Quality Assurance/Quality Control Manual Municipal Separate Stormwater Sewer System Stormwater Monitoring March 2022

In support of

Arizona Department of Transportation Municipal Separate Stormwater Sewer System

Permit No. AZS0000018 - 2021



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ABBREVIATIONS

A.A.C. - Arizona Administrative Code ADEQ - Arizona Department of Environmental Quality ADHS - Arizona Department of Health Services ADOT - Arizona Department of Transportation A.R.S. - Arizona Revised Statutes **BMP** - Best Management Practices **BOD** - Biochemical Oxygen Demand COC - Chain of Custody **COD** - Chemical Oxygen Demand **CRM - Certified Reference Material** E. coli - Escherichia coli EPA - United States Environmental Protection Agency HPLC - High Performance Liquid Chromatography LCS - Laboratory Control Sample LOQ - Limit of Quantitation **MDL** - Method Detection Limit mg/L - Milligrams per Liter MQO - Measurement Quality Objective MPN - Most Probable Number MS/MSD - Matrix Spike/Matrix Spike Duplicate MS4 - Municipal Separate Storm Water Sewer System NTU - Nephelometric Turbidity Units **OAW - Outstanding Arizona Waters** PAH - Polycyclic Aromatic Hydrocarbons **PQLs - Practical Quantitation Limits** QAM - Quality Assurance Manual **QAP** - Quality Assurance Plan QA/QC - Quality Assurance/Quality Control **SOP** - Standard Operating Procedure TDS - Total Dissolved Solids **TSS** - Total Suspended Solids VOC - Volatile Organic Compound WLA - Wasteload Allocation µg/L - Micrograms per Liter

1.0 PROJECT MANAGEMENT

1.1 INTRODUCTION

This Quality Assurance/Quality Control Manual has been prepared for the Arizona Department of Transportation (ADOT) and their contractors to assist in meeting stormwater monitoring requirements as identified within Section 5 of Arizona Pollutant Discharge Elimination System Municipal Separate Storm Sewer System Permit No. AZS0000018-2021 (Permit). This Permit is implemented under Arizona Department of Environmental Quality (ADEQ) Arizona Pollutant Discharge Elimination System (AZPDES) and authorizes ADOT to discharge stormwater to Waters of the United States in Arizona within its Municipal Separate Storm Sewer System (MS4) and select maintenance facilities.

Quality assurance (QA) is defined as methods designed to implement the data quality objectives throughout the sampling and analytical procedure. Quality control (QC) is defined as the methods to measure how effectively the quality assurance methodologies have been applied.

1.2 DATA QUALITY OBJECTIVES

The data quality objectives of this manual are to provide a standard working tool for ADOT personnel and designated contractors in determining the type, quantity and quality of data needed to reach defensible decisions or make credible estimates in meeting Permit conditions as described in Part 5 of the ADOT's MS4 Permit. This regulatory target requires data qualifiers of precision, accuracy and representativeness that governs the data quality objectives of the program.

1.2.1 Precision

Precision refers to the closeness of two or more measurements to each other. Measurements of concentration in sampled stormwater gathered by this program will be compared to Arizona surface water quality standards (A.A.C. Title 18, Chapter 11, Article 1) applicable to receiving waters of the MS4, qualitatively used to evaluate narrative standards to impaired and unique waters. The precision of numeric water quality standards varies but is the most exact of these three uses. Therefore, the precision of any data should be comparable to applicable surface water quality standards of the specific receiving waters.

1.2.2 Accuracy

Accuracy refers to the closeness of a measured value to a standard or known value. For environmental samples the true value is never known, even for a specific aliquot. Therefore, data accuracy can only be determined by intra-laboratory methods. Acceptable levels for accuracy of regulatory data where enforcement actions are possible are quite high and these have been specified by the Arizona Department of Health Services (ADHS) Office of Laboratory Licensure and Certification. All samples collected for monitoring are analyzed by a laboratory licensed by the ADHS and accuracy determined by internal programs of those labs. See Section 3.3 – Acceptance Criteria for further discussion.

1.2.3 Representativeness

Sample representativeness expresses the degree to which data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition. It is dependent on the proper design of the sampling program and will be satisfied by ensuring this approved plan is followed during sampling and analysis. Stormwater sampling variability is continuous; therefore, site characterization standards suggest that the physical nature of the water sample be the best criteria for representativeness. These criteria include location relative to the source of pollution and receiving water, flow discharge and the nature of the rainstorm has specified the locations, sample timing, characteristic rainfall amounts and other qualifiers for the sampling program.

1.2.4 Level of Data Quality

The MS4 permit has assumed a level of data quality needed for compliance by requiring that ADHS certified laboratories are used. The Permit also stipulates the sampling locations, frequency, and antecedent rainfall conditions and by requiring that the data be compared to applicable surface water quality standards of the specific receiving waters and calculated pollutant loads of impaired waters. This level of data quality will be maintained during the implementation of ADOT's monitoring program.

1.3 ROLES, RESPONSIBILITIES, AND QUALIFICATIONS

The organization structure ADOT's stormwater monitoring program is provided in Appendix A and will be updated as needed. The ADOT assigned project manager (ADOT PM) is responsible for compliance with the MS4 Permit. Sampling, monitoring and interpretive support will be assigned to the ADOT Contractor, who will maintain the project database. Data and narrative interpretation will be delivered to the ADOT PM for inclusion in the MS4 Permit Annual Report.

1.4 SAMPLE PARAMETERS AND FREQUENCY

Permit section 5.2(F) identifies parameters and sampling frequency. This table is provided below as Table 1 and Table 2 to assist users of this manual in preparing sampling activities.

Parameter	Units	Monitoring Frequency	Monitoring Type				
Conventional Parameters							
Flow		1x/Sampling Event					
рН	S.U.	1x/Wet Season	Discrete				
Hardness	mg/L	1x/Wet Season	Flow Proportional Composite				
Temperature	°C	1x/Wet Season	Discrete				
Total Suspended Solids	mg/L	1x/Wet Season	Flow Proportional Composite				
	-	Microbiology					
Escherichia coli	cfu/ 100mL or MPN	1x/Wet Season	Discrete				
		Metals (total)					
Arsenic	μg/L	1x/Wet Season	Flow Proportional Composite				
Barium	μg/L	1x/Wet Season	Flow Proportional Composite				
Cadmium	μg/L	1x/Wet Season	Flow Proportional Composite				
Chromium	μg/L	1x/Wet Season	Flow Proportional Composite				
Copper	μg/L	1x/Wet Season	Flow Proportional Composite				
Lead	μg/L	1x/Wet Season	Flow Proportional Composite				
Mercury	μg/L	1x/Wet Season	Flow Proportional Composite				
Selenium	μg/L	1x/Wet Season	Flow Proportional Composite				
Silver	μg/L	1x/Wet Season	Flow Proportional Composite				
Zinc	μg/L	1x/Wet Season	Flow Proportional Composite				
		Nutrients					
Nitrate plus Nitrite as N	mg/L	1x/Wet Season	Flow Proportional Composite				
Ammonia as N	mg/L	1x/Wet Season	Flow Proportional Composite				
Total Kjeldahl Nitrogen	mg/l	1x/Mot Socon	Flow Proportional Composite				
(TKN) as N	IIIg/L	IX/ Wet Season					
Total Phosphorus	mg/L	1x/Wet Season	Flow Proportional Composite				
	C	Organic Toxic Pollutants					
Total Oil and Grease	mg/L	1x/Wet Season	Discrete				
Polycyclic Aromatic Hydrocarbons (PAH)*	μg/L	1x/Wet Season	Discrete				

Table 1. Analytical Wet Weather Monitoring Each Wet Season

*Parameter is not permit required/Voluntary analyses by ADOT

Parameter	Units	Monitoring Frequency	Monitoring Type			
Metals (total)						
Antimony	µg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite			
Barium	µg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite			
Beryllium	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite			
Thallium	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite			
	Vo	latile Organic Compounds (VOC's)				
Acrolien	μg/L	1x /wet season during year 4 of the permit term	Discrete			
Acrylonitrile	μg/L	1x /wet season during year 4 of the permit term	Discrete			
Benzene	μg/L	1x /wet season during year 4 of the permit term	Discrete			
Carbon tetrachloride	μg/L	1x /wet season during year 4 of the permit term	Discrete			
Chlorobenzene	μg/L	1x /wet season during year 4 of the permit term	Discrete			
Chlorodibromomethane	μg/L	1x /wet season during year 4 of the permit term	Discrete			
Chloroethane	μg/L	1x /wet season during year 4 of the permit term	Discrete			
2-chloroethylvinyl ether	μg/L	1x /wet season during year 4 of the permit term	Discrete			
Chloroform	μg/L	1x /wet season during year 4 of the permit term	Discrete			
Dichlorobromomethane	μg/L	1x /wet season during year 4 of the permit term	Discrete			

Table 2. Analytical Wet Weather Characterization Monitoring Year 4

1,2-dichlorobenzene	μg/L	1x /wet season during year 4 of the permit term	Discrete
1,3-dichlorobenzene	μg/L	1x /wet season during year 4 of the permit term	Discrete
1,4-dichlorobenzene	μg/L	1x /wet season during year 4 of the permit term	Discrete
1,1-dichloroethane	μg/L	1x /wet season during year 4 of the permit term	Discrete
1,2-dichloroethane	μg/L	1x /wet season during year 4 of the permit term	Discrete
1,3-dichloropropylene	μg/L	1x /wet season during year 4 of the permit term	Discrete
Ethylbenzene	μg/L	1x /wet season during year 4 of the permit term	Discrete
Methyl bromide	μg/L	1x /wet season during year 4 of the permit term	Discrete
Methyl chloride	μg/L	1x /wet season during year 4 of the permit term	Discrete
Methylene chloride	μg/L	1x /wet season during year 4 of the permit term	Discrete
1,1,2,2-tetrachloroethane	μg/L	1x /wet season during year 4 of the permit term	Discrete
Tetrachloroethylene	μg/L	1x /wet season during year 4 of the permit term	Discrete
Toluene	μg/L	1x /wet season during year 4 of the permit term	Discrete
1,2-trans-dichloroethylene	μg/L	1x /wet season during year 4 of the permit term	Discrete
1,1,1-trichloroethane	μg/L	1x /wet season during year 4 of the permit term	Discrete
1,1,2-trichloroethane	μg/L	1x /wet season during year 4 of the permit term	Discrete

Trichloroethylene	μg/L	1x /wet season during year 4 of the permit term	Discrete
Trimethylbenzene	μg/L	1x /wet season during year 4 of the permit term	Discrete
Vinyl chloride	μg/L	1x /wet season during year 4 of the permit term	Discrete
Xylene	μg/L	1x /wet season during year 4 of the permit term	Discrete
	-	Semi-VOC's – Acid Extractables	
2-chlorophenol	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
2,4-dichlorophenol	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
2,4-dimethylphenol	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
4,6-dinitro-o-cresol	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
2,4-dinitrophenol	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
2-nitrophenol	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
4-nitrophenol	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
p-chloro-m-cresol	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
Pentachlorophenol	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
Phenol	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
2,4,6-trichlorophenol	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
		Semi-VOC's – Base/ Neutrals	
Acenaphthene	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite

Acenaphthylene	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
Anthracene	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
Benz(a)anthracene	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
Benzo(a)pyrene	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
Benzo(b)fluoranthene	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
Benzo(g,h,i)perylene	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
Benzo(k)fluoranthene	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
Chrysene	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
Dibenzo(a,h)anthracene	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
3,3'-dichlorobenzidine	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
Diethyl phthalate	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
Dimethyl phthalate	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
Di-n-butyl phthalate	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
2,4-dinitrotoluene	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
2,6-dinitrotoluene	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
Di-n-octyl phthalate	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite

1,2-diphenylhydrazine (as azobenzene)	μg/L	1x /wet season during year 4 of the permit term Flow Proportional Co	
Fluoranthene	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
Fluorene	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
Hexachlorobenzene	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
Hexachlorobutadiene	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
Hexachlorocyclopentadiene	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
Hexachloroethane	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
Indeno(1,2,3-cd)pyrene	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
Isophorone	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
Naphthalene	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
Nitrobenzene	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
N-nitrosodimethylamine	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
N-nitrosodi-n-propylamine	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
N-nitrosodiphenylamine	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
Phenanthrene	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite
Pyrene	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite

1,2,4-trichlorobenzene	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite				
	PCB / Pesticides						
Aldrin	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite				
Alpha-BHC	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite				
Beta-BHC	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite				
Gamma-BHC	µg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite				
Delta-BHC	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite				
Chlordane	µg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite				
4,4'-DDT	µg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite				
4,4'-DDE	µg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite				
4,4'-DDD	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite				
Dieldrin	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite				
Alpha-endosulfan	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite				
Beta-endosulfan	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite				
Endosulfan sulfate	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite				
Endrin	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite				
Endrin aldehyde	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite				
Heptachlor	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite				

Heptachlor epoxide	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite	
PCB-1242	µg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite	
PCB-1254	µg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite	
PCB-1221	µg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite	
PCB-1232	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite	
PCB-1248	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite	
PCB-1260	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite	
PCB-1016	µg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite	
Toxaphene	μg/L	1x /wet season during year 4 of the permit term	Flow Proportional Composite	

1.5 REGULATORY LIMITS

Analytical results will be compared to their applicable Arizona numeric water quality standards for surface water (A.A.C. Title 18, Chapter 11, Article 1) applicable to the MS4 receiving waters. Current surface water quality standards are available at the following link:

https://apps.azsos.gov/public_services/Title_18/18-11.pdf

2.0 SAMPLE COLLECTION PROCEDURES

2.1 SAMPLING EQUIPMENT

Monitoring equipment will be gathered ahead of time because opportunities to sample during rainfall events often come with little advanced notice. Stormwater monitoring generally requires the following equipment:

- Field forms
- Waterproof pens
- Permanent markers
- Powder-free nitrile gloves
- Clear glass jar for visual examinations
- Sample containers
- Sample preservatives
- Sample container labels

- Chain of Custody (COC) forms
- COC seals
- Ice chest(s)
- Ice
- Foul-weather gear

A MS4 Stormwater Sampling Equipment List is provided in Appendix B to assist sampling technicians in preparing for field activities.

2.2 SAMPLE LOCATIONS

2.2.1 Maintenance Facilities Monitoring Locations

ADOT will conduct stormwater monitoring at selected maintenance facilities, including, but not limited to:

- <u>Nogales Maintenance Yard</u> 1340 N. Hohokam Drive, Nogales (31° 21' 22.97" N; 110° 55' 38.96" W)
- <u>Superior Maintenance Yard</u> 951 Main Street, Superior (33° 17' 14.14" N; 111° 06' 40.31" W)
- <u>Superior Storage and Fuel Yard</u> 952 Main Street, Superior (33° 17' 17.12" N; 111° 06' 43.49" W)

Maintenance Facility Sampling Parameters

ADOT will collect a minimum of one sample per facility from each representative outfall between June 1 and October 31 (summer season) and one sample between November 1 and May 31 (winter season). Samples will be collected utilizing in-ground passive collection bottles installed within protective mounting tubes and retrieved after a storm event.

Maintenance Facility Field Measurements

Field measurements at each maintenance location will consist of the following:

- pH
- Temperature
- Residual chlorine (Nogales Yard only)

Testing equipment will be calibrated prior to measurements and documented on a Field Bench Sheet as provided in Appendix C as per Section 6.1, Item 3 in the Permit. Additionally, field measurements will be recorded in the site location logbook. The completed Field Bench Sheet shall be submitted to ADOT for records retention.

2.2.2 Wet Weather (MS4) Monitoring Locations

ADOT will conduct stormwater monitoring at the following five established MS4 locations:

- <u>Flagstaff 2 MS4</u> S. Beulah Blvd. along north side of street between I-40 overpass and south bound I-17 exit ramp (35°10'20.23"N; 111°39'56.18"W)
- <u>Nogales MS4</u> Morley Road at Intersection of State Route 82 (31° 21' 02.12"N; 110° 55' 24.52"W)

- <u>Phoenix MS4</u> East of State Route 101 on north bank of Skunk Creek (33° 37' 19.86"N; 112° 14' 21.65"W)
- <u>Sedona MS4</u> Below western abutment of State Route 179 bridge over Oak Creek (34° 51'43.95'N; 111° 45' 42.72"W)
- <u>Tucson MS4</u> West of Interstate 10 north of Grant Road within ADOT Yard (32° 15' 17.21"N; 110° 59' 49.43"W)

A map showing the MS4 sampling locations is provided in Appendix D.

MS4 Sampling Parameters

ADOT will collect stormwater samples from the first representative storm event of each wet season (June 1- October 31 and November 1- May 31) and subsequent representative storm events as necessary to collect at least one stormwater sample for each wet season from each outfall or monitoring location. Sampling will be conducted over the first 3 hours of the discharge or for the entire discharge period, if the discharge lasts less than 3 hours. Sampling efforts should include the "first flush" (first 30 minutes of stormwater discharge) whenever possible. A representative storm event is defined in the ADOT Permit as a storm event of greater than 0.1 inches of rainfall and that occurs at least 72 hours after the previously measurable (greater than 0.1 inch of rainfall) storm event.

MS4 Field Measurements

Field measurements at each MS4 location will consist of the following:

- pH
- Temperature
- Flow

Testing equipment will be calibrated prior to measurements and documented on a Field Bench Sheet as provided in Appendix D as per Section 6.1, Item 3 in the Permit. Additionally, field measurements will be recorded in the site location logbook.

MS4 Grab Samples

A minimum of one grab sample will be collected from a discharge resulting from a measurable storm event at each MS4 location and analyzed for the following:

- Escherichia coli (E. coli)
- Polycyclic Aromatic Hydrocarbons (PAHs)
- Residual chlorine (Nogales MS4 only)

Grab sampling information for *E. coli* and PAHs will be recorded on the COC. Information for residual chlorine (Nogales MS4 only) will be recorded in the site location logbook.

MS4 Flow-Weighted Composite Samples

Flow-weighted composite samples will be collected at each MS4 location utilizing an ISCO automated stormwater sampler. Sampling will be conducted over the first three hours of the discharge or for the entire discharge period if the discharge is less than three hours. A list of analyses required for flow-weighted sampling is provided in Table 1 and 2 (see page 3 of this document).

2.3 QUALITY ASSURANCE/QUALITY CONTROL SAMPLING

The Quality Assurance/Quality Control (QA/QC) program ensures that samples collected are of the highest quality and the laboratory analyzing the samples is producing reliable results. In order to be certified by ADHS, an analytical laboratory is required to have a Quality Assurance Plan (QAP) or Quality Assurance Manual (QAM) that contains a set of QA/QC procedures covering all aspects of laboratory operations. The contracted laboratory will be required to provide a copy of its QAP and maintained on file by ADOT or their contractor.

Contamination can be introduced to a sample at any point during equipment preparation, sample collection, transport, or analysis steps and is referred to as sample bias. Standardized procedures for field and laboratory activities minimize the likelihood of contamination of samples or sample bias. Different types of blank samples can be used to determine if contamination has been introduced during any of the steps. The different types of blanks are described in the remainder of this section.

Section 4 of this document outlines required correction procedures in the event of surface water quality standard exceedance.

Trip Blanks

A trip blank sample shall be analyzed every fifth sampling event to estimate sample bias in volatile organic compound (VOC) analyses and analyzed for VOCs during every sampling event. Trip blank samples will be provided by the laboratory and will remain with the sample containers throughout the sampling and shipping process.

Equipment Blanks

Equipment blanks shall be collected by pouring analyte-free water over the decontaminated field equipment before collecting samples from a site. One equipment blank sample will be collected during seasonal maintenance activity (winter and summer). The equipment blank will be submitted to the laboratory and analyzed for the same parameters as the site sample(s).

Matrix Spikes and Matrix Spike Duplicates

Matrix spikes and matrix spike duplicates (MS/MSD) are collected at the same location as the original samples and the laboratory adds (spikes) the sample with a known concentration of analyte to a sample. The samples are then analyzed to determine the concentration of the sample plus the spike. Deviation from 100 percent in the spike recoveries indicates matrix interference. One MS/MSD will be collected for every ten VOC.

Method Blanks

A method blank is used to determine if any contamination is being introduced by laboratory reagents or glassware. For each batch of samples, method blanks will be run by the laboratory and the results of the method blank analysis reported with the sample results as percent

recovery. Method blanks are conducted by the laboratory and no action on the part of the field sampling personnel is required.

Laboratory Duplicates

A laboratory duplicate is a sample that is split into two aliquot samples and then analyzed separately to determine the reproducibility of the laboratory analytical methods. Results of the laboratory duplicate analysis is reported with the sample results. At least one laboratory duplicate sample should be collected once a year from the five MS4 sampling locations. Laboratory duplicates are conducted by the laboratory and no action on the part of the field sampling personnel is required.

2.4 PRESERVATIVES AND HOLDING TIMES

Water sample preservation procedure is based on the particular type of analysis methodology.

- Bottle sets are typically shipped from the contract laboratory with preservatives contained in the bottle but may include separately-contained preservative vials for special circumstances.
- The type of preservative used for the analysis to be performed is typically identified by a colored dot or sticker on the pre-preserved bottle, which may also include a written notation of the added preservative.
- Sample bottles should be shipped for each sampling event on a per event/request basis.
- Bottles shall be new and contain the pre-measured amount of the preservative, except as noted above.
- Any pre-preserved bottle that is discolored around the cap, lost its preservative label, or appears to lack sufficient preservative shall be discarded.
- A crucial requirement for sample preservation is to extract the sample within established hold times for the specific analysis.

A list of analysis methods, bottle requirements, preservatives and hold times for the required analysis is listed in Table 3 and 4 and in accordance with EPA SW-846 requirements.

Analysis	Method	Preservative	Container	Volume Required	Hold Time
Hardness	6010B	Nitric Acid	Plastic 250 mL - Wide	250 mL	28 Days
Total Suspended Solids (TSS)	2540D	None	Plastic 500 mL - Wide- unpreserved	200 mL	7 Days
Escherichia coli (E. coli)	9221F	None	Bacti Bottle 125 mL - Idexx	125 mL	8 Hours
Mercury (CVAA)	245.1 CWA	Nitric Acid	Plastic 500 mL - Wide	100 mL	28 Days
Metals (ICP)	200.7 CWA	Nitric Acid	Plastic 500 mL - Wide	100 mL	180 Days
Metals (ICP/MS)	200.8 CWA LL	Nitric Acid	Plastic 500 mL - Wide	100 mL	180 Days
Nitrate plus Nitrite as N	353.2	Sulfuric Acid	Plastic 250 mL - Wide	250 mL	28 Days
Ammonia as N	350.1	Sulfuric Acid	Plastic 250 mL - Wide	250 mL	28 Days
Total Kjeldahl Nitrogen (TKN) as N	351.2	Sulfuric Acid	Plastic 250 mL - Wide	250 mL	28 Days
Total Phosphorus	365.4	Sulfuric Acid	Plastic 250 mL - Wide	250 mL	28 Days
Total Oil and Grease	1664A	Hydrochloric Acid	Glass/Clear - Wide	1 L	180 Days
Metals (ICP)	200.7 CWA	Nitric Acid	Plastic 500 mL - Wide	100 mL	180 Days
Metals (ICP/MS)	200.8 CWA LL	Nitric Acid	Plastic 500 mL - Wide	100 mL	180 Days
РАН	8310	None	1 Liter Amber - Wide	2000 mL	7 Days
VOC's	8260B	HCL	40 ml Amber- VOA	40 mL	14 Days
Semi-VOC's - Acid Extractables	8270C	None	40 ml Amber- VOA	40 mL	7 Days
Semi-VOC's - Base/Neutrals	8270C	None	40 ml Amber- VOA	40mL	7 Days
PCB / Pesticides	8082	None	1 Liter Amber - Wide	1 L	7 Days

Table 3. Preservatives and Holding Times

2.5 SAMPLE NOMENCLATURE

A consistent system for naming samples ensures that sample data are readily identifiable as to time and location and avoids confusion when samples are collected regularly at the same location over a long period of time. All samples should be named according to the following two-part labeling system:

Part 1 - Location Code

FLAG2 – Flagstaff2 MS4 NOGMS4 - Nogales MS4 PHX - Phoenix MS4 SED - Sedona MS4 TUC - Tucson MS4

NOGYARD - Nogales Maintenance Yard SUPYARD - Superior Maintenance Yard SUPFUEL - Superior Storage and Fuel Yard

Part 2 - Date Code

Include the date in the following format: YYMMDD. An example sample from the Phoenix MS4 sampling location collected on November 26, 2021 would be labeled:

PHX211126

An example of a completed COC is provided in Appendix E of this document.

Laboratory Selection

Laboratories selected for analyses of stormwater samples may include any ADHS certified laboratory. Currently, the following labs have been providing service to ADOT for stormwater analyses:

- Pace Analytical
- Turner Laboratories, Inc.
- Xenco Laboratories

The sampling technician will also document field measurements and observations in the Stormwater Sampling Data Form provided in Appendix F or within the site logbook. Completed Stormwater Sampling Data Forms shall be submitted to ADOT for records retention.

3.0 APPROVED ANALYTICAL METHODS

3.1 ANALYTICAL METHODS

The recommended analytical methods, limits of quantification (LOQs) and method detection limits (MDLs) for specific analytes are provided in Table 4 below and are in accordance with EPA SW-846 requirements.

The analytical method will be specified on the COC form. In addition to these requirements, the Permit requires the selected analytical method to have a LOQ less than the applicable numeric surface water quality standard. If all methods have LOQs higher than applicable numeric surface water quality criteria, ADOT must use the approved analytical method with the lowest LOQ. The laboratory contracted for ADOT stormwater sample analysis must also use a standard calibration where the lowest standard point is equal to or less than the LOQ. This will be verified through review of laboratory data in comparison of the LOQ to surface water quality standards.

Analyte	Method	LOQ	MDL	Units
Hardness	SM 2340B	3.3	0.07	mg/L
Total Dissolved Solids	SM 2540C	20.0	20	mg/L
Escherichia Coli (E. coli)	SM 9221F	1.8	1.8	MPN/100 mL
Arsenic	200.8 LL	0.5	0.247	μg/L
Barium	200.8 LL	0.5	0.259	μg/L
Cadmium	200.8 LL	0.5	0.0231	μg/L
Chromium	200.8 LL	0.5	0.433	μg/L
Copper	200.8 LL	0.5	0.332	μg/L
Lead	200.8 LL	0.5	0.220	μg/L
Mercury	245.1	0.0002	0.00007	mg/L
Selenium	200.8 LL	0.5	0.0743	μg/L
Silver	200.8 LL	0.1	0.0121	μg/L
Zinc	200.8 LL	12.5	3.12	μg/L
Acenaphthene	8310	40.3	1.8	μg/L
Acenaphthylene	8310	45.1	2.3	μg/L
Anthracene	8310	28.7	0.66	μg/L
Benzo(a)anthracene	8310	4.0	0.013	μg/L
Benzo(a)pyrene	8310	4.0	0.023	μg/L
Benzo(b)fluoranthene	8310	3.1	0.018	μg/L
Benzo(ghi)perylene	8310	2.3	0.076	μg/L
Benzo(k)fluoranthene	8310	2.5	0.017	μg/L
Chrysene	8310	4.2	0.15	μg/L
Dibenzo(a,h)anthracene	8310	2.0	0.030	μg/L

Table 4. Analytical Methods Years 1-3

Fluoranthene	8310	3.0	0.21	μg/L
Fluorene	8310	43.0	0.21	μg/L
Indeno(1,2,3-cd)pyrene	8310	3.0	0.043	μg/L
Naphthalene	8310	40.7	1.8	μg/L
Phenanthrene	8310	37.7	0.64	μg/L
Pyrene	8310	3.4	0.27	μg/L
Nitrate plus Nitrite as N	300.0	0.1	0.05	mg/L
Ammonia as N	350.1	0.25	0.12	mg/L
Total Kjeldahl Nitrogen (TKN) as N	351.2	0.25	0.14	mg/L
Total Phosphorus	365.4	0.10	0.04	mg/L
Total Oil and Grease	1664A	0.25	0.12	mg/L

Table 5. Analytical Methods Year 4

Analyte	Method	LOQ	MDL	Units				
	Volatile Organic Compounds (VOC's)							
Acrolien	8260B	0.05	0.00254	mg/L				
Acrylonitrile	8260B	0.01	0.00067	mg/L				
Benzene	8260B	0.001	0.00009	mg/L				
Carbon tetrachloride	8260B	0.001	0.00013	mg/L				
Chlorobenzene	8260B	0.001	0.00012	mg/L				
Chlorodibromomethane	8260B	0.001	0.00014	mg/L				
Chloroethane	8260B	0.005	0.00019	mg/L				
2-chloroethylvinyl ether	8260B	0.001	0.00011	mg/L				
Chloroform	8260B	0.005	0.00011	mg/L				
Dichlorobromomethane	8260B	0.001	0.00012	mg/L				
1,2-dichlorobenzene	8260B	0.001	0.00011	mg/L				
1,3-dichlorobenzene	8260B	0.001	0.00011	mg/L				
1,4-dichlorobenzene	8260B	0.001	0.00012	mg/L				
1,1-dichloroethane	8260B	0.001	0.0001	mg/L				
1,2-dichloroethane	8260B	0.001	0.00019	mg/L				
1,3-dichloropropylene	8260B	0.3001	0.00015	mg/L				
Ethylbenzene	8260B	0.001	0.00014	mg/L				
Methyl bromide	8260B	0.005	0.00043	mg/L				
Methyl chloride	8260B	0.005	0.00043	mg/L				
Methylene chloride	8260B	0.005	0.00043	mg/L				
1,1,2,2-tetrachloroethane	8260B	0.001	0.00013	mg/L				
Tetrachloroethylene	8260B	0.001	0.0030	mg/L				
Toluene	8260B	0.001	0.00028	mg/L				
1,2-trans-dichloroethylene	8260B	0.001	0.00012	mg/L				
1,1,1-trichloroethane	8260B	0.001	0.00015	mg/L				
1,1,2-trichloroethane	8260B	0.001	0.00015	mg/L				
Trichloroethylene	8260B	0.001	0.00019	mg/L				
Trimethylbenzene	8260B	0.001	0.00016	mg/L				
Vinyl chloride	8260B	0.001	0.00023	mg/L				

Xylene	8260B	0.003	0.00017	mg/L
	Semi VOC's – Ad	id Extractables		
2-chlorophenol	8270C	0.01	0.00013	mg/L
2,4-dichlorophenol	8270C	0.01	0.0001	mg/L
2,4-dimethylphenol	8270C	0.01	0.00006	mg/L
4,6-dinitro-o-cresol	8270C	0.01	0.00112	mg/L
2,4-dinitrophenol	8270C	0.01	0.00593	mg/L
2-nitrophenol	8270C	0.01	0.00012	mg/L
4-nitrophenol	8270C	0.01	0.00014	mg/L
p-chloro-m-cresol	8270C	0.01	0.00013	mg/L
Pentachlorophenol	8270C	0.01	0.00031	mg/L
Phenol	8270C	0.01	0.00433	mg/L
2,4,6-trichlorophenol	8270C	0.01	0.0001	mg/L
	Semi-VOC's – E	Base/ Neutrals		
Acenaphthene	8270C	0.01	0.000089	mg/L
Acenaphthylene	8270C	0.01	0.000092	mg/L
Anthracene	8270C	0.01	0.00008	mg/L
Benz(a)anthracene	8270C	0.01	0.0002	mg/L
Benzo(a)pyrene	8270C	0.01	0.00038	mg/L
Benzo(b)fluoranthene	8270C	0.01	0.00013	mg/L
Benzo(g,h,i)perylene	8270C	0.01	0.00012	mg/L
Benzo(k)fluoranthene	8270C	0.01	0.00012	mg/L
Chrysene	8270C	0.01	0.00013	mg/L
Dibenzo(a,h)anthracene	8270C	0.01	0.00008	mg/L
3,3'-dichlorobenzidine	8270C	0.01	0.00021	mg/L
Diethyl phthalate	8270C	0.01	0.00029	mg/L
Dimethyl phthalate	8270C	0.01	0.00026	mg/L
Di-n-butyl phthalate	8270C	0.01	0.00045	mg/L
2,4-dinitrotoluene	8270C	0.01	0.000098	mg/L
2,6-dinitrotoluene	8270C	0.01	0.00025	mg/L
Di-n-octyl phthalate	8270C	0.01	0.00093	mg/L
1,2-diphenylhydrazine	8270C	0.01	0.00084	mg/L
Fluoranthene	8270C	0.01	0.0001	mg/L
Fluorene	8270C	0.01	0.000084	mg/L
Hexachlorobenzene	8270C	0.01	0.000076	mg/L
Hexachlorobutadiene	8270C	0.01	0.000006	mg/L
Hexachlorocyclopentadiene	8270C	0.01	0.00013	mg/L
Hexachloroethane	8270C	0.01	0.00013	mg/L
Indeno(1,2,3-cd)pyrene	8270C	0.01	0.00028	mg/L
Isophorone	8270C	0.01	0.00014	mg/L
Naphthalene	8270C	0.01	0.00026	mg/L
Nitrobenzene	8270C	0.01	0.0003	mg/L
N-nitrosodimethylamine	8270C	0.01	0.00026	mg/L
N-nitrosodi-n-propylamine	8270C	0.01	0.001	mg/L
N-nitrosodiphenylamine	8270C	0.01	0.00237	mg/L
Phenanthrene	8270C	0.01	0.00011	mg/L

Pyrene	8270C	0.01	0.00011	mg/L				
1,2,4-trichlorobenzene	8270C	0.01	0.00007	mg/L				
PCB / Pesticides								
Aldrin	8082	0.001	0.0000500	mg/L				
Alpha-BHC	8082	0.001	0.0000500	mg/L				
Beta-BHC	8082	0.001	0.0000500	mg/L				
Gamma-BHC	8082	0.001	0.0000500	mg/L				
Delta-BHC	8082	0.001	0.0000500	mg/L				
Chlordane	8082	0.001	0.00500	mg/L				
4,4'-DDT	8082	0.001	0.0000500	mg/L				
4,4'-DDE	8082	0.001	0.0000500	mg/L				
4,4'-DDD	8082	0.001	0.0000500	mg/L				
Dieldrin	8082	0.001	0.0000500	mg/L				
Alpha-endosulfan	8082	0.001	0.0000500	mg/L				
Beta-endosulfan	8082	0.001	0.0000500	mg/L				
Endosulfan sulfate	8082	0.001	0.0000500	mg/L				
Endrin	8082	0.001	0.0000500	mg/L				
Endrin aldehyde	8082	0.001	0.0000500	mg/L				
Heptachlor	8082	0.001	0.0000500	mg/L				
Heptachlor epoxide	8082	0.001	0.0000500	mg/L				
PCB-1242	8082	0.001	0.0000500	mg/L				
PCB-1254	8082	0.001	0.0000500	mg/L				
PCB-1221	8082	0.001	0.0000500	mg/L				
PCB-1232	8082	0.001	0.0000500	mg/L				
PCB-1248	8082	0.001	0.0000500	mg/L				
PCB-1260	8082	0.001	0.0000500	mg/L				
PCB-1016	8082	0.001	0.0000500	mg/L				
Toxaphene	8082	0.001	0.000500	mg/L				

3.2 QUALITY CONTROL RESULTS

The subcontracted laboratory will provide the standard Level II data package with the analytical results. This will provide the QA/QC data necessary to evaluate the laboratory results. The standard Level 2 data package with reports include all of the elements of a Level 1 report (the sample analytical results) and also include surrogates and batch QC results. This allows for review of the reliability of the sample data provided. The laboratory shall be submitted to ADOT for records retention.

3.3 ACCEPTANCE CRITERIA

The process of acceptance criteria for laboratory data is important to ensure quality and reliability of the sample results. This process will be conducted by ADOT and/or their designated contractor and may include one or more of the following elements:

- Percent recovery of the laboratory control sample
- Percent recovery of the matrix spike
- Percent difference of the matrix spike duplicate

- Laboratory duplicates and field duplicates
- Replicate analyses

If the sample doesn't completely comply with the criteria, it must be rejected and new sample collected and analyzed.

4.0 CORRECTIVE ACTION

Corrective action is required in response to administrative or technical failures. Any corrective action required will be implemented and documented accordingly. Once the corrective action is identified, ADOT personnel or their designated contractor will initiate activities and provide appropriate documentation of actions taken. A copy of the corrective action will be maintained with this QAM and kept on file for a minimum of five years past the date of the expired permit. The contractor shall document the corrective action in a technical memorandum and submit it to ADOT for records retention.

4.1 Laboratory Corrective Action

Failures in laboratory measurement systems include, but are not limited to: instrument malfunction, calibration failure, sample container breakage, contamination, and QC sample failure. If the failure can be corrected, the analyst documents the issue and resolution in the laboratory records and completes the analyses. If the failure is not resolved, it is conveyed to the respective supervisor who will determine if the analytical failure compromised associated results. The nature and disposition of the problem must be documented in the data report sent to the ADOT Project Manager.

4.2 Field Corrective Action

The field technician team is responsible for responding to failures in their sampling and field measurement systems. These failures may include equipment or technical failures as presented below:

- Equipment Failures If monitoring equipment fails, personnel are to record the issue accordingly. Failing equipment must be replaced or repaired prior to subsequent sampling events.
- *Technical Failures* Technical failures may include dropped or broken sample containers during collection due to site conditions (rain, low visibility, slick surfaces, etc.). If such an event occurs the sampling technician will document the occurrence in the site logbook.

It is the combined responsibility of all members of the field sampling team to determine if requirements of the specific sampling method have been met. The field sampling team will also determine if additional sampling is required and analyses is required.

5.0 DATA REVIEW

The initial data review is conducted by the laboratory to verify holding times, proper COC procedures, preservation, sample data, QC sample data, and laboratory QC data. Any deviations from the requirements are noted by the laboratory and reported with the analytical results.

5.1 REVIEW PROCESS

The laboratory will provide a standard Level II data package and standard turnaround time for analytical results. Standard turnaround times for laboratory data of two to three weeks for electronic data are generally satisfactory for stormwater samples. Receiving the electronic data more quickly allows an early data review to identify any problems that may be corrected through re-extraction or re-analysis of leftover sample still at the laboratory (unless notified to do otherwise, the laboratory only keeps leftover samples for 30 days). The data package should be delivered as electronic.

The data package will include a narrative identifying any problems, corrections, anomalies, and conclusions, as well as completed COC documentation. The standard Level II data package will include:

- Sample extraction and analysis dates
- Results of method blanks
- Summary of analytical accuracy (matrix spike, duplicate compound recoveries, and lab control samples)
- Summary of analytical precision (comparison of laboratory control samples, matrix duplicate, and matrix spike duplicate results)
- Summary of organic method performance (surrogate spike compound recoveries)
- Practical Quantitation Limits (PQLs) and MDLs

The field sampling sheets and analytical data package will be reviewed for unacceptable procedures in the field or laboratory. Analytical data will be reviewed as soon as it is received from the laboratory.

5.2 REPORTING RESULTS

The Permit requires sampling results from the field sampling data forms and the laboratory to be included in the Annual Report. This reporting is the responsibility of the ADOT Water Resources Group.

5.3 RESOLVING DATA QUALITY ISSUES

A Data Quality Assurance Worksheet as provided in Appendix G will be completed upon receipt of laboratory reports to assist in validity of the data. The purpose of this review is not to reject that data, but rather assist in improving the data collection process. In general, given the time constraints involved in stormwater sampling, exceeded hold times on analyses for E. coli and fecal coliform will not automatically trigger resampling. These data will be flagged as necessary for reporting purposes. The completed worksheet shall be submitted to ADOT for records retention.

5.4 DATA USE LIMITATIONS

Data use limitations may also be identified in the Data Quality Assurance Worksheet as provided in Appendix G. Data that do not meet the measurement performance criteria specified in this QAM will be identified and the impact on the project quality objectives documented. Specific actions for data that do not meet the measurement performance criteria depend on the use of the data and may require additional samples be collected or the use of the data restricted. Determination of the overall data quality for a specific sampling event program will be conducted upon receipt of final laboratory report.

5.5 DATA RETENTION

Data will be retained by ADOT for a period of 5 year past the expired/termination date of the permit.

Appendix A: Project Organization Chart

Project Organization Chart



Appendix B: MS4 Stormwater Sampling Equipment List



MS4 Stormwater Sampling Equipment List (all equipment may not be required)

Documentation

f	ield log book or
la	aminated field book
с	amera(if required)

_____GPS (if required)

Sample Collection

- _disp. bailers____>qty. __disp. filters____>qty. _disp. gloves ___pH/temp/SC/E_h meter ____peristaltic pump ____geo-pump tubing calibration standards 200' garden hose 350' rope for bailing ___electric wire pigtails ____controller for ready-flow II _QED Pump controller _QED compressor __solinist _long solinist 1/4" poly tubing _discharge hose __4 water pales & lids decon tube for pump Hand Radios
- ____Keck

Access/Maintenance

- ____tool box 3/8" socket set
- shovel
- ____decon soap
- ____sponges
- ____deionized water
- ___loppers
- ____machete bow saw
- ____J-plugs

Sample Shipping

_____shipping tape/dispenser _____coolers___1_>qty. _____custody seals _____shipping labels

Health and Safety

_____first aid kit _____fire extinguisher ____local phone book _____mobile phone ____shade umbrella _____water igloo container ____truck flags

Personal Gear

- hard hat respirator coveralls rain gear hard toed boots safety glasses
- ____personal cooler



MS4 Stormwater Sampling Equipment List (all equipment may not be required)

Documentation

f	ield log book or
la	aminated field book
с	amera(if required)

_____GPS (if required)

Sample Collection

- _disp. bailers____>qty. __disp. filters____>qty. _disp. gloves ___pH/temp/SC/E_h meter ____peristaltic pump ____geo-pump tubing calibration standards 200' garden hose 350' rope for bailing ___electric wire pigtails ____controller for ready-flow II _QED Pump controller _QED compressor __solinist _long solinist 1/4" poly tubing _discharge hose __4 water pales & lids decon tube for pump Hand Radios
- ____Keck

Access/Maintenance

- ____tool box 3/8" socket set
- shovel
- ____decon soap
- ____sponges
- ____deionized water
- ___loppers
- ____machete bow saw
- ____J-plugs

Sample Shipping

_____shipping tape/dispenser _____coolers___1_>qty. _____custody seals _____shipping labels

Health and Safety

_____first aid kit _____fire extinguisher ____local phone book _____mobile phone ____shade umbrella _____water igloo container ____truck flags

Personal Gear

- hard hat respirator coveralls rain gear hard toed boots safety glasses
- ____personal cooler

Appendix C: Field Bench Sheet

FIELD BENCH SHEET pH and Chlorine Meter Calibration

Date:	Time:	Site:			
		Τe	ech Name:		
Probe "p	H" Cal:		рН	Temp.	Comments
Buffer 4					
Buffer 7					
Observat	ions:				
Does pr	obe need repl	acing? Y/N			
lf yes de	escribe action	taken:			
Other:					
Chlorin	e Meter Calib	ration (Nogal	es sampling on	ly):	
Calibrat	ion Point 1: Re	eading Deioniz	ed Water		

Calibration Point 2: Reading with Reagent _____

Appendix D: ADOT MS4 Sampling Locations



Appendix E: Example Chain-of-Custody Form

	СН	AIN-OF	-CUSTODY Analytical Request Document					LAB USE ONLY- Affix Workorder/Login Label Here or List Pace Workorder Number or												
Pace Analytical	Submitting a sa	mple via this Conditions	:hain of custody constitutes acknowledgment and acceptance of the Pace Terms and found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf							For Example Use Only										
		Chain-of-C	ustody is a LE	tody is a LEGAL DOCUMENT - Complete all relevant fields																
Company: EEC			Billing Info	rmation:	_							ŀ	ALL I	BOLD) OU	TLIN	IED	ARI	EAS a	are for LAB USE ONLY
Address: 7740 N. 16th St., Pho	enix, AZ 850	20	ap@eec	corp.com	1							Con	ntaine	r Presei	rvative	Туре	**			Lab Project Manager:
Report To: John Burton			Email To:	burton@	eeccorp.c	om				** Pres	ervativ	e Types	s: (1) n	itric acio	d, (2) su	Ifuric ad	:id, (3)	hydro	chloric	acid, (4) sodium hydroxide, (5) zinc acetate,
Сору То:			Site Collect	ion Info/A	ddress:					(6) me	hanol,	(7) sod	lium bis	sulfate, ((8) sodi	um thio	sulfate	e, (9) h	iexane,	(A) ascorbic acid, (B) ammonium sulfate,
Oliver Sullivan				Phoenix	MS4					(C) am	noniun	n hydro	oxide, (l	D) TSP, (U) Unp	reserve	d, (O)	Other		Lab Brofile/Line:
Customer Project Name/Number:	ADOT Storm	water	State: /	County/City	y: Time	Zone Colle	ected:	1FT						Analy	yses					Lab Sample Receipt Checklist:
Phone: 602-248-7702	Site/Facility ID	#:	/		Complianc	e Monitorii	ng?	<u> </u>		1										Custody Seals Present/Intact Y N NA Custody Signatures Present Y N NA
Email:jburton@eeccorp.com		ADO	Т		[] Yes	[] No	0													Collector Signature Present Y N NA
Collected By (print):	Purchase Orde	r#:			DW PWS II	D #:			1											Correct Bottles Y N NA
	Quote #:		1		DW Locati	on Code:			- (ī)											Sufficient Volume Y N NA
Collected By (signature):	Turnaround Da	ite Require	ea:			иу Раскей с	on ice:		ss (c											VOA - Headspace Acceptable Y N NA
Sample Disposal:	Rush: (Expedit	e Charges	Apply)		Field Filter	ed (if applic	cable):		Gla											USDA Regulated Soils Y N NA
[] Dispose as appropriate	[] Same D	ay [] N	ext Day		[]Yes	[]No	,		o											Residual Chlorine Present Y N NA
[]Return	[] 2 Day [] 3 Day							c (P)											Cl Strips:
[] Hold:	[] 4 Day [] 5 Day			Analysis: _				lasti											pH Strips:
* Matrix Codes (Insert in Matrix box	(below): Drinkir	ng Water (I	DW), Groun	d Water (G	W), Wastew	vater (WW)	,		e: P											Sulfide Present Y N NA Lead Acetate Strips:
Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Ai	r (AR), Tiss	ue (TS), Bio	assay (B), V	/apor (V), Ot	her (OT)			Ţyp											
Customor Sample ID	Matrix *	Comp /	Collec	ted (or	Compo	site End	Res	# of	iner											LAB USE ONLY: Lab Sample # / Comments:
	IVIALITA	Grab	Date	Time	Date	Time		Ctris	onta											
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															-		-			
																		_		
Customer Remarks / Special Condit	lons / Possible F	lazards:	Type of Ice	Used:	Wet	Blue [Dry	None			SHOP	RT HOL	LDS PF	RESENT	(<72 h	iours)	: Y	N	N/A	Temp Blank Received: Y N NA
			Packing Ma	aterial Used	d:						Lab T	rackin	ng #:							Therm ID#:
			<u> </u>								Sam	oles re	ceiveo	d via:						Cooler 1 Temp Opon Receipt:oc
			Radchem s	ample(s) so	creened (<5	00 cpm):	YN	NA NA			FEI	DEX	UPS	S Cli	ient	Courie	r Pa	ce Co	urier	Cooler 1 Corrected Temp:oC
Relinguished by/Company: (Signati	ure)	Date	/Time:		Received by	//Company	: (Signa	ture)				Date/T	Time:		-	M	TJL LA	AB US	E ONLY	Commences.
								,								Table	#:			
Relinquished by/Company: (Signature) Date/Time:			Received by	//Company	: (Signa	ture)			[Date/T	Time:			Acctr	ium:			Trip Blank Received: Y N NA		
																Temp	late:			HCL MeOH TSP Other
Relinquished by/Company: (Signatu	ure)		/Time·		Received by	//Company	· (Signa	ture))ate/⊤	Time:			Prelo PM·	gin:			Non Conformance(s): Page:
			<i>i</i> i i i i i i i i i i i i i i i i i i		neceiveu D		. (Jigila				ľ	Jule/ I	inic.			PB:				YES / NO of:
																	_	_	_	

Appendix F: Stormwater Sampling Data Form



MS4 Stormwater Sampling

Sample ID: _____

Sample Date: _____

Sampler Name(s):

Time (24 hr time): _____

Sampling Event (circle): Summer / Winter

Site Parameter	Reading	Comments
Flow (gpm)		
pH (SU)		
Temperature (0C)		

*Note: Site parameter readings are not required for Yard Sites

CURRENT WEATHER:

General Conditions

Temperature (F⁰)

Sample Technician Name: _____

Appendix G: Data Quality Assurance Worksheet



Data Quality Assurance Worksheet

Monitoring Site: _____

Sample Date: _____ Sample Time: _____

Sample Type (Circle): Grab Flow-Proportional Duplicate

Split

Analytical Laboratory: _____

		YES (√)	NO (√)	REMARKS
	Did the laboratory analyze all parameters requested on the chain of custody?			
samples	Were the samples analyzed with the analytical methods specified in the monitoring plan?			
Alls	Were all holding times met by both the monitoring personnel and the laboratory?			
	Were the reported values at or below the reporting limits specified in the monitoring plan?			

		YES (√)	NO (√)	REMARKS
ples	For duplicate samples: Does sample duplicate precision meet the specified criteria?			
QC Sam	For split samples: Does sample duplicate precision meet the criteria specified in the monitoring plan?			
	If not, did the laboratories use the same analytical methods?			