable.

MCM 6: Pollution Prevention and Good Housekeeping		
For MCM 6- Pollution Prevention and Good Housekeeping, Insert the Facility Name applicable to the MS4. Use the pull down menu to indicate the BMP Category (column 1). You may override the selection and type in your own BMP. Include a brief description of the BMP (column 2) including the personnel position or department(s) responsible. Describe the Measurable Goals (column 3) for each BMP. Column 3 should include milestones, timeframes and frequencies. Insert the month and year (MM/YY) in the Start Date (column 4) to indicate the date the BMP was initiated or enter your own text to override the Selection. For those BMPs that are not Facility specific, use the rows after the Facility Name inserts.		
BMP Category (enter your own text to override the drop down menu)	BMP Description (include personnel position or department responsible)	Measurable Goals (include milestones, timeframes and frequencies)
Insert Facility Name: Lake Havasu City Airport		
Training and Inspections	Facility will conduct annual inspections. Training Conducted by Water Services.	Training events will continue to be tracked and reported annually. Reports stored on Server Drive
Insert Facility Name: Public Works Vehicle Shop		
Training and Inspections	Facility will conduct annual inspections. Training Conducted by Water Services.	Training events will continue to be tracked and reported annually Reports stored on Server Drive
Insert Facility Name: Mulberry and Island Treatment Plant		
Training	Facility has a no discharge waiver under the MSGP. Continue to train staff on preventing stormwater discharges.	Training events will continue to be tracked and reported annually
Insert Facility Name: Parks		
Training	Facility does not meet classification to require coverage under the MSGP. City will continue training staff to prevent discharges To the MS4.	Training events will continue to be tracked and reported annually
Insert Facility Name: Utilities Shop		
Training	Facility does not meet classification to require coverage under the MSGP. City will continue training staff to prevent discharges To the MS4.	Training events will continue to be tracked and reported annually
Insert Facility Name: Click here to enter text.		

Choose an item.	Click here to enter text.	Click here to enter text.	Choose an item.
Insert Pollution Prevention and Good Housekeeping BMPs that are not facility specific below			
Inventory	Staff will continue to determine if city facilities	New facilities will be tracked and Reported annually.	

Appendix B - Roles and Responsibilities

Lake Havasu Engineering Division Organization Chart - FY2024



Appendix C - Illicit Discharge Detection and Elimination (IDDE) Plan

IDDE Program

Program Elements

The City of Lake Havasu City has implemented this Illicit Discharge Detection and Elimination Program (IDDE Program) to find and eliminate sources of non-stormwater and illicit discharges to its Municipal Separate Storm Sewer System (MS4). Procedures of the IDDE program will be implemented to prevent illicit connections and discharges to the MS4.

The City will utilize the ERP and the protocol of annual SWMP evaluation to evaluate indicators of functionality of this program and track its success. Indicators of program success are outlined in this IDDE program detailing actions required to locate and remove illicit discharges.

The City utilizes the following methods for IDDE:

1. Dry weather monitoring of outfalls
2. Wet weather monitoring of outfalls
3. A complaint hotline (928-680-5460 Ext 4330, Mike Wolfe P.E.)
4. Water Services, Public Works crews and Community Development building Inspectors to report any illicit discharge or illegal dumping to the MS4.

Investigation of IDDE

Water Services uses an investigation system for tracing illicit discharges and illegal dumping. Illicit discharges are investigated by Water Services Watershed Specialist and Stormwater Project Managers. Other staff, including Pretreatment Inspectors may also help identify Illicit Discharges. Results of illicit discharge inspections and any resolution and enforcement are documented in an Illicit Discharge database spreadsheet. Enforcement actions follow the city code and are enforced by code enforcement officers in the City of Lake Havasu.

The City maintains a list of allowable non-Stormwater Discharges in Ordinance 14-1105 - of City Code. Residents in Lake Havasu City are typically more aware of pollution and how it can affect our waterways. Additionally, Water Services uses public education and public outreach as minimum control measures to further the program. These measures have been very effective and dramatically reduced illicit discharges. Water Services educates City field staff to detect and report illicit discharges. Any industrial facility suspected of potentially discharging to the MS4 without MSGP coverage may be identified and reported to the State Arizona Department of Environmental Quality (ADEQ). The City may not notify the facility unless an illicit discharge has occurred to the MS4.

Staff Training

Water Services provides annual training for all staff involved in identifying, reporting and mitigating illicit discharges to the City's MS4 system. These staff may include Water Services Staff, Public Works staff, Building Safety Inspectors, and Community Development. Summary of trained staff is reported in the annual report.

Standard Operating Procedure (SOP)

This SOP describes the procedures used to detect and report illicit discharges. The SOP will be revised as necessary. The City is implementing the following steps:

1. Locate important areas and locations likely to have illicit discharges with proximity to the City MS4.
2. Perform annual inspections of at least 20% of stormwater dry weather per the Dry Weather Outfall Program and Assessment Inspection Form.
3. Review and consider information collected when illicit discharge was initially identified in a previous incident or dry weather inspection.
4. Review procedures to remove the source of an illicit discharge.
5. Refer potential septic system failures to the local health office for enforcement.
6. Follow the City ERP for enforcement.
7. Perform inspections by Water Services staff while they are conducting their duties in and around the MS4 system.
8. Respond to Hotline calls/complaints.
9. Staff will contact the Stormwater Manager or Regulatory Compliance Manager if they see evidence of an illicit discharge or illegal dumping to the MS4. Management will follow the ERP for enforcement.
10. The IDDE program will be evaluated for effectiveness and reported in the Annual report to ADEQ, as needed.

Dry Weather Monitoring Program

The City will inspect approximately 20% of dry weather outfall locations during each permit year. The City currently has 73 dry weather outfall locations. This number can change as inspections during outfall inspections and new outfalls are discovered or existing outfalls are either Not City owned or not actual outfall locations. The actual outfall locations will be updated annually and be reflected on a Collector App that uses the City GIS system.

Each outfall identified must be City owned and operated and discharge to an Appendix B water as identified in the Arizona Administrative Code, Title 18, Chapter 11. Private owned outfalls are not part of the City MS4 program.

The following data will be collected for each outfall inspection:

- Sampling date
- Monitoring location (outfall ID)
- Water of the US that received the discharge
- Flow present
- Presence of floatables
- Visible deposits or staining
- Vegetation conditions
- Objectionable odors
- Evidence of illegal dumping
- Oil, grease or other pollutants
- Refuge or waste

The summary of the results of the Dry Weather Screening will be tabulated and included in the annual report.

Wet Weather Monitoring Program

The City has five outfall locations in the wet weather monitoring program. The sites were selected at locations that have significant concentrations to an Appendix B Water or near the entry into an Appendix B water. The five sites are included on the City GIS system and identified in the Collector App for inspection.

The City will conduct a minimum of two (2) stormwater discharge visual monitoring inspections at each wet weather monitoring representative outfall during each summer and winter wet season. Inspections will be conducted as soon as practicable after a storm event and during regular business hours. The findings will be included in the annual report.
The wet seasons are defined as:

Summer Wet Season: June 1 through October 31
Winter Wet Season: November 1 through May 31

If City staff cannot access an outfall during a wet weather discharge, such as a snowfall or flashflood event, the City shall conduct wet weather screening as soon as practicable after the storm or discharge event.

The following data will be collected for each outfall during a storm event:

- Sampling date
- Monitoring location (outfall ID)
- Water of the US that received the discharge
- Settle-able solids observed
- Objectionable odors
- Unnatural colors
- Oil, grease or other pollutants
- Refuge or waste

The summary of the results of the Wet Weather Screening will be tabulated and included in the annual report.

Visual Monitoring Follow-up Screening Program 6.3.7(c)

The City will investigate any illicit discharge discovered during the dry and wet weather outfall monitoring.

If an illicit discharge or illegal dumping is detected from a complaint report, dry weather outfall monitoring, or wet weather outfall monitoring; a full investigation into the pollutant source will be conducted. If the contaminant is discovered at a piped outfall, upstream manholes will be inspected to determine the discharge location. Enforcement procedure process will follow the City's adopted Enforcement Response Plan. The source will also be added to the schedule for follow-up screening in the following year outfall monitoring. All follow-up screening events will be reported on the annual report.

Indicators of IDDE Program Progress 6.3.8

The City will respond to all illicit discharges as soon as practicable as and typically no later than 5 days of report or discovery. The City will an EXCEL Spreadsheet to illicit discharges to the MS4. The spreadsheet can be found on the following parameters are tracked and recorded:

- Time and Date discharge was reported or discovered
- Location or address of discharge
- Contact information and name (or identity) of person reporting discharge
- Inspector responding to discharge
- Property Owner or responsible party for location of discharge
- Inspection or efforts taken to locate discharge
- Description of discharge with photos
- Remedial action, if any, taken to discontinue or remove the discharge
- Time and date of inspection
- Response time from time of discovery or report to time of inspection
- Violations observed and follow-up inspection recommended
- Enforcement issued (Warning Letter, NOV or referral)
- Follow-up inspection date and time
- Time to close discharge investigation

The permittee shall report the findings of IDDE and report the overall effectiveness of the program in the annual program evaluation and in the annual report.

AZPDES Non-Filers (6.3.10)

Purpose

Pursuant to the general permit for Small MS4s (AZG2021-002), the permittee shall develop, implement, and enforce a program to actively identify facilities and activities (e.g., industrial facilities, construction activities, etc.) that discharge to the MS4 without an AZPDES/NPDES permit.

The permittee shall include the number of facilities contacted each year in the annual report and shall include the facility name, type of activity conducted at the facility (including SIC code, to the extent known), and whether or not the facility has AZPDES permit coverage, if known or available.

A description of the permittee's illicit discharge program shall be included in the SWMP.

Procedure

The city is required to develop, implement, and enforce a program to actively identify facilities and activities (e.g., industrial facilities, construction activities, etc.) that discharge to the MS4 without an AZPDES/NPDES permit. These facilities and activities may include materials handling and storage, equipment maintenance and cleaning, industrial processing, and other operations that occur at industrial facilities and may be exposed to stormwater.

Lake Havasu City Water Services will use data to determine activities that is generated from questionnaires sent to industrial facilities by the Pretreatment Program. The Pretreatment Program uses a review of businesses licenses and online database to search for new and existing businesses that might fall into these categories: storage, manufacturing, industrial, materials handling, chemical storage, machine shops, automotive facilities, pest control, paint manufacturers, and more. Questionnaires are sent to the industrial facilities that may fall into one of these categories.

Lake Havasu City Water Services will include a review of the industrial facilities and compile the following data collected each year in the MS4 annual report:

1. Facility name,
2. Type of activity conducted at the facility (including the SIC code, to the extent known) and,
3. Any AZPDES permit coverage, if known or available.

Appendix D - Stormwater Characterization Monitoring Requirements

The City shall conduct stormwater characterization monitoring for the parameters listed in Table 7.0 below, as required by Parts 7.1, 7.2, and 7.3 of this permit.

Parameter	**Units**	**Monitoring Frequency**	**Monitoring Type**
Metals			
Antimony	µg/L	1x during first 24 months of permit term	Discrete
Barium	µg/L	1x during first 24 months of permit term	Discrete
Beryllium	µg/L	1x during first 24 months of permit term	Discrete
Cadmium	µg/L	1x during first 24 months of permit term	Discrete
Nickel	µg/L	1x during first 24 months of permit term	Discrete
Mercury	µg/L	1x during first 24 months of permit term	Discrete
Silver	µg/L	1x during first 24 months of permit term	Discrete
Thallium	µg/L	1x during first 24 months of permit term	Discrete
Inorganics			
Cyanide	µg/L	1x during first 24 months of permit term	Discrete
Volatile Organic Compounds (VOCs)			
Acrolein	µg/L	1x during first 24 months of permit term	Discrete
Acrylonitrile	µg/L	1x during first 24 months of permit term	Discrete
Benzene	µg/L	1x during first 24 months of permit term	Discrete
Carbon tetrachloride	µg/L	1x during first 24 months of permit term	Discrete
Chlorobenzene	µg/L	1x during first 24 months of permit term	Discrete
Dibromochloromethane	µg/L	1x during first 24 months of permit term	Discrete
Chloroethane	µg/L	1x during first 24 months of permit term	Discrete

2-chloroethylvinyl ether	µg/L	1x during first 24 months of permit term	Discrete
Chloroform	µg/L	1x during first 24 months of permit term	Discrete
Bromodichloromethane	µg/L	1x during first 24 months of permit term	Discrete
1,2-dichlorobenzene	µg/L	1x during first 24 months of permit term	Discrete
1,3-dichlorobenzene	µg/L	1x during first 24 months of permit term	Discrete
1,4-dichlorobenzene	µg/L	1x during first 24 months of permit term	Discrete
1,1-dichloroethane	µg/L	1x during first 24 months of permit term	Discrete
1,2-dichloroethane	µg/L	1x during first 24 months of permit term	Discrete
1,3-dichloropropylene	µg/L	1x during first 24 months of permit term	Discrete
Ethylbenzene	µg/L	1x during first 24 months of permit term	Discrete
Bromomethane	µg/L	1x during first 24 months of permit term	Discrete
Chloromethane	µg/L	1x during first 24 months of permit term	Discrete
Methylene chloride	µg/L	1x during first 24 months of permit term	Discrete
1,1,2,2-tetrachloroethane	µg/L	1x during first 24 months of permit term	Discrete
Tetrachloroethylene	µg/L	1x during first 24 months of permit term	Discrete
Toluene	µg/L	1x during first 24 months of permit term	Discrete
1,2-trans-dichloroethylene	µg/L	1x during first 24 months of permit term	Discrete
1,1,1-trichloroethane	µg/L	1x during first 24 months of permit term	Discrete
1,1,2-trichloroethane	µg/L	1x during first 24 months of permit term	Discrete

Trichloroethylene	µg/L	1x during first 24 months of permit term	Discrete
Vinyl chloride	µg/L	1x during first 24 months of permit term	Discrete
Xylene	µg/L	1x during first 24 months of permit term	Discrete
Semi-VOCs - Acid Extractable			
2-chlorophenol	µg/L	1x during first 24 months of permit term	Discrete
2,4-dichlorophenol	µg/L	1x during first 24 months of permit term	Discrete
2,4-dimethylphenol	µg/L	1x during first 24 months of permit term	Discrete
4,6-dinitro-o-cresol	µg/L	1x during first 24 months of permit term	Discrete
2,4-dinitrophenol	µg/L	1x during first 24 months of permit term	Discrete
2-nitrophenol	µg/L	1x during first 24 months of permit term	Discrete
4-nitrophenol	µg/L	1x during first 24 months of permit term	Discrete
p-chloro-m-cresol	µg/L	1x during first 24 months of permit term	Discrete
Pentachlorophenol	µg/L	1x during first 24 months of permit term	Discrete
Phenol	µg/L	1x during first 24 months of permit term	Discrete
2,4,6-trichlorophenol	µg/L	1x during first 24 months of permit term	Discrete
Semi-VOCs – Base/Neutrals			
Acenaphthene	µg/L	1x during first 24 months of permit term	Discrete
Acenaphthylene	µg/L	1x during first 24 months of permit term	Discrete
Anthracene	µg/L	1x during first 24 months of permit term	Discrete
Benz(a)anthracene	µg/L	1x during first 24 months of permit term	Discrete

Benzo(a)pyrene	µg/L	1x during first 24 months of permit term	Discrete
Benzo(b)fluoranthene	µg/L	1x during first 24 months of permit term	Discrete
Benzo(g,h,i)perylene	µg/L	1x during first 24 months of permit term	Discrete
Benzo(k)fluoranthene	µg/L	1x during first 24 months of permit term	Discrete
Chrysene	µg/L	1x during first 24 months of permit term	Discrete
Dibenzo(a,h)anthracene	µg/L	1x during first 24 months of permit term	Discrete
3,3'-dichlorobenzidine	µg/L	1x during first 24 months of permit term	Discrete
Diethyl phthalate	µg/L	1x during first 24 months of permit term	Discrete
Dimethyl phthalate	µg/L	1x during first 24 months of permit term	Discrete
Di-n-butyl phthalate	µg/L	1x during first 24 months of permit term	Discrete
2,4-dinitrotoluene	µg/L	1x during first 24 months of permit term	Discrete
2,6-dinitrotoluene	µg/L	1x during first 24 months of permit term	Discrete
Di-n-octyl phthalate	µg/L	1x during first 24 months of permit term	Discrete
1,2-diphenylhydrazine (as azobenzene)	µg/L	1x during first 24 months of permit term	Discrete
Fluoranthene	µg/L	1x during first 24 months of permit term	Discrete
Fluorene	µg/L	1x during first 24 months of permit term	Discrete
Hexachlorobenzene	µg/L	1x during first 24 months of permit term	Discrete
Hexachlorobutadiene	µg/L	1x during first 24 months of permit term	Discrete
Hexachlorocyclopentadiene	µg/L	1x during first 24 months of permit term	Discrete

Hexachloroethane	µg/L	1x during first 24 months of permit term	Discrete
Indeno(1,2,3-cd)pyrene	µg/L	1x during first 24 months of permit term	Discrete
Isophorone	µg/L	1x during first 24 months of permit term	Discrete
Naphthalene	µg/L	1x during first 24 months of permit term	Discrete
Nitrobenzene	µg/L	1x during first 24 months of permit term	Discrete
N-nitrosodimethylamine	µg/L	1x during first 24 months of permit term	Discrete
N-nitrosodi-n-propylamine	µg/L	1x during first 24 months of permit term	Discrete
N-nitrosodiphenylamine	µg/L	1x during first 24 months of permit term	Discrete
Phenanthrene	µg/L	1x during first 24 months of permit term	Discrete
Pyrene	µg/L	1x during first 24 months of permit term	Discrete
1,2,4-trichlorobenzene	µg/L	1x during first 24 months of permit term	Discrete
PCB / Pesticides			
Aldrin	µg/L	1x during first 24 months of permit term	Discrete
Alpha-BHC	µg/L	1x during first 24 months of permit term	Discrete
Beta-BHC	µg/L	1x during first 24 months of permit term	Discrete
Gamma-BHC	µg/L	1x during first 24 months of permit term	Discrete
Delta-BHC	µg/L	1x during first 24 months of permit term	Discrete
Chlordane	µg/L	1x during first 24 months of permit term	Discrete
4,4'-DDT	µg/L	1x during first 24 months of permit term	Discrete
4,4'-DDE	µg/L	1x during first 24 months of permit term	Discrete

4,4'-DDD	µg/L	1x during first 24 months of permit term	Discrete
Dieldrin	µg/L	1x during first 24 months of permit term	Discrete
Alpha-endosulfan	µg/L	1x during first 24 months of permit term	Discrete
Beta-endosulfan	µg/L	1x during first 24 months of permit term	Discrete
Endosulfan sulfate	µg/L	1x during first 24 months of permit term	Discrete
Endrin	µg/L	1x during first 24 months of permit term	Discrete
Endrin aldehyde	µg/L	1x during first 24 months of permit term	Discrete
Heptachlor	µg/L	1x during first 24 months of permit term	Discrete
Heptachlor epoxide	µg/L	1x during first 24 months of permit term	Discrete
PCB-1242	µg/L	1x during first 24 months of permit term	Discrete
PCB-1254	µg/L	1x during first 24 months of permit term	Discrete
PCB-1221	µg/L	1x during first 24 months of permit term	Discrete
PCB-1232	µg/L	1x during first 24 months of permit term	Discrete
PCB-1248	µg/L	1x during first 24 months of permit term	Discrete
PCB-1260	µg/L	1x during first 24 months of permit term	Discrete
PCB-1016	µg/L	1x during first 24 months of permit term	Discrete
Toxaphene	µg/L	1x during first 24 months of permit term	Discrete

Appendix E - Discharge Monitoring Reports

AZPDES SMALL MS4 - STORMWATER CHARACTERIZATION DMR

LTF #: 92548

Report/Form ID #: 93223

Date Submitted: 09/25/2023

AZPDES SMALL MS4 STORMWATER CHARACTERIZATION DMR - SUMMARY

Company:

Name: LAKE HAVASU CITY

Question: What is the sample date and lab result received date?

Answer:

Sample Date: 08/19/2023
Lab Result Received Date: 08/21/2023

Question: Did you take samples for field screening points that need to be included in the DMR?

Answer: No

Field Screening Point Name/Number	Latitude	Longitude	Protected Surface Water Name

Question: Identify all your outfalls/field screening points for this DMR.

Answer:

Outfall/Field Screening Point Name/Number	Protected Surface Water Name	Latitude	Longitude	Rainfall Amount (inches)	Land Use
Location 1	Lake Havasu	34.458869	-114.333751	.12	Residential
Location 2	Lake Havasu	34.463463	-114.342216	.12	Industrial
Location 5	Lake Havasu	34.494866	-114.361985	.12	Commercial

Question: Do you need to provide a No Data Indicator (NODI) code for this report at the outfall/field screening point level?

Answer: No

Outfall/Field Screening Point Name/Number	NODI

Question: How many samples for mandatory parameters have been taken for each outfall/field screening point?

Answer:

Outfall/Field Screening Point Name/Number	Type	Parameter	Number of Samples
Location 1	Outfall	1,1,1-TRICHLORO ETHANE	1
Location 1	Outfall	1,1,2,2-TETRACHLORO ETHANE	1
Location 1	Outfall	1,1,2-TRICHLORO ETHANE	1
Location 1	Outfall	1,1-DICHLORO ETHANE	1
Location 1	Outfall	1,2,4-TRICHLORO BENZENE	1
Location 1	Outfall	1,2- TRANS-DICHLORO-ETHYLENE	1
Location 1	Outfall	1,2-DICHLORO BENZENE	1
Location 1	Outfall	1,2-DICHLOROETHANE	1
Location 1	Outfall	1,2-DIPHENYL HYDRAZINE	1
Location 1	Outfall	1,3-DICHLORO BENZENE	1
Location 1	Outfall	1,3-DICHLOROPROPYLENE	1

Outfall/Field Screening Point Name/Number	Type	Parameter	Number of Samples
Location 1	Outfall	1,4-DICHLORO BENZENE 2	1
Location 1	Outfall	2,4,6-TRICHLORO PHENOL	1
Location 1	Outfall	2,4-DICHLORO PHENOL	1
Location 1	Outfall	2,4-DIMETHYL PHENOL	1
Location 1	Outfall	2,4-DINITRO PHENOL	1
Location 1	Outfall	2,4-DINITRO TOLUENE	1
Location 1	Outfall	2,6-DINITRO TOLUENE	1
Location 1	Outfall	2-CHLORO PHENOL	1
Location 1	Outfall	2-CHLOROETHYLVINYL ETHER	1
Location 1	Outfall	2-METHYL-4,6-DINITRO PHENOL 2	1
Location 1	Outfall	2-NITRO PHENOL	1
Location 1	Outfall	3,3-DICHLORO BENZIDINE	1
Location 1	Outfall	4,4- DDD	1
Location 1	Outfall	4,4- DDE	1
Location 1	Outfall	4,4- DDT	1
Location 1	Outfall	4-CHLORO-3-METHYL PHENOL	1

Outfall/Field Screening Point Name/Number	Type	Parameter	Number of Samples
Location 1	Outfall	4-NITRO PHENOL	1
Location 1	Outfall	ACENAPHTHENE	1
Location 1	Outfall	ACENAPHTHYLENE	1
Location 1	Outfall	ACROLEIN	1
Location 1	Outfall	ACRYLONITRILE	1
Location 1	Outfall	ALDRIN	1
Location 1	Outfall	ALPHA- BHC	1
Location 1	Outfall	ANTHRACENE	1
Location 1	Outfall	BENZENE	1
Location 1	Outfall	BENZO(A) ANTHRACENE	1
Location 1	Outfall	BENZO(A) PYRENE	1
Location 1	Outfall	BENZO(B) FLUORANTHENE	1
Location 1	Outfall	BENZO(GHI) PERYLENE	1
Location 1	Outfall	BENZO(K) FLUORANTHENE	1
Location 1	Outfall	BETA- BHC	1
Location 1	Outfall	BHC-DELTA	1

Outfall/Field Screening Point Name/Number	Type	Parameter	Number of Samples
Location 1	Outfall	CARBON TETRACHLORIDE	1
Location 1	Outfall	CHLORDANE	1
Location 1	Outfall	CHLORO BENZENE	1
Location 1	Outfall	CHLOROETHANE	1
Location 1	Outfall	CHLOROFORM	1
Location 1	Outfall	CHRYSENE	1
Location 1	Outfall	DI-N-BUTYL PHTHALATE	1
Location 1	Outfall	DI-N-OCTYL PHTHALATE	1
Location 1	Outfall	DIBENZO(A,H) ANTHRACENE	1
Location 1	Outfall	DIBROMOCHLORO METHANE	1
Location 1	Outfall	DICHLOROBROMO METHANE 1	1
Location 1	Outfall	DIELDRIN	1
Location 1	Outfall	DIETHYL PHTHALATE	1
Location 1	Outfall	DIMETHYL PHTHALATE	1
Location 1	Outfall	ENDOSULFAN I	1
Location 1	Outfall	ENDOSULFAN II	1

Outfall/Field Screening Point Name/Number	Type	Parameter	Number of Samples
Location 1	Outfall	ENDOSULFAN SULFATE	1
Location 1	Outfall	ENDRIN	1
Location 1	Outfall	ENDRINE ALDEHYDE	1
Location 1	Outfall	ETHYL BENZENE	1
Location 1	Outfall	FLUORANTHENE	1
Location 1	Outfall	FLUORENE	1
Location 1	Outfall	GAMMA- BHC (LINDANE)	1
Location 1	Outfall	HEPTACHLOR	1
Location 1	Outfall	HEPTACHLOR EPOXIDE	1
Location 1	Outfall	HEXACHLORO BENZENE	1
Location 1	Outfall	HEXACHLORO BUTADIENE	1
Location 1	Outfall	HEXACHLORO ETHANE	1
Location 1	Outfall	HEXACHLOROCYCLOPENTADIENE (UG/L)	1
Location 1	Outfall	INDENO(1,2,3-CD) PYRENE	1
Location 1	Outfall	ISOPHORONE	1
Location 1	Outfall	METHYL BROMIDE	1

Outfall/Field Screening Point Name/Number	Type	Parameter	Number of Samples
Location 1	Outfall	METHYL CHLORIDE	1
Location 1	Outfall	METHYLENE CHLORIDE 1	1
Location 1	Outfall	N-NITROSO DIMETHYL AMINE	1
Location 1	Outfall	N-NITROSODI-N-PROPYLAMINE	1
Location 1	Outfall	N-NITROSODIPHENYL AMINE	1
Location 1	Outfall	NAPHTHALENE	1
Location 1	Outfall	NITRO BENZENE	1
Location 1	Outfall	PCB-1016	1
Location 1	Outfall	PCB-1221	1
Location 1	Outfall	PCB-1232	1
Location 1	Outfall	PCB-1242	1
Location 1	Outfall	PCB-1248	1
Location 1	Outfall	PCB-1254	1
Location 1	Outfall	PCB-1260	1
Location 1	Outfall	PENTACHLOROPHENOL	1
Location 1	Outfall	PHENANTHRENE	1

Outfall/Field Screening Point Name/Number	Type	Parameter	Number of Samples
Location 1	Outfall	PHENOL	1
Location 1	Outfall	TETRACHLOROETHYLENE	1
Location 1	Outfall	TOLUENE	1
Location 1	Outfall	TOTAL CYANIDE	1
Location 1	Outfall	TOTAL RECOVERABLE ANTIMONY	1
Location 1	Outfall	TOTAL RECOVERABLE BARIUM	1
Location 1	Outfall	TOTAL RECOVERABLE BERYLLIUM	1
Location 1	Outfall	TOTAL RECOVERABLE CADMIUM	1
Location 1	Outfall	TOTAL RECOVERABLE MERCURY	1
Location 1	Outfall	TOTAL RECOVERABLE NICKEL	1
Location 1	Outfall	TOTAL RECOVERABLE SILVER	1
Location 1	Outfall	TOTAL RECOVERABLE THALLIUM	1
Location 1	Outfall	TOTAL XYLENE	1
Location 1	Outfall	TOXAPHENE	1
Location 1	Outfall	TRICHLORO ETHYLENE	1
Location 1	Outfall	VINYL CHLORIDE	1

Outfall/Field Screening Point Name/Number	Type	Parameter	Number of Samples
Location 2	Outfall	1,1,1-TRICHLORO ETHANE	1
Location 2	Outfall	1,1,2,2-TETRACHLORO ETHANE	1
Location 2	Outfall	1,1,2-TRICHLORO ETHANE	1
Location 2	Outfall	1,1-DICHLORO ETHANE	1
Location 2	Outfall	1,2,4-TRICHLORO BENZENE	1
Location 2	Outfall	1,2- TRANS-DICHLORO-ETHYLENE	1
Location 2	Outfall	1,2-DICHLORO BENZENE	1
Location 2	Outfall	1,2-DICHLOROETHANE	1
Location 2	Outfall	1,2-DIPHENYL HYDRAZINE	1
Location 2	Outfall	1,3-DICHLORO BENZENE	1
Location 2	Outfall	1,3-DICHLOROPROPYLENE	1
Location 2	Outfall	1,4-DICHLORO BENZENE 2	1
Location 2	Outfall	2,4,6-TRICHLORO PHENOL	1
Location 2	Outfall	2,4-DICHLORO PHENOL	1
Location 2	Outfall	2,4-DIMETHYL PHENOL	1
Location 2	Outfall	2,4-DINITRO PHENOL	1

Outfall/Field Screening Point Name/Number	Type	Parameter	Number of Samples
Location 2	Outfall	2,4-DINITRO TOLUENE	1
Location 2	Outfall	2,6-DINITRO TOLUENE	1
Location 2	Outfall	2-CHLORO PHENOL	1
Location 2	Outfall	2-CHLOROETHYLVINYL ETHER	1
Location 2	Outfall	2-METHYL-4,6-DINITRO PHENOL 2	1
Location 2	Outfall	2-NITRO PHENOL	1
Location 2	Outfall	3,3-DICHLORO BENZIDINE	1
Location 2	Outfall	4,4- DDD	1
Location 2	Outfall	4,4- DDE	1
Location 2	Outfall	4,4- DDT	1
Location 2	Outfall	4-CHLORO-3-METHYL PHENOL	1
Location 2	Outfall	4-NITRO PHENOL	1
Location 2	Outfall	ACENAPHTHENE	1
Location 2	Outfall	ACENAPHTHYLENE	1
Location 2	Outfall	ACROLEIN	1
Location 2	Outfall	ACRYLONITRILE	1

Outfall/Field Screening Point Name/Number	Type	Parameter	Number of Samples
Location 2	Outfall	ALDRIN	1
Location 2	Outfall	ALPHA- BHC	1
Location 2	Outfall	ANTHRACENE	1
Location 2	Outfall	BENZENE	1
Location 2	Outfall	BENZO(A) ANTHRACENE	1
Location 2	Outfall	BENZO(A) PYRENE	1
Location 2	Outfall	BENZO(B) FLUORANTHENE	1
Location 2	Outfall	BENZO(GHI) PERYLENE	1
Location 2	Outfall	BENZO(K) FLUORANTHENE	1
Location 2	Outfall	BETA- BHC	1
Location 2	Outfall	BHC-DELTA	1
Location 2	Outfall	CARBON TETRACHLORIDE	1
Location 2	Outfall	CHLORDANE	1
Location 2	Outfall	CHLORO BENZENE	1
Location 2	Outfall	CHLOROETHANE	1
Location 2	Outfall	CHLOROFORM	1

Outfall/Field Screening Point Name/Number	Type	Parameter	Number of Samples
Location 2	Outfall	CHRYSENE	1
Location 2	Outfall	DI-N-BUTYL PHTHALATE	1
Location 2	Outfall	DI-N-OCTYL PHTHALATE	1
Location 2	Outfall	DIBENZO(A,H) ANTHRACENE	1
Location 2	Outfall	DIBROMOCHLORO METHANE	1
Location 2	Outfall	DICHLOROBROMO METHANE 1	1
Location 2	Outfall	DIELDRIN	1
Location 2	Outfall	DIETHYL PHTHALATE	1
Location 2	Outfall	DIMETHYL PHTHALATE	1
Location 2	Outfall	ENDOSULFAN I	1
Location 2	Outfall	ENDOSULFAN II	1
Location 2	Outfall	ENDOSULFAN SULFATE	1
Location 2	Outfall	ENDRIN	1
Location 2	Outfall	ENDRINE ALDEHYDE	1
Location 2	Outfall	ETHYL BENZENE	1
Location 2	Outfall	FLUORANTHENE	1

Outfall/Field Screening Point Name/Number	Type	Parameter	Number of Samples
Location 2	Outfall	FLUORENE	1
Location 2	Outfall	GAMMA- BHC (LINDANE)	1
Location 2	Outfall	HEPTACHLOR	1
Location 2	Outfall	HEPTACHLOR EPOXIDE	1
Location 2	Outfall	HEXACHLORO BENZENE	1
Location 2	Outfall	HEXACHLORO BUTADIENE	1
Location 2	Outfall	HEXACHLORO ETHANE	1
Location 2	Outfall	HEXACHLOROCYCLOPENTADIENE (UG/L)	1
Location 2	Outfall	INDENO(1,2,3-CD) PYRENE	1
Location 2	Outfall	ISOPHORONE	1
Location 2	Outfall	METHYL BROMIDE	1
Location 2	Outfall	METHYL CHLORIDE	1
Location 2	Outfall	METHYLENE CHLORIDE 1	1
Location 2	Outfall	N-NITROSO DIMETHYL AMINE	1
Location 2	Outfall	N-NITROSODI-N-PROPYLAMINE	1
Location 2	Outfall	N-NITROSODIPHENYL AMINE	1

Outfall/Field Screening Point Name/Number	Type	Parameter	Number of Samples
Location 2	Outfall	NAPHTHALENE	1
Location 2	Outfall	NITRO BENZENE	1
Location 2	Outfall	PCB-1016	1
Location 2	Outfall	PCB-1221	1
Location 2	Outfall	PCB-1232	1
Location 2	Outfall	PCB-1242	1
Location 2	Outfall	PCB-1248	1
Location 2	Outfall	PCB-1254	1
Location 2	Outfall	PCB-1260	1
Location 2	Outfall	PENTACHLOROPHENOL	1
Location 2	Outfall	PHENANTHRENE	1
Location 2	Outfall	PHENOL	1
Location 2	Outfall	TETRACHLOROETHYLENE	1
Location 2	Outfall	TOLUENE	1
Location 2	Outfall	TOTAL CYANIDE	1
Location 2	Outfall	TOTAL RECOVERABLE ANTIMONY	1

Outfall/Field Screening Point Name/Number	Type	Parameter	Number of Samples
Location 2	Outfall	TOTAL RECOVERABLE BARIUM	1
Location 2	Outfall	TOTAL RECOVERABLE BERYLLIUM	1
Location 2	Outfall	TOTAL RECOVERABLE CADMIUM	1
Location 2	Outfall	TOTAL RECOVERABLE MERCURY	1
Location 2	Outfall	TOTAL RECOVERABLE NICKEL	1
Location 2	Outfall	TOTAL RECOVERABLE SILVER	1
Location 2	Outfall	TOTAL RECOVERABLE THALLIUM	1
Location 2	Outfall	TOTAL XYLENE	1
Location 2	Outfall	TOXAPHENE	1
Location 2	Outfall	TRICHLORO ETHYLENE	1
Location 2	Outfall	VINYL CHLORIDE	1
Location 5	Outfall	1,1,1-TRICHLORO ETHANE	1
Location 5	Outfall	1,1,2,2-TETRACHLORO ETHANE	1
Location 5	Outfall	1,1,2-TRICHLORO ETHANE	1
Location 5	Outfall	1,1-DICHLORO ETHANE	1
Location 5	Outfall	1,2,4-TRICHLORO BENZENE	1

Outfall/Field Screening Point Name/Number	Type	Parameter	Number of Samples
Location 5	Outfall	1,2- TRANS-DICHLORO-ETHYLENE	1
Location 5	Outfall	1,2-DICHLORO BENZENE	1
Location 5	Outfall	1,2-DICHLOROETHANE	1
Location 5	Outfall	1,2-DIPHENYL HYDRAZINE	1
Location 5	Outfall	1,3-DICHLORO BENZENE	1
Location 5	Outfall	1,3-DICHLOROPROPYLENE	1
Location 5	Outfall	1,4-DICHLORO BENZENE 2	1
Location 5	Outfall	2,4,6-TRICHLORO PHENOL	1
Location 5	Outfall	2,4-DICHLORO PHENOL	1
Location 5	Outfall	2,4-DIMETHYL PHENOL	1
Location 5	Outfall	2,4-DINITRO PHENOL	1
Location 5	Outfall	2,4-DINITRO TOLUENE	1
Location 5	Outfall	2,6-DINITRO TOLUENE	1
Location 5	Outfall	2-CHLORO PHENOL	1
Location 5	Outfall	2-CHLOROETHYLVINYL ETHER	1
Location 5	Outfall	2-METHYL-4,6-DINITRO PHENOL 2	1

Outfall/Field Screening Point Name/Number	Type	Parameter	Number of Samples
Location 5	Outfall	2-NITRO PHENOL	1
Location 5	Outfall	3,3-DICHLORO BENZIDINE	1
Location 5	Outfall	4,4- DDD	1
Location 5	Outfall	4,4- DDE	1
Location 5	Outfall	4,4- DDT	1
Location 5	Outfall	4-CHLORO-3-METHYL PHENOL	1
Location 5	Outfall	4-NITRO PHENOL	1
Location 5	Outfall	ACENAPHTHENE	1
Location 5	Outfall	ACENAPHTHYLENE	1
Location 5	Outfall	ACROLEIN	1
Location 5	Outfall	ACRYLONITRILE	1
Location 5	Outfall	ALDRIN	1
Location 5	Outfall	ALPHA- BHC	1
Location 5	Outfall	ANTHRACENE	1
Location 5	Outfall	BENZENE	1
Location 5	Outfall	BENZO(A) ANTHRACENE	1

Outfall/Field Screening Point Name/Number	Type	Parameter	Number of Samples
Location 5	Outfall	BENZO(A) PYRENE	1
Location 5	Outfall	BENZO(B) FLUORANTHENE	1
Location 5	Outfall	BENZO(GHI) PERYLENE	1
Location 5	Outfall	BENZO(K) FLUORANTHENE	1
Location 5	Outfall	BETA- BHC	1
Location 5	Outfall	BHC-DELTA	1
Location 5	Outfall	CARBON TETRACHLORIDE	1
Location 5	Outfall	CHLORDANE	1
Location 5	Outfall	CHLORO BENZENE	1
Location 5	Outfall	CHLOROETHANE	1
Location 5	Outfall	CHLOROFORM	1
Location 5	Outfall	CHRYSENE	1
Location 5	Outfall	DI-N-BUTYL PHTHALATE	1
Location 5	Outfall	DI-N-OCTYL PHTHALATE	1
Location 5	Outfall	DIBENZO(A,H) ANTHRACENE	1
Location 5	Outfall	DIBROMOCHLORO METHANE	1

Outfall/Field Screening Point Name/Number	Type	Parameter	Number of Samples
Location 5	Outfall	DICHLOROBROMO METHANE 1	1
Location 5	Outfall	DIELDRIN	1
Location 5	Outfall	DIETHYL PHTHALATE	1
Location 5	Outfall	DIMETHYL PHTHALATE	1
Location 5	Outfall	ENDOSULFAN I	1
Location 5	Outfall	ENDOSULFAN II	1
Location 5	Outfall	ENDOSULFAN SULFATE	1
Location 5	Outfall	ENDRIN	1
Location 5	Outfall	ENDRINE ALDEHYDE	1
Location 5	Outfall	ETHYL BENZENE	1
Location 5	Outfall	FLUORANTHENE	1
Location 5	Outfall	FLUORENE	1
Location 5	Outfall	GAMMA- BHC (LINDANE)	1
Location 5	Outfall	HEPTACHLOR	1
Location 5	Outfall	HEPTACHLOR EPOXIDE	1
Location 5	Outfall	HEXACHLORO BENZENE	1

Outfall/Field Screening Point Name/Number	Type	Parameter	Number of Samples
Location 5	Outfall	HEXACHLORO BUTADIENE	1
Location 5	Outfall	HEXACHLORO ETHANE	1
Location 5	Outfall	HEXACHLOROCYCLOPENTADIENE (UG/L)	1
Location 5	Outfall	INDENO(1,2,3-CD) PYRENE	1
Location 5	Outfall	ISOPHORONE	1
Location 5	Outfall	METHYL BROMIDE	1
Location 5	Outfall	METHYL CHLORIDE	1
Location 5	Outfall	METHYLENE CHLORIDE 1	1
Location 5	Outfall	N-NITROSO DIMETHYL AMINE	1
Location 5	Outfall	N-NITROSODI-N-PROPYLAMINE	1
Location 5	Outfall	N-NITROSODIPHENYL AMINE	1
Location 5	Outfall	NAPHTHALENE	1
Location 5	Outfall	NITRO BENZENE	1
Location 5	Outfall	PCB-1016	1
Location 5	Outfall	PCB-1221	1
Location 5	Outfall	PCB-1232	1

Outfall/Field Screening Point Name/Number	Type	Parameter	Number of Samples
Location 5	Outfall	PCB-1242	1
Location 5	Outfall	PCB-1248	1
Location 5	Outfall	PCB-1254	1
Location 5	Outfall	PCB-1260	1
Location 5	Outfall	PENTACHLOROPHENOL	1
Location 5	Outfall	PHENANTHRENE	1
Location 5	Outfall	PHENOL	1
Location 5	Outfall	TETRACHLOROETHYLENE	1
Location 5	Outfall	TOLUENE	1
Location 5	Outfall	TOTAL CYANIDE	1
Location 5	Outfall	TOTAL RECOVERABLE ANTIMONY	1
Location 5	Outfall	TOTAL RECOVERABLE BARIUM	1
Location 5	Outfall	TOTAL RECOVERABLE BERYLLIUM	1
Location 5	Outfall	TOTAL RECOVERABLE CADMIUM	1
Location 5	Outfall	TOTAL RECOVERABLE MERCURY	1
Location 5	Outfall	TOTAL RECOVERABLE NICKEL	1

Outfall/Field Screening Point Name/Number	Type	Parameter	Number of Samples
Location 5	Outfall	TOTAL RECOVERABLE SILVER	1
Location 5	Outfall	TOTAL RECOVERABLE THALLIUM	1
Location 5	Outfall	TOTAL XYLENE	1
Location 5	Outfall	TOXAPHENE	1
Location 5	Outfall	TRICHLORO ETHYLENE	1
Location 5	Outfall	VINYL CHLORIDE	1

Question: Did you take samples for any additional parameters that need to be included in the DMR?

Answer: No

Question: Upload completed Excel spreadsheet.

Answer:

File Name: char_dmr_92548_93223.xlsx

Question: Your DMR has been checked for potential deficiencies.

Answer: No Potential Deficiencies Detected

CERTIFICATION OF SUBMISSION

SHAWN M CLARKE

You validated your identity by answering your personal security question and password on myDEQ at **01:37 PM** on **09/25/2023**. At this time, you certified the summary information above by checking that you agreed to the following statement:

Certify your submission:

By checking this box I certify under penalty of law that this submittal was prepared by me, or under my direction or supervision of personnel appropriately qualified to properly gather and evaluate the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I understand that all information submitted to ADEQ is public record unless otherwise identified by law as confidential. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

AZPDES SMALL MS4 - WET SEASON DMR

LTF #: 92548

Report/Form ID #: 93244

Date Submitted: 09/19/2023

AZPDES SMALL MS4 WET SEASON DMR - SUMMARY

Company:

Name: LAKE HAVASU CITY

Question: What is the sample date and lab result received date?

Answer:

Sample Date: 08/19/2023
Lab Result Received Date: 08/24/2023
Wet Season: Summer Wet 2023

Question: Identify all your outfalls for this DMR.

Answer:

Outfall Name/Number	Protected Surface Water Name	Latitude	Longitude
Location 1	Lake Havasu	34.458869	-114.333751
Location 2	Lake Havasu	34.463463	-114.342216
Location 3	Lake Havasu	34.476926	-114.355319
Location 4	Lake Havasu	34.488505	-114.358466
Location 5	Lake Havasu	34.494866	-114.361985
Location 6	Lake Havasu	34.501049	-114.363337
Location 7	Lake Havasu	34.504014	-114.364103
Location 8	Lake Havasu	34.511447	-114.366699
Location 9	Lake Havasu	34.524565	-114.370683

Question: Do you need to provide a No Data Indicator (NODI) code for this report at the outfall level?

Answer: No

NODI	Outfall Name/Number

Question: How many samples for mandatory parameters have been taken for each outfall?

Answer:

Outfall Name/Number	Parameter	Number of Samples

Question: Did you take samples for any additional parameters that need to be included in the DMR?

Answer: Yes

Outfall Name/Number	Parameter	Number of Samples
Location 1	TOTAL RECOVERABLE SELENIUM	1
Location 2	TOTAL RECOVERABLE SELENIUM	1
Location 3	TOTAL RECOVERABLE SELENIUM	1
Location 4	TOTAL RECOVERABLE SELENIUM	1
Location 5	TOTAL RECOVERABLE SELENIUM	1
Location 6	TOTAL RECOVERABLE SELENIUM	1

Outfall Name/Number	Parameter	Number of Samples
Location 7	TOTAL RECOVERABLE SELENIUM	1
Location 8	TOTAL RECOVERABLE SELENIUM	1
Location 9	TOTAL RECOVERABLE SELENIUM	1

Question: Upload completed Excel spreadsheet.

Answer:

File Name: wet_dmr_92548_93244 (1).xlsx

Question: Your DMR has been checked for potential deficiencies.

Answer: No Potential Deficiencies Detected

CERTIFICATION OF SUBMISSION

SHAWN M CLARKE

You validated your identity by answering your personal security question and password on myDEQ at **01:30 PM** on **09/19/2023**. At this time, you certified the summary information above by checking that you agreed to the following statement:

Certify your submission:

By checking this box I certify under penalty of law that this submittal was prepared by me, or under my direction or supervision of personnel appropriately qualified to properly gather and evaluate the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I understand that all information submitted to ADEQ is public record unless otherwise identified by law as confidential. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Appendix F - Outfall Location Mapping


OUTFALL LOCATION MAP
OUTFALL 9 - FELICIDAD DRAIN
OUTFALL 8 - NEPTUNE WASH
OUTFALL 7 - HAVASUPAI WASH
OUTFALL 6- KIOWA DRAIN
Outfall 5 - Industrial Drain
Outfall 4 - El Dorado Wash
Outfall 3- Willow Wash
Outfall 2- Pima Wash
Outfall 1 -Daytona Wash
Legend
Outfall
95
95
N
2 mi
Google Earth

AZPDES SMALL MS4 NOI - SUMMARY

Company:

Name: LAKE HAVASU CITY

Question: Who is the contact person?

Answer:

First Name: Jason

MI: C

Last Name: Hart

Title/Role: Project Manager

Email Address: hartj@lhcaz.gov

Phone#: 9284126758

Question: Which of the following best describes your MS4 type?

Answer: City

What is the estimated population?: Population greater than 10,000, but less than or equal to 100,000

Question: Identify all protected surface waters in your MS4.

Answer:

Receiving Water Name: Lake Havasu

Total Outfalls: 9

HUC-Reach: 34°35'17.71"/114°25'46.86" -

OAW: No

Impaired: No

Not-Attaining: No

Outfall Details:

Outfall Name/Number		Latitude	Longitude
Location 2	Pima Wash	34.463463	-114.342216
Location 3	Willow Wash (El Dorado wash)	34.476926	-114.355319
Location 4		34.488505	-114.358466
Location 5	Industrial Drain	34.494866	-114.361985
Location 6	Kiowa Drain	34.501049	-114.363337
Location 7	Havasupai Wash	34.504014	-114.364103
Location 8	Neptune WASH	34.511447	-114.366699
Location 9	Felicidad Drain	34.524565	-114.370683
Location 1	Daytona Wash	34.458869	-114.333751

Rotary Park → Rotary Park

State Park → Pima Wash

State Park → Willow Wash

State Park → Palo Verde Wash

Industrial Drain

Kiowa Drain

Havasupai

Neptune Wash

Body Beach

Question: Wet Season DMR/Monitoring Requirements for Discharges to Waters that are Impaired, Not-attaining, or OAWs.

Answer: Based on the information provided, there are no Wet Season DMR requirements.

Question: DMR/Monitoring Requirements for Stormwater Characterization Sampling.

Answer: MS4 permits are required to implement stormwater characterization monitoring within two years of obtaining coverage. For additional information, please contact the Stormwater Program at 602-771-1440.

CERTIFICATION OF SUBMISSION

JEREMY JABBOTT

You validated your identity by answering your personal security question and password on myDEQ at **10:23 AM** on **06/04/2019**. At this time, you certified the summary information above by checking that you agreed to the following statement:

Pursuant to A.R.S. § 41-1030:

(1) ADEQ shall not base a licensing decision, in whole or in part, on a requirement or condition not specifically authorized by statute or rule. General authority in a statute does not authorize a requirement or condition unless a rule is made pursuant to it that specifically authorizes the requirement or condition.

(2) Prohibited licensing decisions may be challenged in a private civil action. Relief may be awarded to the prevailing party against ADEQ, including reasonable attorney fees, damages, and all fees associated with the license application.

(3) ADEQ employees may not intentionally or knowingly violate the requirement for specific licensing authority. Violation is cause for disciplinary action or dismissal, pursuant to ADEQ's adopted personnel policy. ADEQ employees are still afforded the immunity in A.R.S. §§ 12-821.01 and 12-820.02.

Certify your submission:

By checking this box I certify under penalty of law that this submittal was prepared by me, or under my direction or supervision of personnel appropriately qualified to properly gather and evaluate the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I understand that all information submitted to ADEQ is public record unless otherwise identified by law as confidential. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Sr.No.	Receiving Water Name	HUC-Reach	Appendix B	OAW	Impaired	Not-Attaining	# of Outfalls
1	LAKE HAVASU	34°35'17.71"/114°25'46.86"- null	Yes	No	No	No	1042

Question: Has a dry-weather visual outfall monitoring program been implemented?

Answer: Yes

Implementation Date: 09/30/2016

Question: How many outfalls will be included in the dry-weather outfall monitoring program?

Answer:

Estimated number of municipal stormwater outfalls: 1042

Percentage of municipal stormwater outfalls that will be monitored each year under the dry-weather monitoring program: 20

Question: Will visual wet-weather monitoring be conducted?

Answer: Yes

Question: Where will visual wet-weather monitoring be conducted?

Answer:

Sr.No.	Outfall or Field Screening Point	Outfall Name/Number	Latitude	Longitude
1	Field Screening Point	WWAP #1	34.510887	-114.359722
2	Field Screening Point	WWAP #2	34.494605	-114.354298
3	Field Screening Point	WWAP #3	34.472149	-114.344111
4	Field Screening Point	WWAP #4	34.453101	-114.307912
5	Field Screening Point	WWAP #5	34.454304	-114.281852

Question: For each outfall or field screening point for visual wet-weather monitoring, what is the receiving water?

Answer:

Sr.No.	Outfall Name/Number	Outfall or Field Screening Point	Receiving Water	Receiving Water Type

1	WWAP #1	Field Screening Point	Colorado River-reach 15030101-1408 - reach 15030101-1415	
2	WWAP #2	Field Screening Point	Colorado River-reach 15030101-1408 - reach 15030101-1415	
3	WWAP #3	Field Screening Point	Colorado River-reach 15030101-1408 - reach 15030101-1415	
4	WWAP #4	Field Screening Point	Colorado River-reach 15030101-1408 - reach 15030101-1415	
5	WWAP #5	Field Screening Point	Colorado River-reach 15030101-1408 - reach 15030101-1415	

Question: Where will analytical discharge monitoring be conducted?

Answer: No

AZPDES SMALL MS4 - WET SEASON DMR

LTF #: 92548

Report/Form ID #: 93244

Date Submitted: 09/19/2023

AZPDES SMALL MS4 WET SEASON DMR - SUMMARY

Company:

Name: LAKE HAVASU CITY

Question: What is the sample date and lab result received date?

Answer:

Sample Date: 08/19/2023
Lab Result Received Date: 08/24/2023
Wet Season: Summer Wet 2023

Question: Identify all your outfalls for this DMR.

Answer:

Outfall Name/Number	Protected Surface Water Name	Latitude	Longitude
Location 1	Lake Havasu	34.458869	-114.333751
Location 2	Lake Havasu	34.463463	-114.342216
Location 3	Lake Havasu	34.476926	-114.355319
Location 4	Lake Havasu	34.488505	-114.358466
Location 5	Lake Havasu	34.494866	-114.361985
Location 6	Lake Havasu	34.501049	-114.363337
Location 7	Lake Havasu	34.504014	-114.364103
Location 8	Lake Havasu	34.511447	-114.366699
Location 9	Lake Havasu	34.524565	-114.370683

Question: Do you need to provide a No Data Indicator (NODI) code for this report at the outfall level?

Answer: No

NODI	Outfall Name/Number

Question: How many samples for mandatory parameters have been taken for each outfall?

Answer:

Outfall Name/Number	Parameter	Number of Samples

Question: Did you take samples for any additional parameters that need to be included in the DMR?

Answer: Yes

Outfall Name/Number	Parameter	Number of Samples
Location 1	TOTAL RECOVERABLE SELENIUM	1
Location 2	TOTAL RECOVERABLE SELENIUM	1
Location 3	TOTAL RECOVERABLE SELENIUM	1
Location 4	TOTAL RECOVERABLE SELENIUM	1
Location 5	TOTAL RECOVERABLE SELENIUM	1
Location 6	TOTAL RECOVERABLE SELENIUM	1

Outfall Name/Number	Parameter	Number of Samples
Location 7	TOTAL RECOVERABLE SELENIUM	1
Location 8	TOTAL RECOVERABLE SELENIUM	1
Location 9	TOTAL RECOVERABLE SELENIUM	1

Question: Upload completed Excel spreadsheet.

Answer:

File Name: wet_dmr_92548_93244 (1).xlsx

Question: Your DMR has been checked for potential deficiencies.

Answer: No Potential Deficiencies Detected

CERTIFICATION OF SUBMISSION

SHAWN M CLARKE

You validated your identity by answering your personal security question and password on myDEQ at **01:30 PM** on **09/19/2023**. At this time, you certified the summary information above by checking that you agreed to the following statement:

Certify your submission:

By checking this box I certify under penalty of law that this submittal was prepared by me, or under my direction or supervision of personnel appropriately qualified to properly gather and evaluate the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I understand that all information submitted to ADEQ is public record unless otherwise identified by law as confidential. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Appendix G - Illicit Discharge Reporting

Date incident reported or discovered	Date of the beginning of your response	Date of the end of your response	Did the discharge reach a protected surface water (yes, no, or unknown)	Incident location (address or latitude and longitude)	Pollutants	Source	Correction method(s)
10/12/2023	10/12/2023	10/12/2023	no	2122 McCulloch Blvd N, Lake Havasu City	Grease from Cooking	Desert Martinin/BJ Bar at location of alley	Owner to stop washing out grease in alley
5/14/2024	5/14/2024	5/17/2024	No	3207 Dolphin Drive	Concrete Mixing Materials	Concrete materials	Homeowner Moved Materials into Garage
5/23/2023	5/23/2023	10/2/2023	no	2255 Victoria farms road	Sediment -construction	Cargo Container	Council action to require grading pemit w/NOI
2/6/2024	2/6/2024	2/13/2024	no	Greasey Material leaking from valley guttrer	Grease/Oils	Mechanic Shop	Owner Cleaned up discharge
4/19/2024	4/19/2024	4/22/2024	No	Paint Materials Discharging to Alley	Paint Debris	Contractor Pressure Washing Bldg.	Contractor Cleaned up Alley
7/17/2024	7/17/2024	7/26/2024	No	225 Acoma Blvd S	Debris Left in Culvert	Homeless Activity and Debris	Cleaned up Site & Trimmed Tree

Appendix H - Employee Training Material

Chapter 1: The Basics of Illicit Discharges

An understanding of the nature of illicit discharges in urban watersheds is essential to find, fix and prevent them. This chapter begins by defining the terms used to describe illicit discharges, and then reviews the water quality problems they cause. Next, the chapter presents the regulatory context for controlling illicit discharges, and reviews the experience local communities have gained in detecting and eliminating them.

1.1 Important Terminology and Key Concepts

This Manual uses several important terms throughout the text that merit upfront explanation. This section defines the terminology to help program managers perform important illicit discharge detective work in their communities. Key concepts are presented to classify illicit discharges, generating sites and control techniques.

Illicit Discharge

The term "illicit discharge" has many meanings in regulation[1] and practice, but we use a four-part definition in this manual.

1. Illicit discharges are defined as a storm drain that has measurable flow during dry weather containing pollutants and/or pathogens. A storm drain with measurable flow but containing no pollutants is simply considered a discharge.
2. Each illicit discharge has a unique frequency, composition and mode of entry in the storm drain system.
3. Illicit discharges are frequently caused when the sewage disposal system interacts with the storm drain system. A variety of monitoring techniques is used to locate and eliminate illegal sewage connections. These techniques trace sewage flows from the stream or outfall, and go back up the pipes or conveyances to reach the problem connection.
4. Illicit discharges of other pollutants are produced from specific source areas and operations known as "generating sites." Knowledge about these generating sites can be helpful to locate and prevent non-sewage illicit discharges. Depending on the regulatory status of specific "generating sites," education, enforcement and other pollution prevention techniques can be used to manage this class of illicit discharges.

Communities need to define illicit discharges as part of an illicit discharge ordinance. Some non-storm water discharges to the MS4 may be allowable, such as discharges resulting from fire fighting activities and air conditioning condensate. Chapter 4 provides more detail on ordinance development.

[1] 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to an MS4 that is not composed entirely of storm water, except allowable discharges pursuant to an NPDES permit, including those resulting from fire fighting activities.

Storm Drain

A **storm drain** can be either an *enclosed pipe or an open channel.* From a regulatory standpoint, **major** storm drains are defined as enclosed storm drain pipes with a diameter of 36 inches, or greater or open channels that drain more than 50 acres. For industrial land uses, major drains are defined as enclosed storm drain pipes 12 inches or greater in diameter and open channels that drain more than two acres. **Minor** storm drains are smaller than these thresholds. Both major and minor storm drains can be a source of illicit discharges, and both merit investigation.

Some "pipes" found in urban areas may look like storm drains but actually serve other purposes. Examples include foundation drains, weep holes, culverts, etc. These pipes are generally not considered storm drains from a regulatory or practical standpoint. Small diameter "straight pipes," however, are a common source of illicit discharges in many communities and should be investigated to determine if they are a pollutant source.

Not all dry weather storm drain flow contains pollutants or pathogens. Indeed, many communities find that storm drains with dry weather flow are, in fact, relatively clean. Flow in these drains may be derived from springs, groundwater seepage, or leaks from water distribution pipes. Consequently, field testing and/or water quality sampling are needed to confirm whether pollutants are actually present in dry weather flow, in order to classify them as an illicit discharge.

Discharge Frequency

The **frequency** of dry weather discharges in storm drains is important, and can be classified as *continuous, intermittent or transitory.*

Continuous discharges occur most or all of the time, are usually easier to detect, and typically produce the greatest pollutant load. **Intermittent** discharges occur over a shorter period of time (e.g., a few hours per day or a few days per year). Because they are infrequent, intermittent discharges are hard to detect, but can still represent a serious water quality problem, depending on their flow type. **Transitory** discharges occur rarely, usually in response to a singular event such as an industrial spill, ruptured tank, sewer break, transport accident or illegal dumping episode. These discharges are extremely hard to detect with routine monitoring, but under the right conditions, can exert severe water quality problems on downstream receiving waters.

Discharge Flow Types

Dry weather discharges are composed of one or more possible **flow types**:

- *Sewage and septage* flows are produced from sewer pipes and septic systems.
- *Washwater* flows are generated from a wide variety of activities and operations. Examples include discharges of gray water (laundry) from homes, commercial carwash wastewater, fleet washing, commercial laundry wastewater, and floor washing to shop drains.
- *Liquid wastes* refers to a wide variety of flows, such as oil, paint, and process water (radiator flushing water, plating bath wastewater, etc.) that enter the storm drain system.
- *Tap water* flows are derived from leaks and losses that occur during the distribution of drinking water in the water supply system. Tap water discharges in the storm drain system may be more prevalent in communities

with high loss rates (i.e., greater than 15%) in their potable water distribution system. (source of 15% is from National Drinking Water Clearinghouse http://www.nesc.wvu.edu/ndwc/articles/OT/FA02/Economics_Water.html)

- *Landscape irrigation* flows occur when excess potable water used for residential or commercial irrigation ends up in the storm drain system.
- *Groundwater and spring water* flows occur when the local water table rises above the bottom elevation of the storm drain (known as the invert) and enters the storm drain either through cracks and joints, or where open channels or pipes associated with the MS4 may intercept seeps and springs.

Water quality testing is used to conclusively identify flow types found in storm drains. Testing can distinguish illicit flow types (sewage/septage, washwater and liquid wastes) from cleaner discharges (tap water, landscape irrigation and ground water).

Each flow type has a distinct chemical fingerprint. Table 1 compares the pollutant fingerprint for different flow types in Alabama. The chemical fingerprint for each flow type can differ regionally, so it is a good idea to develop your own "fingerprint" library by sampling each local flow type.

In practice, many storm drain discharges represent a blend of several flow types, particularly at larger outfalls that drain larger catchments. For example, groundwater flows often dilute sewage thereby masking its presence. Chapter 12 presents several techniques to help isolate illicit discharges that are blended with cleaner discharges. Illicit discharges are also masked by high volumes of storm water runoff making it difficult and frequently impossible to detect them during wet weather periods.

Mode of Entry

Illicit discharges can be further classified based on how they enter the storm drain system. The **mode of entry** can either be **direct** or **indirect. Direct entry** means that the discharge is directly connected to the storm drain pipe through a sewage pipe, shop drain, or other kind of pipe. Direct entry usually produces discharges that are continuous or intermittent. Direct entry usually occurs when two different kinds of "plumbing" are improperly connected. The three main situations where this occurs are:

Sewage cross-connections: A sewer pipe that is improperly connected to the storm drain system produces a continuous discharge of raw sewage to the pipe (Figure 1). Sewage cross-connections can occur in catchments where combined sewers or septic systems are converted to a separate sewer system, and a few pipes get "crossed."

Straight pipe: This term refers to relatively small diameter pipes that intentionally bypass the sanitary connection or septic drain fields, producing a direct discharge into open channels or streams as shown in Figure 2.

Figure 1: Sewer Pipe Discharging to the Storm Drain System

Table 1: Comparative "Fingerprint" (Mean Values) of Flow Types						
Flow Type	**Hardness (mg/L as CaCO3)**	**NH_3 (mg/L)**	**Potassium (mg/L)**	**Conductivity (µS/cm)**	**Fluoride (mg/L)**	**Detergents (mg/L)**
Sewage	50 (0.26)*	25 (0.53)*	12 (0.21)*	1215 (0.45)*	0.7 (0.1)*	9.7 (0.17)*
Septage**	57(0.36)	87 (0.4)	19 (0.42)	502 (0.42)	0.93 (0.39)	3.3 (1.33)
Laundry Washwater	45 (0.33)	3.2 (0.89)	6.5 (0.78)	463.5 (0.88)	0.85 (0.4)	758 (0.27)
Car Washwater	71 (0.27)	0.9 (1.4)	3.6 (0.67)	274 (0.45)	1.2 (1.56)	140 (0.2)
Plating Bath (Liquid Industrial Waste**)	1430 (0.32)	66 (0.66)	1009 (1.24)	10352 (0.45)	5.1 (0.47)	6.8 (0.68)
Radiator Flushing (Liquid Industrial Waste**)	5.6 (1.88)	26 (0.89)	2801 (0.13)	3280 (0.21)	149 (0.16)	15 (0.11)
Tap Water	52 (0.27)	<0.06 (0.55)	1.3 (0.37)	140 (0.07)	0.94 (0.07)	0 (NA)
Groundwater	38 (0.19)	0.06 (1.35)	3.1 (0.55)	149 (0.24)	0.13 (0.93)	0 (NA)
Landscape Irrigation	53 (0.13)	1.3 (1.12)	5.6 (0.5)	180 (0.1)	0.61 (0.35)	0 (NA)

** The number in parentheses after each concentration is the Coefficient of Variation; NA = Not Applicable*
*** All values are from Tuscaloosa, AL monitoring except liquid wastes and septage, which are from Birmingham, AL.*
Sources: Pitt (project support material) and Pitt et al. (1993)

Figure 2: Direct Discharge from a Straight Pipe

Industrial and commercial cross-connections: These occur when a drain pipe is improperly connected to the storm drain system producing a discharge of wash water, process water or other inappropriate flows into the storm drain pipe. A floor shop drain that is illicitly connected to the storm drain system is illustrated in Figure 3.

Sewage has the greatest potential to produce *direct* illicit discharges within any urban subwatershed, regardless of the diverse land uses that it comprises. The most commonly reported sewage-related direct discharges are broken sanitary sewer lines (81% of survey respondents), cross-connections (71% of survey respondents), and straight pipe discharges (38% of survey respondents). (CWP, 2002).

Older industrial areas tend to have a higher potential for illicit cross-connections.

Indirect entry means that flows generated outside the storm drain system enter through storm drain inlets or by infiltrating through the joints of the pipe. Generally, indirect modes of entry produce intermittent or transitory discharges, with the exception of groundwater seepage. The five main modes of indirect entry for discharges include:

Groundwater seepage into the storm drain pipe: Seepage frequently occurs in storm

drains after long periods of above average rainfall. Seepage discharges can be either continuous or intermittent, depending on the depth of the water table and the season. Groundwater seepage usually consists of relatively clean water that is not an illicit discharge by itself, but can mask other illicit discharges. If storm drains are located close to sanitary sewers, groundwater seepage may intermingle with diluted sewage.

Spills that enter the storm drain system at an inlet: These transitory discharges occur when a spill travels across an impervious surface and enters a storm drain inlet. Spills can occur at many industrial, commercial and transport-related sites. A very common example is an oil or gas spill from an accident that then travels across the road and into the storm drain system (Figure 4).

Dumping a liquid into a storm drain inlet: This type of transitory discharge is created when liquid wastes such as oil, grease, paint, solvents, and various automotive fluids are dumped into the storm drain (Figure 5). Liquid dumping occurs intermittently at sites that improperly dispose of rinse water and wash water during maintenance and cleanup operations. A common example is cleaning deep fryers in the parking lot of fast food operations.

Outdoor washing activities that create flow to a storm drain inlet: Outdoor washing may or may not be an illicit discharge, depending on the nature of the generating site that produces the wash water. For example, hosing off individual sidewalks and driveways may not generate significant flows or pollutant loads. On the other hand, routine washing of fueling areas, outdoor storage areas, and parking lots (power washing), and construction equipment cleanouts may result in unacceptable pollutant loads (Figure 6).

Non-target irrigation from landscaping or lawns that reaches the storm drain system: Irrigation can produce intermittent discharges from over-watering or misdirected sprinklers that send tap water over impervious areas (Figure 7). In some instances, non-target irrigation can produce unacceptable loads of nutrients, organic matter or pesticides. The most common example is a discharge from commercial landscaping areas adjacent to parking lots connected to the storm drain system.

Figure 3: A common industrial cross connection is a floor drain that is illicitly connected to a storm drain

Figure 4: Accident spills are significant sources of illicit discharges to the storm drain system

Figure 5: Dumping at a storm drain inlet

Figure 6: Routine outdoor washing and rinsing can cause illicit discharges

Figure 7: Non-target landscaping irrigation water

Land Use and Potential Generating Sites

Land use can predict the potential for indirect discharges, which are often intermittent or transitory. Many indirect discharges can be identified and prevented using the concept of "generating sites," which are sites where common operations can generate indirect discharges in a community. Both research and program experience indicate that a small subset of generating sites within a broader land use category can produce most of the indirect discharges. Consequently, the density of potential generating sites within a subwatershed may be a good indicator of the severity of local illicit discharge problems. Some common generating sites within major land use categories are listed in Table 2, and described below.

Residential Generating Sites: Failing septic systems were the most common residential discharge reported in 33% of IDDE programs surveyed (CWP, 2002). In addition, indirect residential discharges were

also frequently detected in 20% of the IDDE programs surveyed, which consisted of oil dumping, irrigation overflows, swimming pool discharges, and car washing. Many indirect discharges are caused by common residential behaviors and may not be classified as "illicit" even though they can contribute to water quality problems. With the exception of failing septic systems and oil dumping, most communities have chosen education rather than enforcement as the primary tool to prevent illicit discharges from residential areas.

Commercial Generating Sites: Illicit discharges from commercial sites were reported as frequent in almost 20% of local IDDE programs surveyed (CWP, 2002). Typical commercial discharge generators included operations such as outdoor washing; disposal of food wastes; car fueling, repair, and washing; parking lot power washing; and poor dumpster management. Recreational areas, such as marinas and campgrounds, were also reported to be a notable source of sewage discharges. It is important to note that not all businesses within a generating category actually produce illicit discharges; generally only a relatively small fraction do. Consequently, on-site inspections of individual businesses are needed to confirm whether a property is actually a generating site.

Sewage can also be linked to significant *indirect* illicit discharges in the form of sanitary sewer overflows (52% of survey respondents), sewage infiltration/inflow (48% of survey respondents), and sewage dumping from recreational vehicles (33% of survey respondents) (CWP, 2002).

Table 2: Land Uses, Generating Sites and Activities That Produce Indirect Discharges		
Land Use	**Generating Site**	**Activity that Produces Discharge**
Residential	• Apartments • Multi-family • Single Family Detached	• Car Washing • Driveway Cleaning • Dumping/Spills (e.g., leaf litter and RV/boat holding tank effluent) • Equipment Washdowns • Lawn/Landscape Watering • Septic System Maintenance • Swimming Pool Discharges
Commercial	• Campgrounds/RV parks • Car Dealers/Rental Car Companies • Car Washes • Commercial Laundry/Dry Cleaning • Gas Stations/Auto Repair Shops • Marinas • Nurseries and Garden Centers • Oil Change Shops • Restaurants • Swimming Pools	• Building Maintenance (power washing) • Dumping/Spills • Landscaping/Grounds Care (irrigation) • Outdoor Fluid Storage • Parking Lot Maintenance (power washing) • Vehicle Fueling • Vehicle Maintenance/Repair • Vehicle Washing • Washdown of greasy equipment and grease traps
Industrial	• Auto recyclers • Beverages and brewing • Construction vehicle washouts • Distribution centers • Food processing • Garbage truck washouts • Marinas, boat building and repair • Metal plating operations • Paper and wood products • Petroleum storage and refining • Printing	• All commercial activities • Industrial process water or rinse water • Loading and un-loading area washdowns • Outdoor material storage (fluids)
Institutional	• Cemeteries • Churches • Corporate Campuses • Hospitals • Schools and Universities	• Building Maintenance (e.g., power washing) • Dumping/Spills • Landscaping/Grounds Care (irrigation) • Parking Lot Maintenance (power washing) • Vehicle Washing
Municipal	• Airports • Landfills • Maintenance Depots • Municipal Fleet Storage Areas • Ports • Public Works Yards • Streets and Highways	• Building Maintenance (power washing) • Dumping/Spills • Landscaping/Grounds Care (irrigation) • Outdoor Fluid Storage • Parking Lot Maintenance (power washing) • Road Maintenance • Spill Prevention/Response • Vehicle Fueling • Vehicle Maintenance/Repair • Vehicle Washing

Industrial Generating Sites: Industrial sites produce a wide range of flows that can cause illicit discharges. The most common continuous discharges are operations involving the disposal of rinse water, process water, wash water and contaminated, non-contact cooling water. Spills and leaks, ruptured pipes, and leaking underground storage tanks are also a source of indirect discharges. Illicit discharges from industry were detected in nearly 25% of the local IDDE programs surveyed (CWP, 2002).

Industries are classified according to hundreds of different Standard Industrial Classification (SIC) codes. The SIC coding system also includes commercial, institutional and municipal operations[2]. Many industries are required to have storm water pollution prevention and spill response plans under EPA's Industrial Storm Water NPDES Permit Program. A complete list of the industries covered by the Storm Water NPDES Permit Program can be found in Appendix A. The appendix also rates each industrial category based on its potential to produce illicit discharges, based on analysis by Pitt (2001).

Institutional Generating Sites: Institutions such as hospitals, corporate campuses, colleges, churches, and cemeteries can be generating sites if routine maintenance practices/operations create discharges from parking lots and other areas. Many large institutional sites have their own areas for fleet maintenance, fueling, outdoor storage, and loading/unloading that can produce indirect discharges.

[2]More recently, federal agencies including EPA, have adopted the North American Industry Classification System (NAICS, pronounced "Nakes") as the industry classification system. For more information on the NAICS and how it correlates with SIC, visit http://www.census.gov/epcd/www/naics.html.

Municipal Generating Sites: Municipal generating sites include operations that handle solid waste, water, wastewater, street and storm drain maintenance, fleet washing, and yard waste disposal. Transport-related areas such as streets and highways, airports, rail yards, and ports can also generate indirect discharges from spills, accidents and dumping.

Finding, Fixing, and Preventing Illicit Discharges

The purpose of an IDDE program is to find, fix and prevent illicit discharges, and a series of techniques exist to meet these objectives. The remainder of the manual describes the major tools used to build a local IDDE program, but they are briefly introduced below:

Finding Illicit Discharges

The highest priority in most programs is to find any continuous and intermittent sewage discharges to the storm drain system. A range of monitoring techniques can be used to find sewage discharges. In general, monitoring techniques are used to find problem areas and then trace the problem back up the stream or pipe to identify the ultimate generating site or connection. Monitoring can sometimes pick up other types of illicit discharge that occur on a continuous or intermittent basis (e.g., wash water and liquid wastes). Monitoring techniques are classified into three major groups:

- Outfall Reconnaissance Inventory
- Indicator Monitoring at Storm Water Outfalls and In-stream
- Tracking Discharges to their Source

!!! Caution !!!

Using land use as an indicator for certain flow types such as sewage is often less reliable than other factors in predicting the potential severity of sewage discharges. More useful assessment factors for illicit sewage discharges include the age of the sewer system, which helps define the physical integrity and capacity of the pipe network, as well as age of development, which reveals the plumbing codes and practices that existed when individual connections were made over time. Two particular critical phases in the sewer history of a subwatershed are when sanitary sewers were extended to replace existing septic systems, or when a combined sewer was separated. The large number of new connections and/or disconnections during these phases increases the probability of bad plumbing.

Fixing Illicit Discharges

Once sewage discharges or other connections are discovered, they can be fixed, repaired or eliminated through several different mechanisms. Communities should establish targeted education programs along with legal authority to promote timely corrections. A combination of carrots and sticks should be available to deal with the diversity of potential dischargers.

Preventing Illicit Discharges

The old adage "an ounce of prevention is worth a pound of cure" certainly applies to illicit discharges. Transitory discharges from generating sites can be minimized through pollution prevention practices and well-executed spill management and response plans. These plans should be frequently practiced by local emergency response agencies and/or trained workers at generating sites. Other pollution prevention practices are described in Chapter 9 and explored in greater detail in Manual 8 of the Urban Subwatershed Restoration Manual Series (Schueler *et al.*, 2004).

National Urban Runoff Project

EPA's National Urban Runoff Project (NURP) studies highlighted the significance of pollutants from illicit entries into urban storm sewerage (EPA, 1983). Such entries may be evidenced by flow from storm sewer outfalls following substantial dry periods. Such flow, frequently referred to as "baseflow" or "dry weather flow", could be the result of direct "illicit connections" as mentioned in the NURP final report (EPA, 1983), or could result from indirect connections (such as leaky sanitary sewer contributions through infiltration). Many of these dry weather flows are continuous and would therefore occur during rain induced runoff periods. Pollutant contributions from dry weather flows in some storm drains have been shown to be high enough to significantly degrade water quality because of their substantial contributions to the annual mass pollutant loadings to receiving waters (project research).

1.2 The Importance of Illicit Discharges in Urban Water Quality

Dry and wet weather flows have been monitored during several urban runoff studies. These studies have found that discharges observed at outfalls during dry weather were significantly different from wet weather discharges. Data collected during the 1984 Toronto Area Watershed Management Strategy Study monitored and characterized both storm water flows and baseflows (Pitt and McLean, 1986). This project involved intensive monitoring in two test areas (a mixed residential/commercial area and an industrial area) during warm, cold, wet, and dry weather. The annual mass discharges of many pollutants were found to be greater in dry weather flows than in wet weather flows.

A California urban discharge study identified commercial and residential discharges of oil and other automobile-related fluids as a common problem based on visual observations (Montoya, 1987). In another study, visual inspection of storm water pipes discharging to the Rideau River in Ontario found leakage from sanitary sewer joints or broken pipes to be a major source of storm drain contamination (Pitt, 1983).

Several urban communities conducted studies to identify and correct illicit connections to their storm drain systems during the mid-1980s. These studies were usually taken in response to receiving water quality problems or as part of individual NURP research projects. The studies indicated the magnitude and extent of cross-connection problems in many urban watersheds. For example, Washtenaw County, Michigan tested businesses to locate direct illicit connections to the county storm drain system. Of the 160 businesses tested, 38% were found to have illicit storm drain connections (Schmidt and Spencer, 1986). An investigation of the separate storm sewer system in Toronto, Ontario revealed 59% of outfalls had dry weather flows, while 14% of the total outfalls were characterized as "grossly polluted," based on a battery of chemical tests (GLA, 1983). An inspection of the 90 urban storm water outfalls draining into Grays Harbor in Washington showed that 32% had dry weather flows (Pelletier and Determan, 1988). An additional 19 outfalls were considered suspect, based on visual observation and/or elevated pollutant levels compared to typical urban storm water runoff.

The Huron River Pollution Abatement Program ranks as one of the most thorough and systematic early investigations of illicit discharges (Washtenaw County, 1988). More than a thousand businesses, homes and other buildings located in the watershed were dye tested. Illicit connections were found at 60% of the automobile-related businesses tested, which included service stations, automobile dealerships, car washes, and auto body and repair shops. All plating shops inspected were found to have illicit storm drain connections. Additionally, 67% of the manufacturers, 20% of the private service agencies and 88% of the wholesale/retail establishments tested were found to have illicit storm sewer connections. Of the 319 homes dye tested, 19 were found to have direct sanitary connections to storm drains. The direct discharge of rug-cleaning wastes into storm drains by carpet cleaners was also noted as a common problem.

Eliminating illicit discharges is a critical component to restoring urban watersheds. When bodies of water cannot meet designated uses for drinking water, fishing, or recreation, tourism and waterfront home

values may fall; fishing and shellfish harvesting can be restricted or halted; and illicit discharges can close beaches, primarily as a result of bacteria contamination. In addition to the public health and economic impacts associated with illicit discharges, significant impacts to aquatic life and wildlife are realized. Numerous fish kills and other aquatic life losses have occurred in watersheds as a result of illicit or accidental dumping and spills that have resulted in lethal pollutant concentrations in receiving waters.

1.3 Regulatory Background For Illicit Discharges

The history of illicit discharge regulations is long and convoluted, reflecting an ongoing debate as to whether they should be classified as a point or nonpoint source of pollution. The Clean Water Act amendments of 1987 contained the first provisions to specifically regulate discharges from storm drainage systems. Section 402(p)(3)(B) provides that "permits for such discharges:

(i) May be issued on a system or jurisdiction-wide basis

(ii) Shall include a requirement to effectively prohibit non-storm water discharges into the storm sewers; and

(iii) Shall require controls to reduce the discharge of pollutants to the maximum extent practical including management practices, control techniques and system design and engineering methods, and such provisions as the Administrator or the State determines appropriate for the control of such pollutants."

In the last 15 years, NPDES permits have gradually been applied to a greater range of communities. In 1990, EPA issued a final rule, known as Phase I to implement section 402(p) of the Clean Water Act through the NPDES permit system. The EPA effort expanded in December 1999, when the Phase II final rule was issued. A summary of how both rules pertain to MS4s and illicit discharge control is provided below.

Summary of NPDES Phase I Requirements

The NPDES Phase I permit program regulates municipal separate storm sewer systems (MS4s) meeting the following criteria:

- Storm sewer systems located in an incorporated area with a population of 100,000 or more
- Storm sewer systems located in 47 counties identified by EPA as having populations over 100,000 that were unincorporated but considered urbanized areas
- Other storm sewer systems that are specially designated based on the location of storm water discharges with respect to waters of the United States, the size of the discharge, the quantity and nature of the pollutants discharged, and the interrelationship to other regulated storm sewer systems, among other factors

An MS4 is defined as any conveyance or system of conveyances that is owned or operated by a state or local government entity designed for collecting and conveying storm water, which is not part of a Publicly Owned Treatment Works. The total number of permitted MS4s in the Phase I program is 1,059.

PHASE I HIGHLIGHTS

Who must meet the requirements?	MS4s with population ≥100,00
How many Phase I communities exist nationally?	1,059
What are the requirements related to illicit discharges?	Develop programs to prevent, detect and remove illicit discharges

Phase I MS4s were required to submit a two-part application. The first part required information regarding existing programs and the capacity of the municipality to control pollutants. Part 1 also required identification of known "major" outfalls[3] discharging to waters of the United States, and a field screening analysis of representative major outfalls to detect illicit connections. Part 2 of the application required identification of additional major outfalls, limited monitoring, and a proposed storm water management plan (EPA, 1996).

Phase I communities were required to develop programs to detect and remove illicit discharges, and to control and prevent improper disposal into the MS4 of materials such as used oil or seepage from municipal sanitary sewers. The illicit discharge programs were required to include the following elements:

- Implementation and enforcement of an ordinance, orders or similar means to prevent illicit discharges to the MS4
- Procedures to conduct ongoing field screening activities during the life of the permit
- Procedures to be followed to investigate portions of the separate storm sewer system that, based on the results of the field screening required in Part 2 of the application, indicate a reasonable potential for containing illicit discharges or other sources of non-storm water
- Procedures to prevent, contain, and respond to spills that may discharge into the MS4
- A program to promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges from the MS4
- Educational activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials
- Controls to limit infiltration of seepage from municipal sanitary sewers to the MS4

[3]A "major" outfall is defined as an MS4 outfall that discharges from a single pipe with an inside diameter of at least 36 inches, or discharges from a single conveyance other than a circular pipe serving a drainage area of more than 50 acres. An MS4 outfall with a contributing industrial land use that discharges from a single pipe with an inside diameter of 12 inches or more or discharges from a single conveyance other than a circular pipe serving a drainage area of more than two acres.

Summary of NPDES Phase II Requirements

The Phase II Final Rule, published in the Federal Register regulates MS4s that meet both of the following criteria:

- Storm sewer systems that are not a medium or large MS4 covered by Phase I of the NPDES Program
- Storm sewer systems that are located in an Urbanized Area (UA) as defined by the Bureau of the Census, or storm sewer systems located outside of a UA that are designated by NPDES permitting authorities because of one of the following reasons:
  - The MS4's discharges cause, or have the potential to cause, an adverse impact on water quality
  - The MS4 contributes substantially to the pollutant loadings of a physically interconnected MS4 regulated by the NPDES storm water program

MS4s that meet the above criteria are referred to as regulated small MS4s. Each regulated small MS4 must satisfy six minimum control measures:

1. Public education and outreach
2. Public participation/involvement
3. Illicit discharge detection and elimination
4. Construction site runoff control
5. Post-construction runoff control
6. Pollution prevention/Good housekeeping

Under the third minimum measure, an illicit discharge is defined as any discharge to an MS4 that is not composed entirely of storm water, except allowable discharges pursuant to an NPDES permit, including those resulting from fire fighting activities (40 CFR 122.26(b)(2)). To satisfy this minimum measure, the regulated small MS4 must include the following five components:

- Develop a storm sewer system map that shows the location of all outfalls and the names and locations of all waters of the United States that receive discharges from those outfalls
- Prohibit, through ordinance or other regulatory mechanism, non-storm water discharges into the storm sewer system and implement appropriate enforcement procedures and actions
- Develop and implement a plan to detect and address illicit discharges to the MS4
- Educate public employees, businesses, and the general public of hazards associated with illicit discharges and improper disposal of waste
- Identify the appropriate best management practices and measurable goals for this minimum measure

PHASE II HIGHLIGHTS

Who must meet the requirements?	Selected small MS4s 
How many Phase II communities exist nationally?	EPA estimates 5,000–6,000
What are the requirements related to illicit discharges?	Develop programs to prevent, detect and remove illicit discharges
What is the deadline for meeting these requirements?	Permits issued by March 10, 2003. Programs must be fully implemented by the end of first permit term (5 years)

In the regulation, EPA recommends that the plan to detect and address illicit discharges include procedures for:

- Locating priority areas likely to have illicit discharges (which may include visually screening outfalls during dry weather and conducting field tests of selected pollutants)
- Tracing the source of an illicit discharge
- Removing the source of the discharge
- Program evaluation and assessment

1.4 Experience Gained in Phase I

The Center for Watershed Protection conducted a series of surveys and interviews with Phase I communities to determine the current state of the practices utilized in local IDDE programs, and to identify the most practical, low-cost, and effective techniques to find, fix and prevent discharges. The detailed survey included 24 communities from various geographic and climatic regions in the United States. Some of the key findings of the survey are presented below (CWP, 2002)[4].

- Lack of staff significantly hindered implementation of a successful IDDE program. Phase I communities rely heavily on the expertise of their field staff—practical expertise that has been acquired over many years as programs gradually developed. Methods or approaches recommended for Phase II communities should be less dependent on professional judgment.

[4] Survey results are based on responses from 24 jurisdictions from 16 states. Surveys were supplemented by on-site interviews of staff of eight IDDE programs: Baltimore City, MD; Baltimore County, MD; Boston Water and Sewer Commission (BWSC), MA; Cambridge, MA; Dayton, OH; Raleigh, NC; Wayne County, MI; and Fort Worth, TX. Jurisdictions selected for the survey and interviews represent a variety of geographic and climatic regions. The EPA storm water coordinators for each region of the country were contacted for recommendations on jurisdictions to include in the survey. Also, a variety of jurisdiction sizes in terms of population, IDDE program service area, and land use was targeted.

- Clear and effective ordinance language should be adopted by Phase II communities to ensure that all potential sources of illicit discharges are prohibited, and that the community has sufficient legal authority to inspect private properties and enforce corrections.
- Many communities lacked up-to-date mapping resources, and found that mapping layers such as storm sewers, open drainage channels, waters of the U.S., outfalls, and land use were particularly useful to conduct and prioritize effective field investigations.
- Outfall screening required the greatest staff and equipment resources, and did not always find problem outfalls. Communities recommended a fast and efficient sampling approach that utilizes a limited number of indicator parameters at each outfall to find problem outfalls.
- When purchasing equipment, Phase II programs should communicate with other jurisdictions to consider sharing field equipment and laboratory costs.
- Use of some discharge tracers has proven challenging and sometimes fruitless, because of false or ambiguous results and complex or hazardous analytical methods. Accurate, cost-effective, and safe monitoring methods are needed to effectively use tracers.
- Municipal IDDE programs worked best when they integrated illicit discharge control in the wider context of urban watershed restoration. Table 3 provides some examples of how greater interagency cooperation can be achieved by linking restoration program areas.

In summary, survey communities expressed a strong need for relatively simple guidance to perform illicit discharge investigations. To address this need, the Manual has been designed to make simple program and technical recommendations for Phase II communities to develop cost-effective IDDE programs.

Table 3: Linking Other Municipal Programs to IDDE Program Needs	
Watershed-Related Program	**How Program Relates to IDDE Program Needs**
Subwatershed Mapping and Analysis	• Mapping and aerial photography are critical tools needed for illicit connection detection surveys. GIS tax map layers are often useful to identify property ownership.
Rapid Assessment of Stream Corridors	• Observations from physical stream assessments are often useful in identifying problem areas, including dry weather flow outfalls, illegal dumping, and failing infrastructure locations.
Watershed Monitoring and Reporting	• Compiled water quality and other indicator data can be useful in targeting problem areas.
Stream Restoration Opportunities	• Stream restoration opportunities can often be coordinated with sewer infrastructure upgrades and maintenance.
Watershed Education	• Educating the public about unwanted discharges can save programs money by generating volunteer networks to report and locate problem areas. Better awareness by the public can also reduce the likelihood of unintentional cross-connections.
Pollution Prevention for Generating Sites	• Providing incentives to businesses to inspect and correct connections can save programs money.

PROJECT NAME: How to Report an Illicit Discharge

PROJECT NO.: ADEQ Annual Report

DATE: Monday September 9

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PROJECT NAME: Pollution Prevention and Good HouseKeeping

PROJECT NO.: ADEQ Annual Report

DATE: Monday September 9

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PROJECT NAME: Pollution Prevention and Good HouseKeeping

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Appendix I – Public Outreach

ADDITIONAL FREE HOUSEHOLD HAZARDOUS WASTE DAY EVENT

June 21, 2024

Republic Services offers an additional Free Residential Household Hazardous Waste event next Saturday, June 29, from 8:00 a.m. to 12:00 p.m. The event takes place at Fire Station 2, located at 2065 Kiowa Boulevard, North, with public access at College Drive. Signs are posted in the vicinity to assist residents with drop off.

Event is open to Lake Havasu City residents only and offers a safe disposal of a wide range of household generated hazardous wastes. Improper disposal of household hazardous wastes such as pouring them down the drain, on the ground, into sewers, or in some cases, putting them out with the trash can pollute the environment and pose a threat to human health.

No commercial or industrial waste is accepted. Residents must bring ID with a Lake Havasu City address or a recent billing statement showing subscription to trash service within Lake Havasu City.

Accepted at this event: Paint (max 15 gallons, and consolidated into 5 to 6 gallon buckets if possible): oil and latex, stains, varnishes, solvents, thinners, and adhesives; **Automotive Parts and fluid** (max 30 gallons of fluid): motor oil, filters, antifreeze, car batteries, gasoline, tires (max of 4, off rim only), oily water, oily rags and debris, and oily dirt; **Other Chemicals**: flammable liquids and aerosol cans (no pesticides); **Fluorescent Tubes:** tubes, bulbs, and other mercury-containing lamps (not broken); **Batteries**: AA, AAA, C and D cells and button batteries; and, **E-Waste** (max 3 items): televisions, computers, monitors, DVD players, CPUs, hard drives, microwaves, computer mouse, shredders and radios.

Not Accepted at this event: pesticides, poisons, corrosives, medical waste, broken lights, construction debris, and pharmaceuticals.

The City encourages all residents to take advantage of this opportunity to dispose of hazardous items from your home. For additional details, please contact Republic Services.

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Appendix J – Low Impact Development Plan

https://www.lhcaz.gov/public-works/storm-water-management