



MS4 Stormwater Management Plan 2017-2022

City of Arnold
State of Missouri
Department of Public Works

2900 Arnold Tenbrook Road
Arnold, MO 63010

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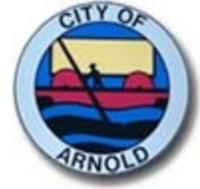
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1.0 Overview

The Environmental Protection Agency's (EPA) National Pollutant Discharge Elimination System (NPDES) Phase II Storm Water Regulations requires nationwide coverage for all operators of Small MS4s (Municipal Separate Storm Sewer System) that are located within the boundaries of a Bureau of the Census defined "urbanized area" based on the latest decennial Census. The City of Arnold was defined as urbanized from the 2000 census and required to obtain permit coverage for discharge of stormwater to Waters of the State.

Missouri's Phase II Stormwater Regulations for small MS4s are contained in Article 10 CSR 20-6.200, which defines the requirements that apply to participants in the State of Missouri to be in compliance with the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress, as amended) (Clean Water Act) and the Missouri Clean Water Law (Chapter 644 R.S. Mo, as amended). In accordance with these regulations, the Missouri State Operating Permit Water Pollution Control Program issued the City of Arnold a General Operating Permit No. MO-R040043.

The MS4 permit governing the City's requirements is located at the following DNR link: <http://www.dnr.mo.gov/env/wpp/permits/issued/R040000.pdf>

The City has been part of the program since 2003. The MS4 permit is set up in 5 year cycles with reporting periods covering January 1st to December 31st each year (previously June 13 through June 12 of each year). The 2016-2021 permit represents the third cycle of the Phase 2 MS4 program. The permit is broken up into six different areas known as Minimum Control Measures (MCM). As such, the City is expected to follow the permit by completing goals, either annually or throughout the 5 year cycle.

The City of Arnold prepared a Storm Water Management Plan (SWMP) in order to comply with the Operating Permit by defining the implementation goals for each permit term. These goals typically consist of structural or non-structural Best Management Practices (BMPs) that the City will perform or oversee. The BMPs are periodically reviewed and assessed for effectiveness with ineffective BMPs revised or removed and replaced with more effective BMPs. Implementation goals are also revised or new goals are added to address changes in the Operating Permit. Any changes in the implementation goals are documented as revisions to the SWMP.

The first permit term SWMP covered the period of March 10, 2003 through June 12, 2008. The SWMP was updated to reflect the new permit requirements for the second permit term which covered the period of June 13, 2008 to June 12, 2013. During this permit term the Missouri Department of Natural Resources (MoDNR) conducted an audit of the City of Arnold's MS4 program. A report of findings and recommendations, dated July 13, 2010 was sent to the City which resulted in a midterm revision to the SWMP (revised July 28, 2011).



The SWMP was updated again in early 2013 to reflect the permit requirements for the third permit term intended to cover the period of June 13, 2013 to June 12, 2018. Delays in adoption and issuance of the third general permit led to the City's operation under the administrative continuation clause of the permit from June 13, 2013 to December 11, 2016. The third permit cycle began covering the period from December 12, 2016 to September 30, 2021.

A second audit was performed by MoDNR on February 22-23, 2017. A report of findings and recommendations, dated March 23, 2017 was sent to the City which resulted in a subsequent revision to the SWMP to incorporate comments as well as revisions to address the new permit conditions. An outline of the intended revisions and plan for implementation was submitted to MoDNR on April 20, 2017 and was found to generally meet the compliance goals. The SWMP was subsequently updated as detailed herein. The previous iterations of the SWMP will be maintained as resources and will not be duplicated in the current SWMP.



2.0 Impaired Waters

The following is a description of the impaired waterways as required by the MS4 permit with permit sections noted.

2.1 Discharges to Impaired Waters – Permit Section 3.1.1.1

The City of Arnold is located in watersheds that discharge into two waterways that are impaired according to the DNR 2012 303(d) List. The Mississippi River is impaired for lead and zinc but was removed from the 2010 list. It is also not listed in the 2012 list. According to the 2012 list, the Meramec River is impaired for E. coli (*Escherichia coli*) bacteria and lead.

For more information on Missouri impaired lakes and streams, please refer to the DNR link: <https://dnr.mo.gov/env/wpp/waterquality/303d/303d.htm>

The source of lead pollution is listed as the nearby mines and smelters, particularly the Herculaneum smelter located downstream of the City. Lead is hazardous to humans, especially children and pregnant women. Lead from surface water may not reach homes and businesses because of regulations to filter water at drinking water intake locations. However, lead may enter the drinking water system from lead pipes normally found in older homes.

For more information on lead, please refer to the EPA link: <http://www.epa.gov/lead/>

Bacteria, as a pollutant, are associated with the following activities: runoff of pet waste and wildlife waste, such as from geese, illegal sewer connections and illicit discharges, sewer overflows, and improper septic system maintenance. These activities are addressed by the City's MS4 program, primarily through public education. Bacteria could pose a threat to humans through contact during water recreation such as swimming.

For more information on bacteria such as E. coli, please refer to the EPA link: <https://www.epa.gov/wqc/microbial-pathogenrecreational-water-quality-criteria>

2.2 Total Maximum Daily Load Reports

The Mississippi River has two EPA-approved Total Maximum Daily Loads (TMDLs). The first report, approved November 3, 2006, is on chlordane and polychlorinated biphenyls (PCBs) along the entire eastern Missouri border including the City.

The report is available at the following DNR link: <https://dnr.mo.gov/env/wpp/tmdl/docs/0226-0356-0701-1604-missouri-r-tmdl.pdf>



According to the US EPA, chlordane was a type of pesticide used in the country from 1948 up until banning in 1988. It can cause health hazards to humans and animals. Chlordane may be concentrated in fish as a result of runoff from farm fields that used the pesticide. It may also exist in the soils near manufacturing facilities that once produced or used the pesticide.

For more information on chlordane, please refer to the EPA link:

<http://www.epa.gov/opptintr/pbt/pubs/chlordane.htm>

PCBs were manufactured and used in the United States from 1929 up until banning in 1979. PCBs can be found in a variety of sources, most notably in electrical transformers and capacitors and caulking. PCBs may cause cancer and other health effects. PCBs present in waterways may have bioaccumulated in fish, causing hazards to people who ingest fish.

Lead and zinc along the border of Jefferson County is addressed in the second report, approved December 9, 2010. Neither of these pollutants is commonly associated with municipal stormwater and the reports list no additional requirement for the City of Arnold. Therefore, the tasks listed in the MCM sections do not address lead and zinc explicitly.

The second report can be found at the following DNR link:

<https://dnr.mo.gov/env/wpp/tmdl/docs/1707-miss-r-info.pdf>

The City of Arnold is not subject to a TMDL requirement.

2.3 Water Quality Controls

In 2011, the City of Arnold performed a sanitary sewer assessment to reduce inflow and infiltration. The report is to provide a plan to maximize benefits to cost when repairing the sewer system. The assessment included locating septic systems and illegal connections into the separate storm sewer system. The City does not own a wastewater treatment plant; sanitary flow goes to a plant owned by St. Louis Metropolitan Sewer District (MSD). On May 15, 2015, the City sold the sanitary sewer infrastructure to Missouri American Water Company for operation and maintenance. The City will coordinate with Missouri American Water if cross contamination of sanitary effluent is discovered in the stormwater collection system of receiving waters.

The City educates residents and businesses through stormwater brochures targeting residents, school children, industry and businesses. The brochures address common stormwater pollutants including pet waste, a possible cause of the E. coli impairment in the Meramec River. Multiple brochures are developed and tailored to each target audience. The stormwater education program also includes best management practices such as press releases, signage, a webpage, and a questionnaire.



3.0 DNR Audit

On February 22-23, 2017, MoDNR conducted an audit of the City of Arnold's MS4 program. A report of finding and recommendations, dated March 23, 2017, was delivered to the city. Copies of the audit letter and associated correspondence is presented in Appendix G. This revised SWMP was developed to address the following:

3.1 MCM 1 - Public Education and Outreach

- Develop a message and method of delivery for public education and outreach efforts targeted to the industries and businesses in the City of Arnold. This MS4 permit is a large encompassing permit, and having input and participation from stakeholder groups is a valuable aspect.
- Consider using surveys, including the one on the City's website, to assess public education and outreach efforts.
- Consider integrating Public Education and Outreach into the marking of stormwater drains. Stenciling of storm drains by local groups provides an opportunity to educate the public on the direct effect litter and spills can have.

3.2 MCM 2 – Public Involvement and Participation

- Provide public notice periods for the development and oversight of the SWMP. Ensure the required plan to target all potentially affected stakeholder groups is enacted for the public involvement and development of the SWMP.
- Identify and obtain citizen volunteers for the Citizen Advisory Board.

3.3 MCM 3 – Illicit Discharge Detection and Elimination

- Develop a written standard operating procedure for tracing the source of an illicit discharge, including the specific technique to be used to detect the location of the source.
- Develop a plan and implementation schedule to detect and address non-stormwater discharges, including discharges from illegal dumping and spills. The plan should include procedures for follow up and enforcement action.
- Consider seasonal education topics for the general public on Illicit Discharge Detection and Elimination topics, such as proper pool drainage and salt usage.
- Consider cross training of City employees to be vigilant and look for illicit discharges during day to day operations along with training on the reporting procedures.

3.4 MCM 4 – Construction Site Stormwater Runoff Control

- No comments.



3.5 MCM 5 – Post-construction Stormwater Management in New Development and Redevelopment

- Develop inspection procedures for Post Construction BMPs including an inspection schedule, tracking of corrective items and recordkeeping. Consider requirements for the owner of the feature to send in annual reports of inspections to compliment municipal oversight inspections.
- Develop a protocol for Community Development to transfer information to Public Works on constructed Water Quality BMPs after final escrow inspection and approval is completed for Public Works' use in beginning compliance oversight inspections and coordination with the Owner of the Water Quality BMP.
- Consider enhancement of the final escrow inspection to include the following: verification the BMP is installed in accordance with the approved plan, the BMP is functioning correctly (including a description of how the BMP should operate), and thorough photographic documentation of each component of the BMP for reference during future inspection cycles.
- Consider adding signage at visible rain gardens or other water quality BMPs for education opportunities.

3.6 MCM 6 – Pollution Prevention and Good Housekeeping for Municipal Operations

- Staff should be trained on how to prevent fuel pumping spills from happening.
- Spills should be cleaned promptly and the spoils disposed of properly.
- Add spill kits, and other BMPs to fueling and liquid storage areas.
- Inspect mechanical equipment for leaks and address leaks directly.
- Ensure the drains are closed properly on the secondary containment.
- Add spill containment to the oil drums inside the garage at Pomme Creek Golf Course.
- Ensure the fuel, and other fluids are drained from non-functioning equipment that is stored outside. Dispose of the drained fluids properly.
- Add BMPs between the salt dome and the detention basin to prevent salt spillage from discharging to the receiving stream.
- Install stormwater diversions or construct containment for the loose sand, and aggregate stockpiles.
- Add a BMP, such as a storm drain cover, to the stormwater drain in the trench where the roll off dumpster is stored.
- The golf cart wash area at Pomme Creek Golf Course must not be used unless the washing is done in a wash bay that is connected to a sanitary sewer.
- Do not store empty drums or barrels outside.
- Remove all tires and solid waste from areas where it could reasonably get to the waterway.



- Move the mulch pile in Ferd B Lang Park so it is not near the bank of a creek.
- Consider a way to promote the correct disposal of large trash.

4.0 Minimum Control Measures (MCM) Updates

The following six MCMs are planned according to requirements in the Operating Permit and recommendations from MoDNR. For each MCM, BMPs with measurable goals were developed for the purpose of reducing stormwater pollution. These may have originated from correspondence, conferences, EPA Fact Sheets for the permit or the MoDNR audit comments. If a BMP goal is not completed by the listed month and year or falls short of the permit requirements and recommendations, changes will be made to the goal. Evaluation of the effectiveness of the BMPs will follow an iterative approach whereby ineffective BMPs will be replaced by effective BMPs. Changes, when needed, will be submitted in the form of an updated SWMP. Updates to the SWMP may be submitted independently or with the biennial reports due February of each odd year. A summary of the public review comments received and follow up responses or actions taken are presented in Appendix F. Please visit the City of Arnold's website, <http://arnoldmo.org> under Stormwater Department, for the most recent plan.

The MCMs are outlined according to requirements in section 4.1 of the Operating Permit. A copy of the permit and more information on the MS4 program may be found on the DNR website: <http://www.dnr.mo.gov/env/wpp/stormwater/sw-local-gov-programs.htm>

In order to document requirements in the permit, a stormwater binder was created and is kept at the Public Works Director's office. This binder contains past Storm Water Management Plans, Annual Reports, related documents, and permits related to the NPDES program.

4.1 Public Education and Outreach

Target Audience: Residents, Businesses (commercial and industrial), and School children

Target Pollutants: Bacteria, Nutrients/Fertilizer, Oil and Grease, Household Hazardous Waste, and Pesticides

Responsibility: Director of Public Works

A detailed Stormwater Pollution Prevention Public Education and Outreach Plan has been developed, refer to Appendix B. Below are the BMPs and goals identified in the plan that will be tracked each year of the permit cycle.

4.1.1 Distribution of Educational Material

Description: Brochures for residents and school children on stormwater pollution and green infrastructure information are available at public facilities and mailed with the sewer/stormwater bill. Brochures targeted toward business and industry audiences will be distributed concurrently with the residential brochure mailings.



The brochures are also available on the City’s stormwater webpage.
<http://www.arnoldmo.org/government/public-works/stormwater/>

Date of Completion: Distribution once every permit year. Brochures are available year round at public facilities. These repositories are checked and restocked each quarter.

Measure of Success: Track the number of brochures printed and mailed to each target audience. Track the number of brochures restocked at repository locations.

4.1.2 Stormwater Webpage

Description: Webpage on stormwater activities is currently online (<http://www.arnoldmo.org/government/public-works/stormwater/>). Items posted include the SWMP, stormwater hotline, brochures, questionnaire, and yearly stormwater reports to the City Council. Press releases are also posted.

Date of Completion: Future items will be posted and updated when developed.

Measure of Success: Track page views for webpage and documents available.

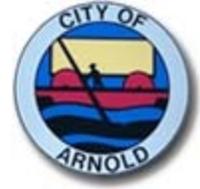
4.1.3 Press Releases

Description: The City will develop stormwater related articles and send to local newspapers and online sites for publishing. The articles are intended to educate residents and businesses on ways to minimize stormwater pollution and on stormwater activities being performed by the City. Potential topics include:

- Potential pollutant sources
- Lawn care
- Stream clean events
- Auto care
- Clean Water Law and other stormwater regulations
- The MS4 program
- Storm drain marker program
- Existing stream impairments
- Illegal dumping
- Stormwater questionnaire survey
- The green infrastructure award
- Land disturbance permit training
- Business and Industrial activities
- Clean Stream Team
- Citizen Advisory Board

Date of Completion: Two articles each permit year.

Measure of Success: Track article subjects, dates released, and where published.



4.1.4 Development of Brochures

Description: Brochures and educational material designed to achieve improvements in the target audience’s understanding of their potential impacts to stormwater and ways they can protect stormwater will be developed and made available at public facilities, hotels, libraries and other locations that may have general public access. The City’s target audience includes residents, businesses, school children, and visitors passing through our City.

Date of Completion: One brochure for each target audience each permit year. The first business and industry focused brochure will be distributed in Fall 2018.

Measure of Success: Track article subjects, dates released, and where published.

4.1.5 Stormwater Questionnaire

Description: A questionnaire on the City’s stormwater work including the MS4 program has been developed and posted on the stormwater website (<http://www.arnoldmo.org/government/public-works/stormwater/city-arnold-stormwater-questionnaire/>). Questions on topics such as water quality, flooding, and regulatory programs (including MS4, construction and industrial sites) are included to assess public knowledge. The questionnaire will stay posted on the website so that residents and businesses can fill them out anytime. Direct mail copies of the survey will be distributed with sewer bills twice during the five year cycle, once at the beginning and once near the end of the permit cycle.

Date of Completion: 1st Round - Mail to residents and businesses in Summer 2017. Develop report by Winter 2017. 2nd Round - Mail to residents and businesses in Spring 2021. Develop report by Fall 2021 for inclusion in biennial report.

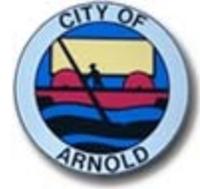
Measure of Success: A summary report of all surveys completed will be included in the biennial report. Major issues identified, such as repeated flooding, will be addressed after receipt of the questionnaire. The survey findings will be used to guide topic selection for press releases and brochure development for the 2018 to 2021 education and outreach efforts.

4.2 Public Involvement/Participation

Target Audience: Residents, Businesses (commercial and industrial), and School children.

Target Pollutants: Bacteria, Trash, Log Jams, Nutrients/Fertilizer, Oil and Grease, Household Hazardous Waste, and Pesticides.

Responsibility: Director of Public Works



4.2.1 Clean Stream Activities

Description: The City will support through manpower and equipment City-sponsored stream clean events. Volunteer-sponsored events will be supported by the City through notification and posting at public facilities.

Date of Completion: Two volunteer- or City-sponsored events will be supported annually.

Measure of Success: Documentation of the number of participants at each event and description of trash, tires, and limbs cleaned out of waterways. Information will be included in each biennial report.

4.2.2 Complaint Hotline

Description: City will utilize the “Mayor’s Hotline” as a means for citizen notification of stormwater issues. Reports on each complaint by telephone or email will be documented and addressed by the appropriate City department. The City also offers an Online Reporting Form (available at <http://www.arnoldmo.org/contact-the-city/>). The form is available for residents to report for non-emergency stormwater, nuisance or code violation issues.

Date of Completion: Hotline and reporting form are ongoing each permit year.

Measure of Success: Track number and nature of stormwater complaints, responses and follow-ups.

4.2.3 Medallion Program

Description: The City will check on previously marked inlets for missing or damaged markers and faded paint. The City will then solicit volunteers and volunteer organizations to place medallion or embossed manhole covers. The purpose will be to educate residents and advise them that only water should go down the storm drain.

Date of Completion: All inlets will be replaced by late 2018 to early 2019.

Measure of Success: Track number of inlets marked and volunteers.

4.2.4 Citizens Advisory Board

Description: The City will consolidate stormwater discussions into a regular council work session. Public volunteers will be sought to join the council during these work sessions and provide citizen representation. If the public volunteer response is significant, the City will ask the volunteers to organize into an advisory committee to



provide recommendations and input. The City will provide meeting space for the committee to meet outside of the stormwater work sessions. The committee will report to the Council during the stormwater work sessions. If no volunteers are found, the City Council and City staff will continue to function as the stormwater committee and additional solicitations for volunteers will be sent with public hearing notifications. The first topic to be discussed will be the draft revisions to the SWMP. Members of the board may include citizens, community groups, City employees, and consultants.

Date of Completion: Meetings will be held throughout the permit cycle.

Measure of Success: Meeting agendas and notes will be posted on the stormwater webpage and documented in the MS4 stormwater binder.

4.2.5 Volunteer Speaker

Description: The City will support one presentation or workshop conducted by a volunteer. The goal for the volunteer will be to increase awareness of stormwater pollution and to present in front of a group of citizens not normally involved in the stormwater planning. Examples of workshop locations are schools or City Hall during public meetings. The City will solicit volunteers and provide notification of meetings by posting in public facilities.

Date of Completion: One presentation will be organized each permit year.

Measure of Success: Topic, volunteer organization (if any), and number of attendees will be documented.

4.2.6 Public Review and Comment

Description: The City will provide opportunities for public review and comment on proposed revisions to the SWMP and on each biennial report. A public hearing presentation will be held, typically during a stormwater work session. The public hearing notice will be advertised in the local newspaper, the City's website and posted on the front doors of City hall 15 days prior to the public hearing. A 15 day comment period will follow the public hearing. All comments received will be summarized with how the comment was addressed and placed in an appendix to the reviewed document.

Date of Completion: Ongoing, one per biennial report. A public hearing for the proposed SWMP update will be held in August 2017.

Measure of Success: Date of public hearing, number of attendees and comments received will be documented.



4.3 Illicit Discharge Detection and Elimination

Target Audience: Public employees, Businesses (commercial and industrial), Residents.

Target Pollutants: Bacteria from pet waste and illegal sewer connections; Oil and Grease, Trash, Paint, and Chlorinated Pool Water illegally discharged to the storm drainage system.

Priority Areas: Industries, residences/neighborhoods, business parking lots.

Responsibility: Director of Public Works

4.3.1 Storm Sewer System Mapping

Description: The storm sewer outfall system was last updated during the 2012-2013 permit year. 265 outfalls (148 pipes and 117 ditches) were discovered. Since 2013, annual dry weather screenings found an additional 62 outfalls (47 pipes and 15 ditches). A map and list of outfalls are provided in Appendix C. During this 5-year cycle, the City will continue to update the storm sewer system map with ditches and pipes discharging into the City's waterways. Outfalls will be located and attributes will be noted using a GPS device during a field survey. Pictures will also be taken of the outfalls.

Date of Completion: December 2021

Measure of Success: Track number of new outfalls mapped and include in next SWMP. Completed map will be verified by City staff.

4.3.2 Dry-weather Screening

Description: City will continue dry-weather screening for potential illicit discharges by inspecting outfalls and stormwater facilities. Screening includes visual observations to include flow, color, odor, and distressed vegetation. Reports will be kept of all findings (and their nature), responses and follow-up in the stormwater binder.

Date of Completion: 20% of outfalls will be analyzed each permit year. 100% of the outfalls will be screened during the 5-year cycle by December 2021.

Measure of Success: Track number of potential findings and follow-ups. Findings will be addressed within three months of filing of the report.

4.3.3 Tracking Complaints

Description: City will track stormwater complaints, nature of complaints, response and follow-up from City workers and residents by mapping locations on a GIS map. Complaints may include reports of illegal dumping or storm drain maintenance



needed. Complaints will be mapped using a database or GPS receiver and associated attributes.

Date of Completion: The map will be updated each permit year.

Measure of Success: A database or printed map will be kept in the stormwater binder.

4.3.4 Illicit Discharge Ordinance

Description: Revise the current City Ordinance regarding emergency actions for containment, clean-up and recovery of discovered illicit discharges; the time of an appeal to a notice of violation; and the procedure for issuing a court summons to violators of the ordinance. The City will report on the number of enforcement measures taken and review the ordinance for possible deficiencies. After a period of five years, the City will review the ordinance and note changes needed.

Date of Completion: Adoption of Ordinance revisions by summer of 2018. Review implementation and lessons learned in the Spring of 2021. Develop and adopt recommendations for improvements to the Ordinance by December 2021.

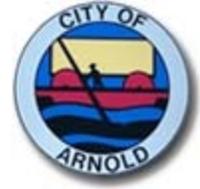
Measure of Success: Track number and type of enforcement measures.

4.3.5 Illicit Discharge Standard Operating Procedures

Description: The City will develop a standard operating procedure for tracing the source of an illicit discharge and will train City staff on implementation procedures. Source tracing techniques may include visual inspections, sampling, televising enclosed systems or dye testing. The standard operating procedure will include an inspection form and Discharge Violation Notification Letter. After a period of five years, the City will review the standard operating procedure and note changes needed. The standard operating procedure, inspection form and notification letter are presented in Appendix D.

Date of Completion: Develop standard operating procedure and begin implementation by December 2017. Review implementation and lessons learned in the Spring of 2021. Develop and adopt recommendations for improvements to the standard operating procedures by December 2021.

Measure of Success: Track number and type of tracing methods used for tracing the source of illicit discharges. Track lessons learned and improvement recommendations.



4.4 Construction Site Runoff Control

Target Audience: Public employees, Engineers/Developers, Construction site operators

Target Pollutants: Sediment, Trash and Debris, Portable Toilet Waste and Concrete Wash

Responsibility: Director of Community Development and Director of Public Works

4.4.1 Construction Site Ordinance Updates

Description: The City has an ordinance to enforce runoff for land disturbance over one acre. The ordinance is based on regulations from St. Louis County and other nearby communities. The City will report on the number of enforcement measures taken and review the ordinance for possible deficiencies. The Ordinance will be reviewed on a biennial basis to determine if revisions or updates to the Ordinance are needed to improve implementation of construction site stormwater runoff control.

Date of Completion: Review implementation and lessons learned from reported enforcement measures in the Spring of each reporting year. Develop and adopt recommendations for improvements to the Ordinance by Winter of each reporting year.

Measure of Success: Track number and type of enforcement measures.

4.4.2 Construction Permit Training

Description: City will host training presentations to educate staff and contractors on DNR construction permits. The training will cover the proper procedures of applying for land disturbance permits with the City and DNR. Inspections, documentation and BMP installation and maintenance tips will also be covered. Training topics may cover lessons learned from enforcement measures and any proposed changes to the Construction Site Ordinance or BMP Guide and Design Manual.

Date of Completion: Training presented in odd permit years after review of implementation and recommended improvements have been developed.

Measure of Success: Track date of training and number of attendees.

4.4.3 BMP Guide and Design Manual Review and Update

Description: The City has adopted a set of design standards for construction site BMPs. The design manual is based on manuals developed by MSD and St. Louis County. These design standards are required for all land disturbance over one acre. The guides will educate and provide recommendations on planning a site, inspection, installation and maintenance of BMPs. The BMP Guide and Design Manual will be reviewed on a biennial basis to determine if revisions or updates to the guidance



documents are needed to remove BMPs that have been found to be ineffective at controlling construction stormwater runoff in the local area. The review will consider the number and type of enforcement measures taken during the review period to determine if additional guidance or clarification of guidance documents is needed.

Date of Completion: Review implementation and lessons learned from reported enforcement measures in the Spring of each reporting year. Develop and adopt recommendations for improvements to the guidance documents by Winter of each reporting year.

Measure of Success: Design manual and guide links posted to stormwater website. Copies for public viewing will be available in City Hall and Public Works Building.

4.5 Post-Construction Stormwater Management

Target Audience: Public employees, Engineers/Developers, Construction site operators, Homeowner associations

Priority Areas: Residential and commercial development, Drainage area to impaired waters

Target Pollutants: Bacteria, Fertilizer, Sediment, Trash, and Volume

Responsibility: Director of Community Development and Director of Public Works

4.5.1 Post-Construction Ordinance Update

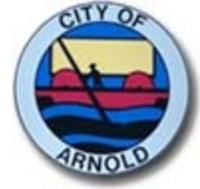
Description: The City is finalizing an ordinance update to clarify that all private stormwater facilities including post construction BMP's are subject to the Post Construction requirements of the existing ordinance for maintenance and operation of post-construction BMPs. The ordinance is based regulations from MSD and St. Louis County. The City will report on the number of enforcement measures taken and review the ordinance for possible deficiencies.

Date of Completion: Ordinance update completed by Spring 2018. Review implementation and lessons learned from reported enforcement measures in the Spring of each reporting year. Develop and adopt recommendations, if necessary, for improvements to the Ordinance by Winter of each reporting year.

Measure of Success: Track number and type of enforcement measures.

4.5.2 Green Infrastructure Award

Description: A system is currently in place to credit residents and businesses, in the form of public recognition, that implement green infrastructure practices such as rain barrels, rain gardens or pervious pavement. The City will continue the reward and review it after a period of 5 years.



Date of Completion: Review completed by fall of 2018.

Measure of Success: Number of rewards and types of practices instituted will be tracked.

4.5.3 BMP Guide and Design Manual Review and Update

Description: The City has adopted a set of design standards for post-construction BMPs. The design manual is based on manuals developed by MSD and St. Louis County. These design standards are required for all land disturbance over one acre. The guides will educate operators on permanent stormwater runoff management including green infrastructure practices. The BMP Guide and Design Manual will be reviewed on a biennial basis to determine if revisions or updates to the guidance documents are needed to remove BMPs that have been found to be ineffective at controlling construction stormwater runoff in the local area. The review will consider the number and type of enforcement measures taken during the review period to determine if additional guidance or clarification of guidance documents is needed.

Date of Completion: Review implementation and lessons learned from reported enforcement measures in the Spring of each reporting year. Develop and adopt recommendations for improvements to the guidance documents by Winter of each reporting year.

Measure of Success: Links for design manual and guides posted to stormwater website. Copies for public viewing will be available in City Hall and Public Works Building.

4.5.4 Post-Construction and Green Infrastructure Training

Description: The City will host training presentations to educate staff and contractors on post-construction BMPs, including green infrastructure. The training will cover types of post-construction BMPs, ordinances and other regulations in place, advantages of green infrastructure, the reward system, and the Missouri Guide to Green Infrastructure. Training topics may cover lessons learned from enforcement measures and any proposed changes to the Post Construction Ordinance or BMP Guide and Design Manual.

Date of Completion: Training presented in even permit years after review of implementation and recommended improvements have been developed.

Measure of Success: Track date of training and number of attendees.



4.5.5 Post-Construction Stormwater BMP Inspection

Description: The City will develop standard inspection forms and a formal BMP log to track ongoing Post Construction BMP maintenance compliance inspections. The inspections are intended to verify maintenance is being performed and reported. Inspection findings will be recorded in the BMP log and will include a summary of all findings (and their nature), responses and follow-up. The City will report on the number of inspections made, enforcement measures taken and any lessons learned. After a period of five years, the City will review the inspection procedures and lessons learned then develop improvement recommendations. The standard inspection forms are presented in Appendix E.

Date of Completion: BMP inspection and checklist forms will be developed by June 2017. A tracking log of BMP installations and inspection history will be developed by June 2017.

City compliance inspections will be performed on a rotating basis with the goal of inspecting each BMP once every three years. Review implementation and lessons learned in the Spring of 2021. Develop and adopt recommendations for improvements to the standard operating procedures by December 2021.

Measure of Success: Track date of inspection, noted violations and date of correction. Track lessons learned and improvement recommendations.

4.6 Pollution Prevention/Good Housekeeping for Municipal Operations

Target Audience: City Employees

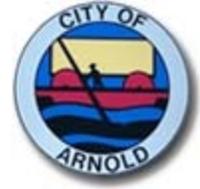
Priority Areas: City-owned facilities including but not limited to City Hall, Public Works Yard, and Pomme Creek Golf Course facilities.

Responsibility: Director of Public Works

4.6.1 Facility Operations and Stormwater Pollution Prevention Plans (SWPPPs)

Description: Inventory storage, use and disposal methods of goods and materials used by the City operations. The inventory will include chemical, paints, fuels, oils, fertilizers, deicing materials, aggregate, and other materials purchased regularly. SWPPPs detail City operations and controls and methods to reduce or eliminate stormwater pollution. SWPPPs also include a map of facilities and an area for emergency contacts. Contracted work, including street sweeping, follows an O&M plan to minimize stormwater impacts.

Date of Completion: Inventory completed June 2015. SWPPPs and contracted O&M plans reviewed once a year and modified if needed.



Measure of Success: Track knowledge of SWPPPs during annual stormwater operations training.

4.6.2 Maintenance of Stormwater System

Description: Utilize City’s Storm Water Department employees for on-going maintenance. Workers will repair and upgrade existing storm sewer system. Repairs will include coordination of Mayor’s Hotline to resolve residents’ concerns and to locate high-priority projects.

Date of Completion: On-going

Measure of Success: Track maintenance activities to include type, location, and overall number of projects.

4.6.3 Training of Municipal Employees

Description: Develop an operations training program for City employees addressing pollution prevention. The presentation will cover the history of the MS4 and CWA programs, impaired waterways, MS4 permit requirements, stormwater impacts of municipal activities, and steps to reduce their impacts. Training will include operational awareness for vigilance of illicit discharges during day to day activities. Training will be delivered to employees on an annual basis.

Date of Completion: Training given annually.

Measure of Success: Track number of attendees and date of training.

4.7 Removal of BMPs

The following are the BMPs that have been superseded or were found to be ineffective during the most recent annual review and have been removed from the SWMP.

4.7.1 General: Ordinance, Manuals and Design Guides

Description: In several of the MCMs, the SWMP goals included the adoption of Ordinances, design guidance documents or design manuals.

Reason for Removal: The goals of adopting Ordinances, Manuals or Design Guides were completed during the previous permit term.

Replaced by: These SWMP goals have been replaced by a biennial review and update goal for each adopted Ordinance, Manual or Design Guide. These iterative reviews



and improvements will help the City protect water quality by replacing ineffective BMPs in a timely manner with more effective BMPs.

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Appendix A

Acronyms

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Appendix A – Acronyms

EPA	Environmental Protection Agency's
NPDES	National Pollutant Discharge Elimination System
MS4s	Municipal Separate Storm Sewer System
MCM	Minimum Control Measures
SWMP	Storm Water Management Plan
BMPs	Best Management Practices
MoDNR	Missouri Department of Natural Resources
E. coli	Escherichia coli
TMDLs	Total Maximum Daily Loads
PCBs	Polychlorinated Biphenyls
MSD	St. Louis Metropolitan Sewer District
SWPPPs	Stormwater Pollution Prevention Plans
O&M	Operations & Maintenance

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Appendix B
Public Education and
Outreach Plan

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CITY OF ARNOLD, MISSOURI



Stormwater Pollution Prevention Public Education and Outreach Plan

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CITY OF ARNOLD

Stormwater Pollution Prevention Public Education and Outreach Plan

Preventing stormwater pollution in the first place is the most effective and cost-efficient way to protect the City's water resources and meet state and federal stormwater regulations. The foundation of a successful pollution prevention program is an active, engaged public that understands the link between individual behavior and its effect on water quality and aquatic resources. The public includes City residents and the local business community. An informed public also knows how to identify and report suspected illicit discharges and can help educate their own family members and neighbors about the importance of preventing pollution.

This plan has been developed in compliance with the City's MDNR Storm Water Audit dated March 23, 2017.

I. Existing Program

The City of Arnold has implemented a comprehensive public education and outreach program as required per the municipal separate storm water system (MS4) permit. Since that time, the program has been enhanced to meet the requirements specified in the MDNR Audit.

General Education and Outreach:

- Mailing of storm water topic brochures to residents and businesses in the City.
- Placement of storm water brochures in lobbies of Hotel's, grocery stores, public library, City Hall, restaurant kiosk's and other public locations.
- Place stormwater literature on the City's website.
- Place additional "Don't Litter" and "Pet Waste" signs throughout the City.
- Continue with stormwater collection system medallion placement or manhole lid covers which state "No Dumping-Drains to Stream".
- Continue our support to Clean Stream efforts with manpower and equipment. We Plan to advertise our support and encourage residents to volunteer in clean stream events thru website and newspaper notices.

Business Outreach:

- Distribute a general environmental education message to each business at least once during each biennial reporting year.
- Target specific business categories for education and outreach based on complaint history and illicit discharge monitoring activities. These include automotive supply and service businesses and food service businesses but not limited to these alone.

II. Permit Requirements

Section 4.2.11.4 of our MDNR MS4 permit, the City must further develop its City's public education and outreach program and provide the public with an opportunity to comment on the City's plan. The storm water operating permit provides that the program must be designed with the following goals:

- Increasing target audience knowledge about the steps that can be taken to reduce stormwater pollution, placing priority on reducing impacts to impaired waters, and other local water pollution concerns;
- Increasing target audience knowledge of hazards associated with illegal discharges and improper disposal of waste, including pertinent legal implications; and,
- Implementing a diverse program with strategies that are targeted toward audiences most likely to have significant stormwater impacts.

The City's program strives to achieve the following:

- Identify known and likely water quality issues and their causes and ways to improve the water quality.
- Identify the target audience most likely to have significant impacts for each high-priority water quality issue;
- Develop messages and associated educational and outreach materials for message distribution to the selected target audiences while considering the viewpoints and concerns of the target audiences.
- Provide the opportunity for public participation during public education and outreach program development;
- Provide for the adjustment of target audiences and messages in order to address observed weaknesses or shortcomings and may be needed.

The MS4 permit allows the City to coordinate public education and outreach efforts with other MS4 localities, recognizing that the City is individually responsible for meeting permit requirements.

Table 1 provides an overview of pollutants on concern in the City and whether each pollutant is considered a “high priority” for the purpose of additional public education and outreach. Table 1 is used to help focus the City’s outreach activities on those pollutants where public education is most likely to lead to a reduction in those pollutants.

Table 1 – Pollutants of Concern Assessment

Pollutant	Discussion	High Priority?
Sediment	The City drains to Meramec River. Sediment deposited in stream beds can smother aquatic life and harm fish. The majority of sediment in urban areas comes from stream bank erosion and construction activities. The City plans to achieve reductions primarily through storm water BMP's the reduce stormwater management and erosion and sediment control regulations. However, the public can play a role by reporting construction activities where erosion and sediment controls may be malfunctioning.	Yes
Fats, Oils, and Grease in	The City has identified fats, oils and grease from restaurant and other food service operations as a problem pollutant through field observations and called in complaints. This can be mitigated by increasing outreach to businesses on how to prevent pollution and the legal consequences on non-compliance.	Yes
Automotive Fluids	The City has identified automotive fluids from vehicle-related services as a problem pollutant through field observation and complaints. Pollution can occur through direct dumping, improper spill and leak prevention and response, and illicit car washing. This can be mitigated by increasing outreach to businesses on how to prevent pollution and the legal consequences of non-compliance.	Yes

Based on the above rationale, the City will focus on those pollutants of concern designed as “high priority” in this Storm Water Pollution Prevention Public Education and outreach plan.

III. Target Audience and Size

The MS4 permit requires the identification of target audiences most likely to have a significant impact on each pollutant of concern for each “high-priority” water quality issue. At a minimum, the education and outreach program must be designed to reach 20% of each target audience on average annually. Table 2 provides an overview of the identified target audiences.

Pollutant	Discussion	Target Audience and Size
Sediment	The public at large has been identified as the target audience. The focus of the sediment efforts will be on educating residents to recognize an erosion control issue and to know where to report the issue.	Residential Households- Approximately 7,000 households
Fats, Oils, and Grease in	Restaurants in general have been identified as the target audience for education and outreach on preventing fats, oils, and grease from entering the storm drain system.	Restaurants within City Limits- Approximately 50
Automotive Fluids	Automotive service centers, including car washes and facilities providing car wash services, have been identified as the target audience for education and outreach on preventing automotive fluids from entering the storm drain system.	Automotive Service Centers within City Limits- Approximately 14

Based on the above rationale, the City will focus on those pollutants of concern designed as “high-priority” in this Stormwater Pollution Prevention Public Education and Outreach Plan.

IV. Education and Outreach Tools

The City has a number of tools at its disposal to engage in public education and outreach. Table 3 provides an overview of significant tools identified by the City and the strengths and limitations of each when considering how to deliver an effective message; while also meeting the permit requirement to quantify the effort towards reaching 20% of each target audience annually.

Table 2– Discussion of Education and Outreach Tools

Tool	Reach	Strengths	Limitations
Brochure Distribution at Events, Meetings, and Stocked in Public Locations	Varies depending on the size of the event	The City has a number of existing brochures covering a number of storm water topics. In addition, there are a number of existing brochures from U.S EPA, and various non-profits that can be easily tailored to the City and that address specific pollutants of concern.	The distribution Target area is relatively limited. It is unknown whether the target audience actually reads the brochure.
Press Releases	Varies depending on readership of the local paper	A press release is submitted to a local newspaper or otherwise be distributed to a larger audience at a low cost to the City.	The Leader Newspaper or Countian is our publication of choice.
Storm Drain Medallions or Embossed Manhole Lids	Varies, but generally those who live near or walk past a storm drain inlet.	The City has a vigorous storm drain marker program with medallions or manhole lids that state NO DUMPING DRAINS TO STREAM where storm inlets exist as a way to educate the public and educate about illicit discharge.	The use of embossed manhole lids are preferred to glue down medallions as they will last longer but are more expensive than medallions.
City	City	The City's existing stormwater page is accessible and contains large amounts of information.	Residents have to have access to the internet to view the City's stormwater page.
Direct Mail through trash and stormwater quarterly billing	Varies depending on targeted audience but can reach 100% provided addresses are available.	The message reaches a defined audience. Stand-alone nature of a direct mailing from the City may increase the chance of being read.	Not all residents will read the message. This option is more expensive since it is done per first class mail.

V. Message Development

The MS4 permit requires the City to develop relevant pollution prevention messages to be delivered to target audiences. Table 4 provides an overview of pollution prevention actions and associated messages based on a review of existing U.S. EPA documents and other sources.

Table 3 – Pollution Prevention Messages

Pollutant	Pollution Prevention Action	Message Highlight
General	Make the connection between individual actions and stormwater pollution	"NO Dumping Drains to Streams"
Nutrients	Mowing high with a sharp blade (2 to 3 inches for cool-season grasses) can keep a lawn greener without fertilizers.	*Protect local streams and the Meramec River.
	Leaving grass clippings on the lawn reduces the need for nitrogen fertilizer by as much as one-third.	* Reduce the cost of drinking water treatment
	For cool season grasses, September through November is the best time for fertilizing.	* Healthier lawn.
	The best way to determine if your lawn needs fertilizer is to test it.	*Saving money (less frequent use of fertilizers).
	Never apply fertilizers to sidewalks, driveways or roadways. Sweep or blow fertilizer spilled on hard surfaces.	* Saving time (no need to fertilize in the fall).
Sediment	Report illicit discharges to the City by contacting the Department of Public Works (636-282-2386) or reporting problems using the City's "contact us" function on the website.	*Protect local streams and the Meramec River. *Reduce the cost of drinking water treatment. * Protecting our water resources is everyone's responsibility.
Bacteria	Pick up after your pet.	* Pet waste goes to our drinking water supply and must be cleaned. That is gross. * Pet waste causes illness making streams unsafe for kids and pets. * Picking up pet waste is the law.

Fats, Oils, and Grease	Fats, Oils, and grease must be properly recycled never down the storm drain.	* Protecting our environment is part of being a good business. * It is the law - fines/jail time can be imposed.
Automotive Fluids	Automotive fluids must be properly recycled-never down the storm drain.	* Protecting our environment is part of being a good business * It is the law - fines/jail time can be imposed.
	All washing activities must be done inside-no wash water to the storm drain	

VI. Public Education and Outreach Strategies

The following public education and outreach strategies have been selected and will be implemented to meet the requirements of the MS4 permit. The strategies were selected taking into account the City’s desire to engage in general outreach, including outreach to the City’s entire population, while also focusing on specific water quality issues and target audiences determined in previous sections. Specific strategies were chosen considering the need to engage 20% of each targeted audience annually and the requirement to document this engagement, the outreach tools at the City’s disposal, and the identified messages. The City also intends to continue its participation in the Clean Stream Clean Up events.

General Education and Outreach

Objective and Expected Results: The purpose of this BMP is to increase general knowledge about the link between individual actions and stormwater pollution and to educate residents about how they can change their behavior to have a positive impact on local streams and the Meramec River.

Implementation and Schedule:

- Distribute water quality messages at the City Hall and during community events.
- Distribute and stock water quality messages at public venues.
- Increase stormwater quality related brochures mailed out to City residents.
- Include a stormwater quality related message in press releases.
- Promote and provide information to City residents and organizations on the storm drain marker program.
- Update the stormwater web page with new information as appropriate.
- Continue with our participation and support of Clean Stream events.

Documentation and Measure of Effectiveness: The City will document efforts to engage and educate citizens and will report on these efforts in the biennial report. This will include the message, amount of materials distributed and an estimate to the number of individuals

reached. The City will provide a summary of the Clean Stream program and the results of any surveys or other mechanisms used to determine program effectiveness.

Nutrients and Fertilizers

Objective and Expected Results: The purpose of this BMP is to provide education and outreach to inform property owners on ways to reduce the impact of nutrients through proper use and application of fertilizers.

Implementation and Schedule: The City has identified all households as the target audience for nutrient-related education. In addition, the City has identified Home Owner Association’s (HOA’s) that manage open space as an additional target audience.

- At least one of the stormwater quality related brochure to be included on the City’s website will focus on the proper use and application of fertilizers.
- In 2020, at least one of the stormwater quality related brochure to be included in the City’s service billing will focus on the proper use and application of fertilizers.
- Participate in the Clean Stream events program effort to reduce water quality impacts from dumping debris along stream banks.
- In 2018, at least one of the stormwater quality related press release message will focus on the proper use and application of fertilizers.
- Annually, approximately 25% of HOA’s will receive a stormwater quality related brochure focused on the proper use and application of fertilizers.

Documentation and Measure of Effectiveness: The City’s Public Works Department will document these efforts in the biennial report.

Target Audience	Strategy	Strategy Reach	Percent Target Reached
All Households	City Website	City-Wide	100% annually
	Brochure	City-Wide	100% in 2018
	Clean Stream Cleanup	City-Wide	100% annually
	Press Release	City-Wide	100% in 2018
HOA’s Associations	Direct Mail/City Website/Newspaper	HOA Association Boards	25% annually

Sediment and Other Illicit Discharges

Objective and Expected Results: The purpose of this BMP is to reduce illicit discharges, with a particular focus on sediment pollution, by educating residents on how to recognize and report a suspected illicit discharge.

Implementation and Schedule: The City has identified all households as the target audience for illicit discharge and sediment-related education.

- In 2020, at least one on the stormwater quality related brochure on the City’s Website will focus on the effects of sediment and other illicit discharges.
- In 2019, at least one of the stormwater quality related brochures to be included annually in the City’s quarterly service billings will focus on how to identify and report an illicit discharge, including erosion and sediment control issues.
- Participate in the Clean Stream program effort to reduce water quality impacts from illicit discharges.
- In 2019, at least one of the stormwater quality related press release message will focus on the effects of sediment and other illicit discharges.
- Maintain City’s website with a specific option for reporting an illicit discharge to the stormwater collection system.
- Highlight alternatives to illicit discharges by promoting the availability of the Jefferson County Hazardous Waste Program, on the City’s website.

Documentation and Measure of Effectiveness: The City will document these efforts in the biennial report.

Target Audience	Strategy	Strategy Reach	Percent Target Reached
All Households	City Website	City-Wide	100% annually
	Brochures	City-Wide	100% in 2019
	Clean Stream Cleanup	City-Wide	100% annually
	Press Releases	City-Wide	100% in 2019

Bacteria

Objective and Expected Results: The purpose of the BMP is to reduce bacteria pollution by educating residents in general, and pet owners specifically, on the impacts of pet waste on water quality and the importance of picking up after pets.

Implementation and Schedule: The City has identified all residents as the target audience for pet waste-related education, with a specific focus on dog owners.

- In 2020, at least one on the stormwater quality related brochure on the City’s Website will focus on the importance of picking up after pets.
- In 2020, at least one of the stormwater quality related brochure to be included in the City’s service billing will focus on the importance of picking up after pets.
- Participate in the Clean Stream Cleanup program to reduce water quality impacts from bacteria caused by illegal dumping, and restock and maintain pet waste stations in public parks.
- In 2020, at least one of the stormwater quality related press release message will focus on the importance of picking up after pets.

Target Audience	Strategy	Strategy Reach	Percent Target Reached
All Households	Message in City Website	City-Wide	100% annually
	Brochures	City-Wide	100% in 2020
	Clean Stream Cleanup	City-Wide	100% annually
	Press Releases	Local Paper	100% in 2020

Targeted Business Outreach

Objective and Expected Results: The purpose of this BMP is to engage businesses in general as partners in protecting water quality and preventing stormwater pollution. In addition, this BMP aims to reduce the discharge of fats, oils, and grease from restaurants and automotive fluids from automotive service centers.

Implementation and Schedule: The City has identified all businesses as the target audience, with a specific focus on restaurants and automotive service centers.

- Distribute a general environmental education message to each business in the City at least once from 2018 through 2022.
- By the end of 2018, send a letter and any other information to all restaurants about the importance of pollution prevention and the legal ramifications for dumping or illicit discharges.
- By the end of 2018, send a letter and any other information to all automotive service centers about the importance of pollution prevention and the legal ramifications for dumping or illicit discharges.

Documentation and Measure of Effectiveness: The City will document these efforts in the biennial report, including sample letters and examples of information provided. The following table provides the City’s plan for meeting the requirement to reach the target audiences.

Target Audience	Strategy	Strategy Reach	Percent Target Reached
All Businesses	Direct Mail	City-Wide	20% annually
Restaurants	Direct Mail	Restaurants	100% in 2018
Automotive Service Centers	Direct Mail	Automotive Service Centers	100% in 2018

VII. Assessment of Strategies

The City will assess the adequacy of selected public education and outreach strategies and include this in each biennial report to MDNR. If the selected BMPs are determined to not be

meeting these goals, the City will document program changes and submit the documentation to MDNR. Prior to application for continued permit coverage, the City will evaluate the entire education and outreach program for the following:

- Appropriateness of the high-priority stormwater issues.
- Appropriateness of the selected target audiences for each high-priority stormwater issue.
- Effectiveness of the message or messages being delivered.
- Effectiveness of the mechanism or mechanisms of delivery employed in reaching the target audiences.

VIII. Public Participation in Plan Development

The draft Stormwater Pollution Prevention Public Education and Outreach Plan was posted for comment on the City's dedicated Stormwater webpage.

In 2018 the City will review the plan with the Citizen's Advisory Board to seek additional feedback and ideas for how to enhance the City's efforts. The Board is intended to consist of 5 citizen representatives appointed by the City Council and includes in its mission educating the public about environmental issues and initiatives.

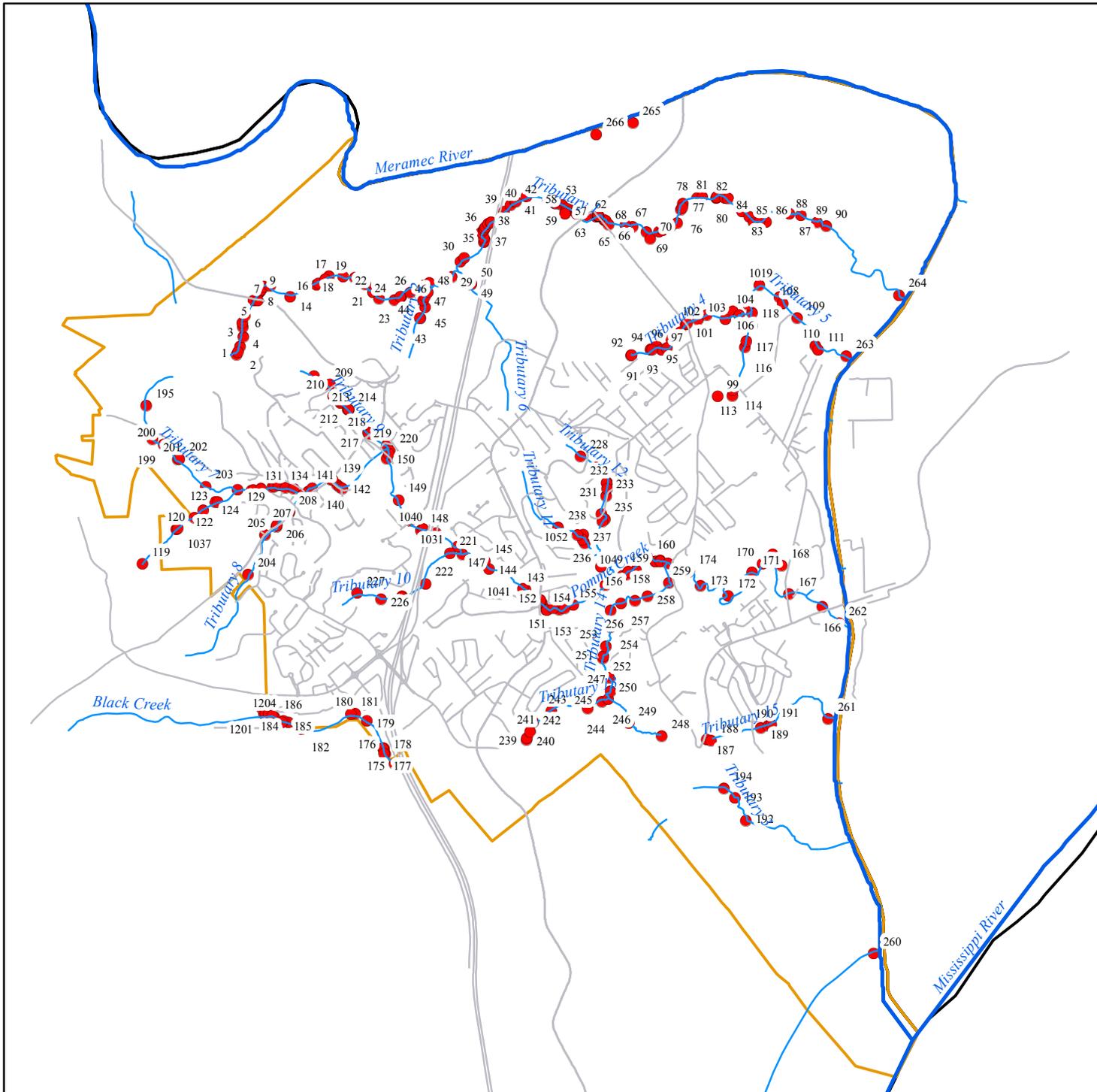
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Appendix C

Stormwater Outfall Map

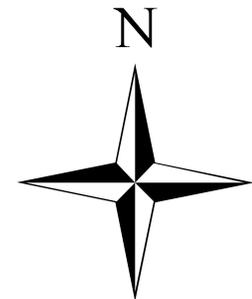
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Appendix C - City of Arnold Outfall Map



Legend

- Outfall
- Rivers
- Roads
- Streams
- City Limits



3,250 1,625 0 3,250 Feet



Appendix C - Stormwater Outfall Table

Outlet Number	Date Surveyed	Size (inches)	Type	Material	Latitude	Longitude	Comments
1	11/19/2012	24	CMP	Pipe	38.438826	-90.402475	
2	11/19/2012	18	PVC	Pipe	38.439431	-90.402153	
3	11/19/2012	48	CMP	Pipe	38.440090	-90.401834	
4	11/19/2012	24	PVC	Pipe	38.440839	-90.401842	
5	11/19/2012	48	CMP	Pipe	38.441130	-90.401890	
6	11/19/2012	36	CMP	Pipe	38.441625	-90.401634	
7	11/19/2012	12	Concrete	Ditch	38.442735	-90.400816	drainage from parking lot
8	11/19/2012	36	Concrete	Pipe	38.442706	-90.400403	drainage from road
9	11/19/2012	18	PVC	Pipe	38.443304	-90.400200	
10	11/19/2012	18	PVC	Pipe	38.443422	-90.400112	
11	11/19/2012	18	PVC	Pipe	38.443455	-90.400064	across stream
12	11/19/2012	96	Concrete	Ditch	38.443713	-90.399806	drainage from road
13	11/19/2012	60	Grass	Ditch	38.443724	-90.399236	
14	11/19/2012	60	CMP	Pipe	38.442908	-90.397382	drains to ditch
15	11/19/2012	8	PVC	Pipe	38.443742	-90.394931	
16	11/19/2012	48	Concrete	Ditch	38.443825	-90.394769	
17	11/19/2012	72	Concrete	Ditch	38.444327	-90.393784	drainage from road
18	11/19/2012	72	Grass	Ditch	38.444266	-90.392433	
19	11/19/2012	36	Grass	Ditch	38.444172	-90.391391	
20	11/19/2012	24	CMP	Pipe	38.443661	-90.390424	2 pipes; 1 is 18in pvc
21	11/19/2012	24	Concrete	Pipe	38.443107	-90.389689	
22	11/19/2012	48	Grass	Ditch	38.443080	-90.389756	orange in ditch
23	11/19/2012	60	Grass	Ditch	38.442606	-90.389214	
24	11/19/2012	18	Concrete	Pipe	38.442482	-90.387781	
25	11/19/2012	8	PVC	Pipe	38.442680	-90.387166	
26	11/19/2012	36	PVC	Pipe	38.442940	-90.386305	
27	11/19/2012	36	Concrete	Pipe	38.443444	-90.385095	
28	11/19/2012	36	CMP	Pipe	38.443632	-90.384522	
29	11/19/2012	36	Grass	Ditch	38.445114	-90.381580	
30	11/19/2012	36	CMP	Pipe	38.445380	-90.381249	
31	11/19/2012	30	CMP	Pipe	38.446483	-90.379398	
32	11/19/2012	48	PVC	Pipe	38.446613	-90.379285	
33	11/19/2012	48	CMP	Pipe	38.446796	-90.379397	
34	11/19/2012	72	Grass	Ditch	38.447184	-90.379597	
35	11/19/2012	36	Concrete	Pipe	38.447359	-90.379338	
36	11/19/2012	8	PVC	Pipe	38.447454	-90.379315	
37	11/19/2012	24	CMP	Pipe	38.447545	-90.379222	
38	11/19/2012	72	Grass	Ditch	38.447790	-90.378947	
39	11/19/2012	36	Grass	Ditch	38.448644	-90.377443	
40	11/19/2012	120	Concrete	Ditch	38.449088	-90.376816	
41	11/19/2012	12	Concrete	Pipe	38.449364	-90.376398	
42	11/19/2012	36	Concrete	Pipe	38.449362	-90.376322	
43	11/20/2012	36	CMP	Pipe	38.441093	-90.385462	
44	11/20/2012	12	PVC	Pipe	38.441082	-90.385487	
49	11/20/2012	96	Concrete	Ditch	38.443490	-90.380652	
50	11/20/2012	96	Concrete	Ditch	38.443458	-90.380687	
52	11/20/2012	36	Concrete	Pipe	38.449323	-90.373230	
54	11/20/2012	10	CMP	Pipe	38.449184	-90.372756	
55	11/20/2012	48	Grass	Ditch	38.449093	-90.372614	
56	11/20/2012	12	CMP	Pipe	38.448998	-90.372065	
60	11/20/2012	12	Concrete	Pipe	38.448636	-90.371374	clay tile
61	11/20/2012	12	Concrete	Pipe	38.448331	-90.370766	
63	11/20/2012	12	CMP	Pipe	38.448088	-90.368965	

Appendix C - Stormwater Outfall Table

Outlet Number	Date Surveyed	Size (inches)	Type	Material	Latitude	Longitude	Comments
64	11/20/2012	15	CMP	Pipe	38.447849	-90.368273	
65	11/20/2012	96	Concrete	Pipe	38.447749	-90.368101	
66	11/20/2012	24	Concrete	Pipe	38.447521	-90.367842	
68	11/20/2012	15	Concrete	Pipe	38.447296	-90.365644	
71	11/20/2012	36	Grass	Ditch	38.446889	-90.363204	
72	11/20/2012	36	Grass	Ditch	38.446963	-90.362872	
73	11/20/2012	36	Grass	Ditch	38.447147	-90.362458	
74	11/20/2012	12	Concrete	Pipe	38.447251	-90.362104	clay tile
75	11/20/2012	12	Concrete	Pipe	38.447462	-90.361532	running water
76	11/20/2012	72	Grass	Ditch	38.448443	-90.361122	
77	11/20/2012	24	CMP	Pipe	38.448846	-90.360918	
78	11/20/2012	24	CMP	Pipe	38.449222	-90.359595	
80	11/21/2012	24	Concrete	Pipe	38.449200	-90.357819	
81	11/21/2012	24	Concrete	Pipe	38.449261	-90.357794	
82	11/21/2012	8	CMP	Pipe	38.449159	-90.357031	
83	11/21/2012	60	Grass	Ditch	38.448180	-90.355505	
84	11/21/2012	12	CMP	Pipe	38.447785	-90.354836	
85	11/21/2012	36	CMP	Pipe	38.447356	-90.354440	drains to short ditch then crk
87	11/21/2012	48	Grass	Ditch	38.447899	-90.351104	
88	11/21/2012	3	PVC	Pipe	38.447747	-90.350082	
89	11/21/2012	36	Grass	Ditch	38.447220	-90.348587	
90	11/21/2012	96	Grass	Ditch	38.446902	-90.347783	
91	11/27/2012	36	Concrete	Pipe	38.437958	-90.366097	
92	11/27/2012	30	CMP	Pipe	38.437970	-90.366071	pipe leads to short ditch
93	11/27/2012	12	PVC	Pipe	38.438362	-90.364266	
94	11/27/2012	2	PVC	Pipe	38.438359	-90.364267	
95	11/27/2012	12	PVC	Pipe	38.438590	-90.363717	
96	11/27/2012	12	CMP	Pipe	38.438584	-90.363718	
97	11/27/2012	72	Grass	Ditch	38.438320	-90.363279	
100	11/27/2012	24	Concrete	Pipe	38.439252	-90.361819	
101	11/27/2012	36	Concrete	Pipe	38.440101	-90.360998	
102	11/27/2012	36	Concrete	Pipe	38.440147	-90.360837	
103	11/27/2012	24	Concrete	Pipe	38.440423	-90.359836	
105	11/27/2012	48	Grass	Ditch	38.440787	-90.354845	
107	11/27/2012	12	CMP	Pipe	38.441861	-90.352277	
108	11/27/2012	48	Grass	Ditch	38.441413	-90.351970	
109	11/27/2012	12	Concrete	Pipe	38.440297	-90.350712	
110	11/27/2012	120	Grass	Ditch	38.438304	-90.349085	
111	11/27/2012	96	Grass	Ditch	38.437968	-90.348837	
112	11/27/2012	36	CMP	Pipe	38.434820	-90.356844	2 36 inch cmp
113	11/27/2012	6	PVC	Pipe	38.435242	-90.356784	
114	11/27/2012	120	Grass	Ditch	38.435583	-90.356591	
115	11/27/2012	24	CMP	Pipe	38.435774	-90.356471	
116	11/27/2012	60	Grass	Ditch	38.438310	-90.355601	
117	11/27/2012	60	Grass	Ditch	38.438761	-90.355454	
119	11/28/2012	120	Grass	Ditch	38.423856	-90.411707	
120	11/28/2012	60	Grass	Ditch	38.427078	-90.406803	
121	11/28/2012	60	Grass	Ditch	38.427627	-90.405967	
122	11/28/2012	120	Grass	Ditch	38.428202	-90.404869	
123	11/28/2012	60	Grass	Ditch	38.428183	-90.404634	
124	11/28/2012	36	Grass	Ditch	38.429034	-90.402765	
125	11/28/2012	60	Grass	Ditch	38.428942	-90.401454	
126	11/28/2012	24	CMP	Pipe	38.428973	-90.401284	

Appendix C - Stormwater Outfall Table

Outlet Number	Date Surveyed	Size (inches)	Type	Material	Latitude	Longitude	Comments
127	11/28/2012	4	PVC	Pipe	38.429071	-90.400580	
128	11/28/2012	12	Concrete	Pipe	38.429163	-90.399545	
129	11/28/2012	18	Concrete	Pipe	38.429233	-90.399326	
130	11/28/2012	60	Grass	Ditch	38.429276	-90.398956	
131	11/28/2012	12	Concrete	Pipe	38.429093	-90.398319	
132	11/28/2012	120	Grass	Ditch	38.428574	-90.396769	
133	11/28/2012	24	Concrete	Pipe	38.428779	-90.396225	
134	11/28/2012	24	Concrete	Pipe	38.429007	-90.395877	
135	11/28/2012	36	Concrete	Pipe	38.429785	-90.394341	
136	11/28/2012	24	Concrete	Pipe	38.429755	-90.394224	
137	11/28/2012	18	Concrete	Pipe	38.429674	-90.394285	
138	11/28/2012	18	Concrete	Pipe	38.429580	-90.394122	
140	11/28/2012	12	Concrete	Pipe	38.429210	-90.393574	
141	11/28/2012	12	Concrete	Pipe	38.429028	-90.393320	
142	11/28/2012	18	Concrete	Pipe	38.428908	-90.393069	
144	11/28/2012	36	Grass	Ditch	38.422790	-90.379748	flow present
145	11/28/2012	36	Concrete	Pipe	38.423370	-90.380144	to ditch then creek, w/flow
146	11/28/2012	36	Grass	Ditch	38.423911	-90.382190	
147	11/28/2012	42	Concrete	Pipe	38.424463	-90.382595	
148	11/28/2012	60	Grass	Ditch	38.425732	-90.385961	
149	11/28/2012	72	Grass	Ditch	38.427941	-90.387913	
150	11/28/2012	120	Grass	Ditch	38.430983	-90.388903	
151	11/29/2012	36	Dirt	Ditch	38.420168	-90.374976	
152	11/29/2012	48	Grass	Ditch	38.419719	-90.374605	widened to 84 in wide, w/flow
153	11/29/2012	36	Grass	Ditch	38.419660	-90.374540	widened to 48 in wide, w/flow
157	11/29/2012	12	CMP	Pipe	38.421382	-90.369095	
161	11/29/2012	8	PVC	Pipe	38.422995	-90.364403	
162	11/29/2012	6	PVC	Pipe	38.422999	-90.364389	
163	11/29/2012	2	PVC	Pipe	38.423050	-90.363933	
164	11/29/2012	6	PVC	Pipe	38.422987	-90.363949	
165	11/29/2012	96	Grass	Ditch	38.422835	-90.363274	
166	11/29/2012	30	Concrete	Pipe	38.419338	-90.349136	leads to short ditch then crk
169	11/29/2012	72	Grass	Ditch	38.423253	-90.353561	
170	11/29/2012	36	Grass	Ditch	38.422595	-90.354513	outfall on west side of creek
171	11/29/2012	24	Grass	Ditch	38.421991	-90.355493	outfall on north side of creek
173	11/29/2012	60	Grass	Ditch	38.421105	-90.360316	outfall on south side of creek
175	11/30/2012	120	Grass	Ditch	38.408850	-90.389004	minor base flow 5ft by 4ft
176	11/30/2012	30	Concrete	Pipe	38.409573	-90.389828	running water
177	11/30/2012	24	Concrete	Pipe	38.409957	-90.389985	good no flow RDB
178	11/30/2012	15	PVC	Pipe	38.409966	-90.389920	no flow damaged LDB
179	11/30/2012	18	Concrete	Pipe	38.412017	-90.391467	
180	11/30/2012	96	dirt	Ditch	38.412567	-90.392496	outfall with overhead pipe LDB
181	11/30/2012	12	Concrete	Pipe	38.412562	-90.392898	with low flow LDB
182	11/30/2012	48	Dirt	Ditch	38.411564	-90.397450	RDB
183	11/30/2012	12	Concrete	Pipe	38.411883	-90.397867	with water
184	11/30/2012	72	Grass	Ditch	38.412101	-90.398680	LDB 6ft by 2ft
185	11/30/2012	24	Grass	Ditch	38.412192	-90.399098	2ft by 2ft good
186	11/30/2012	36	Grass	Ditch	38.412481	-90.399935	on RDB
187	11/30/2012	24	Concrete	Pipe	38.409970	-90.360131	start point
188	11/30/2012	6	PVC	Pipe	38.409877	-90.359772	
189	11/30/2012	36	Concrete	Pipe	38.410675	-90.355135	creek daylight here
190	11/30/2012	18	CMP	Pipe	38.410863	-90.354419	
191	11/30/2012	36	Concrete	Pipe	38.410929	-90.354170	pipe leads to short ditch

Appendix C - Stormwater Outfall Table

Outlet Number	Date Surveyed	Size (inches)	Type	Material	Latitude	Longitude	Comments
192	11/30/2012	72	Grass	Ditch	38.404008	-90.356739	
193	11/30/2012	36	Grass	Ditch	38.405675	-90.357696	
194	11/30/2012	48	Grass	Ditch	38.406402	-90.358665	
195	12/3/2012	36	CMP	Pipe	38.435325	-90.410942	
196	12/3/2012	15	Concrete	Pipe	38.433467	-90.410564	
197	12/3/2012	4	PVC	Pipe	38.433337	-90.410524	
198	12/3/2012	8	PVC	Pipe	38.433338	-90.410517	
199	12/3/2012	48	Grass	Ditch	38.432872	-90.410484	
200	12/3/2012	12	PVC	Pipe	38.432477	-90.409460	
201	12/3/2012	36	Grass	Ditch	38.431352	-90.408199	
202	12/3/2012	48	Grass	Ditch	38.431384	-90.408034	
203	12/3/2012	15	PVC	Pipe	38.429316	-90.405705	
204	12/3/2012	42	Concrete	Pipe	38.422864	-90.402008	
205	12/3/2012	18	Concrete	Pipe	38.425686	-90.400335	2 18 inch pipes
206	12/3/2012	24	Concrete	Ditch	38.426270	-90.399263	
207	12/3/2012	15	CMP	Pipe	38.426415	-90.399228	
208	12/3/2012	15	CMP	Pipe	38.427296	-90.398055	
209	12/3/2012	24	Grass	Ditch	38.436468	-90.394402	
210	12/3/2012	24	Grass	Ditch	38.435630	-90.393675	
211	12/3/2012	24	Grass	Ditch	38.435126	-90.393037	
212	12/3/2012	30	Concrete	Pipe	38.434640	-90.392377	
213	12/3/2012	30	Concrete	Pipe	38.434633	-90.392320	
214	12/3/2012	8	CMP	Pipe	38.434619	-90.392332	metal pipe
215	12/3/2012	24	PVC	Pipe	38.433869	-90.391382	pipe leads to short ditch
216	12/3/2012	24	Grass	Ditch	38.433540	-90.391120	
217	12/3/2012	24	Concrete	Ditch	38.432893	-90.390549	
218	12/3/2012	18	CMP	Pipe	38.432813	-90.390496	
219	12/3/2012	72	Grass	Ditch	38.431973	-90.388880	
220	12/3/2012	36	Grass	Ditch	38.431594	-90.388603	
221	12/5/2012	48	Grass	Ditch	38.424015	-90.383332	
222	12/5/2012	24	Grass	Ditch	38.421827	-90.385669	
223	12/5/2012	72	Concrete	Ditch	38.420987	-90.387857	
224	12/5/2012	72	Concrete	Ditch	38.420926	-90.387913	
225	12/5/2012	24	Grass	Ditch	38.420613	-90.388460	
226	12/5/2012	48	Grass	Ditch	38.420808	-90.389826	
227	12/5/2012	48	Grass	Ditch	38.421300	-90.391979	
228	12/5/2012	24	Concrete	Pipe	38.430731	-90.371051	
229	12/5/2012	4	PVC	Pipe	38.429892	-90.369615	
230	12/5/2012	48	Grass	Ditch	38.429665	-90.368987	culverts recently installed
231	12/5/2012	4	PVC	Pipe	38.428809	-90.368653	
232	12/5/2012	4	PVC	Pipe	38.428770	-90.368704	3 inch and 4 inch pvc pipes
233	12/5/2012	15	CMP	Pipe	38.427812	-90.368768	
234	12/5/2012	24	Concrete	Ditch	38.426537	-90.369253	
235	12/5/2012	72	Grass	Ditch	38.426160	-90.368961	flow present
236	12/5/2012	12	Concrete	Pipe	38.422701	-90.369455	outfalls to pond, flow present
237	12/5/2012	36	Grass	Ditch	38.425088	-90.370995	3ft by 2ft, flow present
238	12/5/2012	42	Concrete	Ditch	38.425635	-90.373282	stream daylight here
239	12/6/2012	30	Concrete	Pipe	38.410322	-90.376779	2 30 inch pipes and start pnt
240	12/6/2012	12	Concrete	Ditch	38.410462	-90.376702	
241	12/6/2012	4	PVC	Pipe	38.410905	-90.376378	
242	12/6/2012	96	Grass	Ditch	38.411602	-90.376102	
243	12/6/2012	72	Grass	Ditch	38.412352	-90.374390	
244	12/6/2012	72	Grass	Ditch	38.412469	-90.371062	

Appendix C - Stormwater Outfall Table

Outlet Number	Date Surveyed	Size (inches)	Type	Material	Latitude	Longitude	Comments
245	12/6/2012	48	Grass	Ditch	38.412939	-90.369691	
246	12/6/2012	72	Grass	Ditch	38.413086	-90.369135	
247	12/6/2012	48	Grass	Ditch	38.413677	-90.368881	
248	12/6/2012	48	Grass	Ditch	38.410292	-90.364273	
249	12/6/2012	72	Grass	Ditch	38.411324	-90.367277	
250	12/6/2012	30	Concrete	Pipe	38.414664	-90.368965	
251	12/6/2012	24	PVC	Pipe	38.416049	-90.369484	
252	12/6/2012	24	Grass	Ditch	38.416229	-90.369460	
253	12/6/2012	8	PVC	Pipe	38.416915	-90.369188	
254	12/6/2012	48	Grass	Ditch	38.418328	-90.368733	
255	12/6/2012	8	PVC	Pipe	38.419507	-90.368670	
256	12/6/2012	4	PVC	Pipe	38.420010	-90.367676	
257	12/6/2012	4	PVC	Pipe	38.420191	-90.366391	
258	12/6/2012	24	Grass	Ditch	38.420456	-90.365224	
259	12/6/2012	4	PVC	Pipe	38.421384	-90.363220	
260	4/11/2013	120	Grass	Ditch	38.394113	-90.345324	35ft ditch
261	4/11/2013	120	Grass	Ditch	38.411194	-90.348908	10ft ditch
262	4/11/2013	120	Grass	Ditch	38.418111	-90.347621	50ft ditch
263	4/11/2013	120	Grass	Ditch	38.437470	-90.346254	20ft ditch
264	4/11/2013	120	Grass	Ditch	38.441760	-90.341231	30ft ditch
265	4/11/2013	36	CMP	Pipe	38.454794	-90.365314	
266	4/11/2013	48	Grass	Ditch	38.454050	-90.368726	
143	11/28/2012	24	Concrete	Pipe	38.421221	-90.376460	pooled water around pipe
158	11/29/2012	72	Grass	Ditch	38.422029	-90.367492	6ft wide 4 ft deep
159	11/29/2012	6	PVC	Pipe	38.422415	-90.366237	could not locate
160	11/29/2012	72	Grass	Ditch	38.423338	-90.365154	6 ft wide 2 ft deep
167	11/29/2012	36	Grass	Ditch	38.420343	-90.352176	outfall on south bank
168	11/29/2012	120	Grass	Ditch	38.422405	-90.352753	
172	11/29/2012	36	Grass	Ditch	38.420327	-90.357792	outfall on south side of creek
174	11/29/2012	24	Grass	Ditch	38.422189	-90.361333	
45	11/20/2012	18	Concrete	Pipe	38.441872	-90.384991	
46	11/20/2012	2	CMP	Pipe	38.442363	-90.385123	
47	11/20/2012	6	PVC	Pipe	38.442669	-90.384974	
48	11/20/2012	12	Concrete	Pipe	38.442941	-90.384667	
51	11/20/2012	36	Concrete	Pipe	38.449367	-90.373385	
59	11/20/2012	10	CMP	Pipe	38.448728	-90.371652	
58	11/20/2012	18	Concrete	Pipe	38.448539	-90.371768	
57	11/20/2012	15	Concrete	Pipe	38.448372	-90.371806	clay tile
53	11/20/2012	36	Concrete	Ditch	38.449213	-90.372668	
86	11/21/2012	96	Grass	Ditch	38.447347	-90.353290	
69	11/20/2012	18	CMP	Pipe	38.446878	-90.364355	
70	11/20/2012	12	CMP	Pipe	38.446370	-90.364031	
67	11/20/2012	18	Concrete	Pipe	38.447429	-90.366274	
106	11/27/2012	24	PVC	Pipe	38.441386	-90.355145	
104	11/27/2012	18	PVC	Pipe	38.440934	-90.356580	
99	11/27/2012	30	Concrete	Pipe	38.434838	-90.358241	
118	11/27/2012	36	Concrete	Pipe	38.439863	-90.354870	
139	11/28/2012	18	Concrete	Pipe	38.429558	-90.393969	
62	11/20/2012	36	Grass	Ditch	38.448146	-90.369943	ed by a 30" CMP & 18" Conc
154	11/29/2012	24	Grass	Ditch	38.419679	-90.373373	
155	11/29/2012	36	Grass	Ditch	38.419985	-90.372082	3 ft x 4 ft ditch, leaf cover
156	11/29/2012	8	PVC	Pipe	38.420791	-90.370090	could not locate
1001		48	Riprap	Ditch	38.447882	-90.378696	

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Outlet Number	Date Surveyed	Size (inches)	Type	Material	Latitude	Longitude	Comments
1002		72	Concrete	Ditch	38.447893	-90.378667	
1003		18	CMP	Pipe	38.444011	-90.382416	4 CMP pipes beneath bridge
1004		12	CMP	Pipe	38.442687	-90.387273	
1005		18	CMP	Pipe	38.444123	-90.394113	
1006		6	PVC	Pipe	38.439032	-90.402350	
1000		4	PVC	Pipe	38.449691	-90.375345	
1007		6	Cement	Pipe	38.447373	-90.353944	
1008		3	PVC	Pipe	38.449114	-90.356745	
1009		18	Cement	Pipe	38.449282	-90.359126	
1010		3	rrugated Plas	Pipe	38.448605	-90.361006	
1011		96	Cement	Ditch	38.438362	-90.364129	Constructed of Cement Bags.
1012		3	rrugated Plas	Pipe	38.439034	-90.362334	Twin
1013		3	rrugated Plas	Pipe	38.439157	-90.362081	
1014		3	rrugated Plas	Pipe	38.439549	-90.361496	
1015		3	PVC	Pipe	38.440730	-90.359007	
1016		4	rrugated Plas	Pipe	38.440406	-90.357327	Twin
1018		3	PVC	Pipe	38.440667	-90.356008	
1019		30	RCP	Pipe	38.442798	-90.354080	
1020		48	Earth	Ditch	38.438422	-90.362767	
1021		6	PVC	Pipe	38.448136	-90.368785	
1022		6	PVC	Pipe	38.448136	-90.368785	
1023		15	RCP	Pipe	38.448136	-90.368785	
1024		15	RCP	Pipe	38.448136	-90.368785	
1025		12	Steel	Pipe	38.448136	-90.368785	
1026		14	Steel	Pipe	38.448136	-90.368785	
1027		14	Steel	Pipe	38.448136	-90.368785	
1028		12	CMP	Pipe	38.425501	-90.384555	Rusted Invert
1029		48	Riprap	Ditch	38.425320	-90.384610	
1030		60	Riprap	Ditch	38.425942	-90.385902	
1031		12	RCP	Pipe	38.426429	-90.386919	Outfall half blocked
1032		6	PVC	Pipe	38.431344	-90.388705	Active flow
1033		12	RCP	Pipe	38.435305	-90.393179	
1034		36	Riprap	Ditch	38.436485	-90.393982	
1035		24	Earth	Ditch	38.437122	-90.395399	
1036		60	RCP	Pipe	38.426285	-90.408492	
1037		36	RCP	Pipe	38.426366	-90.408372	Active Flow.
1038		8	DIP	Pipe	38.429018	-90.397610	
1039		4	PVC	Pipe	38.427369	-90.398029	
1040		42	RCP	Pipe	38.425810	-90.385762	Active Flow
1200		18	concrete	pip			good condition
1201		8	pvc	pipe			flow present
1202		0	Dirt	Ditch			3ft base 4ft deep
1203		12	concrete	Pipe			good condition
1204		0	Dirt	Ditch			eroding channel
1205		0	Dirt	Ditch			2ft by 4ft fair
1206		6	pvc	pipe			no flow
1207		2	pvc	pipe			pool drain no flow top RDB
1041		30	cmp	pipe	38.422614	-90.378411	to ditch leading to stream
1042		30	earth	Ditch	38.421267	-90.376665	suspended ditch into stream
1043		15	RCP	Pipe	38.420292	-90.375112	suspended outfall into culvert
1044		15	RCP	Pipe	38.420420	-90.375121	along left side into culvert
1045		12	earth	Ditch	38.419782	-90.373973	draining from parking lot
1046		36	earth	Ditch	38.419774	-90.372891	3'x1.5' ditch to stream

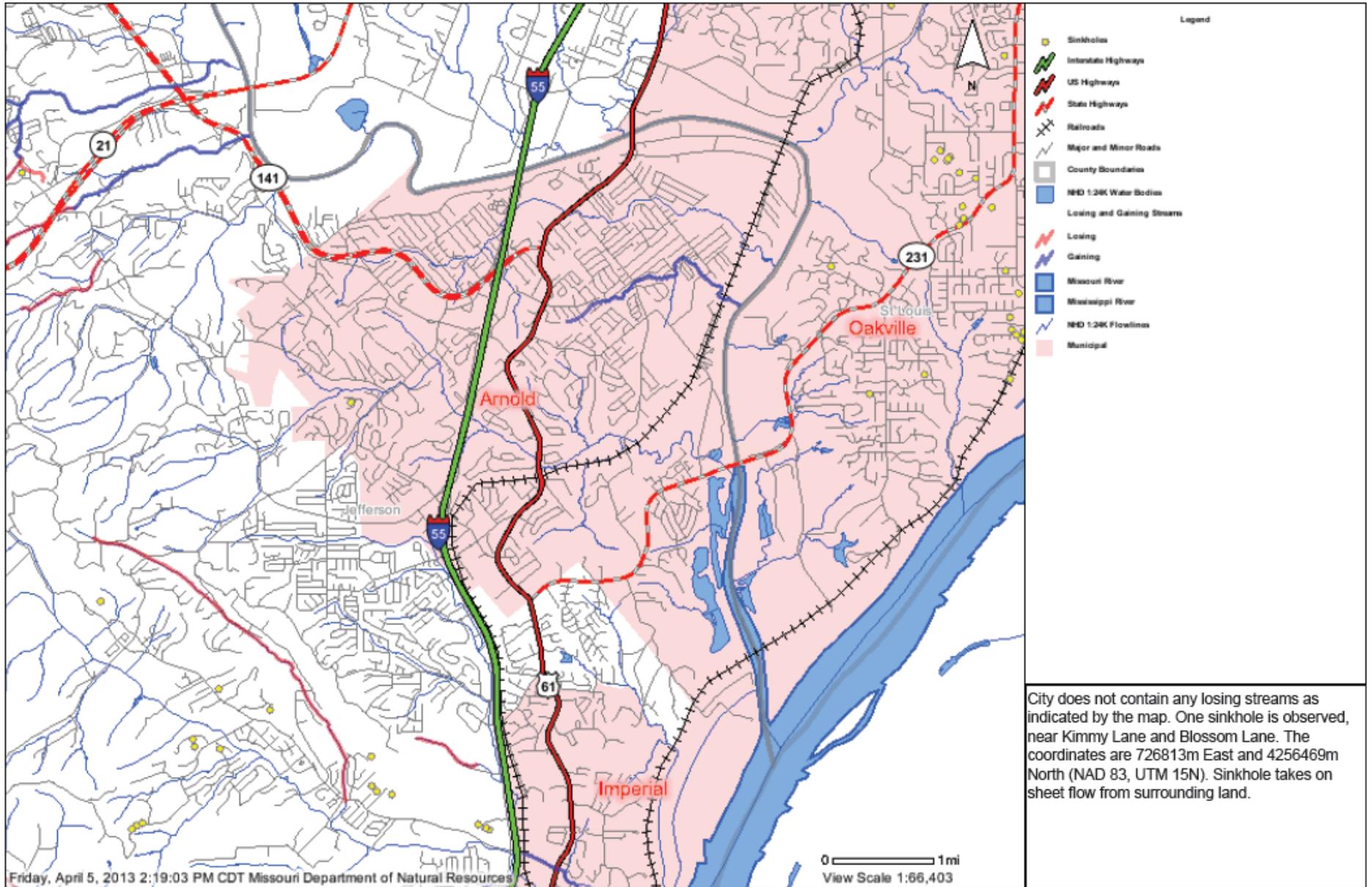
Appendix C - Stormwater Outfall Table

Outlet Number	Date Surveyed	Size (inches)	Type	Material	Latitude	Longitude	Comments
1047		12	Dirt	Ditch	38.420763	-90.370148	ditch rom golf course
1048		5	CPP	Pipe	38.422078	-90.367102	suspended, sitting in rock
1049		5	CPP	Pipe	38.422297	-90.366943	covered in moss
1050		24	RCP	Pipe	38.424449	-90.370870	storm outfall to pond
1051		12	earth	Ditch	38.424699	-90.371042	1 ft wide 2 ft deep
1052		24	RCP	Pipe	38.425051	-90.371497	drains to ditch to stream
1053		6	CCP	Pipe	38.425961	-90.369186	looks like gutter drain
1054		6	CPP	Pipe	38.428346	-90.368678	perched on bank
1055		6	CPP	Pipe	38.429786	-90.369404	gutter drain to stream

Appendix D
Sinkhole and Losing
Stream Map

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Appendix D – Sinkhole and Losing Stream Map



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Appendix E
Illicit Discharge Standard
Operating Procedures
(SOP)

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City of Arnold
Illicit Discharge Detection and
Elimination Plan
And
Spill Response
Standard Operating Procedure
2017

City of Arnold
Illicit Discharge Detection and Elimination Plan (IDDE)

1. INTRODUCTION

This Illicit Discharge Detection and Elimination Plan (IDDE) was developed using the model plan drafted by incorporating other municipality standards.

2. PURPOSE

The intent of this plan is to identify procedures for:

- a. Location of priority areas likely to have illicit discharges
- b. Tracing and removing sources of illicit discharges
- c. Developing standard operating procedures for spill response and enforcement

All activities will be conducted in a manner pursuant to and consistent with the Federal Clean Water Act and any applicable State and local regulations to the maximum extent practicable.

As mandated in Federal Phase II Stormwater Discharge Regulation: CCR 61.8(11)(a)(ii)(C) (Appendix A) this plan has been created for Arnold’s municipal separate storm sewer systems (MS4s).

Ordinance

The City of Arnold Stormwater-Illicit Discharge Ordinance Article VI Illicit connection and Discharge To Storm Drain System.

- a. To regulate the contribution of pollutants to the municipal separate storm sewer system (MS4) by stormwater discharges by any user;
- b. To prohibit Illicit Connections and Discharges to the municipal separate storm sewer system;
- c. To establish legal authority to carry out all inspection, surveillance and monitoring procedures necessary to ensure compliance with this ordinance; and
- d. To promote public awareness of the hazards involved in the improper discharge of trash, yard waste, lawn chemicals, pet waste, wastewater, grease, oil, petroleum products, cleaning products, paint products, hazardous waste, sediment and other pollutants into the storm drainage system.

3. PROHIBITED DISCHARGES.

Prohibited discharges to MS4s are outlined in the City Code of Ordinances Article VI Illicit Connection and Discharge To Storm Drain System.

Sec. 24-138.- Discharge prohibitions.

a) *Prohibition of illegal discharges.*

(1) No person shall discharge or cause to be discharged into the municipal storm drain system or watercourses any materials, including but not limited to pollutants or waters containing any pollutants that cause or contribute to a violation of applicable water quality standards, other than stormwater.

(2) The commencement, conduct or continuance of any illegal discharge to the storm drain system is prohibited except as described as follows:

(3) The following discharges are exempt from discharge prohibitions established by this article: water line flushing or other potable water sources, landscape irrigation or lawn watering, diverted stream flows, rising ground water, ground water infiltration to storm drains, uncontaminated pumped ground water, foundation or footing drains (not including active groundwater dewatering systems), crawl space pumps, air conditioning condensation, springs, noncommercial washing of vehicles, natural riparian habitat or wet-land flows, swimming pools (if dechlorinated-typically less than one (1) PPM chlorine), firefighting activities, and any other water source not containing Pollutants.

(4) Discharges specified in writing by the authorized enforcement agency as being necessary to protect public health and safety.

(5) Dye testing is an allowable discharge, but requires a verbal notification to the authorized enforcement agency prior to the time of the test.

(6) The prohibition shall not apply to any non-stormwater discharge permitted under an NPDES permit, waiver, or waste discharge order issued to the discharger and administered under the authority of the federal Environmental Protection Agency, provided that the discharger is in full compliance with all requirements of the permit, waiver, or order and other applicable laws and regulations, and provided that written approval has been granted for any discharge to the storm drain system.

b) *Prohibition of illicit connections.*

(1) The construction, use maintenance or continued existence of illicit connections to the storm drain system is prohibited.

(2) This prohibition expressly includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under the law or practices applicable or prevailing at the time of connection.

(3) A person is considered to be in violation of this article if the person connects a line conveying sewage to the MS4, or allows such a connection to continue.

4. LOCATION OF PRIORITY AREAS

Outfall Inventory

A comprehensive field survey of outfall locations was conducted in 2012/2013 with the City's stormwater consultant (Intuition and Logic) continuing to update our City's Outfall Map as they undertake the yearly 20% outfall inspections as required by the state operating stormwater permit. In addition, the City's stormwater department continues to work on the task to completing the City's Stormwater Facilities Map to show the locations of all storm sewer structures and piping locations.

Intuition and Logic provides the City with reports of their findings of outfall inspections. Dry weather flow outfall testing provides detection of:

Chlorine	Nitrogen
Conductivity	PH
Dissolved Oxygen	Phosphorus
E. Coli	Potassium
N. Ammonia	Surfactants-Anionics
Turbidity	

Storm Sewer Maintenance Activities

In addition to the outfall inventory, a number of storm sewer maintenance activities are intended to identify illicit discharges and illegal connections. These include:

1. Storm Sewer Inlet cleanout of accumulated debris or blockage.
2. Continue with storm inlet medallion glue down or manhole lid replacement with embossed labeling "No Dumping-Drains to Stream".

4.1 Area Prioritization

On-going monitoring for illicit discharges focuses on areas based on available water quality information, and past and future complaint history plus the public works staff keeping a visual for illicit discharges.

5. TRACING SOURCES OF ILLICIT DISCHARGES

Tracing the sources of illicit discharges and eliminating the sources includes the following activities:

- Response and Investigation
- Enforcement
- Clean-up

These activities are detailed in the Spill Enforcement and Response Standard Operating Procedures.

6. EDUCATION AND OUTREACH

IDDE educational plans and informational campaigns will be incorporated into the IDDE activities using existing programs (public education, possible household hazardous waste disposal programs, watering and fertilizing campaigns, etc.) Forums that may be utilized for these purposes include the City of Arnold website, Clean Stream events, Press releases and other municipal employee education.

7. BI-ANNUAL REPORTING AND PROGRAM EVALUATION

The city's stormwater discharge permit requires the submittal of a bi-annual report that includes the type of enforcement action taken where and when required for illicit discharge detention and spill response actions occur.

APPENDIX A

ILLICIT DISCHARGE DETECTION AND ELIMINATION

This section of the document offers general guidance on how to detect illicit discharges and comply with the minimum control measure. MS4 operators have a wide range of flexibility in choosing how to satisfy the minimum control measure based upon their unique conditions and resources. An illicit discharge is defined by the permit as any discharge to an MS4 that is not composed entirely of stormwater, and has not been authorized under a discharge permit issued by the State of Missouri. Illicit discharges enter the system through either direct connections (e.g., wastewater piping either mistakenly or deliberately connected to the storm drains) or indirect connections (e.g., infiltration into the MS4 from cracked sanitary systems, spills collected by drain outlets, or paint or used oil dumped directly into a drain). The result is untreated discharges. Examples of sources of illicit discharges, as well as some non-stormwater discharges that may be an exception to the illicit discharge requirements, are listed in section B, below. Illicit discharges may be continuous or intermittent. Intermittent discharges tend to occur when carried by a storm event, while continuous illicit discharges often flow during dry weather.

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 Requirements

The regulation (CCR 61.8(11) (a) (ii) (C)) is as follows:

(C) The permittee must develop, implement and enforce a program to detect and eliminate illicit discharge (as defined at 61.2) into the permittee's MS4. The permittee must:

(a) Develop, if not already completed, a storm sewer system map, showing the location of all municipal storm sewer outfalls and the names and location of all state waters that receive discharges from those outfalls;

(b) To the extent allowable under State or local law, effectively prohibit, through ordinance or other regulatory mechanism, non-stormwater discharges into the storm sewer system, and implement appropriate enforcement procedures and actions; and

(c) Develop and implement a plan to detect and address non-stormwater discharges, including illicit discharges and illegal dumping, to the system. The plan must include the following three components: procedures for locating priority areas likely to have illicit discharges; procedures for tracing the source of an illicit discharge; and procedures for removing the source of the discharge.

a. Municipal Stormwater Outfalls and State Waters

The regulation requires that the map include the location of each municipal stormwater outfall, and the subsequent state waters for each outfall. To identify the stormwater outfalls and the state waters within each jurisdiction, it is important to understand the definition of each.

A municipal stormwater outfall means a point source “at the point where a municipal separate storm sewer discharges to state waters and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other state waters and are used to convey state waters.” For purposes of this guidance and when discussing the Illicit Discharge Detection and Elimination Minimum Control Measure, it is assumed that a municipal stormwater outfall is the same as the storm sewer outfall. Because a municipal stormwater outfall has been defined as the point where a municipal separate storm sewer discharges to state waters, it is also important to understand what are state waters, is “any and all surface and subsurface waters which are contained in or flow in or through this State, but does not include waters in sewage systems, waters in treatment works of disposal systems, waters in potable water distribution systems, and all water withdrawn for use and treatment until use and treatment have been completed.” Therefore, most surface water is considered state waters, including canals, ditches and man-made conveyance structures. State waters may be categorized as “classified” or “unclassified.” Classified state waters are listed and determined by the Missouri Department on Natural Resources. Classified state waters, by definition, exempt “waters in ditches and other manmade conveyance structures.” Because water quality standards are not applied, waters in ditches and other man-made conveyance structures are considered “unclassified” state waters. For the purposes of the Phase II Stormwater Regulations, Illicit Discharge Detection and Elimination Control Measure, the permittee must map the municipal stormwater outfalls that discharge to both classified state waters and unclassified state waters (irrigation ditches, canals, and other man-made diversions where that may apply).

C. Connections to the Storm Water Utility System

- a) Connections by Authorized Personnel. No person not authorized by the Public Works Director shall tap or connect to any part of the storm water system.
- b) Connections Made in Compliance with Approval. No person shall fail to make authorized connections to the storm water in accordance with the terms and conditions of the permit or approval issued therefore and the City of Arnold Design and Construction-Standards.
- c) Costs of Connection. No person requesting or required to make connections to the storm water system shall fail to pay the costs for such connection that may apply.
- d) Prohibited Connections. No person shall make, maintain, or use any illicit connection to the city’s storm water system.

D. Discharges to the Storm Water System.

- a. Discharges Prohibited. No user or other person shall discharge any sewage, other polluted waters, or other deleterious substance from any premises within the city into or upon any public highway, street, sidewalk, alley, land, public place, stream, ditch, or other watercourse or into any cesspool, storm or private sewer, or natural water outlet, except where suitable treatment has been provided in accordance with provisions of applicable federal, state, and local laws.
- b. Cleaning of Hard Surfaces. The owner of any paved parking lot, street or drive shall clean the pavement as necessary to prevent the buildup and discharge of pollutants. Paved surfaces shall be cleaned by dry sweeping, wet vacuum sweeping, collection and treatment of wash water or other methods in compliance with this chapter, or other applicable federal, state, and local laws.
- c. Material Storage. No person shall store materials including, without limitation, stockpiles used in construction and landscaping activities, in a manner which may cause discharge or threatened discharges of pollutants into the storm sewer system or receiving water.
- d. Exemptions. The following discharges are exempt from the discharge permit requirements established by this chapter:
 - (1) Landscape irrigation and lawn watering associated with single family detached or duplex development, uncontaminated groundwater from an individual single family residential detached or duplex foundation drainage system, individual residential car washing of less than two consecutive days in duration for charity or non-profit fundraising, dechlorinated swimming pool discharges, water line and fire hydrant flushing, fire-fighting activities, or street cleaning operations conducted by the city; or
 - (2) Any discharge that is authorized by the Public Works Director.

SPILL ENFORCEMENT AND RESPONSE STANDARD OPERATING PROCEDURES

Purpose: The purpose of this section is to outline the city of Arnold's Spill Enforcement and Response Procedures. These procedures include the following activities:

- Response and Investigation
- Enforcement
- Clean- up

Standard Response – non-hazardous material or non-emergency incidents

The City of Arnold Public Works Department is the principal agency which responds to spills of non-hazardous materials. Emergency response protocols are followed if the incident is determined to be hazardous, an emergency situation or beyond the capabilities of the Public Works Department.

Primary Response

Response by: City of Arnold Public Works Department
 2900 Arnold Tenbrook Road
 Arnold, MO 63010
 636-282-2386

- Identifies nature of the spill, isolates and contains non-hazardous materials within capabilities.
- Implements Emergency Response Procedures if spill is determined to be hazardous, unknown materials or beyond operational capacity.
- Assesses area of impact and public safety concern.
- Provides traffic control and resident notification.
- Assist in enforcement activities.
- Coordinate with Environmental Contractor (Clean Harbors Company), if needed.

EMERGENCY RESPONSE - hazardous or unknown material incident

The Rock Community Fire District and the City of Arnold Police Department are the principal agencies, which respond to spills of hazardous materials. These agencies are the designated emergency response agencies and are responsible for providing and maintaining the capability for emergency response to a hazardous substance incident occurring within its jurisdiction. In addition, the Jefferson County Homeland Security Emergency Response Team provides assistance when required.

EMERGENCIES (Hazardous and Unknown Materials)

Primary Response

Response by : Rock Community Fire Protection District / Arnold Police Department
3749 Telegraph Road
Arnold, MO 63010
636-296-2211

- Identifies nature of the spill, isolates, and contains hazardous materials within capabilities.
- Assesses area of contamination and public safety.
- Decontaminates individuals (on site) exposed to hazardous materials.
- Handles rescue operations and transmit information to assisting units.
- Provide traffic control and resident notification.

Arnold Public Works Department

- Assist in response in spill containment
- Assist in environmental impact assessment
- Assist recovery
- Assist in enforcement activities
- Coordinate with Environmental Contractor (Clean Harbors Company).

Environmental Contractor –

Clean Harbors Company (1-800-645-8265); Environmental Works, Inc. (1-877-827-9500); or others.

Can provide spill, containment, and clean-up services for spill response, chemical hazards, biological and infectious agent response, natural disasters, field investigations, & laboratory services. All OSHA trained and certified employees.

INVESTIGATIONS

Source Identification

Some of the methods to be included in this source location are listed below:

- Use of storm sewer outfall maps to trace suspected discharges to a point of origin;
- Use of water quality data to determine sources of detected chemicals, and trace them upstream;
- On-the-ground physical investigation of outfalls and storm sewer inputs or evidence of prohibited discharges (discoloration of ground, odors, leaky containers, flowing water during dry periods, etc.);
- Dye-testing to delineate potential source areas;
- Smoke tests to delineate potential source areas;
- Collect samples of the discharge and of potential sources of the discharge, and comparing the chemical analysis results;
- TV or video-taping storm sewers; and
- Recruiting public involvement to report illicit discharges.

Documenting Source Investigations

The report will include incident location, incident type, date, responsible party, business type, enforcement action, and resolution.

Environmental Damage Assessment

Environmental consulting services may be contracted to determine water quality impact of spills released to the environment.

Sampling for Laboratory Analysis

In some situations (e.g. for enforcement, etc.) samples may need to be collected for laboratory analysis. In these cases, sample collection is conducted according to applicable evidence sampling collection protocols.

ENFORCEMENT-(Refer to City Code of Ordinances Article VI)

Fire Department/Hazmat Team (for emergency and toxic spills and Police Department)

- Notifies other government agencies for potential violations of federal, state and local regulations.

City Staff

- Issues Compliance Directive or Notice of Violations
- Conducts follow-up inspections to insure compliance with directives

- Distributes brochures, door hangers and other information for proper disposal on non-stormwater materials.
- Insures that the individual who reported the illicit discharge is followed up with commendation.

Enforcement Options (Refer to City Code of Ordinances Article VI)

More serious violations, or situations where a reasonable attempt has been made to educate a responsible party, but compliance has not been achieved, may require a more aggressive and enforcement-oriented approach. Enforcement approaches and actions should be based on several factors including the severity of the violation (environmental health threat), site-specific circumstances, and past compliance history. The following outlines enforcement options:

Compliance Directive (see Sample A)

Immediately up identification of an illegal discharge or threatened discharge the inspector may issue a Compliance Directive to the responsible entity. The Directive orders cessation of the discharge and clean-up of any remaining problem by a time certain, typically within several hours. If the responsible party is not cooperative or if criminal sanctions may be appropriate, police or other enforcement assistance is immediately requested and a citation requiring court appearance is issued.

Notice of Violation (see Sample B)

After the field situation is stabilized and the immediate threat abated, a Notice of Violation (NOV) is typically issued to the responsible party, business owner, and landowner (if different). The NOV should contain:

- 1) The name and address of alleged violator;
- 2) The address when available of a description of the building, structure or land upon which the violation(s) is occurring, or has occurred;
- 3) A statement specifying the nature of the violation;
- 4) A warning with respect to further violations;
- 5) A description of the remedial measures necessary to restore compliance and a time schedule for the completion of such remedial action; and
- 6) A statement of the penalty or penalties that shall or may be assessed against the person to whom the notice of violation is directed.
- 7) A statement that the determination of violation may be appealed to the [local enforcement authority] by filing a written notice of appeal within **10** days of service of the violation;

Such notice may require without limitation:

- 1) The performance of monitoring, analyses, and reporting;
- 2) The elimination of illicit connections or discharges;
- 3) That violating discharges, practices, or operations shall cease and desist;
- 4) The abatement or remediation of storm water pollution or contamination hazards and the restoration of any affected property; and
- 5) Payment of a fine to cover administrative and remediation costs; and

6) The implementation of source control or treatment BMPs.

If abatement of a violation and/or restoration of affected property is required, the notice shall set forth a deadline within which such remediation or restoration must be completed. Said notice shall further advise that, should the violator fail to remediate or restore within the established deadline, the work will be done by a designated governmental agency or a contractor and the expense thereof shall be charged to the violator.

The Notice of Violation typically follows the incident by several days allowing time for the city staff to determine the effectiveness of the actions taken in the field and the extent to which other measures will be needed to prevent reoccurrence.

Citation / Summons

In the case of egregious or repeated violations, a code enforcement officer may issue a summons / complaint. Authority for enforcement of illicit discharges and illegal connections found in the City Code of Ordinances Article VI.

CLEAN-UP AND COST RECOVERY

The responsible party is responsible to remove and clean-up discharged materials from the city or public property (such as gutters, storm drains and creeks). If the responsible party fails to remove and clean-up materials, the City's environmental contractor entity must conduct the work, and the responsible party will be billed by the city for time and materials. This billing procedure is conducted separately from any penalty action taken.

Examples of Non-Hazardous or Threatened Discharges

Non-emergency calls typically involve illicit discharges that are made up of:

1. Trash.
2. Yard waste.
3. Landscaping materials.
4. Pet waste.
5. Cleaning products.
6. Sediment.
7. Illicit discharges from toilets, sinks, industrial processes, cooling systems, or boilers.
8. Fabric cleaning.
9. Equipment cleaning.
10. Commercial vehicle cleaning.
11. Construction activities including but not limited to; painting, paving, concrete placement, saw-cutting, and grading.
12. Existence of illicit connections to the storm drain system.
13. Any material deposited in such a manner or location as to constitute a threatened discharge into storm drains, gutters or waters of the state.

A “threatened discharge” is a condition creating a substantial probability of harm, when the probability and potential extent of harm make it reasonably necessary to take immediate action to prevent, reduce or mitigate damages to persons, property or natural resources.

Domestic or industrial wastes that are no longer contained in a pipe, tank or other container are considered to be threatened discharges unless

they are actively being cleaned up.

14. Any maliciously destroyed or interfered with stormwater pollution prevention BMP.

15. Any watercourse that is not free of trash, debris, excessive vegetation, and other obstacles that would pollute, contaminate, or significantly retard the flow of water through the watercourse.

16. Any visible buildup of mechanical fluid, waste materials, sediment or debris.

17. Mobile cleaning operations discharging to the storm drainage system.

18. Any leak or spill related to equipment maintenance in an outdoor, uncovered area.

19. Any vehicles, machinery and equipment leaking fluids.

20. Materials stored to as to potentially release pollutants

EXAMPLES OF PROHIBITED DISCHARGES

Sanitary wastewater

Sanitary wastewater (usually untreated) from improper sewerage connections, exfiltration, or leakage

Effluent from improperly operating or improperly designed septic tanks

Overflows of sanitary sewerage systems

Automobile maintenance and operation

Commercial car wash wastewaters

Radiator flushing wastewaters

Engine degreasing wastes

Improper oil disposal

Leaky underground storage tanks

Landscape irrigation sources

Direct spraying of fertilizers, pesticides or herbicides onto impervious surfaces

Over - application of fertilizers, pesticides or herbicides onto landscaping

Other sources

Laundry wastes

Non- contact cooling waters

Metal plating baths

Dewatering of construction sites

Washing of concrete ready- mix trucks

Contaminated sump pump discharges

Improper disposal of household toxic wastes

Spills from roadway and other accident s

Chemical, hazardous materials, garbage, and sanitary sludge landfills and disposal sites

Discharges not prohibited

Landscape irrigation

Lawn watering

Diverted stream flows

Irrigation return flow

Rising ground waters

Uncontaminated ground water infiltration {as defined at 40 CFR 35.2005(20)}

Uncontaminated pumped ground water

Springs

Flows from riparian habitats and wetlands

Water line flushing

Discharges from potable water sources

Foundation drains

Air conditioning condensation

Water from crawl space pumps

Footing drains

Individual residential car washing

Dechlorinated swimming pool discharges

Street wash water

City of Arnold
Compliance Directive (Sample A)

No person shall discharge or cause to be discharged into the municipal separate storm sewer system (MS4) or watercourses any materials, including but not limited to pollutants or waters containing any pollutants that cause or contribute to a violation of applicable water quality standards, other than stormwater.

It is unlawful to cause materials to be deposited in such a manner or location as to constitute a threatened discharge into storm drains, gutters or waters of the State. Materials that are no longer contained in a pipe, tank or other container are considered to be threatened discharges unless they are actively being cleaned up.

It has been noted that following is a pollutant contained in a threatened or actual discharge to the municipal separate storm sewer system:

- paints, varnishes, and solvents;
- oil and other automotive fluids;
- non- hazardous liquid and solid wastes;
- yard wastes;
- trash, refuse, rubbish, garbage;
- food waste;
- litter;
- oil and grease;
- cleaning products;
- pesticides, herbicides, and fertilizers;
- landscaping materials;
- hazardous substances and wastes;
- sewage, fecal coliform and pathogens;
- dissolved and particulate metals;
- animal wastes;
- wastes and residues from construction activities including but not limited to, painting, paving, concrete placement, saw-cutting, and grading;
- wastes and residues that result from mobile washing operations;
- discharges from toilets; sinks; industrial processes; cooling systems; boilers;
- fabric cleaning; equipment cleaning; commercial vehicle cleaning;
- substances added to the storm drain to control root growth
- noxious or offensive matter of any kind.

Other: _____

Location: _____

You are required to immediately remedy the situation.

A follow up inspection will be performed on

_____.

Received

by: _____ (signature) _____ (address) _____ (phone)

City of Arnold
Notice of Violation (Sample B)

Date

Name
Address
City

Subject: Illegal or Threatened Discharge to Municipal Separate Storm Sewer System

The City of Arnold alleges that **Name** has violated certain provisions of the Stormwater - Illicit Discharge Ordinance [Article VI]. The specific allegation is a violation of [Article VI] which indicates:

No person shall release or cause to be released into the municipal separate storm sewer system (MS4) or watercourses any discharge that is not composed entirely of uncontaminated stormwater .

This allegation is outline in the table below:

Date	Location	Violation
------	----------	-----------

On Date your employee, Name, was seen

After Name was notified of this violation

At this time, we find it necessary to require that *you instruct all your employees on the appropriate procedures for* _____ .
Please contact Arnold Public Works Department for guidance in this matter.

This allegation maybe appealed to the [Public Works Director] by filing written notice of appeal within 10 days of service of this violation.

Failure to comply with this Notice or future violations may result in further enforcement action by the [City of Arnold]. Violations of this ordinance may result in fines of up to \$500.00 per incident, or incarceration for up to 90 days, or both.

Water that enters the storm drain system flows directly into local streams and lakes without treatment. Therefore, any pollutant s in these waters could have adverse effects on water quality, fish and other aquatic life.

Please contact Arnold Public Works at 636-282-2386 if you have any questions.

Sincerely,

City of Arnold Public Works

Illicit Discharge Reporting Form	
Incident ID:	
Responder Information	
Report taken by:	Report Date:
Department:	Report Time:
Rainfall in past 24-48 hrs:	
Reporter Information	
Incident Time:	Incident Date:
Caller contact information:	
Name:	Phone:
Street Address:	Email:
Other Notes:	
Incident Location	
Tax Map #:	Northern/ Easting:
Stream (HUC) Address or Outfall #:	
Closest Street Address:	Nearby Landmark:
Primary Location Description	Secondary Location Description
<input type="checkbox"/> Stream Corridor <i>(in or adjacent to stream)</i>	<input type="checkbox"/> Outfall <input type="checkbox"/> In-stream flow <input type="checkbox"/> Along banks
<input type="checkbox"/> Upland Area <i>(land not adjacent to stream)</i>	<input type="checkbox"/> Near Storm Drain <input type="checkbox"/> Near other water source (stormwater pond, wetland etc):
Narrative description of location:	
Inland Problem Indicator Description	
<input type="checkbox"/> Dumping	<input type="checkbox"/> Oil/solvents/chemicals <input type="checkbox"/> Sewage
<input type="checkbox"/> Wash water, suds, etc.	<input type="checkbox"/> Other:
Stream Corridor Problem Indicator Description	
Odor	
<input type="checkbox"/> None	<input type="checkbox"/> Sewage <input type="checkbox"/> Rancid/Sour
<input type="checkbox"/> Sulfide (rotten eggs, natural gas)	<input type="checkbox"/> Cloudy <input type="checkbox"/> Oil Sheen <input type="checkbox"/> Suds
<input type="checkbox"/> Petroleum (gas)	<input type="checkbox"/> Other <input type="checkbox"/> Other: Describe in narrative section
Appearance	
<input type="checkbox"/> None <input type="checkbox"/> Sewage <input type="checkbox"/> Algae <input type="checkbox"/> Dead fish <input type="checkbox"/> Other	
Narrative description of problem indicators:	
Suspected Violator (name, personal or vehicle description, license plate #, address, etc.):	
Investigation Information	
Lead Investigator:	<input type="checkbox"/> Closed
Date Closed:	Closed by:
Summarize Resolution :	

INSTRUCTIONS TO COMPLETE ILLICIT DISCHARGE (PID) REPORTING FORM

WHAT IS AN ILLICIT DISCHARGE:

An illicit discharge is any discharge into the highway storm sewer system that is not composed entirely of stormwater. **Examples:**

- Dry weather discharges of wastewater into the storm sewer system from illegal dumping; spills and other non-stormwater pollution sources
- Discharges of pollutants, contaminants or illicit materials into storm drainage/sewer systems (oil, grease, solvents, metals, nutrients, toxics, viruses, bacteria)
- Improper antifreeze, oil disposal from vehicle maintenance, service stations
- Vehicle washing wastewaters
- Autobody/repair facility waste waters
- Plating shop waste water
- Manufacturers waste water
- Private service agencies waste water
- Wholesale/retail est. waste water
- Sanitary wastewater/connections
- Mobile rug cleaning waste dumping
- Laundry waste waters
- Disposal of auto/household toxics
- Vehicular/accidental spills
- Dairy barn waste waters
- On-lot disposal system- sewage effluent.

WHAT IS NOT AN ILLICIT DISCHARGE:

The following non-stormwater discharges are not illicit discharges:

- Discharges from firefighting activities
- Potable water sources including dechlorinated waterline and fire hydrant flushings
- Irrigation drainage
- Lawn watering
- Water from individual residential car washing
- Dechlorinated swimming pool discharges
- Water from crawl space pumps
- Uncontaminated water from foundation or footing drains
- Routine external building wash down which does not use detergents or other compounds
- Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless spilled material has been removed) and where detergents are not use
- Air conditioning condensate
- Springs
- Uncontaminated groundwater

(1.) Property Owner Information:

Determine property owners name, if available, and street address of the discharge source in the event that follow-up action or elimination is required. If unable to determine owner, write in "undetermined".

(2.) Description of Discharge for source identification/verification.

a. **Odor:** Determine which odors apply.

b. **Clarity:** How clear is the discharge?

c. **Color:** Discharge color and colors in swale, pipe, ditch, etc. (Document if red/green deficient)

d. **Solids/Floatables:** Identify indicators of source.

Description of Solids/Floatables: • Iron vs. Oil Sheens:

Iron leaches from soils forming a breakable sheen on stagnant water surfaces when poked with a stick. Oil sheens will conform around and coat the surface of the stick.

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Appendix F
Post Construction
Stormwater BMP
Inspection Forms

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Stormwater BMP Owner Inspection Form – Bioretention City of Arnold, Missouri

Address: _____
 Owner: _____
 Legal: _____
 Date: _____ E-mail: _____ Phone: (____) ____-_____

I. GENERAL INSPECTION RESULTS					
Item	Inspection Results			BMP's in General	
1	<input type="checkbox"/>	Apparent problems	<input type="checkbox"/>	No problems	BMP does not appear to be well maintained.
2	<input type="checkbox"/>	Design flaws	<input type="checkbox"/>	No flaws	BMP observed to have significant design flaws which lessen its effectiveness.
3	<input type="checkbox"/>	Unauthorized modifications	<input type="checkbox"/>	No modifications	BMP has unauthorized modifications that reduce its effectiveness.
4	<input type="checkbox"/>	BMP removed	<input type="checkbox"/>	BMP present	BMP has been destroyed or removed from property.
5	<input type="checkbox"/>	Trash	<input type="checkbox"/>	No Trash	Trash and debris has accumulated on/in BMP. Yard waste in BMP.
6	<input type="checkbox"/>	Contaminated	<input type="checkbox"/>	Uncontaminated	Evidence of Oil, gasoline. Contaminants or other pollutants.
7	<input type="checkbox"/>	Smells	<input type="checkbox"/>	Doesn't smell	Unpleasant odors from the BMP.
II. BMP SPECIFIC INSPECTION RESULTS - BIORETENTION					
Item	Inspection Results			BMP : Bioretention	
1	<input type="checkbox"/>	Clogged	<input type="checkbox"/>	Not clogged	Flow spreader uneven or clogged so flows are not uniformly distributed across BMP.
2	<input type="checkbox"/>	Sediment accumulated	<input type="checkbox"/>	No sediment accumulated	Sediment depth exceeds 2 inches on more than 10% of vegetated treatment area or interferes with BMP performance.
3	<input type="checkbox"/>	Erosion or scouring	<input type="checkbox"/>	No erosion or scouring	Eroded or scoured areas (including spillway) due to flow channelization, higher flows, wind or water.
4	<input type="checkbox"/>	Poor vegetation	<input type="checkbox"/>	Proper vegetation	Planted vegetation is sparse or bare or eroded patches occur in more than 10% of the BMP. Vegetation is not higher than ponding depth.
5	<input type="checkbox"/>	Nuisance vegetation	<input type="checkbox"/>	Proper vegetation	Planted vegetation is excessively tall; nuisance weeds, invasive or noxious vegetation are overgrown; vegetation reduces free movement of water through BMP.

6	<input type="checkbox"/>	Brush/trees	<input type="checkbox"/>	Proper vegetation	Growth of brush and trees does not allow for proper maintenance.
7	<input type="checkbox"/>	Standing water	<input type="checkbox"/>	No standing water	Water is observed within the BMP (between storms) and appears not to drain freely or soil is excessively soggy. Excessive ponding of water within vegetated swale or other BMP.
8	<input type="checkbox"/>	Clogged	<input type="checkbox"/>	Not clogged	Inlet/outlet clogged or obstructed with sediment and/or debris.
9	<input type="checkbox"/>	Present	<input type="checkbox"/>	Not present	Small quantities of water present in the BMP, even when it has been dry for weeks, and an eroded, muddy channel has formed in the bottom.
10	<input type="checkbox"/>	Clogged	<input type="checkbox"/>	Not clogged	Overflow clogged or obstructed with sediment and/or debris.
11	<input type="checkbox"/>	Obstructed	<input type="checkbox"/>	Open	Stone diaphragm obstructed or covered with weeds or sediment.
1. Is maintenance needed at this time?					<input type="checkbox"/> Yes <input type="checkbox"/> No
2. Are mosquitoes or mosquito larvae present?					<input type="checkbox"/> Yes <input type="checkbox"/> No
3. Maintenance items completed					
:					

Inspected by:

Signature

[Print Full Name]

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Comments/Corrective actions required:	

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636/282-2386



Stormwater BMP Owner Inspection Form – Catch Basin Inserts

City of Arnold, Missouri

Address: _____

Owner: _____

Legal: _____

Date: _____ E-mail: _____ Phone: (____) _____ - _____

I. GENERAL INSPECTION RESULTS					
Item	Inspection Results				BMP's in General
1	<input type="checkbox"/>	Apparent problems	<input type="checkbox"/>	No problems	BMP does not appear to be well maintained.
2	<input type="checkbox"/>	Design flaws	<input type="checkbox"/>	No flaws	BMP observed to have significant design flaws which lessen its effectiveness.
3	<input type="checkbox"/>	Unauthorized modifications	<input type="checkbox"/>	No modifications	BMP has unauthorized modifications that reduce its effectiveness.
4	<input type="checkbox"/>	BMP removed	<input type="checkbox"/>	BMP present	BMP has been destroyed or removed from property.
5	<input type="checkbox"/>	Trash	<input type="checkbox"/>	No Trash	Trash and debris has accumulated on/in BMP. Yard waste in BMP.
6	<input type="checkbox"/>	Contaminated	<input type="checkbox"/>	Uncontaminated	Evidence of Oil, gasoline. Contaminants or other pollutants.
7	<input type="checkbox"/>	Smells	<input type="checkbox"/>	Doesn't smell	Unpleasant odors from the BMP.
II. BMP SPECIFIC INSPECTION RESULTS – CATCH BASIN INSERTS					
Item	Inspection Results				BMP : Catch Basin Inserts
1	<input type="checkbox"/>	Cap has formed	<input type="checkbox"/>	No cap	Sediment has formed a cap over the insert media of the insert and/or unit.
2	<input type="checkbox"/>	Sheen present	<input type="checkbox"/>	No sheen	Effluent water from media insert has visible sheen.
3	<input type="checkbox"/>	Saturated	<input type="checkbox"/>	Unsaturated	Catch basin insert is saturated with water and no longer has the capacity to absorb.

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4	<input type="checkbox"/>	Saturated	<input type="checkbox"/>	Unsaturated	Media insert is oil saturated due to petroleum spill that drains into catch basin.	
5	<input type="checkbox"/>	Beyond typical life	<input type="checkbox"/>	Not beyond typical life	Media has been used beyond the typical average life of media insert product.	
1. Is maintenance needed at this time?					<input type="checkbox"/> Yes	<input type="checkbox"/> No
2. Are mosquitoes or mosquito larvae present?					<input type="checkbox"/> Yes	<input type="checkbox"/> No
3. Maintenance items completed						
:						

Inspected by:

Signature

[Print Full Name]

FOR CITY USE ONLY - DO NOT FILL	
Date received : _____	Received By: _____
Comments/Corrective actions required:	



Stormwater BMP Owner Inspection Form – Dry Detention City of Arnold, Missouri

Address: _____

Owner: _____

Legal: _____

Date: _____ E-mail: _____ Phone: (____) _____ - _____

I. GENERAL INSPECTION RESULTS					
Item	Inspection Results				BMP's in General
1	<input type="checkbox"/>	Apparent problems	<input type="checkbox"/>	No problems	BMP does not appear to be well maintained.
2	<input type="checkbox"/>	Design flaws	<input type="checkbox"/>	No flaws	BMP observed to have significant design flaws which lessen its effectiveness.
3	<input type="checkbox"/>	Unauthorized modifications	<input type="checkbox"/>	No modifications	BMP has unauthorized modifications that reduce its effectiveness.
4	<input type="checkbox"/>	BMP removed	<input type="checkbox"/>	BMP present	BMP has been destroyed or removed from property.
5	<input type="checkbox"/>	Trash	<input type="checkbox"/>	No Trash	Trash and debris has accumulated on/in BMP. Yard waste in BMP.
6	<input type="checkbox"/>	Contaminated	<input type="checkbox"/>	Uncontaminated	Evidence of Oil, gasoline. Contaminants or other pollutants.
7	<input type="checkbox"/>	Smells	<input type="checkbox"/>	Doesn't smell	Unpleasant odors from the BMP.
II. BMP SPECIFIC INSPECTION RESULTS – DRY DETENTION					
Item	Inspection Results				BMP : Dry Detention
1	<input type="checkbox"/>	Weeds	<input type="checkbox"/>	No weeds	Invasive, nuisance vegetation or weeds are present.
2	<input type="checkbox"/>	Brush/trees	<input type="checkbox"/>	Proper vegetation	Growth of brush and trees does not allow for proper maintenance. Dead, diseased, or dying trees are present. Tree growth on berms or emergency spillway >4' in height or covering more than 10% of spillway.
3	<input type="checkbox"/>	Sediment accumulated	<input type="checkbox"/>	No accumulated sediment	Sediment in storage areas, rock filters, and pond has reduced storage volume.

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4	<input type="checkbox"/>	Erosion	<input type="checkbox"/>	No erosion	Eroded damage over two inches deep; potential for continued erosion; any erosion on a compacted berm embankment; soil from adjacent areas washes into/on BMP; continued erosion is prevalent.
5	<input type="checkbox"/>	Rodent holes	<input type="checkbox"/>	No rodent holes	If facility acts as a dam or berm, any evidence of rodent holes, or any evidence of water piping through dam or berm via rodent holes.
6	<input type="checkbox"/>	Insects	<input type="checkbox"/>	No insects	Wasps, hornets or bees interfere with maintenance activities. Excessive or nuisance levels.
7	<input type="checkbox"/>	Standing water	<input type="checkbox"/>	No standing water	Water is observed within the BMP (between storms) and appears not to drain freely or soil is excessively soggy. Excessive ponding of water within vegetated swale or other BMP.
8	<input type="checkbox"/>	Unleveled berm	<input type="checkbox"/>	Level berm	Unleveled internal berm dividing wet pond cells.
9	<input type="checkbox"/>	Contaminated	<input type="checkbox"/>	No contaminants	Prevalent and visible contaminants such as oil.
10	<input type="checkbox"/>	Clogged	<input type="checkbox"/>	Not clogged	Overflow or low flow orifice is clogged or obstructed with sediment and/or debris.
11	<input type="checkbox"/>	Spillway in disrepair	<input type="checkbox"/>	Open	Emergency spillway is obstructed, filled with sediment, eroded out, or in disrepair.
12	<input type="checkbox"/>	Rip rap needs repair	<input type="checkbox"/>	Rip rap in good condition	Rip rap is washed out or insufficient to handle discharges.
13	<input type="checkbox"/>	Forebay non-operational	<input type="checkbox"/>	Operating properly	Sediment forebay is either filled with sediment (greater than 50% of design depth), being bypassed, or does not exist
14	<input type="checkbox"/>	Trash racks need cleaning	<input type="checkbox"/>	Trash racks are clean	Debris has accumulated on trash racks.

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15	<input type="checkbox"/>	Pipes/structural repairs needed	<input type="checkbox"/>	Pipes/structure are sound	Pipes and structures show signs of corrosion, spalls, leaks, deformation, crushing or other material failure.
16	<input type="checkbox"/>	Sediment in overflow	<input type="checkbox"/>	Overflow clear	Sediment has accumulated in overflow.
17	<input type="checkbox"/>	Dam needs repair	<input type="checkbox"/>	Dam is sound	The dam/embankment has visible signs of cracking, sliding, piping, leaking or bulging.
18	<input type="checkbox"/>	Slope protection failure	<input type="checkbox"/>	Slope protection adequate	Slope reinforcing has been eroded or otherwise damaged so that slope is unstable.

1. Is maintenance needed at this time?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
2. Are mosquitoes or mosquito larvae present?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
3. Maintenance items completed: _____		

Inspected by: _____
Signature

[Print Full Name]

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Comments/Corrective actions required:	



Stormwater BMP Owner Inspection Form – Engineered Channel

City of Arnold, Missouri

Address: _____

Owner: _____

Legal: _____

Date: _____ E-mail: _____ Phone: (____) _____ - _____

I. GENERAL INSPECTION RESULTS					
Item	Inspection Results				BMP's in General
1	<input type="checkbox"/>	Apparent problems	<input type="checkbox"/>	No problems	BMP does not appear to be well maintained.
2	<input type="checkbox"/>	Design flaws	<input type="checkbox"/>	No flaws	BMP observed to have significant design flaws which lessen its effectiveness.
3	<input type="checkbox"/>	Unauthorized modifications	<input type="checkbox"/>	No modifications	BMP has unauthorized modifications that reduce its effectiveness.
4	<input type="checkbox"/>	BMP removed	<input type="checkbox"/>	BMP present	BMP has been destroyed or removed from property.
5	<input type="checkbox"/>	Trash	<input type="checkbox"/>	No Trash	Trash and debris has accumulated on/in BMP. Yard waste in BMP.
6	<input type="checkbox"/>	Contaminated	<input type="checkbox"/>	Uncontaminated	Evidence of Oil, gasoline. Contaminants or other pollutants.
7	<input type="checkbox"/>	Smells	<input type="checkbox"/>	Doesn't smell	Unpleasant odors from the BMP.
II. BMP SPECIFIC INSPECTION RESULTS – ENGINEERED CHANNEL					
Item	Inspection Results				BMP : Engineered Channel
1	<input type="checkbox"/>	Clogged	<input type="checkbox"/>	Not clogged	Flow spreader uneven or clogged so flows are not uniformly distributed across BMP.
2	<input type="checkbox"/>	Sediment accumulated	<input type="checkbox"/>	No sediment accumulated	Forebay sediment depth exceeds 50% of design capacity.
3	<input type="checkbox"/>	Sediment accumulated	<input type="checkbox"/>	No sediment accumulated	Sediment depth exceeds 2 inches on more than 10% of vegetated treatment area or interferes with BMP performance.
4	<input type="checkbox"/>	Erosion or scouring	<input type="checkbox"/>	No erosion or scouring	Eroded or scoured areas due to flow channelization, higher flows, wind or water.

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5	<input type="checkbox"/>	Poor vegetation	<input type="checkbox"/>	Proper vegetation	Planted vegetation is sparse or bare or eroded patches occur in more than 10% of the BMP.
6	<input type="checkbox"/>	Nuisance vegetation	<input type="checkbox"/>	Proper vegetation	Planted vegetation is excessively tall; nuisance weeds, invasive or noxious vegetation are overgrown; vegetation reduces free movement of water through BMP.
7	<input type="checkbox"/>	Brush/trees	<input type="checkbox"/>	Proper vegetation	Growth of brush and trees does not allow for proper maintenance.
8	<input type="checkbox"/>	Standing water	<input type="checkbox"/>	No standing water	Water is observed within the BMP (between storms) and appears not to drain freely or soil is excessively soggy. Excessive ponding of water within vegetated swale or other BMP.
9	<input type="checkbox"/>	Clogged	<input type="checkbox"/>	Not clogged	Inlet/outlet clogged or obstructed with sediment and/or debris.
10	<input type="checkbox"/>	Flow	<input type="checkbox"/>	No flow	Small quantities of water flow through the vegetated swale, even when it has been dry for weeks, and eroded muddy channel has formed in the swale bottom
11	<input type="checkbox"/>	Plant stress	<input type="checkbox"/>	No stress	Plant stress evident from inadequate watering.
12	<input type="checkbox"/>	Needs mowing	<input type="checkbox"/>	Grass Mowed	Grass is overgrown.
*(If an item in the left column is checked, corrective maintenance is required)					
1. Is maintenance needed at this time?					<input type="checkbox"/> Yes <input type="checkbox"/> No
2. Are mosquitoes or mosquito larvae present?					<input type="checkbox"/> Yes <input type="checkbox"/> No
3. Maintenance items competed: _____					

Inspected by: _____

Signature

[Print Full Name]

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Stormwater BMP Owner Inspection Form – Extended Dry Detention

City of Arnold, Missouri

Address: _____

Owner: _____

Legal: _____

Date: _____ E-mail: _____ Phone: (____) _____ - _____

I. GENERAL INSPECTION RESULTS					
Item	Inspection Results				BMP's in General
1	<input type="checkbox"/>	Apparent problems	<input type="checkbox"/>	No problems	BMP does not appear to be well maintained.
2	<input type="checkbox"/>	Design flaws	<input type="checkbox"/>	No flaws	BMP observed to have significant design flaws which lessen its effectiveness.
3	<input type="checkbox"/>	Unauthorized modifications	<input type="checkbox"/>	No modifications	BMP has unauthorized modifications that reduce its effectiveness.
4	<input type="checkbox"/>	BMP removed	<input type="checkbox"/>	BMP present	BMP has been destroyed or removed from property.
5	<input type="checkbox"/>	Trash	<input type="checkbox"/>	No Trash	Trash and debris has accumulated on/in BMP. Yard waste in BMP.
6	<input type="checkbox"/>	Contaminated	<input type="checkbox"/>	Uncontaminated	Evidence of Oil, gasoline. Contaminants or other pollutants.
7	<input type="checkbox"/>	Smells	<input type="checkbox"/>	Doesn't smell	Unpleasant odors from the BMP.
II. BMP SPECIFIC INSPECTION RESULTS – EXTENDED DRY DETENTION					
Item	Inspection Results				BMP: Extended Dry Detention
1	<input type="checkbox"/>	Weeds	<input type="checkbox"/>	No weeds	Invasive, nuisance vegetation or weeds are present.
2	<input type="checkbox"/>	Brush/trees	<input type="checkbox"/>	Proper vegetation	Growth of brush and trees does not allow for proper maintenance. Dead, diseased, or dying trees are present. Tree growth on berms or emergency spillway >4' in height or covering more than 10% of spillway.
3	<input type="checkbox"/>	Sediment accumulated	<input type="checkbox"/>	No accumulated sediment	Sediment in storage areas, rock filters, and pond has significantly reduced storage volume.

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4	<input type="checkbox"/>	Erosion	<input type="checkbox"/>	No erosion	Eroded damage over two inches deep; potential for continued erosion; any erosion on a compacted berm embankment; soil from adjacent areas washes into/on BMP; continued erosion is prevalent.
5	<input type="checkbox"/>	Rodent holes	<input type="checkbox"/>	No rodent holes	If facility acts as a dam or berm, any evidence of rodent holes, or any evidence of water piping through dam or berm via rodent holes.
6	<input type="checkbox"/>	Insects	<input type="checkbox"/>	No insects	Wasps, hornets or bees interfere with maintenance activities. Excessive or nuisance levels.
7	<input type="checkbox"/>	Standing water	<input type="checkbox"/>	No standing water	Water is observed within the BMP (between storms) and appears not to drain freely or soil is excessively soggy. Excessive ponding of water within vegetated swale or other BMP.
8	<input type="checkbox"/>	Uneveled berm	<input type="checkbox"/>	Level berm	Uneveled internal berm dividing wet pond cells.
9	<input type="checkbox"/>	Contaminated	<input type="checkbox"/>	No contaminants	Prevalent and visible contaminants such as oil.
10	<input type="checkbox"/>	Clogged	<input type="checkbox"/>	Not clogged	Overflow or low flow orifice is clogged or obstructed with sediment and/or debris.
11	<input type="checkbox"/>	Spillway in disrepair	<input type="checkbox"/>	Open	Emergency spillway is obstructed, filled with sediment, eroded out, or in disrepair.
12	<input type="checkbox"/>	Rip rap needs repair	<input type="checkbox"/>	Rip rap in good condition	Rip rap is washed out or insufficient to handle discharges.
13	<input type="checkbox"/>	Forebay non-operational	<input type="checkbox"/>	Operating properly	Sediment forebay is either filled with sediment (greater than 50% of design depth), being bypassed, or does not exist
14	<input type="checkbox"/>	Trash racks need cleaning	<input type="checkbox"/>	Trash racks are clean	Debris has accumulated on trash racks.

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15	<input type="checkbox"/>	Pipes/structural repairs needed	<input type="checkbox"/>	Pipes/structure are sound	Pipes and structures show signs of corrosion, spalls, leaks, deformation, crushing or other material failure.
16	<input type="checkbox"/>	Sediment in overflow	<input type="checkbox"/>	Overflow clear	Sediment has accumulated in overflow.
17	<input type="checkbox"/>	Dam needs repair	<input type="checkbox"/>	Dam is sound	The dam/embankment has visible signs of cracking, sliding, piping, leaking or bulging.
18	<input type="checkbox"/>	Slope protection failure	<input type="checkbox"/>	Slope protection adequate	Slope reinforcing has been eroded or otherwise damaged so that slope is unstable.

1. Is maintenance needed at this time?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
2. Are mosquitoes or mosquito larvae present?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
3. Maintenance items completed: _____		

Inspected by: _____
Signature

[Print Full Name]

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Date received : _____	Received By: _____
Comments/Corrective actions required:	



Stormwater BMP Owner Inspection Form – Filter Strip

City of Arnold, Missouri

Address: _____

Owner: _____

Legal: _____

Date: _____ E-mail: _____ Phone: (____) _____ - _____

I. GENERAL INSPECTION RESULTS					
Item	Inspection Results				BMP's in General
1	<input type="checkbox"/>	Apparent problems	<input type="checkbox"/>	No problems	BMP does not appear to be well maintained.
2	<input type="checkbox"/>	Design flaws	<input type="checkbox"/>	No flaws	BMP observed to have significant design flaws which lessen its effectiveness.
3	<input type="checkbox"/>	Unauthorized modifications	<input type="checkbox"/>	No modifications	BMP has unauthorized modifications that reduce its effectiveness.
4	<input type="checkbox"/>	BMP removed	<input type="checkbox"/>	BMP present	BMP has been destroyed or removed from property.
5	<input type="checkbox"/>	Trash	<input type="checkbox"/>	No Trash	Trash and debris has accumulated on/in BMP. Yard waste in BMP.
6	<input type="checkbox"/>	Contaminated	<input type="checkbox"/>	Uncontaminated	Evidence of Oil, gasoline. Contaminants or other pollutants.
7	<input type="checkbox"/>	Smells	<input type="checkbox"/>	Doesn't smell	Unpleasant odors from the BMP.
II. BMP SPECIFIC INSPECTION RESULTS – FILTER STRIP					
Item	Inspection Results				BMP : Filter Strip
1	<input type="checkbox"/>	Clogged	<input type="checkbox"/>	Not clogged	Flow spreader uneven or clogged so flows are not uniformly distributed across BMP.
2	<input type="checkbox"/>	Sediment accumulated	<input type="checkbox"/>	No sediment accumulated	Sediment depth exceeds 2 inches on more than 10% of vegetated treatment area or interferes with BMP performance.
3	<input type="checkbox"/>	Erosion or scouring	<input type="checkbox"/>	No erosion or scouring	Eroded or scoured areas due to flow channelization, higher flows, wind or water.

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4	<input type="checkbox"/>	Poor vegetation	<input type="checkbox"/>	Proper vegetation	Planted vegetation is sparse or bare or eroded patches occur in more than 10% of the BMP.
5	<input type="checkbox"/>	Nuisance vegetation	<input type="checkbox"/>	Proper vegetation	Planted vegetation is excessively tall; nuisance weeds, invasive or noxious vegetation are overgrown; vegetation reduces free movement of water through BMP.
6	<input type="checkbox"/>	Brush/trees	<input type="checkbox"/>	Proper vegetation	Growth of brush and trees does not allow for proper maintenance.
7	<input type="checkbox"/>	Standing water	<input type="checkbox"/>	No standing water	Water is observed within the BMP (between storms) and appears not to drain freely or soil is excessively soggy. Excessive ponding of water within vegetated swale or other BMP.
8	<input type="checkbox"/>	Clogged	<input type="checkbox"/>	Not clogged	Inlet/outlet clogged or obstructed with sediment and/or debris.
9	<input type="checkbox"/>	Flow	<input type="checkbox"/>	No flow	Small quantities of water flow through the BMP, even when it has been dry for weeks, and an eroded, muddy channel has formed in the bottom.
10	<input type="checkbox"/>	Plant stress	<input type="checkbox"/>	No stress	Plant stress evident from inadequate watering.
11	<input type="checkbox"/>	Needs mowing	<input type="checkbox"/>	Grass mowed	Grass is overgrown.
1. Is maintenance needed at this time?					<input type="checkbox"/> Yes <input type="checkbox"/> No
2. Are mosquitoes or mosquito larvae present?					<input type="checkbox"/> Yes <input type="checkbox"/> No
3. Maintenance items completed: _____					

Inspected by: _____

Signature

[Print Full Name]

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Date received : _____

Received
By: _____

Comments/Corrective actions required:



Stormwater BMP Owner Inspection Form – Infiltration Basin City of Arnold, Missouri

Address: _____

Owner: _____

Legal: _____

Date: _____ E-mail: _____ Phone: (____) ____-_____

I. GENERAL INSPECTION RESULTS					
Item	Inspection Results				BMP's in General
1	<input type="checkbox"/>	Apparent problems	<input type="checkbox"/>	No problems	BMP does not appear to be well maintained.
2	<input type="checkbox"/>	Design flaws	<input type="checkbox"/>	No flaws	BMP observed to have significant design flaws which lessen its effectiveness.
3	<input type="checkbox"/>	Unauthorized modifications	<input type="checkbox"/>	No modifications	BMP has unauthorized modifications that reduce its effectiveness.
4	<input type="checkbox"/>	BMP removed	<input type="checkbox"/>	BMP present	BMP has been destroyed or removed from property.
5	<input type="checkbox"/>	Trash	<input type="checkbox"/>	No Trash	Trash and debris has accumulated on/in BMP. Yard waste in BMP.
6	<input type="checkbox"/>	Contaminated	<input type="checkbox"/>	Uncontaminated	Evidence of Oil, gasoline. Contaminants or other pollutants.
7	<input type="checkbox"/>	Smells	<input type="checkbox"/>	Doesn't smell	Unpleasant odors from the BMP.
II. BMP SPECIFIC INSPECTION RESULTS – INFILTRATION BASIN					
Item	Inspection Results				BMP : Infiltration Basin
1	<input type="checkbox"/>	Clogged	<input type="checkbox"/>	Not clogged	Flow spreader uneven or clogged so flows are not uniformly distributed across BMP.
2	<input type="checkbox"/>	No sediment trapped	<input type="checkbox"/>	Sediment trapped	The forebay is not trapping sediment before it reaches infiltration basin.
3	<input type="checkbox"/>	Silted in	<input type="checkbox"/>	Enough capacity	Capacity in sediment forebay is less than 50% of design capacity.
4	<input type="checkbox"/>	Inlets need repair	<input type="checkbox"/>	Inlets in good condition	Inlets/pipes are crushed, deformed, damaged, corroded, and in need of repair.

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5	<input type="checkbox"/>	Flow bypasses facility	<input type="checkbox"/>	Flow enters BMP	Flow bypasses facility by overtopping berms, erosion channels, or other means.	
6	<input type="checkbox"/>	Weeds	<input type="checkbox"/>	No weeds	Invasive, nuisance vegetation or weeds are present.	
7	<input type="checkbox"/>	Brush/trees	<input type="checkbox"/>	Proper vegetation	Growth of brush and trees does not allow for proper maintenance. Dead, diseased, or dying trees are present. Tree growth on berms or emergency spillway > 4' in height or covering more than 10% of spillway.	
8	<input type="checkbox"/>	Sediment accumulated	<input type="checkbox"/>	No accumulated sediment	Sediment in storage areas, rock filters, and pre-settling ponds and vaults prevents infiltration.	
9	<input type="checkbox"/>	Erosion	<input type="checkbox"/>	No erosion	Eroded damage over two inches deep; potential for continued erosion; any erosion on a compacted berm embankment; soil from adjacent areas washes into/on BMP; continued erosion is prevalent.	
10	<input type="checkbox"/>	Rodent holes	<input type="checkbox"/>	No rodent holes	If facility acts as a dam or berm, any evidence of rodent holes, or any evidence of water piping through dam or berm via rodent holes.	
11	<input type="checkbox"/>	Insects	<input type="checkbox"/>	No insects	Wasps, hornets or bees interfere with maintenance activities. Excessive or nuisance levels.	
12	<input type="checkbox"/>	Standing water	<input type="checkbox"/>	No standing water	Water is observed within the BMP (between storms) and appears not to drain freely or soil is excessively soggy. Excessive ponding of water within vegetated swale or other BMP.	
1. Is maintenance needed at this time?					<input type="checkbox"/> Yes	<input type="checkbox"/> No
2. Are mosquitoes or mosquito larvae present?					<input type="checkbox"/> Yes	<input type="checkbox"/> No
3. Maintenance items completed: _____						

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Signature

[Print Full Name]

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Comments/Corrective actions required:	



Stormwater BMP Owner Inspection Form – Infiltration Trench

City of Arnold, Missouri

Address: _____

Owner: _____

Legal: _____

Date: _____ E-mail: _____ Phone: (____) ____-_____

I. GENERAL INSPECTION RESULTS					
Item	Inspection Results				BMP's in General
1	<input type="checkbox"/>	Apparent problems	<input type="checkbox"/>	No problems	BMP does not appear to be well maintained.
2	<input type="checkbox"/>	Design flaws	<input type="checkbox"/>	No flaws	BMP observed to have significant design flaws which lessen its effectiveness.
3	<input type="checkbox"/>	Unauthorized modifications	<input type="checkbox"/>	No modifications	BMP has unauthorized modifications that reduce its effectiveness.
4	<input type="checkbox"/>	BMP removed	<input type="checkbox"/>	BMP present	BMP has been destroyed or removed from property.
5	<input type="checkbox"/>	Trash	<input type="checkbox"/>	No Trash	Trash and debris has accumulated on/in BMP. Yard waste in BMP.
6	<input type="checkbox"/>	Contaminated	<input type="checkbox"/>	Uncontaminated	Evidence of Oil, gasoline. Contaminants or other pollutants.
7	<input type="checkbox"/>	Smells	<input type="checkbox"/>	Doesn't smell	Unpleasant odors from the BMP.
II. BMP SPECIFIC INSPECTION RESULTS – INFILTRATION TRENCH					
Item	Inspection Results				BMP : Infiltration Trench
1	<input type="checkbox"/>	Clogged	<input type="checkbox"/>	Not clogged	Flow spreader uneven or clogged so flows are not uniformly distributed across BMP.
2	<input type="checkbox"/>	No sediment trapped	<input type="checkbox"/>	Sediment trapped	The forebay is not trapping sediment before it reaches infiltration trench.
3	<input type="checkbox"/>	Silted in	<input type="checkbox"/>	Enough capacity	Capacity in sediment forebay is less than 50% of design capacity.
4	<input type="checkbox"/>	Inlets need repair	<input type="checkbox"/>	Inlets in good condition	Inlets/pipes are crushed, deformed, damaged, corroded, and in need of repair.

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5	<input type="checkbox"/>	Flow bypasses facility	<input type="checkbox"/>	Flow enters BMP	Flow bypasses facility by overtopping berms, erosion channels, or other means.	
6	<input type="checkbox"/>	Weeds	<input type="checkbox"/>	No weeds	Invasive, nuisance vegetation or weeds are present.	
7	<input type="checkbox"/>	Brush/trees	<input type="checkbox"/>	Proper vegetation	Growth of brush and trees does not allow for proper maintenance. Dead, diseased, or dying trees are present. Tree growth on berms or emergency spillway > 4' in height or covering more than 10% of spillway.	
8	<input type="checkbox"/>	Sediment accumulated	<input type="checkbox"/>	No accumulated sediment	Sediment in storage areas, rock filters, and pre-settling ponds and vaults prevents infiltration.	
9	<input type="checkbox"/>	Erosion	<input type="checkbox"/>	No erosion	Eroded damage over two inches deep; potential for continued erosion; any erosion on a compacted berm embankment; soil from adjacent areas washes into/on BMP; continued erosion is prevalent.	
10	<input type="checkbox"/>	Rodent holes	<input type="checkbox"/>	No rodent holes	If facility acts as a dam or berm, any evidence of rodent holes, or any evidence of water piping through dam or berm via rodent holes.	
11	<input type="checkbox"/>	Insects	<input type="checkbox"/>	No insects	Wasps, hornets or bees interfere with maintenance activities. Excessive or nuisance levels.	
12	<input type="checkbox"/>	Standing water	<input type="checkbox"/>	No standing water	Water is observed within the BMP (between storms) and appears not to drain freely or soil is excessively soggy. Excessive ponding of water within vegetated swale or other BMP.	
13		Clogged		Not clogged	Ponded water is visible from the observation well 24 hours or several days following a storm event indicating the bottom of trench is clogged.	
1. Is maintenance needed at this time?					<input type="checkbox"/> Yes	<input type="checkbox"/> No
2. Are mosquitoes or mosquito larvae present?					<input type="checkbox"/> Yes	<input type="checkbox"/> No

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3. Maintenance items
completed: _____

Inspected by: _____

Signature

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Stormwater BMP Owner Inspection Form – Lake or Pond City of Arnold, Missouri

Address: _____

Owner: _____

Legal: _____

Date: _____ E-mail: _____ Phone: (____) _____ - _____

I. GENERAL INSPECTION RESULTS					
Item	Inspection Results				BMP's in General
1	<input type="checkbox"/>	Apparent problems	<input type="checkbox"/>	No problems	BMP does not appear to be well maintained.
2	<input type="checkbox"/>	Design flaws	<input type="checkbox"/>	No flaws	BMP observed to have significant design flaws which lessen its effectiveness.
3	<input type="checkbox"/>	Unauthorized modifications	<input type="checkbox"/>	No modifications	BMP has unauthorized modifications that reduce its effectiveness.
4	<input type="checkbox"/>	BMP removed	<input type="checkbox"/>	BMP present	BMP has been destroyed or removed from property.
5	<input type="checkbox"/>	Trash	<input type="checkbox"/>	No Trash	Trash and debris has accumulated on/in BMP. Yard waste in BMP.
6	<input type="checkbox"/>	Contaminated	<input type="checkbox"/>	Uncontaminated	Evidence of Oil, gasoline. Contaminants or other pollutants.
7	<input type="checkbox"/>	Smells	<input type="checkbox"/>	Doesn't smell	Unpleasant odors from the BMP.
II. BMP SPECIFIC INSPECTION RESULTS – LAKE / POND					
Item	Inspection Results				BMP : Lake / Pond
1	<input type="checkbox"/>	Clogged	<input type="checkbox"/>	Not clogged	Flow spreader uneven or clogged so flows are not uniformly distributed across BMP.
2	<input type="checkbox"/>	Sediment accumulated	<input type="checkbox"/>	No sediment accumulated	Sediment depth exceeds 2 inches on more than 10% of vegetated treatment area or interferes with BMP performance.
3	<input type="checkbox"/>	Erosion or scouring	<input type="checkbox"/>	No erosion or scouring	Eroded or scoured areas (including spillway) due to flow channelization, higher flows, wind or water.

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4	<input type="checkbox"/>	Poor vegetation	<input type="checkbox"/>	Proper vegetation	Planted vegetation is sparse or bare or eroded patches occur in more than 10% of the BMP. Vegetation is not higher than ponding depth.
5	<input type="checkbox"/>	Nuisance vegetation	<input type="checkbox"/>	Proper vegetation	Planted vegetation is excessively tall; nuisance weeds, invasive or noxious vegetation are overgrown; vegetation reduces free movement of water through BMP.
6	<input type="checkbox"/>	Brush/trees	<input type="checkbox"/>	Proper vegetation	Growth of brush and trees does not allow for proper maintenance.
7	<input type="checkbox"/>	Clogged	<input type="checkbox"/>	Not clogged	Inlet/outlet clogged or obstructed with sediment and/or debris.
8	<input type="checkbox"/>	Clogged	<input type="checkbox"/>	Not clogged	Overflow clogged or obstructed with sediment and/or debris.
9	<input type="checkbox"/>	Obstructed	<input type="checkbox"/>	Open	Stone diaphragm obstructed or covered with weeds or sediment.
1. Is maintenance needed at this time?					<input type="checkbox"/> Yes <input type="checkbox"/> No
2. Are mosquitoes or mosquito larvae present?					<input type="checkbox"/> Yes <input type="checkbox"/> No
3. Maintenance items completed: _____					

Inspected by: _____
Signature

[Print Full Name]

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Stormwater BMP Owner Inspection Form – Native Vegetation

City of Arnold, Missouri

Address: _____

Owner: _____

Legal: _____

Date: _____ E-mail: _____ Phone: (____) _____ - _____

I. GENERAL INSPECTION RESULTS					
Item	Inspection Results				BMP's in General
1	<input type="checkbox"/>	Apparent problems	<input type="checkbox"/>	No problems	BMP does not appear to be well maintained.
2	<input type="checkbox"/>	Design flaws	<input type="checkbox"/>	No flaws	BMP observed to have significant design flaws which lessen its effectiveness.
3	<input type="checkbox"/>	Unauthorized modifications	<input type="checkbox"/>	No modifications	BMP has unauthorized modifications that reduce its effectiveness.
4	<input type="checkbox"/>	BMP removed	<input type="checkbox"/>	BMP present	BMP has been destroyed or removed from property.
5	<input type="checkbox"/>	Trash	<input type="checkbox"/>	No Trash	Trash and debris has accumulated on/in BMP. Yard waste in BMP.
6	<input type="checkbox"/>	Contaminated	<input type="checkbox"/>	Uncontaminated	Evidence of Oil, gasoline. Contaminants or other pollutants.
7	<input type="checkbox"/>	Smells	<input type="checkbox"/>	Doesn't smell	Unpleasant odors from the BMP.
II. BMP SPECIFIC INSPECTION RESULTS – Native Vegetation					
Item	Inspection Results				BMP : Native vegetation
1	<input type="checkbox"/>	Does not correspond	<input type="checkbox"/>	Corresponds	Current plantings correspond to plants in the planting plan for the BMP.
1. Is maintenance needed at this time?					<input type="checkbox"/> Yes <input type="checkbox"/> No
2. Are mosquitoes or mosquito larvae present?					<input type="checkbox"/> Yes <input type="checkbox"/> No
3. Maintenance items completed					
: _____					

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Signature

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Received

By: _____

Comments/Corrective actions required:



Stormwater BMP Owner Inspection Form – Pervious Pavement City of Arnold, Missouri

Address: _____

Owner: _____

Legal: _____

Date: _____ E-mail: _____ Phone: (____) ____-_____

I. GENERAL INSPECTION RESULTS					
Item	Inspection Results				BMP's in General
1	<input type="checkbox"/>	Apparent problems	<input type="checkbox"/>	No problems	BMP does not appear to be well maintained.
2	<input type="checkbox"/>	Design flaws	<input type="checkbox"/>	No flaws	BMP observed to have significant design flaws which lessen its effectiveness.
3	<input type="checkbox"/>	Unauthorized modifications	<input type="checkbox"/>	No modifications	BMP has unauthorized modifications that reduce its effectiveness.
4	<input type="checkbox"/>	BMP removed	<input type="checkbox"/>	BMP present	BMP has been destroyed or removed from property.
5	<input type="checkbox"/>	Trash	<input type="checkbox"/>	No Trash	Trash and debris has accumulated on/in BMP. Yard waste in BMP.
6	<input type="checkbox"/>	Contaminated	<input type="checkbox"/>	Uncontaminated	Evidence of Oil, gasoline. Contaminants or other pollutants.
7	<input type="checkbox"/>	Smells	<input type="checkbox"/>	Doesn't smell	Unpleasant odors from the BMP.
II. BMP SPECIFIC INSPECTION RESULTS – PERVIOUS PAVEMENT					
Item	Inspection Results				BMP : Pervious Pavement
1	<input type="checkbox"/>	Debris on surface	<input type="checkbox"/>	Debris free	Is the surface covered with trash, yard clippings, or other types of debris?
2	<input type="checkbox"/>	Ponded water	<input type="checkbox"/>	Draining freely	Is there water ponding on the surface?
3	<input type="checkbox"/>	Clogged pores	<input type="checkbox"/>	Pores open	Pores on the surface are clogged.
4	<input type="checkbox"/>	Obstructed	<input type="checkbox"/>	No obstructions	Overflow devices are obstructed or debris has collected.
5	<input type="checkbox"/>	Sediment accumulated	<input type="checkbox"/>	No accumulated sediment	Sediment has accumulated and is not allowing water through the surface of the pavement.

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6	<input type="checkbox"/>	Damaged pipes	<input type="checkbox"/>	No damage	Part of the underdrain piping is crushed, deformed, damaged, in need of repair or any other failure. (If installed)
7	<input type="checkbox"/>	Weeds	<input type="checkbox"/>	No weeds	Invasive, nuisance vegetation or weeds are present.

1. Is maintenance needed at this time?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
2. Are mosquitoes or mosquito larvae present?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
3. Maintenance items completed: _____ _____ _____ _____		

Inspected by: _____
Signature

[Print Full Name]

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Stormwater BMP Owner Inspection Form – RainGarden City of Arnold, Missouri

Address: _____

Owner: _____

Legal: _____

Date: _____ E-mail: _____ Phone: (____) _____ - _____

I. GENERAL INSPECTION RESULTS					
Item	Inspection Results				BMP's in General
1	<input type="checkbox"/>	Apparent problems	<input type="checkbox"/>	No problems	BMP does not appear to be well maintained.
2	<input type="checkbox"/>	Design flaws	<input type="checkbox"/>	No flaws	BMP observed to have significant design flaws which lessen its effectiveness.
3	<input type="checkbox"/>	Unauthorized modifications	<input type="checkbox"/>	No modifications	BMP has unauthorized modifications that reduce its effectiveness.
4	<input type="checkbox"/>	BMP removed	<input type="checkbox"/>	BMP present	BMP has been destroyed or removed from property.
5	<input type="checkbox"/>	Trash	<input type="checkbox"/>	No Trash	Trash and debris has accumulated on/in BMP. Yard waste in BMP.
6	<input type="checkbox"/>	Contaminated	<input type="checkbox"/>	Uncontaminated	Evidence of Oil, gasoline. Contaminants or other pollutants.
7	<input type="checkbox"/>	Smells	<input type="checkbox"/>	Doesn't smell	Unpleasant odors from the BMP.
II. BMP SPECIFIC INSPECTION RESULTS - RAINGARDEN					
Item	Inspection Results				BMP : Raingarden
1	<input type="checkbox"/>	Sediment accumulated	<input type="checkbox"/>	No sediment accumulated	Sediment depth exceeds 2 inches on more than 10% of vegetated treatment area or interferes with BMP performance.
2	<input type="checkbox"/>	Erosion or scouring	<input type="checkbox"/>	No erosion or scouring	Eroded or scoured areas (including spillway) due to flow channelization, higher flows, wind or water.

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3	<input type="checkbox"/>	Poor vegetation	<input type="checkbox"/>	Proper vegetation	Planted vegetation is sparse or bare or eroded patches occur in more than 10% of the BMP.
4	<input type="checkbox"/>	Nuisance vegetation	<input type="checkbox"/>	Proper vegetation	Planted vegetation is excessively tall; nuisance weeds, invasive or noxious vegetation are overgrown; vegetation reduces free movement of water through BMP.
5	<input type="checkbox"/>	Brush/trees	<input type="checkbox"/>	Proper vegetation	Growth of brush and trees does not allow for proper maintenance.
6	<input type="checkbox"/>	Standing water	<input type="checkbox"/>	No standing water	Water is observed within the BMP (between storms) and appears not to drain freely or soil is excessively soggy. Excessive ponding of water within vegetated swale or other BMP.
7	<input type="checkbox"/>	Clogged	<input type="checkbox"/>	Not clogged	Inlet/outlet clogged or obstructed with sediment and/or debris.
8	<input type="checkbox"/>	Flow	<input type="checkbox"/>	No flow	Small quantities of water flow through the BMP, even when it has been dry for weeks, and an eroded, muddy channel has formed in the bottom.
9	<input type="checkbox"/>	Clogged	<input type="checkbox"/>	Not clogged	Overflow clogged or obstructed with sediment and/or debris.
*(If an item in the left column is checked, corrective maintenance is required)					
1. Is maintenance needed at this time?					<input type="checkbox"/> Yes <input type="checkbox"/> No
2. Are mosquitoes or mosquito larvae present?					<input type="checkbox"/> Yes <input type="checkbox"/> No
3. Maintenance items completed:					

Inspected by:

Signature

[Print Full Name]

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Stormwater BMP Owner Inspection Form – Rock Channel City of Arnold, Missouri

Address: _____

Owner: _____

Legal: _____

Date: _____ E-mail: _____ Phone: (____) _____ - _____

I. GENERAL INSPECTION RESULTS					
Item	Inspection Results				BMP's in General
1	<input type="checkbox"/>	Apparent problems	<input type="checkbox"/>	No problems	BMP does not appear to be well maintained.
2	<input type="checkbox"/>	Design flaws	<input type="checkbox"/>	No flaws	BMP observed to have significant design flaws which lessen its effectiveness.
3	<input type="checkbox"/>	Unauthorized modifications	<input type="checkbox"/>	No modifications	BMP has unauthorized modifications that reduce its effectiveness.
4	<input type="checkbox"/>	BMP removed	<input type="checkbox"/>	BMP present	BMP has been destroyed or removed from property.
5	<input type="checkbox"/>	Trash	<input type="checkbox"/>	No Trash	Trash and debris has accumulated on/in BMP. Yard waste in BMP.
6	<input type="checkbox"/>	Contaminated	<input type="checkbox"/>	Uncontaminated	Evidence of Oil, gasoline. Contaminants or other pollutants.
7	<input type="checkbox"/>	Smells	<input type="checkbox"/>	Doesn't smell	Unpleasant odors from the BMP.
II. BMP SPECIFIC INSPECTION RESULTS – ROCK CHANNEL					
Item	Inspection Results				BMP : Rock Channel
1	<input type="checkbox"/>	Clogged	<input type="checkbox"/>	Not clogged	Flow spreader uneven or clogged so flows are not uniformly distributed across BMP.
2	<input type="checkbox"/>	Sediment accumulated	<input type="checkbox"/>	No sediment accumulated	Forebay sediment depth exceeds 50% of design capacity.
3	<input type="checkbox"/>	Sediment accumulated	<input type="checkbox"/>	No sediment accumulated	Sediment depth exceeds 2 inches on more than 10% of vegetated treatment area or interferes with BMP performance.
4	<input type="checkbox"/>	Erosion or scouring	<input type="checkbox"/>	No erosion or scouring	Eroded or scoured areas due to flow channelization, higher flows, wind or water.

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5	<input type="checkbox"/>	Poor vegetation	<input type="checkbox"/>	Proper vegetation	Planted vegetation is sparse or bare or eroded patches occur in more than 10% of the BMP.
6	<input type="checkbox"/>	Nuisance vegetation	<input type="checkbox"/>	Proper vegetation	Planted vegetation is excessively tall; nuisance weeds, invasive or noxious vegetation are overgrown; vegetation reduces free movement of water through BMP.
7	<input type="checkbox"/>	Brush/trees	<input type="checkbox"/>	Proper vegetation	Growth of brush and trees does not allow for proper maintenance.
8	<input type="checkbox"/>	Standing water	<input type="checkbox"/>	No standing water	Water is observed within the BMP (between storms) and appears not to drain freely or soil is excessively soggy. Excessive ponding of water within vegetated swale or other BMP.
9	<input type="checkbox"/>	Clogged	<input type="checkbox"/>	Not clogged	Inlet/outlet clogged or obstructed with sediment and/or debris.
10	<input type="checkbox"/>	Flow	<input type="checkbox"/>	No flow	Small quantities of water flow through the vegetated swale, even when it has been dry for weeks, and eroded muddy channel has formed in the swale bottom
11	<input type="checkbox"/>	Plant stress	<input type="checkbox"/>	No stress	Plant stress evident from inadequate watering.
12	<input type="checkbox"/>	Needs mowing	<input type="checkbox"/>	Grass Mowed	Grass is overgrown.
*(If an item in the left column is checked, corrective maintenance is required)					
1. Is maintenance needed at this time?					<input type="checkbox"/> Yes <input type="checkbox"/> No
2. Are mosquitoes or mosquito larvae present?					<input type="checkbox"/> Yes <input type="checkbox"/> No
3. Maintenance items competed: _____					

Inspected by: _____
Signature

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Stormwater BMP Owner Inspection Form – Sand Filter City of Arnold, Missouri

Address: _____

Owner: _____

Legal: _____

Date: _____ E-mail: _____ Phone: (____) _____ - _____

I. GENERAL INSPECTION RESULTS					
Item	Inspection Results				BMP's in General
1	<input type="checkbox"/>	Apparent problems	<input type="checkbox"/>	No problems	BMP does not appear to be well maintained.
2	<input type="checkbox"/>	Design flaws	<input type="checkbox"/>	No flaws	BMP observed to have significant design flaws which lessen its effectiveness.
3	<input type="checkbox"/>	Unauthorized modifications	<input type="checkbox"/>	No modifications	BMP has unauthorized modifications that reduce its effectiveness.
4	<input type="checkbox"/>	BMP removed	<input type="checkbox"/>	BMP present	BMP has been destroyed or removed from property.
5	<input type="checkbox"/>	Trash	<input type="checkbox"/>	No Trash	Trash and debris has accumulated on/in BMP. Yard waste in BMP.
6	<input type="checkbox"/>	Contaminated	<input type="checkbox"/>	Uncontaminated	Evidence of Oil, gasoline. Contaminants or other pollutants.
7	<input type="checkbox"/>	Smells	<input type="checkbox"/>	Doesn't smell	Unpleasant odors from the BMP.
II. BMP SPECIFIC INSPECTION RESULTS – SAND FILTER					
Item	Inspection Results				BMP : Sand Filter
1	<input type="checkbox"/>	Access cover problem	<input type="checkbox"/>	No access cover problem	Cover cannot be opened, corrosion/deformation of cover; maintenance person cannot remove cover using normal lifting pressure; cover is missing or partially in place.
2	<input type="checkbox"/>	Deteriorating paint	<input type="checkbox"/>	Paint is good	Part or parts have a rusting or scaling condition and have affected structural adequacy.
3	<input type="checkbox"/>	Sediment accumulated	<input type="checkbox"/>	No accumulated sediment	Sediment depth exceeds acceptable levels, >50% of design depth)

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4	<input type="checkbox"/>	Holding or sedimentation chamber dry	<input type="checkbox"/>	At normal pool	Holding or sedimentation chamber is leaking and not maintaining normal pool level.
5	<input type="checkbox"/>	Ineffective media	<input type="checkbox"/>	Media effective	Filter media ineffective in doing intended function and needs to be replaced; filter is beyond the typical average life of product.
6	<input type="checkbox"/>	Visible liner damage	<input type="checkbox"/>	No liner damage	Liner is visible and has more than three 1/4-inch holes in it or is damaged.
7	<input type="checkbox"/>	Compromised	<input type="checkbox"/>	Uncompromised	Membrane or roof structure is compromised by either roots and/or water discharge.
8	<input type="checkbox"/>	Short circuiting	<input type="checkbox"/>	Normal flow	Seepage/flows occur along the vault walls and corners. Sand eroding near inflow area. Flows become concentrated over one section of the sand filter rather than disperse.
9	<input type="checkbox"/>	Damaged pipes	<input type="checkbox"/>	No damage	Part of the piping is crushed, deformed, damaged, in need of repair or any other failure to the piping.
10	<input type="checkbox"/>	Trash rack missing	<input type="checkbox"/>	Trash rack present	Trash racking is either missing or damaged.
11	<input type="checkbox"/>	Sediment in pipes	<input type="checkbox"/>	Pipes clear	Drain pipes and/or cleanouts are full of sediment and/or debris.
12	<input type="checkbox"/>	Vault damaged	<input type="checkbox"/>	Vault undamaged	Vault structure has cracks in walls, bottom, top slab. There is damage to frame.
13	<input type="checkbox"/>	Damaged baffles	<input type="checkbox"/>	No damage	Baffles are corroded, cracked, warped and or showing signs of failure.
14	<input type="checkbox"/>	Oil accumulated	<input type="checkbox"/>	No Oil	Oil accumulations exceed 1-inch at the surface of the water
15	<input type="checkbox"/>	Blocked air vents	<input type="checkbox"/>	Air vents open	One half of the cross section of a vent is blocked or the vent is damaged.
16	<input type="checkbox"/>	Internal walls damaged	<input type="checkbox"/>	Internal walls are sound	Internal walls are corroded, cracked, warped, and/or showing signs of failure.

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17	<input type="checkbox"/>	Prolonged flows	<input type="checkbox"/>	Standard flow	Sand is saturated for prolonged periods of time (several weeks) and does not dry out between storms due to continuous base flow or prolonged flows from detention facilities.	
18	<input type="checkbox"/>	Erosion	<input type="checkbox"/>	No erosion	Erosion is evident at outlet/spillway	
19	<input type="checkbox"/>	Mosquitos	<input type="checkbox"/>	No mosquitos	Mosquitos or larvae are present in standing water.	
*(If an item in the left column is checked, corrective maintenance is required)					<input type="checkbox"/> Yes	<input type="checkbox"/> No
1. Is maintenance needed at this time?					<input type="checkbox"/> Yes	<input type="checkbox"/> No
2. Are mosquitoes or mosquito larvae present?					<input type="checkbox"/> Yes	<input type="checkbox"/> No
3. Comments/Notes: _____ _____ _____						

Inspected by: _____

Signature

[Print Full Name]

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Stormwater BMP Owner Inspection Form – Underground Detention

City of Arnold, Missouri

Address: _____

Owner: _____

Legal: _____

Date: _____ E-mail: _____ Phone: (____) _____-_____

I. GENERAL INSPECTION RESULTS					
Item	Inspection Results				BMP's in General
1	<input type="checkbox"/>	Apparent problems	<input type="checkbox"/>	No problems	BMP does not appear to be well maintained.
2	<input type="checkbox"/>	Design flaws	<input type="checkbox"/>	No flaws	BMP observed to have significant design flaws which lessen its effectiveness.
3	<input type="checkbox"/>	Unauthorized modifications	<input type="checkbox"/>	No modifications	BMP has unauthorized modifications that reduce its effectiveness.
4	<input type="checkbox"/>	BMP removed	<input type="checkbox"/>	BMP present	BMP has been destroyed or removed from property.
5	<input type="checkbox"/>	Trash	<input type="checkbox"/>	No Trash	Trash and debris has accumulated on/in BMP. Yard waste in BMP.
6	<input type="checkbox"/>	Contaminated	<input type="checkbox"/>	Uncontaminated	Evidence of Oil, gasoline. Contaminants or other pollutants.
7	<input type="checkbox"/>	Smells	<input type="checkbox"/>	Doesn't smell	Unpleasant odors from the BMP.
II. BMP SPECIFIC INSPECTION RESULTS – UNDERGROUND DETENTION					
Item	Inspection Results				BMP : Underground Detention
1	<input type="checkbox"/>	Weeds	<input type="checkbox"/>	No weeds	Invasive, nuisance vegetation or weeds are present.
2	<input type="checkbox"/>	Sediment accumulated	<input type="checkbox"/>	No accumulated sediment	Sediment in storage areas or filter, and has reduced storage volume.
3	<input type="checkbox"/>	Erosion	<input type="checkbox"/>	No erosion	Eroded damage over two inches deep; potential for continued erosion; any erosion on a compacted berm embankment; soil from adjacent areas washes into/on BMP; continued erosion is prevalent.

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4	<input type="checkbox"/>	Insects	<input type="checkbox"/>	No insects	Wasps, hornets or bees interfere with maintenance activities. Excessive or nuisance levels.
5	<input type="checkbox"/>	Contaminated	<input type="checkbox"/>	No contaminants	Prevalent and visible contaminants such as oil.
6	<input type="checkbox"/>	Clogged	<input type="checkbox"/>	Not clogged	Entry point for water is clogged or obstructed with sediment and/or debris.
7	<input type="checkbox"/>	Forebay non-operational	<input type="checkbox"/>	Operating properly	Sediment forebay is either filled with sediment (greater than 50% of design depth), being bypassed, or does not exist
8	<input type="checkbox"/>	Pipes/structural repairs needed	<input type="checkbox"/>	Pipes/structure are sound	Pipes and structures show signs of corrosion, spalls, leaks, deformation, crushing or other material failure.

1. Is maintenance needed at this time?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
2. Are mosquitoes or mosquito larvae present?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
3. Maintenance items completed: _____ _____ _____		

Inspected by: _____
Signature

[Print Full Name]

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Stormwater BMP Owner Inspection Form – Vegetated Swale City of Arnold, Missouri

Address: _____

Owner: _____

Legal: _____

Date: _____ E-mail: _____ Phone: (____) ____-_____

I. GENERAL INSPECTION RESULTS					
Item	Inspection Results				BMP's in General
1	<input type="checkbox"/>	Apparent problems	<input type="checkbox"/>	No problems	BMP does not appear to be well maintained.
2	<input type="checkbox"/>	Design flaws	<input type="checkbox"/>	No flaws	BMP observed to have significant design flaws which lessen its effectiveness.
3	<input type="checkbox"/>	Unauthorized modifications	<input type="checkbox"/>	No modifications	BMP has unauthorized modifications that reduce its effectiveness.
4	<input type="checkbox"/>	BMP removed	<input type="checkbox"/>	BMP present	BMP has been destroyed or removed from property.
5	<input type="checkbox"/>	Trash	<input type="checkbox"/>	No Trash	Trash and debris has accumulated on/in BMP. Yard waste in BMP.
6	<input type="checkbox"/>	Contaminated	<input type="checkbox"/>	Uncontaminated	Evidence of Oil, gasoline. Contaminants or other pollutants.
7	<input type="checkbox"/>	Smells	<input type="checkbox"/>	Doesn't smell	Unpleasant odors from the BMP.
II. BMP SPECIFIC INSPECTION RESULTS – VEGETATED SWALE					
Item	Inspection Results				BMP : Vegetated Swale
1	<input type="checkbox"/>	Clogged	<input type="checkbox"/>	Not clogged	Flow spreader uneven or clogged so flows are not uniformly distributed across BMP.
2	<input type="checkbox"/>	Sediment accumulated	<input type="checkbox"/>	No sediment accumulated	Forebay sediment depth exceeds 50% of design capacity.
3	<input type="checkbox"/>	Sediment accumulated	<input type="checkbox"/>	No sediment accumulated	Sediment depth exceeds 2 inches on more than 10% of vegetated treatment area or interferes with BMP performance.
4	<input type="checkbox"/>	Erosion or scouring	<input type="checkbox"/>	No erosion or scouring	Eroded or scoured areas due to flow channelization, higher flows, wind or water.

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5	<input type="checkbox"/>	Poor vegetation	<input type="checkbox"/>	Proper vegetation	Planted vegetation is sparse or bare or eroded patches occur in more than 10% of the BMP.
6	<input type="checkbox"/>	Nuisance vegetation	<input type="checkbox"/>	Proper vegetation	Planted vegetation is excessively tall; nuisance weeds, invasive or noxious vegetation are overgrown; vegetation reduces free movement of water through BMP.
7	<input type="checkbox"/>	Brush/trees	<input type="checkbox"/>	Proper vegetation	Growth of brush and trees does not allow for proper maintenance.
8	<input type="checkbox"/>	Standing water	<input type="checkbox"/>	No standing water	Water is observed within the BMP (between storms) and appears not to drain freely or soil is excessively soggy. Excessive ponding of water within vegetated swale or other BMP.
9	<input type="checkbox"/>	Clogged	<input type="checkbox"/>	Not clogged	Inlet/outlet clogged or obstructed with sediment and/or debris.
10	<input type="checkbox"/>	Plant stress	<input type="checkbox"/>	No stress	Plant stress evident from inadequate watering.
11	<input type="checkbox"/>	Needs mowing	<input type="checkbox"/>	Grass Mowed	Grass is overgrown.
*(If an item in the left column is checked, corrective maintenance is required)					
1. Is maintenance needed at this time?					<input type="checkbox"/> Yes <input type="checkbox"/> No
2. Are mosquitoes or mosquito larvae present?					<input type="checkbox"/> Yes <input type="checkbox"/> No
3. Maintenance items completed: _____					

Inspected by: _____

Signature

[Print Full Name]

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Stormwater BMP Owner Inspection Form – Wet Detention City of Arnold, Missouri

Address: _____

Owner: _____

Legal: _____

Date: _____ E-mail: _____ Phone: (____) ____-_____

I. GENERAL INSPECTION RESULTS					
Item	Inspection Results				BMP's in General
1	<input type="checkbox"/>	Apparent problems	<input type="checkbox"/>	No problems	BMP does not appear to be well maintained.
2	<input type="checkbox"/>	Design flaws	<input type="checkbox"/>	No flaws	BMP observed to have significant design flaws which lessen its effectiveness.
3	<input type="checkbox"/>	Unauthorized modifications	<input type="checkbox"/>	No modifications	BMP has unauthorized modifications that reduce its effectiveness.
4	<input type="checkbox"/>	BMP removed	<input type="checkbox"/>	BMP present	BMP has been destroyed or removed from property.
5	<input type="checkbox"/>	Trash	<input type="checkbox"/>	No Trash	Trash and debris has accumulated on/in BMP. Yard waste in BMP.
6	<input type="checkbox"/>	Contaminated	<input type="checkbox"/>	Uncontaminated	Evidence of Oil, gasoline. Contaminants or other pollutants.
7	<input type="checkbox"/>	Smells	<input type="checkbox"/>	Doesn't smell	Unpleasant odors from the BMP.
II. BMP SPECIFIC INSPECTION RESULTS – WET DETENTION					
Item	Inspection Results				BMP : Wet Detention
1	<input type="checkbox"/>	Weeds	<input type="checkbox"/>	No weeds	Invasive, nuisance vegetation or weeds are present.
2	<input type="checkbox"/>	Brush/trees	<input type="checkbox"/>	Proper vegetation	Growth of brush and trees does not allow for proper maintenance. Dead, diseased, or dying trees are present. Tree growth on berms or emergency spillway >4' in height or covering more than 10% of spillway.

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3	<input type="checkbox"/>	Sediment accumulated	<input type="checkbox"/>	No accumulated sediment	Sediment in storage areas, rock filters, and detention area has reduced storage volume significantly.
4	<input type="checkbox"/>	Erosion	<input type="checkbox"/>	No erosion	Eroded damage over two inches deep; potential for continued erosion; any erosion on a compacted berm embankment; soil from adjacent areas washes into/on BMP; continued erosion is prevalent.
5	<input type="checkbox"/>	Rodent holes	<input type="checkbox"/>	No rodent holes	If facility acts as a dam or berm, any evidence of rodent holes, or any evidence of water piping through dam or berm via rodent holes.
6	<input type="checkbox"/>	Insects	<input type="checkbox"/>	No insects	Wasps, hornets or bees interfere with maintenance activities. Excessive or nuisance levels.
7	<input type="checkbox"/>	Unleveled berm	<input type="checkbox"/>	Level berm	Unleveled internal berm (if present) dividing wet pond cells.
8	<input type="checkbox"/>	Contaminated	<input type="checkbox"/>	No contaminants	Prevalent and visible contaminants such as oil.
9	<input type="checkbox"/>	Clogged	<input type="checkbox"/>	Not clogged	Overflow or low flow orifice is clogged or obstructed with sediment and/or debris.
10	<input type="checkbox"/>	Spillway in disrepair	<input type="checkbox"/>	Open	Emergency spillway is obstructed, filled with sediment, eroded out, or in disrepair.
11	<input type="checkbox"/>	Rip rap needs repair	<input type="checkbox"/>	Rip rap in good condition	Rip rap is washed out or insufficient to handle discharges.
12	<input type="checkbox"/>	Forebay non-operational	<input type="checkbox"/>	Operating properly	Sediment forebay is either filled with sediment (greater than 50% of design depth), being bypassed, or does not exist
13	<input type="checkbox"/>	Trash racks need cleaning	<input type="checkbox"/>	Trash racks are clean	Debris has accumulated on trash racks.
14	<input type="checkbox"/>	Pipes/structural repairs needed	<input type="checkbox"/>	Pipes/structure are sound	Pipes and structures show signs of corrosion, spalls, leaks, deformation, crushing or other material failure.
15	<input type="checkbox"/>	Sediment in overflow	<input type="checkbox"/>	Overflow clear	Sediment has accumulated in overflow.

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16	<input type="checkbox"/>	Dam needs repair	<input type="checkbox"/>	Dam is sound	The dam/embankment has visible signs of cracking, sliding, piping, leaking or bulging.
17	<input type="checkbox"/>	Slope protection failure	<input type="checkbox"/>	Slope protection adequate	Slope reinforcing has been eroded or otherwise damaged so that slope is unstable.

1. Is maintenance needed at this time?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
2. Are mosquitoes or mosquito larvae present?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
3. Maintenance items completed: _____		

Inspected by: _____
Signature

[Print Full Name]

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Comments/Corrective actions required:	



Stormwater BMP Owner Inspection Form – Wetlands City of Arnold, Missouri

Address: _____

Owner: _____

Legal: _____

Date: _____ E-mail: _____ Phone: (____) _____ - _____

I. GENERAL INSPECTION RESULTS					
Item	Inspection Results				BMP's in General
1	<input type="checkbox"/>	Apparent problems	<input type="checkbox"/>	No problems	BMP does not appear to be well maintained.
2	<input type="checkbox"/>	Design flaws	<input type="checkbox"/>	No flaws	BMP observed to have significant design flaws which lessen its effectiveness.
3	<input type="checkbox"/>	Unauthorized modifications	<input type="checkbox"/>	No modifications	BMP has unauthorized modifications that reduce its effectiveness.
4	<input type="checkbox"/>	BMP removed	<input type="checkbox"/>	BMP present	BMP has been destroyed or removed from property.
5	<input type="checkbox"/>	Trash	<input type="checkbox"/>	No Trash	Trash and debris has accumulated on/in BMP. Yard waste in BMP.
6	<input type="checkbox"/>	Contaminated	<input type="checkbox"/>	Uncontaminated	Evidence of Oil, gasoline. Contaminants or other pollutants.
7	<input type="checkbox"/>	Smells	<input type="checkbox"/>	Doesn't smell	Unpleasant odors from the BMP.
II. BMP SPECIFIC INSPECTION RESULTS - WETLANDS					
Item	Inspection Results				BMP : Wetlands
1	<input type="checkbox"/>	Clogged	<input type="checkbox"/>	Not clogged	Flow spreader uneven or clogged so flows are not uniformly distributed across BMP.
2	<input type="checkbox"/>	Sediment accumulated	<input type="checkbox"/>	No sediment accumulated	Sediment depth exceeds 2 inches on more than 10% of vegetated treatment area or interferes with BMP performance.
3	<input type="checkbox"/>	Erosion or scouring	<input type="checkbox"/>	No erosion or scouring	Eroded or scoured areas (including spillway) due to flow channelization, higher flows, wind or water.

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4	<input type="checkbox"/>	Poor vegetation	<input type="checkbox"/>	Proper vegetation	Planted vegetation is sparse or bare or eroded patches occur in more than 10% of the BMP. Vegetation is not higher than ponding depth.	
5	<input type="checkbox"/>	Nuisance vegetation	<input type="checkbox"/>	Proper vegetation	Planted vegetation is excessively tall; nuisance weeds, invasive or noxious vegetation are overgrown; vegetation reduces free movement of water through BMP.	
6	<input type="checkbox"/>	Brush/trees	<input type="checkbox"/>	Proper vegetation	Growth of brush and trees does not allow for proper maintenance.	
7	<input type="checkbox"/>	Clogged	<input type="checkbox"/>	Not clogged	Inlet/outlet clogged or obstructed with sediment and/or debris.	
8	<input type="checkbox"/>	Present	<input type="checkbox"/>	Not present	Small quantities of water present in the BMP, even when it has been dry for weeks, and an eroded, muddy channel has formed in the bottom.	
9	<input type="checkbox"/>	Clogged	<input type="checkbox"/>	Not clogged	Overflow clogged or obstructed with sediment and/or debris.	
10	<input type="checkbox"/>	Obstructed	<input type="checkbox"/>	Open	Stone diaphragm obstructed or covered with weeds or sediment.	
1. Is maintenance needed at this time?					<input type="checkbox"/> Yes	<input type="checkbox"/> No
2. Are mosquitoes or mosquito larvae present?					<input type="checkbox"/> Yes	<input type="checkbox"/> No
3. Maintenance items completed: _____						

Inspected by: _____

Signature

[Print Full Name]

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Appendix G
Public Review Comments
and Response

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Public Review and Comment

To: File
By: DTS
QC Review:
Date: 10/30/2017
Re: Storm Water Master Plan – Public Review and Comment

As a part of the Storm Water Master Plan (SWMP) revision and update, the draft SWMP was released for public review and comment in accordance with Section 4.2.2.1 of the Arnold Municipal Separate Storm Sewer System General State Operating Permit. The City of Arnold placed a public notice seeking review and comment in *The Countian – Jefferson County* on Friday, August 25, 2017. The SWMP was posted electronically on the City's website and printed copies were available at City Hall for interested parties. The public notice also included a notification for the Public Hearing held on September 21, 2017. Notice of the Public Hearing was also posted on the City's website at that time.

The Public Hearing had 14 attendees in addition to City Council. An executive summary of the proposed changes to the SWMP was reviewed at the hearing. A copy of the meeting minutes, executive summary and the attendee list is included in this appendix.

The public comment period lasted until Friday, October 13, 2017. Comments were accepted at the Public Hearing, via email or in writing addressed to the City of Arnold Public Works Department. At the time of the close of the public comment period no comments were received. In the event any comments are received after the close of the public comment period, these will be reviewed and considered for inclusion.

**Public Notice: MS4 Storm Water Management Plan 2017 – 2022
For the City of Arnold, Missouri.**

Notice is hereby given that the City of Arnold, Missouri wishes to update its Storm Water Management *Plan (SWMP)* as required by the Missouri Department of Natural Resources and the EPA National Pollutant Discharge Elimination System (NPDES) for compliance with the General State Operating Permit for the Arnold Municipal Separate Storm Sewer System (MS4).

The proposed plan has been updated to address public education and outreach, illicit discharges, pre/post-construction storm water runoff, pollution prevention, and good housekeeping for the City.

A Public Hearing on the matter will be conducted during the regularly scheduled City council meeting set for 7 p.m., Central Time, Thursday, September 21, 2017, in the Council Chambers, located at City Hall, 2101 Jeffco Blvd., Arnold, Missouri 63010. The hearing will be open to the public. All interested parties are encouraged to attend.

A copy of the proposed Storm Water Management Plan (SWMP) is available for public inspection in the Office of the City Clerk, located at City Hall, 2101 Jeffco Blvd. Arnold, Missouri between the hours of 8 a.m. and 4 p.m., Central Time, Monday through Friday. The proposed plan is also available for review on the storm water page of the City's website.

The City will be accepting comments on the proposed plan until Friday, October 13, 2017. Comments may be sent in writing or email to the following location:

City of Arnold
Public Works Department
2900 Arnold Tenbrook Road
Arnold, MO 63010
eblattner@arnoldmo.org



MS4 STORM WATER MANAGEMENT PLAN 2017-2022

Executive Summary

1. The City of Arnold's Municipal Separate Storm Sewer System (MS4) program was developed in 2003 as required by the Missouri State Operating Permit for storm water discharges in compliance with Missouri Clean Water Law and the Federal Clean Water Act. The permit is administered by the Missouri Department of Natural Resources (MDNR).
2. Compliance with the Operating Permit is achieved by meeting implementation goals for the six Minimum Control Measures (MCM). These goals typically consist of Best Management Practices (BMPs) that the City will perform or oversee. The BMPs are periodically reviewed and assessed for effectiveness with ineffective BMPs revised or removed and replaced with more effective BMPs. A Storm Water Master Plan (SWMP) was prepared to document the BMP goals that will be implemented during each permit term.
3. Revisions to the SWMP have been prepared for compliance with the new Operating Permit conditions and to address comments received from a MDNR audit conducted in February 2017.
4. A public hearing was held on September 21, 2017 to solicit comments and feedback on the Draft SWMP from the Citizens of Arnold.
5. The City of Arnold is in the Meramec River watershed which MDNR has listed as impaired for E-coli bacteria (from animal waste and illegal sanitary sewer discharges) and lead.
6. The revised SWMP addresses the Minimum Control Measures (MCM) by implementing the following BMP goals during the next 5 year permit cycle:
 - 1) Public Education and Outreach.
 - a. Implement new Stormwater Pollution Prevention Public Education and Outreach Plan.
 - i. Informational Storm Water Website; Educational Press Releases & Brochures; Stormwater Survey & Online Questionnaire.
 - 2) Public Involvement and Participation.
 - a. Support Clean Stream Activities; Provide Complaint Hotline; Storm Inlet Medallion Program (No Dumping – Drains to Stream); Volunteer Speaker Program; Solicit volunteers and form a Citizen Advisory Board.
 - 3) Illicit Discharge Detection and Elimination.
 - a. Continue Updating Storm Sewer System Mapping; Continue Dry Weather Screenings of Storm Outfalls; Update Illicit Discharge Ordinance.
 - b. Implement new Illicit Discharge Detection, Elimination and Spill Response Standard Operating Procedure.
 - 4) Construction Site Storm Water Runoff Control.
 - a. Update Construction Site Ordinance; Continue Construction Permit Training; Review and update BMP Design Manual and Reference Guide.
 - 5) Post Construction Storm Water in new development and redevelopment.
 - a. Update Post Construction Ordinance; Continue Green Infrastructure Award program; Review and update Post Construction BMP Design Manual and Reference Guide; Continue providing Post Construction and Green Infrastructure Training Seminars; Increase BMP Inspections
 - 6) Pollution Prevention and Good Housekeeping for Municipal Operations.
 - a. Review and update Municipal Facility Storm Water Pollution Prevention Plans (SWPPP); Continue SWPPP Training; Continue Storm Water Collection System Maintenance; Continue Annual Municipal Employee Training program.

The Public Hearing was called to order by Mayor Counts at 7:00 p.m. City Clerk Tammi Casey made note of those in attendance: Mayor Counts, Hood, Sullivan, McArthur, Cooley, Fleischmann, Fulbright, Owens (excused), Plunk (excused), Richison, Holden, Sweeney, Brown, Blattner, Kroupa (arrived 7:02) and Chief Shockey.

A. MS4 STORM WATER MANAGEMENT PLAN 2017-2022

Ed Blattner spoke to council regarding the 2017-2022 storm water management plan, as required by Missouri Department of Natural Resources and the EPA, as a condition of the new five year storm water operating permit.

A copy of the plan summary given by Mr. Blattner is hereto attached and made part of this record.

B. 2017-14 MINOR RECORD PLAT, RICHARDSON SQUARE, PLAT 19

Mary Holden stated that this consists of converting two lots into one. The properties are the Goodwill store in Richardson Square and the empty grass lot next to it. Jefferson County currently owns the empty lot for nonpayment of taxes. Goodwill is purchasing it. The Planning Commission held a Public Hearing at its September 12, 2017 meeting. There were no comments during the Public Hearing and the Planning Commission is forwarding a recommendation of approval by a vote of 8-0.

PUBLIC COMMENTS

NONE

COUNCIL COMMENTS

NONE

The Public Hearing ended at 7:05 p.m.

City Clerk Tammi Casey, MRCC

MS4 STORM WAER MANAGEMENT PLAN (SWMP) 2017-2022

PUBLIC HEARING ATTENDANCE

SIGN IN SHEET September 21, 2017

NAME	Address	PHONE	E-MAIL
Ed Blattner	2900 Arnold Tenbrook 63010	636-282-6650	eblattner@arnoldmo.org
JULIE ROSE	844 EDGEWOOD DR	314-712-0051	
Carolyn Doty	1960 Redwood Dr	314-808-1799	
James Sarthwick	3975 Ryan Rd Arnold	636 296 7729 x149	
in ARK Bosso	2838 ROSEWOOD ARNOLD MO	636 287 6228	
Mary Palombo	1945 Forest Haven Imperial, MO 63052	636 464 4136	
Diana Brunswick-Bosso	2838 Rosewood Dr Arnold MO	636-633-6328	
Tim DEAN	1&L	636-777-3000	
DAV GOVERD	5929 OLD STATE Rd IMPERIAL, MO 63052	636-464-9380	
DO MFOFF	2090 20th St & 30th St	257-5756	
SUSAN Flanagan	2335 Tribute Dr Arnold, 63010	314-409- 4899	
Tammi Colley	6330 Old Lemay Ferry Imperial, MO 63052		

MS4 STORM WATER MANAGEMENT PLAN 2017-2022

Public hearing presentation outline for September 21, 2017

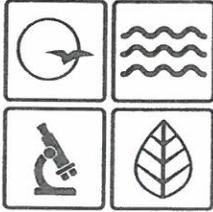
1. New Updated SWMP required by MDNR & EPA as a condition of the new 5 year storm water operating permit.
2. A public hearing is required and a public attendance sheet has been passed around to record those in attendance this evening.
3. The City and our storm water consultant, Intuition & Logic, prepared the revised SWMP to comply with the state storm water operating permit and the BMP's (Best Management Practices) we must implement.
4. Many revisions to the SWMP are a direct result of the MDNR audit that occurred in February 2017.
5. The City of Arnold is in the Meramec River watershed which MDNR has listed as impaired for E-coli bacteria (from animal waste and illegal sanitary sewer discharges).
6. Our revised SWMP addresses the following minimum control measures (MCM).
 - a. Public Education and Outreach.
 - b. Public Involvement and Participation.
 - c. Illicit Discharge Detection and Elimination.
 - d. Construction Site Storm Water Runoff Control.
 - e. Post Construction Storm Water in new development and redevelopment.
 - f. Pollution Prevention and good housekeeping for municipal operations.
7. Plan of Action during the 5 year permit cycle to address the minimum control measures.
 - a. The City's storm water webpage.
 - b. Press releases.
 - c. Educational brochures & a Storm water pollution public education/ outreach plan.
 - d. Website storm water questionnaire and resident survey mailing.
 - e. Clean stream activities.
 - f. Installation of additional storm inlet medallions stating "Dump No Waste-Drains to Stream".
 - g. Seek volunteer speakers to address water quality issues at public meetings.
 - h. Continue with our storm sewer mapping and outfall locations.
 - i. Continuation of Dry weather screenings of outfall locations.
 - j. Updating our illicit discharge ordinance.
 - k. We have created an Illicit Discharge Detection, Elimination Plan and Spill Response Standard Operating Procedure.
 - l. Construction site ordinance updates.
 - m. Construction permits training.
 - n. BMP guide and design manual review and updates.
 - o. Post Construction Ordinance review and update.
 - p. Green infrastructure recognition award.
 - q. Increased storm water BMP inspections and record keeping
 - r. Municipal operations training in pollution prevention and good housekeeping for City operations.
 - s. Creation of a Citizen's Advisory Board to assist the City Council, staff, and residents to meet the storm water operating permit requirements. This advisory board should be in place by the spring of 2018.
 - t. Our storm water consultant, Intuition & Logic will continue to assist us in ensuring we meet MDNR storm water permit requirements.

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Appendix H

MoDNR Audit Response

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Missouri Department of dnr.mo.gov

NATURAL RESOURCES

Eric R. Greitens, Governor

Carol S. Comer, Director

May 11, 2017

Mayor Ron Counts
City of Arnold
2101 Jeffco Blvd.
Arnold, MO 63010

RETURN TO COMPLIANCE

Dear Mr. Counts:

Staff from the Department of Natural Resources conducted an audit on February 22- 23, 2017 of The City of Arnold's Municipal Separate Storm Sewer System (MS4) program. The entity operates under the authority of Missouri State Operating Permit MOR040043

On April 20, 2017 a sufficient response was received to the required actions in the March 23, 2017 report. We are returning the City of Arnold to compliance with the expectation that the future actions laid out in the response are completed. Continue working on targeted education messages for industries and businesses. Ensure all required public notice periods are met for the development and oversight of the Stormwater Management Plan. Solicit volunteers from the public to serve on the Citizen Advisory Board. Maintain a log of all post construction best management practice inspection records. Continue working on a written standard operating procedure for the discharges found, including follow up and enforcement action. Make certain attention is kept on the best management practices at municipally own facilities. No further response is required to address the report.

The response shows that you recognize our mutual goal in providing a quality life for Missouri's citizens through environmental compliance. The department appreciates your voluntary efforts to comply with the laws of Missouri and your continued efforts to work with us to improve protection of Missouri citizens and our natural resources.

If you have any questions, please contact Sarah Wright-Aholt by mail at the St. Louis Regional Office, 7545 South Lindbergh, Ste. 210, St. Louis, Missouri 63125; by phone at 314-416-2960; or by email at sarah.wright-aholt@dnr.mo.gov.

Sincerely,

ST. LOUIS REGIONAL OFFICE

Paul Morris
Environmental Supervisor

EM/SWA/jws

C: Ed Blattner, Public Works Director, City of Arnold

Mary Holden, Community Development Director, City of Arnold





City of Arnold

Ron Counts, Mayor

April 20, 2017

Ms. Ethel Myers, Water Section Manager
State of Missouri Department of Natural Resources
St. Louis Regional Office
7545 South Lindberg, Suite 210
St. Louis, Missouri 63125

RE: LETTER OF WARNING RESPONSE REQUIRED DATED 3/23/2017

Dear Ms. Meyers:

In response to your letter of March 23, 2017 (copy attached) please find our written response documenting the actions the City of Arnold will take to address the violations listed in the MDNR Audit undertaken on February 22 & 23, 2017.

Violation# 1. The City of Arnold will work with our storm water consultant, Intuition & Logic to develop an expanded Education and Outreach Program which will add targeted outreach to industry and business audiences within the City such as Schools, Restaurants, Shopping Centers, Automotive Establishments, Grocery Stores, Mobile operations (Carpet Cleaners, Painters, Pressure Washers), Lawn and Garden Centers, and others. The goal would be to eliminate or reduce behaviors and practices that cause or contribute to adverse storm water impacts. We plan to design brochures and educational material to achieve improvements in the targeted audience's understanding of their potential impacts on stormwater and ways to protect stormwater. We will work with our stormwater consultant to incorporate these revisions into the draft Stormwater Master Plan (SWMP)-MCM1 Public Education and Outreach Plan.

Action implemented:

Revised SWMP is in progress.

Action to be implemented:

Prepare draft educational brochures. Targeted industrial and commercial brochures will be developed and sent concurrently with the residential outreach program.

Start: April 2017

Completion by August 2018

Distributed in Fall of 2018

We do not anticipate any changes to existing City Ordinances.

City Hall
2101 Jeffco Blvd.
Arnold, MO 63010
636/296-2100

Parks and Recreation
1695 Missouri State Rd.
Arnold, MO 63010
636/282-2380

Public Works
2900 Arnold Tenbrook
Arnold, MO 63010
636/282-2386

Violation# 2. Our current SWMP is being revised and updated to address changes from the previous permit. Our storm water consultant is currently working on the revisions to our current SWMP with the intended plan to hold a public hearing and comment period before the City Council meeting no sooner than in May 2017 but before the end of August 2017. The public hearing notice will be published in a legal newspaper publication, the City's website, and posted on the front doors of City Hall 15 days prior to the public hearing. The public hearing notice procedure will be followed for all future revisions to the SWMP and prior to submittal of the biennial report.

Action implemented:

Revised SWMP is in progress.

Action to be implemented:

Public Hearing presentation for revisions to the SWMP to be undertaken between May and August 2017. The completion date will depend on the extent of comments received. A summary of comments and how the comment was addressed will be included as an appendix to the SWMP.

Violation# 3. Citizen Advisory Board: The City Council and certain City staff members have served the City in this capacity. Council meetings and work sessions have always been open to the public and welcome citizen input. Typically, stormwater issues have been discussed on an as needed basis. The City proposes to consolidate stormwater discussions into a regular work sessions. The City will solicit volunteers from the general public to join the City Council during these work sessions and provide citizen representation. Solicitation for volunteers will follow the public notification procedures outlined above.

Action implemented:

Revised SWMP is in progress.

Action to be implemented:

Solicitations for volunteers will occur concurrently with the public hearing notifications for the proposed revisions to the SWMP. Review of the draft revisions is anticipated to be the first involvement actions. If the public volunteer response is significant, the City will ask the volunteers to organize into an advisory committee to provide recommendations and other input. The City will provide meeting space for the committee to hold regular meetings outside of City Council meetings or work sessions. The committee will report to Council any input or recommendations during regular council meetings or work sessions. Anticipate regular participation by citizen volunteers by 4th quarter 2017. In the event that no volunteers are found, the City Council members and City staff will continue to function as the stormwater committee and additional solicitations for volunteers will be made each time a public hearing request is made.

Violation# 4. Procedures for Tracing the source of an Illicit Discharge: The City will develop a standard operating procedure for tracing the source of an illicit discharge and will train City staff on implementation procedures. Source tracing techniques may include visual inspections, sampling, televising enclosed systems, or dye testing.

Action implemented:

Revised SWMP is in progress. The City has prepared a new Illicit Discharge Reporting Form with our stormwater consultant regarding the preparation of illicit discharge source tracing standard operating procedure.

Action to be implemented:

1. Preparing proposed revisions to our existing illicit discharge ordinance for review by City Attorney for submission to City Council for public hearing and eventual ordinance adoption.
2. Work with our storm water consultant to prepare an illicit discharge standard operating procedure.
3. Prepare budget requests for required equipment, material, and employee training.
4. Seek contract services for an on-call Environmental Contractor.

Schedule dates:

Illicit Discharge Standard Operating Procedure: Start: May 2017 End: November 2017

Violation# 5. Illicit Discharge detection, follow up and enforcement action. The City's current City Ordinance, Article VI-Illicit Connection and Discharge to the Storm Drain system meets the requirements of 10CSR 20-6.200 and 40CFR 122.34 (b) (3) but may need updating concerning emergency action regarding containment, clean-up, and recovery of discovered illicit discharges; the time of an appeal to a notice of violation; and the procedure for issuing a court summons to any person who violated or continues to violate the illicit discharge ordinance. The standard operating procedure response plan for significant spills, or spills containing hazardous/explosive material will require multi-agency cooperation between the:

Rock Creek Fire Protection District
Jefferson County Health Department
MoDOT
The Arnold Police Department
The Arnold Public Works Department
And an Environmental Contractor on 24 hour 7 days a week notice

Actions implemented:

The City has developed a draft Illicit Discharge Reporting Form and standard Illicit Discharge Violation Letter (copies are attached). Have already spoken with the stormwater superintendent regarding illicit discharge reports and staff being more observant and pro-active in finding illicit discharges, documenting when found, and providing follow-up with necessary enforcement action when required. Start date: Immediate - End date: Ongoing

Actions being implemented:

1. Preparing proposed revisions to our existing illicit discharge ordinance for review by City Attorney for submission to City Council for public hearing and eventual ordinance adoption (if changes are needed).
2. Work with our storm water consultant to prepare an illicit discharge detection standard operating procedure.

3. Prepare budget requests for required equipment, material, and employee training.
4. Seek contract services for an on-call Environmental Contractor.

Schedule dates:

Ordinance changes:	Start: May 2017 – End: August 2017
City Attorney Review:	Start: August 2017 – End: October 2017
Presentation to City Council:	Start: November 2017 – End: December 2017
Public Hearing:	January 2018
Council Ordinance Adoption:	February 2018
2018 Budget Requests (city 2018 budget starts September1):	Start: April 2017 – End: August 2017
Equipment, Materials, Employee training acquisitions:	Start: September 2017 Total Completion End: May 2018
Environmental Contractor On-Call service’s Contract:	Start: May 2017 – End October 2017

Violation# 6. Inspection plan and Implementation schedule for post-construction storm water BMP’s and their inspection.

Action currently in place, Community Development:

In January 2014 the City of Arnold adopted MSD 2006 Rules and Regulations Chapter 4 Design Requirements for Storm Drainage Facilities Since adopting these regulations; all new detention basins, ponds and post construction BMP’s are required to have Easements Maintenance Agreement in place. After inspections, escrow release and close out of the subdivision or project SWPPP, there are annual inspections and reporting required by the owner. Projects that were closed out since the adoption of this regulation DO have Maintenance Agreements in place. These inspection reports are to be submitted to the City of Arnold Public Works. A sample document of easement and Maintenance Agreement was provided at the time of audit.

The City’s storm water department currently undertakes post BMP inspections but can only do so on a limited basis due to manpower limitations. We will consider requesting the City Council authorize the addition of a new storm water department employee to assist in the requirements per stated in violation# 6 and required action.

Actions implemented, Community Development:

At close out, the Community Development Department will coordinate information to the Public Works Department in regard to new basins, ponds and post BMP’s. Information will include identifying: type, location, easements, photos and maintenance agreements.

The Community Development department will identify any detention, pond, or BMP that has been developed with the 2014 regulation requirements. This information will be transmitted to Public Works for their record and inspections as indicated.

Actions implemented, Public Works Stormwater Department :

Have immediately begun the process to develop BMP inspection and checklist forms to cover:

1. Bio-retention (completed)*
2. Catch Basin (completed)*
3. Dry Detention (completed)*
4. Channels /Creeks (completed)*
5. Lakes/Ponds (completed)*
6. Native Vegetation/Buffer (completed)*
7. Rain Garden (completed)*
8. Rock Channel (completed)*
9. Underground Detention (completed)*
10. Swales (completed)*
11. Wet Detention (completed)*
12. Wetlands (completed)*
13. Hydrodynamic Separator (completed)*
14. BMP Log sheet (completed)*

*Forms under-review and will complete by June 2017

Actions to be implemented by Public Works Stormwater Department:

Creation of various above listed inspection forms and a formal BMP log location and inspection record listing.

Schedule: Start: April 2017 - End: June 2017

Actions to be implemented by Community Development:

Start the process of amending City Ordinances for Chapter 525-Stormwater and Erosion Control, Article III Post Construction Requirements OR other. The Amendment is to clarify that all private stormwater facilities including post construction BMP's are subject to Post construction requirements of this section.

Ordinance changes: Start: May 2017 – End: August 2017

Violation# 7. Violation of Municipal Operations MCM regarding sufficient practices of spill prevention, control and management:

Actions implemented:

Universal Chemical (1505 WYK Absorbent Products) spill kits have been ordered (with spares) and will be placed as follows:

Note: The audit referenced a bone yard of unusable lawn mowers. The referenced lawnmowers have been disposed of or recycled.

- a. Public Works Fuel station.
- b. Public Works used oil tank location.
- c. Public Works garage
- d. Pomme Creek Golf Course fueling station.

- e. Pomme Creek Golf Course maintenance facility (will inspect oil drums and other fluids for proper storage & containment). Expected placement date: early April 2017
- f. Drain plug for the Golf Course fueling station has been reinstalled.

Actions being implemented:

All various department supervisors are instructing all staff on proper vehicle and equipment fueling and spill control procedures. Areas of contaminated ground will be cleaned or excavated and disposed of per hazardous waste disposal protocol.

The storm water department will assist the Golf Course staff in ensuring they have proper spill control and containment of fuels and chemicals. Expected Completion Date: June 2017.

- Violation# 8.** Controls for reducing or eliminating the discharge of pollutants from street, roads etc. from areas the permittee operates. Response is as follows:

Actions implemented:

- a. Salt dome location and spillage into the adjacent detention basin and beyond.

We have contacted our storm water consultant to review our salt dome locations and natural drainage paths to see what preventative BMP's are recommended. We have installed temporary sediment control fiber rolls around the salt dome as an intermediate measure.

Start Date: April 2017 End date with preventative BMP's selected by August 2017.

- b. Roll off dumpster pit with floor storm drain.

We will no longer place the trash dumpster in the referenced pit, keeping all debris out of the pit.

Start Date: May 2017 End Completion Date: September 2017

- c. Stored empty barrels – If needed, all will be moved to inside enclosed storage buildings. If not needed, they will be crushed and metal collected and recycled.

Start Date: April 2017 End completion date: May 2017

- d. The Pomme Creek Golf Course has been advised to cease washing golf vehicles in their open wash area as the drain pipe discharges into the nearby creek. We will evaluate the feasibility of connecting the wash station discharge to the sanitary system. If not feasible, a collection system will be implemented with wastewater collected and disposed of.

Implementation date: April 2017

- e. The public works storm water department will work with the Pomme Creek Golf staff to remove all outside stored used tires from the premises.

Implementation Date: April 2017

- f. The public works storm water department will assist the parks department staff in relocating referenced mulch pile so it is not a potential pollution source.

Implementation Date: April 2017

Audit Recommendations – Responses

1. Per the current SWMP the stormwater department is scheduled to mail a follow up stormwater questionnaire in 2017 to assess the public's understanding of storm water issues. The findings of the survey will be reported with the next biennial report.

The storm water department is phasing out the use of storm water drain markers and using embossed storm inlet manhole covers which show a larger message of "No Dumping – Drains to Stream". They will last longer than the glued down medallions.

2. We plan to train and instruct public works staff to increase their awareness of illicit discharges such as improper commercial property vehicle washing, disposal of paint, grass clippings or any other debris for violation notification and abatement. We will introduce seasonal education topics with the educational brochures and mailers.
3. The public works department will continue to support and assist the Community Development staff with regards to developments where Post Construction Storm water BMP's are required and their inspections during construction, escrow inspections, and long term commercial and home owner's association maintenance of permanent BMP best practices.

Action item #6 clearly indicates that communication will be improved to coordinate efforts between Community Development and Public Works to support that private stormwater improvements are tracked, inspected and maintained properly by the owner.

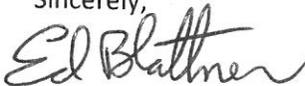
4. We will consider using signage at rain gardens, bio-retention basin's or other quality post construction features to help promote and educate the public as to how these BMP treatments are beneficial to water quality and the environment.
5. Illegal dumping of large trash items (couches, mattresses, rugs, furniture and other) as well as small item trash is a problem for us. Trash collection and disposal is expensive, time consuming, and at times a challenge for us. We'll be reviewing all options to help us manage this concern.
6. Our Operations and Maintenance manuals will be updated as necessary to be in compliance with our storm water operating permit requirements.
7. The City of Arnold plans to continue to support & assist Arnold Stream Team(Mighty 211) in all their clean stream efforts when and wherever we can. Their efforts and leadership of the Mighty 211 in the debris removal from our areas streams and improvement in water quality is most appreciated by all Arnold residents.

8. The public works department will continue to provide assistance to our Community Development Department in all storm water BMP and water quality measures for new construction and redevelopments as may be necessary to meet the requirements of our storm water operating permit.

It is our hope the responses we have made herein to your Audit Letter of March 23, 2017 are sufficient to meet all the "Letter of Warnings" and "Recommendations" listed in your referenced letter.

Your timely response in this matter will be most appreciated.

Sincerely,



Ed Blattner, P.E.
Public Works Director

Cc: Bryan Richison, City Administrator
Mary Holden, Community Development Director
Christie Hull-Bettale, Community Development Engineer
Tom Palasky, Asst. Public Works Director
Charlie Allen, Street Superintendent
Tom Passig, Storm Water Superintendent
Tim Dean, Intuition and Logic

City of Arnold Public Works

Illicit Discharge Reporting Form

Incident ID:	
Responder Information	
Report taken by:	Report Date:
Department:	Report Time:
Rainfall in past 24-48 hrs:	
Reporter Information	
Incident Time:	Incident Date:
Caller contact information:	
Name:	Phone:
Street Address:	Email:
Other Notes:	
Incident Location	
Tax Map #:	Northern/ Easting:
Stream (HUC) Address or Outfall #:	
Closest Street Address:	Nearby Landmark:
Primary Location Description	Secondary Location Description
<input type="checkbox"/> Stream Corridor (<i>immediately adjacent to stream</i>)	<input type="checkbox"/> Outfall
<input type="checkbox"/> Upland Area (<i>immediately not adjacent to stream</i>)	<input type="checkbox"/> In-stream flow
	<input type="checkbox"/> Along banks
	<input type="checkbox"/> Near Storm Drain
	<input type="checkbox"/> Near other water source (stormwater pond, wetland etc):
Narrative description of location:	
Upland Problem Indicator Description	
<input type="checkbox"/> Dumping	<input type="checkbox"/> Oil/solvents/chemicals
<input type="checkbox"/> Wash water, suds, etc.	<input type="checkbox"/> Sewage
	<input type="checkbox"/> Other:
Stream Corridor Problem Indicator Description	
Odor	Appearance
<input type="checkbox"/> None	<input type="checkbox"/> "Normal"
<input type="checkbox"/> Sulfide (rotten eggs, natural gas)	<input type="checkbox"/> Cloudy
<input type="checkbox"/> Petroleum (gas)	<input type="checkbox"/> Oil Sheen
<input type="checkbox"/> Sewage	<input type="checkbox"/> Suds
<input type="checkbox"/> Rancid/Sour	<input type="checkbox"/> Other: Describe in narrative section
<input type="checkbox"/> Other	
Floatables	
<input type="checkbox"/> None	<input type="checkbox"/> Sewage
<input type="checkbox"/> Algae	<input type="checkbox"/> Dead fish
<input type="checkbox"/> Other	<input type="checkbox"/> Other
Narrative description of problem indicators:	
Suspected Violator (name, personal or vehicle description, license plate #, address, etc.):	
Investigation Information	
Lead Investigator:	<input type="checkbox"/> Closed
Date Closed:	Closed by:
Summarize Resolution :	

INSTRUCTIONS TO COMPLETE ILLICIT DISCHARGE (PID) REPORTING FORM

WHAT IS AN ILLICIT DISCHARGE:

An illicit discharge is any discharge into the highway storm sewer system that is not composed entirely of stormwater. Examples:

- Dry weather discharges of wastewater into the storm sewer system from illegal dumping; spills and other non-stormwater pollution sources
- Discharges of pollutants, contaminants or illicit materials into storm drainage/sewer systems (oil, grease, solvents, metals, nutrients, toxics, viruses, bacteria)
- Improper antifreeze, oil disposal from vehicle maintenance, service stations
- Vehicle washing wastewaters
- Autobody/repair facility waste waters
- Plating shop waste water
- Manufacturers waste water
- Private service agencies waste water
- Wholesale/retail est. waste water
- Sanitary wastewater/connections
- Mobile rug cleaning waste dumping
- Laundry waste waters
- Disposal of auto/household toxics
- Vehicular/accidental spills
- Dairy barn waste waters
- On-lot disposal system- sewage effluent.

WHAT IS NOT AN ILLICIT DISCHARGE:

The following non-stormwater discharges are not illicit discharges:

- Discharges from firefighting activities
- Potable water sources including dechlorinated waterline and fire hydrant flushings
- Irrigation drainage
- Lawn watering
- Water from individual residential car washing
- Dechlorinated swimming pool discharges
- Water from crawl space pumps
- Uncontaminated water from foundation or footing drains
- Routine external building wash down which does not use detergents or other compounds
- Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless spilled material has been removed) and where detergents are not use
- Air conditioning condensate
- Springs
- Uncontaminated groundwater

(1.) Property Owner Information:

Determine property owners name, if available, and street address of the discharge source in the event that follow-up action or elimination is required. If unable to determine owner, write in "undetermined".

(2.) Description of Discharge for source identification/verification.

a. **Odor:** Determine which odors apply.

b. **Clarity:** How clear is the discharge?

c. **Color:** Discharge color and colors in swale, pipe, ditch, etc. (Document if red/green deficient)

d. **Solids/Floatables:** Identify indicators of source.

Description of Solids/Floatables: • Iron vs. Oil Sheens:

Iron leaches from soils forming a breakable sheen on stagnant water surfaces when poked with a stick. Oil sheens will conform around and coat the surface of the stick.



City of Arnold

Ron Counts, Mayor

Date

Name

Address

Arnold, MO 63010

Re: ILLICIT DISCHARGE VIOLATION NOTICE

Dear Sirs:

The City of Arnold's storm water department visited the above mentioned site on _____ and found an illicit discharge of _____. Please be advised the described act is in violation of City Ordinances and request you take appropriate action to cease the referenced violation.

Please see the attached informational brochure for information on illicit discharges.

Sincerely,

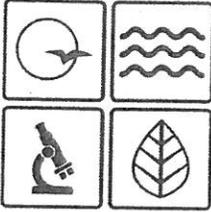
Tom Passig
Storm Water Superintendent

Cc: Brian Richison, City Administrator
Ed Blattner, Public Works Director

City Hall
2101 Jeffco Blvd.
Arnold, MO 63010
636/296-2100

Parks and Recreation
1695 Missouri State Rd.
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Public Works
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Arnold, MO 63010
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Missouri Department of dnr.mo.gov

NATURAL RESOURCES

Eric R. Greitens, Governor

Carol S. Comer, Director

March 23, 2017

Mayor Ron Counts
City of Arnold
2101 Jeffco Blvd.
Arnold, MO 63010

LETTER OF WARNING RESPONSE REQUIRED

Dear Mayor Counts:

Staff from the Department of Natural Resources conducted an audit on February 22-23, 2017 of The City of Arnold's Municipal Separate Storm Sewer System (MS4) program. The entity operates under the authority of Missouri State Operating Permit MOR040043.

Compliance with Missouri Clean Water Law was evaluated. The enclosed audit report is being issued with a Letter of Warning (LOW) for the violations identified in the enclosed report.

Please direct your attention to the **Compliance Determination and Listing of Violations and Required Actions** in the enclosed report. The report documents the findings and the actions that you must take to address the violations. **A written response documenting actions taken to correct the violations is required by the date specified in the report.**

Failure to address the required actions will result in the issuance of a Notice of Violation. If you have any questions or would like to schedule a time to meet with department staff to discuss compliance requirements, please contact Sarah Wright-Aholt by mail at the Missouri Department of Natural Resources, St. Louis Regional Office, 7545 South Lindbergh Blvd., Suite 210, St. Louis, Missouri 63125; by phone at (314) 416-2960; or by email at sarah.wright-aholt@dnr.mo.gov.

Sincerely,

ST LOUIS REGIONAL OFFICE

Ethel Myers
Water Section Manager

EM/SWA/aa

Enclosures: Report of Audit

C: Michael Abbott, MS4 coordinator, WPCB Permits Section
Ed Blattner, Public Works Director, City of Arnold
Mary Holden, Community Development Director, City of Arnold

**Missouri Department of Natural Resources
St. Louis Regional Office/Water Protection Program
Report of Audit
City of Arnold
415 Elm Grove Lane
Arnold, MO 63042
Jefferson County
MOR040043
March 23, 2017**

Introduction

Pursuant to Section 644.026.1 of the Missouri Clean Water Law, I, Sarah Wright-Aholt of the Missouri Department of Natural Resources' St Louis Regional Office, conducted a routine audit of the City of Arnold's Municipal Separate Storm Sewer System (MS4) program, located in Jefferson County, Missouri on February 22, and February 23, 2017. I conducted the audit to determine the facility's compliance with Missouri State Operating Permit MOR040043, the Missouri Clean Water Commission Regulations, and the Missouri Clean Water Law. This report presents my findings and the observations I made during the audit.

Participants:

City of Arnold

Ed Blattner, Public Works Director
636-282-6650 eblattner@arnoldmo.org

Tom Passig, Stormwater Superintendent
636-282-6650 tpassig@arnoldmo.org

Mary Holden, Community Development Director
636-282-2378 mholden@arnoldmo.org

Christie Hull Bettale, Community Development Engineer
636-282-2378 chullbettale@arnoldmo.org

Ray Dornseif, Maintenance Manager Parks Department

Tristan Donald, Assistant Superintendent, Pomme Creek Golf Course

Missouri Department of Natural Resources

Sarah Wright-Aholt, Environmental Specialist
314-416-2960 sarah.wright-aholt@dnr.mo.gov

Paul Morris, Environmental Supervisor
314-416-2960 paul.morris@dnr.mo.gov

Martha Cruse, Environmental Specialist
314-416-2960 martha.cruse@dnr.mo.gov

Intuition Logic

Tim Dean, Project Manager
636-777-3000 tim@ilincworld.com

Hensley Construction

Mike E. Willen, Field Operation

Facility Description and History

I reviewed the files for the City of Arnold stormwater program, including the Permit Conditions of Missouri State Operating Permit MOR040043, to familiarize myself with the requirements specific to this facility. I also reviewed the City of Arnold Operations and Maintenance Program for the Municipal Operations, and the Land Disturbance Ordinance prior to the day of the audit.

Missouri State Operating Permit MOR040043 was last issued on December 14, 2016 and expires on September 30, 2021. This permit sets forth permit conditions, both standard and specific, and monitoring requirements that the permittee is to follow.

The City of Arnold is located in northern Jefferson County, along the Interstate 55 corridor. Arnold is the largest city in Jefferson County. With an estimated population of 20,808, the City of Arnold covers 11.94 square miles, including 230 acres of water. Arnold is located in the Meramec Watershed, (HUC #07140102) and the Cahokia-Joachim Watershed, (HUC #07140101).

Discussion of Inspection and Observations

Information presented below that I obtained on the Arnold's MS4 program was gathered at various times. Some of the information was gathered during the records review process prior to the audit, during the audit interviews, during the site visits, and following the audit during review of documents obtained during the audit and during review of the department's records.

There are six Minimum Control Measures (MCMs) defined in the MS4 permit as follows:

MCM#1 Public Education and Outreach on Storm Water Impacts

MCM#2 Public Involvement/ Participation

MCM#3 Illicit Discharge Detection and Elimination

MCM#4 Construction Site Storm Water Runoff Control

MCM#5 Post Construction Storm Water Management in New Development and Redevelopment

MCM#6 Pollution Prevention/ Good Housekeeping for Municipal Operations

The City of Arnold prepared the Stormwater Management Plan (SWMP), as required by permit condition 4.1. The SWMP details the MCMs used by the city to address the permit conditions of Missouri State Operating Permit #MOR040043.

The inspection was conducted during normal business hours. I provided prior notification of the inspection to ensure timely access to the sites. After introductions, I outlined the purpose and scope of the audit. We reviewed paperwork and discussed the overall audit agenda.

MCM #1: Public Education and Outreach

Section 4.2.1.1 of the operating permit requires MS4 permittees to implement a public education program to distribute educational material to the community, or conduct equivalent outreach activities about the impacts of stormwater discharges on waterbodies and steps the public can take to reduce pollutants in stormwater runoff.

The Public Works Department oversees this MCM, we had a discussion over this MCM on the morning of February 22, 2017. Mr. Blattner explained the City of Arnold describes the target audiences as residents, businesses and school children. The city utilizes brochures to address topics such as common stormwater pollutants, rain gardens, and sediment. The city distributes a brochure with the trash bill on a quarterly basis. The brochures were developed by the City of Arnold, and are available on line. The city also issues two articles to local newspapers covering topics to educate residents and businesses to minimize stormwater.

Mr. Blattner was unsure of how effective the brochures, articles, and website were and did not have a way to measure the impact of these outreach method. **(See Recommendation #001.)** Mr. Blattner and Mr. Passig expressed that the response to the distributed brochures is an increase in complaints of mostly private property issues. Mr. Blattner stated the city does not tailor the message for different audiences and had no plan for creating a separate approach to educating business and industries in the city. **(See Letter of Warning #001.)**

The SWMP states a stormwater webpage is available and that page views by the public would be tracked. There is a stormwater page with the online versions of the brochures, and a stormwater questionnaire for city residents. Mr. Blattner and Mr. Passig did not know any results or responses from the survey, stating they only receive complaints of failing infrastructure. Mr. Blattner expressed dumping and litter as the pollutant source of most concern for the City of Arnold. He informed us the city has “No Litter” and “No Dumping” signage throughout the city.

The city has medallions for marking stormwater drains. Mr. Blattner estimates the city has marked 50% of the drains. He also stated this work was performed by city staff. The City of Arnold is home to one of the largest Stream Teams in Missouri, Stream Team 211. The city provides support to this team in the form of manpower, trucks, and dumpsters for clean-up events. The Public Works yard has two dedicated dumpsters for the Stream Team to use, which is a well utilized resource and saves the volunteer organization money. The team organizes at minimum two clean ups in Arnold every year. The city is provided the quantity of trash, metal, and tires recovered from the land and water activities but the city does not track these numbers. The Stream Team has also provided educational presentations to schools and before city council meetings.

MCM #2: Public Involvement and Participation

Section 4.2.2.1 of the permit requires the permittee to implement a public involvement/ participation program that provides opportunity for public involvement in the development and oversight of the permittee’s Stormwater Management Program, and provides opportunity for public involvement of the permittee’s renewal application. The permit requires all permitted MS4s to provide opportunities and work with citizen volunteers to educate the public about the SWMP.

The Public Works Department oversees this MCM, we had a discussion over this MCM on the morning of February 22, 2017. The permit requires a public notice period to allow the public an opportunity to review the SWMP and the renewal process. In addition to the public notice, the permit requires the permittee to provide a notice of public meeting with regards to the SWMP and public notice for the meeting if it is determined appropriate due to comments or other justifications. It is recommended this notice should be at least 72 hours prior to the meeting. The current SWMP does not cover the issue of public notice. **(See Letter of Warning #002.)** Mr.

Blattner stated this may be during a City Council meeting. This meeting would need to have public notification prior to allow comments.

A plan is required to target all potentially affected stakeholder groups. Mr. Blattner stated this may be at a City Council meeting. The SWMP for the City of Arnold states the Citizen Advisory Board will continue to address stormwater issues. Mr. Blattner stated this board does not have any citizens and that there are no plans to bring in citizens. **(See Letter of Warning #003.)** The permit also requires that if a stormwater management panel or committee is utilized that there shall be provided opportunities for citizen representatives on the panel or committee.

MCM #3: Illicit Discharge Detection and Elimination

Section 4.2.3.1 of the permit requires the permittee to develop, implement, and enforce a program to detect and eliminate illicit discharges, as defined in 10 CSR 20-6.200 and 40 CFR 122.34(b)(3), into the permittee's regulated MS4.

Illicit discharges are handled through the Public Works Department, we had a discussion over this topic on the morning of February 23, 2017. The SWMP describes the target pollutants as pet waste, illegal sewer connections, oil and grease, trash, paint, and chlorinated pool water.

The City of Arnold covers litter and dumping prohibition, under Chapter 235 Article IV, and prohibited discharges are cover under Article II, Section 700. The SWMP states the city will track complaints and follow up actions. Mr. Blattner stated dumping of solid waste is the biggest issue. He stated the city utilizes "No dumping", and "No littering" signage throughout the city to inform residents of the issue. Illicit discharge is also covered by one of the city's brochures. **(See Recommendation #002.)**

When the city receives information dealing with an illicit discharge, the stormwater department investigates. Mr. Blattner stated the dumping is difficult to control because it is done anonymously so enforcement is not possible. Follow up is tracked as a work order to clean up the dump site.

When the city receives information dealing with an illicit discharge in the form of a spill, the procedure is to contact the Missouri Department of Natural Resources' spill line. **(See Letter of Warning #004.)** Mr. Blattner did mention two previous cases in the past calendar year, both of which Missouri Department of Natural Resources responded instead of the city. One case was of a cleaning chemical spill into a stream near the Arnold high school. The Missouri Department of Natural Resources' St. Louis Regional Office responded instead of The City of Arnold, and a Letter of Warning issued to the School District. The other incident was a case of trace dye from sewer line testing, the Missouri Department of Natural Resources' Environmental Emergency Response responded to investigate along with the city. There was no follow up action from the city for either of these incidents. **(See Letter of Warning #005.)**

The City of Arnold has a map of storm sewer outfalls both as electronic and as paper, but only 80% of the neighborhood mapping is completed. This map is updated every year, after the yearly creek walks are conducted. This mapping is contracted out to the firm Intuition Logic. Mr. Dean explained the yearly process of walking the creeks and locating outfalls. Each year 20% of the outfalls are inspected. The locations are marked and photos are taken, which are compared to the previous screening to determine if there have been any changes.

Mr. Dean stated the procedure is to wait for a period of twelve days with no precipitation before conducting dry weather screenings to help exclude natural springs. When a discharge is found in the field and samples are needed, Mr. Dean collects for Nitrogen, Phosphorus, metals, *E. coli*, Chlorine, Ammonia, along with temperature, dissolved oxygen, turbidity, and pH. He will report all findings to Mr. Blattner as soon as he discovers and issue, as well as the sample results when they are known. Mr. Dean also informed me he submits an annual report to The City of Arnold covering the finding for the 20% of outfalls that were inspected.

On the afternoon of February 23, 2017, I accompanied Mr. Dean in Ferd B Lang Park to walk a half mile section of Pomme Creek. As we walked downstream, north to south, Mr. Dean showed me his procedures and the programs on his mapping equipment. A handheld GPS locates the outfalls. I observed Mr. Dean noting an outfall into the creek (see photo #001). He explained he can pull up the data point on GIS to locate information from previous inspections.

We continued downstream and Mr. Dean showed me another outfall pipe, and I observed it was discharging liquid (see photo #002). He explained this one was discharging during the previous inspection and a sample had been taken and was judged to be a spring. He explained when a discharge is observed he notes color, odor, and presences of any sheen.

While walking downstream Mr. Dean also made notes pertaining to erosion of stream banks and litter issues (see photo #003). The information gathered in the field is compared to the previous findings and data points are made more accurate.

Overall the field dry weather screening of illicit discharge and detection was well implemented. Mr. Dean did a thorough inspection of the creek and did not miss obvious issues. He used a checklist and wrote detailed notes to document findings during the inspection.

MCM #4 Construction Site Stormwater Runoff Control

Section 4.2.4 of the current general MS4 permit requires the permittee to develop, implement, and enforce a program to reduce pollutants in any storm water runoff to their regulated small MS4 from construction activities that result in a land disturbance of greater than or equal to one acre, or if less than one acre if that activity is part of a larger common plan of development or sale that would disturb one acre or more. The requirements for the construction site storm water runoff control program are listed in Sections 4.2.4.1.1 through 4.2.4.1.6 of permit MOR040043.

This MCM is covered through the Community Development office. We met in the afternoon of February 22, 2017 with Ms. Warden and Ms. Hull Bettale for discussion of this program.

The City of Arnold has Ordinance 8.460, the Land Disturbance Ordinance of the City of Arnold, Missouri. Under this ordinance all commercial and any residential land disturbance over half an acre are required to submit an erosion and sediment control plan for approval. Sites with disturbances less than half an acre, such as private residential sites, will still receive a note from Ms. Hull Bettale explaining the site still needs to comply with proper sediment and erosion control.

Ms. Hull Bettale reviews all the plans with a standard checklist and retains copies of all documents in a file for each site. Ms. Hull Bettale checks the plan for any low areas that may be

of interest for water quality issues. The application also requires an escrow and a State of Missouri land disturbance permit if applicable. The project must also have an inspector with licensing or certification to conduct inspections of the site. Once the site has met all conditions of approval, Ms. Hull Bettale will do an initial inspection. The city keeps a list of active sites.

Complaints are received via email, phone, and walk in. Each one is followed up by an investigation. Most issues are track out related and are handled by a phone call or email. During rainfall, Ms. Hull Bettale will drive by sites to ensure there are no runoff issues.

On the afternoon of February 23, 2017 I conducted an oversight inspection of Ms. Hull Bettale. She conducted a site inspection of Session Fixtures at 15 Tenbrook Industrial Park, which is covered under Missouri State Operating Permit MORA09097.

Ms. Hull Bettale began by reviewing the file for the site, including a review of the site map for any low areas that may be of concern for water quality issues. She also noted this site will have three bioretention features, post construction BMPs, when complete. Ms. Hull Bettale provided prior notice, and after reviewing the files she entered the site, introduced herself to Mr. Willen and explained the purpose of her visit. She reviewed the SWPPP onsite and explained how to change the map, and other requirements.

From the entrance Ms. Hull Bettale walked the eastern border checking the installation of the silt fence (see photo #004). Along the eastern edge I saw her check the low laying area where the silt fence may need reinforcement. As we walked she explained the progress of the grading and what would be done next. She continued around the northern side further and I saw her note another place where runoff may collect and cause an issue. The western side was inaccessible due to active grading (see photo #005). Ms. Hull Bettale mentioned there were no areas of concern for that side as it was up the hill. She noted the large buffer of grass between the active grading and the silt fence. She stated she would follow up with the site to ensure the issues are examined by the site inspector.

Overall, Ms. Hull Bettale did a thorough inspection of the site and did not miss obvious violations. She was clearly well trained on BMP use and the SWPPP requirements. She was familiar with the site and the SWPPP for the site. She used a checklist and wrote detailed notes to document findings during the inspection. The overall program for this MCM is well organized and well documented.

MCM #5: Post Construction Storm Water Management in New Development and Redevelopment

Section 4.2.5.1 of the permit requires the permittee to develop, implement and enforce a program to address the quality of long-term stormwater runoff from new development and redevelopment projects that disturb equal to and greater than one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into the permittee's regulated Small MS4. The permittee's program shall ensure controls are in place that have been designed and implemented to prevent or minimize water quality impacts.

This MCM is covered by the City of Arnold's ordinance 8.460 Chapter 525. This MCM is covered by both the Public Works department and the Community Development department.

(See Recommendation #003.) Any site over one acre or half acre for commercial is required to include a stormwater maintenance feature.

The initial plans for the post construction stormwater feature is reviewed by Ms. Hull Bettale. She ensures the easement and indentures are set up. If a residential development is constructing the feature, the trustee of the subdivision must be vested for all maintenance of the feature. If the feature is on a single lot the ownership of the lot is vested as the owner of the feature and must handle all maintenance. Ms. Hull Bettale uses a checklist for the plan review and approval process, and maintains the records in the file for the site.

When the construction is complete, a final escrow inspection is conducted. There was no clear consensus on which department conducts the final escrow inspection. The ordinance does not specifically state which department handles this final inspection. **(See Recommendation #003.)** The Public Works department will conduct any further inspections on the feature. The city has no set number or percentage to inspect each year. **(See Letter of Warning #006.)** Mr. Blattner stated the city did not have a checklist specific to bio-retention; however he sent a follow up email on February 24, 2017 with an attached checklist for bio-retention inspections. The city does not track the quantity or locations of water quality stormwater features. Any issues found during an inspection are communicated to the responsible party by letter or email. If necessary the city could escalate enforcement to notice of violations and legal actions.

On the morning of February 23, 2017 oversight inspections of two bio-retention sites were conducted. I met Mr. Passig at Metal Container Corp at 42 Tenbrook Industrial Park to inspect rain garden. Mr. Passig began his inspection on the parking lot, noting an erosion issue was filling the garden with sediment (see photo #006). He walked the entire perimeter of the bio-retention noting there was no litter, nuisance vegetation or signs of clogs or ponding. He thoroughly checked the clean out structure and outfall. He stated he would follow up with the facility over the sediment build up. He did not have a checklist to record findings of common maintenance problems.

Next we went to the Regions Bank at 180 Richardson Crossings (see photo #007). Mr. Passig walked the site noting some litter (see photo #008). He noted there were no signs of erosion, sediment build up or ponding. Mr. Passig mentioned possible signage could be made, explaining that these are rain gardens and why they are there, may be a way to educate the public. **(See Recommendation #004.)**

Mr. Passig did a basic inspection of the bio-retention and did not miss obvious violations. However, he did not use a checklist, but noticed and verbalized all the features that are covered on the checklist provided by Mr. Blattner the following day.

The City of Arnold also has a tree preservation plan which requires a certain percentage of trees of a certain type and size remain on site. The sizes and types vary by what types of trees are already on site. If further removal is necessary, the site must replace the tree with a similar or more desirable type. Stormwater BMPs such as rain gardens can be considered as replacement on the tree preservation plan. The city also has flood zone restrictions. There have been recent flooding and the city cleaned the areas affected to prevent solid waste from re-entering the streams and river.

MCM#6 Pollution Prevention/ Good Housekeeping for Municipal Operation

Section 4.2.6 of the current general Small Municipal Separate Storm Sewer Systems (MS4) permit requires the permittee to develop and implement an operation and maintenance program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations. The requirements for the pollution prevention/good housekeeping program are listed in Sections 4.2.6.11 through 4.2.6.2 of permit MOR040043.

Prior to the audit, the department requested a copy of Arnold's Operations and Maintenance Manual, which was provided via email. The City of Arnold municipal operation facility stormwater plan covered under MCM#6 is described in the document, "City of Arnold Public Works Department Updated Stormwater Operations and Maintenance Plan" (The O&M Manual). The O&M Manual contains a list of all the municipal operations impacted by this program and the designated stormwater contact for each facility. It was last updated spring 2015

The Public Works department oversees this MCM for the city. Training conducted by Intuition Logic is provided annually and is required for all employees of the Public Works department. Mr. Blattner stated some staff from the Parks department and Community Development department attends as well. Topics covered include chemical use, spills, proper storage and use of BMPs.

Prior to the inspection I received SWPPPs for the Public Works yard, the Arnold Recreation Center, and Pomme Creek Golf Course.

The City of Arnold contracts out street sweeping twice a year, in the spring and fall. The spoils are disposed of in dumpsters to a landfill. Salt is the only deicer used in the city. The main salt dome is in the public works yard, with storage boxes set up on private streets in the city. The city uses calibrated equipment to reduce the amount of salt used. Vehicle maintenance is conducted inside a garage with drains to sanitary sewers.

Inspections of municipally owned facilities were conducted on February 22, 2017. I started at the Public Works Department (See Site Map #003). I saw a stormwater inlet on the ground with no markings with a shed behind it with a PVC pipe sticking out (see photo #009). Mr. Blattner stated the shed was for storage, and the pipe was not for drainage. I saw a fueling station on the far side of the shed. I walked to the front of the fueling station. I saw the tanks were in secondary containment, however I also saw the ground was stained and a puddle of water had a noticeable sheen (see photo #010). (See Letter of Warning #007.) I also noticed there was no spill kit in the immediate vicinity.

To the east of the fueling station I saw salt spreaders hung up under cover next to a row of city vehicles (see photo #011). I saw no evidence of spills in this area. Toward the northwest I saw more covered storage area with a salt spreader hanging (see photo #012). Next to this structure I saw the dumpster the City of Arnold allows for the local Stream Team to use for metal recycling.

Heading north I saw another storm drain with a large pile of sand approximately 50 feet behind it (see photo #013). Continuing past the sand pile in the eastern corner of the yard I saw the stormwater detention basin (see photo #014). All of the storm drains in the yard drain to this basin before exiting the site to the east. Immediately next to the detention basin I saw the city

salt dome with some staining on the ground in front of the opening (see photo #015). I saw no BMPs between the salt dome and the detention basin (see photo #016). **(See Letter of Warning #008.)**

Continuing to the northern corner, I observed a pile of soil next to a pile of used sandbags (see photo #017). I noticed there were no bins, berms or covers to maintain the material. **(See Letter of Warning #008.)** Across from these piles I saw stockpiles of rock and other aggregate material in open air bins (see photo #018). I went past more used sandbags, which Mr. Blattner stated were destined for landfill. Continuing around the yard I observed a boneyard of lawnmowers and noticed some staining on the ground (see photo #019). **(See Letter of Warning #007.)**

We walked by more covered storage and the back to the center of the lot. I saw a large roll off dumpster (see photo #020). Mr. Blattner stated this was used by the local Stream Team, which was evident by the Stream Team bags visible in the dumpster. This dumpster was in a constructed trench, and I saw a storm drain at the bottom of this channel (see photo #021). **(See Letter of Warning #008.)**

After the Public Works lot, I also inspected two park facilities. I began at the maintenance facility at Pomme Creek Golf Course, at 1 Golfview Drive on the morning of February 22, 2017. Mr. Donald met with us at this location. Upon arrival at the facility I saw two fuel tanks (see photo #022). I noticed these were both in secondary containment, however the drain was open on one of the containment tanks (see photo #023). **(See Letter of Warning #007.)**

Across the parking lot I saw an open air bin containing sand (see photo #024). There was a thick tarp pulled open on the top of the bin. Next to the bin I saw a dumpster with the lid properly closed, and a pile of rock without any containment. I walked behind the garage and saw landscaping equipment and metal barrels (see photo #025). These barrels were empty of the original product but now held water from rain. **(See Letter of Warning #008.)** If there were a spill, the fuel would not be contained.

I asked Mr. Donald if they performed any vehicle washing at this location and he stated they did and often detergents were used in the process. He showed me a concrete pad with a drain on the southeastern side of the garage (see photo #027). This edge of the facility is bordered by a tributary to Pomme Creek (see photo #026). I asked if the drain went to sanitary sewer and he stated he believed it did. Mr. Morris asked if they could run water from the hose located at the pad through the pad's drainage grate. They ran the water a while and I observed a corrugated plastic pipe on the bank of the tributary to Pomme Creek. After shutting off the flow, there was a pause of a few seconds, then water began draining out of the corrugated plastic pipe into the tributary to Pomme Creek (see photo #027). **(See Letter of Warning #008.)** Drainage of wastewater generated from vehicle washing to the creek is an illicit discharge.

I walked back to the garage, and saw tires and other solid waste on the southeastern side of the building (see photo #029). **(See Letter of Warning #008.)** I then entered the garage, and observed two large barrels with staining on the ground below them, and no secondary containment (see photo #030). **(See Letter of Warning #007.)** I also observed other liquid chemicals stored in this building. I saw no floor drains and the floor sloped to the outside. Without containment, fluids could spill and drain to the outside for exposure to stormwater runoff. I asked if there were any spill kits or clean up kits, Mr. Donald stated there were none. **(See Letter of Warning #007.)**

From this location we traveled to Ferd B. Lang Park, a 25 acre park with trails, dog park, skate park, and Pomme Creek flowing through the center of the park. Mr. Dornseif showed us around the park. At the entrance to the park I saw prominent signage dealing with pet waste and no littering (see photo #031). I saw ample trash bins and recycle bins (see photo #032)

As I walked the park I noticed signage and waste disposal bags at the dog park, and ample trash and recycle bins throughout. In a parking area near Pomme Creek I observed four dumpsters and a pile of mulch. Mr. Dornseif mentioned the dumpsters are often full of large waste dropped off by residents, even though the dumpsters are not meant for the public use. (**See Recommendation #005.**) Behind the dumpster I saw Pomme Creek. I also noted the mulch pile was falling over the bank and into the stream (see photo #033). (**See Letter of Warning #008.**) Mr. Dornseif stated he would push the pile further away from the stream.

Next, Mr. Dornseif showed me the park building at the entrance to the park. Inside I saw the storage for deicers, chemicals, and some small equipment (see photo #034). Behind the building I saw covered storage of equipment, and gas canisters (see photo #035). Mr. Dornseif explained there is no fueling facility on site, that they use the canisters to fill up at a gas station and bring those back. I did not see a spill kit. I saw more covered storage holding equipment (see photo #036).

Before leaving on the afternoon of February 23, 2017, I investigated the outfall from the detention basin on the Public Works lot. Upon locating the outfall, I saw the leaves and debris at the end of the pipe were coated with white (see photo #037.) (**See Letter of Warning #008.**) This white coating indicates some pollutants are leaving the Public Works lot. I followed the ditch, and the white coating was visible for approximately 400 feet (see photo #038).

Sampling and Monitoring

No sampling materials were taken on the Audit for sampling.

Compliance Determination

The facility was found to be in non-compliance with the Missouri Clean Water Law, the Clean Water Commission Regulations, and Missouri State Operating Permit MOR040043 based upon the observations made at the time of the inspection, and a Letter of Warning (LOW) is being issued for the violations identified below.

Listing of Violations and Required Actions

Letter of Warning:

Failed to meet the following permit conditions of Missouri State Operating Permit (MSOP) MO-R040043 [Section 644.076.1, RSMo and 10 CSR 20-6.200]:

1. The City of Arnold is in violation of 4.2.1.1.4 As part of the SWMP, the Public Education and Outreach Program shall include... The outreach strategy, including the mechanisms to reach target audience. The industries and businesses in the City of Arnold were specified in the SWMP as part of the target audience but haven't been addressed explicitly.

REQUIRED ACTION: A message and method of delivery must be developed for the industries and businesses in the City of Arnold. This MS4 permit is a large encompassing permit, and having input and participation from stakeholder groups is a valuable aspect. An effective way of gaining support for this permit is to encourage participation.

2. The City of Arnold is in violation of 4.2.2.1.1- 4.2.2.1.3 which states the MCM shall have a public notice period to allow the public to review the SWMP and renewal application prior to the submission of the SWMP and renewal application to the Department. A notice of public meeting regarding the SWMP and renewal application. The public notice period should allow for opportunities to educate the residents about the MS4 as a whole, and the SWMP specifically. The groups include but are not limited to, commercial and industrial businesses, trade associations, environmental groups, homeowner associations, and educational organizations.

REQUIRED ACTION: Ensure all required public notice periods are met for the development and oversight of the SWMP. Ensure the required plan to target all potentially affected stakeholder groups is enacted for the public involvement and development of the SWMP.

3. The City of Arnold is in violation of 4.2.2.1.4 stating if the permittee utilizes a stormwater management panel/committee, then the permittee shall provide opportunities for citizen representatives on the panel/committee.

REQUIRED ACTION: It is required to have citizen volunteers on the Citizen Advisory Board. This board is currently acting to address stormwater issues and is a natural tool to involve residents.

4. The City of Arnold is in violation of 4.2.3.1.6 regarding procedures for tracing the source of an illicit discharge, including the specific technique the permittee will use to detect the location of the source. The City of Arnold does not have its own procedure for addressing non-stormwater discharges. Currently when a spill is detected, the city calls the Missouri Department of Natural Resources spill line.

REQUIRED ACTION: A written standard operating procedure for the discharges found must be developed and followed by the city.

5. The City of Arnold is in violation of 4.2.3.1.3 to have a plan and implementation schedule to detect and address non-stormwater discharges, including discharges from illegal dumping and spills, to the permittee's system. When a discharge is detected the city, there is currently no follow up with enforcement action.

REQUIRED ACTION: The City of Arnold shall develop and use a plan concerning how to address illicit discharges with follow up and enforcement action.

6. The City of Arnold is in violation of 4.2.5.1.4- 4.2.5.1.5 which states the permittee shall have an inspection plan with implementation schedules for post-construction stormwater BMPs and the permittee shall inspect or require the inspection of post-construction stormwater BMPs to ensure that all BMPs are implemented and effective.

REQUIRED ACTION: The city must inspect the BMPs and maintain documentation for tracking of the routine inspections. Also consider requirements for the owner of the feature to send in annual reports of inspections to compliment municipal oversight inspections.

7. The City of Arnold is in violation of 4.2.6.2 under the Municipal Operations MCM which states sufficient practices of spill prevention, control, and/or management shall be provided to prevent any spill of these pollutants from entering waters of the state. Any containment system used to implement this requirement shall be constructed of materials compatible with the substances contained and shall also prevent the contamination of groundwater.

- a. The fuel station at the Public Works lot shows signs of spill, with no spill kit.
- b. The fueling station secondary containment at Pomme Creek Golf Course was found with the drain open.
- c. The inside of the garage at Pomme Creek Golf Course had drums of oil, and other fluids with signs of spills on the ground and without containment can drain to the outside.
- d. There was no spill kit at Pomme Creek Golf Course.

REQUIRED ACTION: Staff should be trained on how to prevent fuel pumping spills from happening. The ground should be cleaned, and the spoils disposed of properly. If this staining is due to mechanical malfunction, that should be addressed immediately. Spill kits, and other BMPs should be added to this area. The contaminated ground has potential of causing pollution to waters of the state.

Ensure the drains are closed properly on the secondary containment. When left open, the containment is rendered ineffective if there was a spill from the fuel tank.

Add spill containment to the oil drums inside the garage at Pomme Creek Golf Course. Uncontained, a spill could quickly reach the stream. If there is a spill at the tank or in the garage at Pomme Creek Golf Course there is no way to manage the spill. With the stream in such close proximity, this has potential for water quality violations.

Ensure the fuel, and other fluids are drained from non-functioning equipment that is stored outside. Dispose of the drained fluids properly.

8. The City of Arnold is in violation of 4.2.6.1.4 for controls for reducing or eliminating the discharge of pollutants from street, roads, highways, municipal parking lots, maintenance and storage yards, waste transfer station, fleet or maintenance shops with outdoor storage areas, and salt/sand storage locations and snow disposal areas the permittee operates.

- a. The salt dome sits next to the detention basin on the Public Works lot with no BMPs between. Salt spillage was evident on the ground and can easily wash into the dry detention basin and out the discharge pipe of the receiving tributary. The detention basin is not designed as a water quality stormwater feature; the salt runoff will enter the storm sewer system and waterways. White deposits were found at the outfall of the detention basin, which may have been caused by salt.
- b. The roll off dumpster in the Public Works lot sits above an open inlet. Stormwater can drain out of the dumpster and directly into the stormwater drain.
- c. Empty barrels were stored outside uncovered allowing stormwater to enter the containers.
- d. The golf cart vehicle wash area at Pomme Creek Golf Course was discharging process wastewater through a plastic pipe uphill of and into the tributary to

- e. Pomme Creek. All wastewater from vehicle washing entering the creek is considered illicit discharge and a possible pollutant.
- f. There were used tires being stored outside the garage at Pomme Creek which is immediately by a tributary to Pomme Creek.
- g. The mulch pile in Ferd B Lang park is on the bank of the creek creating a potential source of pollution.

REQUIRED ACTION: Add BMPs between the salt dome and the detention basin. Install stormwater diversion or construct containment for the loose sand, and aggregate. By improving housekeeping the amount of potential pollutants will be reduced. Implementing inspections will ensure issues are not overlooked. If inspections are accurate and reflected by staff training, possible stormwater impacts can be reduced.

Add a BMP, such as a storm drain cover, to the stormwater drain in the trench where the roll off dumpster is stored.

The golf cart wash area must not be used unless the washing is done in a wash bay that is connected to a sanitary sewer.

Do not store empty drums or barrels outside. Residual product may still remain in the containers; any spill would carry the product with the stormwater to the waterway.

Remove all tires and solid waste from areas where it could reasonably get to the waterway.

Move the mulch pile in Ferd B Lang park so it is not near the bank of a creek. A flash flood could reasonably pull the organic matter into the stream.

REQUIRED ACTION: **By April 24, 2017**, submit a written report for all of the above violations, to the St. Louis Regional Office, which outlines what actions have been implemented and are being implemented to address the deficiencies. The response should address each of the individual requirements noted above. The response should include a detailed schedule, with dates, of expected actions, including any proposed changes to ordinances.

If you have any questions or would like to meet with department staff, please contact Sarah Wright-Aholt by mail at the Missouri Department of Natural Resources, St. Louis Regional Office, 7545 S.Lindbergh Blvd., Suite 210, St. Louis, MO 63125; by phone at (314) 416-2960; or by email at sarah.wright-aholt@dnr.mo.gov.

Recommendations

1. Overall MCM #1 needs an effective mechanism for evaluating success. Mr. Blattner stated developing a survey by mail could be a useful way of gauging how much the public understands stormwater issues.

It is encouraged to utilize the survey currently on the City of Arnold webpage (<http://www.arnoldmo.org/government/public-works/stormwater/city-arnold-stormwater-questionnaire/>). The results could help gauge what the residents know, where to build the education offered and what mechanisms may be the best method of delivery. Mr. Blattner stated

the public doesn't want to fund any stormwater issues because they don't understand the issues. By utilizing this MCM to the fuller potential the issue of not understanding can be managed.

Consider integrating Public Education and Outreach into the marking of stormwater drains. Local groups such as Girl Scouts or Boy Scouts can be used in this activity, which also provides an opportunity to educate the public on the direct effect litter and spills can have. When residents come together for a clean-up, this may be an opportunity to educate a willing group on other ways they can impact stormwater pollution prevention. Stream Teams also perform water quality monitoring on streams and may be able to help with the city with information pertaining to other MCMs.

2. Public education of Illicit Discharge Detection and Elimination is important. Consider seasonal education topics, such as proper pool drainage, salt usage. The city places salt boxes at private streets for the citizens on that street to use. These boxes would provide a place to add signage to educate over the importance of reducing salt usage for water quality. Ensure city employees are trained to notice other discharges, such as vehicle washing at businesses, or improper disposal of paint, for times when they may be traveling through the city.

3. The overall program for Post Construction Stormwater Management in New Development and Redevelopment needs a mechanism for better communication between the plan review and time of the escrow inspection. The initial review of the plan and the indenture agreement are handled through the Community Development department. There are different views on which department handles the final escrow inspection, and the Public Works department would do oversight inspections for future maintenance. Developing a better way of communicating will ensure the water quality features are being tracked and subsequently maintained properly. The escrow inspection should also confirm the BMP is correctly installed and agrees with the approved plan. This inspection should be well document and include photographs to provide any future inspections a reference of how the BMP should look and operate.

4. The idea of signage at visible rain gardens or other water quality post construction features is a great idea and is encouraged. This could help educate the public on stormwater and how bio retention is beneficial to water quality.

5. Consider a way to promote the correct disposal of large trash. Dumping was stated as the most common pollution issue, and the dumpsters at Ferd B Lang Park are utilized by the public to dump off items. This may indicate they citizens are willing to dispose of waste in more appropriate ways if given a method.

Additional Comments/Conclusions

The City of Arnold should continue reviewing and modifying its Operations and Maintenance manual as necessary to reflect any future changes in permit conditions and SWMP responsibilities, as necessary.

The City of Arnold has a strong, praiseworthy Stream Team. Stream Team 211 is a beneficial resource for the City of Arnold should be recognized for their activities. It is encouraged for the city to continue supporting their actions and possibly look to this group for more opportunities

in the realm of education for the public. The donation of dumpsters to this group is very valuable and should be continued. Involving citizen in stewardship projects such as litter pickups can be a tool to a greater understanding of ways to improve stormwater quality.

The indenture requirements for the post construction water quality features are good and should be continued to ensure the water quality BMPs remain in working condition. The tree preservation plan is encouraged. Trees act as a natural BMP and retain a large quantity of stormwater. Urban watersheds have a high rate of water passing through the watershed that is often beyond the natural capacity of local creeks. By maintaining a natural riparian corridor, the flow can be slowed down and spread out and allowed to soak in. This natural process will improve water quality by filtering runoff through plants and soil and help prevent or lessen erosion by cutting down on the amount and velocity of water flowing into creeks.

Signatures

SUBMITTED BY:



Sarah Wright-Aholt
Environmental Specialist I
St Louis Regional Office

REVIEWED BY:



Paul Morris
Water Pollution Control Unit Chief
St Louis Regional Office

PHM/SWA/aa

Attachments

Attachment 1: Photos #001 through #038

Attachment 2: Ariel Maps #001-#003



Photo #: 001
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: #MOR040043
Location: Pomme Creek

Description: Outfall pipe, picture from previous inspection used as comparison for condition.

Date Taken: February 23, 2017
Program: WPC Unit



Photo #: 002
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: #MOR040043
Location: Pomme Creek

Description: Outfall pipe, was sampled from previous year.

Date Taken: February 23, 2017
Program: WPC Unit



Photo #: 003
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: #MOR040043
Location: Pomme Creek

Description: Litter and erosion observed and noted.

Date Taken: February 23, 2017
Program: WPC Unit

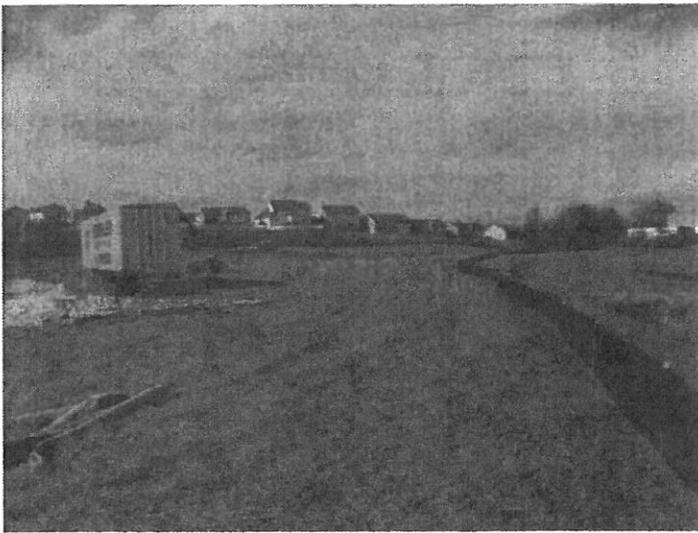


Photo #: 004
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Land disturbance oversight inspection.
MORA09097

Description: Eastern side near the entrance,
properly installed sediment fence.

Date/Time Taken: February 23, 2017
Program: WPC Unit



Photo #: 005
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Land disturbance oversight inspection.
MORA09097

Description: Western side being brought to grade.

Date/Time Taken: February 23, 2017
Program: WPC Unit

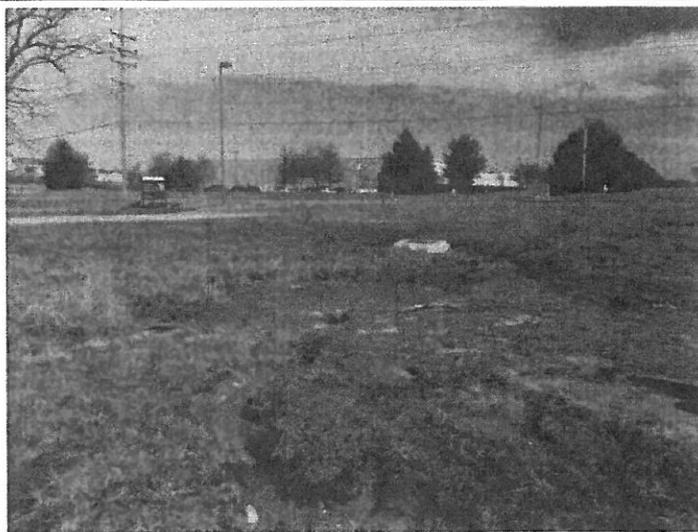


Photo #: 006
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Water Quality BMP oversight inspection.
Metal Container Corp.

Description: Erosion causing sediment builds up in
the bio retention.

Date/Time Taken: February 23, 2017
Program: WPC Unit

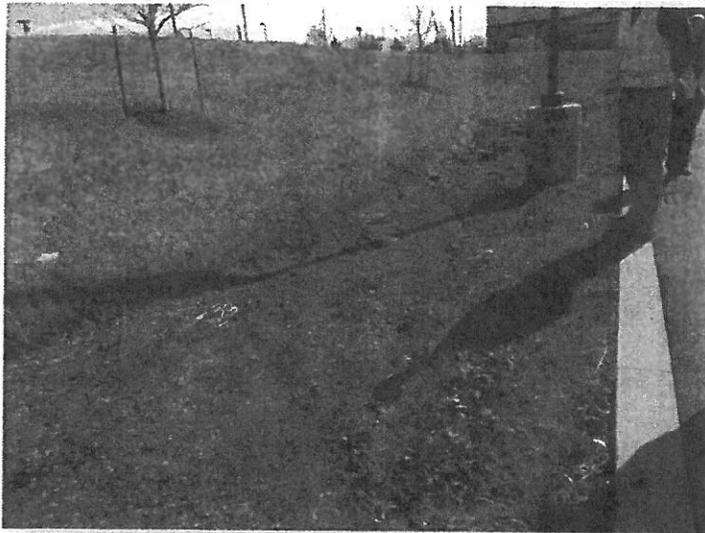


Photo #: 007
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Water Quality BMP oversight inspection
Regions Bank

Description: Rain garden on northeast side of parking lot.

Date/Time Taken: February 23, 2017
Program: WPC Unit

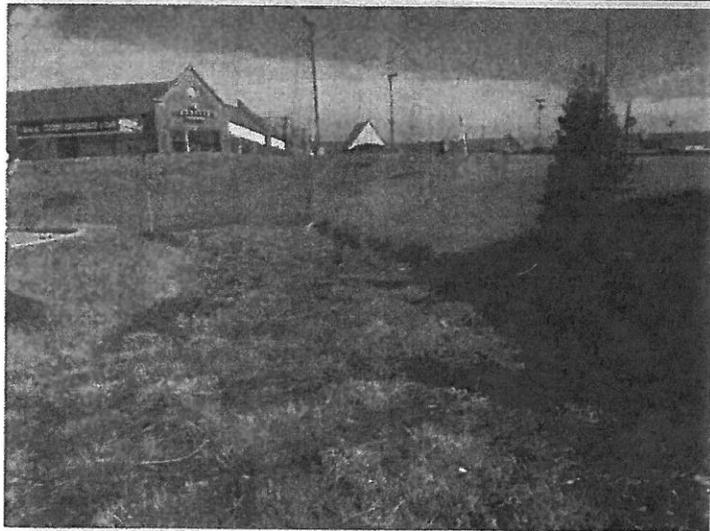


Photo #: 008
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Water Quality BMP oversight inspection
Regions Bank

Description: Rain garden on the southeast side of the parking lot, some litter present.

Date/Time Taken: February 23, 2017
Program: WPC Unit



Photo #: 009
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Public Works lot.

Description: Unmarked storm drain, shed with pipe in background. Fueling station behind the shed.

Date/Time Taken: February 22, 2017
Program: WPC Unit

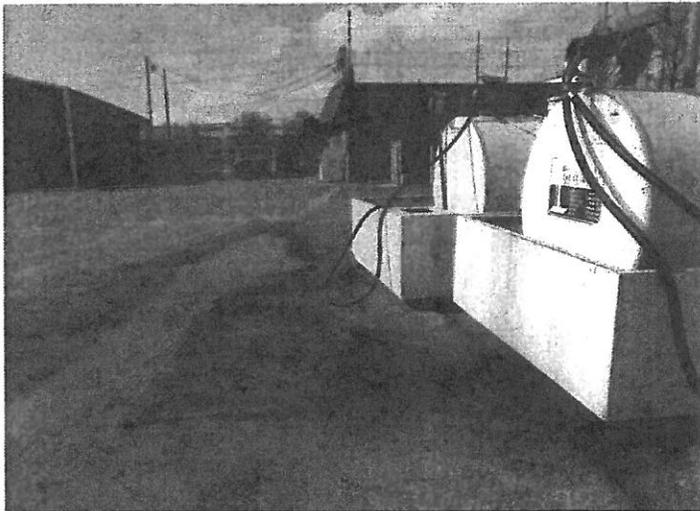


Photo #: 010
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Public Works lot.

Description: Fueling station, signs of spills, no spill kit in the area.

Date/Time Taken: February 22, 2017
Program: WPC Unit

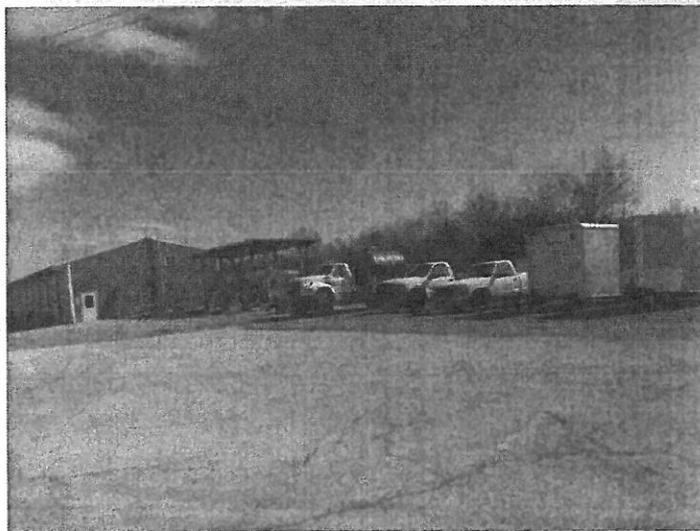


Photo #: 011
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Public Works lot, eastern edge.

Description: Salt spreaders under storage, vehicle parking. No staining underneath.

Date/Time Taken: February 22, 2017
Program: WPC Unit



Photo #: 012
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Public Works lot, center.

Description: Covered storage with a salt spreader, orange dumpster for use by local Stream Team.

Date/Time Taken: February 22, 2017
Program: WPC Unit



Photo #: 013
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Public Works lot, center.

Description: Pile of sand in center of yard. Storm drain in front of picture, salt dome in back.

Date/Time Taken: February 22, 2017
Program: WPC Unit

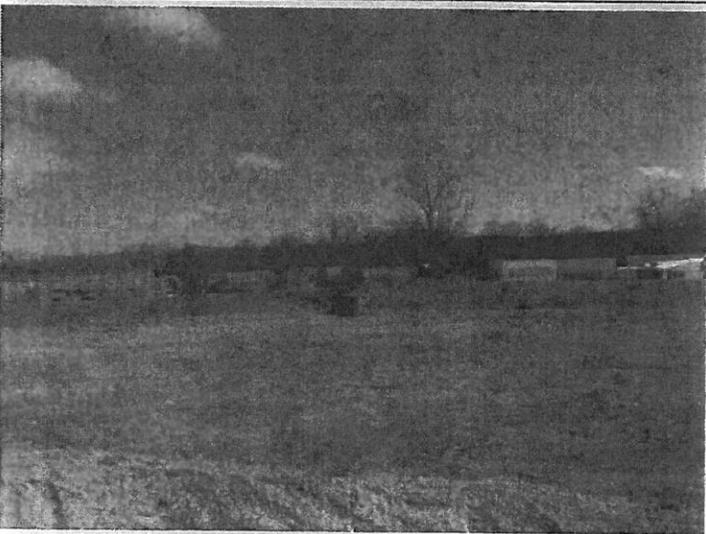


Photo #: 014
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Public Works lot, eastern corner.

Description: Detention basin, recently cleaned out.

Date/Time Taken: February 22, 2017
Program: WPC Unit

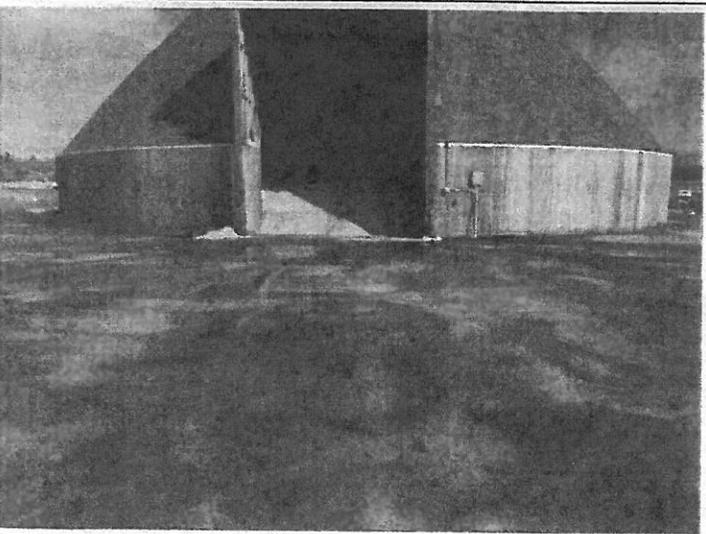


Photo #: 015
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Public Works lot.

Description: Salt dome, signs of spillage, salt outside the dome.

Date/Time Taken: February 22, 2017
Program: WPC Unit

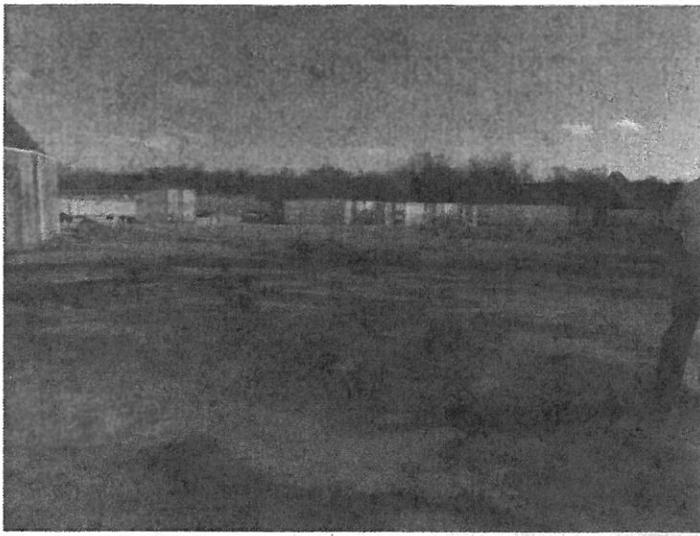


Photo #: 016
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Public works lot, eastern corner.

Description: Salt dome on the left, detention basin on the right. No BMPs between the runoff and the basin.

Date/Time Taken: February 22, 2017
Program: WPC Unit



Photo #: 017
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Public works lot, northern corner.

Description: Soil stockpile in front, used sandbag pile behind.

Date/Time Taken: February 22, 2017
Program: WPC Unit

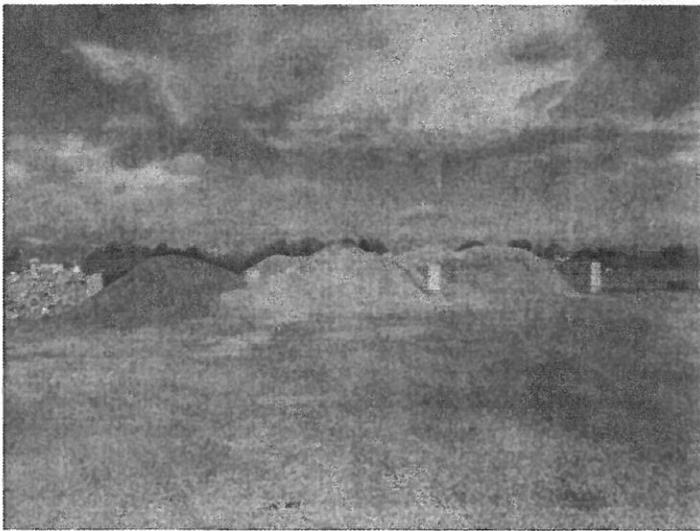


Photo #: 018
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Public Works lot, northern corner.

Description: Stockpiles of aggregate and rock.

Date/Time Taken: February 22, 2017
Program: WPC Unit



Photo #: 019
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Public Works lot.

Description: Boneyard of lawnmowers and equipment. Some staining on the ground.

Date/Time Taken: February 22, 2017
Program: WPC Unit



Photo #: 020
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Public Works lot, center

Description: Roll off dumpster, for use by local Stream Team.

Date/Time Taken: February 22, 2017
Program: WPC Unit



Photo #: 021
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Public works lot, center.

Description: Storm drain under roll off dumpster, no BMPs.

Date/Time Taken: February 22, 2017
Program: WPC Unit

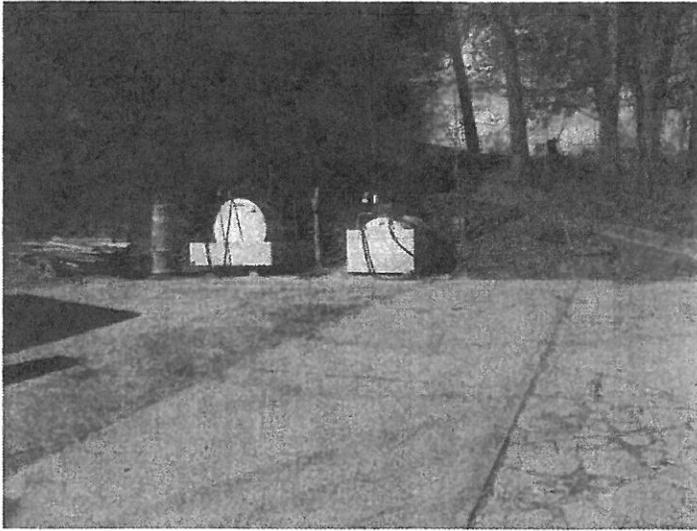


Photo #: 022
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Pomme Creek Golf Course.

Description: Fuel tanks, no spill kit.

Date/Time Taken: February 22, 2017
Program: WPC Unit



Photo #: 023
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Pomme Creek Golf Course.

Description: Fuel tank secondary containment drain open.

Date/Time Taken: February 22, 2017
Program: WPC Unit



Photo #: 024
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Pomme Creek Golf Course.

Description: Sand stockpile in bin with durable cover opened, closed dumpster, uncontained rock pile.

Date/Time Taken: February 22, 2017
Program: WPC Unit

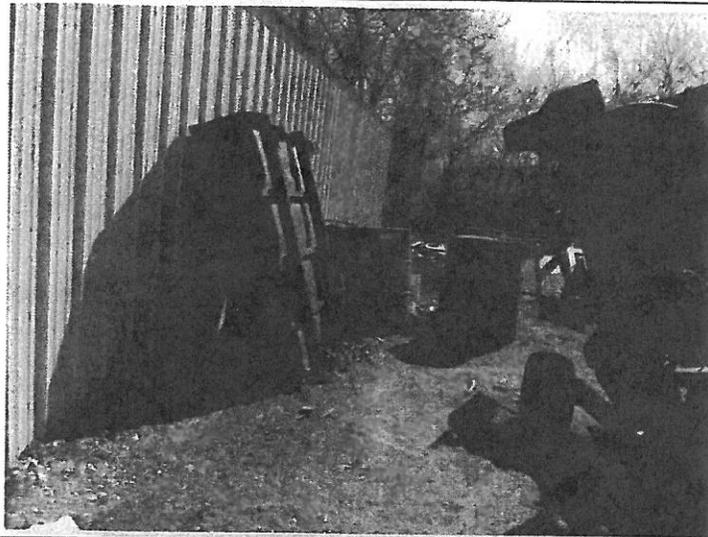


Photo #: 025
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Pomme Creek Golf Course

Description: Barrels retaining stormwater behind the garage.

Date/Time Taken: February 22, 2017
Program: WPC Unit

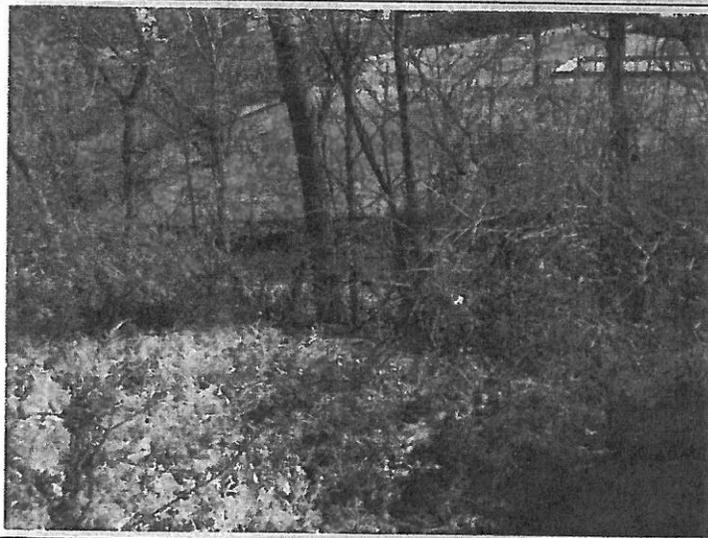


Photo #: 026
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Pomme Creek Golf Course

Description: Eastern edge bordered by tributary to Pomme Creek.

Date/Time Taken: February 22, 2017
Program: WPC Unit



Photo #: 027
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Pomme Creek Golf Course

Description: Wash pad, drain at low point, and creek bank in background.

Date/Time Taken: February 22, 2017
Program: WPC Unit



Photo #: 028
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Pomme Creek Golf Course

Description: Black plastic corrugated pipe drains vehicle washing area into tributary to Pomme Creek.

Date/Time Taken: February 22, 2017
Program: WPC Unit



Photo #: 029
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Pomme Creek Golf Course

Description: Southeast end of garage, solid waste.

Date/Time Taken: February 22, 2017
Program: WPC Unit

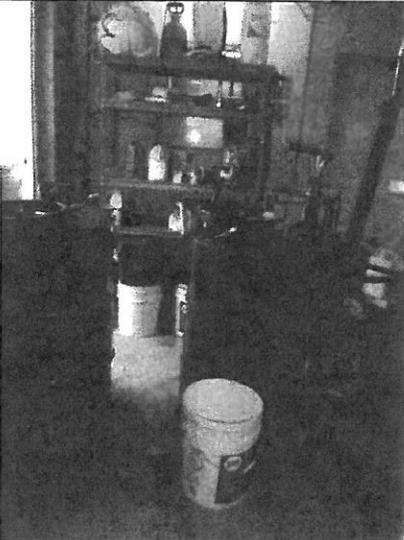


Photo #: 030
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Pomme Creek Golf Course

Description: Inside garage. No drains, staining under barrels. No spill kit. Other chemicals stored in background.

Date/Time Taken: February 22, 2017
Program: WPC Unit

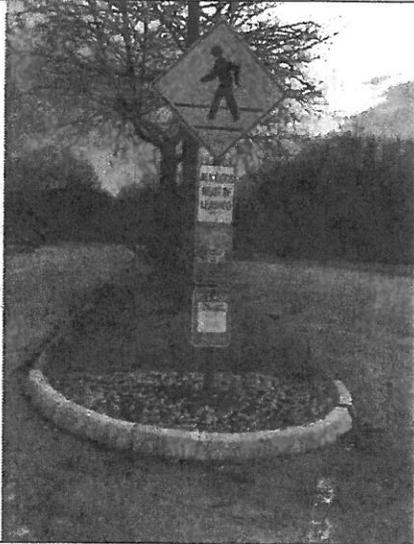


Photo #: 031
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Ferd B Lang Park

Description: Pet waste and litter signs posted.

Date/Time Taken: February 22, 2017
Program: WPC Unit



Photo #: 032
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Ferd B Lang Park

Description: Trash bins and recycle bins.

Date/Time Taken: February 22, 2017
Program: WPC Unit



Photo #: 033
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Ferd B Lang Park

Description: Dumpsters and mulch. Mulch is over the bank of Pomme Creek.

Date/Time Taken: February 22, 2017
Program: WPC Unit

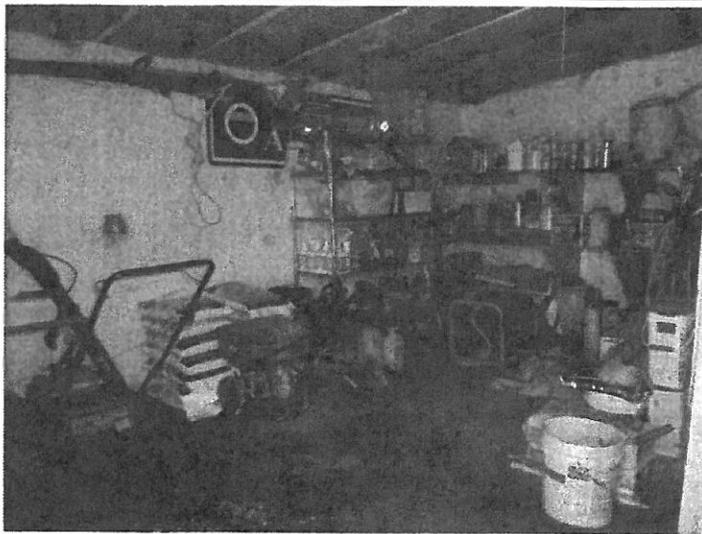


Photo #: 034
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Ferd B Lang Park

Description: Indoor storage of equipment, deicer, and chemicals.

Date/Time Taken: February 22, 2017
Program: WPC Unit

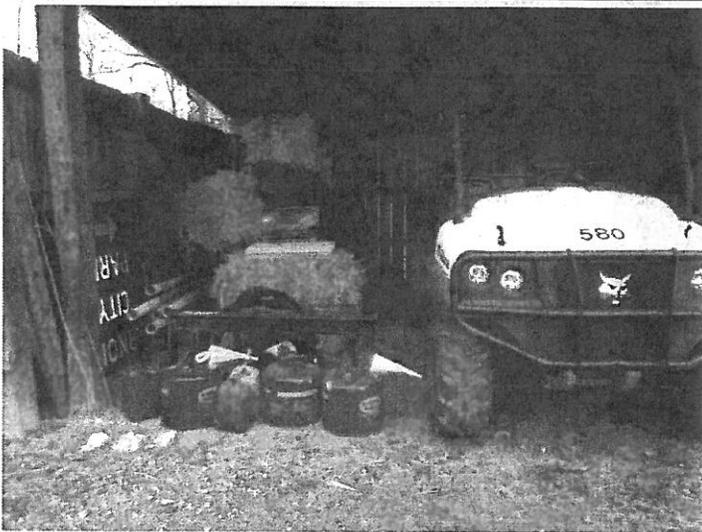


Photo #: 035
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Ferd B Lang Park

Description: Equipment stored undercover. Gas cans stored undercover.

Date/Time Taken: February 22, 2017
Program: WPC Unit

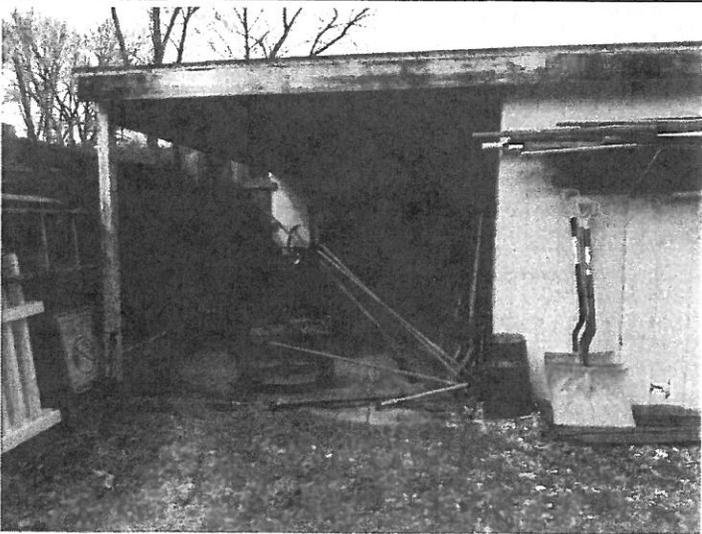


Photo #: 036
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Ferd B Lang Park

Description: Equipment stored under cover.

Date/Time Taken: February 22, 2017
Program: WPC Unit

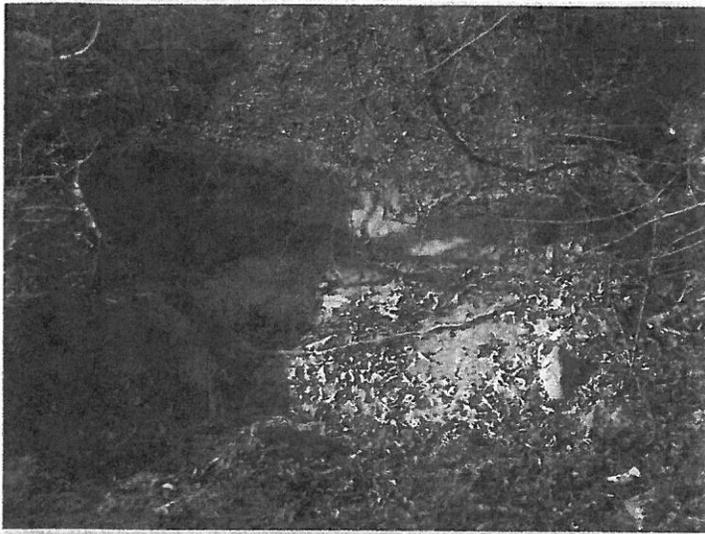


Photo #: 037
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Outfall from Public Works yard.

Description: White coating on leaves and debris.

Date/Time Taken: February 22, 2017
Program: WPC Unit

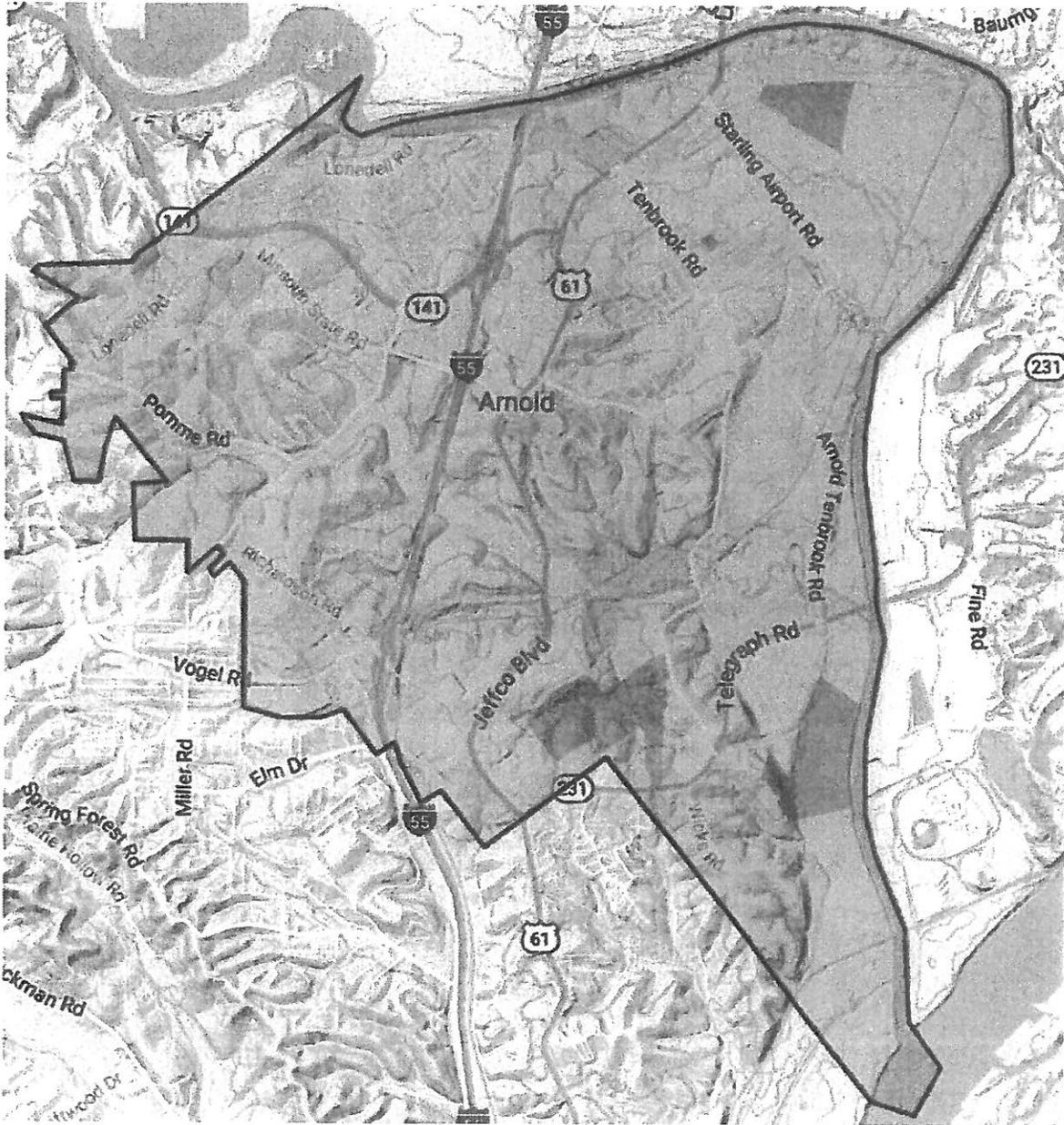


Photo #: 038
By: Sarah Wright-Aholt
Facility: City of Arnold
Permit: MOR040043
Location: Ditch from outfall of Public Works yard.

Description: White coating visible for approximately 400 feet. Solid waste is visible.

Date/Time Taken: February 22, 2017
Program: WPC Unit

Site Map #001: Boundaries of the city of Arnold.



Site Map #002: Sites visited in the City of Arnold.



Key:

- A) Public Works facility
- B) Pomme Creek Golf Course
- C) Ferd B Lang Park
- D) Metal Container Corp bio retention
- E) Regions Bank bio retention
- F) Pomme Creek illicit discharge detection
- G) MORA09097

Site Map #003: Public Works facility City of Arnold.



- A) Storm drain
- B) Fueling station
- C) Covered salt spreaders
- D) Covered storage, metal recycling
- E) Storm drain
- F) Sand pile
- G) Detention Basin
- H) Salt dome
- I) Sandbags
- J) Aggregate
- K) Lawnmower boneyard
- L) Dumpster