

APPENDIX C
Storm Water Monitoring Plan

TABLE OF CONTENTS

1.0	INTRODUCTION	C-1
2.0	OUTFALL MONITORING LOCATIONS	C-2
3.0	MONITORING REQUIREMENTS	C-5
3.1	VISUAL MONITORING	C-5
3.2	ANALYTICAL MONITORING	C-6
3.2.1.	BENCHMARK MONITORING.....	C-6
3.2.2.	NUMERIC EFFLUENT LIMITATION MONITORING	C-7
3.3	ANALYTICAL TESTING PRIOR TO WASTEWATER DISCHARGE	C-8
3.4	TEMPORARY SUSPENSION AND POTENTIAL WAIVER FROM TPDES MONITORING REQUIREMENTS	C-8
4.0	SAMPLING AND ANALYTICAL PROCEDURES	C-10
4.1	SAMPLING PROCEDURES	C-10
4.2	ANALYTICAL QUALITY CONTROL PROCEDURES	C-11
5.0	DOCUMENTATION	C-12
6.0	PROGRAM REVIEW AND REVISION	C-13

TABLES

Table C-1	Storm Water Analyses – Required Containers, Preservation Techniques, and Holding Times
Table C-2	Typical Storm Water Description For Visual Monitoring

FORMS

Form C-1	Record of Quarterly Visual Storm Water Monitoring
Form C-2	Record of Annual Outfall Monitoring Event

1.0 INTRODUCTION

This Storm Water Monitoring (SWM) Plan describes the visual and analytical monitoring program that has been developed for the Austin-Bergstrom International Airport (ABIA) property. This Plan has been developed by the Department of Aviation (DOA) in accordance with the Texas Pollutant Discharge Elimination System (TPDES) regulations. The TPDES regulations are designed to protect the quality of storm water runoff from industrial properties. TPDES became effective August 20, 2001 and is administered by the Texas Commission on Environmental Quality (TCEQ).

This SWM Plan addresses the following elements:

- Outfall Monitoring Locations
- Visual and Analytical Monitoring Requirements
- Sampling and Analytical Procedures
- Recordkeeping
- Program Review and Revisions

This SWM Plan is an integral part of the ABIA Storm Water Pollution Prevention Plan (SWP3). All Tenants at ABIA are responsible for conducting their operations in a manner that helps to ensure the storm water discharge standards set forth in this Plan are achieved. Although the DOA will take the primary lead in conducting the monitoring activities, all Tenants are responsible for knowing and adhering to the requirements and protocols established herein.

2.0 OUTFALL MONITORING LOCATIONS

With certain provisional exceptions, the TPDES regulations require that all outfalls discharging storm water from “industrial” drainage areas be actively monitored for physical and chemical water quality parameters. As illustrated on Figure 4-1 of the SWP3, 24 drainage areas have been delineated across the property. Of these, TPDES-regulated industrial activities are conducted in 16 (See Table 4-1). These drainage areas are therefore subject to TPDES monitoring requirements. There are 19 outfalls associated with these 16 industrial drainage areas, as described below:

Outfall Number	Drainage Area Number	Description of Industrial Activity
1	DA-1	Ground Service Equipment (GSE) and Aircraft Fueling, Maintenance, Washing, and De/anti-icing; Materials Loading/Unloading (Airside Air Cargo)
2	DA-2	Materials Loading/Unloading and Vehicle Washing (Landside Air Cargo)
3	DA-3A	Taxiway De/anti-icing (North of West Runway)
5	DA-3C	Taxiway De/anti-icing (North of West Runway)
8	DA-6B	Runway/Taxiway De/anti-icing; Runway Derubberizing and Washing (W. Runway)
9	DA-6C	Runway/Taxiway De/anti-icing; Runway Derubberizing and Washing (W. Runway)
11	DA-6E	Taxiway De/anti-icing (W. Runway)
12	DA-7D	Runway/Taxiway De/anti-icing; Runway Derubberizing and Washing (W. Runway)
13	DA-7C and DA-7E	GSE and Aircraft Fueling, Materials Storage, Maintenance, and Washing (South FBO); Taxiway/Runway De/anti-icing; Runway Derubberizing and Washing (E. Runway)
14	DA-7F	Runway/Taxiway De/anti-icing; Runway Derubberizing and Washing (E. Runway)
15	DA-7F	Runway De/anti-icing; Runway Derubberizing and Washing (E. Runway)
16	DA-7A, DA-7B	GSE and Aircraft Fueling, Materials Storage, Maintenance, Washing and De/anti-icing (Airside Passenger Terminal, North FBO, etc.)
19	DA-5C	Aircraft Fueling, Materials Storage, Maintenance, and Washing
20	DA-5B	Taxiway De/anti-icing (W. Runway)
21	DA-4	Materials Storage; GSE and Vehicle Maintenance Washing and Fueling (Ground Service Equipment Maintenance, Car Rentals)
22	DA-7E	Material Storage, GSE/Aircraft Fueling, maintenance, and washing (TANG)
23	DA-7G	Runway De/anti-icing; Runway Derubberizing and Washing (E. Runway)
24	DA-7G	Runway De/anti-icing; Runway Derubberizing and Washing (E. Runway)
25	DA-7F	Runway/Taxiway De/anti-icing; Runway Derubberizing and Washing (E. Runway)

Provisions within Part III Section C of the TPDES GP allow for “representative” sampling for outfalls where similar discharges would be expected based on such factors as: the nature of operations conducted, the type of significant materials stored or handled, and the management practices and pollution control structures that occur within the drainage area of each outfall. The DOA has evaluated each of the industrial outfalls in consideration of these criteria, based on this evaluation, the DOA has identified several outfalls that will be monitored based on representative sampling, as explained below:

TAXIWAY AND RUNWAY MAINTENANCE AREAS

- The industrial operations conducted within drainage areas 3A, 3C, 5B, 6B, 6C, 6E, 7D, 7F, and 7G are similar, each consisting only of runway and taxiway maintenance activities involving de-/anti-icing and/or de-rubberizing/washing (see descriptions above). Storm water discharges from these areas are expected to be similar based on a comparison of the following factors:
 - the nature of operations (i.e., de-/anti-icing and de-rubberizing) conducted in these areas,
 - the significant materials (i.e., de-/anti-icing and de-rubberizing materials) handled within these areas, and
 - the management practices and pollution control structures (i.e., vegetated filter strips located between the material handling areas and storm drain inlets).
- Based on this, and in accordance with TPDES provisions, only one of the outfalls from these drainage areas will be actively monitored. The outfall selected for monitoring is Outfall 24 (DA-7G). Storm water discharges at Outfall 24 are expected, based on the similarities noted above, to be representative of discharges from the following group of similar outfalls:

3, 5, 8, 9, 11, 12, 14, 15, 20, 23, 24 and 25

AIRCRAFT FUELING, MATERIALS STORAGE, MAINTENANCE, AND WASHING AREAS

- The industrial operations conducted within drainage areas 5C, 7A, 7B, 7C, and 7E are similar, each consisting of aircraft and GSE fueling, materials storage, maintenance, and washing activities (see descriptions above). Storm water discharges from these areas are expected to be similar based on a comparison of the following factors:
 - the nature of operations (i.e., fueling, materials storage, and washing) conducted in these areas,
 - the significant materials (i.e., fuels, oils, lubricants, antifreeze, paint, solvents, soaps, etc.) handled within these areas, and
 - the management practices and pollution control structures (i.e., water quality ponds, oil/water separators, curbing, etc.) located between the material handling areas and storm drain inlets).
- Based on this, and in accordance with TPDES provisions, only two of the outfalls from these drainage areas will be actively monitored. The outfalls selected for monitoring are

Outfall 13 (DA-7C and DA-7E), and Outfall 16 (DA-7A and DA-7B). Storm water discharges at Outfalls 13 and 16 are expected, based on the similarities noted above, to be representative of discharges from Outfall 19 and 22.

In summary, based on the outfalls identified in association with industrial drainage areas across ABIA, and in consideration of the representative monitoring provisions described above, a total of 6 outfalls will be actively monitored at ABIA. These outfalls are as follows:

1, 2, 13, 16, 21 and 24

3.0 MONITORING REQUIREMENTS

Two types of storm water monitoring are required under ABIA's TPDES GP: visual monitoring and analytical monitoring. The purpose of the monitoring is to evaluate the degree to which storm water quality may be impacted by the industrial activities performed at a facility, and to assess the effectiveness of Best Management Practices (BMPs) and environmental policies and procedures that are designed to prevent or reduce adverse effects on water quality. Each type of monitoring, and the specific monitoring requirements, are described in the following sections.

3.1 VISUAL MONITORING

Visual examinations are conducted to qualitatively evaluate impacts to storm water quality and the effectiveness of a facility's BMP implementation. Visual monitoring involves the performance of visual examinations of storm water samples collected from each monitored outfall location. **Visual monitoring does not involve laboratory analyses.** The GP requires that visual monitoring be conducted on a quarterly basis **at each outfall**. This means that, if a given rainfall event does not result in monitoring from all actively monitored outfalls, those outfalls not monitored must be monitored during a subsequent representative rainfall event.

The visual monitoring program at ABIA will consist of the following:

- Visual monitoring will be conducted at least once during each calendar quarter of each year and will be performed only during "representative" storm events. A representative storm event is defined as follows:
 - A measurable storm event that results in an actual discharge from the site; and
 - At least 72 hours (3 days) have passed since the previous measurable storm event that resulted in an actual discharge.
- Sampling procedures will be conducted as described in Section 4.0. The visual examinations must note observations for color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and any other indicators that may be used to identify storm water degradation due to upstream industrial activities. Examples of descriptions to be noted during the visual examinations are shown in Table C-2. The visual examination results will be recorded on the Record of Quarterly Visual Storm Water Monitoring Form, C-1 included in the Forms Section of the SWP3. The personnel who perform the observations must be identified on the form.
- Visual monitoring will only be conducted during daylight hours, and will not be conducted during adverse weather conditions. Adverse weather conditions include dangerous conditions such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc., or other conditions that otherwise make a visual observation impracticable, such as a drought or extended frozen conditions. If an examination cannot be performed due to adverse climatic conditions, the reason(s) shall be documented. Documentation shall be made in the space provided on a Record of Quarterly Visual Storm Water Monitoring Form C-1.
- If indications of storm water quality impacts, such as discoloration, solids, or oil sheen are observed at an outfall, the following steps will be taken:
 - consider potential sources within the drainage area that contribute runoff to the outfall;

- evaluate the effectiveness of BMPs;
- revise BMPs, if necessary; and
- revise the SWP3 accordingly.

It is noted that, where observations may indicate the storm water runoff has some degree of color, cloudiness, floating vegetation or sediment (soil/dirt), such conditions may be naturally occurring and not indicative of industrial impact. Examples of sources of such characteristics include ambient soot, seasonal pollen, and wind-borne soil or dust.

The results of the visual monitoring will be documented on the Record of Quarterly Visual Storm Water Monitoring Form C-1. The recorded information shall include the date and time, name(s) of examination personnel, designated storm water discharge outfall location, observations made, potential source(s) of observed materials or characteristics, and actions taken, if applicable. The completed forms will be retained in the DOA's Master File.

3.2 ANALYTICAL MONITORING

TPDES regulations may require analytical monitoring for Sector S and P regulated entities. The sections below discuss the analytical monitoring requirements for Sector S and P, and how they apply to ABIA activities.

3.2.1 Benchmark Monitoring

Benchmark monitoring involves collection and analysis of storm water samples for comparison to Benchmark Values established by the USEPA for a list of common water quality parameters. From a TPDES perspective, Benchmark Monitoring is only required at airports where de/anti-icing activities involve the use of more than 100,000 gallons of ethylene glycol or 100 tons of urea per year. Because ABIA does not use either chemical or exceed these thresholds for other de/anti-icing chemicals used at ABIA the associated benchmark monitoring requirements do not apply. The types and quantities of de/anti-icing chemicals used at ABIA are tabulated in Table 10-4.

A summary of all, including historical, or Pre-TPDES, monitoring results is provided in Table 11-1.

3.2.2 Numeric Effluent Limitation Monitoring

Under TPDES, State Numeric Effluent Limitation (NEL) provisions require industrial outfalls to be sampled and analyzed annually for certain total (i.e. not dissolved) metal constituents. However, if specific conditions are met, TPDES regulations allow for this requirement to be waived.

The NEL monitoring must be conducted prior to December 31st of each year. Samples collected will be submitted for total metals analyses using EPA methods 200.7 and 245.1. The results will be compared to Daily Maximum values, as follows:

Total Metals Daily Maximum

(Total)	(mg/l)
Arsenic	0.3
Barium	4.0
Cadmium	0.2
Chromium	5.0
Copper	2.0
Lead	1.5
Manganese	3.0
Mercury	0.01
Nickel	3.0
Selenium	0.2
Silver	0.2
Zinc	6.0

The results must be reported using the approved TPDES Discharge Monitoring Report (DMR) Form (EPA No. 3320-1) which is included in the Forms Section of the SWP3. Results must be available by TCEQ personnel.

Analytical results indicating an exceedance of one or more of the total metal values will constitute a violation of the GP. Further, if a value exceeds the listed effluent limitation by more than 40%, it shall be reported in writing to the TCEQ regional office and to the Enforcement Division within 5 working days of becoming aware of the analytical result.

3.3 ANALYTICAL TESTING PRIOR TO WASTEWATER DISCHARGE

When de-/anti-icing activities are performed, the first one half-inch of storm water runoff from the Cargo and Passenger Terminal aprons is captured and retained in concrete-lined water quality ponds (WQP-N and WQP-E). Storm water captured in these detention ponds during the de-/anti-icing season will be analytically tested to determine the concentration of de-/anti-icing chemicals in the run-off. The sampling and testing procedures must be conducted in accordance with the DOA's Industrial Waste Discharge Permit (No. 719AUS0002331) criteria.

If evidence of de-/anti-icing contamination above specified criteria is determined based on the analytical results, the collected storm water will be discharged to the COA wastewater treatment system. If the storm water analytical testing determines the water does not contain de-/anti-icing chemicals above the specified criteria, it can then be discharged to the storm drainage system. All analytical test results must be retained in the DOA Master File.

3.4 TEMPORARY SUSPENSION AND POTENTIAL WAIVER FROM TPDES MONITORING REQUIREMENTS

Temporary suspension, and a potential waiver, from both visual and analytical monitoring requirements within a given monitoring period may be automatically granted if adverse weather conditions prevent the prescribed activity from being performed. As described previously, adverse weather conditions are conditions that are either dangerous to personnel (e.g., high wind, lightning) or weather conditions that prohibit access to a discharge (e.g., flooding, freezing conditions, extended periods of drought, etc.). Such events must be documented and included as part of the SWP3 record. Documentation shall include the date, time, names of personnel that witnessed the adverse conditions, and the nature of the adverse condition.

When a monitoring event (visual or analytical) is missed due to adverse conditions, that monitoring event must be conducted within the next quarter. The “makeup” monitoring event is in addition to any monitoring event already required for that period. However, if the missed monitoring event again cannot be fulfilled during the next quarter, then the requirement to perform the event is automatically and permanently waived.

4.0 SAMPLING AND ANALYTICAL PROCEDURES

Sampling, monitoring, and analyses must be conducted according to procedures specified in 30 TAC §§319.11 - 319.12, 40 CFR Part 136, the latest edition of Standard Methods for the Examination of Water and Wastewater; or EPA SW-846, as applicable; unless otherwise specified. The procedures that will be followed are described in the following sections. Analytical methods, sample container requirements, and sample preservative requirements are summarized in Table C-1.

4.1 SAMPLING PROCEDURES

Storm water sampling procedures for visual and analytical monitoring purposes will be conducted as follows:

- Sample collection should be performed in a manner that permits assessment of the runoff occurring in the first 30 minutes, and no longer than the first one hour, of discharge from a representative rainfall event. For outfalls where structural controls capture the “first-flush” volume of runoff (e.g., in the sedimentation/filtration portions of the WQP treatment systems), sampling can be conducted after 30 minutes, but prior to complete drainage of the catchment structure.
- Storm water samples will be collected in clear glass containers and the visual examinations will be conducted during daylight hours, in well lit areas. Storm water runoff samples will be collected as “grab” samples, not composite samples. The samples will be collected into new or pre-cleaned de-ionized water bottles, or directly into laboratory-supplied sample jars.
- To the extent practicable, the same personnel should perform storm water sampling each time.

Completed labels will be affixed to each laboratory sample container at the time of sampling. Storm water samples requiring laboratory analysis must be accompanied by properly completed chain of custody forms. The information to be included on the chain of custody forms consists of the following:

- sample number and location,
- time and date of sample collection,
- sampler name,
- preservation methods, and
- laboratory analyses to be performed.

The samples will be delivered to the laboratory for analysis within 24 hours of the time the samples are collected.

Outfalls will be sampled in an order designed to ensure representation of the first 30 minutes of runoff is accomplished, where practicable. Therefore, outfalls where runoff is not detained by structural controls (e.g., water quality ponds), or where discharge is likely to begin earlier than

at other outfalls, should be sampled first. The order of outfall sampling will also depend on the nature of the rainfall event, including local variations in the timing and intensity of precipitation in different areas within the ABIA property.

4.2 ANALYTICAL QUALITY CONTROL PROCEDURES

The analytical laboratory shall routinely use and document laboratory quality control practices. These practices will include the use of internal quality control check samples including spike samples and duplicate samples to test for accuracy and precision. Analytical reports must identify the analytical procedures used and the associated quality control and quality assurance data.

5.0 DOCUMENTATION

The procedures and results of the storm water monitoring program must be well documented. Records of storm water monitoring shall include, at a minimum, the following:

- the date, time and place of sample collection and/or measurement;
- identity of the individual who collected the sample, made the measurement or observation, or performed the analysis;
- identity of the individual and laboratory who performed the analysis and the analysis conducted;
- the results of the measurement, observation, or analysis; and
- the quality assurance/quality control measures that were employed and their results.

All monitoring record documentation will be maintained in the Master File by the DOA, and appended to the SWP3 as deemed appropriate. The records will be retained for a period of three years unless otherwise specified. During periodic updates of the SWP3, all analytical data will be added to the database and included in the SWP3 records.

6.0 PROGRAM REVIEW AND REVISIONS

Elements of the DOA adopted monitoring program should be reviewed and revised as deemed necessary based on results of visual observations and storm water sampling and analyses.

TABLE C-1
Storm Water Analyses – Required Containers, Preservation
Techniques, and Holding Times

Table C-1
Storm Water Analyses – Required Containers,
Preservation Techniques, and Holding Times
 Storm Water Pollution Prevention Plan
 Austin Bergstrom International Airport

Analysis Parameter	EPA Method	Container Type	Preservation Technique	Maximum Holding Time
pH	150.1	Plastic	Do not chill	Analyze Immediately
Metals	200.7 and 245.1	Plastic	Cool to 4° C HNO ₃ pH < 2	6 months from sample date
Ammonia	350.3	Glass or Plastic	Cool to 4° C H ₂ SO ₄	28 Days
BOD (Biological Oxygen Demand)	405.1	Glass or Plastic	Cool to 4° C	48 Hours
COD (Chemical Oxygen Demand)	410.1	Glass or Plastic	Cool to 4° C H ₂ SO ₄ pH<2	28 Days

HNO₃ = nitric acid

H₂SO₄= sulfuric acid

TABLE C-2
Typical Storm Water Description For Visual Monitoring

Table C-2
Typical Storm Water Description For Visual Monitoring
 Storm Water Pollution Prevention Plan
 Austin Bergstrom International Airport

Category	Terms
COLOR	Red, Brown, Yellow, Green, Blue, Grey
ODOR	Musty, Sewage, Oil, Gasoline, Rotten Eggs, Sour Milk
CLARITY	Clear, Cloudy, Opaque, Suspended Materials
FLOATING/SETTLED SOLIDS	Soil, Garbage, Paper, Wood, Plastic, Sewage
FOAM OR OIL SHEEN	Describe if Present

Form C-1 & C-2
Record of Quarterly Visual Storm Water Monitoring
Record of Annual Outfall Monitoring Event
(See Forms Section of SWP3)