

**Stormwater Management Plan
City of Duquesne, Missouri
Small MS4 Permit # MO-R040051**

Prepared for:

**City of Duquesne
1501 South Duquesne
Joplin, Missouri 64801**

**ATTN: Denny White
Mayor**

HYDRO DIVISION

ALLGEIER, MARTIN and ASSOCIATES, INC.
Consulting Engineers • Hydrologists • Surveyors

112 West 8th Street
Rolla, Missouri 65401
1-800-994-9487
573-341-9487, Fax 573-341-9486
<http://www.amce.com>

February 25, 2010
Project # 74010403

RECEIVED
MAR - 1 2010
WATER PROTECTION PROGRAM

Stormwater Management Plan
City of Duquesne, Missouri
Small MS4 Permit # MO-R040051

Prepared for:

City of Duquesne
1501 South Duquesne
Joplin, Missouri 64801

Prepared by:
ALLGEIER, MARTIN and ASSOCIATES, INC.
Hydro Division

February 25, 2010

Stormwater Management Plan
City of Duquesne, Missouri
Small MS4 Permit # MO-R040051
Table of Contents
February 25, 2010

MCM #1 – Public Education and Outreach	Page 1
MCM #2 – Public Involvement and Participation	Page 4
MCM #3 – Illicit Discharge Detention and Elimination	Page 6
MCM #4 – Construction Site Stormwater Runoff Control	Page 11
MCM #5 – Post-Construction Stormwater Management	Page 13
MCM #6 –Pollution Prevention and Good Housekeeping	Page 16
Commitment to Annual Reports	Page 18
Contact Information	Page 19
Outfall Map	Figure1
List of Outfalls and Receiving Waters	Page 21

Public Education and Outreach on Stormwater Impacts Minimum Control Measure #1

Statement of Minimal Need

There is minimal need for the City of Duquesne to implement measures for Public Education and Outreach. The City of Joplin provides educational brochures for Duquesne to print and distribute. Duquesne shares local media with Joplin and Joplin provides public service announcements, newspaper articles, press releases and other educational opportunities regarding local stormwater issues. A library of stormwater information is available at Duquesne City Hall and Duquesne will continue to send out newsletters for public education that include stormwater quality issues and notification of opportunities provided by Joplin.

Educational Methods	2010	2011	2012	2013	2014
Distribute Brochures	X	X	X	X	X
Newsletters (Minimum Yearly)	X	X	X	X	X

Decision Process

Duquesne developed their stormwater public education and outreach program in cooperation with other jurisdictions in the region. The target pollutants were identified and prioritized. The actions that impact the target pollutants were identified. The public education program was designed to impact the actions identified.

Target Audiences

During the development of the education program, Duquesne identified the sources of stormwater pollutants that needed to be reduced to improve overall water quality. The target audiences were selected because changing their behavior would have a significant stormwater quality impact on the target pollutants. The target audiences for the public education program are:

1. Citizens (Homeowners)
2. Developers and Home Builders
3. Service Station and Oil/Lube Business Owners and Operators
4. Elected Officials
5. City Staff

Target Pollutants

The following is a prioritized list of the leading pollutants, experienced in the permitted area, that are carried by stormwater runoff into water bodies. (1 = having most impact and 10 = having least impact)

- 1 Suspended Solids
- 2 Nutrients
- 3 Pesticides
- 10 Metals
- 8 Bacteria
- 9 Oxygen-Depleting Substances (BOD & other organics)
- 7 Oil and Grease
- 5 Salinity (Salt)
- 4 Priority Toxic Organic Chemicals (Household Hazardous Waste Pesticide/Herbicides)
- 6 Habitat Alterations
- 4 Floatables
- 10 Temperature

Target Pollutant Sources

The target pollutant sources having a major impact on stormwater quality were identified. The following is a list of potential sources of pollutants that are experienced in the permitted area. (1 = Major impact, 2 = Minor impact, 3 = Not an impact)

- 1 Construction activities (sediment, construction chemicals and debris, solid and sanitary wastes)
- 1 Overapplication of fertilizer, herbicides, pesticides
- 2 Improper disposal of paint and household hazardous chemicals
- 3 Pet waste contamination
- 1 Improper disposal of waste oil, grease, and gasoline
- 2 Trash, debris, and illegal dumping
- 3 Detergents washed into drains
- 2 Snow removal (salt, sand and snow disposal)
- 3 Sanitary sewer overflows
- 3 Infiltration from cracked sanitary sewers
- 3 Failing septic systems
- 3 Sewer service connections to storm drainage system
- 3 Foundation drains connected to storm drainage system
- 3 Downspouts connected to storm drainage system
- 2 Spills from roadway accidents or fires
- 3 Connected impervious areas covering large acreages (such as malls, institutions with large parking areas)
- 3 Stream bank erosion
- 3 Waste transfer station

Outreach Strategy & Partnerships

Duquesne's outreach strategy is to implement a variety of methods to reach a number of different target audiences multiple times. To change behavior, repetition is important. The mechanisms are described in the above statement of minimal need.

Partnerships with other governmental and non-governmental entities will be formed in order to execute the public outreach strategy. The idea is to share information and resources so as to prevent duplication of outreach efforts. The following entities will be assisting with the effort:

1. Other Communities in the Region, especially Joplin
2. County Extension
3. EPA
4. Other: Missouri Southern State College and Local Schools

The estimated number of people targeted to be reached by the public education and outreach strategy is 325 per year.

Person Responsible

The person responsible for overall management and implementation of the permittee's stormwater public education and outreach program is the MAYOR. Others may be involved in the execution of each of the individual activities in the program.

Measurable Goals

Duquesne selected the measurable goals for each of the BMPs after reviewing EPA & ASCE research on the effectiveness of certain BMPs. The BMPs selected were chosen because of the evidence that they will have a positive impact on the target pollutants identified as a concern for Duquesne. The public education and outreach BMPs were also selected because many have been effective methods of communicating with the public for our community. The implementation of the BMPs selected (shown in the above table) will determine the success of the measure on water quality.

Public Involvement and Participation Minimum Control Measure #2

Permit Requirements

Duquesne will comply with State and Local public notice requirements when implementing the public involvement and participation program.

Decision Process

The following is the documentation for Duquesne's decision process and rationale statement for the development of a stormwater public involvement and participation program. It documents the overall program and the individual BMPs, measurable goals, and responsible party for the program.

Involving the Public in Developing the Submittal

Duquesne has involved the public in the development and submittal of the application and stormwater management program as follows:

1. Held Stakeholder Meeting
2. Held a Public Hearing
3. Posted Public Meeting Announcements

Involving the Public in Program Implementation

Duquesne plans to actively involve the public in the development and implementation of the stormwater program through a number of different methods selected because they are existing effective methods used by Duquesne or because of EPA guidance documents that list these BMPs as effective public involvement methods.

Target Audiences to Involve in Program

The target audiences for the permittee's public involvement program are:

1. Citizens (Homeowners)
2. Mass Media
3. Local Elected Officials
4. Contractors, Home Builders, and Developers

Public Involvement Activities

Duquesne plans to involve the public through the activities described below:

Community Involvement	2010	2011	2012	2013	2014
Community Hotline	X	X	X	X	X
Public Meetings	X	X	X	X	X

Person Responsible

The person responsible for the overall management and implementation of the permittee's stormwater public involvement/participation program is the MAYOR. Others may be involved in the execution of each of the individual activities in the programs.

Measurable Goals Selection

Duquesne selected the measurable goals for each of the BMPs after reviewing EPA & ASCE research on the effectiveness of certain BMPs. The BMPs selected were chosen because of the evidence that they will have a positive impact the target pollutants identified as a concern for Duquesne. Some of the public involvement methods selected were also chosen because they have been used effectively by Duquesne in the past. The implementation of BMPs selected will determine the success of the measure on water quality.

Illicit Discharge Detection and Elimination Minimum Control Measure #3

Overview

Duquesne will develop, implement and enforce a program to detect and eliminate illicit discharges (as defined in 10 CSR 20-6.200) into their small MS4.

Outfall Map

Duquesne has developed a storm sewer map showing the location of outfalls and the names and location of all waters of the State that receive discharges from those outfalls. The map will be updated each time there is a change in the corporate limits of the City of Duquesne.

Enforcement

Duquesne will effectively prohibit non-stormwater discharges into the city's stormwater system via ordinances and regulations. Each ordinance is enforceable by Duquesne with appropriate procedures and consequential actions.

Detection Methods

Duquesne will implement a plan using the following methods to detect and address non-stormwater discharges, including illegal dumping to the stormwater system:

Illicit Discharge Detection Methods	2010	2011	2012	2013	2014
Dry Weather Field Screening	X	X	X	X	X
Wet Weather Field Screening	X	X	X	X	X

Duquesne will detect and address illicit discharges to the MS4, including discharges from illegal dumping and spills. Duquesne's program will address on-site sewage disposal systems that flow into the MS4.

Informing the Public

Duquesne will inform public employees, businesses and the general public of hazards associated with illegal discharges and improper disposal of waste using the following methods:

Methods for Informing the Public: Educational Programs	2010	2011	2012	2013	2014
Procedural Training for City Staff	X	X	X	X	X
Distribute Literature (See also Minimum Control Measure #1)	X	X	X	X	X
Newsletter (See also Minimum Control Measure #1)	X	X	X	X	X

Methods for Informing the Public: Volunteer Programs	2010	2011	2012	2013	2014
Community Hotline (See also Minimum Control Measure #2)	X	X	X	X	X

Not Significant Contributors

Duquesne has not identified any of the following categories of non-stormwater discharges or flows (i.e. illicit discharges) as significant contributors of pollutants to their small MS4: water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated ground water infiltration (as defined in 10 CSR 20-6.200), uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, springs, water from crawl space pumps, footing drains, lawn watering, flows from riparian habitats and wetlands, and street wash water (discharges or flows from fire fighting activities are excluded from the effective prohibition against non-stormwater and will only be addressed where they are identified as significant sources of pollutants to waters of the State).

Occasional Incidental Non-Stormwater Discharges

Duquesne's illicit discharge ordinance will include a list of other similar occasional incidental non-stormwater discharges (e.g. non-commercial or charity car washes, etc.) that will not be addressed as illicit discharges because they are not reasonably significant sources of pollutants to the MS4. Should these occasional or incidental non-stormwater discharges be identified in the future, those entities responsible for discharging will be prohibited or conditions placed on them so as to minimize their discharge of pollutants.

Decision Process

Duquesne has documented their decision process for the development of a stormwater illicit discharge detection and elimination program. Duquesne's rationale statement addresses both their overall illicit discharge detection and elimination program and the individual BMPs, measurable goals, and responsible persons for their program.

Regulatory Mechanism

Duquesne will use the following mechanism to effectively prohibit illicit discharges to the MS4:

1. City Ordinance
2. Inspection

This mechanism was selected because ordinances are commonly used by Duquesne to establish laws and set forth the enforcement mechanisms. The ordinance will establish legal authority to:

1. Regulate the contribution of pollutants to the municipal separate storm sewer system (MS4) of stormwater discharges by any use
2. Prohibit illicit connections and discharges to the MS4;
3. Carry out all inspections, surveillance and monitoring procedures necessary to ensure compliance.

Duquesne will develop and implement the following mechanisms to effectively prohibit illicit discharges to the MS4 on the following schedule:

Regulatory Mechanisms	2010	2011	2012	2013	2014
City Ordinance	X				
Inspection	X	X	X	X	X

Enforcement

Duquesne will set forth in the ordinance enforcement procedures intended to remove the source of the illicit discharge detected. Duquesne will ensure compliance with the ordinance through civil penalties.

Identify Priority Areas

Duquesne will use the map identified above and other data to identify priority areas with likelihood of illicit connections.

Removal

Duquesne will follow the enforcement mechanisms detailed in the ordinance, including those legal actions described above, to enforce the removal of an identified illicit connection.

Responsible Party

The MAYOR will be responsible for overall management and implementation of Duquesne's stormwater illicit discharge detection and elimination program. Others may be involved in the execution of each of the individual activities in the programs.

Measurable Goals and Program Evaluation

Duquesne will evaluate the success of the program based on the number of illicit connections discovered and eliminated.

Duquesne selected the measurable goals for each of the BMPs after reviewing EPA & ASCE research on the effectiveness of certain BMPs. The BMPs selected were chosen because of the evidence that they will have a positive impact the target pollutants identified as a concern for Duquesne. Some of the methods to detect and eliminate illicit discharges were also chosen because they have been used effectively by Duquesne in the past. The implementation of BMPs selected will determine the success of the measure on water quality.

Construction Site Stormwater Runoff Control Minimum Control Measure #4

Permit Requirements

Duquesne plans to develop, implement, and enforce a program to reduce pollutants in any stormwater runoff from construction activities that result in disturbance of greater than or equal to one acre. Duquesne also plans to reduce pollutants in stormwater runoff from construction activities that disturb an area less than one acre if the site is part of a larger common plan of development or sale.

Decision process

The following is the rationale statement for the development of Duquesne's overall construction site stormwater runoff control program. It documents the individual BMPs, measurable goals, and responsible party for their program.

Regulatory Mechanism

Duquesne will adopt updated stormwater regulations that will require the use of erosion and sediment controls on construction sites. Duquesne will require construction site operators to implement the appropriate erosion and sediment control Best Management Practices (BMPs).

The updated regulations will include construction specifications and design standards and will outline the requirements for designers and contractors before, during and after the construction activities. The ordinance adopting these new regulations will provide enforcement measures for those designers and contractors who do not follow the regulations.

Pre-Construction Site Plan Review

Duquesne will implement procedures for site plan review, including the review of pre-construction plans, which will look at the potential water quality impacts. Duquesne will implement procedures and rationale for those sites that do not require site plan review. The estimated percentage of sites that will have a preconstruction site plan review is 100%.

Site Inspection

Duquesne will implement procedures for site inspection and enforcement of erosion and sediment control measures. The sites will be inspected using a priority rating system. The site with the most potential risk to the community will be top on the priority list.

Enforcement

Duquesne will ensure compliance with the developed regulations by including an enforcement section detailing the sanctions and enforcement mechanisms. Duquesne will use the following sanctions:

- 1. Fines
- 2. Permit Denial for Non-Compliance

Implementation Schedule

The implementation schedule will be as follows:

Implementation Schedule	2010	2011	2012	2013	2014
Adoption of Updated Stormwater Regulations	X				
Pre-Construction Plan Review	X	X	X	X	X
Site Inspections	X	X	X	X	X

Public Input on Submittals

Duquesne will implement procedures for receipt and consideration of information submitted by the public.

Wastes to Be Controlled

Duquesne will require construction site operators to control wastes that may cause adverse impacts to water quality such as:

- 1. Discarded Building Materials
- 2. Sediment
- 3. Litter or Trash
- 4. Sanitary Waste

Person Responsible

The person responsible for overall management and implementation of the permittee's stormwater public education and outreach program is the **MAYOR**. Others may be involved in the execution of each of the individual activities in the programs.

Measurable Goals

Duquesne selected the measurable goals for each of the BMPs after reviewing EPA & ASCE research on the effectiveness of certain BMPs. The BMPs selected were chosen because of the evidence that they will have a positive impact on the target pollutants identified for Duquesne. The implementation of BMPs selected will determine the success of the measure on water quality.

Post-Construction Stormwater Management in New Development and Redevelopment Minimum Control Measure #5

Overview

Duquesne will continue its program to address stormwater runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale.

Decision process

The following is the rationale statement for the development of a post-construction stormwater management program. It documents the BMPs, measurable goals, and responsible party for the program.

Strategies

Duquesne will continue the strategies currently in place, which include a combination of structural and/or non-structural Best Management Practices (BMPs).

Regulatory Procedures

Duquesne will implement regulatory procedures that will be specifically tailored for the community, minimize water quality impacts, and attempt to maintain pre-development runoff conditions.

Regulatory Procedures: Non-Structural Best Management Practices (BMPs)

Duquesne will implement policies and ordinances that will help minimize water quality impacts.

Policies & Ordinances	2010	2011	2012	2013	2014
Maintain and/or Increase Open Space			X		
Minimize Disturbance of Soils and Vegetation			X		

Regulatory Procedures: Structural Best Management Practices (BMPs)

Duquesne currently requires detention/retention for all land development on any site having a gross land area of one-half acre or more.

Current stormwater regulations will be updated to better address post-construction runoff from new development and water quality from redevelopment. Duquesne will implement updated regulatory procedures requiring reasonable mimicking of pre-development runoff conditions for new development and minimization of water quality impacts for redevelopment.

The updated regulations will include construction specifications and design standards and will outline the requirements for designers and contractors before, during and after the construction activities. The ordinance adopting these new regulations will provide enforcement measures for those designers and contractors who do not follow the regulations.

Duquesne will implement the following structural BMPs:

Structural BMPs	2010	2011	2012	2013	2014
Detention/Retention	X	X	X	X	X
Filtration Practices	X	X	X	X	X
Infiltration Practices	X	X	X	X	X

Duquesne will continue to ensure compliance with the regulations by way of sanctions and enforcement mechanisms. Duquesne has implemented the following sanctions in their ordinance:

1. Fines
2. Permit Denial for Non-Compliance
3. Ordinance

Long-Term Operation & Maintenance

Duquesne will implement options to help ensure the long-term operation and maintenance of their selected BMPs. These options will help ensure that future O&M responsibilities are clearly identified.

Priority Areas

There are no areas identified as a priority for regulatory procedures.

Responsible Party

The person responsible for overall management and implementation of the permittee's stormwater public education and outreach program is the **MAYOR**. Others may be involved in the execution of each of the individual activities in the programs.

Measurable Goals

Duquesne selected the measurable goals for each of the BMPs after reviewing EPA & ASCE research on the effectiveness of certain BMPs. The BMPs selected were chosen because of the evidence that they will have a positive impact on the target pollutants identified as a concern for Duquesne. The implementation of BMPs selected will determine the success of the measure on water quality.

Pollution Prevention/Good Housekeeping for Municipal Operations Minimum Control Measure #6

Statement of Minimal Need

There is minimal need for the City of Duquesne to implement measures for Pollution Prevention and Good Housekeeping for Municipal Operations. The City contracts out all maintenance and city services.

Accountability

The City of Duquesne will develop a Stormwater Quality Plan that includes Best Management Practices (BMPs) to be followed by all contractors for city services. An ordinance will be adopted that requires all contractors for city services to sign a statement saying they will follow all applicable BMPs included in the Stormwater Quality Plan. The BMPs are to be implemented by the contractor in order to prevent and reduce stormwater pollution.

Right of Way Clean-up

Duquesne currently requires property owners to maintain their own right-of way. Newsletters included in Minimum Control Measure #1 will remind owners of this responsibility and encourage frequent litter pick-up to reduce floatables and improve water quality.

Implementation Schedule

The implementation schedule will be as follows:

Implementation Schedule	2010	2011	2012	2013	2014
Develop Stormwater Quality Plan		X			
Pass Ordinance		X	X	X	X
Send Out Newsletters (See Minimum Control Measure #1)	X	X	X	X	X

Responsible Party

The **MAYOR** will be responsible for overall management and implementation of the pollution prevention and good housekeeping program for Duquesne. Others may be involved in the execution of each of the individual activities in the programs.

Program Evaluation

Duquesne will evaluate the success of the pollution prevention/good housekeeping minimum control measure by tracking the progress of each measure against the implementation schedule. Each one of the measures described in this permit was chosen based on its implementability by Duquesne staff and impact on water quality.

Commitment to Annual Reporting

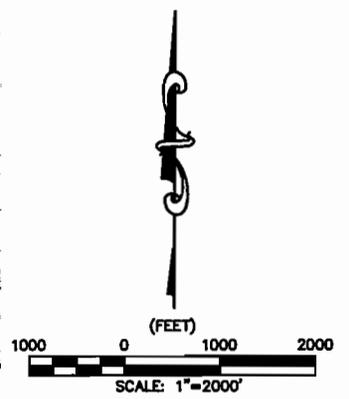
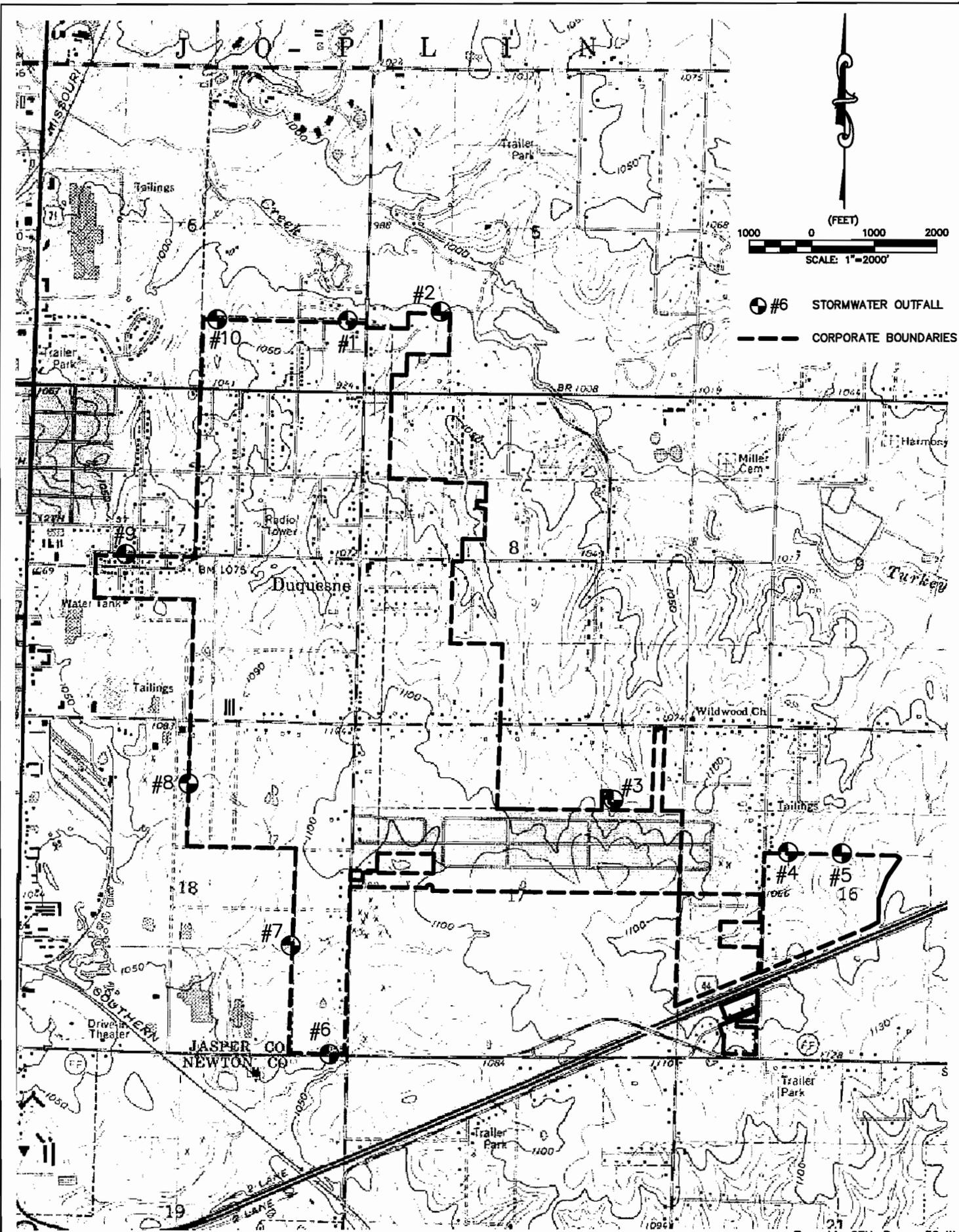
The City of Duquesne will prepare and submit an annual report for by July 28th of each year. The first reporting period under this Stormwater Management Plan will be from January 2010 through June 2010. Subsequent reporting periods will start in July and end in June of the following year.

Contact Information City of Duquesne, MO

Mailing Address: 1500 S. Duquesne Rd. Joplin, MO 64801

Primary Contact: Mayor Denny White
Phone Number: (417) 781-5085
Fax Number: (417) 781-4652

Secondary Contact: Terry Ingram
Phone Number: (417) 781-5085
Fax Number: (417) 781-4652



- #6 STORMWATER OUTFALL
- CORPORATE BOUNDARIES

Rev.	Description	Date

Designed: SMS Date: 12-2-09
 Drawn: SMS Scale: 1"=2000'
 Checked: JPW Proj. No.: 74010403
 Duquesne City Limits.dwg

ALLGEIER MARSH ASSOCIATES, INC.
 Consulting Engineers and Surveyors

 HYDRO DIVISION

MS4 Permit Renewal
 City of Duquesne, MO
 Stormwater Outfalls

Sheet No.:
1

Stormwater Outfalls and Receiving Waters City of Duquesne, MO

OUTLET #1

SE 1/4, SE 1/4, Sec. 6 , T 27N, R 32W, Jasper County Lat 37° 05' 14" N, Long 94° 27' 37" W NAD83
Unnamed tributary to Turkey Creek (U)
11070207-160020
Turkey Creek 2 (P), 03217

OUTLET #2

SW 1/4, SW 1/4, Sec. 5 , T 27N, R 32W, Jasper County Lat 37° 05' 15" N, Long 94° 27' 19" W NAD83
Unnamed tributary to Turkey Creek (U)
11070207-160020
Turkey Creek 2 (P), 03217

OUTLET #3

NE 1/4, NE 1/4, Sec. 17, T 27N, R 32W, Jasper County Lat 37° 04' 00" N, Long 94° 26' 38" W NAD83
Unnamed tributary to Turkey Creek (U)
11070207-160020
Turkey Creek 2 (P), 03217

OUTLET #4

SE 1/4, NW 1/4, Sec. 16, T 27N, R 32W, Jasper County Lat 37° 03' 49" N, Long 94° 26' 10" W NAD83
Unnamed tributary to Turkey Creek (U)
11070207-160020
Turkey Creek 2 (P), 03217

OUTLET #5

SE 1/4, NW 1/4, Sec. 16, T 27N, R 32W, Jasper County Lat 37° 03' 49" N, Long 94° 26' 00" W NAD83
Unnamed tributary to Turkey Creek (U)
11070207-160020
Turkey Creek 2 (P), 03217

OUTLET #6

NE 1/4, SE 1/4, Sec. 18, T 27N, R 32W, Jasper County Lat 37° 03' 18" N, Long 94° 27' 40" W NAD83
Unnamed tributary to Silver Creek (U)
11070207-170005
Silver Creek (P), 03244

OUTLET #7

NE 1/4, SE 1/4, Sec. 18, T 27N, R 32W, Jasper County Lat 37° 03' 35" N, Long 94° 27' 48" W NAD83
Unnamed tributary to Joplin Creek (U)
11070207-170005
Silver Creek (P), 03244

OUTLET #8

NW 1/4, NE 1/4, Sec. 18, T 27N, R 32W, Jasper County Lat 37° 04' 00" N, Long 94° 28' 08" W NAD83
Unnamed tributary to Turkey Creek (U)
11070207-160020
Turkey Creek (P), 03216

OUTLET #9

NE 1/4, SW 1/4, Sec. 7 , T 27N, R 32W, Jasper County
Unnamed tributary to Turkey Creek 2 (U)
11070207-160020
Turkey Creek 2 (P), 03217

Lat 37° 04' 37" N, Long 94° 28' 21" W NAD83

OUTLET #10

SW 1/4, SE 1/4, Sec. 6 , T 27N, R 32W, Jasper County
Unnamed tributary to Turkey Creek (U)
11070207-160020
Turkey Creek 2 (P), 03217

Lat 37°05' 14" N, Long 94° 28' 02" W NAD83