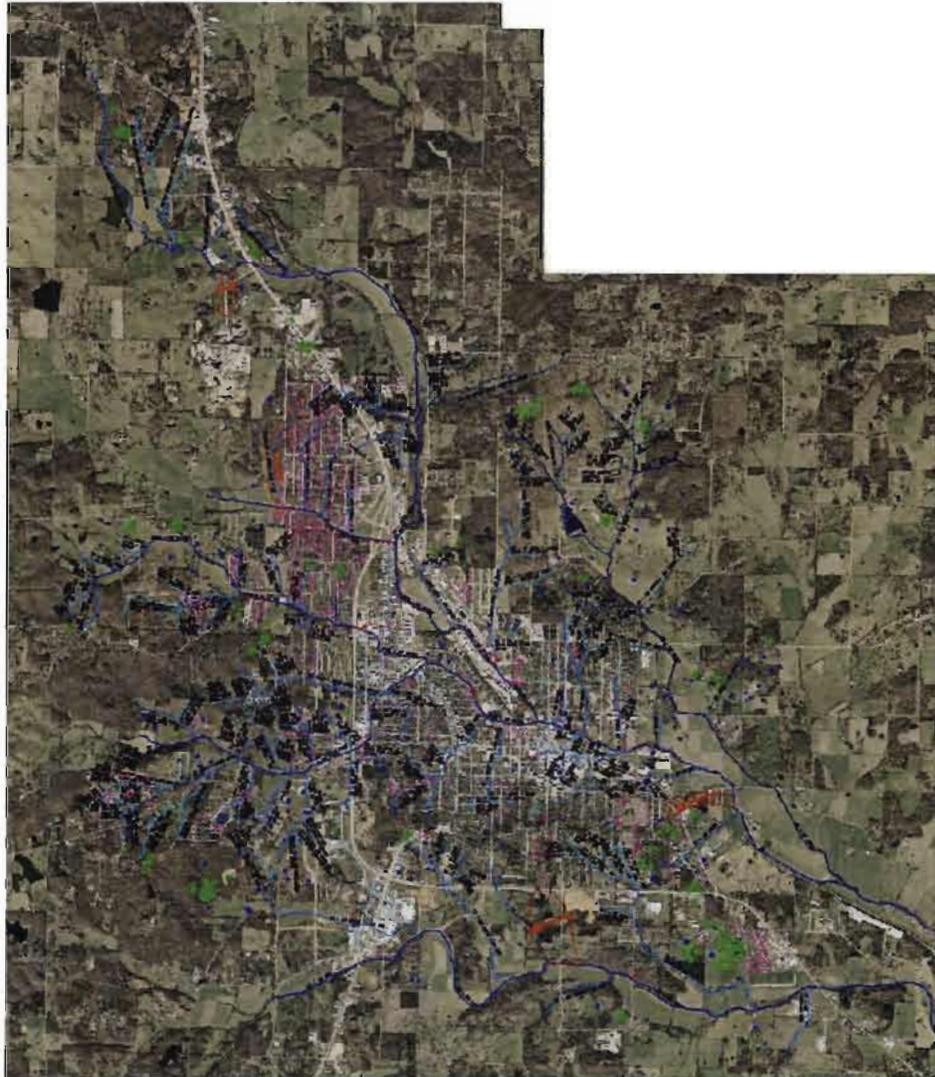


Storm Water Management Program
City of West Plains, Missouri
Permit Period 2013-2017
December 14, 2012



1910 Holiday Lane
West Plains, Missouri 65775



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WATER PROTECTION PROGRAM

Chapter I – PUBLIC EDUCATION AND OUTREACH

A. Benefits of a Public Education and Outreach Program

An informed and knowledgeable community is crucial to the success of a stormwater management program. Without a public knowledge about local water quality problems caused by urban runoff, it is difficult to obtain public support for local stormwater programs. This support ranges from individuals changing their daily actions to community support for all stormwater quantity and quality measures. As with all of the measures, the goal is to reduce the magnitude of a flood and the degradation of local water bodies and improve chemical, physical and biological quality of state waters. In order to achieve these benefits, public education programs shall be targeted to these outcomes:

- **Improve understanding** of the reasons why stormwater quantity and quality programs exist. Public understanding of local impacts is particularly important for municipal funding initiatives for the program or seeking volunteers to help implement programs.
- **Improve compliance** with the programs as the public becomes aware of community and individual responsibilities expected in order to protect or improve the stormwater runoff from the community.

B. Program Implementation

The goal of the public education and outreach program is informing the public of the environmental effects of quantity and quality of stormwater, including potential pollutants and/or pathogens in stormwater. The City will receive assistance from the Environmental Protection Agency, the Missouri Department of Conservation and the Natural Resources Conservation Service in presenting the environmental effects of pathogens in stormwater. In order to educate as many residents as possible on the subject the City is going to ask local businesses to assist in providing incentives, such as, prizes/discounts to residents that attend the presentations.

Environmental effects of flooding and potential pollutants and/or pathogens in stormwater will be explained in a newspaper article with an invitation to the presentation. During the presentation information will as be given on how the public can help. After educating the public on the effects, the City will present its plan of meeting Federal/State regulations and how it intends to fund the program. The components of the public education and outreach program are shown below and followed with the measurable goals.

- **City will contact businesses on possible incentives to residents that attend the presentation “Stormwater Pollution Reduction for residential households”**
- **Run a newspaper article “Stormwater Pollution Reduction for residential households”**
 1. Summary of the impacts
 2. Invitation to the presentation
 3. State incentives that residents can receive for attending.
- **Presentation of “Stormwater Pollution Reduction for residential households”**
 1. City or representatives of the City, Environmental Protection Agency, Missouri Department of Conservation and Natural Resources Conservation Service will provide information or give presentations.
 2. The presentations will include information on how the public can become involved; for example, stream teams, stream cleanups, and drain stenciling.
- **Develop and print brochure “Stormwater Pollution Reduction for commercial properties”**
 1. Includes the following information:

- a. What is stormwater runoff?
 - b. Why is stormwater runoff a problem?
 - c. The effects of flooding and/or pollution.
 - d. Grease traps (Outside)
 - e. Dumpsters
 - f. Parking lot maintenance
2. Mail to all commercial property owners
- **Booth at Home and Garden Show “Stormwater Pollution Reduction for residential and commercial properties”**
 1. Will include exhibits from Environmental Protection Agency, Missouri Department of Conservation, Natural Resources Conservation Service, and the Missouri Department of Natural Resources.
 - **Elementary and Middle School Educational Programs**
 1. Conduct educational programs for the school systems.
 2. Have information for students to take home to their parents
 - **Presentation to Homebuilders Association and the Board of Realtors**

C. Measurable Goals

MCM #1 PUBLIC EDUCATION AND OUTREACH	SWMP Element Description	Implementation Schedule
Contact businesses on potential incentives to residents that attend "Stormwater Pollution Reduction for residential households"	Get incentives, such as, prizes/discounts	March/April 2014 – Year 2
Develop and print newspaper article	"Stormwater Pollution Reduction for residential households"	May 2014 – Year 2
Presentation "Stormwater Pollution Reduction for residential households"	Information presentation and promotion of public involvement	June 2014 – Year 2
Develop and print brochure "Stormwater Pollution Reduction for commercial properties"	Development of newsletter to inform commercial properties	July 2015 - Year 3
Distribute brochure "Stormwater Pollution Reduction for commercial properties"	Mailing to all commercial properties	July 2015 - Year 3
Booth at Home and Garden Show	"Stormwater Pollution Reduction for residential households and commercial properties"	March 2014 – Year 2 March 2015 – Year 3 March 2016 – Year 4
Elementary and Middle School presentations	"Stormwater Pollution Reduction for residential households"	September 2014 – Year 2
Presentation to Home Builders Association and Board of Realtors	Stormwater Pollution Reduction for residential and commercial properties	December 2015 – Year 3

Chapter II –PUBLIC PARTICIPATION/INVOLVEMENT

A. Benefits of a Public Participation and Involvement Program

The public can provide valuable input and assistance to a municipal Stormwater Management Program. Since the activities of the public within urban landscapes are what produce increased runoff and pollution of stormwater, and because the public funds municipalities/utilities, it is imperative that the public be given every opportunity to play an active role in both the development and implementation of the program. An active and involved community is crucial to the success of a Stormwater Management Program because it allows for:

- **Broader public support** since citizens who participate in the development and decision making process are involved, they are partially responsible for the program and thus, more likely to take an active role in its implementation;
- **A broader base of expertise and economic benefits**, since the community can be a valuable, free, intellectual resource; and thus can be utilized to promote and support the stormwater program.
- **Conduits to other programs** since citizens involved in the stormwater program process provide important connections and relationships with other community and government programs.

B. Program Implementation

- **Community Clean-up Program**
 1. Maintain existing clean-up teams
 2. Cite: <http://mdc.mo.gov/documents/fish/streams/litter.pdf>
 3. Recruit the public for an important role in removing trash and debris from the streams in the watershed.
 4. Document approximate length of stream clean-up.
 5. Map locations of clean-up for reporting records and for the volunteers.
 6. Document number of bags of litter filled.
- **Storm Drain Stenciling Program**
 1. Maintain storm drain stenciling team(s)
 2. Cite: http://mdc.mo.gov/documents/fish/streams/drain_stencil.pdf
 3. Offer storm drain stenciling program to non-profit organizations, clubs, fraternities, sororities, and volunteers.
 4. Paint pre-existing inlets or storm boxes
 5. Use the same phrase on all stenciling projects so public can associate with the phrase used.
 6. Map the locations that need to be stenciled and offer specific areas for volunteers to document the amount of storm drains stenciled per “cycle” year.
- **Stream teams**
 1. Maintain stream team(s)
 2. Cite: <http://www.mostreamteam.org/wqintro.asp>
 3. Cite: <http://www.mdc.mo.gov/documents/fish/streams/streamteam.pdf>
 4. Cite: http://mdc.mo.gov/documents/fish/streams/now_what.pdf
 5. Use data as a water quality monitoring tool
 6. Cite: <http://www.mdc.mo.gov/documents/fish/streams/volunteer.pdf>

- **Develop Citizen Watch Group**
 1. Watch group goals will be to report any illegal dumping or any illicit discharge to the City of West Plains Stormwater Hotline

- **Maintain Twenty-Four Hour Stormwater “Hotline” Service**
 1. Maintain “Hotline” for the public/citizen complaints, questions, and concerns regarding all of the following but not limited to:
 - a. Reporting of Illicit discharges from residents, industries, etc.
 - b. Reporting of illegal dumping.
 - c. Reporting of public or private areas with large, medium, small amounts of litter.
 - d. Questions regarding public participation or involvement activities, construction site runoff, public education and outreach, municipal activities affecting stormwater, etc.
 2. Document calls weekly/monthly regarding all “Hotline” activities.
 3. Contact the citizen that called the “Hotline” within 72 hours unless it’s an emergency, in which case contact the proper authorities.
 4. Document all findings through the “Hotline” to find if it is affective and if it is, in what way.
 5. Report all findings and information collected from the “Hotline” in the Annual Report.

C. Measurable Goals

MCM #2 PUBLIC PARTICIPATION/INVOLVEMENT	SWMP Element Description	Implementation Schedule
Community Clean-up Program	Removing trash and debris	June 2013 – Year 1 April 2014 – Year 2 April 2015 – Year 3 April 2016 – Year 4 April 2017 – Year 5
Storm Drain Stenciling Program	Drain Stenciling Events	June 2013 – Year 1 April 2014 – Year 2 April 2015 – Year 3 April 2016 – Year 4 April 2017 – Year 5
Stream Team Monitoring	Monitor Galloway Creek through volunteers and assist in trash removal from creeks	July 2013 - Year 1 April 2014 – Year 2 April 2015 – Year 3 April 2016 – Year 4 April 2017 – Year 5
Develop Citizen Watch Group	Setup watch group to report illegal dumping and illicit discharges throughout City Limits	January 2015 – Year 3
“Hotline” Service	Complaints, questions, and concerns with stormwater related issues	January 2014 – Year 2

Chapter III – ILLICIT DISCHARGE DETECTION AND ELIMINATION

A. Benefits of an Illicit Discharge Detection and Elimination Program

Illicit discharges can result in untreated discharges that contribute high levels of pollutants, including heavy metals, toxics, oil and grease, solvents, nutrients, viruses, and bacteria to receiving water bodies. Pollutant levels from these illicit discharges have been shown in EPA studies to be high enough to significantly degrade receiving water quality and threaten aquatic life, wildlife, and human health.

B. Program Implementation

Illicit discharges are defined as a measurable flow during dry weather containing pollutants and/or pathogens in or leaving a stormwater conveyance structure. A stormwater conveyance structure is defined as pipes, junction boxes, inlet boxes, and open channels used to transport stormwater. Measurable flow in or leaving a storm conveyance structure but containing no pollutants and/or pathogens is simply considered discharge. The goal of this plan is to remove discharge that is considered illicit. In order to have a successful program to remove illicit discharges the City will implement or continue the following measures.

- **Continue development of the Storm Sewer System Map by collecting information with (GIS) and (GPS) software and equipment.**
- **Maintain the “Hotline” for residents to report illegal dumping, illicit discharges, odors, discolored water, and any other pollutant/pathogen 24 hours a day. (Located in chapter III Public Participation/Involvement)**
 1. Calls will be logged on a daily/monthly basis using a data filing system.
 2. Calls will be monitored within a 72 hour window unless an emergency, in which case they will make the report with 911/local emergency agencies.
 3. Reports will be filed on all calls. If illicit discharge is found, the proper procedures will be followed to eliminate the threat of spreading or contamination.
 4. “Citizens Watch Group” will be developed to assist in located illicit discharges throughout the city limits
 5. Fire Department handles all spills and cleanups regarding hazardous waste. They have a policy and procedures manual they must follow according to the federal, state and local regulations.
- **Enforcement of removal of illicit discharges through an illicit discharge ordinance.**
- **Maintain Program for Storm Drain Stenciling (located in chapter III public participation/ involvement).**
- **Conduct lawn testing for proper fertilizer amount.**
- **Maintain a household hazardous waste program through the recycling facility.**
- **Educate public employees and the public about the harm of illicit discharges (located in chapter VII pollution prevention/good housekeeping).**
- **Develop program to monitor and inspect Commercial/Restaurants properties for any type of illicit discharge.**
 1. Document any specific complaints received.
 2. Document inspections and/or findings from each Commercial/Restaurant property.

3. Document number of illicit discharges detected.
 4. Document number of illicit discharges eliminated
- **Maintain a program to inspect all major outfalls, medium outfalls (30" or larger), small outfalls (30" or smaller), and priority areas.**
 1. Inspect/monitor site on a regular basis (semi-annually).
 2. Document number of illicit discharges detected.
 3. Document number of illicit discharges eliminated.
 4. Document number of dye or smoke tests conducted.
 - **Maintain a spill response plan for the City Engineering Department for coordination with emergency responders and the Missouri Department of Natural Resources (MDNR).**
 1. Document any spills that have entered the stormwater conveyance system.
 2. Identify BMPs that can be used to insure spills do not enter the stormwater conveyance system.
 3. Spill response program will be handled by the Fire Department due to federal, state and local laws. The stormwater program will work with them on BMPs to make the job easier and efficient.

C. Measurable Goals

MCM #3 ILLCIT DISCHARGE DETECTION AND ELIMINATION	SWMP Element Description	Implementation Schedule
Maintain Hazardous waste pickup program	Identifying products homeowners use that the current sanitary waste company will not pick up. After identifying these products the City will set a day each year in early spring to collect these products and dispose of them properly.	First pickup April/May 2013 - Year 1 April/May 2014 - Year 2 April/May 2015 - Year 3 April/May 2016 - Year 4 April/May 2017 - Year 5
Newspaper article	Write about the need for illicit discharge detection and elimination, Federal/State/City requirements, and information on the hazardous waste pickup program.	January 2014 – Year 2 January 2015 – Year 3
Enforce and Update Illicit Discharge Ordinance as needed or required	Enforcement mechanism	Ongoing
Storm sewer map	City will continue to update the storm sewer system map.	Ongoing
Field data inspections -Dry Weather Inspection -Wet Weather Inspection	Use City inspection form and complete the form for stormwater discharge points, all open channels, and creeks within the City limits. The inspection form is used to identify illicit discharges during dry weather conditions. If illicit discharges are located, they may require testing to indicate source and that it is considered illicit.	August 2013- Year 1 August 2014 – Year 2 August 2015 – Year 3 August 2016 – Year 4 August 2017 – Year 5
Restaurant/Commercial inspections	Develop an inspection form and complete the form for restaurants and commercial properties, and identify any illicit discharges.	Inspection form completed on : 50% by August 2015 – Year 3 100% by August 2016 – Year 4
Spill Response plan	Fire Department is responsible due to the federal, state, and local laws City stormwater department will work with First Responders and MDNR to develop and implement the use of BMPs to insure spills do not enter the storm- water conveyance system.	Ongoing

Chapter IV – CONSTRUCTION SITE STORMWATER RUNOFF CONTROL

A. Benefits of a Construction Site Stormwater Runoff Program

Polluted stormwater runoff from construction sites often flows to storm sewer systems and ultimately is discharged into local rivers and streams. Sediment is usually the main pollutant of concern. Studies by others have shown sediment runoff rates from construction sites are typically 10 to 20 times greater than those of agricultural lands, and 1,000 to 2,000 times greater than those of forest lands. During a short period of time, construction sites can contribute more sediment to streams than can be deposited naturally during several decades. The resulting situation, and the contribution of other pollutants from construction sites, can cause physical, chemical, and biological harm to our nation's waters.

Additional pollutants are also often present in stormwater runoff from construction sites and may result in degradation of receiving water. Nutrients (nitrogen and phosphorous) are of specific concern and can cause significant impairment. In addition, solid and sanitary wastes, pesticides, oil and grease, concrete truck washout, construction chemicals, construction debris and metals may be discharged and cause an impact on receiving waters.

B. Program Implementation

The main audiences for this control measure are developers, contractors and the City of West Plains. The main targeted pollutant is sediment, but construction debris, construction chemicals and concrete truck washout are targeted as well.

In order to meet the MDNR requirements the City is going to maintain a program that covers land disturbance activities equal to or greater than one acre. Land disturbance is defined as any activity that results in the destruction of the root zone and/or an act that is reasonably certain to cause pollution to the waters of the state. The first step in most construction projects is moving earth. Moving earth can be as minor as stripping the top soil and be considered land disturbance. The key to implementing a successful program requires: the proper amount of funding, educating the public on the need, informing the land disturbers (contractors and developers) on the requirements, and then enforcing the requirements.

Education of the requirements will be implemented and achieved through training for developers and contractors. The training will cover the City of West Plains and MDNR land disturbance requirements and will include the following:

1. Requirements for land disturbance.
2. The concept of a Stormwater Pollution Prevention Plan (SWPPP) and who can develop and prepare one.
3. Modifying a SWPPP; when and by who?
4. Installation practices for sediment and erosion BMPs
5. Maintenance practices for sediment and erosion BMPs
6. Spill prevention and control facilities for materials such as paint, solvents, petroleum products, chemicals, toxic or hazardous substances, substances regulated under the Resource Conservation and Recovery Act (RCRA) or the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Other considerations should include: control of concrete truck washouts, and assurance that on-site fueling facilities will adhere to applicable federal and state regulations concerning storage and dispensers.

The requirements include: submitting the Stormwater Pollution Prevention Plan (SWPPP), a copy of the Missouri Department of Natural Resources (MDNR) land disturbance permit, and a completed grading permit application with a city grading permit fee. The backbone of the requirements is the SWPPP, which

is the plan taken by the contractor to address stormwater pollution prevention. The submittal requirements of the SWPPP are as follows:

1. Name, address and telephone number of the site owner and the name, address and telephone number of the individual who will be in overall responsible charge of construction/development activities at the site.
2. Name, address and telephone number of the Land Disturbance Quality Control Officer.
3. Site address or location description of the site.
4. A site map showing the outlines of the total project area, the areas to be disturbed, existing land uses, locations and names of surface water bodies, locations of flood plains, and locations of erosion and sediment Best Management Practices (BMP). Existing contours of the site and adjoining strips of off-site property and proposed contours after completion of the proposed land disturbance and development. Existing and proposed contours shall be shown at two foot contours. Location of benchmark on site that contour elevations are based and elevation of buildings, walks, drives, street and roads should be shown. The existing and proposed contours shall be shown at two foot elevation intervals.
5. The site plan and SWPPP document must be signed and sealed by a Professional Engineer licensed in the State of Missouri. The site plan must include a statement: I, signature of P.E., certify that the SWPPP has been developed to minimize erosion and reduce sediment from entering any state, city, or privately owned waters to maximum extent practicable. I have verified any special conditions for this site and have incorporated it into the SWPPP. I shall amend the SWPPP whenever current SWPPP does not meet state standards for stormwater outfall requirements, site conditions change BMP requirements, excessive amounts of erosion have occurred or noticeable sediment has left the site. I understand that the SWPPP is developed to protect the water quality to the maximum extent practicable, and this may require modification to the SWPPP during the duration of the project. If the owner of properties name or Land Disturbance Quality Control Officer name contacts me to update or change the SWPPP and I agree, then the SWPPP will be updated within 72 hours of noted need of change to the SWPPP. If I disagree with amending the SWPPP and the changes are not required by Federal, State, or City requirements, then it should be noted that I take liability for any degradation of water quality that may occur by not making the requested amendment to the SWPPP. If changes are made to the SWPPP, I will publish all changes to the SWPPP with an indicator to all parties to which copy is current.
6. The site plan must include a statement: I, property owners signature. assume and acknowledge any land clearing, construction, or development involving the movement of earth shall be in accordance with the Stormwater Pollution Prevention Plan. I will maintain a current copy of the SWPPP on the site in a location visible to anyone entering the site. This will allow City personal to perform quality assurance inspections when no one representing SWPPP is on site. I will also maintain all site inspections with the SWPPP on site. I understand that the SWPPP is developed to protect the water quality to the maximum extent practicable and this may require modification to the SWPPP during duration of the project. If the representative of the City of West Plains, the land disturbance quality control officer, or the designer of the SWPPP, notifies me that the SWPPP needs to be amended I will notify the designer of the SWPPP to insure recommendations are considered.
7. The site plan must include a statement: I, signature of Land Disturbance Quality Control Officer. am the agent of owner of properties name to insure that this site is in accordance with the Stormwater Pollution Prevention Plan. I will perform site inspections at least once per week and no later than 72 hours after a heavy rain. These site inspections will be recorded on a land disturbance quality control inspection form located in the City of West Plains Stormwater Management Manual. The purpose of such inspections will be to ensure proper installation, operation and maintenance of BMP's and to determine the overall effectiveness of the SWPPP and the need for additional control measures. If changes to the SWPPP are required I will notify the owner of properties name and Name of P.E. within 24 hours.
8. A copy of design calculations used for selection of the BMP's is in the site plan.
9. The anticipated sequence of construction and land disturbance activities, including installation of BMP's, removal of temporary BMP's, stripping and clearing; rough grading; construction utilities,

- infrastructure, and buildings; and final grading and landscaping. I don't think the prior sentence makes sense, no verb. Sequencing shall identify the expected date(s) on which clearing will begin, the estimated duration of exposure of cleared areas, areas of clearing, installation of temporary erosion and sediment control measures, and establishment of permanent vegetation.
10. Seeding mixtures and rates, types of sod, method of seed-bed preparation, depth of topsoil in final grading, if used, expected seeding dates, type and rate of lime and fertilizer application, and kind and quantity of mulching for both temporary and permanent vegetative control measures. Steeper sloped areas may require specialized seed and mulching practices. Details on erosion control should be given on steep sloped areas. Watering methods and schedules included in order to establish vegetation dry periods.
 11. Details on access to the construction site.
 12. Location of temporary off-street parking, and wash-down area for related vehicles.
 13. Method of removing sediment from City streets tracked from the site due to vehicles leaving by a method that does not place the sediment in the City's storm sewers.
 14. Sources of off-site borrow material or spoil sites, and all information relative to haul routes, trucks and equipment.
 15. Description of BMP's to be utilized to prevent other potential pollutants such as construction waste, toxic or hazards substances, petroleum products, pesticides, herbicides, site litter, sanitary wastes and other pollutants from entering the natural drainage ways during the period of construction and land disturbance. This should include spill prevention and control facilities for materials such as paint, solvents, petroleum products, chemicals, toxic or hazardous substances, substances regulated under the Resource Conservation and Recovery Act (RCRA) or the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Other considerations should include: control of concrete truck washouts, assurance that on-site fueling facilities will adhere to applicable federal and state regulations concerning storage and dispensers.
 16. Dust abatement methods for dry periods of the year.
 17. Amount of impervious area after completion.

If the amount of impervious area on the site is equal to or greater than 1 acre then City's post construction requirements will be required. The post-construction requirements are discussed in Post Construction MCM #5 of this document. Guidance to meet the land disturbance and post-construction requirements are published in the City of West Plains Stormwater Management Manual. The City requirements will be submitted and a reviewed by the Engineering Department of the City of West Plains. After approval by the City of land disturbance requirements a grading permit will be issued.

Enforcement of the land disturbance requirements are set out in the land disturbance ordinance and by quality assurance inspections by the City. It is important that the requirements be addressed but it is just as important to have legal procedures in place to insure that when the requirements are not met the City can take appropriate action. The ordinance cites the City of West Plains Stormwater Manual for requirements and guidance. The next method of insuring enforcement of the land disturbance requirements is performing site inspections. Requirements 5, 6, and 7 of the SWPPP on page 25 and 26 of this document put the responsibility of SWPPP on the owner of the property and his agents. The City representatives act as quality assurance to insure the owner and his agents are fulfilling the requirements.

Funding of the land disturbance program will be covered by the City of West Plains grading permit fee and stormwater utility fee.

C. Measurable Goals

MCM #4 Construction Site Stormwater runoff control	SWMP Element Description	Implementation Schedule
Newspaper article	Print an article on the need for erosion and sediment control on construction sites, Federal/State/City requirements, and invitation to free training for contractors and developers	January 2014 – Year 2 January 2015 – Year 3 January 2016 – Year 4
Land Disturbance Training for contractors and developers	Presentation/educational classes for contractors and developers. The objective will be to provide education on construction site runoff, construction site cleanliness, BMP's, Cities Ordinance, Permits, SWPPPs, and etc.	February 2014 – Year 2 March 2015 – Year 3 March 2016 – Year 4
Enforce and Update Land Disturbance Ordinance	Enforcement mechanism	Ongoing
Enforce and Update Erosion and Sediment Control Manual (ESC)	Cited in Land Disturbance Ordinance for requirements and guidance for land disturbance activity equal to or greater than one acre.	Ongoing
Land Disturbance Quality Assurance Inspections	The stormwater coordinator will inspect and enforce all sites that have applied and been accepted for a grading permit using the Quality Assurance Land Disturbance Form in the Stormwater Manual	Conduct inspections on 100% of all sites approved for a grading permit. Number of sites inspected will be documented in annual report. Ongoing
Review & Issuing Grading Permits	The stormwater coordinator will review and approve SWPPPs and issue grading permits for sites equal to or greater than 1 acre of land disturbance.	Conduct reviews of 100% of all sites 1 acre or more. The sites reviewed will be documented in the annual report. Ongoing
Permit/Site Plan Tracking System for Land Disturbance using (LAMA)	The city will use GPS, GIS, and Access to track all permits and site plans. This will allow the City to know how many plans or permits are in effect.	Create a program and track 100% of permits and site plans. Number of permits and site plans will be documented in annual report Ongoing

Chapter V – POST-CONSTRUCTION STORMWATER MANAGEMENT

A. Benefits of a Post-Construction Stormwater Program

Post-construction stormwater management in areas undergoing new development or redevelopment is necessary because runoff from these areas has been shown to significantly affect receiving water bodies. Many studies indicate that prior planning and design for the minimization of pollutants in post-construction stormwater discharges is the most cost-effective approach to stormwater quality management.

There are generally two forms of substantial impacts from post-construction runoff. The first is caused by an increase in the type and quantity of pollutants in stormwater runoff. As runoff flows over areas altered by development, it picks up harmful sediment and chemicals such as oil and grease, pesticides, heavy metals, and nutrients (e.g., nitrogen and phosphorus). These pollutants often become suspended in runoff and are carried to receiving waters, such as lakes, ponds, and streams. Once deposited, these pollutants can enter the food chain through small aquatic life, eventually entering the tissues of fish and humans. The second kind of post-construction runoff impact occurs by increasing the quantity of water delivered to the water body during storms. Increased impervious surfaces interrupt the natural cycle of gradual percolation of water through vegetation and soil. Instead, water is collected from surfaces such as asphalt and concrete and routed to drainage systems where large volumes of runoff quickly flow to the nearest receiving water. The effects of this process include stream bank scouring and downstream flooding, which often lead to a loss of aquatic life and damage to property.

B. Program Implementation

The goal of this minimum control measure is to improve stormwater quality and reduce total stormwater amount by using structural and non-structural best management practices for proposed and existing commercial developments, industrial developments, and subdivision developments.

Proposed developments

The mechanism used to meet this goal for proposed developments will be the development, implementation, and enforcement of post construction measures for developments equal or greater than 1 or more acres of impervious area. The intent and enforcement will come in the form of a stormwater ordinance. This ordinance will cite the City of West Plains Stormwater Management Manual for requirements and guidance.

All developments 1 or more acres of imperious area will undergo a review and approval process. This review will require the development of a Stormwater Management Concept Plan (SWMCP), which must be sealed by a licensed engineer in the state of Missouri. The submittal requirements of the SWMCP are as follows:

1. Name, address and telephone number of the site owner and the name, address and telephone number of the individual who will be in overall responsible charge of site design.
2. Site address or location description of the site.
3. A site map showing the boundaries of the total project area, the areas to be developed, existing land uses, locations and names of bodies of surface water, locations of flood plains, locations of all proposed Best Management Practices (BMPs), and location of all proposed impervious areas; existing contours of the site and adjoining strips of off-site property and proposed contours after completion of the proposed development. Existing and proposed contours shall be shown at two foot contours.
4. Post-developed stormwater flow rates with locations leaving the site.
5. Pre-developed stormwater flow rates with locations leaving the site.
6. Design calculations used for the selection of Best Management Practices (BMPs) shown on the site map. The designer should consider BMPs that improve stormwater quality and reduce total stormwater amount to the maximum extent practical for the site. These methods should include

options that reduce the total amount of impervious area, filtering, and infiltration of stormwater on the site.

At a minimum the City of West Plains will require BMPs for developments to restrict post stormwater flow rate to pre-developed flow rates. This will assist in reducing downstream flooding and erosion; extended detention time of stormwater on site that can reduce transportation of sediment and possibly other pollutants from the site. This will also reduce the possibility of future litigations with downstream homeowners that may be flooded by increased stormwater flow rates.

The SWMCP includes more extensive best management practices; for example, reduction of imperious areas, filtering methods, and infiltration on the site. Guidance and references are shown in the stormwater management manual under the post- construction section. The SWMCP phase of planning of the stormwater controls on the site require interaction of the City of West Plains and the design engineer to develop a concept that will reduce the discharge of stormwater and potential pollutants from the site to the maximum extent practicable (MEP). When the City of West Plains approves the specific concept in the SWMCP, the design engineer is required to submit the Stormwater Management Design Plan (SWMDP) when the final plans of the site are complete.

The SWMDP includes the final design calculations for all stormwater infrastructures and must also include the approved concept design from the SWMDP. The submittal requirements of the SWMCP are as follows:

1. Name, address and telephone number of the site owner and the name, address and telephone number of the individual who will be in overall responsible charge of site design.
2. Site address or location description of the site.
3. A final site map showing the boundaries of the total project area, the areas to be developed, existing land uses, locations and names of bodies of surface water, locations of flood plains, locations of all Best Management Practices (BMPs), and location of all proposed impervious areas. Existing contours of the site and adjoining strips of off-site property and proposed contours after completion of the proposed development shall be included. Existing and proposed contours shall be shown at two foot contours.
4. Post- developed stormwater flow rates with locations leaving the site.
5. Pre- developed stormwater flow rates with locations leaving the site.
6. Final design calculations used for selection of Best Management Practices (BMPs) and all storm-water pipes and structures.
7. Specifications for all stormwater infrastructures, including BMPs and stormwater conveyance systems.

The final site plan, calculations performed by the engineer, and specifications must be sealed by a registered engineer in the state of Missouri. The requirements and guidance for SWMCP will be located in the City of West Plains Stormwater Management Manual. The City will provide training to the engineer on requirements and guidance (see measureable goals below). Review and inspection of the requirements for new developments 1 acre our more of impervious area will be performed by the City Engineer for the City of West Plains.

When the SWMDP is approved by the City a construction permit will be issued with an inspection sheet tailored to the site. The inspection sheet will have a checklist for the inspector to follow to approving the construction of stormwater infrastructure at key points during the construction process. This will insure that the infrastructure is in place per the SWMDP. The owner will not receive an operating permit until all the requirements of the inspection sheet are met. The owner will be required to pay a fee for the construction permit. This fee will be used to fund the inspection during the construction of the storm-water infrastructure. This cost incurred by the City for review and approval of the SWMCP and SWMDP will be covered by the stormwater utility fee. The stormwater utility fee will be explained in more depth in chapter VII of this document.

This fee will also fund annual City inspections of the stormwater infrastructure. The City archives and tracks annual inspection data using database and global information system (GIS). This inspection program will allow the City to collect some data on performance and maintenance requirements of specific types of BMPs. These data can be used to update the guidance section of the Stormwater Management Manual and the development for maintenance requirements to be included in operating permits. If the annual inspections show the BMPs are not operating as intended, and/or require maintenance, the owner will receive a notice from the City to fix the issues within a fixed period of time. If the owner does not make the required improvements to allow the BMPs to work as intended, the operation permit will be lifted. The lifting of the operating permit will place the owner in violation per the ordinance and any stormwater utility fee credits on impervious area reduction due to being connected to on-site BMPs.

Individual homeowners that have on-site BMPs and get a stormwater utility fee credit will also have a required operating permit and will require annual inspections. If their annual inspections show the BMPs are not operating properly, or require maintenance, the City will handle the situation the same as other developments that operate BMPs.

Existing developments and homeowners

All impervious area in the city limits of West Plains will be subject to a stormwater utility fee. The City streets will be exempt. All land owners will be required to pay on their impervious area. All concrete, asphalt, rooftop, or all other objects that are impervious will be subjected to the fee. The funding requirements of the fee are shown in Chapter VII of this Stormwater Management Plan. Existing developments and existing homeowners will have incentive to incorporate BMPs to reduce the fee. Any impervious area that is connected to BMP will not be considered as impervious area. This will reduce their monthly utility fee.

Existing developments with more than one acre of impervious area will be required to go through the same process as proposed developments, which will include retaining an engineer to develop a SWMCP and SWMDP and obtain a construction permit, following up with an operating permit.

Existing homeowners who are considering implementing BMPs should follow the process and guidance document "Homeowners guide to implementing BMPs". This process requires working with the City but does not require retaining an engineer. After approval by the City, a construction permit, followed by an operating permit, will be issued by the City.

Other BMPs that do not reduce the amount of impervious area will be enforced by ordinances or the City will provide training and recommend that the homeowner implement them. The following BMPs will be enforced with ordinances: animal waste ordinance, debris and yard waste, litter control, disposal of waste.

The City will require pet owners to pickup and properly dispose of pet waste. In parks disposal of waste will be available on site by a pet waste scoop dispenser and signage to notify visitors of the requirement. Enforcement of waste on someone's own property by their animals will not be enforced unless smell or water quality requires action by the City. Disposal of waste product of homeowners will be improved by the City developing a program to collect items not considered sanitary trash, like hazardous waste products. The City will recommend stream buffers and fertilizer control.

C. Measurable Goals

MCM #5 POST-CONSTRUCTION STORM WATER MANAGEMENT	SWMP Element Description	Implementation Schedule
Newspaper article	Article on the need for post-construction control, Federal/State/City requirements, possible fee reduction for homeowners, and invitation to free training for homeowners, engineers	January 2014 – Year 2
Conduct Lawn Testing for Residential and Commercial Properties	City will conduct lawn testing for any willing resident or commercial outfit. There will be a minimum fee of at least 15 dollars.	Maintain program for lawn testing. March 2015 – Year 3
Training for homeowners	Presentation/educational classes for homeowners. The objective will be to educate on ways to receive stormwater credits and reduce stormwater utility fee by using "Homeowners guide to implementing BMPs"	February 2014 – Year 2 May 2015 – Year 3 August 2016 – Year 4
Training for engineers	Presentation/educational classes for engineers. The objective will be to educate on post-BMP's, city's requirements	January 2014 – Year 2 April 2015 – Year 3 June 2016 – Year 4
Enforce Animal Waste Ordinance	Enforcement mechanism	Ongoing
Enforce and Update Post-Construction Ordinance	Enforcement mechanism	Ongoing
Enforce Stream Buffer Ordinance	Enforcement mechanism	Ongoing
Manage and Enforce Stormwater Management Manual	Cited in Post-Construction Ordinance for requirements and guidance for developers with equal to or greater than one acre of impervious area.	Ongoing
Quality Assurance Inspections	The City Engineer will inspect construction of stormwater infrastructure per inspection sheet issued with the construction permit. The requirements of the inspection sheet must be met to receive an operation permit.	Conduct inspections on 100% of all sites. Number of sites inspected will be documented in annual report. Ongoing
Review & Issuing Construction and Operating Permits	The City Engineer will review and approve SWMCP, SWMDP, and issue construction and operating permits for developments with equal to or greater than one acre of area.	Conduct reviews of 100%. The number of sites reviewed will be documented in the annual report. Ongoing
Permit/Site Plan Tracking System	The City will use GPS, GIS, and Access to track all construction permits, operating permits, and inspections.	Create a program and track 100% of construction permits, operating permits, and inspections. Number of permits and inspections will be documented in annual report. Ongoing

Chapter VI – POLLUTION PREVENTION/GOOD HOUSEKEEPING FOR MUNICIPAL OPERATIONS

A. Benefits of a Pollution Prevention/Good Housekeeping Program

The Pollution Prevention/Good Housekeeping Operations is a key element of the Stormwater Management Program. This measure requires the examination and subsequently altered actions to help ensure a reduction in the amount and type of pollution that: (1) collects on streets, parking lots, open spaces, and storage and vehicle maintenance areas, all of which is discharged into local waterways; and (2) results from actions such as street maintenance, environmentally damaging municipal land development and flood management practices, or poor maintenance of storm sewer systems. While this measure is meant primarily to improve or protect receiving water quality by altering municipal activities, facility operations and property management, the City of West Plains can also realize cost savings from such things as spill prevention (thus reducing clean-up costs), inventory control, and re-use/recycling of materials.

B. Program Implementation

Over the five years of the stormwater management program plan the City of West Plains will be bringing the awareness of stormwater quality into the homes of most citizens of the City of West Plains. Some of these citizens may resist the requirements implemented to insure the City meets Federal and State regulations. Due to this possible resistance the City needs to be the strongest advocate and make sure it is meeting requirements.

The City will develop and implement an operation and maintenance program. The main intent of the program is preventing pollutant runoff from municipal operations. In order to prevent this, the City will check all facilities for possible illicit discharges. For example, some of the floor drains may be connected to the storm sewer and the janitor pours something down the drain that is considered a pollutant. The operation and maintenance program will follow guidance in the City's Operation and Maintenance Manual. The manual will consider the following topics:

1. Locations of all City Infrastructure.
2. Description of the facilities and activities they perform.
3. Identification of all activities that may cause pollutant runoff.
4. Determination of Best Management Practices (BMPs) that could mitigate the risk of pollutant runoff. This will include spill prevention and control facilities for materials such as paint, solvents, petroleum products, chemicals, toxic or hazardous substances, and substances regulated under the Resource Conservation and Recovery Act (RCRA) or the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Requirements for on-site fueling facilities to meet federal and state regulations concerning storage and dispensers.
5. Required annual training by the City on BMPs for each facility.
6. Inspection requirements.
7. Rewards and enforcement methods.

The City will also consider implementing additional environmental friendly practices in the manual that are not required for each City facility, for example:

1. Materials/Supplies acquisition, storage and usage
 - a. Material description
 - b. Maximum quantity kept on hand
 - c. Allowable storage times
 - d. Storage location

2. Waste generation, storage, disposal, recycling
 - a. Waste description
 - b. Maximum storage capacity
 - c. Storage location
 - d. Method of disposal
 - e. Pickup times, contractor name
 - f. Frequency

C. Measurable Goals

MCM #6 POLLUTION PREVENTION/GOOD HOUSEKEEPING FOR MUNICIPAL OPERATIONS	SWMP Element Description	Implementation Schedule
Implement O&M Manual for Municipal Operations	Guidance manual	August 2014 – Year 2
Training for City Employees	City operation and maintenance manual	August 2014 – Year 2 August 2015 – Year 3 August 2016 – Year 4
Inspections	The City Department of Public Works will perform inspection following requirements of City operation and maintenance manual	Complete inspection form on 25% of City facilities October 2014 – Year 2

Chapter VII – FUNDING

Stormwater management is a state and federally mandated program that requires the City to regulate stormwater runoff in an effort to reduce pollution. This mandate does not require the state or federal government to provide funding for this program. Therefore, revenue sources needed to fund the mandate must be identified, and a fair way to do so is by establishing a stormwater utility fee, based on the amount of runoff from a property. This fee, authorized in the City of West Plains Stormwater Ordinance will pay for stormwater services that include public education, storm sewer inspection, cleaning, maintenance and repair, and administrative costs that are associated with stormwater management. Practices and capital improvement projects that help improve water quality will also be funded, at least in part, by the fee structure, including new storm sewer construction and changes to existing system problems. This fee is applied to owners of developed property that contains impervious areas, such as a building or a paved area or any impenetrable surface. The fee applies to all property within the City; both residential and non-residential owners, to commercial and industrial property, and churches and government owned property. Residential property owners including single family homes, mobile homes, multi-family dwellings and condominiums will have an applied fee.

The estimated cost of implementing this program from March 2013 to March 2017 is shown on the following pages.

YEAR 1		
ITEM	WHO IS PERFORMING WORK	COST
Administrator of Stormwater Program	City	\$60,000 (Full time)
Populate GIS	City	\$60,000 (Full time)
Enforcement of Management Manual & Ordinances	City	\$0
Stormwater Management Plan	City	\$2,000
Annual Report	City	\$2,000
Contacting businesses on potential prizes/discounts to attend "Environmental effects of potential pollutant and/or pathogens in stormwater"	City	\$0
Develop and print Newspaper article "Environmental impacts of stormwater and its pollutants and/or pathogens "	EPA, Missouri Department of Conservation & NRCS	\$0
Presentation "Stormwater Pollution prevention for residential households"	EPA, Missouri Department of Conservation & NRCS	\$0
Distribute City newsletter "Stormwater pollution prevention for residential households"	City	\$10,000
Presentation "Stormwater Pollution prevention for residential households"	City	\$2,000
Booth at County Fair	City, EPA, Missouri Department of Conservation, NRCS, and MDNR	\$0
Elementary and Middle School presentations	City	\$0
Implement Stormwater Utility Fee	City	\$0
Annual Report for Year 1	City	\$2,000
Community Clean-up	City	\$500
Storm Sewer Stenciling	City	\$500
Stream Team	City	\$500
BMP and Rain Garden Installation and Maintenance – Tree Planting to reduce stormwater runoff	Construction, City	\$25,000
Total for Year 1		164,500

YEAR 2		
ITEM	WHO IS PERFORMING WORK	COST
Administrator of Stormwater Program/Inspector	City	\$60,000 (Full time)
Stormwater Inspector	City	\$60,000 (Full time)
Populate GIS	City	\$20,000 (1/3 time)
Newspaper article for land disturbance	City	\$2,000
Training for contractors and developers for land disturbance	City- Professional Engineer February 2014 – Year 2 May 2015 – Year 2 August 2016 – Year 2	\$11,500
Enforce Land Disturbance Ordinance	City	\$0
Stormwater Management Manual	City	\$0
Quality Assurance Inspections for Land Disturbance	City	\$0
Review SWPPPs	City	\$0
Permit/Site Plan Tracking System for Land Disturbance	City	\$0
"Hotline" Service	City	\$1,200
Annual Report for Year 2	City	\$2,000
Community Clean-up	City	\$500
Storm Sewer Stenciling	City	\$500
Stream Team	City	\$500
BMP and Rain Garden Installation and Maintenance – Tree Planting for stormwater runoff	Construction, City	\$25,000
Total for Year 2		\$124,500

YEAR 3		
ITEM	WHO IS PERFORMING WORK	COST
Administrator of Stormwater Program/Inspector	City	\$60,000 (Full time)
Stormwater Inspector	City	\$60,000 (Full time)
Populate GIS	City	\$20,000 (1/3 time)
Training for contractors and developers for land disturbance	City March 2014 – Year 2 March 2015 – Year 3	\$5,000
Quality Assurance Inspections for Land Disturbance	City	\$0
Review SWPPPs	City	\$0
Conduct Lawn Testing for Residential and Commercial Properties	City	\$0
Hazardous waste pickup program	City	\$10,000
Newspaper article for Illicit Discharge	City	\$2,000
Enforce illicit discharge Ordinance	City	Paid in Year 1
Storm Sewer Map	City	\$0
Field Data Inspections for Illicit discharge	City	\$0
Commercial Inspections	City	\$0
Spill Response plan	City	\$0
Permit/Site Plan Tracking System for Land Disturbance	City	\$0
"Hotline" Service	City	\$1,200
Annual Report for Year 3	City	\$2,000
Community Clean-up	City	\$500
Storm Sewer Stenciling	City	\$500
Stream Team	City	\$500
BMP and Rain Garden Installation and Maintenance – Tree Planting for stormwater runoff	Construction, City	\$45,000
Total for Year 3		\$206,700

YEAR 4		
ITEM	WHO IS PERFORMING WORK	COST
Administrator of Stormwater Program/Inspector	City	\$60,000 (Full time)
Stormwater Inspector	City	\$60,000 (Full time)
Populate GIS	City	\$20,000 (1/3 time)
Training for contractors and developers for land disturbance	City March 2014 – Year 2 March 2015 – Year 3 March 2016 – Year 4	\$7,500
Review SWPPPs	City	\$0
Hazardous waste pickup program	City	\$0
Newspaper article for Post-Construction and possible fee reduction for homeowner that uses BMPs	City	\$2,000
Conduct Lawn Testing for Residential and Commercial Properties	City	\$0
Training for contractors and developers for land disturbance	City March 2014 – Year 2 March 2015 – Year 3	\$7,500
Training for homeowners for Post-construction BMPs and Stormwater Credits	City February 2014 – Year 2 May 2015 – Year 3 August 2016 – Year 4	\$11,500
Training for engineers for Post-construction design and requirements	City January 2014 – Year 2 April 2015 – Year 3 June 2016 – Year 4	\$11,500
Enforce Animal Waste Ordinance	City	\$0
Enforce Post Construction Ordinance	City	\$0
Enforce Stream Buffer Ordinance	City	\$0
Enforce and Update Stormwater Management Manual	City	\$0
Quality Assurance Inspections for Land Disturbance and Post-Construction Operating Permit inspections for Post Construction BMPs	City	\$0
Review SWMCP & SWMDP	City	\$0
Permit/Site Plan Tracking System for Land Disturbance and Post Construction BMPs	City	\$0
Field Data Inspections for Illicit discharge	City	\$0
Commercial Inspections for Illicit discharge	City	\$0
“Hotline” Service	City	\$1,200
Annual Report for Year 4	City	\$2,000
Community Clean-up	City	\$500
Storm Sewer Stenciling	City	\$500
Stream Team	City	\$500
BMP and Rain Garden Installation and Maintenance – Tree planting for stormwater runoff	Construction, City	\$45,000

Total for Year 4		\$229,700
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YEAR 5

ITEM	WHO IS PERFORMING WORK	COST
Administrator of Stormwater Program/Inspector	City	\$60,000 (Full time)
Stormwater Inspector	City	\$60,000 (Full time)
Populate GIS	City	\$20,000 (1/3 time)
Review SWPPPs	City	\$0
Hazardous waste pickup program	City	\$10,000
Conduct Lawn Testing for Residential and Commercial Properties	City	\$0
Implement O&M Manual for Municipal Operations	City	\$14,000
Training for City Employees	City	\$4,000
Implement Training for City Employees	City	\$0
Inspections of City Facilities	City	\$0
Quality Assurance Inspections for Land Disturbance and Post-Construction	City	\$0
Operating Permit inspections for Post Construction BMPs		
Review SWMCP & SWMDP	City	\$0
Permit/Site Plan Tracking System for Land Disturbance and Post-Construction BMPs	City	\$0
Field Data Inspections for Illicit discharge	City	\$0
Commercial Inspections for Illicit discharge	City	\$0
"Hotline" Service	City	\$1,200
Annual Report for Year 5	City	\$2,000
Community Clean-up	City	\$500
Storm Sewer Stenciling	City	\$500
Stream Team	City	\$500
BMP and Rain Garden Installation and Maintenance – Tree Planting for stormwater runoff	Construction, City	\$45,000
Total for Year 5		\$217,700

Based on the funding of \$200,000/yr and an estimate of 54,000,000 ft² of impervious area the following monthly fee per a square foot would be charged.

This equals 0.83 cents per square foot

The estimated total square feet of impervious area are based on the following:

1. Average resident has 1800 ft² of impervious area.
2. 6000 residents
3. Commercial impervious area is equal to the amount of residential impervious area.
4. Area of streets was not included.

This is a rough estimate of total area; the amount will change with more accurate estimates of total impervious area. Based on this total amount of impervious area some estimates of monthly rates follows:

Average house with paved driveway would pay \$.83 month.

An average sized church with a paved parking lot would be \$15 month.

Large commercial with parking lot would pay \$250+ month.