



NPDES Permit #57-35-0-00 2020 Annual Report

City of Hiawatha
101 Emmons Street
Hiawatha, Iowa 52233

October 2020

Joe Griffin
NPDES Section
Environmental Protection Division
Wallace State Building
502 E 9th Street
Des Moines, Iowa

RE: NPDES MS4 Permit No. 57-35-0-00

Dear Mr. Griffin:

The City of Hiawatha is pleased to submit the 2020 Annual Report for the above NPDES permit issued February of 2016. This annual report summarizes the activities during the 12-month period of July 2019 to June 2020. The annual report is coordinated and prepared by the City Engineering Department and the Hiawatha Community Development Department in conformance with the reporting requirements in the City's discharge permit. The current permit was approved and made effective February 1, 2016 and will expire on January 31, 2021.

Hiawatha is located in Linn County with a current population of just over 7500 within an area of approximately 5 square miles. Storm water from the City of Hiawatha discharges directly to Dry Creek, Otter Creek, Ushers Ferry Creek, and other major creeks that drain to the Cedar River. The six control measures as defined in our NPDES permit are:

- Public Education and Outreach
- Public Involvement and Participation
- Illicit Discharge Detection and Elimination
- Construction Site Storm Water Management
- Post-Construction Storm Water Management
- Pollution Prevention and Good Housekeeping

The objective of the City of Hiawatha's various storm water ordinances is to protect the taxpayer's health, safety and welfare through an economically viable storm water quality and quantity programs. We attempt to diminish threats to the public caused by runoff of excessive storm water and reducing possibilities of hydraulic overloading of the storm sewer system. These ordinances provide regulations for subdivision layout and construction, regulations for excavating and grading, regulations for erosion control, and regulations for building construction. Before starting construction, applicants must submit preliminary plans and specifications to show compliance with the provisions set forth in these ordinances.

The City of Hiawatha uses a server-based application and documentation reporting software, Citizenserve. Citizenserve is a fully customized on-line program for permitting and inspection data collection and filing for SWPPP, detention basin, and GP#2 tracking. A sample of the quarterly GP#2 inspection report is attached.

The City ordinance Chapter 101 was enacted to establish a storm water drainage district system and provides a means of funding the operation and maintenance of the storm water facilities. The ordinance imposes a monthly fee on all water meters in every residence, apartment, dwelling unit, commercial or industrial business. The fees are adjusted yearly, but do not provide enough revenue to fund a full-time storm water coordinator and all the operations required of staff. Storm water monitoring duties are shared by existing staff. A copy of Chapter 101 is attached.

Although it is difficult to list all the City's activities during this 2020 year, this report attempts to identify some of our major activities. We have organized the report according to the outline developed in Part II of the permit:

A. Public Education and Outreach

- The City participated in several seminars held to provide training for City personnel and other local contractors. Training attended:
 - Indian Creek Watershed Management Authority Board of Directors Meeting- July 2019, October 2019, January 2020, April 2020
 - SW Summit- December 2019
 - ICCSPPI- February 2020
 - Eastern Iowa Meeting- February 2020
 - Joint ISWEP Meeting- June 2020
- Staff for the City of Hiawatha maintain the following certifications pertaining to storm water management and pollution prevention:
 - IDOT Erosion Control Basic: 1 Staff
 - IDOT Certified Erosion Control Technician: 1 Staff
 - Iowa Certified Construction Site Pollution Prevention Inspector: 3 Staff
 - Work Zone Safety: 9 Staff
 - ICIMPSP: 1
- We placed articles in the City's newsletter to provide information on improving urban water quality.

- The City has developed and upgraded general informational brochures regarding control of storm water. Copies of handouts are available to contractors or citizens at our Community Development Department. Samples are:
 - Rainscaping Urban Landscapes
 - Construction Site Runoff Control
 - Conservation Strategies for Growing Communities
 - Storm Water Regulations and the Construction Industry
 - Drainage in Your Neighborhood
 - Soil Quality Restoration (SQR)
 - Managing Storm Water in Iowa Communities
 - Minor Erosion and Sediment Control (Residential)
 - Rainwater Harvesting
 - Green Roofs
 - Permeable Pavers
 - Bioretention Cells

- The City of Hiawatha provides education and contact information for reporting problems and or concerns through the City's web site. The web site of Hiawatha has been redevelopment and has a new look and layout. Copies of the storm water information and ways to report nuisances are included in the City of Hiawatha's Community Development page. The telephone hotline number is 319-393-1515.

B. Public Involvement and Participation

- A Storm Water Advisory Committee has been organized and is meeting on a quarterly basis. The committee currently has 3 members and is made up of a local technician, a retired contractor, and a mechanical engineer. The committee has been reviewing many of the City's ordinances and department procedures that include the storm water regulations. Updated ordinances will be adopted by the City Council. A copy of the September 2020 meeting minutes is attached.

- The City is a partner in the Indian Creek Watershed Management Authority. The Watershed Management Authority uses a cooperative, multi-jurisdictional for:
 - Water Shed Characterization and Quality
 - Hydrology and Stream Health
 - Watershed Action Plan
 - Funding Sources
 - Education and Outreach

- Water Monitoring Plan
- Soil Health Partnership

- A copy of the Indian Creek Watershed Recommended Management Strategies is included. The entire Indian Creek Watershed Plan can be reviewed at: <http://www.indiancreekwma.org/>

- The storm drain labeling has been done in previous years. The City's storm sewer intake labeling program continues each year with messages added to all new intakes that read "No Dumping, Drains to Stream". The labels are an excellent warning to help prevent hazardous material for entering the creeks.

C. Illicit Discharge and Elimination

- Review and update of the illicit discharge ordinance has been conducted by the Storm Water Advisory Committee and adopted by the City Council.

- The City of Hiawatha has a complete storm sewer map in our GIS system. Pipes, intakes, outlets, and drain tiles have been mapped. Storm sewers constructed in new subdivision are added to the map as they are accepted into the system. New detention basin is also added to the file as constructed and certified.

- Other storm water release locations were also inspected for illicit discharges during dry weather seasons. The locations chosen were the drainage way on Northwood Dr, the drainage way along 4th Ave and a manhole at 12th Ave and Bowler St. All three locations did not have any running water. The Northwood Dr location drains into Dry Creek basin. The other 2 locations drain into McLeod Run basin.

- The Engineering Department, Community Development, or Fire Department can be notified of any reported illicit discharge.

D. Construction Site Storm Water Runoff Control

- Construction site runoff control is monitored throughout the project by the building inspectors on staff as part of their normal duties. Projects of proper size are required to have a Storm Water General Permit #2 and follow the requirements of that permit. On smaller projects within the City, the site plans or

house plans are reviewed and best management practices (BMP) are required for erosion control before the permit is issued.

- There is a \$200 fee for the major erosion control permit, which is defined as site more than 1 acre. There is a \$100 fee for a minor erosion control permit.
- Engineering Department inspects capital improvement projects and subdivision sites more than one acre. Commercial sites and single-family dwellings are inspected by the Building Department. The Engineering Department conducts the quarterly SWPPP inspections on active construction sites in the City that hold a General Permit #2 from IDNR
- The sites are monitored during construction and recorded:
 - The City staff logged over 388 inspection reports from daily site reviews identifying the results of checking storm water runoff controls.
 - The staff approved 6 site plans for commercial developments that provided erosion control plans with required SWPPP associated with construction activity.
 - The staff approved 13 site plans for residential developments that provide erosion control plans with SWPPP associated with construction activity.
 - Planning and Zoning Commission approved 2 new residential subdivisions that required erosion control plans, SWPPP submittal, and General Permit No. 2.
 - Active construction sites are visited often usually done weekly as part of other normal duties by staff. Pollution prevention facilities are reviewed to monitor if they are operating properly. If not, permit holders are notified to take corrective action.

E. Post-construction Storm water Management

- The storm water committee has updated the post-construction ordinance and it has been adopted by the City Council. A copy of Chapter 162 is attached.
- The City monitors construction projects for restoration and erosion control applications.
- GP2 quarterly reports are now scanned into the building department data base for easy access. Currently we have 24 open GP-2 permits. A sample quarterly inspection report is attached.

- The City is in the process of identifying the location of private detention facilities and developing a data base of owners. The City contacted all owners to continue with the recertification process of existing detention facilities. A City map has been developed in the GIS system to locate all privately owned detention facilities. The goal is to calculate the per cent of the runoff in the City that is routed to detention facilities. A sample map has been included along with a sample recertification letter from a local engineer.
- The City has been active in the local Home Builders Association (HBA). Many building site issues are being addressed by this organization. One such issue is the proposed topsoil rule for any new housing developments. The City Council adopted a new topsoil rule along with the adoption of the 2018 SUDAS regulations.
- The Storm Water Advisory Committee has met quarterly during the identified fiscal year. Meeting minutes can be found on the City website, with a sample of the agenda items attached. The committee proposed new topsoil regulations to be included in the updated construction specifications. The City is in the process of updating the Metro Standard Specifications to the Iowa SUDAS Specifications. New specifications with topsoil regulations were enacted in January 2018.

F. Pollution prevention/Good housekeeping

- The City's storm sewer system is monitored and maintained by the Public Services Department. Costs associated with storm water repairs, by either staff or contractors are tracked. These costs can include education, design, maintenance and operating supplies. A cost summary is attached.
- During the previous year, new storm sewer and drain tile have been installed, or upgraded by new subdivisions. All new subdivisions are required to have detention and water quality facilities. The approximate new materials have been added:
 - 4000 lf of storm sewer in various sizes
 - 69 storm sewer intakes
 - 9279 lf of 6" diameter drain tile
- City of Hiawatha staff that handle and applied and pesticides or fertilizer are provided the proper training in methods of storage, application, and disposal of these materials. Staff attend classes annually to keep certifications current.

- Each spring the Ushers Ferry Creek & the Dry Creek drainage areas are assessed and a program for removal of debris is developed to prevent blockage and backups. The City hires a private contracting firm to clean and remove down trees and other obstructions. This will improve flow and reduce the possibility of localized flooding.

G. Contacts for the City of Hiawatha

- Patrick Parsley / Community Development Director
 - (319)393-1515 ext. 229
 - pparsley@hiawatha-iowa.com
- Jon Fitch PE/ City Engineer
 - (319)393-1515 ext. 528
 - jfitch@hiawatha-iowa.com

Thank you for this opportunity, and if you have any questions please feel free to contact us at 319-393-1515, ext. 528.

Sincerely,

A handwritten signature in blue ink that reads "Jon Fitch".

Jon Fitch PE
City Engineer
City of Hiawatha
101 Emmons St.
Hiawatha, Iowa 52233

2020 ANNUAL DNR STORMWATER REPORT

APPENDIX

CHAPTER 101

STORM WATER DRAINAGE SYSTEM

101.01 Purpose	101.05 Lien for Nonpayment
101.02 Storm Water Drainage System	101.06 Storm Water Emergencies
101.03 Rates	101.07 Storm Water Emergencies Fees
101.04 Payment of Rates	

101.01 PURPOSE.

The purpose of this chapter is to establish a storm water drainage system district and provide a means of funding the operation and maintenance of storm water management facilities including, but not limited to, retention or detention basins, storm sewers, inlets, ditches and drains.

101.02 STORM WATER DRAINAGE SYSTEM.

The entire City is hereby declared a storm water drainage system district for the purpose of establishing, imposing, adjusting and providing for the collection of rates for the operation and maintenance of storm water management facilities. As additional areas are annexed to the City they shall immediately be included in the storm water drainage system district.

101.03 RATES.

The rates for the operation and maintenance of the storm water management facilities shall be collected by imposing a monthly rate on every City water meter, and on every residence, apartment and dwelling unit in mobile home parks. A monthly rate of \$5.50 shall be collected on every business, commercial and industrial City water meter. A monthly rate of \$3.25 shall be collected on every residence, apartment and dwelling unit in mobile home parks. The rates shall be billed and collected in the same manner as water service rates. The Council shall have the authority to establish different monthly rates for different classifications of City water meters.

101.04 PAYMENT OF RATES.

The monthly rates are due and payable under the same terms and conditions as sewer service charges. Procedures for delinquent final accounts and write offs shall be adopted by resolution passed by the City Council.

101.05 LIEN FOR NONPAYMENT.

Except as provided for in Section 99.06 of this Code of Ordinances, the owner of the premises served and any lessee or tenant thereof shall be jointly and severally liable for charges for the operation and maintenance of the storm water management facilities. Any such charges remaining unpaid and delinquent shall constitute a lien upon the premises served and shall be certified to the County Treasurer for collection in the same manner as property taxes.

(Code of Iowa, Sec. 384.84)

101.06 STORM WATER EMERGENCIES.

The City's Public Works Department is available seven days week, 24 hours a day to assist City property owners in the event that a storm water emergency occurs. In the event a property owner contacts the City to report a storm water emergency including, the backup of retention or detention basins, storm sewers, inlets, ditches, or drains, and a Public Works employee goes out to the property to investigate or perform maintenance work in relation to the storm water emergency; and after investigation by the Public Works employee the storm water emergency is determined to be caused by the privately owned portion of the storm water drainage system; labor and equipment fees can be assessed to the property owner as outlined in 101.07. The City will only maintain and repair City owned infrastructure.

101.07 STORM WATER EMERGENCIES FEES.

All fees associated with Section 101.06 of this chapter will be mailed to the property owner as an invoice and said fees shall be paid to the City of Hiawatha by the due date listed on the invoice for payment.

1. Fees associated with activities as provided in Section 101.06 of this chapter shall be adopted by resolution passed by City Council.
2. Fees charged in connection with activities as provided in Section 101.06 of this chapter shall cover only the City's costs, including but not limited to, City employee labor and the use of City equipment.

CHAPTER 162

STORM WATER RUNOFF CONTROL

162.01 Purpose	162.13 Detention Facilities in Floodplains
162.02 Other Permits	162.14 Flows from Upland Areas
162.03 Definitions	162.15 Preliminary and Final Plat Requirements
162.04 Applicability	162.16 Drainage and Detention Design Standards
162.05 Design Storm Event	162.17 Rooftop, Parking Lot and Other Detention Storage
162.06 Detention of Excess Storm Water Runoff	162.18 Certification and Maintenance
162.07 Discharge Rate	162.19 Safety Features
162.08 Discharge Velocity	162.20 Administration
162.09 Emergency Spillway	162.21 Variances
162.10 Freeboard	162.22 Special Use Permit
162.11 Joint Development of Control Systems	162.23 Official Maps and Profiles
162.12 Early Installation of Control Systems	162.24 Interpretation

162.01 PURPOSE.

The purpose of this chapter is to diminish threats to public health and safety caused by the runoff of excessive storm waters, reduce the possibilities of hydraulic overloading of the storm sewer system, reduce economic losses to individuals and the community at large, enhance broader social orderly development, and prevent victimizations and fraud. The provisions of this chapter further supplement:

1. Subdivision Regulations. The subdivision, layout, and improvement of lands located within the corporate limits of the City.
2. Excavating and Grading Regulations. The excavating, filling, and grading of lots and other parcels or areas.
3. Building Construction Regulations. The construction of buildings and the drainage of the sites on which those structures are located, to include parking and other paved areas.
4. Storm Water Drainage Systems. The design, construction, and maintenance of storm water drainage facilities and systems.

162.02 OTHER PERMITS.

Before starting any construction regulated by this chapter, an applicant shall comply with the requirements set forth in other applicable chapters of this Code of Ordinances with respect to the submission and approval of preliminary and final subdivision plats, improvement plans, building and zoning permits, inspections, appeals and similar matters, along with those set forth in this chapter and as may be required by State statutes and the regulations of any Department of the State of Iowa.

162.03 DEFINITIONS.

For the purposes of this chapter, the following definitions are adopted:

1. "Base flood elevation" means the elevation of delineating the flood level having a one-percent probability of being equaled or exceeded in any given year (also known as the 100-year flood), as determined from Flood Insurance Rate Maps (FIRMs) or the best available information.
2. "Capacity of a storm drainage facility" means the maximum capability of a storm drainage facility to convey storm water flows without causing damage to public or private property; and, in the case of a pipe, without surcharging.
3. "Channel" means a natural or manmade open watercourse with definite bed and banks which periodically or continuously contains moving water; or which forms a connecting link between two bodies of water.
4. "Compensatory storage" means an artificially excavated volume of storage within a floodplain used to balance the loss of natural flood storage capacity when artificial fill or structures are placed within the floodplain.
5. "Conduit" means any channel, pipe, sewer, or culvert used for the conveyance or movement of water, whether open or closed.
6. "Design standards for public improvements" means standards formally adopted by the City to which all designs, and the resulting public improvements, must conform.
7. "Detention basin" means a facility constructed or modified to restrict the flow of storm water to a prescribed maximum rate, and to concurrently detain the excess waters that accumulate behind the outlet.
8. "Detention storage" means the temporary detaining or storage of storm water in storage basin, on rooftops, in streets, parking lots, school yards, parks, open space, or other areas under predetermined and controlled conditions, with the rate of drainage therefrom regulated by appropriately installed devices.
9. "Development" means the change or improvement of any parcel of land for residential, commercial, industrial, institutional, recreational, or public utility purpose, said change or improvement to include but not be limited to erection of a new structure; expansion of an existing structure; construction of a new parking area; expansion of an existing parking area; or construction of a new access drive.
10. "Discharge" means the rate of outflow of water from any source.
11. "Drainage area" means the area from which water is carried off by a drainage system, i.e. a watershed or catchment area.

12. "Dry bottom detention basin" means a basin designed to be completely drained after having provided its planned detention of runoff during a storm event.
13. "Excess storm water runoff" means the volume and rate of flow of storm water discharged from an urbanized drainage area which is or will be in excess of that volume and rate which occurred before urbanization.
14. "Fifty-year, 24-hour storm" means a precipitation event of 24-hours' duration, having a two percent chance of occurring in any one year.
15. "Floodplain" means the special flood hazard lands adjoining a watercourse, the surface elevation of which is lower than the base flood elevation and is subject to periodic inundation.
16. "Hydrograph" means a graph showing, for a stream or conduit, the runoff flowrate time.
17. "One hundred-year, 24-hour storm" means a precipitation event of 24-hours' duration, having a one percent chance of occurring in any one year.
18. "Peak flow" means the maximum rate of flow of storm water at a given point in a channel or conduit resulting from a predetermined storm or flood.
19. "Retention basin" means a structure or feature designed to retain storm water over a period of time, with its release being positively controlled over a longer period of time than in a detention basin.
20. "SCS method" means a technique for calculating storm water runoff volume and peak flow described in Soil Conservation Service (SCS) Technical Release 55.
21. "Special use" means all conditional uses or accessory uses and any use not previously defined or contemplated in this chapter or in the Zoning Ordinance.
22. "Storm water drainage facility" means any element in a storm water drainage system which is made or improved by man.
23. "Storm water drainage system" means all means, natural or manmade, used for conducting storm water to, through, or from a drainage area to the point of final outlet, including (but not limited to) any of the following: open and closed conduits and appurtenant features, canals, channels, ditches, streams, swales, culverts, streets, and pumping stations.
24. "Storm water runoff" means the waters derived from precipitation within a tributary drainage area, flowing over the surface of the ground or collected in channels or conduits.
25. "Ten-year storm" means a precipitation event having a ten percent chance of occurring in any one year.
26. "Ten-year storm runoff" means the storm water runoff having a ten percent probability of occurring on any one year.
27. "Time of concentration" means the elapsed time for storm water to flow from the most distant point in a drainage area to the outlet or other predetermined point.
28. "Unprotected channel" means a channel which receives storm water discharge and which is not paved, rip-rapped, or otherwise improved by addition of manmade materials so as to reduce the potential for erosion.
29. "Urbanization" mean the development, change, or improvement of any parcel of land consisting of one or more lots for residential, commercial, industrial, institutional, recreational or public utility purposes.
30. "Water body" means any natural or artificial pond, lake, reservoir, or other area which ordinarily or intermittently contains water and which has a discernible shoreline.
31. "Watercourse" means any natural or artificial stream, river, creek, channel, ditch, canal, conduit, culvert, drain, waterway, gully, ravine, street, roadway, swale, or wash in which water flows in a definite direction, either continuously or intermittently, and which has a definite channel, bed, or banks.
32. "Wet bottom detention basin" means a basin designed to retain a permanent pool of storm water after having provided its planned detention of runoff during a storm event.

162.04 APPLICABILITY.

This chapter applies to any new development, subject to the following conditions:

1. Detention Storage Required. The City retains the right to require detention storage in all cases in which the proposed development will generate sufficient excess runoff from the design storm to adversely affect the carrying capacity of the receiving water body or water course.
2. One CFS/Acre Runoff. New developments generating less than one cubic foot per second (CFS)/acre runoff for the design storm shall not be required to provide detention storage, unless condition in subsection 1 is applicable.

162.05 DESIGN STORM EVENT.

Storage capacity of detention facilities and discharge rates therefrom shall be such that the runoff from the "after fully developed area" shall not exceed the rate of runoff generated by the development area prior to development during the five-year frequency storm. Storage capacity/volume shall be adequate to store the excess runoff generated by the fully developed area up to and including the 100-year rainfall event.

162.06 DETENTION OF EXCESS STORM WATER RUNOFF.

The increased storm water runoff resulting from the proposed development shall be detained by the provision of appropriate dry-bottom reservoir(s); by temporary storage on flat roofs, parking lots, or streets; or by other acceptable techniques. Capacity will be sufficient to control excess flows from the design storm.

162.07 DISCHARGE RATE.

Peak discharge rates from detention storage facilities shall not exceed the maximum pre-development peak discharge rate as calculated under Section 162.06.

162.08 DISCHARGE VELOCITY.

Detention facilities shall discharge storm water at a non-erosive velocity as measured in the unprotected channel. The non-erosive velocity shall be determined through consultation of appropriate handbooks and manuals; as approved by the City. Protected channels receiving detention discharge shall incorporate features to reduce velocity to non-erosive levels at the point such discharge enters the unprotected channel.

162.09 EMERGENCY SPILLWAY.

Emergency spillways shall be provided to permit the safe passage of runoff generated from rainfall events in excess of the 100-year rainfall event. Emergency spillways shall be designed on the assumption that the pipe outlet is discharging at full capacity for the spillway elevation.

162.10 FREEBOARD.

Detention storage areas shall have adequate capacity to contain the storage volume of tributary storm water runoff with at least one foot of freeboard above the water surface during the 100-year rainfall event. Top of spillway elevations shall be one foot below the freeboard elevation.

162.11 JOINT DEVELOPMENT OF CONTROL SYSTEMS.

Storm water control systems may be planned in coordination by two or more property owners as long as the potential for damage from storm water is not increased at intervening locations.

162.12 EARLY INSTALLATION OF CONTROL SYSTEMS.

Storm water control measures shall be installed as soon as possible during the course of site development. A schedule of construction shall be submitted by the owner(s)/developer(s) prior to initiation of construction to the City.

162.13 DETENTION FACILITIES IN FLOODPLAINS.

If detention storage is provided within a floodplain, only the net increase in storage volume above that which naturally existed on the floodplain shall be credited to the development. No credit will be granted for volumes below the base flood elevation at that location unless compensatory storage is also provided.

162.14 FLOWS FROM UPLAND AREAS.

The total drainage area must be used in calculating the allowable release rate. The required storage volume will be based on the project area only, with extraneous flows from upland areas being by-passed or discharged via overflow spillways or other devices.

162.15 PRELIMINARY AND FINAL PLAT REQUIREMENTS.

Accompanying the preliminary and final plats of each proposed subdivision or any applicable construction there shall be furnished information consistent with the requirements of the City's *Design Standards for Public Improvements*. All computations, plans, and specifications related to the implementation of this chapter must be prepared and sealed by a Professional Engineer registered in the State of Iowa.

162.16 DRAINAGE AND DETENTION DESIGN STANDARDS.

All subdivisions and other proposed improvements which fall under the applicability of requirements of Section 162.04 shall be required to incorporate design features in accordance with City Standards as defined in the Unified Development Code adopted by the City. Variation from these standards will be permitted only upon submittal of a petition describing in detail the rationale for the proposed design with subsequent review by the City Engineer and approval from the Council.

162.17 ROOFTOP, PARKING LOT, AND OTHER DETENTION STORAGE.

Designs for rooftop detention storage, parking lot storage, and detention storage in underground tanks, surface swales, oversized storm sewers, or other facilities shall be submitted to the City Engineer for approval.

162.18 CERTIFICATION AND MAINTENANCE.

Detention facilities must be designed in accordance with City Standards as defined in the Unified Development Code adopted by the City. The growth of obnoxious weeds, the creation of conditions which support the growth of mosquitoes and other insects, and the decrease in available storage by accumulated sediments shall all be controlled. The cleanup of accumulated debris, flotsam, and other materials after runoff events have subsided shall be assured. Assignment of responsibility for certifying and maintaining facilities serving more than one lot or property holding will be documented and recorded by appropriate covenants to property deeds unless responsibility is formally assigned to and accepted by a public body.

1. **Certifications.** The development owner (equitable titleholder) of a privately owned detention storage facility ("Facility") must file with the City Clerk a certification signed by a licensed Iowa professional engineer ("Certification"). The Certification must certify the Facility's current storage volume and release rate, as well as the storage volume and release rate for which the Facility was initially designed. A newly constructed Facility shall be certified at the completion of the construction of that Facility. For those Facilities located on a lot for which a certificate of occupancy is issued, the construction of that Facility shall be deemed completed when the first certificate of occupancy is issued for that lot.

2. **Maintenance Responsibility.** The development owner (equitable titleholder) shall be responsible for all future grading, repairs, and maintenance to the said storm drainage and storm water facilities subject to the following conditions:

A. That said development owner (equitable titleholder) shall protect, defend and hold the City, harmless from any and all damages or claims for damages that might arise or accrue as a result of flooding, erosion from flooding, deposits of sediment in said areas.

B. The development owner (equitable titleholder) shall to not place fill material, to erect no buildings, obstructions, or other improvements on the area reserved for private storm water purposes.

C. The development owner (equitable titleholder) shall provide a re-certification by a Licensed Iowa Professional Engineer, every subsequent five years. A facility that is exclusively constructed, located and maintained on a paved surface is exempt from the re-certification requirements of this chapter. The certification shall include the following:

(1) The storm water facility's storage volume, as approved by the City, has not decreased.

(2) The storm water facility's release rate, as approved by the City, has not increased.

3. Corrective Measures. If deficiencies are found by the inspector, the development owner (equitable titleholder) shall be required to take the necessary measures to eliminate nuisances and correct structural deficiencies within a reasonable amount of time. If the development owner (equitable titleholder) fails to do so, the City may cause the work to be completed and shall collect the cost therefore from the development owner (equitable titleholder) taking appropriate action as necessary.

162.19 SAFETY FEATURES.

Designs of detention facilities shall incorporate safety features; particularly at inlets, outlets, on steep slopes, and at any attractive nuisances. These features shall include, but not limited to, fencing, hand rails, lighting, steps, grills, signs, and other protective or warning devices.

162.20 ADMINISTRATION.

The administration of this chapter shall be the responsibility of the Building Official and the City Engineer.

1. Creation. The City of Hiawatha Storm Water Advisory Committee is hereby created.

2. Members. The Storm Water Advisory Committee will consist of at least three members. Members shall be residents of the City of Hiawatha and shall serve without compensation. Members will be qualified by knowledge or experience to act in matters pertaining to the development of storm water policies. Members shall not hold any elected office in City government.

3. Removal of Members. Members of the Storm Water Advisory Committee may be removed by the City Council for such cause as the City Council may determine necessary.

4. Duties. The Storm Water Advisory Committee will have such duties as set forth in this chapter or as prescribed by the City Council. Specifically the duties will include:

A. Develop and recommend storm water policies.

B. Advise City Council in regards to needed storm water capital improvement projects.

C. Review any public input regarding storm water drainage or erosion control.

D. Make such reports to the City Council as may be requested from time to time.

E. Recommend best management practices for development of storm water management and water quality.

5. Meetings. Meetings will be scheduled quarterly. All meetings are open to the public. Meetings may be cancelled if there are no agenda items.

162.21 VARIANCES.

No variance shall be issued without the review and recommendation of the Planning and Zoning Commission and approval of the Council.

162.22 SPECIAL USE PERMIT.

No special use permit shall be issued without the prior concurrence of the City Engineer and approval by the Council.

162.23 OFFICIAL MAPS AND PROFILES.

Responsibility for all changes to official maps and profiles is conferred to the City Engineer.

162.24 INTERPRETATION.

In the interpretation and application of this chapter, the provisions expressed herein shall be held to be the minimum requirements and shall be liberally construed in favor of the City; and shall not be deemed a limitation or repeal of any other powers granted by the *Code of Iowa*.

Minutes

Hiawatha Storm Water Advisory Committee

September 24, 2019 at 5:00 pm-6:00pm

City Hall Multi-purpose Room

1. Call to order-Present:

Ted Martin

Kevin Neuendorf

John Bender-City Engineer

Patrick Parsley-Community Development Director

Cindy Kudrna-Finance Director

2 Minutes: John Bender provided the minutes of the June 25, 2019 meeting.

- a. Minutes were approved.

3 Discussion:

- a. Proposed FY21 Storm Water Rates. Cindy opened discussion of the residential and commercial rates in Chapter 101, Storm Water Drainage System:
 - The discussion of the current Section 101.03, Rates.
 - Discussion of current and previous storm water rates dating back to 2010.
 - The discussion of two proposals for storm water rates for FY 21 budget.
 - Discussion of storm water projects completed over previous years that did not utilize storm water utility funds.
 - Discussion of the ever increasing requirements of cities in Iowa with the MS4 Permit from the Iowa Department of Natural Resources.
 - After the discussion of this ordinance, it will be the recommendation of the storm water advisory committee to the City Council that proposal (2)

be accepted adjusting the rate for a residential unit at \$3.75/month, and the business, commercial, or industrial rate at \$6.50/month. These rates to be used for budgeting revenue for FY21.

4 Review:

- a. Discussion of new proposed FEMA flood hazard mapping and the proposed schedule.
- b. Discussion of GP-2 permits and the inspection report used for the quarterly report.
- c. Discussion of the locations and ownership of the almost 100 detention basins in the City that are privately owners and operated.

5 Future Ordinance Review

- a. Patrick provided new draft copies of the updated Chapter 161 the will modify the definition of “designee” as the administrator of the ordinance.
- b. Federal Emergency Management Administration flood hazard mapping has only minor changes for Hiawatha:
 - i. Area “B” has very little change
 - ii. Willwood has area reduced in the back yards
 - iii. Stonegate area a little less
 - iv. Reduced area along east side of Guthridge Park
 - v. Drainage area on Hunt Road and Edgewood Road increased
- c. Discussion of the Base Flood elevation included in the ordinance and that there is no change recommended.
- d. Discussion of the Accumulative Occurrence Clarification will be revised by modifying the substantial damage language in 161.04

6 Adjourn

- a. Next meeting proposed for late December, however we have normally not held a meeting in December unless necessary.

REVENUE & EXPENSE REPORT
CALENDAR 6/2020, FISCAL 12/2020

PCT OF FISCAL YTD 100.0%

ACCOUNT NUMBER	ACCOUNT TITLE	TOTAL BUDGET	MTD BALANCE	YTD BALANCE	PERCENT EXPENDED
740-865-6010	SALARIES--STORM SEWER	66,741.00	5,060.76	70,715.89	105.96
740-865-6110	FICA/MEDICARE--STORM SEWE	5,106.00	383.37	5,345.78	104.70
740-865-6130	IPERS--STORM SEWER	6,300.00	477.75	6,675.21	105.96
740-865-6151	HEALTH INS & DEDUCTIBLE	.00	.00	.00	.00
740-865-6160	WORK COMP INSURANCE	400.00	.00	307.53	76.88
740-865-6210	DUES/MEMBERSHIP/SUBSCRIPT	3,500.00	.00	3,335.00	95.29
740-865-6230	EDUCATION & TRAINING	3,000.00	.00	.00	.00
740-865-6331	VEHICLE MAINTENANCE SUPPL	3,000.00	.00	1,766.65	58.89
740-865-6332	VEHICLE/EQUIP REPAIR & MA	.00	.00	.00	.00
740-865-6407	ENGINEERING	.00	.00	.00	.00
740-865-6498	STREET SWEEPING	.00	.00	.00	.00
740-865-6499	MISC CONTRACTUAL	2,000.00	.00	1,035.50	51.78
740-865-6507	OPERATING SUPPLIES & MISC	4,000.00	.00	2,321.00	58.03
740-865-6511	VEHICLE OPERATING SUPPLY	1,500.00	127.40	606.38	40.43
740-865-6674	EPA STORM WATER PLAN	5,000.00	.00	3,031.00	60.62
740-865-6717	KAINZ DR	.00	.00	.00	.00
740-865-6754	COLD STORAGE FACILITY	.00	.00	.00	.00
740-865-6765	VARIOUS DRAINAGE PROJECTS	35,000.00	.00	31,493.00	89.98
740-865-6766	CATCH BASIN REPAIR/RECON	.00	.00	.00	.00
	STORM SEWER TOTAL	135,547.00	6,049.28	126,632.94	93.42
740-910-6910	TRANSFER OUT--EQUIP RESER	22,000.00	.00	22,000.00	100.00
740-910-6916	TRANSFER OUT--INT TO PTRF	.00	.00	.00	.00
	TRANSFERS TOTAL	22,000.00	.00	22,000.00	100.00
	STORM SEWER TOTAL	157,547.00	6,049.28	148,632.94	94.34
	TOTAL OF ALL EXPENSES	157,547.00	6,049.28	148,632.94	94.34

REVENUE & EXPENSE REPORT
CALENDAR 6/2020, FISCAL 12/2020

PCT OF FISCAL YTD 100.0%

ACCOUNT NUMBER	ACCOUNT TITLE	TOTAL BUDGET	MTD BALANCE	YTD BALANCE	PERCENT EXPENDED
740-865-4500	STORM WATER UTILITY FEES	160,000.00	11,916.35	145,193.81	90.75
	STORM SEWER TOTAL	160,000.00	11,916.35	145,193.81	90.75
740-950-4300	INTEREST--STORM SEWER	4,000.00	.00	2,702.48	67.56
	NON-PROGRAM TOTAL	4,000.00	.00	2,702.48	67.56
	STORM SEWER TOTAL	164,000.00	11,916.35	147,896.29	90.18
	TOTAL OF ALL REVENUES	164,000.00	11,916.35	147,896.29	90.18



10/01/2020

NEWELL MACHINERY CO INC
1405 MITCHELL DR
HIAWATHA IA 52233

Re: Storm Water Detention Facility at 1405 MITCHELL Drive

Dear NEWELL MACHINERY CO INC

Our records indicate the certification of the storm water detention facility at 1405 MITCHELL Drive constructed during the development and platting of the property has expired. All owners of a privately owned detention storage facility must file a recertification certificate with the City every **five (5)** years. This requirement is outlined in Chapter 162 of the Hiawatha Code of Ordinances to meet the guidelines of the Cities' Municipal Separate Storm Sewer System (MS4) management permit with the Department of Natural Resources.

A recertification certificate must be submitted to the City of Hiawatha within thirty days of this notice. This certificate must be signed by a licensed professional engineer in the State of Iowa. In order to maintain the proper operation of these important facilities, the City of Hiawatha would appreciate your cooperation in this matter.

Again it should be noted that the City of Hiawatha Storm Water Ordinance No. 162 paragraph 162.19 states the following:

C. *The development owner (equitable titleholder) shall provide a re-certification by a Licensed Iowa Professional Engineer every subsequent five years. A Facility that is exclusively constructed, located and maintained on a paved surface is exempt from the Re-Certification requirements of this chapter. The certification shall include the following:*

- (1) *The storm water facility's storage volume, as approved by the City, has not decreased.*
- (2) *The storm water facility's release rate, as approved by the City, has not increased.*

3. *Corrective Measures. If deficiencies are found by the inspector, the development owner (equitable titleholder) shall be required to take the necessary measures to eliminate nuisances and correct structural deficiencies within a reasonable amount of time. If the development owner (equitable titleholder) fails to do so, the City may cause the work to be completed and shall collect the cost therefore from the development owner (equitable titleholder) taking appropriate action as necessary.*

For more information, the entire Chapter 162 can be found on www.hiawatha-iowa.com under tabs community development/storm water management/ordinance regarding storm water runoff.

Please send the recertification certificate to:

City Engineer
City of Hiawatha
Hiawatha IA 52233

If you have submitted the recertification within the last five (5) years, please send a copy of the recertification to update our records.

If you have any questions, please contact this office at 319-393-1515.

Sincerely,

A handwritten signature in black ink, appearing to read "Patrick Parsley".

Patrick Parsley
Community Development Director

October 13, 2020

ATTN: City Engineer
City of Hiawatha
101 Emmons Street
Hiawatha, IA 52233-1697

**RE: STORMWATER DETENTION FACILITY AT
820 N. 15TH AVENUE, HIAWATHA, IOWA 52233**

Dear City Engineer:

We completed a field verification of the detention basin located on Lot 3, Hiawatha North 23rd Addition on October 13, 2020. Following are a series of photos taken at this time:



Photo 1 – Looking south from the north end of the basin



Photo 2 – Looking east at the truck dock rip-rap flume



Photo 3 – Looking east at the dock drain outlet pipe



Photo 4 – Looking south at basin outlet structure, storm sewer outlet and rip-rap flume from parking area



Photo 5 – Looking northwest from parking area down into the basin at the outlet structure

I observed the detention basin is very well maintained and high functioning. The basin bottom & slopes were well vegetated and with no evidence of erosion. There was very little trash accumulated in the bottom of the basin (unlike typical detention basins), evidence of “good housekeeping” of the property.

There is a small area of accumulated sediment at the outlet structure, that was approximate 7’ wide by 7’ long by 4” deep in size (~20 cubic feet) – refer to photo 4. This small amount of sediment does not appreciably affect basin performance. We recommend that this sediment be removed prior to the next certification in five years as part of routine basin maintenance.

There was a small amount of erosion starting at the north side of the rip-rap flume from the truck dock pavement north of the building – refer to photo 2. This appears to be caused by some accumulated sediment in the flume directing flows around the sides of the rip-rap flume. This is not currently affecting basin performance, but this sort of erosion can progress quickly during large storm events. We recommend that this situation be corrected by removing the accumulated sediment from the top side of the flume and also by moving some of the revetment stone from the middle of the rip-rap flume and moving it to the sides to better direct runoff truck dock runoff into the middle of the flume.

Based on our site visit observations I hereby certify that the storage volume has not decreased and the release rate has not increased from what was approved by the City for the detention basin. I trust this certification will satisfy your requirements. Please contact me if you need any further information.

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

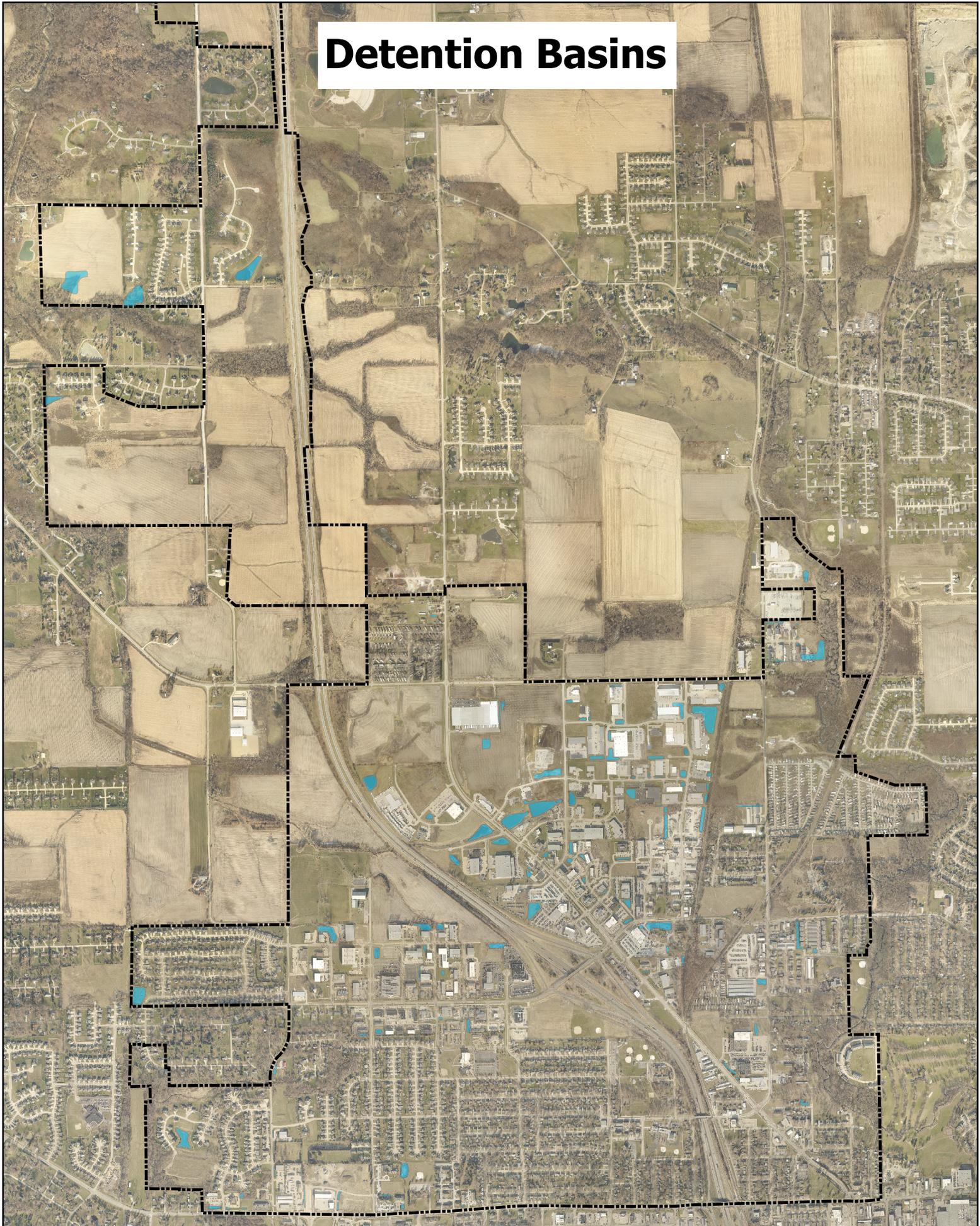


Executed in Cedar Rapids, Iowa, this 13th day of October 2020.

Tred Schnoor, PE
No. 16326
My license renewal date is December 31, 2021

Copy: Randy Novak, RKAVON, LLC (via e-mail: randy@novakheating.com)
Jake Hayden, Compass Commercial Services, LLC (via e-mail: jhayden@compass-built.com)

Detention Basins



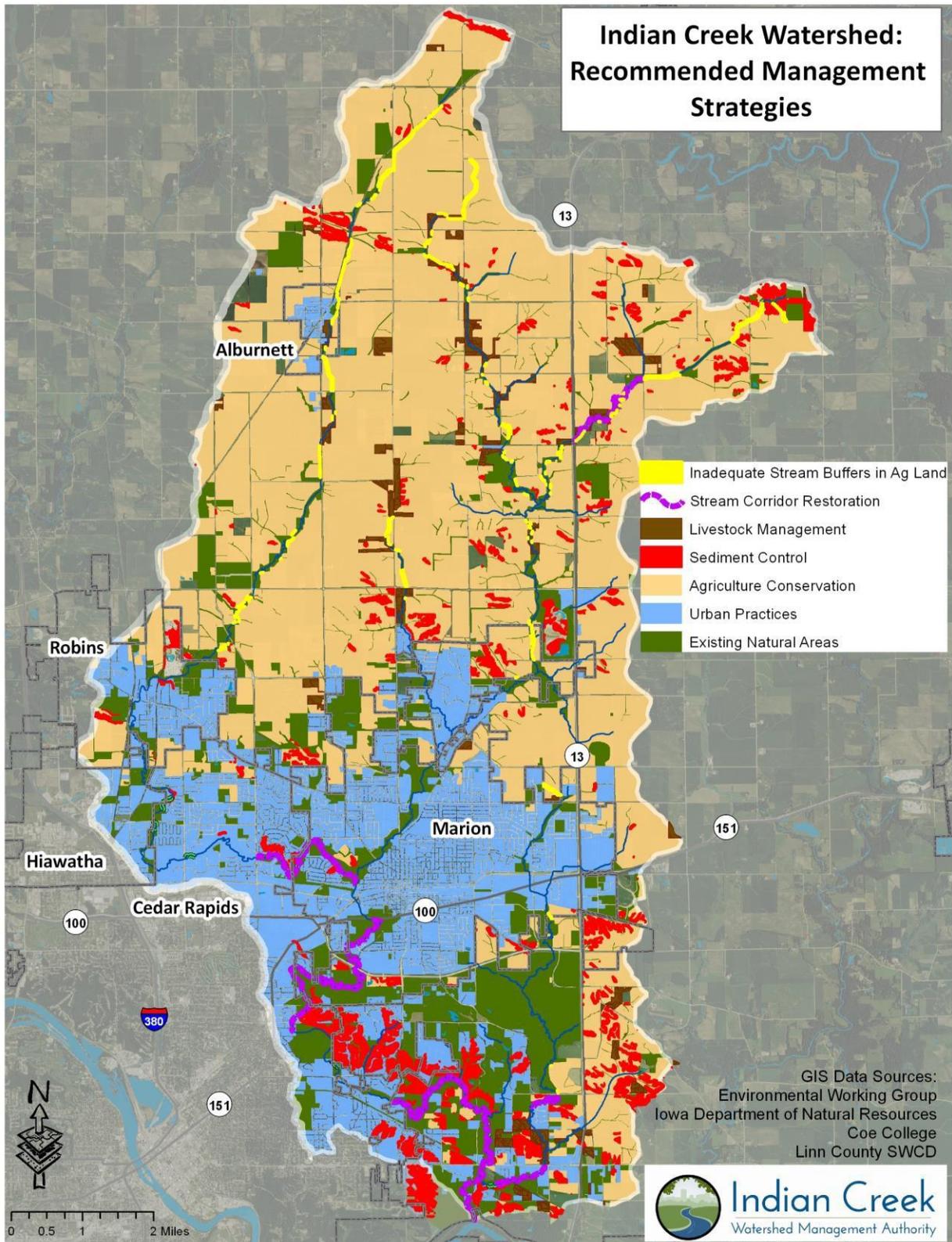


Indian Creek Watershed Management Plan

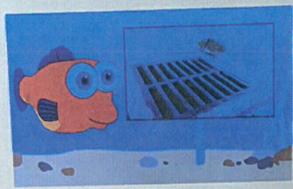
June 2015



Figure 7-1. Zones for Recommended Management Strategies in Indian Creek



Source: ECICOG and Iowa Department of Natural Resources



RAINSCAPING URBAN LANDSCAPES
INSPIRING COMMERCIAL, INSTITUTIONAL & INDUSTRIAL SITES

Rainwater Harvesting
Simple Solutions for Stormwater Management

GREEN ROOFS
Green Infrastructure For Stormwater Management

PERMEABLE PAVERS
Permeation and Stormwater Infrastructure

BIORETENTION CELLS
Green Infrastructure For Stormwater Management

SOIL QUALITY RESTORATION
Improving Soil Health

IOWA URBAN CONSERVATION

Stormwater Pollution Prevention Plan

Individual Building Site Stormwater Pollution Prevention

Individual Building Site Stormwater Pollution Prevention

Item	Description	Quantity
1	Stormwater Pollution Prevention Plan	1
2	Individual Building Site Stormwater Pollution Prevention	1
3	Stormwater Pollution Prevention Plan	1
4	Individual Building Site Stormwater Pollution Prevention	1
5	Stormwater Pollution Prevention Plan	1
6	Individual Building Site Stormwater Pollution Prevention	1

REQUIRED SEDIMENT CONTROLS

- Perimeter Controls
- Concrete Washout
- Paint Washout
- Debris Confinement
- Graveled Drive
- Good housekeeping

SILT FENCE INSTALLATION REQUIREMENTS

- Install parallel on the lower contours of site with the ends extending upward, creating a J-Hook, thus containing and allowing water to pond behind fence.
- Entrench 6-8 inches deep.
- Stake every 3 ft. unless in a high flow concentrated area, then the staking distance is every foot.
- Overlap sections of silt fence leaving no gaps between fences.

FILTER SOCK INSTALLATION REQUIREMENTS

- Composed of compost or wood mulch.
- Stake every 3 ft. unless in a high flow concentrated area, then the staking distance is every foot.
- When used as a perimeter control, the size shall be determined by the steepness of the slope.

RESOURCES

- www.iowastormwater.org
- www.iowadnr.gov
- Hiawatha Storm Water Hotline:
(319) 393-1515 ext. 229

ALTERNATE PERIMETER CONTROL REQUIREMENTS

- Compost Berm: 3ft. base x 1 ft. width at top x 1ft. height.
- Vegetative buffer strip: 20 ft. wide and a minimum of 6 inches in height on slopes less than 6% in height.
- Wattles on slopes less than 6% (Must be approved by a City Official).

CONCRETE WASHOUT REQUIREMENTS

- Must be located within the lot's perimeter controls, on level ground, and accessible from a hard surface.
- May be constructed with a double layer of 12-18 inch filter sock with (2) layers of 6 mil plastic.
- If using a concrete bag, it must be staked and tied up.

PAINT WASHOUT

- Must be located within the lot's perimeter controls and placed on level ground.
- Shall be secured.

DEBRIS CONFINEMENT

- Install a trash container on site.
- All containers must have lids.
- Can be comprised of trash bins, trash cans, or dumpster, etc. (Anything smaller than a bin, or dumpster, must have lids and be tied and staked down.
- All debris containers shall remain covered at all times.

GRAVEL DRIVE REQUIREMENTS

- Use rock that is 2 inches or greater in size.
- It shall extend a minimum of 20 ft. from the curb/street.

PORT-A-JOHNS

- Shall be located on level area within the perimeter controls.
- Must be secured with 18 inch stakes (minimum).
- DO NOT locate on or near storm sewer intakes.

STOCKPILES

- Sediment controls may need to be installed around its perimeter.
- DO NOT locate near any down slope, street, driveway, street/road, ditch, waterway, basin, stream, pond, lake, and/or wetland.
- If stockpiles are inactive, for more than 14 days, temp seeding and mulching practices shall be implemented.

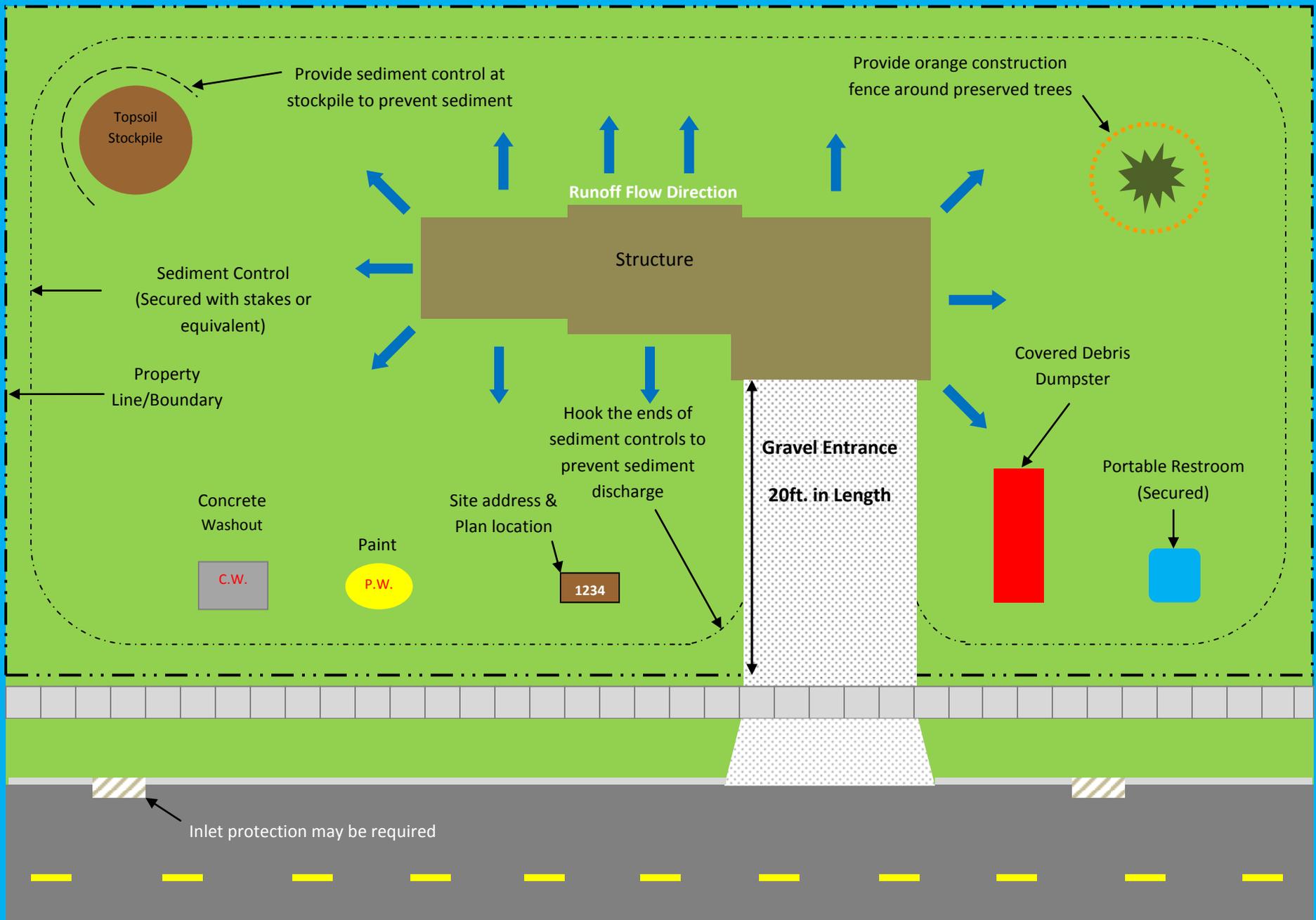
GOOD HOUSEKEEPING:

Maintain/replace damaged sediment controls, cleanup sediment that has been carried off site by vehicles and/or storm water runoff.

REQUIRED INSPECTIONS

- Weekly
- After each significant storm event
- Documentation shall be available within 2 hours of request.

EROSION & SEDIMENT CONTROL



EROSION AND SEDIMENT CONTROL INSPECTION REPORT

Project: _____

Date of Inspection: _____

Project Owner: _____

Activity ID: _____

Prime Contractor: _____

DNR Permit No: _____

Reason for Inspection: Weekly Rainfall Event ____ in., Date of rain _____

Other: _____

Storm Water Pollution Prevention Plan (SWPPP) available on site? Yes No

Inspector: _____

EROSION AND SEDIMENT CONTROL INSPECTION

Area Inspected: _____

Inspection of Best Management Practices:

BMP	Control Practice Effective			Maintenance/Modification Required			BMP	Control Practice Effective			Maintenance/Modification Required		
	Y	N	N/A	Y	N	N/A		Y	N	N/A	Y	N	N/A
Silt Fencing							Stockpile Stabilization						
Ditch Checks							Mulching						
Rip Rap							Erosion Matting						
Inlet Protection							Temporary Seeding						
Drainage Swales							Permanent Seeding						
Construction Site Exits							Sodding						
Project Schedule							Other _____						
Grading Practices							Other _____						

INSPECTION COMMENT / SITE OBSERVATIONS:

Follow up required by Storm water Utility for potential NPDES violation? Yes No

Was maintenance/modification completed? No Yes (Date _____)

Report violation to DNR? No Yes (Date _____)



EROSION AND SEDIMENT CONTROL INSPECTION

3rd QUARTER REPORT

CITY PERMIT #: GPR19-000008
Date of Inspection: 09/11/2020
Address or Location: 000 Sherman Square
Owner:
Description: IDNR construction permit
NPDES Permit No: 36500-36160
Inspector: Rick Harbaugh

Storm Water Pollution Prevention Plan (SWPPP) available on site?

Best Management Practice	Control Installed Properly	Corrective Action Required	Best Management Practice	Control Installed Properly	Corrective Action Required
Silt Fencing	Yes	No	Stockpile Stabilization	Yes	No
Ditch Checks	N/A	N/A	Mulching	Yes	No
Rip Rap	N/A	N/A	Erosion Matting	Yes	No
Inlet Protection	Yes	No	Temporary Seeding	N/A	N/A
Drainage Swales	N/A	N/A	Permanent Seeding	N/A	N/A
Construction Site Exits	Yes	No	Sodding	N/A	N/A
Project Schedule	Yes	No	Weekly Logs	N/A	N/A
Grading Practices	Yes	No	Other -	N/A	N/A

NOTE: Items requiring corrective action may be considered violations if not repaired

ADDITIONAL INSPECTION COMMENT / SITE OBSERVATIONS:

No issues. Site still needs to be seeded.

This Quarterly inspection report is performed in accordance with the MS-4 Permit requirements for the City of Hiawatha. All records of this inspection are public and will be provided to the Iowa Department of Natural Resources (IDNR) or to the general public upon request. Your next quarter inspection will be in December-2020

It is the responsibility of the NPDES Permit holder to make the necessary site corrections to comply with the permit and applicable SWPPP provisions including but not limited to the installation and maintenance of all control measures. The permittee is also required to maintain the associated documentation and provide copies upon request.



EROSION AND SEDIMENT CONTROL INSPECTION

3rd QUARTER REPORT

CITY PERMIT #: GPR20-000007
Date of Inspection: 09/11/2020
Address or Location: 2915 FITZROY Road
Owner: HIAWATHA CITY OF
Description: IDNR construction permit
NPDES Permit No: 37946-37590
Inspector: Rick Harbaugh

Storm Water Pollution Prevention Plan (SWPPP) available on site?

Best Management Practice	Control Installed Properly	Corrective Action Required	Best Management Practice	Control Installed Properly	Corrective Action Required
Silt Fencing	Yes	No	Stockpile Stabilization	Yes	No
Ditch Checks	N/A	N/A	Mulching	N/A	N/A
Rip Rap	N/A	N/A	Erosion Matting	N/A	N/A
Inlet Protection	N/A	N/A	Temporary Seeding	N/A	N/A
Drainage Swales	N/A	N/A	Permanent Seeding	N/A	N/A
Construction Site Exits	Yes	No	Sodding	N/A	N/A
Project Schedule	Yes	No	Weekly Logs	N/A	N/A
Grading Practices	Yes	No	Other -	N/A	N/A

NOTE: Items requiring corrective action may be considered violations if not repaired

ADDITIONAL INSPECTION COMMENT / SITE OBSERVATIONS:

No issues. Silt Fence placed and grading site.

This Quarterly inspection report is performed in accordance with the MS-4 Permit requirements for the City of Hiawatha. All records of this inspection are public and will be provided to the Iowa Department of Natural Resources (IDNR) or to the general public upon request. Your next quarter inspection will be in December-2020

It is the responsibility of the NPDES Permit holder to make the necessary site corrections to comply with the permit and applicable SWPPP provisions including but not limited to the installation and maintenance of all control measures. The permittee is also required to maintain the associated documentation and provide copies upon request.



Certificate of Membership

City of Hiawatha

is a MS4 Community member in good standing with the
Iowa Stormwater Education Partnership
for the fiscal year 2020-2021

Patricia A. Samu

Executive Director



SOIL ANALYSIS



Submitted by **EW50014108**
IOWA STORM WATER EDUCATION PARTNERSHIP
5215 MARYLAND ST
AMES, IA 50014

Submitted for
CITY OF HIAWATHA

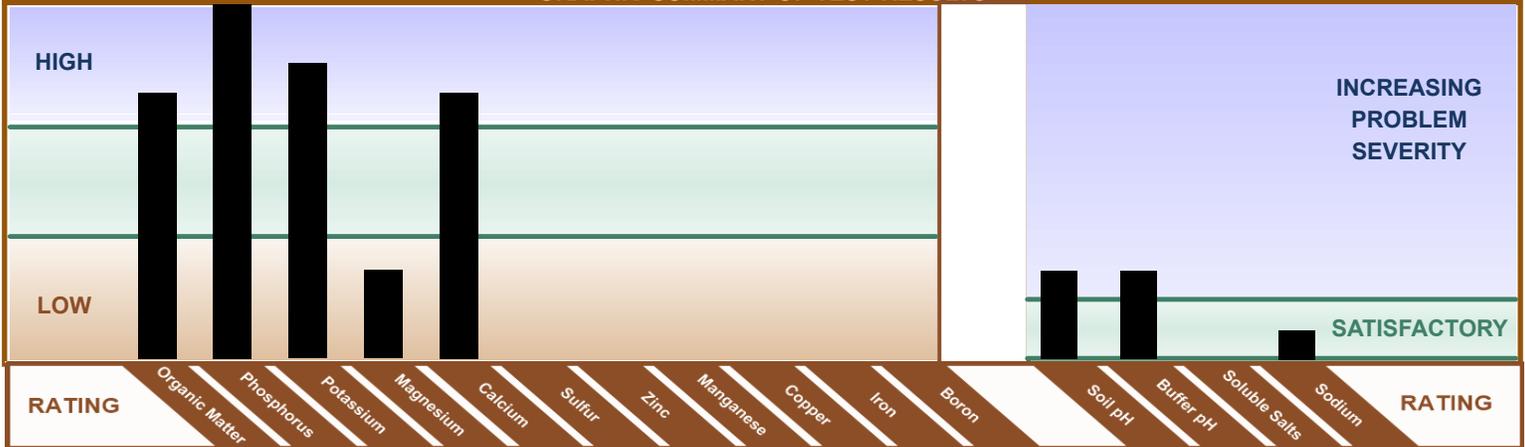
Laboratory Sample #
BR32294
 Information Sheet #
S1112-1683

Date Received
12-Nov-2019

Date Reported
15-Nov-2019

Laboratory Turnaround **3 Days** Samples Will Be Stored Until **27-Nov-2019** Field Identification **HIAWATHA**

GRAPHIC SUMMARY OF TEST RESULTS



REPORT OF ANALYSIS	
YOUR SAMPLE NUMBER	
TUCKERPARK	
Soil pH	7.4
Buffer Index	7.3
Soluble Salts mmhos/cm	--
Sodium ppm	10.8
% Organic Matter	4.7
ANALYSIS OF NUTRIENT ELEMENTS IS IN PARTS PER MILLION (ppm)	
Nitrate N	11.0
Phosphorus Mehlich III	40
--	--
--	--
--	--
Potassium	216
Magnesium	244
Calcium	4197
Sulfate Sulfur	--
Zinc	--
Manganese	--
Copper	--
Iron	--
Boron	--

FERTILIZER GUIDELINES IN: Lbs/1000 sq ft									
1st Option Intended Crop			2nd Option Intended Crop			3rd Option Intended Crop			
Lawn									
Yield Goal			Yield Goal			Yield Goal			
1 NO									
Preceding Crop			Preceding Crop			Preceding Crop			
PLANT FOOD GUIDELINE RANGES		CROP REMOVAL RATES	PLANT FOOD GUIDELINE RANGES		CROP REMOVAL RATES	PLANT FOOD GUIDELINE RANGES		CROP REMOVAL RATES	
N	1.3		N			N			
P ₂ O ₅	0.0		P ₂ O ₅			P ₂ O ₅			
K ₂ O	0.0		K ₂ O			K ₂ O			
MgO	0.3		MgO			MgO			
S			S			S			
Zn			Zn			Zn			
Mn			Mn			Mn			
Cu			Cu			Cu			
Fe			Fe			Fe			
B			B			B			
None	0		None			None			

Lime Guidelines are for 100% Effective Calcium Carbonate (ECC) with a 6" Incorporation Depth.

ACTUAL AND SUGGESTED PERCENT OF TOTAL CEC (BASE SATURATION)								ESTIMATED		
Actual % Hydrogen	Suggested Hydrogen	Actual % Potassium	Suggested Potassium	Actual % Magnesium	Suggested Magnesium	Actual % Calcium	Suggested Calcium	Actual % Sodium	Suggested Sodium	CEC for Your Soil
0.0	0 - 5	2.3	2 - 7	8.5	15 - 20	88.9	65 - 75	0.2	0 - 5	23.6

DISCLAIMER: Data and information in this report are intended solely for the individual(s) for whom samples were submitted. Reproduction of this report must be in its entirety. Levels listed are guidelines only. Data was reported based on standard laboratory procedures and deviations.

SOIL ANALYSIS



Submitted by **EW50014108**
IOWA STORM WATER EDUCATION PARTNERSHIP
5215 MARYLAND ST
AMES, IA 50014

Submitted for
CITY OF HIAWATHA

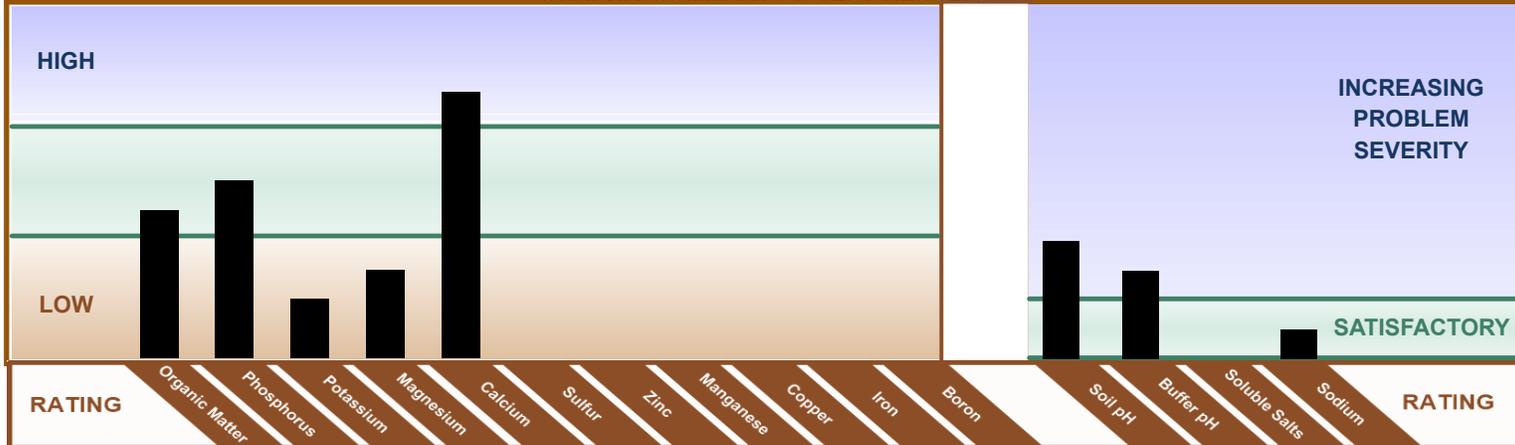
Laboratory Sample #
BR32295
 Information Sheet #
S1112-1683

Date Received
12-Nov-2019

Date Reported
15-Nov-2019

Laboratory Turnaround **3 Days** Samples Will Be Stored Until **27-Nov-2019** Field Identification **HIAWATHA**

GRAPHIC SUMMARY OF TEST RESULTS



REPORT OF ANALYSIS	
YOUR SAMPLE NUMBER	
12THAVERET	
Soil pH	7.4
Buffer Index	7.4
Soluble Salts mmhos/cm	--
Sodium ppm	17.3
% Organic Matter	2.9
ANALYSIS OF NUTRIENT ELEMENTS IS IN PARTS PER MILLION (ppm)	
Nitrate N	24.7
Phosphorus Mehlich III	17
--	--
--	--
--	--
Potassium	107
Magnesium	238
Calcium	3198
Sulfate Sulfur	--
Zinc	--
Manganese	--
Copper	--
Iron	--
Boron	--

FERTILIZER GUIDELINES IN: Lbs/1000 sq ft						
1st Option Intended Crop			2nd Option Intended Crop		3rd Option Intended Crop	
Lawn						
Yield Goal			Yield Goal		Yield Goal	
1 NO						
Preceding Crop			Preceding Crop		Preceding Crop	
PLANT FOOD GUIDELINE RANGES			PLANT FOOD GUIDELINE RANGES		PLANT FOOD GUIDELINE RANGES	
N	0.9	CROP REMOVAL RATES	N		N	
P ₂ O ₅	0.7		P ₂ O ₅		P ₂ O ₅	
K ₂ O	1.8		K ₂ O		K ₂ O	
MgO	0.0		MgO		MgO	
S			S		S	
Zn			Zn		Zn	
Mn			Mn		Mn	
Cu			Cu		Cu	
Fe			Fe		Fe	
B			B		B	
None	0		None		None	

Lime Guidelines are for 100% Effective Calcium Carbonate (ECC) with a 6" Incorporation Depth.

ACTUAL AND SUGGESTED PERCENT OF TOTAL CEC (BASE SATURATION)								ESTIMATED		
Actual % Hydrogen	Suggested Hydrogen	Actual % Potassium	Suggested Potassium	Actual % Magnesium	Suggested Magnesium	Actual % Calcium	Suggested Calcium	Actual % Sodium	Suggested Sodium	CEC for Your Soil
0.1	0 - 5	1.5	2 - 7	10.7	15 - 20	87.3	65 - 75	0.4	0 - 5	18.3

DISCLAIMER: Data and information in this report are intended solely for the individual(s) for whom samples were submitted. Reproduction of this report must be in its entirety. Levels listed are guidelines only. Data was reported based on standard laboratory procedures and deviations.

SOIL ANALYSIS



Submitted by **EW50014108**
IOWA STORM WATER EDUCATION PARTNERSHIP
5215 MARYLAND ST
AMES, IA 50014

Submitted for
CITY OF HIAWATHA

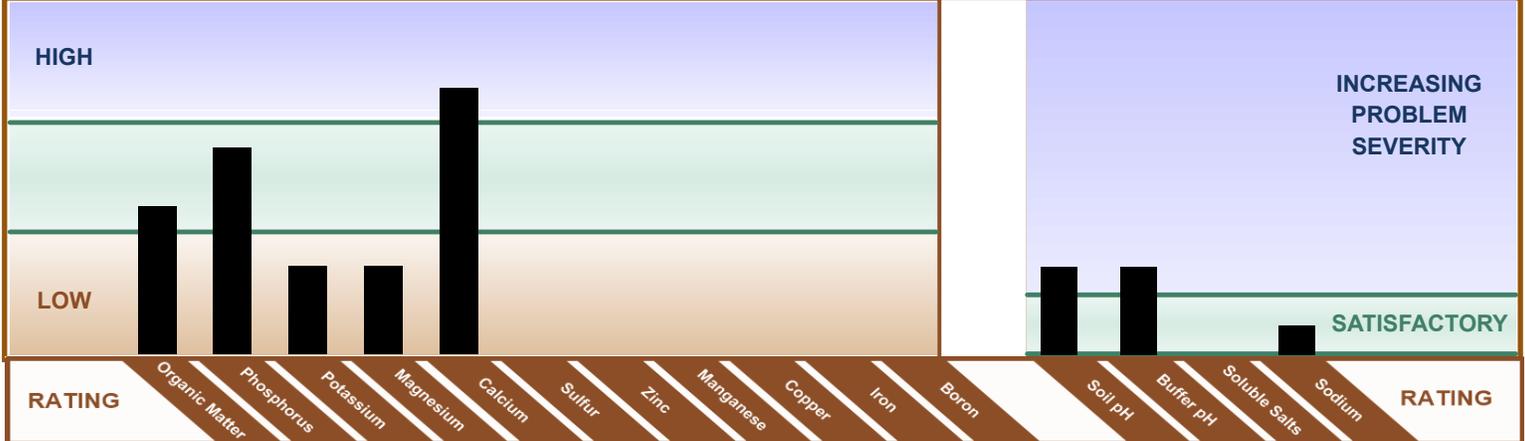
Laboratory Sample #
BR32296
 Information Sheet #
S1112-1683

Date Received
12-Nov-2019

Date Reported
15-Nov-2019

Laboratory Turnaround **3 Days** Samples Will Be Stored Until **27-Nov-2019** Field Identification **HIAWATHA**

GRAPHIC SUMMARY OF TEST RESULTS



REPORT OF ANALYSIS	
YOUR SAMPLE NUMBER	
GUTHRIDGEPARK	
Soil pH	7.4
Buffer Index	7.4
Soluble Salts mmhos/cm	--
Sodium ppm	9.7
% Organic Matter	2.8
ANALYSIS OF NUTRIENT ELEMENTS IS IN PARTS PER MILLION (ppm)	
Nitrate N	5.3
Phosphorus Mehlich III	20
--	--
--	--
--	--
Potassium	133
Magnesium	233
Calcium	3394
Sulfate Sulfur	--
Zinc	--
Manganese	--
Copper	--
Iron	--
Boron	--

FERTILIZER GUIDELINES IN: Lbs/1000 sq ft									
1st Option Intended Crop			2nd Option Intended Crop			3rd Option Intended Crop			
Lawn									
Yield Goal			Yield Goal			Yield Goal			
1 NO									
Preceding Crop			Preceding Crop			Preceding Crop			
PLANT FOOD GUIDELINE RANGES		CROP REMOVAL RATES	PLANT FOOD GUIDELINE RANGES		CROP REMOVAL RATES	PLANT FOOD GUIDELINE RANGES		CROP REMOVAL RATES	
N	1.9		N			N			
P ₂ O ₅	0.7		P ₂ O ₅			P ₂ O ₅			
K ₂ O	1.2		K ₂ O			K ₂ O			
MgO	0.3		MgO			MgO			
S			S			S			
Zn			Zn			Zn			
Mn			Mn			Mn			
Cu			Cu			Cu			
Fe			Fe			Fe			
B			B			B			
None	0		None			None			

Lime Guidelines are for 100% Effective Calcium Carbonate (ECC) with a 6" Incorporation Depth.

ACTUAL AND SUGGESTED PERCENT OF TOTAL CEC (BASE SATURATION)								ESTIMATED		
Actual % Hydrogen	Suggested Hydrogen	Actual % Potassium	Suggested Potassium	Actual % Magnesium	Suggested Magnesium	Actual % Calcium	Suggested Calcium	Actual % Sodium	Suggested Sodium	CEC for Your Soil
0.1	0 - 5	1.8	2 - 7	10.0	15 - 20	88.0	65 - 75	0.2	0 - 5	19.2

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SOIL ANALYSIS



Submitted by **EW50014108**
IOWA STORM WATER EDUCATION PARTNERSHIP
5215 MARYLAND ST
AMES, IA 50014

Submitted for
CITY OF HIAWATHA

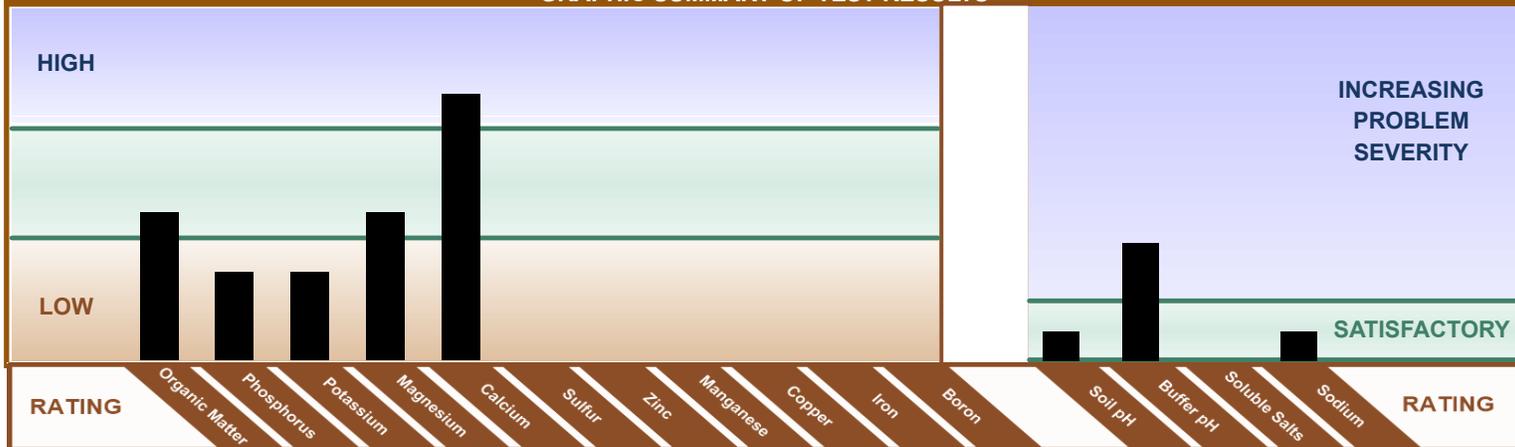
Laboratory Sample #
BR32297
 Information Sheet #
S1112-1683

Date Received
12-Nov-2019

Date Reported
15-Nov-2019

Laboratory Turnaround **3 Days** Samples Will Be Stored Until **27-Nov-2019** Field Identification **HIAWATHA**

GRAPHIC SUMMARY OF TEST RESULTS



REPORT OF ANALYSIS	
YOUR SAMPLE NUMBER	
CLARKPARK	
Soil pH	7.2
Buffer Index	7.2
Soluble Salts mmhos/cm	--
Sodium ppm	10.8
% Organic Matter	2.7
ANALYSIS OF NUTRIENT ELEMENTS IS IN PARTS PER MILLION (ppm)	
Nitrate N	7.4
Phosphorus Mehlich III	10
--	--
--	--
--	--
Potassium	129
Magnesium	269
Calcium	2432
Sulfate Sulfur	--
Zinc	--
Manganese	--
Copper	--
Iron	--
Boron	--

FERTILIZER GUIDELINES IN: Lbs/1000 sq ft									
1st Option Intended Crop			2nd Option Intended Crop			3rd Option Intended Crop			
Lawn									
Yield Goal			Yield Goal			Yield Goal			
1 NO									
Preceding Crop			Preceding Crop			Preceding Crop			
PLANT FOOD GUIDELINE RANGES		CROP REMOVAL RATES	PLANT FOOD GUIDELINE RANGES		CROP REMOVAL RATES	PLANT FOOD GUIDELINE RANGES		CROP REMOVAL RATES	
N	1.8		N			N			
P ₂ O ₅	1.2		P ₂ O ₅			P ₂ O ₅			
K ₂ O	1.3		K ₂ O			K ₂ O			
MgO	0.0		MgO			MgO			
S			S			S			
Zn			Zn			Zn			
Mn			Mn			Mn			
Cu			Cu			Cu			
Fe			Fe			Fe			
B			B			B			
None	0		None			None			

Lime Guidelines are for 100% Effective Calcium Carbonate (ECC) with a 6" Incorporation Depth.

ACTUAL AND SUGGESTED PERCENT OF TOTAL CEC (BASE SATURATION)								ESTIMATED		
Actual % Hydrogen	Suggested Hydrogen	Actual % Potassium	Suggested Potassium	Actual % Magnesium	Suggested Magnesium	Actual % Calcium	Suggested Calcium	Actual % Sodium	Suggested Sodium	CEC for Your Soil
0.1	0 - 5	2.2	2 - 7	15.0	15 - 20	82.3	65 - 75	0.3	0 - 5	14.7

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SOIL ANALYSIS



Submitted by **EW50014108**
IOWA STORM WATER EDUCATION PARTNERSHIP
5215 MARYLAND ST
AMES, IA 50014

Submitted for
CITY OF HIAWATHA

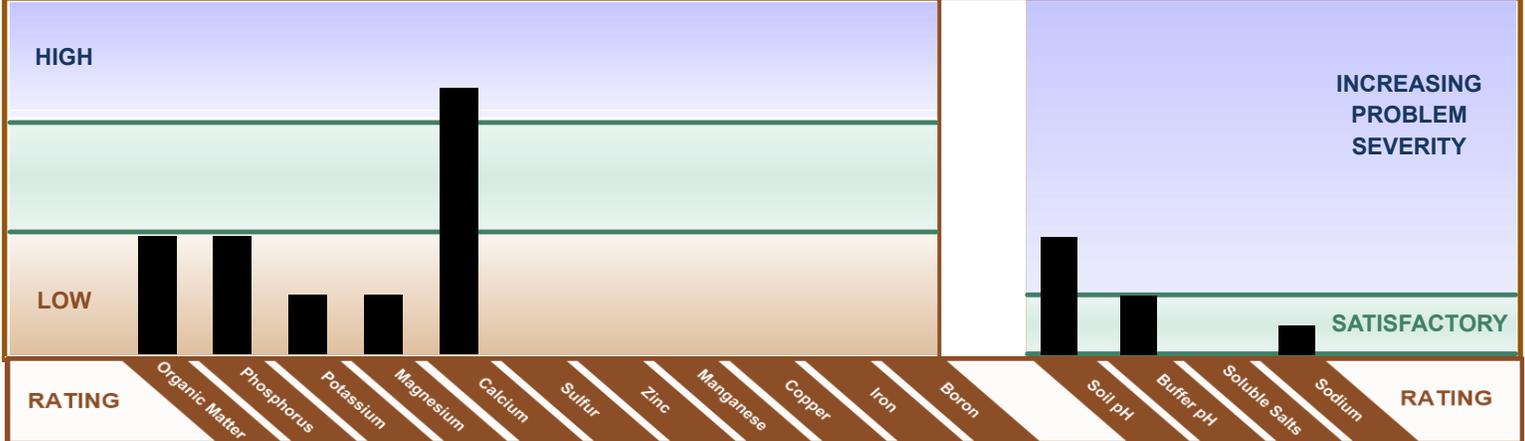
Laboratory Sample #
BR32298
 Information Sheet #
S1112-1683

Date Received
12-Nov-2019

Date Reported
15-Nov-2019

Laboratory Turnaround **3 Days** Samples Will Be Stored Until **27-Nov-2019** Field Identification **HIAWATHA**

GRAPHIC SUMMARY OF TEST RESULTS



REPORT OF ANALYSIS	
YOUR SAMPLE NUMBER	
CITYHALL	
Soil pH	7.7
Buffer Index	7.5
Soluble Salts mmhos/cm	--
Sodium ppm	43.3
% Organic Matter	2.3
ANALYSIS OF NUTRIENT ELEMENTS IS IN PARTS PER MILLION (ppm)	
Nitrate N	6.8
Phosphorus Mehlich III	14
--	--
--	--
--	--
Potassium	58
Magnesium	137
Calcium	4080
Sulfate Sulfur	--
Zinc	--
Manganese	--
Copper	--
Iron	--
Boron	--

FERTILIZER GUIDELINES IN: Lbs/1000 sq ft							
1st Option Intended Crop			2nd Option Intended Crop		3rd Option Intended Crop		
Lawn							
Yield Goal			Yield Goal		Yield Goal		
1 NO							
Preceding Crop			Preceding Crop		Preceding Crop		
PLANT FOOD GUIDELINE RANGES		CROP REMOVAL RATES	PLANT FOOD GUIDELINE RANGES		CROP REMOVAL RATES	PLANT FOOD GUIDELINE RANGES	
N	1.9		N			N	
P ₂ O ₅	0.8		P ₂ O ₅			P ₂ O ₅	
K ₂ O	2.5		K ₂ O			K ₂ O	
MgO	0.6		MgO			MgO	
S			S			S	
Zn			Zn			Zn	
Mn			Mn			Mn	
Cu			Cu			Cu	
Fe			Fe			Fe	
B			B			B	
None	0		None			None	

Lime Guidelines are for 100% Effective Calcium Carbonate (ECC) with a 6" Incorporation Depth.

ACTUAL AND SUGGESTED PERCENT OF TOTAL CEC (BASE SATURATION)								ESTIMATED		
Actual % Hydrogen	Suggested Hydrogen	Actual % Potassium	Suggested Potassium	Actual % Magnesium	Suggested Magnesium	Actual % Calcium	Suggested Calcium	Actual % Sodium	Suggested Sodium	CEC for Your Soil
0.0	0 - 5	0.7	2 - 7	5.2	15 - 20	93.3	65 - 75	0.9	0 - 5	21.8

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Understanding a Soil Test Report

The graph at the top of the soil test report shows how your results relate to expected ranges for each test element. The results are on the left side and in the center of the report are fertilizer guidelines for managing the fertility of your lawn or garden.

Results

Soil pH is a measure of the acidity in the soil. An acidic soil has a pH below 7.0. Values above 7.0 indicate a basic soil. The pH values of most soils range from 5.0 to 8.5; lawn soils typically will not need pH adjustment. Some flower and vegetables require acidic soils for best growth.

Buffer Index pH measures the response of the soil to a known amount of lime. Lime is added to soil to neutralize soil acidity and raise pH if it is too acidic, but lawns typically do not need lime additions.

Soluble Salts measures the concentration of dissolved salts in the soil solution. High values are associated with reduced plant growth. The critical value is between 1.0 and 1.5 mmhos/cm.

Exchangeable Sodium (Na) is not a required nutrient for plants but can have detrimental effects on the soil. Sodium content in the soil above 250 ppm could reduce water infiltration and limit root growth.

Organic Matter (OM) refers to the portion of the soil consisting of decomposed plant and animal residues. The organic matter content, expressed as a percent, reflects the ability of the soil to supply nutrients, moisture, and other physical benefits to growing plants. Healthy soils have a range from 2.5% up to 5% organic matter, but urban soils are highly disturbed and may have very little organic matter (0.5% to 2%). Organic matter acts as a storehouse for plant nutrients and improves physical structure of the soil. It has a very high capacity for holding soil water.

Nitrate Nitrogen (NO₃-N) is the most common measure of available nitrogen in the soil. Nitrogen is an essential plant nutrient. Nitrogen is usually applied to the soil as fertilizer, but it is also available from biological sources such as compost or manure. Nitrate is a form of nitrogen that is easily absorbed by plants and utilized by soil microorganisms, yet it can rapidly leach out of the soil. Because of this mobility the nitrate value indicates the available nitrogen at the time the sample was collected, but not what will be available later in the season. Excess nitrate can be lost from the lawn in water that runs off or flows down through the subsoil and eventually discharges into local waterbodies, causing water pollution.

Phosphorus (P) is an essential plant nutrient related to energy use in the plant and to root development. Therefore, phosphorus may need to be applied to help establish a new lawn or garden. But established lawns are often high in phosphorus from many years of fertilizer application and do not need any more. Excess phosphorus can wash off the lawn or move with eroded soil and eventually discharge to local waterbodies which can cause water pollution.

Potassium (K) is another essential plant nutrient that is used in large amounts by plants and is typically added as fertilizer to lawns and gardens. Potassium helps control the flow of water through plants in transpiration and is associated with winter hardiness and disease resistance. Soil texture and organic matter have a big influence on potassium availability. Soils with sandy texture and low organic matter may have low potassium levels because of their ability to leach.

Magnesium (Mg) is an essential plant nutrient that is part of the chlorophyll molecule, which means it is essential for photosynthesis. If magnesium is low it is often associated with acidic soil and then, because the soil requires lime to raise the pH, ground limestone containing magnesium can be used as the liming material.

Calcium (Ca) is an important part of plant cell walls, giving overall strength to the plant and supporting good root growth. Calcium is abundant in most soils. Because limestone contains calcium carbonate it is also added to the soil when lime is applied to manage soil acidity.

Sulfate Sulfur (S) is part of certain amino acids and is important to the formation of protein. The supply of sulfur in the soil is controlled by the organic matter and any recent additions of compost, or from air pollution that is deposited through rainfall. These sources are usually enough to meet plant requirements, or small additions of S can be applied as fertilizer.

Zinc (Zn) helps plants with use of energy and chlorophyll production. Very small quantities of zinc are needed by plants so levels in the soil of 2 ppm and above are adequate.

Manganese (Mn) is also involved in photosynthesis. Manganese availability in the soil is enhanced by managing soil pH and organic matter content as described above. Deficiencies may occur when the values extracted from the soil are below 4 ppm.

Copper (Cu) is important to many enzymes in plants. Deficiencies of copper are found in very acidic soils with naturally high levels of organic matter (such as peat or muck soils) and when the extracted levels are below 0.5 ppm.

Iron (Fe) is required in chlorophyll production and in many plant enzymes. Iron is common in most soils, but uptake is limited by waterlogging and low soil pH. Testing the soil can show the probability that iron deficiency will occur. Soils with values below 5 ppm are the most likely to exhibit poor plant growth.

Boron (B) is required in carbohydrate metabolism the plant. The availability of this micronutrient is most limited on sandy soils with low organic matter. Boron soil test values below 0.7 ppm are considered low while values above 5.0 ppm may actually be toxic for some plants.

Cation Exchange Capacity (CEC) refers to the ability of the soil to attract and retain nutrients that are cations (elements with positive charges such as potassium, calcium, magnesium, sodium and hydrogen). These elements are held on exchange sites present on the clay and organic matter particles in the soil. A higher value indicates that the soil has a greater capacity to supply these elements to plants. Increases in soil organic matter and high clay content are associated with improved soil fertility because they increase the CEC.

Base Saturation is the measure of the relative quantity of the basic elements (potassium, calcium, magnesium and sodium) present on the cation exchange sites in the soil. Soils that have a neutral to basic pH (6.5 to 8.0) have a higher base saturation. Hydrogen (H⁺) is an acidic cation and is the source of acidity in the soil. A soil with a low pH (acidic) will have a high hydrogen content and display lower base saturation values. Knowing the base saturation helps in understanding the influence of pH on soil because the availability of K, Ca, and Mg as plant nutrients is improved at higher base saturations.

Units of Measurement

Parts per million (ppm) is used for most elements in soil testing. This unit covers the very low test levels of micronutrients, often between 0.1 and 1.0 ppm, and the high test levels of potassium and calcium in the range of 200 to 5,000 ppm. This unit of measure is equivalent to the metric form indicated as mg/kg or mg/L.

Percent (%) is used to express the organic matter content as well as the ratios of elements (Base Saturation) within the soil's cation exchange capacity.

Milli-equivalents per 100 grams (meq/100g) is the measure of the cation exchange capacity (CEC) of the soil. The value is related to the number of positive (+) charged ions held by the clay and organic matter particles.

Millimhos per centimeter (mmhos/cm) is a measure of the salt content of a solution using electrical conductivity. This value increases with salt content. Because soil solution contains dissolved salts it can be measured in this way.

Fertilizer Guidelines

Pounds per thousand square feet (Lbs/1000 sq ft) is used in the Fertilizer Guidelines to express the amount of fertilizer nutrients to apply to the soil. This is an area measuring 10 ft X 100 ft, or 20 ft X 50 ft. To estimate the area of your lawn or garden measure off rectangular areas of the space in feet and multiply the length times the width. Add all the areas you measured together to find the total area that will be fertilized. That number divided by 1000 will give you the pounds of fertilizer element required for your lawn or garden.

Each element (N, P₂O₅ and K₂O) are listed separately in the guidelines. If a mixed fertilizer (containing N, P₂O₅ and K₂O together in one bag) is used calculate the amount needed to meet the lowest value in the guidelines to use as the base application. The numbers 10-10-10 indicate that the fertilizer contains 10% of each element.

For Example: Using a 10-10-10 fertilizer and a guideline of 2.2 Lbs N/1000 sq ft, 0.7 Lbs P₂O₅/1000 sq ft and 1.0 Lbs K₂O/1000 sq ft the amount to apply will be based on the P₂O₅ requirement:

$$(0.7 \text{ Lbs } P_2O_5/1000 \text{ sq ft} \times (100/10\% \text{ } P_2O_5 \text{ in fertilizer}) \times [\text{area of your yard, sq ft} / 1000]) =$$
$$35 \text{ Lbs of 10-10-10 fertilizer} \times [\text{area of your yard, sq ft} / 1000]$$

This will be enough to meet the 0.7 Lbs P₂O₅/1000 sq ft guideline and will not apply too much N or K₂O. Use the same formula to find out how much N and K₂O was applied and then apply the remaining amounts using a fertilizer that contains only N or K₂O to make up the difference.

Another approach is to purchase a fertilizer that has a ratio of elements similar to the ratio in the fertilizer guidelines. In this example that could be 10-5-5 or 20-10-10. Then use the process detailed above.

To reduce the chances of contributing to environmental pollution, and to save money, be careful not to overapply any one of these elements as you meet these guidelines.