AGENDA
SPECIAL MEETING OF THE AMES CITY COUNCIL
COUNCIL CHAMBERS - CITY HALL
515 CLARK AVENUE
NOVEMBER 20, 2018

CALL TO ORDER: 6:00 p.m.

PUBLIC WORKS:
1. Storm Water Ordinance Modification

WATER & POLLUTION CONTROL:
2. Nutrient Reduction Strategy Study

DISPOSITION OF COMMUNICATIONS TO COUNCIL:

COUNCIL COMMENTS:

ADJOURNMENT:

ITEM # 1

Staff Report

POST-CONSTRUCTION STORMWATER MANAGEMENT ORDINANCE

November 20, 2018

BACKGROUND:

On April 17, 2018 the Ames City Council held a workshop to discuss various components of the existing Post-Construction Stormwater Management Ordinance. Following City staff's presentation about the ordinance, the public was invited to provide their thoughts and comments about the existing ordinance and desired changes. Ultimately, this resulted in several motions by City Council for additional information and alternatives to be brought back at a future meeting. On June 26, 2018 City staff presented a staff report providing that additional information.

In July 2018 an on-line public survey and three open houses were held to receive public input on the proposed changes to the ordinance. This report includes the survey feedback from citizens and stakeholders, information from the 2018 Residential Satisfaction Survey, and then provides options and recommendations for potential revisions to the ordinance.

As a result of the April 17, 2018 City Council meeting, the following five issues remain open for discussion and direction.

ISSUE 1: MAINTENANCE OF PARKING LOTS:

Moved by Corrieri, seconded by Martin, to direct staff to prepare a report to remove the triggering of Chapter 5B when parking lots are maintained but does not increase the impervious surface, with allowances and options for incentivizing additional water quality improvements.

Currently, maintenance of parking lots is understood to include patching, milling and overlaying, etc. (work not involving removing pavement to expose soil) and it does not trigger any City review for stormwater. However, the reconstruction of a parking lot is not considered maintenance. Reconstruction is considered creation of a new impervious surface since the pavement is removed and bare soil is exposed. According to existing ordinance, if this area is greater than 10,000 square feet in size, it is subject to meeting stormwater treatment requirements of 5B. For context, the 10,000 square foot threshold is roughly equal to a standard 30 to 35 space parking lot.

Public Online Survey Question:

Would you support a revision to the Post Construction Storm Water Ordinance that will allow business to reconstruct their current parking lot (with no change in size) without stormwater facilities?

29 people responded yes,
12 people responded no,
5 people needed more information.

Comments Received at Open Houses and Online Survey:

- Allow businesses to redevelop existing parking lot w/o stormwater management if less than XX sf in area, or $XX of improvement. If larger parking lot or more expensive, then require stormwater management. Try to avoid situations where a $50,000 parking lot requires $75,000 in added stormwater management.
- Provide cost-sharing or access to grants (City).
- Require minor improvements but not full requirements so that it is cost prohibitive.
- As long as neighboring areas do not experience regular flooding and additional impervious area is not added.
- Pay into a stormwater management fund that will help pay for stormwater management improvements on other properties.
- Yes, but perhaps with cost-sharing or access to grants.
- Yes, but if drainage infrastructure or overland flow path is adjacent to site, investigation to use as a suitable outlet may be a requirement
- Unfortunately, this is aimed at determining an individual's value set. If it was my preference, I'd hope I'd be integrating stormwater best management practices. However, who am I to enforce my desired values on those who may prefer lawn and pavement?
- Require minor improvement to stormwater facilities but not full requirements so that it is cost prohibitive.
- Yes, as long as neighboring areas do not experience regular flooding and additional impervious area is not added.
- I am a longtime member of Wheatsfield, and when that co-op did an expensive parking-lot rebuild that incorporated methods of managing and cleansing stormwater, I was very supportive in spite of the cost. So, I was not happy to later read about how the Earl May parking lot was rebuilt without stormwater measures and also without, as I understand it, the proper permit. Although I am sometimes a customer of Earl May, I think Earl May should pay, one way or

another, for that parking-lot decision. If the Earl May parking lot is not rebuilt, Earl May could perhaps pay into an Ames stormwater management fund that will help pay for stormwater management improvements on other properties.

OPTIONS:

Option 1. Chapter 5B could be modified to define parking lot reconstruction with no net increase in impervious area as maintenance, thus making it exempt from 5B requirements entirely. **To clarify, if the parking lot is expanded while replacing the existing parking lot, such a project would be subject to the Chapter 5B requirements for the whole project (not just the incremental increase).**

A reconstructed parking lot would still be subject to Zoning Ordinance standards of Chapter 29 (parking quantity, dimensions of the spaces/aisles, and landscaping).

Option 2. A second option for reconstruction would be to require partial compliance with 5B to meet water quality standards only, rather than both water quantity and quality requirements. This approach would lessen the size of the stormwater management features that would be required.

Option 3. A third option would be to establish a fund for Fee-In-Lieu payments for stormwater management requirements. These funds would be used for the establishment of a City-owned regional stormwater management facilities in certain locations throughout the community. Developers would have certain criteria that they would need to meet in order to be allowed to pay into/buy rights into a regional facility. It should be noted, that under this option there could be a lag between when the development is constructed and when sufficient funds are accumulated to purchase the necessary land or construct a regional facility.

Option 4. Rather than exempting reconstruction from the 5B requirements, the City Council could focus on allowances to reduce required parking and landscaping. Currently, the Planning Director can waive up to 10% of the required parking for sites with 30 or more spaces for the purpose of adding landscaping, which could include stormwater features. Additionally, using landscaping as a stormwater treatment measure can serve to substitute for other landscaping requirements within parking lots.

Should the City Council believe this current 10% incentive is not sufficient, direction can be given to make changes to the zoning standards to allow for a greater parking reduction (i.e. 20% reduction) or for any size of parking lot (not just 30 spaces or more) to take advantage of the reduction to help facilitate stormwater improvements with parking lot reconstruction.

Option 5. The City Council could **maintain the current standard** that parking lot reconstruction of greater than 10,000 SF must comply with 5B.

ISSUE 2: FINANCIAL SECURITY:

Moved by Corrieri, seconded by Nelson, that financial security would be required prior to occupancy if the requirements have not been met.

The current ordinance requires that financial security must be submitted prior to approval of stormwater management improvement plans.

Once a development receives temporary occupancy, residents/businesses have moved in to the building. Some developments occupy buildings under temporary occupancy for multiple years as they take care of outstanding items (Planning, Public Works, and Building Inspection requirements).

During 2018, one of the new apartment buildings constructed the stormwater management system so different from the approved stormwater management plan that they had to update the stormwater management calculations and provide as-builts (which are currently under review) all while under a temporary occupancy status.

Public Online Survey Question:
Currently, financial security for the development of storm water facilities is required prior to construction. Would you support a revision to the Post Construction Storm Water Ordinance that would allow financial security to be obtained before occupancy?

a. Yes: Temporary Occupancy- 15
b. Yes: Final Occupancy- 22
c. No Change -10

OPTIONS:

Option 1. Amend Chapter 5B to require financial security in an amount for the total estimated construction cost to be on file with the City prior to a temporary Certificate of Occupancy being granted.

Option 2. Amend Chapter 5B to require financial security in an amount for the total estimated construction cost to be on file with the City prior to a final Certificate of Occupancy being granted.

Option 3. Maintain Chapter 5B as it currently exists, thereby requiring the financial security to be submitted prior to issuance of permits and commencement of construction.

If City Council chooses to amend the current ordinance, staff would prefer Option 1 (security prior to temporary Certificate of Occupancy). This is because if Option 2 is followed, there is the potential that the work may not be completed since the building is fully occupied.

Under either of these Options, this financial security or bond would be released in full only upon submission of "as built plans" of all stormwater BMPs specified in the stormwater management plan and written certification, etc. as already specified in the ordinance (paragraph from current ordinance).

ISSUE 3: RUNOFF CURVE NUMBER:

Moved by Betcher, seconded by Nelson, to direct staff to report on whether runoff curve number 58 is the only number or most appropriate number for all of Ames.

Under the Post Construction Storm Water Management Ordinance, a development site that exceeds 10,000 square feet is required to maintain the rate and volume of surface water run-off, which flows from any specific development project site after completion to not exceed the pre-development hydrologic regime of meadow in good condition.

The run-off curve numbers (CN) indicate the runoff potential of an area. The higher the CN, the higher the runoff that is allowed to leave the site. **In the June 26, 2018 Staff report, additional information how the Runoff Curve Number 58 (meadow in good condition) was established based on historic soil information from Soil Survey of Story County.**

Public Online Survey Question:

The City of Ames Post Construction Storm Water Management Ordinance currently has the allowed runoff curve number set at 58. Would you propose a revision to this level?

a. No change 17
b. Yes –Comments:
    a. USDA Soil Survey of Story County (9)
    b. The CN should more closely match the original conditions of the site. If the site was row crop in good condition then a higher post construction CN should be used as a standard. (1)
    c. 72 (1)
    d. 65 (1)
    e. Match the current condition of the property, don't arbitrarily hold it to the standard of a meadow in good condition. (1)
    f. Use current existing conditions. (1)
    g. 58 for new development only and compare existing to proposed in redevelopment unless 50% or more of the site is disturbed. (1)
    h. Decrease requirements to those at or less than peer communities. (1)
    i. CN 58 is fine. It is reasonable and it works. It would be tough to justify a different value with the same intent. Consider the ability for a

developer to justify a different value on a site-by-site basis if it complies with intent.

j. There needs to be ways to create green spaces in the 10,000 sq ft. (1)
k. This is a highly technical area and the determination should not be left up to a popular vote/survey. (1)
l. This question is way too technical for a public survey. In order to determine if I'd suggest a revision then I'd need more information on who the value of 58 was established and set as the standard value. (1)
m. Do not build on the flood planes anymore. (1)
n. Decrease requirements to those at or less than peer communities. (1)
o. Nip the problem in the bud and stop allowing so much development and fill in the flood plain. (1)

OPTIONS:

Option 1. Direct staff to bring an ordinance amendment that uses the USDA Soil Survey to determine the runoff curve number **for each site**.

Option 2. Direct staff to maintain the current meadow in good condition (58) runoff curve number.

Based on historic soil information that 82% of Story County soils from the Soil Survey of Story County for the Ames area are reflected by the 58 runoff curve number, staff recommends Option 2 for maintaining the runoff curve number of 58 reflecting a "meadow in good condition".

ISSUE 4: STORMWATER MANAGEMENT THRESHOLD CRITERIA:

Moved by Nelson, seconded by Corrieri, to direct staff to come back with suggestions to change 5B to make impervious cover be the same as a land disturbance at one acre to be included in the previous staff report.

The current ordinance states that stormwater requirements apply to any new development, any redevelopment disturbing 1 acre or more of land, or to any development disturbing less than 1 acreage of land if the amount of impervious cover created exceeds 10,000 square feet.

Online Survey Question:

The Post Construction Storm Water Management Ordinance goes into effect when a development site reaches 10,000 square feet of impervious surface. Would you support a revision to this threshold?

a. No change - 9
b. Yes-all development regardless of size - 6
c. 25,000 square foot development - 6

d. 1 acre development area - 25

Comments Received at Open Houses and Online Survey:

- Can the City designate targeted neighborhoods/regions of town that are high priority for improvement and then offer cost share for redevelopment of stormwater management?
- Triggering 5B stormwater management at a 1 acre threshold or even ½ acre is a bad idea. It will put the public at risk.
- Consider stormwater utility incentives for businesses that implement stormwater management on property, when not required. Would require larger rates.
    - Related to comment above, consider modifying base utility rates for business based on contribution. Currently large lot business pay little to nothing. Make it enough to incentivize improvement while increasing City funds to address problems that are caused by lack of stormwater management.

As shown in the following comparison the Ames' thresholds are roughly in the middle of the range of thresholds requirements of other cities in Iowa:

Land Disturbance Threshold

Cedar Rapids	All development
Cedar Falls	
Redevelopment	25,000 sf
New development	1 Acre
Ames	**1 Acre**
Council Bluffs	1 Acre
Waterloo	1 Acre
Iowa City	3 Acres
Sioux City	Impervious threshold only

Impervious Cover Threshold

Cedar Rapids	All development
Cedar Falls	5,000 SF
Waterloo	5,000 SF
Sioux City	5,000 SF
Ames	**10,000 SF**
Council Bluffs	Land disturbance threshold only
Iowa City	Land disturbance threshold only

OPTIONS:

Option 1A. Direct staff to bring an ordinance amendment that changes the impervious threshold for meeting Chapter 5B Post Construction Stormwater Management Ordinance requirements to 1 acre.

Changes to this requirement may result in additional localized flooding and increased costs through G.O. Bonds and/or Storm Water Utility fees for future CIP projects.

Option 2. Maintain Chapter 5B Post-Construction Stormwater Management Ordinance as it currently exists, thus requiring projects with impervious area of 10,000 sf or more to meet all provisions of the current ordinance.

ISSUE 5: INSPECTIONS:

Moved by Corrieri, seconded by Betcher, to ask staff to provide recommendations for alternative inspections besides a licensed plumber.

A reasonable alternative to requiring on-site stormwater management systems to meet city Plumbing Code requirements as installed by a licensed plumber, can be to require that installation meets Statewide Urban Design and Specifications (SUDAS) and City of Ames Supplemental Specifications as already adopted and used for public infrastructure construction such as storm sewer.

If this alternative is confirmed by City Council, staff would coordinate with Building Inspections and Public Works staff to implement this change, including eliminating the requirement that a licensed plumber be responsible for completing these inspections.

Under this change an inspection of the connection into the public storm sewer system would be performed by Public Works and the as-built requirements would be revised to require a video of the installed storm sewer to insure proper installation.

OPTIONS:

Option 1. Direct that stormwater management system components be constructed in accordance with SUDAS and City of Ames Supplemental Specifications, negating the need for a licensed lumber to perform inspections. Staff believes this is a reasonable change.

Option 2. Maintain the current requirement of a licensed plumber for inspecting the stormwater management system.

STAFF COMMENTS:

During the past few years, when there has been above-average and more intense rainfall, customer calls regarding drainage issues have increased proportionately. Based on the historic rainfall data and more recent rainfall events, it should be expected that without a strong storm water management ordinance, storm water impacts to properties will continue to increase.

As indicated from the results of the 2018 Residential Satisfaction Survey, our citizens seem to concur with the importance of adequate storm water management. The results of the survey indicate that 76% of respondents considered “storm water drainage improvements” as very or somewhat important. In terms of capital improvement priorities in the 2018 survey, “stormwater drainage improvements” ranked in 3rd place behind reconstruction of existing streets and traffic flow improvements, showing that residents continue to place a high priority on “storm water improvements”.

Additional comments about the Post Construction Storm Water Management Ordinance from Public Online Survey

a. Sounds like you are pushing for less chances to allow storm water to be mitigated into the environment. You must add green spaces to every 5000 sq ft to allow for better drainage and a more beautiful city. Has all areas in Ames been retrofitted to make sure rain water is not draining into the sewer. Flooding seems to continue to be a concern in the city of Ames.

b. Planned undeveloped areas for stormwater collection. More green space required near businesses

c. Build a regional detention system in Ames and build more systems North of Ames to detain stormwater from the watershed

d. Not require upgrade to standard if amount of area is not increased.

e. Instead of making the entire Iowa Stormwater Management manual the adopted guidelines of the City, specify the guidelines the City would like to adhere to, such as providing a condensed list of standards developed from the Ames Technical Guidance

f. Q3 and Q11 - I was unable to provide additional information to either of these questions above. Q3 - Since I don't test water quality I don't have access to gauge whether there has been an improvement with this. We have experienced some intense rainfalls this year and weathered these fairly well as a result of there being little water in our watersways prior to these events and a low water table. What I saw was muddy water at bank full condition or very minor flooding; which ddidn't give me an opportunity to really gauge whether stormwater has improved since some of our more recent flood events; and particularly resulting from efforts stemming from the 5B. Q11 - would like more information on why the alternate values should be considered. I may support a revision but am not sure how 10,000 was originally determined or why 25,000 should be considered. I do know that 1 acre would sync with the SWPP Plan requirement. As for the purpose of this question it really depends on the overall desired outcome. If we're trying to soften impact from heavy rainfalls then we may want to explore investing in bmps upstream that could intercept stormwater, reduce flows and extend time to peak. Paired with additional approaches within the city; potentially looking at integration of constructed wetlands in areas where we have developed in the floodplain to build back capacity would go a long ways towards helping alleviate major flooding threats. I'd be interested to know how water concentrates and flows in different parts of the city and how this discharge affects not only the stormwater system but also our

watersheds, if this water eventually dumps into these. Are there certain areas of town that capture more water and move it quickly to Squaw Creek or the S. Skunk and therefore drastically impact capacity and raise flooding potential? If so, then logic would dictate improvements to these areas would be sound investments for the city at large.

g. Perhaps to encourage public/private partnership and innovation (things I love about Ames!), set a goal and budget for implementing 'green' infrastructure (pervious pavers, curb necks, manhole WQ vortexes, etc) into public works projects and also double down on publicizing Smart Watershed benefits and cost sharing for doing same on private (green roofs, barrels, rain gardens, etc). I don't think it's necessarily going to be productive to push the burden onto business owners redoing existing impervious surfaces. That could just lead to delayed maintenance and price some business owners out. I think dealing with increased rainfall intensities should fall more on the public, and secondly on developers breaking ground. Rains are more intense now than they used to be, and unfortunately there isn't much we can do about the rain. We might consider increasing the design year (intensity) for sizing new stormwater improvements since it's relatively cheap to put a pipe in, and expensive to dig it up. Also big picture for river flooding --- not local stormwater collection -- we could look at regional flood control wetlands (quad benefits: flood control, wetland banking, nutrient credit trading for WPC, education for kids).

h. Stop developing in the flood plan create more shared water retention methods that will allow the influx of water levels in local streams and rivers. Work on a more holistic plan that includes farmers, business owners, developers, university, residents and city. We all are affected.

i. In this little space?

j. small watersheds that have repeatedly experienced property damage due to flash flooding should be identified. Regional detention facilities should be explored in these areas and stricter standards may need to be adopted based on location. New development can accommodate the more stringent standards during the platting phase significantly cheaper than sites who are only re-paving a parking lot.

k. My first suggestion is to listen to and base policies on the best stormwater expertise. My second suggestion is to continue to make it easier to incorporate native landscaping into the city, because native plants used to hold and cleanse huge amounts of stormwater long before Ames was built. My third suggestion is to strongly consider the needs and interests of people downstream from Ames and people who will live in Ames decades from

now, as stormwater decisions are made. My fourth suggestion is to consider how prescribed fire management can be used on native-plant areas as the City continues to grow. Fire is often the best option for managing the native vegetation that helps hold and cleanse stormwater. My final suggestion is for the City to keep in mind that the "abnormal" heavy rainfalls we are now experiencing are the "normal" rainfalls of the future, thanks to climate change. All of Iowa needs to make stormwater policies accordingly, and Ames can and should help lead the way.

l. Work more with homeowners to increase the adoption of small scale structural and nonstructural BMPs to reduce stormwater quantity and improve stormwater quality.

m. I would like if the sump pump ordinances were reviewed and made to be more lenient in certain circumstances--it would be beneficial to be able to discharge sump pump water into the yard in circumstances where the property owner has taken steps to account for the extra water (like creating a city-approved rain garden and funneling it there). We have to deal with water in our basement since the cost of installing water guard + sump pump + getting it to the sewer system is cost prohibitive.

n. stop building on flood planes

o. Hold Story and Hamilton County accountable for inundating our rivers and creeks

p. Not sure/none

q. Increase space requirement and allow maintenance of facilities or surface without initiating the stormwater ordinance

r. Every flood there is a recommendation to stop adding fill to the flood zone and this lasts a year or two. Why pay for these studies again and again if you aren't going to follow them?

ITEM #4

Staff Report

REVIEW OF POST-CONSTRUCTION STORMWATER MANAGEMENT ORDINANCE

April 17, 2018

BACKGROUND:

The City of Ames adopted Chapter 5B Post Construction Stormwater Management Ordinance on April 22, 2014. This Ordinance meets the requirements of the U.S Environmental Protection Agency's National Pollutant Discharge Elimination System (NPDES) permit program as administered by the Iowa Department of Natural Resources (IDNR). The City of Ames was required to obtain an NPDES Permit for the discharge of stormwater from a Municipal Separate Storm Sewer System (MS4 Permit).

The ordinance requires that the site improvements be designed to control water quantity (flow rates) and to improve water quality from the stormwater runoff of applicable development properties within the City. It also encourages the use of low impact development to increase on-site infiltration, reduce pollutant loads in receiving waterways, and reduce stormwater runoff volumes from developed areas.

Since adoption of the ordinance, reduction in stormwater runoff volumes on re-developments, new developments, and the City Hall Parking Lot project **have been achieved through either detention basins or underground storage**. Water quality improvements **have been achieved primarily through wet detention basins, soil quality restoration, native landscaping, or underground mechanical units**.

The ordinance applies to the following properties and/or development sites:

- Any new development or redevelopment disturbing more than one acre of land.

- Any new development of redevelopment creating more than 10,000 SF of impervious cover.

The following are exempt from the ordinance:

- Any agricultural activity.

- Additions or modifications to an existing single-family property.

- Storm Water Management Design standards do not apply to any area within a 1,000' distance from any City of Ames drinking water well located in the Southeast Well Field and Youth Complex Well Field. In these specific areas, developments will need to meet requirements for stormwater quality-based treatment or a combination of quantity and quality-based treatment as approved

by both the Director of Public Works and the Director of Water Pollution Control.

- **Partial waiver can be granted to allow the movement of stormwater management facilities to an off-site location with sufficient justification.**

STAFF COMMENTS:

The ordinance has been in place for four years since its original adoption. Because this ordinance implemented new requirements and practices for developers to follow and new requirements for staff to administer, it was anticipated that this ordinance would be brought back to City Council for review. Therefore, the City Council previously directed the staff to schedule a workshop to review the City's Post Construction Stormwater Ordinance (5b) with area developers and engineers.

It is important to gain the input from those that must comply with the ordinance and also maintain the stormwater management and quality improvements that it in turn provides for the community. Invitations were sent by email and press release was distributed giving notice of the workshop.

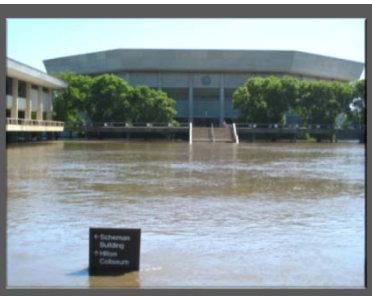
Attachments:

- Post Construction Workshop Presentation Slides
- Chapter 5B Post Construction Stormwater Management Ordinance
- Table: Summary of Iowa Municipalities – Stormwater Management Ordinance Applicablity and Exceptions
- Comparative Stormwater Management Thresholds
- Listing of Post Construction Sites developed since adoption of the ordinance

POST-CONSTRUCTION STORMWATER MANAGEMENT ORDINANCE

1





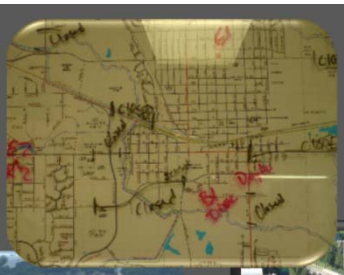

CITY OF ames

City Council Workshop April 17, 2018

CITY OF AMES HISTORY OF FLOODING

2

- 1965
- 1975
- 1990
- 1993
- 1996
- 2007
- 2008
- 2010
- 2016

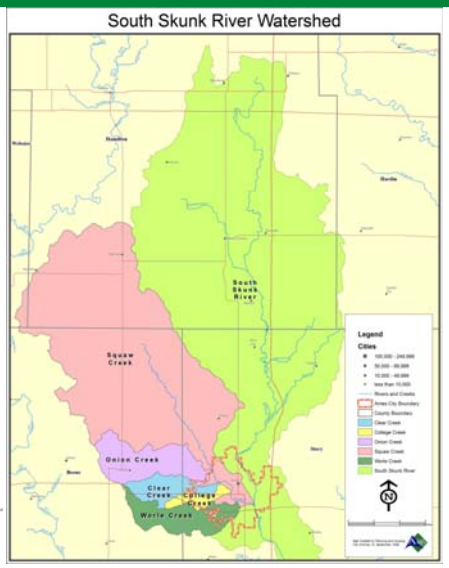



SMART WATERSHEDS

Ames Watersheds

3

- South Skunk River
- Squaw Creek
- Onion Creek
- Clear Creek
- College Creek
- Worle Creek

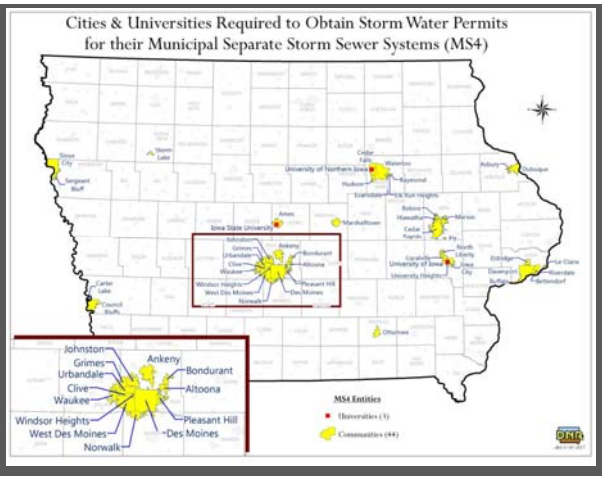


- S Skunk River Watershed:
  - Watershed covers parts of 13 counties
  - Drainage area of approximately 315 sq miles
    - 65% row crops
    - 30% wetlands/forest/grassland
    - 5% developed
  - Watershed has over 2,320 miles of streams
- Squaw Creek Watershed:
  - Watershed covers parts of 4 counties
  - Drainage area of approximately 204 sq miles
    - 83% row crops
    - 10% wetlands/forest/grassland
    - 7% developed
  - Squaw Creek terminates in Ames at S Skunk River

CITY OF AMES MUNICIPAL SEPARATE STORM SEWER (MS4) NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT

4

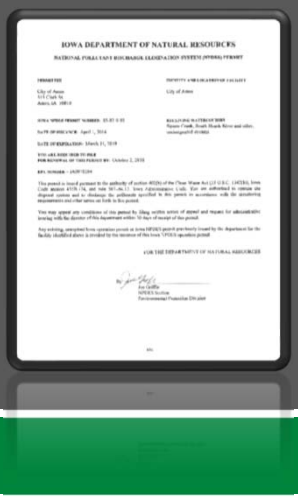
The determination of which cities and universities are required to obtain MS4 permits involves a combination of population, proximity to large, urbanized areas, and the water quality of receiving streams.



CITY OF AMES MUNICIPAL SEPARATE STORM SEWER (MS4) NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT

5

- Current 5-year MS4 Permit from Iowa DNR (April 2014 – March 2019)
  - Public Education and Outreach on Storm Water Impacts
  - Public Involvement and Participation
  - Illicit Discharge Detection and Elimination
  - Construction Site Storm Water Runoff Control
  - Post-Construction Storm Water Management
  - Pollution Prevention/Good Housekeeping



SMART WATERSHEDS

Conservation Subdivision Ordinance

6

•Response to proposed development in Ada Hayden Heritage Park watershed

•Low Impact Development need to protect Ada Hayden water quality

•Alternative to common residential subdivision development in Ames, however, shall apply to all residential subdivision development in the undeveloped areas of Ada Hayden Watershed north of Bloomington Road.

•City staff met several times with developers and development engineers to develop various components to make up Conservation Subdivision Ordinance

•Engineers created sample conservation layouts for potential developments

•Conservation Subdivision Ordinance adoption by Ames City Council in 2010

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SMART WATERSHEDS

Conservation Subdivision Ordinance

7

- Required in the Ada Haden Watershed
- Preserve existing natural features of the site
- Preserve the natural drainage features and hydrologic characteristics of the landscape
- Reduce the impacts of development on the landscape
- Promote interconnected greenways
- Provide commonly-owned open space and conservation areas for passive and/or active recreational use by residents
- Conservation area shall be designated as a Conservation Easement
- Conservation areas and open space shall be distributed throughout the development and combined shall comprise at least twenty-five (25) percent of the total area of the subdivision

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SMART WATERSHEDS

Conservation Subdivision Ordinance

8

- All residential units should be in cluster groups unless the site has been designed to preserve sensitive areas and maintain a stormwater treatment train
- Eighty percent (80%) of residential lots shall abut a conservation area or open space
- Within all conservation areas, separation between external roads and residential lots, a vegetated buffer area at least 25 feet in width shall be maintained or established
- A 50-foot native vegetative buffer shall be maintained around open water areas such as ponds and lakes
- Stream buffers with native vegetation shall be maintained along stream areas
- Minimize the use of storm sewer piping and maximize the use of swales

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SMART WATERSHEDS

Conservation Subdivision Ordinance

9

- An accessible and interconnected shared use path system shall be developed to connect residential areas with open space/conservation areas
- Sidewalk only required on one side of street, however each lot has access to either sidewalk or shared use path
- Mass grading of sites shall be minimized
- All new landscaping in conservation areas to be native vegetation
- Trees of native species
- Informal, irregular, or natural arrangement is required for newly planted trees to avoid the urban appearance

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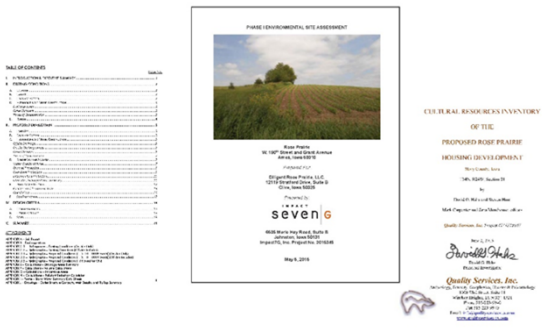
SMART WATERSHEDS

Conservation Subdivision Ordinance

10

- Conservation Area Management Plan
- Financial security in a form acceptable to the city for the maintenance and operation costs of conservation areas for a two-year period of time at time of the Final Plat
- Ownership Alternatives: Conservation Areas
  - Homeowners Association
  - Non/For-Profit Conservation Org
  - Other as approved by City Council



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SMART WATERSHEDS

Post-Construction Stormwater Management Ordinance

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Post-Construction Storm Water Management Ordinance Adopted 2014

MS4 Permit requirement - Post-Construction Runoff Control Policy Ordinance - An ordinance shall be adopted or amended as needed and enforced which will address the control of runoff from building activities after construction has been completed. The ordinance shall require water quality and quantity components be considered in the design of new construction and implemented when practical. The statement shall promote the use of storm water detention and retention, grass swales, bioretention swales, riparian buffers and proper operation and maintenance of these facilities.

The ordinance shall be enforced by the Engineering and Planning Department for the duration of the permit. (2009-2014 MS4 Permit language)

Pre 2014: "The rainfall frequencies that shall be incorporated in the design of the stormwater management system shall include the 5 year, 10 year, 50 year, and 100 year design storm events."

CITY OF ames SMART WATERSHEDS

Post Construction Stormwater Management Ordinance

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- Portions of the community older than 1980s- Collect in storm drains and discharge to stream: Doesn't address water quality nor flood control.
- Subdivisions (in general) built 1980s to 2014: wet or dry ponds: Collect in storm drains discharge to ponds-throttle down discharge rate, minimal treatment, impact stream stability-flashy flows

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Post-Construction Stormwater Management Ordinance

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MS4 Permit requirement - An ordinance shall be amended as needed and enforced which will address the control of runoff from building activities after construction has been completed. The ordinance shall require water quality and quantity components be considered in the design of new construction and implemented when practical. The ordinance shall promote the use of storm water detention, retention, infiltration, other Best Management Practices specific to each site which address water quality and quantity issues and proper operation and maintenance of these facilities.

(2014-2019 MS4 Permit language)

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Post-Construction Stormwater Management Ordinance

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- Issues/Challenges being addressed
  - Reduce stream/river and localized flooding
  - Reduce home flooding (walk-outs, lowest entry)
  - Reduce stream /river erosion
  - Reduce alterations to hydrologic landscape
  - Protect and recharge local water resources (aquifer)
  - Improve water quality (nutrient and pollution reduction)
  - Protect and enhance natural resources
  - Excessive soil compaction resulting in increased runoff

Urban soils become compacted thru the development process

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Post Construction Stormwater Management Ordinance

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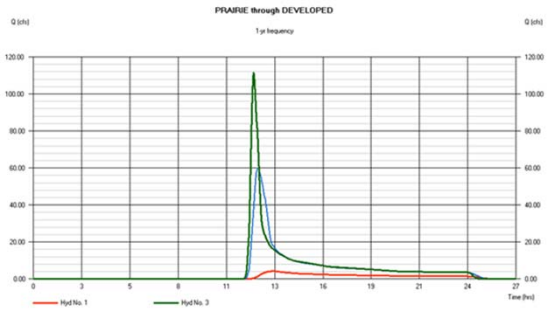
- Historic Landscapes
  - Prairie soils had 8-10% organic matter content and 45% pore space
  - Now soils have < 4% OM
  - Even less organic matter on construction sites
  - Soils have lost 60-80% of their ability to absorb and infiltrate rainfall events



- Red = Prairie
- Blue = Agriculture
- Green = Urban Single Family Residential

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SMART WATERSHEDS

Post Construction Stormwater Management Ordinance

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- Presentation to City Council – Decision Points


AMES STREAM ASSESSMENT 2011
Ames, Iowa

Final Report – February 6, 2012

Background Information

Research and Analysis Methods

APPENDIX A 2011 Ames Stream Assessment: Context Map

Extent of Stream Included in Study

Mimi Wagner Landscape Architecture LLC
Ames Iowa September 30, 2011

APPENDIX C2. 2011 Ames Stream Assessment: Squaw Creek Stream Bank Erosion

Mimi Wagner Landscape Architecture LLC
Ames Iowa September 30, 2011

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SMART WATERSHEDS

Post Construction Stormwater Management Ordinance

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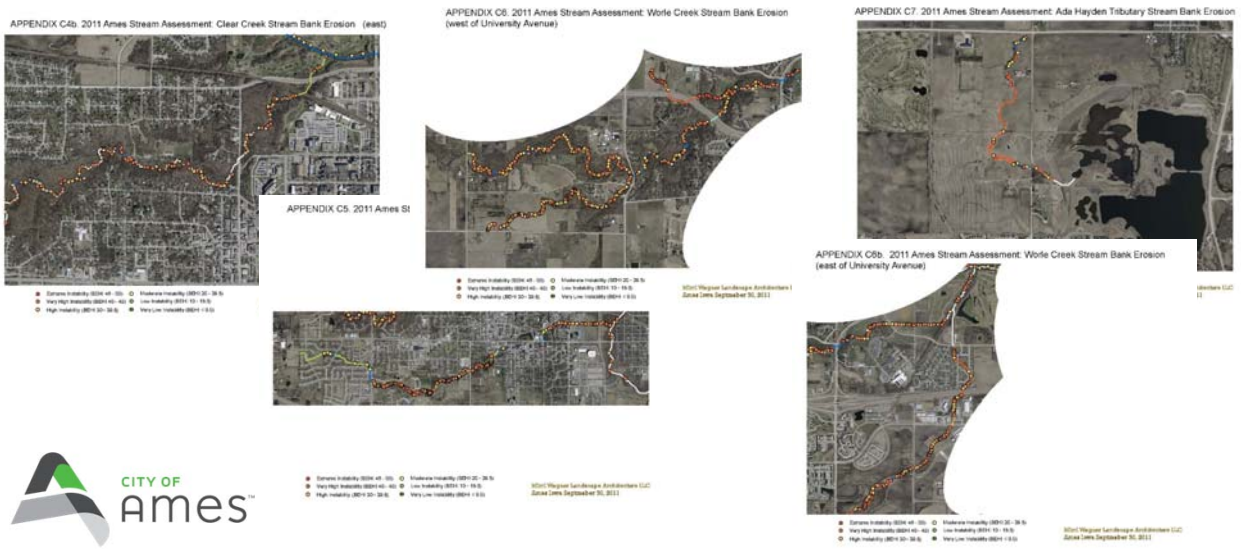

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Post Construction Stormwater Management Ordinance

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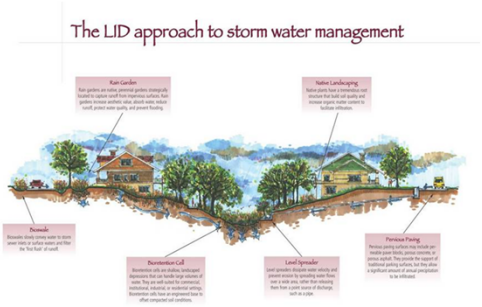
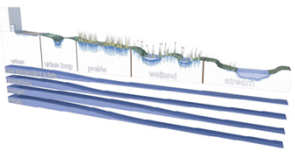
- Local goals of a Post-Construction Ordinance:
  - Utilize a combination of best management practices (BMPs) (also known as a stormwater treatment train)
  - Minimize increases in stormwater runoff,
  - Minimize non-point source pollution, and
  - Minimize mass grading





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Post Construction Stormwater Management Ordinance

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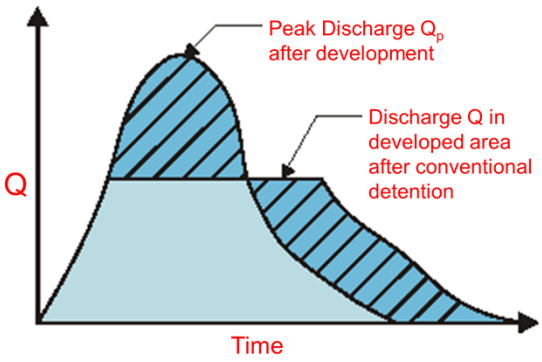
- Hydraulic alteration after traditional methods



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SMART WATERSHEDS

Post Construction Stormwater Management Ordinance

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- Build off of the Conservation Subdivision Ordinance
- Meetings with community, developers, and engineers/designers
- Considered comments received
- Presentation to City Council
  - Education about stormwater
  - Why a new ordinance
  - Decision points

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SMART WATERSHEDS

Post Construction Stormwater Management Ordinance

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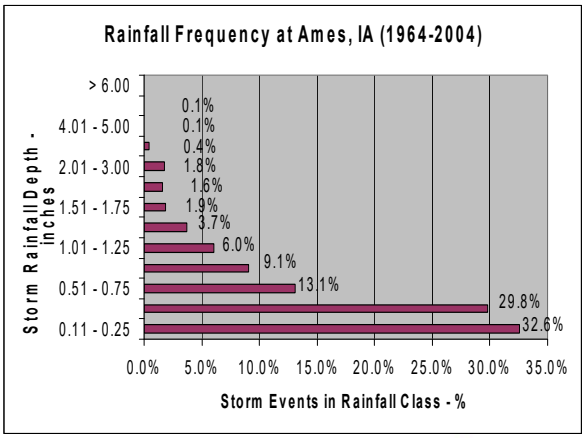
- The 'first flush' of rainfall moves pollutant loads to surface waters
- Use practices that retain water from the small storms water on-site
- Strategies include:
  - Slow down,
  - infiltrate,
  - cleanse,
  - discharge



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SMART WATERSHEDS

Post Construction Stormwater Management Ordinance

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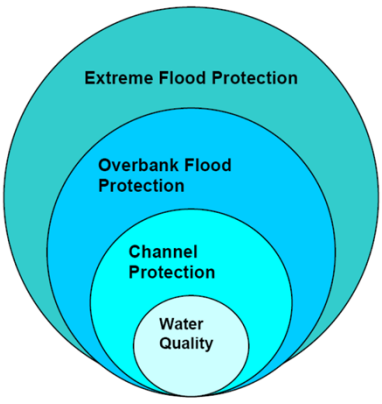
- Unified Sizing Criteria
  - Water Quality Volume
    - 1.25" rainfall event
    - 90% Ames rain events
  - Channel Protection Volume
    - 1-year, 24 hour storm event
    - Reduce rapid fluctuation in urban streams
      - Leads to erosive velocities and unstable stream conditions



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SMART WATERSHEDS

Post Construction Stormwater Management Ordinance

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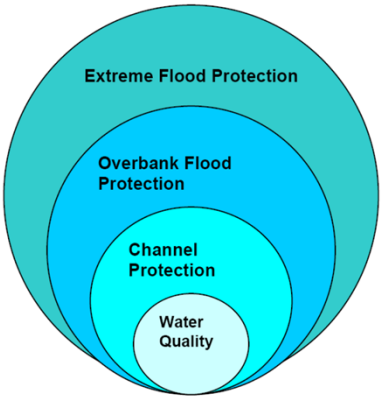
- Unified Sizing Criteria (continued)
  - Overbank Flood Protection
    - 5-year, 24 hour storm event
    - Reduces potential surcharge of local storm sewer system and/or overbank flooding
  - Extreme Flood Protection
    - Volume and peak runoff control of major storms (10 year to 100 year events)
    - Reduces potential infrastructure damage from major flooding



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Post Construction Stormwater Management Ordinance

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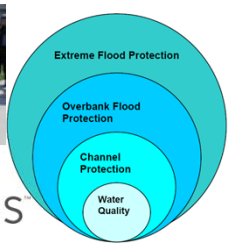
Stormwater Quality Management

- ❑ Low Impact Development
- ❑ Bioretention Cells
- ❑ Bioswales
- ❑ Native Landscaping
- ❑ Permeable Paving
- ❑ Rain Gardens
- ❑ Soil Quality Restoration



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Post Construction Stormwater Management Ordinance

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- 2014 Presentation to City Council – Decision Points
  - Where would this apply?
    - New development and redevelopment if creating 10,000 sf of impervious cover
  - Manage water quality and quantity
    - Runoff Curve Number 58 (meadow with soils in good condition to mimic historic landscape)
  - Adoption of Iowa Stormwater Management Manual
    - Already being created and maintained through Iowa Dept. of Natural Resources
    - 14 of 26 MS4 community ordinances referenced


CHAPTER 58
POST CONSTRUCTION STORMWATER MANAGEMENT

CITY OF ames

SMART WATERSHEDS

Post Construction Stormwater Management Ordinance

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- 2014 Presentation to City Council – Decision Points
  - Lowest opening 3 feet above 100 year WSE
    - Address local flooding issues/complaints
  - Maintenance responsibility
    - Routine and Long-Term responsibilities
    - Private (HOA) vs Public (City)
    - Regional detention for residential (long-term maintenance by City through easement)
  - Maintenance, Repair, and Landscaping Plan


Elevation Certificate

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Post Construction Stormwater Management Ordinance

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- 2014 Presentation to City Council – Decision Points
  - Topographic Base Watershed Map
  - Natural Resource Inventory
    - Inventory by a knowledgeable professional
  - Soil Management Plans
    - Technical assessment, including hydric soils
    - Information for successful placement of BMPs
    - General soils info free (website)
    - Soil borings for additional information (as needed)
    - 8 of 26 MS4 communities required

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Post Construction Stormwater Management Ordinance

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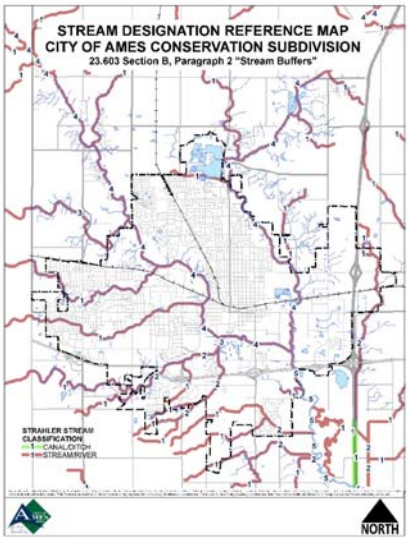
- 2014 Presentation to City Council – Decision Points
  - Stream buffers with native vegetation maintained or established along stream areas



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Post Construction Stormwater Management Ordinance

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- 2014 Presentation to City Council – Decision Points
  - Financial Security
    - Ensure correct construction of BMPs
    - Total estimated construction cost
    - Receive as-built plans
    - Final inspection/review
    - Release financial security
  - Performance Bond
    - Ensure BMPs maintained in effective state
    - Native vegetation establishment
    - 4 year period

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Post Construction Stormwater Management Ordinance

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- 2014 Presentation to City Council – Decision Points
  - Waivers
    - Partial Waivers – granted by Municipal Engineer for redevelopment projects if proposed development does not impair objectives of ordinance
      - Alternative minimum requirements for on-site management
      - Provisions made to manage stormwater by an off-site facility
  - Appeals
    - Heard by City Council
    - Made in writing and filed with City Clerk no later than 20 days

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SMART WATERSHEDS

Post Construction Stormwater Management Ordinance

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CHAPTER 58

POST CONSTRUCTION STORMWATER MANAGEMENT

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SMART WATERSHEDS

Post Construction Stormwater Management Ordinance

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Smart Watershed Design Principles

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Natural Resource Checklist


Storm Water Summary Data Sheet

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POST-CONSTRUCTION STORMWATER MANAGEMENT ORDINANCE

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POST-CONSTRUCTION STORMWATER MANAGEMENT ORDINANCE

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POST-CONSTRUCTION STORMWATER MANAGEMENT ORDINANCE

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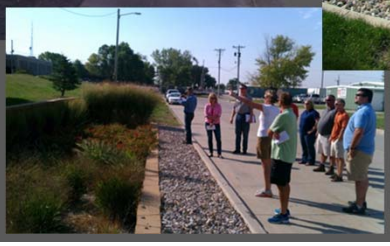


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POST-CONSTRUCTION STORMWATER MANAGEMENT ORDINANCE

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Post Construction Stormwater Management Ordinance

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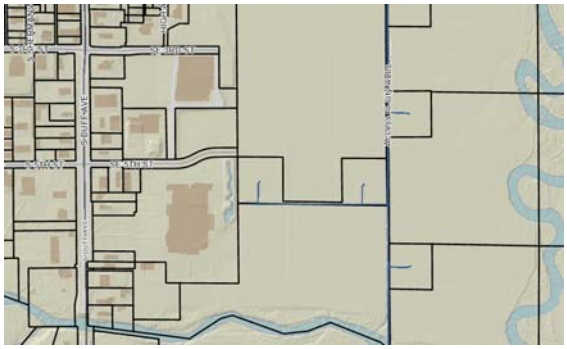
- Challenges to date:
  - Groundwater Source
    - Protection from reclassification
    - No open ground water detention
      - Within 1,000 ft of well Fields at SE 16th & Youth Sports Complex
    - Super Wal-Mart
      - Bioretention Cell
        - Only Roof Run-Off



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SMART WATERSHEDS

Post Construction Stormwater Management Ordinance

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- Challenges to date:
  - As-built conditions
    - Volumes not consistent with design
  - Financial Security/Performance Bond
    - Infrequent/New developers surprised
  - Re-development
    - Most challenged to meet requirements

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SMART WATERSHEDS

Post Construction Stormwater Management Ordinance

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- Challenges to date:
  - Partial Waivers
    - Requests due to financial
    - Combination on-site and off-site
  - Geothermal Wells
    - Request/Approval to be in Conservation Easement area
  - Proprietary Units
    - Proof meet water quality improvements

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SMART WATERSHEDS

Post Construction Stormwater Management Ordinance

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- Challenges to date:
  - Soils information
    - Organic content
    - Infiltration rate – testing vs assuming
    - Accurate classification of soils (A, B, C, D)
      - Considering construction activity
  - Native Vegetation/Maintenance Plans
    - Time
    - Patience
    - Maintenance
    - Knowledge

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SMART WATERSHEDS

CITY OF AMES PUBLIC WORKS

45

Tracy L. Warner, P.E.
Municipal Engineer

515-239-5163
twarner@city.ames.ia.us

SMART WATERSHEDS

ORDINANCE NO. 4174

AN ORDINANCE TO AMEND THE MUNICIPAL CODE OF THE CITY OF AMES, IOWA, BY ENACTING A NEW CHAPTER 5B THEREOF, FOR THE PURPOSE OF POST CONSTRUCTION STORMWATER MANAGEMENT IN COMPLIANCE WITH BOTH FEDERAL AND STATE ENVIRONMENTAL LAWS; REPEALING ANY AND ALL ORDINANCES OR PARTS OF ORDINANCES IN CONFLICT TO THE EXTENT OF SUCH CONFLICT; AND ESTABLISHING AN EFFECTIVE DATE.

BE IT ENACTED, by the City Council for the City of Ames, Iowa, that:

Section One. The Municipal Code of the City of Ames, Iowa shall be and the same is hereby amended by enacting a new Chapter 5B as follows:

"**CHAPTER 5B**
POST CONSTRUCTION STORMWATER MANAGEMENT

Sec 5B.1. GENERAL PROVISIONS

(1) The U.S. Environmental Protection Agency's National Pollutant Discharge Elimination System (NPDES) permit program (Program) administered by the Iowa Department of Natural Resources (IDNR) requires that cities meeting certain demographic and environmental impact criteria obtain from the IDNR an NPDES permit for the discharge of stormwater from a Municipal Separate Storm Sewer System (MS4) (the MS4 Permit). The City of Ames (City) is subject to the Program and is required to obtain, and has obtained, an MS4 Permit. The City's MS4 Permit is on file at the office of the City Clerk and is available for public inspection during regular office hours.

(2) As a condition of the City's MS4 Permit, the City is obliged to develop, implement and enforce a program to address stormwater runoff from new construction and reconstruction projects for which stormwater permit coverage is required.

(3) No state or federal funds have been made available to assist the City with inspections, monitoring and/or enforcing the Program. Accordingly, the City shall fund its inspection, monitoring and enforcement responsibilities entirely by fees imposed on the owners of properties which are made subject to the Program by virtue of state and federal law, and/or other sources of funding established by a separate ordinance.

(4) Land development and associated increases in impervious cover alter the hydrologic response of local watersheds and increase stormwater runoff rates and volumes, flooding, stream channel erosion, and sediment transport and deposition if left uncontrolled; this uncontrolled stormwater runoff contributes to increased quantities of water-borne pollutants, and; stormwater runoff, soil erosion and nonpoint source pollution can be controlled and minimized through the regulation of stormwater runoff from development sites.

(5) Therefore, City establishes this set of City stormwater standards applicable to all surface waters to provide reasonable guidance for the regulation of stormwater runoff for the purpose of protecting local water resources from degradation. It is determined that the regulation of stormwater runoff discharges from land development and other construction activities shall not result in increases in stormwater runoff rates and volumes, soil erosion, stream channel erosion, and non-point source pollution associated with stormwater runoff, is in the public interest and will prevent threats to public health and safety.

(6) The Iowa Stormwater Management Manual published by the Iowa Department of Natural Resources and maintained by the Iowa Storm Water Education Program establishes guidelines consisting of unified sizing criteria (water quality volume, channel protection storage volume, overbank flood protection, extreme flood protection) stormwater management designs, specifications, and best management practices (BMPs). City hereby finds and declares that the guidelines provided in the Iowa Stormwater Management Manual, and in future editions thereof, along with any locally adopted modifications, are hereby adopted as the stormwater management standards of City. Any BMP installation that complies with the provisions of the Iowa Stormwater Management Manual, or future editions thereof, along with any locally adopted modifications, at the time of installation shall be deemed to have been installed in accordance with this ordinance.

(7) The purpose of this ordinance is to adopt as City's standards the guidelines established in the Iowa Stormwater Management Manual (hereinafter collectively City's stormwater requirements or standards) in order to protect and safeguard the general health, safety, and welfare of the public within this jurisdiction. This ordinance seeks to meet that purpose through the following objectives:

(a) Minimize increases in stormwater runoff from development within the city limits and within 2 mile limit where the City has exercised subdivision authority fringe area in order to reduce flooding, siltation, increases in stream temperature, and stream bank erosion in order to maintain the integrity of stream channels;

(b) Minimize mass grading of sites to preserve natural features and drainageways as well as protection of open space and impervious cover minimization;

(c) Minimize increases in non-point source pollution caused by stormwater runoff from development which would otherwise degrade local water quality;

(d) Distribute and minimize runoff by utilizing vegetated areas for stormwater treatment (e.g. parking lot islands, vegetated areas along property boundaries, front and rear yards, building landscaping. Encourage infiltration and soil storage of runoff through such practices as bioswales, soil quality improvement with compaction reduction and compost amendments, bioretention cells and rain gardens. Plant vegetation that does not require irrigation beyond natural rainfall and runoff from the site;

(e) Mitigate stormwater runoff rates and volumes, soil erosion and non-point source pollution, wherever possible, through establishment of appropriate minimum stormwater management standards and BMPs and to ensure that BMPs are properly maintained and pose no threat to public safety.

(8) This ordinance shall be applicable to all development and redevelopment applications meeting the minimum square foot applicability criteria of 5B.1.(8)(a), unless eligible for an exemption or granted a waiver by City under Section 5B.4 of this ordinance. The ordinance also applies to land disturbance activities that are smaller than the minimum square foot applicability criteria specified in 5B.1.(8)(a) if such activities are part of a larger common plan of development or redevelopment that meets the minimum square foot applicability criteria of 5B.1.(8)(a), even though multiple separate and distinct land development activities may take place at different times on different schedules:

(a) City stormwater requirements must be met for development or redevelopment to be approved. City stormwater requirements apply to any new development, redevelopment disturbing 1 acre or more of land, or to any development disturbing less than said acreage of land if the amount of impervious cover created exceeds 10,000 square feet. New development includes any new residential, commercial, or industrial subdivision or individual site improvement requiring a site development plan. The following activities are exempt from this ordinance:

(i) Any agricultural activity.

(ii) Additions or modifications to an existing single family property.

(iii) Storm Water Management Design standards do not apply to any area within a 1,000-foot distance from any City of Ames drinking water well located in the Southeast Well Field and Youth Sports Complex Well Field. In these specific areas, developments will need to meet requirements for storm water quality-based treatment or a combination of quantity- and quality-based treatment, as approved by both the Director of Public Works and the Director of Water and Pollution Control.

(9) Compatibility with Other Permit and Ordinance Requirements is as follows:

(a) It is intended that this ordinance be construed to be consistent with Municipal Code Chapter 5A Construction Site Erosion and Sediment Control, Chapter 23 Subdivisions, Chapter 28 Utilities, and Chapter 29 Zoning.

(b) The requirements of this ordinance should be considered minimum requirements, and where any provision of this ordinance imposes restrictions different from those imposed by any other ordinance, rule or regulation, or other provision of law, whichever provisions are more restrictive or impose higher protective standards for human health or the environment shall be considered to take precedence.

Sec 5B.2. DEFINITIONS

(1) Terms related to stormwater management in this ordinance other than those defined below shall have the meanings set out in the Iowa Storm Water Management Manual.

"**Applicant**" means a property owner or agent of a property owner who has filed an application for a storm water management permit.

"**Best Management Practice (BMP)**" means a practice or series of practices used to manage stormwater and as further defined in the Iowa Stormwater Management Manual.

"**Building**" means any structure, either temporary or permanent, having walls and a roof, designed for the shelter of any person, animal, or property, and occupying more than 150 square feet of area.

"**Channel Protection Storage Volume**" means providing for practices that will allow for extended detention of the runoff generated by a 1-year, 24-hour event. This means capturing the runoff volume from a storm of this nature, and slowly releasing it over a period of no less than 24-hours to reduce the rapid "bounce" effect common in many urban streams that leads to downcutting and streambank erosion.

"**City Stormwater Requirements**" or "standards" mean the guidelines provided for in this ordinance and the Iowa Stormwater Management Manual.

"**COSESCO**" means Construction Site Erosion and Sediment Control Ordinance permit issued by the City of Ames Public Works Department.

"**Dedication**" means the deliberate appropriation of property by its owner for general public use.

"**Developer**" means a person or entity that undertakes land development activities.

"**Development**" means land disturbance activity of one acre (43,560 square feet) or more on land previously vacant of buildings or largely free of previous land disturbance activity other than agriculture.
"**Drainage Easement**" means a legal right granted by a landowner to a grantee allowing the use of private land for stormwater management purposes.
"**Enforcement Officer**" means that person or persons designated by the City having responsibility for administration and enforcement of this ordinance.
"**Extreme Flood Protection**" means managing the effects of larger storm events (10-year to 100-year recurrence intervals) on the stormwater management system, adjacent property, and downstream facilities and property. The impacts of these extreme events is accomplished using detention controls and/or floodplain management.
"**Fee in Lieu**" means a payment of money in place of achieving or exceeding all or part of City stormwater requirements.
"**Impervious Surface**" means surfaces (roads, sidewalks, driveways and parking lots) that are covered by impenetrable materials such as asphalt, concrete, brick, and stone, rooftops as well as soils compacted by urban development.
"**Iowa Stormwater Management Manual (ISWMM)**" means the manual collaboratively developed by the Iowa Department of Natural Resources (IDNR) and the Center for Transportation Research and Education (CTRE) at Iowa State University and updated by the Iowa Storm Water Education Program that contains the sizing criteria, design and specification guidelines and BMPs that address stormwater quality and quantity management.
"**Land Disturbance Activity**" means any grading, digging, cutting, scraping, or excavating of soil, placement of fill materials, paving, construction, substantial removal of vegetation, or any activity which bares soil or rock or involves the diversion or piping of any natural or man-made watercourse.
"Low Impact Development" means an approach to stormwater management that attempts to mimic pre-development conditions by compensating for losses of rainfall abstraction through infiltration, evapotranspiration, surface storage, and increased travel time to reduce excess runoff.
"**Landowner**" means the legal or beneficial owner of land, including those holding the right to purchase or lease the land, or any other person holding proprietary rights to the land.
"Overbank Flood Protection" means providing on-site stormwater detention to limit runoff peak flow rates from the 5-year recurrence interval storm event to prevent downstream surcharge of conveyance systems and reduce overbank flooding. At the site development level, this can be accomplished by providing detention practices with multi-stage outlets that control the outflow from these events to pre-settlement conditions (meadow in good condition).
"**Pre-Settlement Land and Vegetation Conditions**" means for intended stormwater design calculations, meadow in good condition.
"**Redevelopment**" means land disturbance activity in areas where existing land use is commercial, industrial, institutional or multi-family residential.
"**Stormwater Management**" means the use of BMPs that are designed in accordance with City stormwater requirements to reduce stormwater runoff pollutant loads, discharge volumes, peak flow discharge rates and detrimental changes in stream temperature that affect water quality and habitat.
"**Stormwater Management Plan**" means a plan that addresses post construction stormwater management addressing water quality and quantity.
"**Storm Water Pollution Prevention Plan**" (SWPPP) means a plan that is designed to minimize the accelerated erosion and sediment runoff at a site during construction activities and includes provisions for additional pollution prevention and addresses stormwater quality and quantity management after construction.
"**Stream**" means perennial and intermittent water sources identified through site inspection, and/or an approved city of Ames map, and/or United States Geological Survey (USGS) 7.5 minute series topographical map.
"**Stream Buffer**" means a vegetated strip of land which lies adjacent to a stream and provides such functions as protecting water quality, providing wildlife habitat and storing flood waters.
"**Stream Order**" means a classification rank, used by the United States Geological Survey and other hydrological entities, of the relative sizes of streams draining a watershed based on the nature of their tributaries. The smallest unbranched tributary is first order, the stream receiving the tributary is second order etc.
"**Unified Sizing Criteria**" means an integrated approach to managing stormwater runoff quality and quantity by addressing the adverse impacts of stormwater runoff from development. The intent is to comprehensively manage stormwater to remove pollutants and improve water quality, prevent downstream streambank and channel erosion, reduce downstream overbank flooding and safely convey and reduce runoff from extreme storm events.
"**Water Quality Volume**" means the runoff resulting from a rainfall depth of 1.25", or less which is approximately 90% of the rainfall events in Central Iowa. By managing these storms many of the "first flush" pollutants of concern will be effectively managed on-site.

Sec 5B.3. PROCEDURES AND REQUIREMENTS

(1) No land owner or developer shall receive any building or other site development approvals without first meeting the requirements of this ordinance.

(2) Unless otherwise exempted by this ordinance, the Stormwater Management Plan and maintenance plan must be included with the site plan or subdivision preliminary plat and include the COSESCO permit application or approved COSESCO permit.

(3) The stormwater management plan and maintenance plan shall be prepared to meet the requirements of Section 5B.3(7) of this ordinance, and fees shall be those established by the City as necessary by separate ordinance or resolution.

(4) Following submission and approval of Stormwater Management Plans to the City, all applicable state and federal environmental permits shall be obtained prior to issuance of local permits including floodplain permits.

(5) If the stormwater management plan and maintenance plan are approved by the City, all appropriate local land development activity permits may be issued.

(6) Approvals issued in connection with this ordinance shall be valid from the date of issuance through the date City notifies the permit holder that all stormwater management BMPs have passed the final inspection required and the financial security has been released.

(7) The stormwater management plan and maintenance plan shall be prepared to meet the following requirements:

(a) Be prepared by a Licensed Professional Engineer (PE) or Professional Landscape Architect or credentialed in a manner acceptable to the City; and

(b) Indicate whether stormwater will be managed on-site or off-site and, if on-site, the general location and type of BMPs, with clear citations to the Iowa Storm Water Management Manual; and

(c) Include a signed and dated certification, under penalty of perjury by the preparer, of the stormwater management plan that it complies with all requirements of this ordinance and applicable sections of the Iowa Stormwater Management Manual, meets the submittal requirements outlined in the Iowa Stormwater Management Manual, and is designed to achieve City stormwater requirements.

(d) Contact Information, including but not limited to the name, address, and telephone number of all persons having a legal interest in the property and the tax reference number and parcel number of the property or properties affected.

(e) Topographic Base Watershed Map, at a scale no greater than 1" = 100' which extends a minimum of 200' beyond the limits of the proposed development and indicates existing surface water drainage including streams, ponds, culverts, field tiles, ditches, and wetlands; current land use including all existing structures; locations of utilities, roads, and easements; and significant natural and manmade features not otherwise shown. A minimum of 2' contours shall be shown on-site and 2' contours outside of the proposed property.

(f) A written or graphic inventory of the natural resources at the site and immediate area as it exists prior to the commencement of the project and a description of the watershed and its relation to the project site. This description should include a discussion of existing predevelopment soil conditions such as hydric soils and areas for infiltration-based BMPs, vegetative and forest cover, topography, wetlands, and other native vegetative areas on the site. Particular attention should be paid to environmentally sensitive resources that provide particular opportunities or constraints for development.

(g) Use hydrologic and hydraulic design calculations for the pre-development and post-development conditions for the design storms specified in the Iowa Stormwater Management Manual. Low Impact Development hydrology should be applied where appropriate and as approved by the City Municipal Engineer. Provide information in accordance with Section 2A-5 Project Drainage Report using the methodologies referenced in Sections 2B and 2C in the Iowa Stormwater Management Manual.

(h) Minimize the rate and volume of surface water runoff which flows from any specific development project site after completion to not exceed the pre-development hydrologic regime of meadow in good condition.

(i) If mass grading is used, flows shall not exceed the predevelopment hydrologic requirements of meadow in good condition. Classification of the altered soils shall be taken into consideration throughout the design.

(j) Utilize Low Impact Development features such as (but not limited to):

(i) Open space protection and restoration through conservation of existing natural areas, reforestation, re-establishment of prairies and wetlands, and re-establishment of native vegetation into the landscape including native turf.

(ii) Minimizing impervious cover.

(iii) Capture, store and reuse runoff for irrigation in areas where irrigation is necessary.

(k) A soil management plan shall be provided that includes a site map that identifies areas where soils and vegetation will not be disturbed and shows where topsoil will be stripped and stockpiled. It shall include, if used, a description of soil health (quality) improvement methods such as tilling, ripping, and amending with materials such as compost and topsoil. It shall also include a technical assessment of soils that identifies the soil series and the site limitations based on soils data provided in the Web Soil Survey for Story County hosted by Natural Resources Conservation Service (NRCS). Soil borings shall be included when necessary to confirm suitable site conditions for placement of buildings with basements and related structures, especially in areas with hydric soils

and shallow depth to groundwater. Existing soil conditions should be considered when designing the site layout. If a stormwater BMP depends on the properties of soils, the assessment shall include the necessary information such as, but not limited to: organic content and percolation/infiltration rates. The number and location of required soil borings and/or soil test sites shall be determined based on what is needed to determine the suitability and distribution of soil types present at the location of the BMP. This information shall be used to provide a summary of the associated risks and potential for adequate drainage related to infiltration practices, groundwater mounding and basement flooding. Consultation with a Certified Professional Soil Scientist or Soil Classifier may be necessary or required.

(l) Provisions shall be made for stream buffers. The area shall be defined within a recorded easement that includes a management plan. They shall be maintained with native vegetation along naturally occurring stream areas using the following requirements based on stream order:

(i) Streams exceeding 3rd order and above, the City requires sketches, maps, studies, engineering reports, tests, profiles, cross-sections, construction plans and specifications to determine adequate buffer widths.

(ii) Perennial streams (1st and 2nd order). The total required stream buffer width is one hundred (100) feet on each side perpendicular to the waterway measured from the outer wet edge of the channel during base flows.

(iii) Intermittent streams. The total required stream buffer width is fifty (50) feet on each side perpendicular to the water way measured from the centerline of the channel.

(iv) Waterways and/or dry channels that have a contributing drainage area of fifty (50) acres or greater. The total required stream buffer width is thirty (30) feet on each side perpendicular to the waterway measured from the centerline of the waterway.

(v) Waterways and/or dry channels with a contributing drainage area of less than 50 acres. The total required stream buffer width is twenty (20) feet on each side perpendicular to the waterway measured from the centerline of the waterway.

(m) A Maintenance, Repair, and Landscaping Plan that is periodically updated for all structural and nonstructural stormwater BMPs including detailed routine maintenance as well as long-term maintenance of vegetation, and repair procedures to ensure their continued efficient function shall be provided to the Public Works Department. These plans will identify the parts or components of a stormwater BMP that need to be maintained and the equipment, skills or training necessary. The plan shall also indicate who will be responsible for the maintenance of vegetation at the site. Provisions for the periodic review and evaluation of the effectiveness of the maintenance program and the need for revisions or additional maintenance procedures shall be included in the plan. Native Iowa plants and trees shall be considered for use with stormwater BMPs.

(n) Proof of permanent recorded Maintenance Easements that will ensure access to all stormwater BMPs at the site for the purpose of inspection and repair. These easements will be recorded with the stormwater management final plan and will remain in effect even with transfer of title to the property.

(o) Dedicating Drainage Easements: Any stormwater BMP outside of the public right-of-way shall be dedicated in a perpetual unobstructed easement with satisfactory access to a public way and from a public way to a natural watercourse or to other stormwater management measure. Any such easement shall be secured by the subdivider or developer and dedicated to the City without cost to the City.

(p) The property owners of residential, commercial, and industrial properties are responsible for short and long-term maintenance of all water quality practices. The City of Ames accepts long-term responsibility (e.g. dredging, outlet structure replacement) for large water quantity (flood) control practices (e.g. detention basins) as part of residential developments. A recorded easement shall be provided to the City of Ames to cover the entirety of and access to the large water quantity control practices. The property owners have short-term maintenance responsibility (e.g. mowing, weed control, removal of volunteer trees) of the water quantity (flood) control practices as part of residential developments. The property owners are responsible for maintenance of all stormwater facilities as part of commercial and industrial properties.

(q) Copies of all existing SWPPPs (as required by the City's COSESCO ordinance) current as of the date of submission of the stormwater management final plan for all construction activities related to implementing any on-site stormwater BMPs .

(r) For lot development impacted by stormwater BMPs and conveyance features:

(i) The builder shall provide to the Municipal Engineer, or designated City representative, an Elevation Certificate that is signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information.

(ii) The Elevation Certificate shall certify that the protected level (lowest opening or protective flood barrier that achieves the same result) of all buildings shall be a minimum of 3 feet above the 100 year water surface elevation of stormwater BMPs.

(iii) Building foundations adjacent to stormwater BMPSs and/or stormwater infrastructure (i.e. conveyance features, inlets, manholes) shall be 3 feet above the 100 year water surface elevation.

(s) Any required storm sewers including foundation drain collector lines shall be separate from any required sanitary sewers and shall be installed at the subdivider's or developer's expense and subject to requirements of the City and shall be adequate to serve all lots or parcels of land within the area to be subdivided.

(i) The storm sewer system shall be designed with due regard to the present and reasonably foreseeable needs of the area to be subdivided and to the location and capacity of existing storm sewers and other stormwater management measures available to serve existing and reasonably anticipated development or use of areas abutting the area to be subdivided.

(ii) Upon determination by Municipal Engineer, such storm sewers may become the property of the City, upon determination of the Municipal Engineer through the City's inspection, approval, and acceptance of such sewers, after the subdivider pays to the City any costs associated with their installation including any reasonable charge for any supervisory or other services provided by the City.

(t) Accommodating Upstream Drainage Areas: Any necessary and appropriate stormwater BMPs shall be designed to accommodate runoff from any upstream area potentially draining into or through the area to be subdivided, whether such area is inside or outside the area to be subdivided. Such design shall assume that the upstream area upon development or redevelopment will be regulated such that volume of surface water runoff shall be equal to the runoff from the current landuse condition.

(u) Protecting Downstream Drainage Areas: Any development shall provide for mitigation of any overload condition reasonably anticipated on any existing downstream stormwater BMPs outside the area to be subdivided, provided that the development or use of the area to be subdivided creates or contributes to such condition.

Sec 5B.4. WAIVERS

(1) Every applicant shall provide for stormwater management as required by this ordinance except in certain redevelopment situations when confronted with difficult site conditions that limit design of such BMPs listed in the Iowa Stormwater Management Manual. In such case, a written request must be filed to waive implementation of BMPs in part or in whole. Requests to waive implementation of BMPs in part as defined in 5B.4(2) shall be submitted to the Municipal Engineer for approval.

(2) Partial Waivers

(a) Partial waivers of BMPs required by this ordinance may be granted for redevelopment projects if the proposed development is not likely to impair attainment of the objectives of this ordinance. At least one of the following conditions, in successive order, shall be established by applicant based on authoritative written evidence satisfactory to the Municipal Engineer:

(i) Alternative minimum requirements for on-site management of stormwater have been established in a stormwater management plan that has been approved by the Municipal Engineer and fully implemented. If the applicant is unable, for good cause shown, to meet the requirements of this subsection, the applicant shall meet the following condition:

(ii) Provisions are made to manage stormwater by an off-site facility that has been approved by the Municipal Engineer. The off-site facility is required to be in place, to be designed and adequately sized to provide a level of stormwater control that is equal to or greater than that which would be afforded by on-site practices and there is a responsible entity legally obligated to monitor the performance of and maintain the efficiency of stormwater BMPs in accordance with an approved maintenance plan.

(b) In instances where one of the above conditions is established, the applicant must further establish by authoritative written evidence satisfactory to the Municipal Engineer that the partial waiver will not result in any of the following impacts to downstream waterways:

(i) deterioration of existing culverts, bridges, dams, and other structures;

(ii) degradation of biological functions or habitat;

(iii) accelerated streambank or streambed erosion or siltation;

(iv) increased threat of flood damage to public health, life, property.

Sec 5B.5. FINANCIAL SECURITY AND PERFORMANCE BOND

(1) City shall require the submittal of an installation performance security or bond prior to issuance of approval in order to insure that the stormwater BMPs are installed as required by the approved stormwater management final plan:

(a) The amount of the installation financial security or bond shall be the total estimated construction cost of the stormwater BMPs approved in the stormwater management plan. The installation financial security or bond shall contain forfeiture provisions for failure to complete work specified in the stormwater management plan.

(b) The installation financial security or bond shall be released in full only upon submission of "as built plans" of all stormwater BMPs specified in the stormwater management plan and written certification by a Licensed Professional Engineer or Professional Landscape Architect or person credentialed in a manner suitable to the city that the stormwater BMPs have been installed in accordance with the approved stormwater management final plan and other applicable provisions of this ordinance. City will make a final inspection of stormwater BMPs to ensure compliance with the approved stormwater management plan and the provisions of this ordinance. Provisions for a partial pro-rata release of the installation performance security or bond based on the completion of various development stages can be made at the discretion of the Municipal Engineer.

(2) City shall also require the submittal of a maintenance performance security or bond prior to issuance of a permit in order to insure that the stormwater BMPs are maintained in an effective state for a minimum of four years. This maintenance performance security or bond may be released by the City upon a showing satisfactory to the Municipal Engineer that:

(a) another bona fide financially responsible legal entity, such as a home-owners' or similar organization organized under Iowa law, has been assigned responsibility for maintenance of the stormwater BMPs in an effective state for the balance of the four year period after assignment; and

(b) said assignee-legal-entity has fully accepted such responsibility in a written document that qualifies for recording and has been recorded in the county recorder's office under Iowa law; and

(c) said assignee-legal-entity posts a substitute maintenance performance security or bond subject to release at the end of the initial four year period upon a further showing by the assignee-legal-entity that the stormwater BMPs are, in City's sole judgment, still reasonably effective.

Sec 5B.6. CONSTRUCTION INSPECTION

(1) After construction is completed, applicants are required to submit actual "as built" drawings satisfactory to City for any stormwater BMPs located on-site. The drawings must show the final design specifications for all stormwater BMPs and must be certified by a Professional Engineer, Landscape Architect or credentialed in a manner acceptable to the city. A final inspection by City is required before the release of any performance securities can occur.

(2) Construction inspections will be conducted by the City or designated representative of the City at the conclusion of a development or redevelopment project after as-built plans are submitted to the City to ensure the stormwater BMPs have been built according to the stormwater management plan. For subdivisions, the owner is responsible for covering actual Engineering cost per City code. For individual site developments, the cost is included in the COSESCO fee.

(3) Financial security or bond will be released upon acceptance.

Sec 5B.7. MAINTENANCE AND REPAIR OF STORMWATER BMPs

(1) The applicant or owner of every site, or an assignee qualified, shall be responsible for maintaining as-built water quality BMPs in an effective state.

(2) Prior to the issuance of a COSESCO permit that has a stormwater management BMP as one of its requirements of the permit, and part of receiving approval of the stormwater management plan, the applicant or owner of the site agree to provide for access to the BMP and the land it serves at reasonable times for periodic inspection by City or City's designee and for regular or special assessments of property owners to ensure that the BMP is maintained in proper working condition to meet City stormwater requirements.

(3) Maintenance of all stormwater management BMPs shall be ensured through the creation of a maintenance plan that must be approved by City at time of the stormwater management plan approval. As part of the plan, a schedule shall be developed for when and how often maintenance will occur to ensure proper function of the stormwater management BMPs. The plan shall also include plans for periodic inspections to ensure proper performance of the BMPs between scheduled cleanouts.

(4) All stormwater management BMPs must undergo an annual inspection to document maintenance and repair needs and ensure compliance with the requirements of this ordinance and accomplishment of its purposes. Any maintenance or repair needs detected must be corrected by the developer or entity responsible in a timely manner, as determined by City, and the inspection and maintenance requirement may be increased as deemed necessary to ensure proper functioning of the stormwater management BMPs.

(5) Inspection programs may be established on any reasonable basis. Inspections may include, but are not limited to: reviewing maintenance and repair records; sampling discharges, surface water, groundwater, and material or water in storm water BMPs, and evaluating the condition of stormwater management BMPs.

(6) Parties responsible for the operation and maintenance of stormwater management BMPs shall make records of the installation and of all maintenance and repairs, and shall retain the records for at least 3 years. These records shall be made available to City during inspection of the facility and at other reasonable times upon request.

(7) If a responsible party fails or refuses to meet the requirements of the approved plan or any provision of this ordinance, City, after reasonable notice, may correct a violation by performing all necessary work to place the BMP in proper working condition. In the event that the stormwater management BMP becomes a danger

to public safety or public health, City shall notify the party responsible for maintenance of the stormwater management BMP in writing. Upon receipt of that notice, the responsible person shall have 30 days to effect maintenance and repair of the stormwater management BMP in an approved manner. After proper notice, City may assess, jointly and severally, the owner(s) of the stormwater management BMP or the property owners or the parties responsible for maintenance under any applicable written agreement for the cost of repair work and any penalties; and the cost of the work shall be a lien on the property, or prorated against the beneficial users of the property, and may be placed on the tax bill and collected as ordinary taxes.

Sec 5B.8. ENFORCEMENT BY LEGAL OR ADMINISTRATIVE ACTION

(1) Violation of any provision of this ordinance may be enforced by civil action including an action for injunctive relief. In any civil enforcement action, administrative or judicial, the City shall be entitled to recover its attorneys' fees and costs from a person who is determined by a court of competent jurisdiction to have violated this ordinance.

(2) Violation of any provision of this ordinance may also be enforced as a municipal infraction within the meaning of Iowa Code Section §364.22, pursuant to the City's municipal infraction ordinance.

(3) Restoration of lands: Any violator may be required to restore land to its undisturbed condition. In the event that restoration is not undertaken within a reasonable time after notice, City may take necessary corrective action, the cost of which shall become a lien upon the property until paid.

(4) Holds on Occupation Permits: Occupancy permits shall not be granted until all storm water management BMPs have been inspected and approved by City.

Sec 5B.9. MEANS OF APPEAL

Any person directly affected by a decision of the Municipal Engineer or other City staff, or a notice or order issued under this code, shall have the right to appeal. That appeal shall be heard by the City Council. An appeal shall be made in writing and be filed with the City Clerk no later than 20 days after the date of the notice or order. The written appeal shall specify in detail the action appealed from, the errors allegedly made by the enforcement officer giving rise to the appeal, a written summary of all oral and written testimony the applicant intends to introduce at the hearing, including the names and addresses of all witnesses the applicant intends to call, copies of all documents the applicant intends to introduce at the hearing, and the relief requested.

An application for appeal shall be based on a claim that:

(1) the true intent of this Code or the rules legally adopted hereunder have been incorrectly interpreted, or

(2) the provisions of this Code do not fully apply, or

(3) the requirements of this Code are adequately satisfied by other means, and the specific proposed alternative action will increase the degree of general code compliance of the specific system or the building and premises, or

(4) there are specific fixed conditions that make strict compliance with this Code impracticable, or

(5) required actions cannot be completed within the time limit specified by the Municipal Engineer or other City official."

Section Two. All ordinances, or parts of ordinances, in conflict herewith are hereby repealed to the extent of such conflict, if any.

Section Three. This ordinance shall be in full force and effect from and after its passage and publication as required by law.

Adopted this 22nd day of April, 2014.

Diane R. Voss

Diane R. Voss, City Clerk

Ann H. Campbell

Ann H. Campbell, Mayor

SUMMARY OF IOWA MUNICIPALITIES STORMWATER MANAGEMENT ORDINANCE APPLICABILITY AND EXCEPTIONS

CITY	APPLICATION	EXEMPTIONS
Ames	*1. All development and redevelopment within the city:* *a. **Disturbing 1 acre of more of land** or* ***b. Creating at least 10,000 square feet of impervious cover.*** *Impervious cover means surfaces (roads, sidewalks, driveways, and parking lots) that are covered by impenetrable materials such as asphalt, concrete, brick, and stone, rooftops as well as soils compacted by urban development.*	*1. Agricultural activity.* *2. Additions or modifications to an existing single family property.* *3. Stormwater Management Design standards do not apply to any area within a 1,000 foot distance from any City of Ames drinking water well located in the Southeast Well Field and Youth Complex Well Field. In these specific area, developments will need to meet requirements for storm water quality-based treatment or a combination of quantity and quality based treatment, as approved by both the Director of Public Works and the Director of Water and Pollution Control.* ***4. Partials waiver for on-site controls of redevelopment sites if approved by Municipal Engineer.***
Cedar Rapids	1. All development within the city. Development is defined as "improvement of land from its existing state". 2. Stormwater detention basins intended to serve single family residential development shall be publicly owned and maintained, unless approved otherwise by the City Engineer. 3. Non-single family lots with an overall area of one acre or more shall provide on-site stormwater detention. Non-single family lots with an overall area less than one acre shall comply with one of the following, as approved by the City Engineer: a. Privately owned, on-site detention basin. b. Tributary to a privately or publicly owned detention basin. In some watersheds, on-site stormwater detention may be required, at the discretion of the City Engineer, for non single-family lots with an overall area of less than one acre. 4. At the discretion of the City Engineer, if a detention basin serves non-single family zoning districts and can provide stormwater attenuation for a substantial drainage area, the facilities may be publicly owned and maintained.	1. Agricultural use of land 2. Emergencies posing an immediate danger to life or property, or substantial flood or fire hazards; 3. Land within flood plain areas as designated in the Federal Emergency Management Agency maps in effect at the time of development. 4. **Areas deemed appropriate by the City Engineer**.
Cedar Falls	1. Land disturbing activity exceeding 43,560 square feet in area on land previously vacant of buildings or largely free of previous land disturbing activity other than traditional agricultural activities; or 2. Land disturbing activity creating 5,000 square feet in area or more of impervious cover; or 3. Land disturbing activities that are smaller than the minimum square feet applicability criteria set forth in this subsection, if such activities are part of a larger common plan of development that may or may not take place at the same time; or 4. Land disturbing exceeding 25,000 square feet in area where the existing land is being redeveloped.	1. Any logging or agricultural activity which is consistent with an approved soil conservation plan or an approved timber management plan. 2. Additions or modifications to existing single family structures.

SUMMARY OF IOWA MUNICIPALITIES STORMWATER MANAGEMENT ORDINANCE APPLICABILITY AND EXCEPTIONS

Council Bluffs	1. Development of one acre of more of land or less than one acre if proposed disturbance is part of a larger common plan of development that meets the one acre minimum.	1. Any logging or agricultural activity consistent with an approved soil conservation plan of a timber management plan. 2. Additions of modifications to existing single family structures. 3. Developments that do not disturb more than one acre of land provided they are not part of a larger common development plan. 4. Repairs to any stormwater management implementations deemed necessary by the City.
Des Moines	1. Water Quality controls for 1.25" storm. 2. Detention required on-site for any development site exceeding 10,000 square feet in area or for redevelopment sites when the disturbed area of impervious surfacing exceeds 10,000 square feet.	1. Currently the Neighborhood Pedestrian Commercial District (NPC) allows the stormwater release rate to be at the 5-year storm of the current conditions (instead of 100% grass) **(this is anticipated to be eliminated with zoning code revisions taking place now for adoption in May 2018)**
Iowa City	1. Development which results in an aggregate gross area of three (3) acres or more of drainage from or to a single drainage area. The gross aggregate drainage area shall include streets and other dedicated lands.	2. **Excludes the central business district.** 3. Excludes the area designated as the new south side neighborhood.
Sioux City	1. Construction activity creating 5,000 or more square feet of impervious surface.	1. Logging or agricultural activity consistent with an approved soil conservation plan or a timber management plan. 2. Additions or modifications to existing single-family structures. 3. Developments that do not create more than 5,000 square feet of impervious surface, provided they are not part of a larger common development plan. 4. Repairs to any storm water treatment practice deemed necessary by the City Engineer.
Waterloo	1. Land disturbing activity exceeding forty-three thousand five hundred sixty (43,560) square feet or more in area on land previously vacant of buildings or largely free of previous land disturbing activity; or 2. Land disturbing activity creating five thousand (5,000) square feet or more in area of impervious surface; or 3. Land disturbing activity that is smaller than the minimum area criteria set forth in this subsection, if such activities are part of a larger common plan of development that may or may not take place at the same time; or 4. Construction of new parking and storage areas or the expansion, reconstruction or hard surfacing of existing parking lots or storage areas. The addition of granular material to the existing footprint of a granular surfaced parking lot or storage area shall not be considered reconstruction.	**1. Development or redevelopment of property within the central business district, as defined in the current city of Waterloo zoning ordinance.** 2. Any additions or modifications to existing single-family dwellings provided that said additions and/or modifications do not create a dwelling with impervious surfaces greater than five thousand (5,000) square feet. 3. Any logging activity consistent with an approved timber management plan. **4.** Any agricultural activity consistent with an approved soil conservation plan.

STORMWATER MANAGEMENT ORDINANCE APPLICABILITY THRESHOLDS

Land Disturbance

Cedar Rapids	All development
Cedar Falls	0.57 Acres (25,000 SF for redevelopment)
Cedar Falls	1 Acre (new development)
Ames	1 Acre
Council Bluffs	1 Acre
Waterloo	1 Acre
Iowa City	3 Acres
Sioux City	Impervious threshold only

Impervious Cover

Cedar Rapids	All development
Cedar Falls	5000 SF
Waterloo	5000 SF
Sioux City	5000 SF
Ames	10,000 SF
Council Bluffs	Land disturbance threshold only
Iowa City	Land disturbance threshold only

Post Construction Stormwater Management Site Inventory 2014 through 2018

Site	Post Construction Required Yes or No		SQR	Water Quality Volume (1.25")	Channel Protection Volume (1 year)	Overbank Flood Protectoin (5 Year)	Extreme Flood Protection (10 and 100 year)	Dry Basin	Wet Basin	Infiltration BMP (swale/Basin)	Forebays	Bioretention Cell	Underground WQ System	Underground infiltration	Underground Storage
3334 Lincoln Way	Yes	Convert existing Wendy building into bank branch	no	Underground Storm-Tech Storage	Underground Storm-Tech Storage	Underground Storm-Tech Storage	Underground Storm-Tech Storage						1	1	1
413 Northwestern Ave	Yes	Parking Expansion (Wheatsfield)	no	Trench Drains, Bio-Retention, Permeable pavement	Underground Storm-Tech Storage	Underground Storm-Tech Storage	Underground Storm-Tech Storage					1	1	1	1
230 South Duff	Yes	Construction of Chick-Fill-A	no	Underground Storm-Tech Storage	Underground Storm-Tech Storage	Underground Storm-Tech Storage	Underground Storm-Tech Storage						1	1	
3105 Grand and 30th (North Walmart)	Yes	New Walmart	no	Wet Detention Basin and Vortex Separator) (Downstream Defender) and Underground Detention	Wet Detention Basin and Vortex Separator) (Downstream Defender) and Underground Detention	Wet Detention Basin and Vortex Separator) (Downstream Defender) and Underground Detention	Wet Detention Basin and Vortex Separator) (Downstream Defender) and Underground Detention		1		1		1	1	1
511 South 17th Street	Yes, WQV on site In underground detention, Quality regional	Replace parking lot surface													
122 Hayward	Yes, Underground detentnion	Demo and constructon of commercial with parking and apartment units	no	Undertround Stone Storage	Underground Stone Storage	Underground Stone Storage	Underground Stone Storage								1
436 South Duff	Yes, Underground detention	Construction of Panda Express Restaurant	Yes	Undertround Stone Storage	Undertround Stone Storage	Undertround Stone Storage	Undertround Stone Storage						1	1	1
4506 Lincoln Way	Yes Underground detention and above grade detention	Demo old and built new Kum & Go	Yes	Chambers)	Undreground Storage and Detention Basin	Detention Basin	Detention Basin	1					1	1	1
2700 Block of Lincoln Way	Yes Underground detention	OPUS - Seven Story Mixed use building with underground parking													
3306, 3326 Lincoln Way (Aspen Heights)	Yes - Underground Detentnion on North	Multi family with retail													
2401 (2311) Chamberlain Street	Yes, underground detention (verify) Mindy CGA	New Building	no	Underground Storm-Tech Storage	Underground Storm-Tech Storage	Underground Storm-Tech Storage	Underground Storm-Tech Storage						1		1
Buchanan Residenance hall -Iowa State	Yes, underground detention	Buchanan Residenance Hall - New building and Parking	Yes	Underground Storm-Tech Storage	Underground Storm-Tech Storage	Underground Storm-Tech Storage	Underground Storm-Tech Storage							1	1
517 Lincoln Way (submitted 8-8-14) Laundy Facility	Yes - with waver close to well	construction of commercial building		WAIVER-WELL ON-SITE											
1204 South 4th Street	Yes - Waver of buffer	Apartment Buildings	Yes	Underground Trench	Dry Detention Basin	Dry Detention Basin	Dry Detention Basin	1						1	1
1400 McKinley Drive	Yes	New elementary school	Yes	Staorage chamber (60" CMP in 6'x7' stone	Staorage chamber (60" CMP in 6'x7' stone	Staorage chamber (60" CMP in 6'x7' stone	Staorage chamber (60" CMP in 6'x7' stone	1					1	1	1
611 East Lincoln Way	Yes	Construction of new commercial building infiltrates on north side													
1200 McCormick Avenue	Yes, Waiver	Parking lot and layout improvements													
115 South Dakota (4619, 4701 Tood Drive after address change)	yes	Apartment Complex	Yes	5 BioWet Detention Cells	Dry Detention Basin	Dry Detention Basin	Dry Detention Basin	1			5	5			1
4316 Ontario	Yes	Sawyer Elementary	Yes	Bioretention Cell and Underground	Dry Retention Basins and Underground	Dry Retention Basins and Underground Storage	Dry Retention Basins and Underground Chamber	2				1	1	1	1
3915 Mortensen Road	Yes	Dotson Drive Extension - parking lot													
2005 24th Street	Yes	Admin Bld, Sports Complex	Yes	SQR	Dry Detention Basin	Dry Detention Basin	Dry Detention Basin	3			3				
111 Lynn Ave	Yes	University Towers Subdivision													
3915 / 3914 Mortensen Road	Yes	Middle School Track improvements	No	extended detention basin	Detention Basin	Detention Basin	Detention Basin	1							
519 South Duff Avenue	Yes	2 building additions and parking lot addition		NO REPORT-found SWPPP only											
100 Dayton Ave	Yes	Expand Existing North Parking lot and add spaces (Hatch Chemical)	No	Detention Basin Forebay	Detention Basin	Detention Basin	Detention Basin	1			1				
2710 South Loop	Yes	Office Building - Vermeer Bld.		REPORT?	Detention Basin	Detention Basin	Detention Basin	1							
202 SE 5th Street	Yes, Partial Waver (Native Plants, SQR, Reduced impervious by 10,000 but disturbe	Removal of structure and waterproofing													
100 Dayton Ave	Yes	South Parking lot addition	No	Detention Basin Forebay	Detention Basin	Detention Basin	Detention Basin	1			1				
2503 South Loop	Yes	Newlink Genetics Building 5 improvements													
101, 105, 107, 205 South Wilmoth (Aspen Heights)	Yes	Multi-family residential and limited retail.	Yes	Infiltration Basin and Underground Storm Tech	Infiltratin Basin and Underground Stormtech	Infiltration Basin and Underground Stormtech	Infiltration Basin and Underground Storm Tech						1	1	1
108 S. 5th Street	Yes	New Aldi Grocery Store	No	BioWet Detention Cell	Dry Detention Basin	Dry Detention Basin	Dry Detention Basin	2			1	1			
919 East Lincoln Way	Yes	Strip Industrail office and warehouse	Yes	SQR	Dry Detention Basin	Dry Detention Basin	Dry Detention Basin								
5310 Mortensen	Yes	Multi-family residential with clubhouse complex													
122 North Dakota	Yes	Apartment Bldg	No	Extended Detention	Detention Basin	Detention Basin	Detention Basin	1							
3915 Mortensen Road	Yes	Middle School Stadium Improvements													
535, 600 Soth 17th Street (Quarters Site at Aspen Ridge)	Yes	Apartment Complex, poo, clubhouse, and parking	No	Infiltration Basin	Infiltration Basin	Infiltration Basin	Infiltration Basin			1	1				
3012 Duff Avenue	Yes	Site Improvements Northwood preschool center	No	extended detention-underground											1
516 S. 17th Street (535, 600 S. 17th Street)	Yes with Quarters Site	Aspen Business Park 3rd Addition													
302, 304, 308 S. 3rd Street	Yes	Demo and build new Bldg with underground detentnion	No	Bioretention and Underground Detention								1	1		1
3303 and 3311 East Lincoln Way	Yes	Barilla - New buildings, rails	No	Swales	Detention Basin	Detention Basin	Detention Basin	4							
722 South Duff	Yes	Uhaul site improvements - underground detention													
2500 Duff Ave	Yes	Park improvments Miracle Park	No	Detention Basins	Detention Basin	Detention Basin	Detention Basin	4							
530 and 900 SE 16th Stree (menards Site)	yes	Menards Site													
311 Sondrol Ave	yes	Confirm with Nate Willey													
415 Stanton Ave (renovate school to apartments/condo)	Yes	Renovate School Building and new parking lot													
Regional Facilites															
2600/2618/2626 Bobcat Drive	yes	Construction of 3 12 Plexes North end of Ringenberg		REPORT? Pipes go to Co-op detention basin											
2617 Bobcat Drive (Ringenbert North end Subdivsion)	Yes	Construct 22 Townhomes (Regional Facilites)													
2135 Cottonwood	Yes, Regional with subdivsion	Apartment Buildings													
2121 Cottonwood	Yes, Regional with subdivsion	Apartment Buildings													
2110, 2126 Cottonwood	Yes, Regional with subdivsion	Aparmtent Buildings	Yes	Dry Detention Basins and Wet Detention Basins	Dry Detention Basin and Wet Detention Basin	Dry Detention Basin and Wet Detention Basin	Dry Detention Basin and Wet Detention Basin	2	1						
2041, 2105 Cottonwood Raod	Yes, Regional with subdivsion	Apartment Buildings													
Ringenberg 5th, Townhomes on bobcat	Yes	Town Homes on Bobcat.													
3500 University Boulevard	Yes, Regional water quality and quantity	Mcfarland Clinic at ISU research park													
3400 University Blvd Research Park	Yes	ISU Research Park Phase 3													
Mcfarland Clinic	Yes	At Research Park Regional													
3600 University	Yes	Ames Racquet and Fitness facility	Yes	Infiltration Trenches and Swales	Dry Detention Basin	Dry Detention Basin	Dry Detention Basin	1		2					
3305, 3315, 3331, 3405, 3400, 3420, Village Park Apartments	Yes Regional with Plat	Village Park Apartments													
3535 530th	Yes	Village Park Subdivision													
2151 Cottonwood	Yes	Village Park Subdivision Apartment Building													
1115 South Bell	Yes	Industrail spec building - Regional, Calculated water quality in basin													
810 South Bell	Yes	Approved but never built - industrial building													
1213 South Bell Ave	Yes (regional quantity and quality)	Industrial office building													
1216 South Bell	Yes - Regional facilities	Building, Storage, Bus Storage													
810 South Bell	Yes - Regional facilities	Office Building													
2825 Wakefield Circle	Yes	Draintech													
5499 Mortensen (crane farms subdivision)	Yes	Crane Farms Subdivision	Yes	Wet Detention Basins (sotheast and center of property)	Wet Detention Basins (sotheast and center of property)	Wet Detention Basins (sotheast and center of property)	Wet Detention Basins (sotheast and center of property)		2		1				
5498 Mortensen Ave (Mortensen Heights 2nd Addition in crane farms	Yes		Yes	Retention Basin	Retention Basin	Retention Basin	Retention Basin		2						
Crane Farms 2nd Addtion	Yes	Single Family lots on Wilder													
5400 Mortensen	Yes, Crane Farms Regional	Dog Park													
5414 Mortensen	Yes	Apartments													
5312 Mortensen	Yes	Apartments													
Southfork 8th	Yes - Credit for regional detention	Single family home development													
Southfork subdivision	Regional	southfork subdivision													
Haydens Crossing	Yes	Subdivision	Yes	West-Forebay & Wet DetentionBasin, East-Infiltration Basin	West-Forebay & Wet DetentionBasin, East-Infiltration Basin	West-Forebay & Wet DetentionBasin, East-Infiltration Basin	West-Forebay & Wet DetentionBasin, East-Infiltration Basin		1	1	1				
Haydens Crossing 2nd	yes	Haydens Crossing 2nd													
5400 Grant Ave	Yes	Haydens Crossing													
Dauntless Subdivision (1010 Dickinson Ave) BB and Tennis Courts	Yes	basketball court, parking lot, tennis facility, detention basin	Yes	Contech Hydodynamic Separator	Wet Detention Basin	Wet Detention Basin	Wet Detention Basin		1				1		
4710 Mortensen Road (West of Hilton Garden Inn)	Yes, WQV only, took credit for vomume in pond	3 Multifamily Residential Buildings		REPORT?											
Quarry Estates	Yes	Subdivision	Yes	2 Detention Basins with Forebays	Detention Basin	Detention Basin	Detention Basin	2			2				
Walnut Ridge 3rd Addition (3505, 3515 Lincoln Way)	Yes, water quality, Reginal water quantity (off site credit swap)	construction of commercial building	Yes	Dry Detention Basins and Underground Stone/	Dry Detention Basins and Underground Storage	Dry Detention Basins and Underground Storage		1					2	2	2
3505 & 3515 Lincoln Way (Walnut Ridge 3rd)	Yes	Mixed use development to construct two three story apartment buildings													
5752 GW Carver	Yes	Irons Subdivision													
Dotson Drive Development	Yes	Dotson Drive Development Subdivision	Yes	Detention Basin and Infiltration Trench	Detention Basin and Underground Infiltration Trench	Detention Basin	Detention Basin	1					1	1	1
901 (825 & 835) Airport Road	Yes	Office, commercial bldg expansion (Mun Lumber)	Yes	SQR	Dry Detention Basin	Dry Detention Basin	Dry Detention Basin								1
2400 North Loop Drive	Yes - water quality in existing basin, quantity regional	Porvision /Fougasse Restaurant (lot 42)	Yes	SQR (east) and Reginal Wet Detention Basin	Off-site Wet Detention Basin	Off-site Wet Detention Basin	Off-site Wet Detention Basin		1(regional)						
900 Airport Road	Yes	Airport Hanger		REPORT?											
900 Airport Road	Yes	Airport Terminal													
1509 Baltimore	Yes , regional quantity, on site water quality	New office building, parking, drives, sidewalk.		Wet Detention Basin	Wet Detention Basin	Wet Detention Basin	Wet Detention Basin		1						
1519 Baltimore Drive	Yes, Regional quantity , On site water quality	New office building (Bolton & Menk)		REPORT?											
601 and 705 Dotson	Yes	Dotson Development													
Sunset Ridge 7th (south townhomes)	Yes	Sunset Ridge	Yes	Water Quality Swales and SQR	Existing Detention Basins #1 within Sunset Ridge	Existing Detention Basins #1 within Sunset Ridge	Existing Detention Basins #1 within Sunset Ridge								
5871 Ontario Street Birtch Meadows Subdivison	Yes	Broadmoore Heights changed name to birtch meadows	Yes	Wet Detention Basin(south) with forebay, Detention Basin (northwest)	Wet Detention Basin(south) with forebay, Detention Basin (southwest) Detention Basin	Wet Detention Basin(south) with forebay, Detention Basin (southwest) Detention Basin	Wet Detention Basin(south) with forebay, Detention Basin (southwest) Detention Basin (northwest)	1	1		1				
3599 GW Carver	Yes	Scenic Point	Yes	SQR	Detention Basin	Detention Basin	Detention Basin	1							
Irons Subdivision (5252) GW Carver Ave	Yes	Single Family , Regional Detention	Yes	NO REPORT-found SWPPP only	Wet Detention Basins	Wet Detention Basins	Wet Detention Basins		3						
101 Dayton (LDY Subdivision) (2105 East Lincoln Way)	Yes	3 commercial lots	Yes	Retention Basin	Retention Basin	Retention Basin	Retention Basin		1		1				
2100 Green Hills Drive	Yes	Addition with parking lot to Green Hills with basins													
Bricktowne Development (3119,3301,3325,3409,3115,3413, S Duff)	Yes	Bricktown Development	Yes	Retention	Retention	Retention	Retention	2	5						
2005 24th Street (school admin tennis courts)	Yes will be required	This is in addition to the orrigional SWM Plan													
321 State Street	N/A stormwater for street - not fully designed yet. GDBG funds	single famly subdivision													
926 South 16th Street	Yes	Noodles Restaurant	yes	SQR	Dry Detention Basin	Dry Detention	Dry Detention	1							
3305 Stange Road	Yes	Northridge Village 2nd building	Yes	SQR	Wet Detention Basin	Wet Detention Basin	Wet Detention Basin								
Trinitas Site (lincoln Way and 500th Avenue)	Yes - was withdrawn never had approved site plan	Approved for stormwater, denied by council		PROJECT DENIED BY COUNCIL					1						
4811 Hyde - Rose Prairie	Yes - overall concept is approved	Will submit to confirm with each plat.		PRELIMINARY DESIGN-FINAL DESIGN TO BE SUBMITTED LATER											
2325 N Loop	No, Less than 10,000	Building Addition and Driveway entrance addition (BIOVA)													
2500 North Loop Drive	No, temporary and less than 10,000	Temporary Water Tank													

Post Construction Stormwater Management Site Inventory 2014 through 2018

2609 Ferndale	No, Less than 10,000	New Mainenance Building
23 Space Parking Lot (5300 Grant Ave Project)	N/A case withdrawn	Was part of Grand Ave Construction and SWMP
905 9th Street	No, Less than 10,000	Play Ground structure
1125 South 16th	No, Less than 10,000	Play Ground Structure
1205 Buckeye Ave	No, Less than 10,000	Replace Paving and install landscaping and loadign dock
3311 East Lincoln Way	No, Less than 10,000	New lilo support structure and breezeway
3440 Grand Ave	No, Less than 10,000	Building addition and parking improvements
201 Gray Ave	No, Less than 10,000	Addition to fraternity house
905 9th Street	No, less than 10,000	Roosevelt Park Amenities
Green Brior Park Amenities	No, less than 10,000	Green briar Park Amenities
311 East Lincoln Way	No, less than 10,000	Barilla silo support structure and breezeway
135 Campus Avenue	No, less than 10,000	(new apartment building)
2400 bloomington	No, less than 10,000	Ascension Lutheran Church modular classroom
111 Lynn Ave	No, less than 10,000	Renovaton of existing apartment
307 Ash	No, less than 10,000	Convert apartments into sorority housse
2600 Norhridge Parkway	No, less than 10,000	Flatiron Lofts , small office building
2200 Hamilton Drive	No, less than 10,000	Green Hills improvments
400 Main Street Ames	No, less than 10,000	sitewalk improvements
1105 Top O Hollow Road	No - less than 10,000	Addition to substation
1805 East Lincon Way	No	?
2120 Lincoln Way	No	Improvments to fraternity
2500 Ford Street	No	This site has a 2010 site plan which did quantity controls
2007 Greeley Street	No	Improvments to sorority
215 SE 5th	No , less than 10,000 interior work	Petsmart to new store
2804 & 2410 Chamberlain Street	No, less than 10,000	Apartments/Restoratn on ground floor
1712 East Lincoln Way	No - Less than 10,000	Parking lot improvements and demo of building
1404 Boston Ave	No - less than 10,000	Pizza Ranch
534 South Duff	No	Improvments to Walmart.
2312 Edision	No, less than 10,000	
2400 University	No, less than 10,000	Addition to gas station (car wash)
2326 SE 5th Street	No, Less than 10,000	Paved parking lot, possible future buiding.
820 miller (play ground equipment)	no (soccer field did not effect storm water management	soccer field
600 South Maple Ave	No, less than 10,000	Construction of a wireless tower and shelter
Cochrane Farms SD	Not yet	Not yet designed
Southfork 9th	No	single family lots on Coy East end
Scenic Valley 2nd Addition	No, Many componants of 5B, came in with 1st addion, Nate Easter	Scenic Valley
2516 Lincoln Way	No, Less than 10,000 (excludes sidewalk)	Mixed use development (Randle propery on Lincoln Way)
301 South 4th	No, Less than 10,000 Fire	Construcion of apartment building
114 South Duff	No, Less than 10,000	Demo of old building, build new boulder tap house restaurant
2320 Lincoln Way	No, less than 10,000	Exterior attached walk in cooler for blaze pizza
801 Dayton	No, Less than 10,000	50X11'4" mobile modular laboratory
1300 Coconino	No, Less than 10,000	Sidewalk, fence, pavement around pool, landscaping
409 South Duff	No, Less than 10,000	exterior shell and façade renovation and parking lot renovation
1015, 1111 Duff Ave	No, Less than 10,000	MGMC Paving repairs - Medical Arts Bldg
301 South 4th	No, rebuilt after fire (less then 10,000)	Multi Family Residential Building (Oakridge Apartments)
313 Lynn Ave	No, Less than 10,000	Remodel and building additon (Delta Gamma Sorority)
406 & 410 Freel Drive	no , less than 10,000	Concrete Slab expansion for two existing bldgs
3502 Lincoln Way	Case withdrawn	
517 Lincoln Way	No, Less than 10,000	Tropial Smoothie Café Deck
1300 Coconino	No, Less than 10,000	5,000 square foot garage and parking
1320 Dickson	No (regional and less than 10,000)	Mini golf course
201 Gray Ave	No, might have pervious pavement	Addition to fraternity house
316 Hayward	No, Less than 10,000	Construction of town homes
439 South Maple	No, Less than 10,000	Parking Lot Renovations
1307 East Lincoln Way	No, Less than 10,000	J&K Shop Addition
1209 North Dakota	No, Less than 10,000	construction of maintenance shed
2120 East 13th	No - Less then 10,000	Manatts office building addition
1000 East 13th street	No - Less then 10,000	AOA Ash Handling Operation Bldg.
138 Gray Ave	No, Did pervous pavemet to stay below 10,000	Fraternity House 3 story 42 bed.
217 6th Street	No, Less than 10,000	east entry enclosure
1200 East 13th	No, Less than 10,000	Park Shelter and water fountain
3720 Lincoln Way	No, Less than 10,000	Demo and constructon of restaurant (sports page)
3615 Lincoln Way	No, Less than 10,000	Attached garage and driveway
716 South Duff	No, Less than 10,000	Restaurant and retail (jimmy Johns)
2811 West Street	No, Less than 10,000	Apartment Construction with grading, paving, and utility work (west street lofts)
3020 South Duff	No, Less than 10,000	Addition and remodel of esisting Casey store
1817 East Lincoln Way	No, Less than 10,000	Enterprise Rent-A-Car
Revisions to 2807 & 2810 Bobcat Drive	no	Previously did SWM
2120 E. 13th Street	No, Less than 10,000	Reconstruct Manatts office Bldg
408 Freel Drive	No, Less than 10,000	50 x 75 building
615 South Dayton Avenue	No, Less than 10,000	Warehouse Addition
314 South 17th Street	N/A case withdrawn	Bld. Addtion, Detention Basin
311 Ash	No, Less than 10,000	Addition and Renovation of Fraternity
3707, 3711, 3715 Marigold Drive	No - regional detention in subdivision	Construction of three townhomes
2715 Northridge Parkway	No, Less than 10,000	Construct 1 Story commercial Building - office building
1205 Buckeye Ave	No, Less than 10,000	Paving, loading Dock, trash enclosure

MINUTES OF THE SPECIAL MEETING OF THE AMES CITY COUNCIL
AMES, IOWA APRIL 17, 2018

The Special Meeting of the Ames City Council was called to order by Mayor John Haila at 6:00 p.m. on the 17th day of April, 2018, in the City Council Chambers in City Hall, 515 Clark Avenue. Council Members Bronwyn Beatty-Hansen, Gloria Betcher, Amber Corrieri, Tim Gartin, David Martin, and Chris Nelson were present. *Ex officio* Member Rob Bingham was also in attendance.

2018 AMES ANNUAL OUTDOOR SCULPTURE EXHIBITION SELECTIONS: Moved by Beatty-Hansen, seconded by Gartin, to adopt RESOLUTION NO. 18-202 approving 2018 Ames Annual Outdoor Sculpture Exhibition selections.
Roll Call Vote: 6-0. Resolution declared adopted unanimously, signed by the Mayor, and hereby made a portion of these Minutes.

AWARD CONTRACT TO BRIMHALL INDUSTRIAL, INC., MONTE VISTA, CO, FOR UNIT 8 FEEDWATER PUMP INSPECTION AND REPAIR: Moved by Corrieri, seconded by Gartin, to adopt RESOLUTION NO. 18-203 awarding a contract to Brimhall Industrial, Inc., Monte Vista, CO, for Unit 8 Feedwater Pump Inspection and Repair in the amount of $61,590 plus applicable sales taxes to be paid directly by the City of Ames to the state of Iowa.
Roll Call Vote: 6-0. Resolution declared adopted unanimously, signed by the Mayor, and hereby made a portion of these Minutes.

ORDINANCE VACATION OF APPLE PLACE AND PEACH LANE RIGHTS-OF-WAY: Moved by Betcher, seconded by Beatty-Hansen, to pass on second reading an Ordinance to vacate Apple Place and Peach Lane rights-of-way.
Roll Call Vote: 6-0. Motion declared carried unanimously.

POST-CONSTRUCTION STORMWATER MANAGEMENT ORDINANCE: Municipal Engineer Tracy Warner reminded Council about the Ordinance that was passed four year ago. Ames is required to obtain a Municipal Separate Storm Sewer System (MS4 Permit). The Ordinance requires that the site improvements be designed to control water quantity and to improve water quality from the stormwater runoff of applicable development properties within the City. It also encourages the use of low impact development to increase on-site infiltration, reduce pollutant loads in receiving waterways, and reduce stormwater runoff volumes from developed areas. Ames has the following Watersheds: South Skunk River, Squaw Creek, Onion Creek, Clear Creek, College Creek, and Worle Creek. The City of Ames is a Phase II MS4 community; which is determined by population, proximity to large, urbanized areas, and the water quality of receiving streams.

Municipal Engineer Warner informed Council about the response to the proposed development and concern to protect the Ada Hayden Watershed. There was a lot of community discussions about low-impact development and the look. Staff met with developers and engineers to work out conservation plans on the parcels and ultimately came up with an Ordinance that was required in the undeveloped portions of Ada Hayden Watershed north of Bloomington Road that could also be implemented all over the City. This was adopted by City Council in 2010. The features were to protect the quality of water. Staff recognized the need for Conservation Area Management Plans. This is to make sure the conservation areas are maintained and functional into the future.

Council Member Gartin conveyed some frustration that the restricted covenant did not reference the efforts for conservation of the Watershed. There are some specific expectations the City has stated to conserve the Ada Hayden Watershed. It is unrealistic to think a buyer is going to look for those kinds of things, which makes this effort difficult to enforce. Mr. Gartin is very concerned about protecting the Watershed. Ms. Warner responded that buffer locations were discussed along with conservation easement areas, native landscaping, rock areas, mailings to get education out and outreach to the lawn care companies. Council Member Gartin confirmed that there is water testing every five years.

Ms. Warner stated the requirement of the MS4 Permit is the adoption of the Ordinance and amendment, as needed, to enforce the reduction in stormwater runoff volumes on redevelopments and new developments after construction has been completed. Water quality and quantity components must be considered in the design of new construction and implemented when practical. The use of storm water detention, retention, infiltration, and other Best Management Practices are promoted. The City Hall Parking Lot project, and other new developments and redevelopments have been achieved this goal through either detention basins or underground storage. Water quality improvements have been achieved primarily through wet detention basins, soil quality restoration, native landscaping, or underground mechanical units.

Municipal Engineer Warner noted that many workshops and public meetings were held to discuss the historic landscape, development, and how the uncontrolled runoff it has a higher rate of flow than if there was agriculture or prairie. Stream assessments were done in 2007 and updated in 2011 to show the condition and erosion of all the streams in Ames. This let staff know the condition of the streams to help when creating an Ordinance. Stormwater Quality points are native landscaping, permeable paving, rain gardens, and soil quality restoration.

Ms. Warner stated that staff knew that water quality and quantity needed to be managed. The runoff curb number 58 is used now considering a meadow in good condition to design back to. If an area is paved now and then redeveloped, there is no flood reduction and improved water quality, so it should go back to the meadow in good condition. A runoff curb number was incorporated as well as adoption of the Stormwater Management Manual.

Council Member Nelson inquired about the runoff number of 58. Ms. Warner replied that any category can be used. Ames is more in the prairie and wet marshy areas that mimic the more historic landscape of Ames. Mr. Nelson wondered if one category is a good approximation for the whole town of Ames. Ms. Warner responded that the curb number could be lower due to the land being very wet and where people once were able to duck hunt.

Ms. Warner continued to report on localized flooding that occurred due to housing being adjacent to water features. The concept of three foot above the 100-year water surface elevation to give the houses some cushion to make sure the houses would not be impacted in the new housing developments. They also had the option to flood proof. Staff recommended not taking on the long-term maintenance responsibility because the homeowners associations often don't have the money to do big pond maintenance. Council Member Gartin interjected that the Council had felt that this

was a public benefit. The benefit was not just for that homeowner association, but the whole community. Mr. Gartin said he believed that when one area is cleaned out and functioning well, it benefits the whole community. It was viewed as a public good so that the costs would be socialized across the community.

Municipal Engineer Warner educated Council on the Financial security and Performance Bonds. Financial Security is the component to make sure the facilities are constructed correctly. Once the facility is constructed, the City receives as-builts, which staff will review. Staff will go back to the engineers with questions, or if it is meeting expectations, staff will ask the engineer to make a statement stating that it does comply, then staff will release the Financial Security. That is when a Performance Bond is necessary because the native vegetation takes three to four years to get established, and the City wants to make sure that will be maintained. Council Member Nelson asked at what point in the development process the Financial Security would be required to be submitted. Ms. Warner responded that for a site plan, it is at approval time; for subdivisions, it would be at the time the Final Plat is filed for City approval.

Ms. Warner stated that there is the ability to do waivers. Partial waivers could be on-site or a combination of on-site and off-site facilities. Most appeals have been financial-related and are not a consideration under the Ordinance. Council Member Gartin inquired if the City had granted some waivers. Ms. Warner responded that the City has granted some waivers.

Municipal Engineer Warner informed Council that after the Ordinance was passed staff, wanted to support the development community as it was implemented. A Technical Guidance document was created, a class was given about the Ordinance; and staff created checklists, data summary sheets, and design principles. Some features in the City are underground facilities, ponds, the permeable paving parking lot at City Hall, rain gardens, and use of retaining walls. Some of the challenges are groundwater source, protecting the wells, as-built conditions, financial security catching developers off guard, redevelopment, and maintenance.

Council Member Gartin inquired about measures taken outside of the Stormwater Management Ordinance to handle flood waters. Ms. Warner responded that the flood mitigation study was done with a concept to do channel clearing at South Duff. In the Capitol Improvements Plan (CIP), there is a stormwater system analysis for looking at the hydraulic capacities throughout town to see where there are issues with the stormsewer capacities. Council Member Gartin added that there are other factors that contribute to the flooding. Ms. Warner noted that there is a lot fewer phones calls on home flooding and less flooding at the City's intersections.

Erv Klaas, 1405 Grand Avenue, Ames, stated that the Friends of Ada Hayden is developing and planning some outreach and education to the homeowners and signs to help protect the watershed. Climate change is going to impact this area with increased rainfall and possibly more flooding. That is why the Watershed is so important. It is important to stress building soil health by adding more organic matter to the soil and increasing permeability. Infiltrating water goes into deep ground and becomes part of the ground water; which means that it slowly seeps into the streams. It relieves the drought effects.

Luke Jensen, 2519 Chamberlain, Ames, stated his focus was on pure maintenance activities related to existing parking lots; areas slated for general improvement. That will trigger Ordinance 5B, and he feels that creates undue tension with parking compliance. The second point are the challenges that relate to infill sites (smaller sites that are two to three acres or less that are within neighborhoods). Feasability and practicality are not being implemented when trying to accomplish all things with a building structure on a small lot and then having to go underground to meet this Ordinance. Mr. Jensen suggested relaxing the one-acre disturbance and moving it back to two to three acres. Mayor Haila asked Mr. Jensen to explain his point concerning the maintenance activities. Mr. Jensen responded that there needs to be a clarification between a maintenance activity and redevelopment activity.

Justin Dodge, 105 South 16th Street, Ames, prepared a table of the ten largest cities in Iowa that have an MS4 Permit. Mr. Dodge stated that the disturbance area threshold is one acre or impervious paving of 10,000 square feet is the criterion in Ames that triggers the Post Stormwater Ordinance. The Department of Natural Resources (DNR) threshold that is recommended for the minimum is one acre. He hopes to drop off the impervious. Mr. Dodge feels that Ames is a little stringent in comparison to the ten largest cities in Iowa. He feels that things were pushed through because of the scare of losing the MS4 Permit. In reference to the meadow in good condition Class B Soils, Mr. Dodge suggested to look at the condition of soils when it was being farmed and earlier times. Another concern was that there must be a distinction between create versus replacement when deciding on compliance for things such as parking lots. Mayor Haila stated his concern about Ames being built in a swamp area. One acre is a substantial amount of area to dump into the stormsewer system, considering the low lying areas and the adverse affect on them. Mr. Dodge stated that one acre is a small size when looking at parcel sizes and what land actually has to be disturbed.

Ben Jensen, 708 Highway 69, Huxley, stated that the size is very important. Some projects can become financially infeasible by hitting that 10,000 square foot threshold, then having to do underground stormwater management, which can be up to 10% of the total cost of the construction for the site. There have been at least two projects that did not happen due to the additional burden of the stormwater management. He suggested the expansion to one acre for land disturbance and impervious pavement being a net, not a gross, amount. Mr. Jensen addressed the financial security for stormwater management. This is time-consuming and holds up construction; can be a 30-day delay. This also puts additional burden on staff. He stated that he pays twice, because he begins by paying the City for the financial security for ten months, but also has to pay the contractor at the same time.

Council Member Gartin asked Ms. Warner to what degree should Council be concerned about the financial impact of the project. Council wants to encourage development but also respect stewardship to the citizens about the flooding. Ms. Warner responded that making changes piece by piece will be a long-term investment.

Scott Renaud, 414 S. 17th Street, Ames, feels that the City should be looking to see if there is an issue downstream to determine if that 10,000 square feet criteria is necessary in a particular location. If there is not an issue downstream, it doesn't make sense to spend the extra money. There are some

areas where it does need to be done. It is necessary to be wise about the use of the money. Mr. Renaud stated that he feels that there are some costs that come with a project that are unnecessary. The systems are not plumbing systems and should not be required to have a plumbers permit for the stormwater systems. The systems are specialized environmental systems with specialized requirements that are certified by a landscape or engineer or architect.

Mr. Renaud feels that Financial Security is not necessary and is not a requirement of the DNR. The bond form that is supplied by the City is difficult to understand, owners do not typically bond, and it is a time issue that creates a lot of work, but doesn't produce anything. The systems are the first thing put in, but the last thing to get money back. There is a lot of money out there for a long period of time doing nothing. He suggested more of a blanket number per acre, not necessarily a large amount. He asked the City to simplify the financial security amount per acre and have a simple system that is one page either cash or escrow. The bonding would be with the Site Plan Permit.

Chuck Winkelblack, 105 S. 16th Street, Ames, reminded Council of the discussions that were had when 5B was created. Mr. Winkelblack stressed education to the neighbors about restrictions for the Watershed by getting mailers out. He feels the simplest solution to financial security is to tie it to occupancy. Many things are done while putting in the stormwater management system. Sub-contractors now have to decide what is with the system. Put it in the process before occupancy is certified. The process is cumbersome. Sometimes things seem to not make sense and cost money, but developers need to know things are done right. If the structure needs to be corrected, before the contractor gets paid is the best time to get that person back to correct the issues and have it done right.

Mr. Winkelblack addressed the meadow in good condition in Ames. The commercial area is tight. Such areas as the Lincoln Way Corridor, unless there is combining of sites together, there is not a lot of space to do it. There is not always a place to outlet the stormsewer water. There are places in the City that don't have effective stormsewers. New development does not have many issues, it is the redevelopment or infill that cause the anxiety. He recommended the DNR minimum of one acre for land disturbance.

Jeff Harris, 1615 Golden Aspen Drive,Suite 110, Ames, stated there needs to be a definition among maintenance project, redevelopment, and new development. The language needs to be clarified for people to understand. He feels that on new projects the 10,000 feet is appropriate, but for redevelopment the one acre would be sufficient. There needs to be some distinction for maintenance projects. Maintenance projects are not creating any impervious cover, it is pre-existing, taking it down for maintenance purposes and replacing it. Redevelopment is making changes to the land and structure. Creating means bringing something new that was not there before; working on vacant land.

Roger Kluesner, 2702 Cottonwood Road, Ames, stated that he is representing an entity that is affected by this. McFarland has been in need of parking lot repairs for the past two years. The goal was to tear up the payment and fix a little intake that had sunk a bit and pave the little under an acre area. McFarland was told there was a stormwater issue and that it was subject to the stormwater

requirement. This requirement increased the repair of the parking lot by 60%. This is impractical and would require taking a lot of resources from other things that need more attention. The interpretation needs to be cleared up among development, redevelopment, and maintenance.

Council Member Gartin suggested eliminating the triggering of the Stormwater Ordinance when maintenance is being done to a parking lot, but not increasing the square footage or impervious surface. The City needs to balance between the benefit to the City and the cost to an owner. Council Member Betcher stated there has to be a time to improve the situations of areas before the Stormwater Ordinance came into effect. The opportunity is when there is enough tearing up of the land.

Moved by Gartin, seconded by Corrieri, to direct staff to come back with a revision to the Storm Water Ordinance that the maintenance of a parking lot, not an increase of impervious surface, of a parking lot does not trigger the 5B obligations.

Municipal Engineer Warner cautioned Council that replacing the parking lot of an older lot could mean that it might not meet current parking regulations. The replacement of the parking lot may expand the impervious surface in order to meet the new regulations. She noted that she will need to have a conversation with Planning.

Council Member Betcher conveyed her uncertainty that every parking lot is in the same situation. There could be a parking lot that will only have one chance to correct stormwater issues. The cost of that could be the continued flooding if something isn't done and will cost everyone because of the impacts of the flood.

Mayor Haila commented that he would like to see if there could be data on whether the amount of money to put into the larger parking lots for the stormsewers would reap an equivalent benefit for the City. Municipal Engineer Warner responded that the system analysis that is going to be done to identify where there are deficiencies in the pipe network would be able to help. That is not a study that has been done at this time. Council Member Beatty-Hansen added that her concern is that people will let those parking lots just deteriorate. Then it will be a huge financial burden to get those lots back up to par. Council Member Betcher inquired as to whom will have the negative effect, the individual owner that is not putting the money into their parking lot or the taxpayers that may have the impact of the flooding because property owners did not put in appropriate drainage. Council Member Nelson added that this will cause people to not invest in properties because $200,000 per acre is an insurmountable amount of money for a small project when the land is only a quarter of that per acre.

Council Member Martin suggested the encouragement of use of biosoils. Council Member Nelson added that there might be a way to reduce parking requirements to put in biosoil. Ms. Warner stated she could speak with Planning concerning the parking requirements and how they have changed. A change could be to require owners to do water quality volume addressing the nutrients the first flush of an inch and a quarter per acre to go through the biosoils, but then not the flood control. This would quantify giving features that manage that water quality volume.

Council Member Gartin withdrew his motion.

Moved by Corrieri, seconded by Martin, to direct staff to prepare a report to remove the triggering of Chapter 5B when parking lots are maintained but does not increase the impervious surface, with allowances, and options for incentivizing additional water quality improvements.
Vote on Motion: 5-1. Voting Aye: Nelson, Martin, Beatty-Hansen, Gartin, Corrieri. Voting Nay: Betcher. Motion declared carried.

Moved by Corrieri, seconded by Nelson, that financial security would be required prior to occupancy if the requirements have not been met.

Council Member Nelson stated this holds the money for the shortest amount of time should the money need to be held. This also gives the City recourse.

Vote on Motion: 6-0. Motion declared unanimously.

Moved by Betcher, seconded by Nelson, to direct staff to report on whether runoff curb number 58 is the only number or most appropriate number for all of Ames.
Vote on Motion: 5-1. Voting Aye: Nelson, Martin, Beatty-Hansen, Gartin, Betcher. Voting Nay: Corrieri. Motion declared carried.

Moved by Betcher, seconded by Beatty-Hansen, to direct staff to bring back a report on some areas outside of Iowa that have similar hydrology and what their standards for impervious surface are and what the post construction Stormwater Ordinances are.

Council Member Nelson commented that is very broad spectrum. Just in Iowa it is very broad. He feels Council has flexibility to do what is best for the community. Council Member Gartin added that these regulations are developing within a state regulatory scheme. Each state would be somewhat different than Iowa.

Vote on Motion: 1-5. Voting Aye: Betcher. Voting Nay: Nelson, Martin, Beatty-Hansen, Gartin, Corrieri. Motion failed.

Moved by Nelson, seconded by Corrieri, to direct staff to come back with suggestions to change 5B to make impervious cover be the same as a land disturbance at one acre to be included in the previous staff report.

Vote on Motion: 5-1. Voting Aye: Nelson, Martin, Beatty-Hansen, Gartin. Voting Nay: Betcher. Motion declared carried.

Moved by Corrieri, seconded by Betcher, to ask staff to provide recommendations for alternative inspections besides a licensed plumber.
Vote on Motion: 6-0. Motion declared unanimously.

Moved by Gartin, seconded by Betcher, to direct staff to provide Council a report on the use of cover crops, buffer strips, and other best practices in conservation for the City-owned farmland.
Vote on Motion: 6-0. Motion declared unanimously.

Moved by Gartin, seconded by Corrieri, to direct staff to provide Council a report on the status of bank stabilization on South Duff and put on future agenda.
Vote on Motion: 6-0. Motion declared carried unanimously.

DISPOSITION OF COMMUNICATIONS TO COUNCIL: Moved by Corrieri, seconded by Nelson, to refer the letter concerning tennis courts and possible partnership with the School District to Parks and Recreation.
Vote on Motion: 6-0. Motion declared unanimously.

Moved by Gartin, seconded by Corrieri, to direct staff prepare a report in respect to the sale of the City-owned land on 6th Street.
Vote on Motion: 6-0. Motion declared unanimously.

COUNCIL COMMENTS: *Ex officio* Rob Bingham informed Council about the preparation for the next *Ex officio.*

Moved by Beatty-Hansen to adjourn at 9:24 p.m.

Staff Report

POST-CONSTRUCTION STORMWATER MANAGEMENT ORDINANCE

June 26, 2018

BACKGROUND:

On April 17, 2018 the Ames City Council held a workshop to discuss various components of the existing Post-Construction Stormwater Management Ordinance. Following City staff's presentation about the ordinance, the public was invited to provide their thoughts and comments about the existing ordinance and desired changes. Ultimately, this resulted in several motions by City Council for additional information and alternatives to be brought back at a future meeting.

MAINTENANCE OF PARKING LOTS:

Moved by Corrieri, seconded by Martin, to direct staff to prepare a report to remove the triggering of Chapter 5B when parking lots are maintained but does not increase the impervious surface, with allowances and options for incentivizing additional water quality improvements.

Currently, maintenance of parking lots is understood to include patching, milling and overlaying, etc. and it does not trigger any City review for stormwater. The reconstruction of a parking lot is not considered maintenance. Reconstruction is considered creation of a new impervious surface and, according to our existing Code, if it is greater than 10,000 square feet in size, it is subject to meeting stormwater treatment requirements of 5B. For context, the 10,000 square foot threshold is roughly equal to a standard 30 to 35 space parking lot.

Before contemplating a change in the 10,000 square foot threshold, the City Council should understand the impact on the City's sewer system by parking lot runoff. As an example of how runoff is generated from parking lots, staff has calculated the stormwater runoff from two of the sites discussed during the City Council workshop in April. As can be seen in the following tables, these peak flows have been equated to a pipe diameter.

	Fareway Parking Lot (1.5 acres) TR-55 Runoff Analysis		
	24-hour Storm Event (in)	Peak Flow (cfs)	Equivalent Concrete Pipe Diameter Flowing Full at 0.28% slope
1-year	2.67	5.04	16 inches
5-year	3.81	7.26	18 inches
10-year	4.46	8.51	20 inches
100-year	7.12	13.66	24 inches

The existing storm sewer pipe where the Fareway in downtown currently discharges is an 18-inch pipe. If left as it is today, the Fareway parking lot runoff would use nearly the full capacity of the adjacent storm sewer pipe in a 5-year event.

	McFarland West Parking Lot (1.25 acres) TR-55 Runoff Analysis		
	24-hour Storm Event (in)	Peak Flow (cfs)	Equivalent Concrete Pipe Diameter Flowing Full at 1% slope
1-year	2.67	4.20	13 inches
5-year	3.81	6.05	15 inches
10-year	4.46	7.09	16 inches
100-year	7.12	11.38	18 inches

The existing pipe adjacent to the McFarland West site is 24-inch and drains approximately 40 acres of developed land. In a 5-year storm event, if left as it is today, the McFarland West parking lot runoff would use one-fourth of the capacity of the adjacent storm sewer pipe.

This illustrates the opportunity that is lost to make improvements for the existing storm sewer system if run-off is left uncontrolled following parking lot reconstruction.

OPTIONS:

Option 1. Chapter 5B could be modified to define parking lot reconstruction with no net increase in impervious area as maintenance, thus making it exempt from 5B requirements entirely. **Alternatively, if the parking lot is expanded while replacing the existing parking lot, such a project would be subject to the Chapter 5B requirements for the whole project.**

A reconstructed parking lot would still be subject to Zoning Ordinance standards of Chapter 29 (parking quantity, dimensions of the spaces/aisles, and landscaping).

Option 2. A second option for reconstruction would be to require only partial compliance with 5B to meet water quality only rather than both water quantity and quality requirements. This approach would lessen the size of the stormwater management features that would be required.

Option 3. Rather than exempting reconstruction from the 5B requirements, the City Council could focus on allowances to reduce required parking and landscaping. Currently, the Planning Director can waive up to 10% of the required parking for sites with 30 or more spaces for the purpose of adding landscaping, which could include stormwater features. Additionally, using landscaping as a stormwater treatment measure can serve to substitute for other landscaping requirements within parking lots. **Should the City Council believe this 10% incentive is not sufficient, direction can be given to make changes to the zoning standards to allow for a greater parking reduction (i.e. 20% reduction) or for any size of parking lot (not just 30 spaces or**

more) to take advantage of the reduction to help facilitate stormwater improvements with parking lot reconstruction.

Option 4. The City Council could **maintain the current standard** that parking lot reconstruction of greater than 10,000 SF must comply with 5B.

FINANCIAL SECURITY:

Moved by Corrieri, seconded by Nelson, that financial security would be required prior to occupancy if the requirements have not been met.

The current ordinance requires that financial security must be submitted prior to approval of stormwater management improvement plans.

OPTIONS:

Option 1. Amend Chapter 5B to require financial security in an amount for the total estimated construction cost to be on file with the City prior to a temporary Certificate of Occupancy being granted.

Option 2. Amend Chapter 5B to require financial security in an amount for the total estimated construction cost to be on file with the City prior to a final Certificate of Occupancy being granted.

Option 3. Maintain Chapter 5B as it currently exists, thereby requiring the financial security to be submitted prior to issuance of permits and commencement of construction

If City Council chooses to amend the current ordinance, staff would prefer Option 1 (security prior to temporary Certificate of Occupancy). This is because if Option 2 is followed, there is the potential that the work may not be completed since the building is fully occupied.

Under either of these Options, this financial security or bond would be released in full only upon submission of "as built plans" of all stormwater BMPs specified in the stormwater management plan and written certification, etc. as already specified in the ordinance (paragraph from current ordinance).

RUNOFF CURVE NUMBER:

Moved by Betcher, seconded by Nelson, to direct staff to report on whether runoff curve number 58 is the only number or most appropriate number for all of Ames.

The current ordinance requires the rate and volume of surface water runoff which flows from any specific development project site after completion to **not exceed the pre-development hydrologic regime of meadow in good condition**.

Runoff curve numbers (CN) indicate the runoff potential of an area. **The higher the CN, the higher the runoff that is allowed to leave the site.** Soil properties influence the relationship between runoff and rainfall since soils have differing rates of infiltration.

As described by the United States Department of Agriculture (USDA), soils are assigned to one of four hydrologic soil groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms. The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

The historic landscape of Ames is said to have been open tall grass prairie. Historic soil surveys of the Ames area refer to glacial origin. Below are some highlights from the 1903 *Soil Survey of Story County*. **This indicates that over 82% of area soils were Marshall loam which is a Group B soil.**

Viewed broadly, the surface of Story County is a level plain. Its average elevation above sea level is about 1,000 feet. The greatest elevation is reached near Summit, at a point on the Gary Moraine, which is 1,075 feet above tide, and the lowest level is reached in the valley of the Skunk River, where that stream leaves the county at an elevation of 830 feet above sea level. Kamelike eminences occur quite frequently in the moraine belts and, rising in groups of gravelly knolls, form a salient feature of the landscape in some sections of the county.

The drainage features of the area may be described as extremely immature. It needs but a casual glance at the surface of the county to see that the present stream system is entirely inadequate to carry off the annual rainfall. The main drainage systems are the Skunk River, with its tributary, Squaw Creek, and Indian Creek, which flows into the Skunk River beyond the limits of the county. Skunk River, in the southern part of the county, occupies a broad, level valley and meanders widely upon its flood plain. Here it undoubtedly occupies a preglacial drainage valley, which has been filled in to a depth of 100 or more feet by glacial and fluvial material. Above Harmonies Mill, however, the valley shows more signs of youth and the river seems to be active in deepening its channel rather than broadening its flood plain. This part of its course is probably of postglacial formation.

SOILS.

Six soils were recognized and mapped in the area surveyed. Of these one type, the Marshall loam, covers over 82 per cent of the area, the remaining five types thus covering less than 20 per cent. The

names and the actual and relative areas of these soil types are given in the following table:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Marshall loam	303,808	82.4	Marshall clay loam	8,384	2.3
Miami black clay loam	21,952	6.0	Marshall fine sand	3,072	.8
Meadow	18,048	4.9	Total	368,640	.....
Miami clay loam	13,376	3.6			

The Marshall loam is found in every part of the area, covering about four-fifths of Story County. In general it occupies level or gently rolling prairie. Differences of more than 25 or 30 feet in elevation are rare, although in the regions of the glacial moraines small kamelike eminences occur, which rise to a considerable altitude above the surrounding prairie.

The origin, physiography, and drainage features of this soil are very intimately related to each other. The material was originally derived by glacial action at the time of the great Ice Age. In its retreat the ice sheet left a mass of débris of somewhat uneven thickness, covering the entire surface of the country. This great mass of material upon settling assumed the slightly hummocky surface which is now seen to characterize the prairie regions. The consequence was that there were innumerable little saucer-shaped depressions which had no natural outlet for the draining off of surface waters.

Natural Resources Conservation Service (NRCS) (part of USDA) established several runoff curve numbers based on soil infiltration rates**. Included below are a few relevant curve numbers, including the 58 (Meadow in good condition, Group B soils) as currently required in the Post-Construction Stormwater Management Ordinance. As previously noted, this value was based on the historic landscape of the Ames/Story County area.** Also included below are curve numbers for other conditions (which would be higher than meadow, indicating that the soils are more

compacted and runoff is more prevalent). **Another runoff curve number could be selected, however it would not reflect the historic landscape of Story County/Ames area. Since the runoff curve number is based on soils, other communities who have stormwater management requirements may use different runoff curve number requirements based on their historic landscape and soils.**

Cover description	*Curve numbers for hydrologic soil*			
Cover type	**A**	**B**	**C**	**D**
Agricultural land use				
Meadow – continuous grass, protected from grazing and generally mowed for hay	30	58	71	78
Woods:				
Poor condition	45	66	77	83
Fair condition	36	60	73	79
Good condition	304	55	70	77
Straight Row crops				
Poor condition	72	81	88	91
Good condition	67	78	85	89

The runoff curve number designated to be used for existing conditions affects the total runoff (rate and volume) able to be released from the site (into the existing storm sewer system and/or creek/river). **For example, as designated in the current ordinance, using a 58 runoff curve number will require detaining more volume for a period of time with a release slower into the public system than a site using a 71 runoff curve number, therefore a higher runoff curve number is not recommended by staff.**

OPTIONS:

Option 1. Direct staff to bring an ordinance amendment that designates a different runoff curve number (associated with a certain cover type, condition, and hydrologic soils group not native to Ames).

Option 2. Direct staff to maintain the current meadow in good condition (58) runoff curve number.

STORMWATER MANAGEMENT THRESHOLD CRITERIA:

Moved by Nelson, seconded by Corrieri, to direct staff to come back with suggestions to change 5B to make impervious cover be the same as a land disturbance at one acre to be included in the previous staff report.

The current ordinance states that stormwater requirements apply to any new development, any redevelopment disturbing 1 acre or more of land, or to any development disturbing less than 1 acreage of land if the amount of impervious cover created exceeds 10,000 square feet.

City Council should note that prior to adoption of the new Post-Construction Stormwater Management Ordinance in April 2014, all site developments were not able to increase runoff rates. With the new ordinance, sites with less than 10,000 square feet impervious became exempt from having to meet new ordinance requirements. Therefore, prior to April 2014 adoption, sites creating 10,000 sf or less were exempt from stormwater management requirements.

The following tables illustrate the increased run-off that is created by a 1 acre site as compared to run-off from a 10,000 SF site.

	10,000 SF of Impervious Area TR-55 Runoff Analysis		
	24-hour Storm Event (in)	Peak Flow (cfs)	Equivalent Concrete Pipe Diameter Flowing Full at 1% slope
1-year	2.67	0.77	8 inches
5-year	3.81	1.12	8 inches
10-year	4.46	1.31	8 inches
100-year	7.12	2.10	10 inches

	1 Acre (43,560 SF) of Impervious Area TR-55 Runoff Analysis		
	24-hour Storm Event (in)	Peak Flow (cfs)	Equivalent Concrete Pipe Diameter Flowing Full at 1% slope
1-year	2.67	3.36	12 inches
5-year	3.81	4.84	15 inches
10-year	4.46	5.67	15 inches
100-year	7.12	9.10	18 inches

Thus, increasing the impervious area allowed without needing to meet 5B Post Construction Stormwater Management Ordinance requirements will increase runoff from these sites and will likely increase the flash flooding potential already experienced in the Ames community. This could result in the need to replace/increase storm sewer pipe capacities throughout the community which would be reflected in an increase in the CIP budget to improve deficiencies.

OPTIONS:

Option 1. Direct staff to bring an ordinance amendment that changes the impervious threshold for meeting Chapter 5B Post Construction Stormwater Management Ordinance requirements to **1 acre**.

Option 2. **Maintain Chapter 5B** Post-Construction Stormwater Management Ordinance **as it currently exists**, thus requiring projects with impervious area of 10,000 sf or more to meet all provisions of the current ordinance.

INSPECTIONS:

Moved by Corrieri, seconded by Betcher, to ask staff to provide recommendations for alternative inspections besides a licensed plumber.

A reasonable alternative to requiring on-site stormwater management systems to meet city Plumbing Code requirements as installed by a licensed plumber, can be to require that installation meets Statewide Urban Design and Specifications (SUDAS) and City of Ames Supplemental Specifications as already adopted and used for public infrastructure construction such as storm sewer.

If this alternative is confirmed by City Council, staff would coordinate with Building Inspections and Public Works staff to implement this change, including eliminating the requirement that a licensed plumber be responsible for completing these inspections.

OPTIONS:

Option 1. Direct that stormwater management system components be constructed in accordance with SUDAS and City of Ames Supplemental Specifications, negating the need for a licensed lumber to perform inspections. Staff believes this is a reasonable change.

Option 2. Maintain the current requirement of a licensed plumber for inspecting the stormwater management system.

CITY OF AMES FARMLAND CONSERVATION BEST PRACTICES:

Moved by Gartin, seconded by Betcher, to direct staff to provide Council a report on the use of cover crops, buffer strips, and other best practices in conservation for the City-owned farmland.

A City Manager Memo has been provided to City Council.

FLOOD MITIGATION – RIVER FLOODING PROJECT UPDATE:

Moved by Gartin, seconded by Corrieri, to direct staff to provide Council a report on the status of bank stabilization on South Duff and put on future agenda.

A Major Projects Update Staff Report will be provided to City Council by the beginning of July.

RECENT COMMUNITY FLOODING UPDATE:

The City of Ames continues to experience significant flooding in the community. Some floods are result of river/creek flooding (community runoff and rain in the watershed) and other more frequent flooding (runoff from impervious areas, flash flooding, localized

flooding in neighborhoods) are the results of significant (heavy) rain fall intensities such as more than 5 inches of rain falling over a short period of time on September 22, 2016 and again on June 14, 2018.

On average, the public storm sewer system in the community is designed to accommodate flows of a 5 to 10 year rainfall intensity. A 10-year rainfall intensity would be considered when 4.94 inches of rain falls over a 48-hour period or 3.61 inches of rain falls in a 6-hour period.

On June 14, 2018, the Ames Municipal Airport weather gauge indicated that 4.25 inches of rain fell in the area between 3:30 AM and 11:00 AM. This would equate close to a 25-year intensity. Numerous residents of the north part of Ames have indicated that their rain gauges reported more like 6.8 inches of rain during that same rain event, which would equate closer to a 100-year intensity.

During the June 14, 2018 rain event, several streets were temporary closed due to flooding. Eventually, the storm sewer systems were able to catch up when the water levels receded and streets were re-opened to traffic. Additionally, that morning, numerous residents experienced water in basements due to sump pumps not being able to discharge against full capacity storm sewer pipes. Some residents and businesses experienced surface water entering through windows or doors. Other residents experienced cars being flooded in parking lot within the floodway area.

The current requirements of Chapter 5B Post-Construction Stormwater Management Ordinance are intended to mitigate these types of effects that we are experiencing in Ames. Relaxing these requirements could exacerbate the negative impacts from heavy rainfall and flooding.

If City Council selects options that result in ordinance changes, staff will bring back a revised ordinance for three readings and adoption at a future City Council meeting.

MINUTES OF THE REGULAR MEETING OF THE AMES CITY COUNCIL

AMES, IOWA **JUNE 26, 2018**

The Regular Meeting of the Ames City Council was called to order by Mayor John Haila at 6:00 p.m. on June 12, 2018, in the City Council Chambers in City Hall, 515 Clark Avenue, pursuant to law. Present were Council Members Gloria Betcher, Bronwyn Beatty-Hansen, Tim Gartin, David Martin, and Chris Nelson. Council Member Amber Corrieri joined the meeting telephonically. *Ex officio* Member Allie Hoskins was also present.

Mayor Haila announced that Council would be working off of an Amended Agenda. Added under Consent were:

1. Motion approving 5-day (July 22-26) Class C Liquor & Outdoor Service for Your Private Bartender at Reiman Gardens, 1407 University Boulevard, pending approval of Iowa State University
2. Resolution approving Commission On The Arts (COTA) Special Project Grants for Fall 2018
2. Resolution approving partial completion of public improvements and reducing amount of security required for Crane Farm Subdivision 2nd Addition

CONSENT AGENDA: Council Member Martin requested to pull Item No. 20, requests for Ames Pridefest on September 29, 2018 for separate discussion.

Moved by Betcher, seconded by Beatty-Hansen, to approve the following items on the Consent Agenda with the corrected Minutes:

3. Motion approving payment of claims
4. Motion approving Minutes of Regular Meeting of June 12, 2018
5. Motion approving Report of Contract Change Orders for June 1-15, 2018
6. Motion approving new Class C Liquor & B Native Wine Permit for BN'C Fieldhouse, 206 Welch Avenue, pending final inspection
8. Motion approving 5-day (July 22-26) Class C Liquor & Outdoor Service for Your Private Bartender at Reiman Gardens, 1407 University Boulevard, pending approval of Iowa State University
9. Motion approving temporary Outdoor Service (for sidewalk café) for Olde Main Brewing Company, 316 Main Street
10. Motion approving temporary Outdoor Service (for sidewalk café) for JJC Ames 1 LLC (Fuzzy's Taco Shop), 2420 Lincoln Way, Ste. 103
11. Motion approving temporary extension of Outdoor Service area for The Mucky Duck, 3100 S. Duff Avenue for July 24-25
12. Motion approving renewal of the following Beer Permits, Wine Permits, and Liquor Licenses:
    a. Special Class C Liquor – Hickory Park, 1404 South Duff Ave.
    b. Special Class C Liquor & Outdoor Service – Botanero Latino, 604 E. Lincoln Way
    c. Class C Liquor & Catering – Jethro's BBQ, 1301 Buckeye Avenue
13. Motion approving request from Ames Convention & Visitors Bureau for Fireworks Permit for display from ISU Lot G7 at dusk on July 3 with rain date of July 5 at dusk for Independence Day

documents indefinitely and also review the cost and retention strategy in July of 2020.

Vote on Amendment: 6-0. Amendment declared carried.

Vote on Motion, as Amended: 6-0. Motion declared carried unanimously.

Moved by Martin to have staff report back to Council on how far back old records could be put online.

Ms. Gwiasda stated that the actual pdf files are probably kept from the last three to four years.

Motion died for lack of second.

Meeting recessed at 9:00 p.m. and reconvened at 9:12 p.m.

Council Member Corrieri has left the meeting.

POST-CONSTRUCTION STORMWATER MANAGEMENT ORDINANCE: Municipal Engineer Tracy Warner explained that maintenance is meaning reconstruction when discussing parking lots. If a business would reconstruct, take it back to soil with the 10,000 square feet of impervious area that is what would trigger the stormwater management requirements. There are additional current zoning requirements that would be a part of the requirements. City Council asked to have additional water quality improvement incentives. The option currently is to waive 10% of the parking standards to allow for additional landscaping. Incentivizing for landscaping could be used for surface water treatment, or look at further parking reductions.

Council Member Martin inquired about the incentive option in reduction of parking spaces. He wanted to know what sort of relief that gave to the developer in construction cost. Ms. Warner responded that the first inch and a quarter of rain per acre would be treated in water quality volume. The first inch and a quarter would remove pollutants through a system so not to degrade the streams. Some landscape medians could be a depression and some of the water can go into those and can be planted with soil and plants and that uptakes the nutrients and filters it out before it goes into the sewer system. Council Member Beatty-Hansen noted that the incentive can be dependent on size of the property. A big box store may not have much incentive from this, but a smaller store may.

Ms. Warner discussed Financial Security of what is required before occupancy. If there is outstanding landscaping issues, Inspections will only issue a Temporary Certificate of Occupancy (CO) to ensure that items are addressed and corrected prior to a final occupancy of the building. This way the City will still get the financial security prior to a temporary occupancy. Developments want occupancy by the end of July, but don't have the as-builts done for the stormwater system that they have been built. That is the reasoning for the financial security. Director Joiner added that the financial security is required before work begins. Rather than doing that, there is an option to get

the financial security at the time of temporary CO or when the developer seeks the final CO. Engineer Warner clarified that the stormwater system is typically one of the first things built. It is a matter of whether the as-builts were created. Financial Security can be a letter of credit, bond, or whatever the legal team has reviewed as deems secure. City Manager Schainker commented the financial burden on the developer is the cost involved to obtain the letter of credit and the bank may want to secure that letter of credit by putting security on other properties the person may have.

Council Member Gartin expressed concern on requesting the total construction cost to be the amount of the bond. He suggested flexibility of having the bond based on the amount of the work to be completed instead of total construction amount. The City is imposing a cost on a developer, but the citizens must be protected also. Ms. Warner stated the intent is to ensure it is being built and constructed correctly. The financial security is in the amount that the developer would pay, which is far less than the City would pay. If the developer would go "belly up" the City may not have enough financial security. The Construction Site Erosion Control has a financial security of $500 per acre so staff can stabilize the area if a developer would walk away. Council Member Gartin liked a specific intention, a rational relationship between the amount of the bond and the work that is left to be completed.

Engineer Warner explained that the run-off curb number is something the USDA and NRCS established related to the conditions with the soils and considering those numbers with the land covers and soil types. Ames is tall grass prairie with B soil to make up the Curb Number (CN) of 58 was created and put into the Post-Construction Stormwater Management Ordinance to detain back to. Mayor Haila stated the reason for the numbers is to figure how much the rivers can handle. The run-off numbers are trying to get back to where they used to be so the streams are not being over tasked by the quick run-off. Ms. Warner stated that the paved surface is just going to run off quickly into the stormsewer system and it fills up the streams. The water that is being detained on-site is released over 48 hours to reduce the flooding and allow capacity in the stormsewer network for the other run-off that has not been detained.

Engineer Warner discussed impervious cover and land disturbance of one acre versus 10,000 square feet with illustrations of flows and pipe diameters. A majority are 15 and 18 inch stormsewers. Staff would continue to analyze capacity deficiencies, and Council would see some suggestions on improvements in the Capital Improvements Plan in the fall.

Ms. Warner stated that Inspections adopted Statewide Urban Design Standards and Specifications (SUDAS). The water main, sanitary sewers, streets, public infrastructure could comply and would not require a licensed plumber. Coordination with Building Inspections would be needed on who was doing the construction inspection. Mayor Haila inquired that the motion had to do with the cost of using a licensed plumber. Council Member Martin noted that Options 1 and 2 only address inspection and not construction. Ms. Warner confirmed that the intent is that a licensed plumber would not be needed because there would be coordination with Building Inspections. It would be likely that the staff construction inspectors would do that inspection rather than a licensed plumber being required on-site. Director Joiner confirmed that by using SUDAS, the City would not need

a licensed plumber.

City Manager Schainker reminded Council of the memo that was sent out about the City's greatest farmland holdings being the Airport and the Water Pollution Control Plant.

Ms. Warner stated that there has been a major project update drafted flood mitigation for East Industrial and Grand Avenue. The City did not get the FEMA grant for the flood mitigation, but will reapply for the grant again this fall.

Engineer Warner informed Council that North Ames did receive a considerable amount of rain. There is some stormwater management there, but many streets flooded. Staff was there looking and meeting with property owners. Some intakes had sticks and other debris causing issues, but because of the amount of rain it just took time to dissipate. There is work being done on the Teagarden drainage improvements for better flow. The Brick Towne site is still under construction, so the stormsewer system is not in yet.

City Manager Schainker stated this was for Council information first. The report will generate a lot of feedback by developers and others. The next course is to bring that feedback to Council and make decisions to begin to draft an ordinance. Public Works Director Joiner suggested bringing the feedback to the July 31 Council meeting. Ms. Warner noted that there will be an open house that will be held over the lunch hour or after work and it is online so people can submit their comments.

2017/18 SOUTH DUFF AVENUE IMPROVEMENTS (TABLED FROM JUNE 12, 2018): Public Works Director John Joiner stated that staff went over the project designs, bid items, discussed the project with the DOT, and looked over ways that money could be saved through change order. Iowa DOT did believe that a change order could be used for changes on Highway 69. The best estimate of savings would be $200,000. The full amount would have to be awarded but can be changed once awarded. There is $500,000 in the General Obligation Funds. The staff recommendation is to rebid the project with a formal redesign into a new set of plans. The other option is negotiate with contractor by change order. There is a risk in negotiating with the contractor, but there is also a risk in rebidding, but staff believes the bidding environment would be better.

Council Member Gartin asked about obligations of the City in concert with the development of Brick Towne. Director Joiner responded that in the Developer Agreement the City will do the road improvements and the developer in exchange will do the stormwater improvements. The developer has a deadline of occupancy of October of this year, whichever comes first. The City section for Highway 69 does not have a formal deadline. However, the intent of the project is to facilitate access and improve the traffic flow for that development. There was an intent to diligently move forward with the project, but no formal date was in the Agreement. Council Member Gartin suggested in the future there be a certainty put into the Agreement.

City Manager Schainker stated that the City has enough to cover the whole cost now. It is possible

ITEM # 2

Staff Report

NUTRIENT REDUCTION EVALUATION

November 20, 2018

At the workshop on November 20, 2018, City staff and its consulting engineers with HDR Engineering, Inc. will provide a brief review of the evaluation that has been performed to identify the strategy for complying with the Iowa Nutrient Reduction Strategy. The final recommendation from the evaluation is that the City should pursue a two-track approach to meet the goals of the Nutrient Reduction Strategy.

The first track is to modify the Water Pollution Control Facility to achieve the targeted 67% reduction in Total Nitrogen and 75% reduction in Total Phosphorus, with the implementation being phased in over a period of 20 years. The phased approach allows existing infrastructure with remaining useful life to be fully utilized before being replaced. It also allows for the facility's capacity to be expanded over time to accommodate growth in the Ames community.

The second track is to pursue watershed-based Best Management Practices (such as wetlands, buffer strips, cover crops, stream bank stabilization, and similar land practices). These practices will not reduce the size or scope of the mechanical upgrades at the Water Pollution Control Facility. However, staff believes that the nutrient reduction from these sorts of projects will ultimately be able to be "banked" in the newly created Nutrient Reduction Exchange, and be available as an offset for any further reductions in the nutrient standards in the future.

Projects that would be pursued under this track would be those that would offer additional ancillary benefits in addition to nutrient reduction. Potential ancillary benefits would vary by project, but could include things like: flood mitigation; drinking water source protection; new or improved recreational opportunities; improved or restored wildlife habitat; and water quality benefits beyond nutrient reduction.

BACKGROUND:

The Ames Water Pollution Control Facility (WPCF) is an advanced secondary treatment facility using a trickling filter/solids contact treatment scheme. The facility has a rated maximum wet-weather capacity of 20.4 million gallons per day and had an annual average flow of 6.0 million gallons per day in calendar year 2017. The facility has maintained a 100% compliance record with the numeric limitations of its permit since becoming fully operational; a streak that, according to the National Association of Clean Water Agencies, is the second-longest active compliance record in the nation.

In May 2016, the City received a draft NPDES permit from the Iowa Department of Natural Resources. Included in that draft was a requirement to perform an evaluation of the feasibility and reasonableness of reducing nitrogen and phosphorus discharged into the receiving stream. The City raised a number of concerns with new requirements contained in the draft permit, including the nutrient reduction requirements. The City was notified in August 2016 that the permit was being withdrawn. As of the date of this staff report, no replacement permit has been provided by the State, and the Facility continues to operate under the terms of its expired permit.

Even though no new permit has been issued and the obligation to perform a nutrient reduction feasibility study has not formally been imposed, the City chose to perform that evaluation now. The reason was a concern about the remaining life of the trickling filter media. The four filters are packed with corrugated plastic sheeting that provides a surface for the waste-consuming bacteria to attach to and grow. The plastic modular media is original to the plant construction, and has been in service for 29 years. The media has an assumed life of 20-30 years, and staff estimate a cost in excess of $10 million to replace the media in the filters. While trickling filters are very good at removing conventional pollutants like biochemical oxygen demand (BOD) and Total Suspended Solids (TSS), they perform poorly at removing nutrients. As such, staff felt this was a significant financial reason for determining a long-term strategy to comply with the Nutrient Reduction Strategy.

In April of 2018, City Council executed a contract with HDR Engineering to perform the nutrient reduction evaluation. A workshop-based process has been utilized that maximized participation by multiple City departments (Water & Pollution Control, Public Works, Parks & Recreation), as well as important external stakeholders like Prairie Rivers of Iowa, Iowa State University, and the Iowa Department of Natural Resources. That process culminates in the City Council workshop on November 20, 2018.

WATERSHED-BASED ALTERNATIVES:

Nutrient offset is a form of water quality trading whereby nutrient reduction requirements for point sources under the Clean Water Act may be achieved from offsite reductions. As

commonly conceived, agricultural practices play an integral role in providing such offsets. The motivations for point-nonpoint source trading can be numerous including reduced costs and other ancillary benefits such as mitigating the impacts of flooding. Implementation practices designed to reduce agricultural nutrient loadings can also help improve agricultural productivity by improving soil quality, moisture retention, and the timing of nutrient availability.

Recognizing the potential benefits of water quality trading, the Iowa Nutrient Reduction Strategy states that the Water Resources Coordinating Council (WRCC) and its member organizations will cooperate with and assist non-governmental organizations interested in developing a voluntary nutrient credit trading program in Iowa. Furthermore, the NRS states that where available and allowable by law, incentives may be provided to encourage and facilitate nutrient credit trading as a means to reduce nutrient loadings to rivers and streams.

After evaluating a wide range of watershed-based Best Management Practices, it was concluded that watershed-based nutrient reduction is not a practical means to completely eliminate the need for nutrient reduction improvements at the Ames WPC Facility. Land requirements for achieving those nutrient reductions are surprisingly large. Approximately 176,500 acres suitable for constructed wetlands and 235,100 acres suitable for riparian buffers have been identified in the upstream watershed. **To fully offset the required WPCF phosphorus reductions, approximately 115,700 acres suitable for constructed wetlands (i.e., 66 percent of suitable acreage), 372,700 acres suitable for riparian buffers (i.e., over 100 percent of suitable acreage), or some combination of the two would be required. The consultants noted that there is no precedent with the Iowa Department of Natural Resources to offset point source nutrient reduction requirements by using watershed BMP projects. As such, money invested in watershed reductions demonstrates commitment and progress towards the objectives of the Iowa NRS, but provides no direct short-term benefit in terms of mitigating WPCF nutrient reduction requirements.**

Even though the study determined that offsite nutrient reduction was not a viable route towards offsetting the City's obligations at the WPC Facility, the study nevertheless recommends that the City make a commitment to pursue watershed-based BMP projects for the following reasons.

- It demonstrates commitment to the goals and objectives of the Iowa Nutrient Reduction Strategy.

- When performed on City property, it demonstrates leadership and good stewardship on behalf of the City.

- When properly selected, BMP's can provide additional ancillary benefits like flood mitigation, erosion control, source water protection, habitat restoration, and recreational opportunities.

- While there is not currently a regulatory benefit for implementing watershed practices, the Iowa Department of Natural Resources is working with the Iowa League of Cities to establish the Iowa Nutrient Reduction Exchange. The Iowa DNR's stated intent is to allow projects registered with the Exchange to offset any more stringent requirements in the future.

The study recommends that watershed-based projects be prioritized in the following order.

- Projects on City-owned land. This should be the first priority as both a demonstration of responsible land ownership and a show of support for the ultimate goals of the Iowa Nutrient Reduction Strategy.

- Projects within the City limits that provide additional ancillary benefits. Staff believes that projects that provide additional benefits would provide a greater return on the investment of sewer rate payer's monies. And having those benefits inside the City limits provides the greatest access to any ancillary amenities for Ames rate payers.

- Projects upstream of Ames that provide additional ancillary benefits. Performing these improvements upstream means that any water quality or quantity benefits will be realized by Ames rate payers.

WATER POLLUTION CONTROL FACILITY IMPROVEMENTS:

The study revealed that 20 percent of the phosphorus and 5 percent of the nitrogen loadings on the Skunk River immediately downstream of the Ames WPC Facility are from the WPC Facility itself. Iowa's Nutrient Reduction Strategy targets 75 percent reduction in phosphorus and 67 percent reduction in nitrogen loadings from wastewater treatment facilities. These reductions are to be achieved through implementation of biological nutrient removal through improvements on a timeline to be established by each City, but ultimately approved by the Iowa Department of Natural Resources.

The study reached the following conclusions about the existing infrastructure at the WPC Facility.

- The existing trickling filters have performed extremely well for BOD and TSS removal, but they provide limited capability to achieve the required nutrient reduction and have a limited capacity for future growth. Coupled with uncertainty regarding the remaining useful life of the media, the existing trickling filters should not be a significant part of the long-term solution and may not be worth continued investment short-term. The remaining useful life of the trickling filters is difficult to predict but generally believed to be as few as 5 years and as many as 10 years.

- Money could be better spent moving forward with an alternative technology to replace the trickling filters to provide both nutrient reduction and capacity for growth.

- The existing Solids Contact Basin and existing clarifiers have considerable remaining useful life and should be integrated with the alternative technology to the extent possible.

- Optimization of the existing trickling filter system makes sense in concept, but only as an initial, interim step and only to the extent that such optimization does not require any additional significant investment in the existing trickling filters.

Multiple treatment technologies were evaluated, with consideration given for both the up-front capital costs as well as the on-going operations and maintenance costs. Additionally, a series of non-monetary criteria were also considered, including things like: the response of the treatment scheme to wet-weather flows; impacts to the solids handling portion of the treatment process; the safety of the technology; and consideration for the degree of operator and maintenance "friendliness" of the technology.

Ultimately, three technologies emerged as potential candidates.

Technology	Total Capital Costs*	Annual O&M Costs	Present Worth**
Simultaneous Nitrification Denitrification	$28.0 million	$1.69 million	$53.1 million
Conventional Activated Sludge configured for Biological Nutrient Removal	$26.3 million	$1.20 million	$44.3 million
Granular Activated Sludge	$32.1 million	$1.15 million	$49.3 million

* - includes engineering costs

** - 3% interest, 20 years

The ultimate recommendation from the study was to tentatively adopt the conventional activated sludge-biological nutrient removal scheme for the purposes of establishing budgets and rates. Given the very high level cost estimates developed as a part of this study, all three projects could be considered to have essentially the same capital costs. Technology for nutrient removal is evolving at a very quick pace, and it seems reasonable to anticipate that costs may lower over time for some of the technologies.

PHASING OF MODIFICATIONS AT THE WPC FACILITY:

As was described above, one of the goals of the study was to identify ways to maximize the use of the existing infrastructure. The biggest hurdle in doing so was the trickling filters. The filters do not have a meaningful role in the future for nutrient reduction, but are believed to have another five to ten years of useful life remaining.

With that thought in mind, the consulting team devised a phased implementation scheme that will allow the trickling filters to operate for another ten years, while progressively moving the facility towards fully achieving the goals of the Nutrient Reduction Strategy over a period of 20 years. Implementation would progress in three phases.

- **Phase One** would include the construction of additional capacity downstream of the 1st stage trickling filters and upstream of the existing Solids Contact Basin. This capacity could provide redundant capacity should the trickling filters fail, thus allowing the trickling filters to "run to failure" without a significant risk of violating the discharge permit requirements.

- **Phase Two** would remove the 1st stage trickling filters, and convert the basins constructed in Phase One to the conventional activated sludge-biological nutrient removal treatment process. It would also include the construction of a new return/waste sludge pump station, sludge fermentation, sludge thickening, and additional blower capacity.

- **Phase Three** would remove the 2nd stage trickling filters, add additional conventional activated sludge-biological nutrient removal treatment trains, and add additional blower capacity.

STAKEHOLDER ENGAGEMENT:

Gathering input and feedback from stakeholders is an important goal for all major initiatives at the City of Ames. This study took a unique approach by actually inviting several key stakeholder groups to be active participants in the process, allowing staff and its consultants to gain their perspectives immediately. The participating stakeholder groups included: Prairie Rivers of Iowa, faculty and research staff from Iowa State University, and representatives from the Iowa Department of Natural Resources. One of the outcomes of this form of stakeholder engagement was that City staff were able to partner with ISU researchers to submit a grant that evaluates the interrelationship between water, energy, and food production systems.

Additionally, two public open house-style meetings were held in October to offer an opportunity for other interested individuals and organizations to learn more about the study, and to offer their thoughts on the direction the City should take. The feedback from the October open houses was revealing, even when considering that the survey responders were predisposed to have an interest in the topic.

- Every response (18 out of 18) answered "yes" to the question "Based on your knowledge, do you believe the Ames Sewer Utility should invest rate payer dollars in addressing nutrients?"

- 85% responded that they would support the City spending rate payer dollars to invest in upstream watershed projects.

- 89% responded that they would support the City spending rate payer dollars to invest in treatment plant upgrades.

- Below are responses to the following question: "The current median residential sewer bill in Ames is $27.15 per month. How much additional do you think is reasonable to ask rate payers to pay to address nutrients in and around Ames?"

    - 6% chose "An additional 50% (an additional $13.58 per month)
    - 44% chose "An additional 25% (an additional $4.79 per month)
    - 44% chose "An additional 10% (an additional $2.72 per month)
    - 6% chose "No additional increase in sewers bills would be appropriate).
    - Comments on this question are shown below.
        - Why should rate payers pay for the problem? Find the source and have them pay for it.
        - $35 per month
        - Not enough info to make informed choice; additional 35% might be reasonable. It's a big problem.
        - $5.00 per month

- Other comments provided are shown below.
    - I would understand paying for practices outside city limits and rate increases to meet treatment levels. Ames should be a state leader in demonstrating and promoting.
    - Make a better awareness to the public about the concerns of excess nutrients so that they would be more willing and understanding to support rate payer dollars to go towards environmental causes.
    - Cities are going to be forced to act. The hope is that the agro community will also eventually be required to act.
    - I think that there is too much fertilization and treatment with pesticides and herbicides to lawns and grassy areas such as golf courses and parks. I also think building infrastructure in floodplain is insane.

IMPLEMENTATION:

Based on the conclusions and recommendations of this study, staff has prepared two Capital Improvement Plan projects that will be presented to Council in January.

The first CIP project will be an updated version of the "Nutrient Reduction Modifications" project that was included in last year's CIP. This new page will include the capital cost information provided by HDR, *with the costs inflated forward to the year each phase would be implemented*. That project will earmark the following dollar amounts. **It should be noted that the total project cost is slightly less than is shown in the current version of the CIP, but the costs are now spread out over 20 years, instead of all being incurred within the first six years.**

2022/23 – 2024/25	Phase One	$10,200,000
2027/28 – 2028/29	Phase Two	$14,260,000
2037/38 – 2038/39	Phase Three	$15,170,000
	Total	$39,630,000

The second CIP project will be a new project shown for the first time, titled "Watershed-Based Nutrient Reduction." This project will set aside $100,000 per year to undertake the implementation of Best Management Practices in the watershed. The money can be considered as a "placeholder," until specific projects are identified. It is possible that the funds could be allowed to accumulate for a few years to allow for larger scale projects to be undertaken. It would also allow the flexibility to suspend the project for a year or two if the funds are needed for other higher-priority purposes.

Working draft copies of the planned Capital Improvements Plan (CIP) projects are shown on the following pages.

DRAFT

NUTRIENT REDUCTION MODIFICATIONS **PROJECT STATUS:** Scope Change Cost Change 11-14-18

City of Ames, Iowa
Capital Improvements Plan

DESCRIPTION/JUSTIFICATION

In early 2013, the Iowa Department of Natural Resources (IDNR) released the Iowa Nutrient Reduction Strategy. This strategy will require the State's 102 largest municipal wastewater facilities to install "technically and economically feasible process changes for nutrient removal." A feasibility study was completed in early 2019 that identified the City's desired approach to meet the nutrient standards. The cost estimates shown below are built around the "Conventional Activated Sludge – Biological Nutrient Removal" treatment scheme, implemented over a 20 year period. The actual treatment scheme will need to be confirmed closer to construction so that advances in technology and the state of the art can be incorporated.

COMMENTS

The Iowa Nutrient Reduction Strategy lays out a schedule for point source discharges based on the National Pollutant Discharge Elimination System (NPDES) permit renewal cycle for each facility. When the next permit is issued, the City will be required to submit a plan to the Iowa Department of Natural Resources that evaluates the cost and feasibility of installing nutrient reduction at the facility. The facility will then receive a compliance schedule requiring the construction of nutrient reduction facilities during subsequent NPDES permits.

2017/18	$ 285,000	Preliminary Engineering Report
2022/23 – 2024/25	10,200,000	Phase 1 Engineering and Construction
2027/28 – 2028/29	14,260,000	Phase 2 Engineering and Construction
2037/38 – 2038/39	15,170,000	Phase 3 Engineering and Construction
Total	$ 39.915.000	

The above schedule would construct back-up capacity for the trickling filters in Phase 1, with engineering beginning in FY 22/23 and construction occurring over the following two years. The second phase would begin in approximately FY 27/28 and would remove the trickling filters and construct additional nutrient removal capacity. The third and final phase would begin in approximately FY 37/38, bringing on-line the full nutrient reduction capacity. This work will replace other major investments that would otherwise be needed, including: an "integrated fixed-film activated sludge" modification to meet the anticipated lower ammonia discharge limits ($3.16 million); and a trickling filter media replacement ($8.13 million).

LOCATION

WPC Facility; four miles south of Highway 30, east of I-35

	TOTAL	2019/20	2020/21	2021/22	2022/23	2023/24
COST:						
Engineering	1,260,000				1,260,000	
Construction	4,390,000					4,390,000
TOTAL	**5,650,000**				**1,260,000**	**4,390,000**
FINANCING:						
Clean Water State Revolving Fund	5,650,000				1,260,000	4,390,000
TOTAL	**5,650,000**				**1,260,000**	**4,390,000**

PROGRAM - ACTIVITY: Utilities - WPC Plant

DEPARTMENT: Water and Pollution Control

ACCOUNT NO.

WATERSHED-BASED NUTRIENT REDUCTION **PROJECT STATUS:** New

DRAFT
10-26-18

City of Ames, Iowa
Capital Improvements Plan

DESCRIPTION/JUSTIFICATION

The Water Pollution Control Facility is being converted to a nutrient removal treatment technology over a period of 20 years. Separate from the work that will occur inside the treatment plant, watershed-based improvements performed by the City can be included in the Iowa Nutrient Reduction Exchange. Staff is currently working with the Iowa League of Cities and other large utilities to encourage the Iowa Department of Natural Resources to allow these off-site nutrient reductions to be "banked" as credit towards any future, more stringent nutrient reduction requirements imposed on the WPC Facility. This project sets aside $100,000 per year that can be put towards urban watershed improvements that have a nutrient reduction component.

COMMENTS

Projects undertaken will not only have a nutrient reduction element, but will also be projects that provide additional, ancillary benefits such as: flood risk reduction, increased recreational opportunities; improved wildlife habitat; urban storm water management; and drinking water source protection. It is possible that a project may not be undertaken every year. Funds may be allowed to accumulate to enable a larger-scale project to be undertaken.

LOCATION

Throughout the community; specific locations will vary by year

	TOTAL	2019/20	2020/21	2021/22	2022/23	2023/24
COST:						
Engineering	100,000	20,000	20,000	20,000	20,000	20,000
Construction	400,000	80,000	80,000	80,000	80,000	80,000
TOTAL	**500,000**	**100,000**	**100,000**	**100,000**	**100,000**	**100,000**
FINANCING:						
Sewer Utility Fund	500,000	100,000	100,000	100,000	100,000	100,000
TOTAL	**500,000**	**100,000**	**100,000**	**100,000**	**100,000**	**100,000**

PROGRAM - ACTIVITY: Utilities - WPC Plant

DEPARTMENT: Water and Pollution Control

ACCOUNT NO.

City of Ames

Nutrient Feasibility Study

Today's Objective

Council Work Session

1. Provide overview of work completed to date.
2. Identify recommended path forward (unless directed otherwise).

Today's Agenda

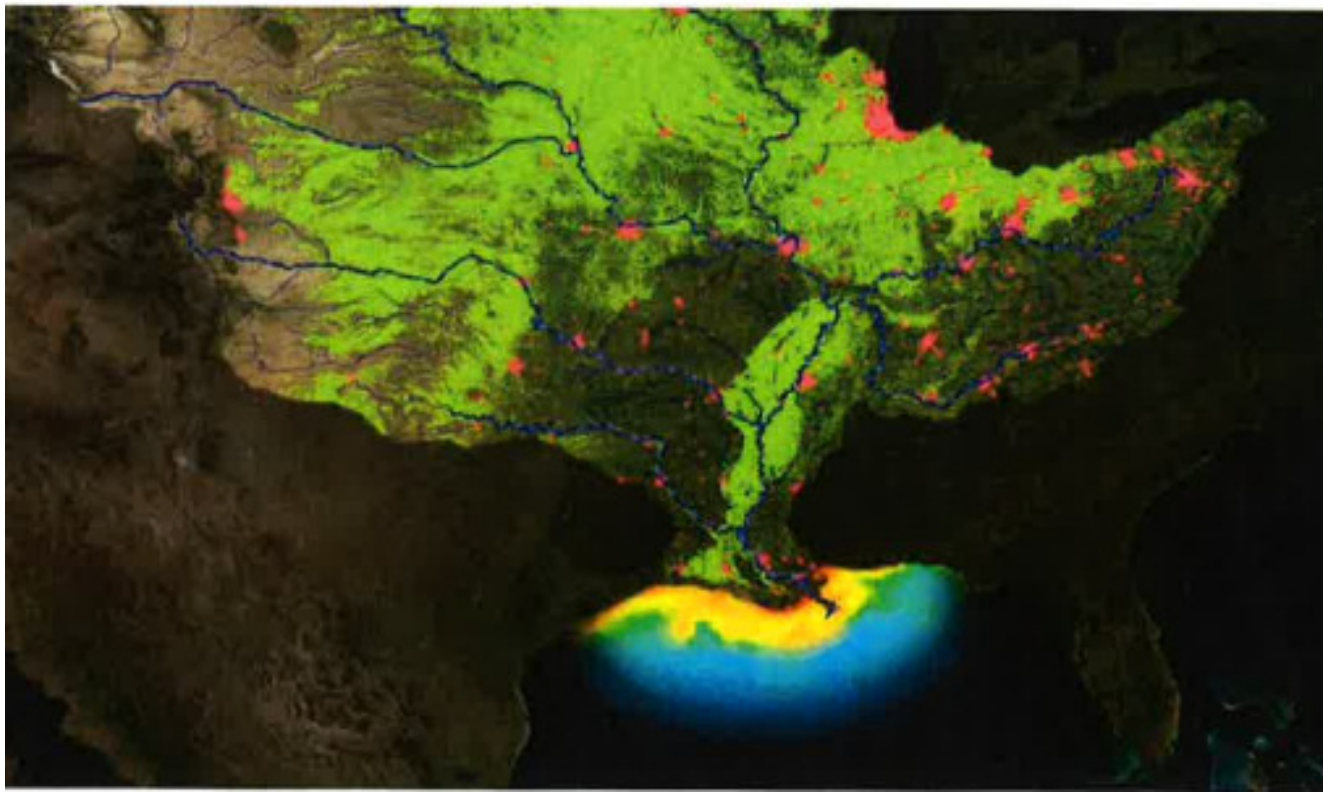
Council Work Session

1. Drivers
2. Approach
3. Watershed Analysis and Findings
4. Water Pollution Control Facility (WPCF) Analysis and Findings
5. Watershed Alternatives
6. WPCF Alternatives
7. Summary Strategy
8. Questions and Directions

Drivers

Iowa Nutrient Reduction Strategy

45% Reduction in Nutrients (Nitrogen and Phosphorus) Leaving the State



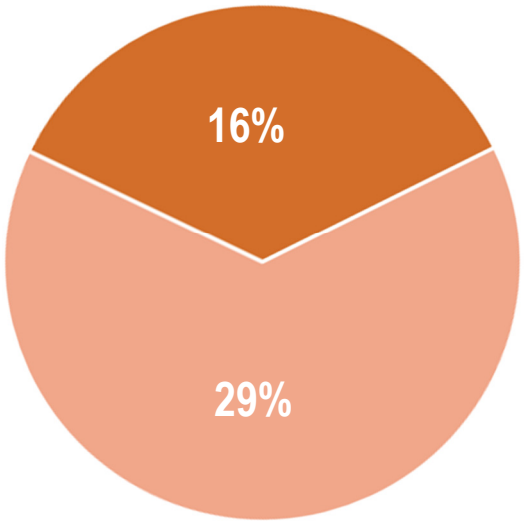
Iowa Nutrient Reduction Strategy

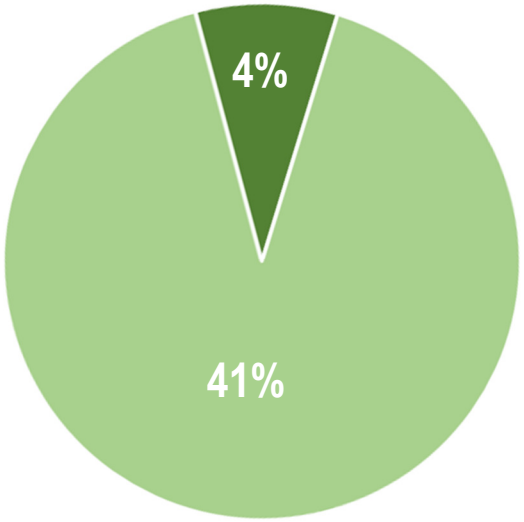
45% Reduction in Nutrients (Nitrogen and Phosphorus) Leaving the State

Biological Nutrient Removal (BNR) for Point Sources

Required ~75% Phosphorus Reduction & ~67% Nitrogen Reduction

Current ~19% Phosphorus & ~36% Nitrogen



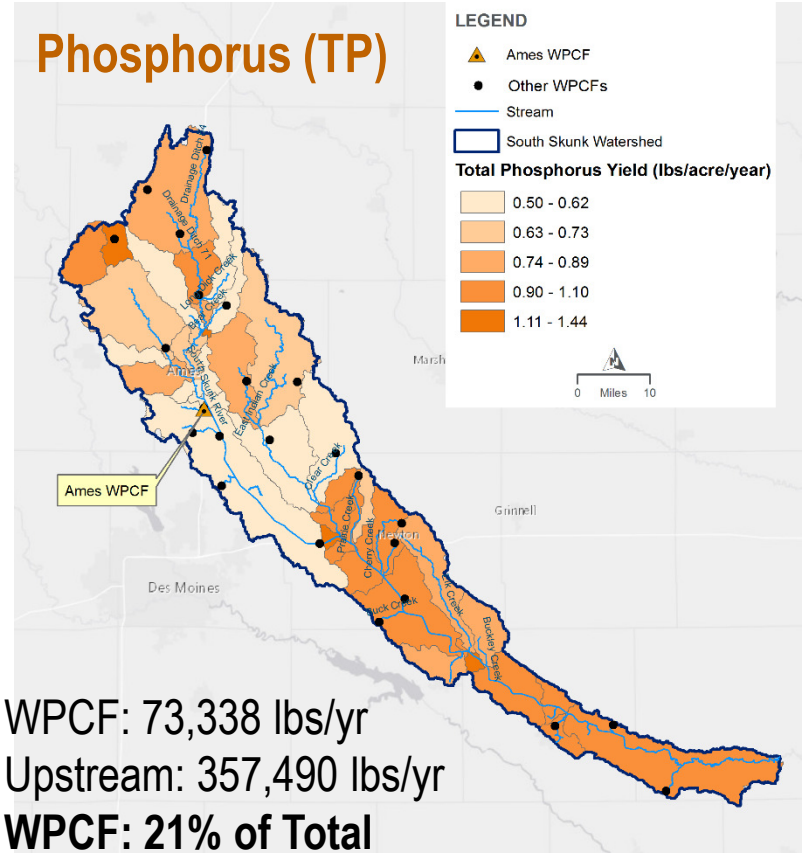


Voluntary Reductions from Nonpoint Sources

Nutrient Baseline

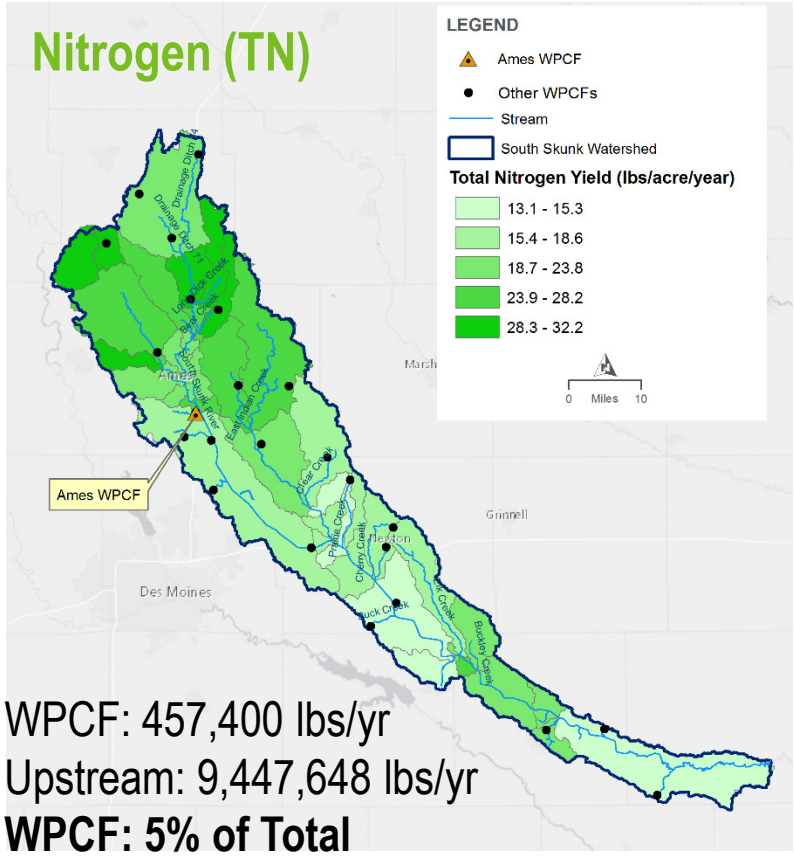
SPARROW Model Upstream of WPCF

Phosphorus (TP)



WPCF: 73,338 lbs/yr
Upstream: 357,490 lbs/yr
WPCF: 21% of Total

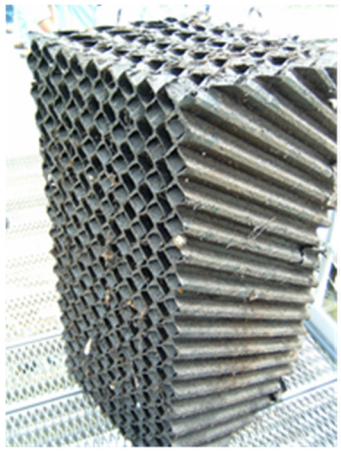
Nitrogen (TN)



WPCF: 457,400 lbs/yr
Upstream: 9,447,648 lbs/yr
WPCF: 5% of Total

Age and Condition of Trickling Filters

Initial Operation in 1989



Media Inside

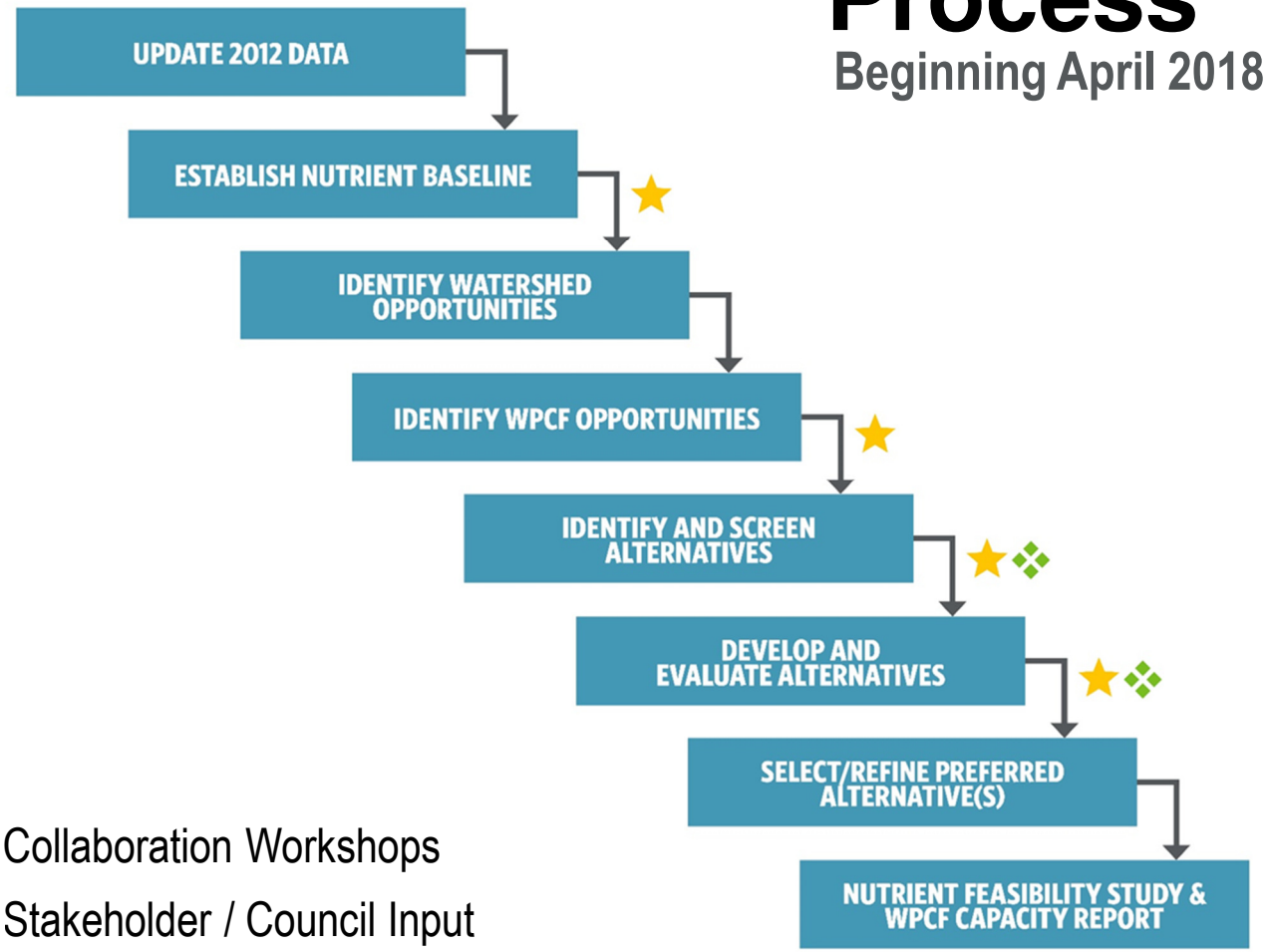
Exterior Structure

- 5 - 10 Years Remaining?
- $8.8 million to Replace
- Great for Organics
- Limited Value for BNR

Approach

Process

Beginning April 2018



★ Collaboration Workshops

❖ Stakeholder / Council Input

Objective

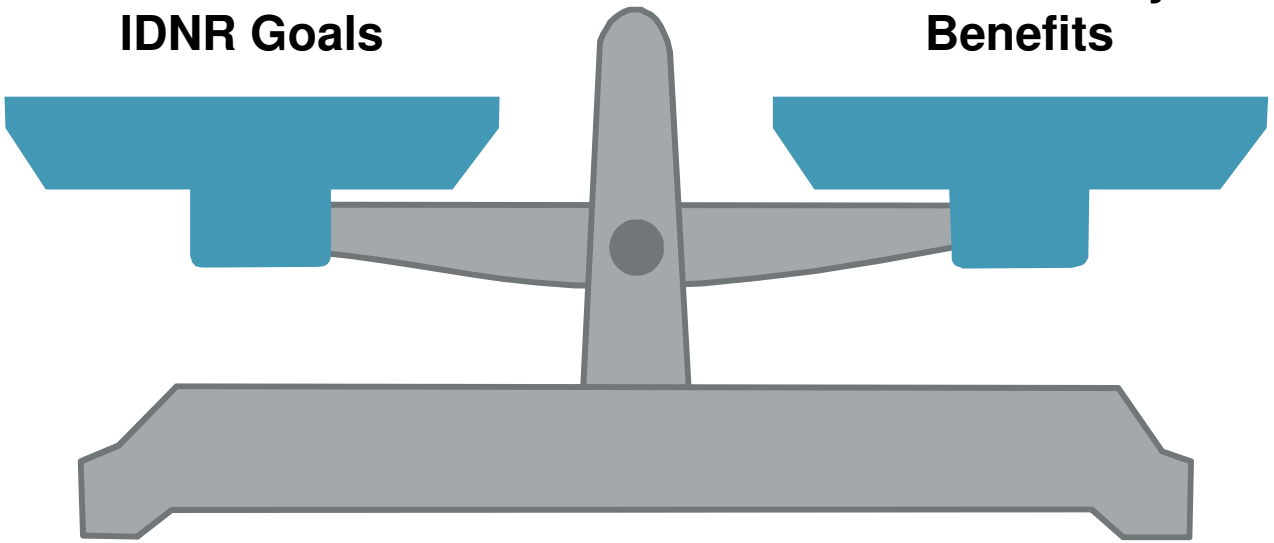
Find the Appropriate Balance

Cost of and timing of Nutrient Removal

IDNR Goals

Rate Impacts

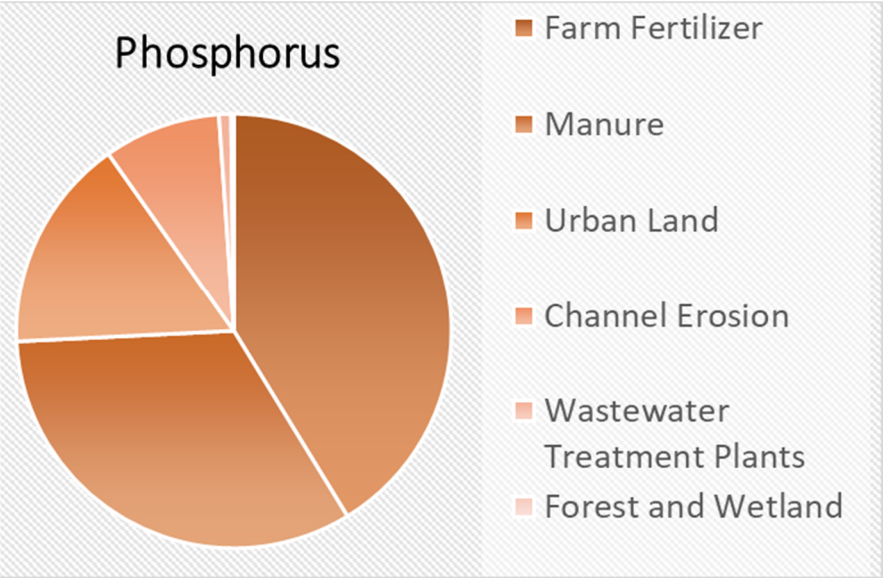
Water Quality Benefits

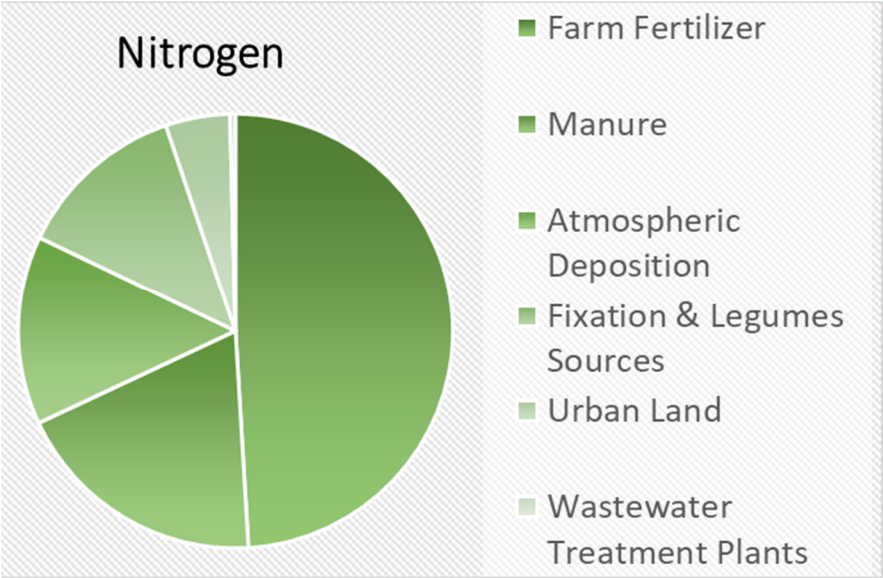


Watershed Analysis and Findings

Watershed Sources

SPARROW Model Upstream of Ames WPCF





Farm Fertilizer and Manure are 74% of Phosphorus and 68% of Nitrogen Loadings

Watershed Reduction Options

Potential Offsets for WPCF Reductions

Practice
Cover crops
Water & Sediment Control Basins
Constructed wetlands
Denitrification bioreactors
Riparian buffers
Grassed waterways

Water & Sediment Control Basin

Riparian Buffer

Constructed Wetland

Grassed Waterway

Woodchip Bioreactor

Watershed Reduction Options

Reductions & Costs

Practice	% Reduction		Cost of TN Reduction, $/lb	Cost of TP Reduction, $/lb
	TN	TP		
Cover crops	31%	29%	$6.00	$210
Water and sediment control basins	0%	80%	--	$29
Constructed wetlands	52%	58%	$1.20	$35
Denitrification bioreactors	43%	0%	$1.50	--
Riparian buffers	7%	18%	$5.50	$70
Grassed waterways	7%	18%	$33	$410

Constructed Wetlands are Best Value for Nitrogen and Phosphorus

Bioreactors for Nitrogen & WASCBs for Phosphorus also offer Value

Watershed Reduction Options

Potential Applicability

Practice	Treatment Area, ac	Potential Credits (lbs/yr)	
		TN	TP
Cover crops	304,133	2,262,768	65,280
Water & Sediment Control Basins	7,768	0	4,896
Constructed wetlands	**176,507**	**2,202,792**	**75,752**
Denitrification bioreactors	57,870	597,176	0
Riparian buffers	**235,100**	**394,944**	**31,280**
Grassed waterways	65,663	110,296	8,704

Cover Crops are focus of ISU Research

WPCF Required Reductions

- 49,640 lbs/yr TP
  - 67% Available Wetland Acres
- 213,890 lbs/yr TN
  - 10% Available Wetland Acres
  - 54% Available Riparian Acres

Limited potential for TP Offsets
Some potential for TN Offsets

Watershed Reduction Options

Ongoing ISU Efforts

Perennial Ground Cover

Riparian Energy Crop

Affordable nonpoint source reductions relieve pressure on future point source reductions

Urban BMPs

With Ancillary Nutrient Reduction Benefits

- City Hall Parking Lot Reconstruction
- Stormwater Erosion Control Project - South Skunk River from Carr Park to Homewood Golf Course
- Bioretention Cells on 24th Street with Street Rehabilitation Project
- Riffle Pools and Streambank Stabilization with Squaw Creek Water Main Stabilization at Lincoln Way
- Phosphorus Free Fertilizer on Parks
- Water Quality Treatment of Stormwater Runoff through City's Current Post-Construction Ordinance

Watershed Findings

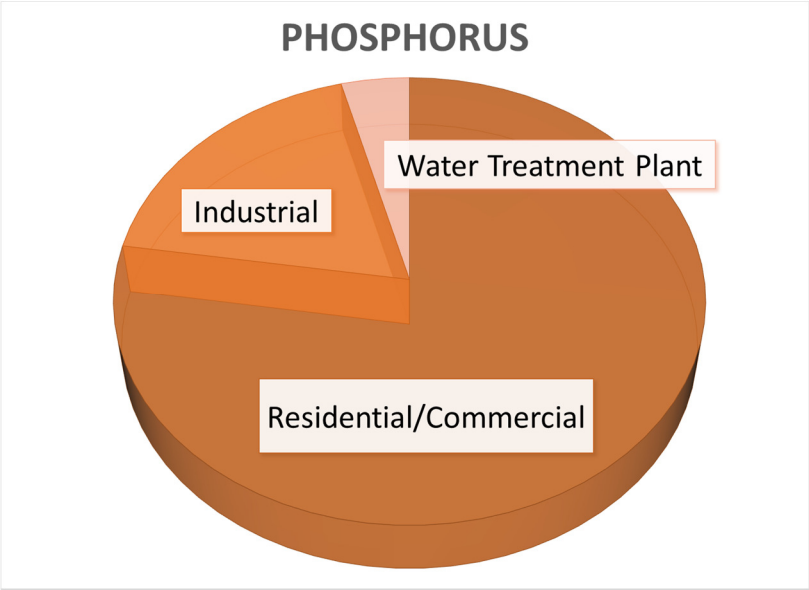
Nutrient Reduction

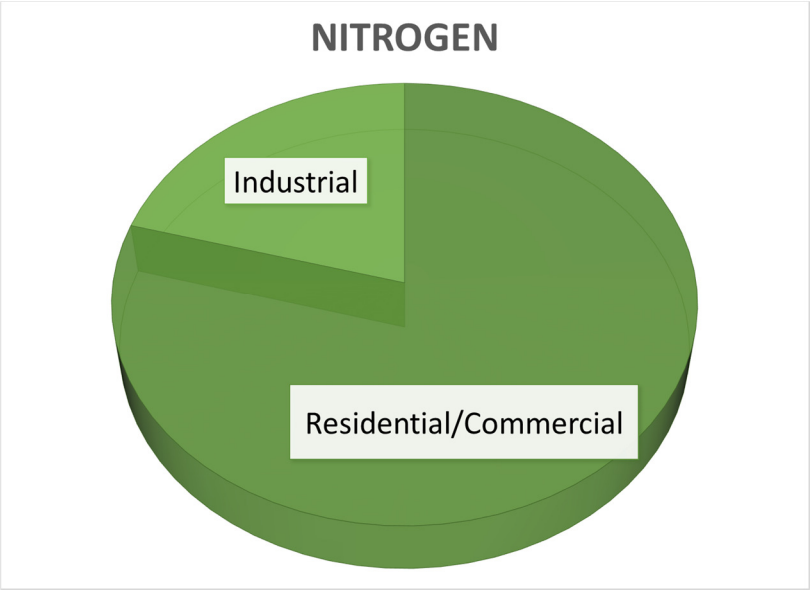
- ***Not practical to entirely offset the need for WPCF reductions.***
- Land requirements are surprisingly large.
- There is no guarantee off offsets short term but an exchange program is under development for offsets longer term .
- The City has and should continue to include urban BMPs that have achieved nutrient reductions as ancillary benefits.
- Watershed reductions may still be useful to demonstrate leadership, make progress, and offset future requirements.

WPCF Analysis and Findings

WPCF Sources

WPCF Influent Data





Greatest contribution is from Residential / Commercial Sources

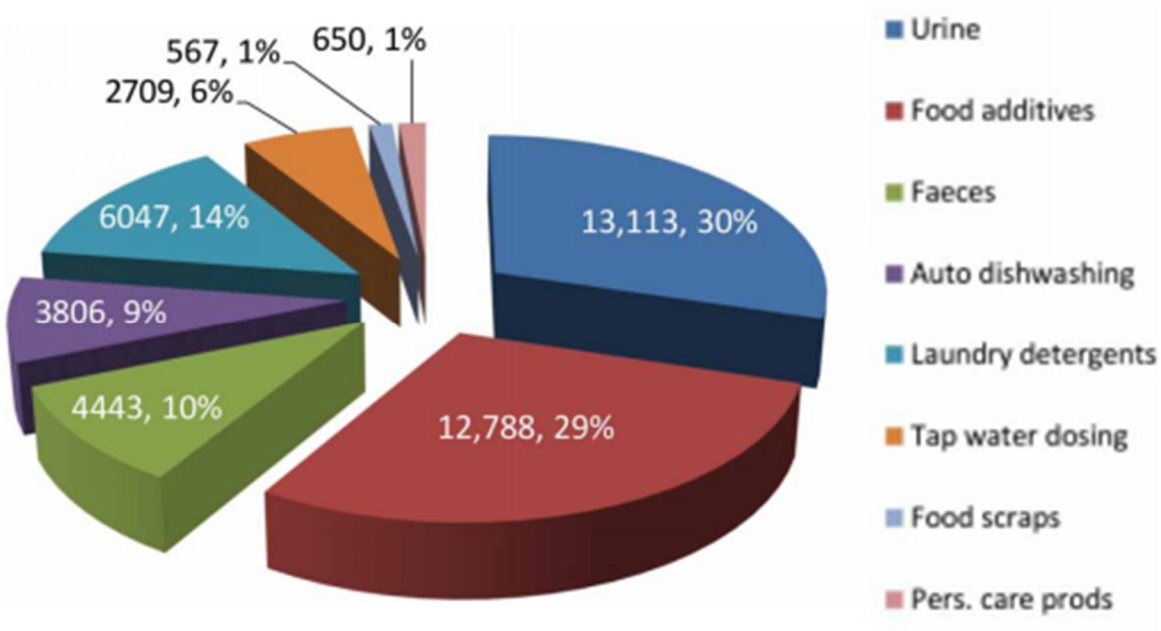
No single large industrial contributor

(ISU Central Campus, Hach South, NCAH North, Mary Greeley, Danfoss)

Water Treatment Plant is insignificant.

Residential / Commercial Sources

Phosphorus Data from Sean Comber, etal 2012



Detergent Contributions have been reduced Significantly in last 10 years

Additional Residential / Commercial Source Reductions are Challenging

WPCF Optimization Potential

Existing WPCF Modifications for Nutrient Removal

- 6 options – flow routing, repurposing of facilities, separate solids thickening, and/or modified operation
- Some achieved the required phosphorus reduction but with limited nitrogen reduction
- Capital Costs from $4.9 to $10.6 million
- Continued dependency on trickling filter technology

Cost effective if implemented in conjunction with alternative technology

WPCF Findings

Nutrient Reduction

- ***Facilities incorporating alternative treatment technology will be required to achieve required reductions.***
- Source reductions alone can not achieve required reductions.
- Facility optimization alone can not achieve required reductions.
- Existing trickling filters are not part of long term solution due to process limitations and condition
- Existing trickling filters should be used as long as condition allows to minimize customer rate impacts.

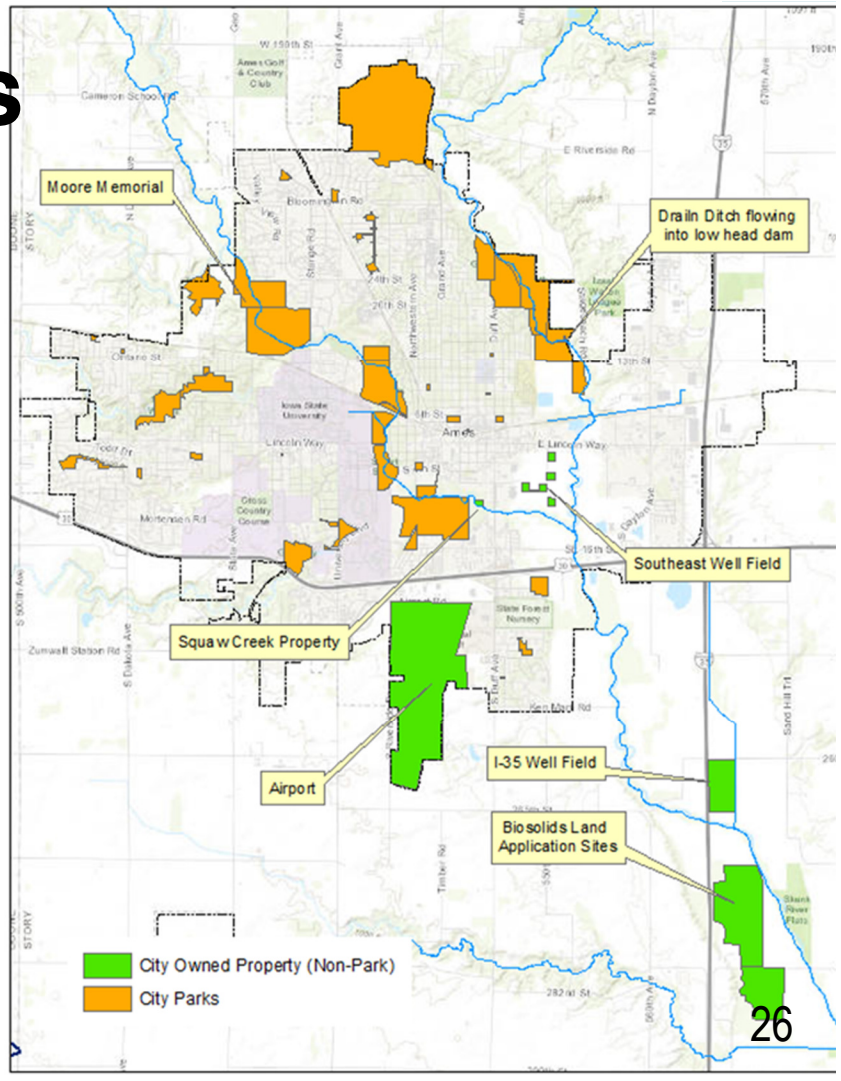
Watershed Alternatives

Watershed Alternatives

Potential Sites/Projects on City Property

- **Simply Examples to Convey Concepts**

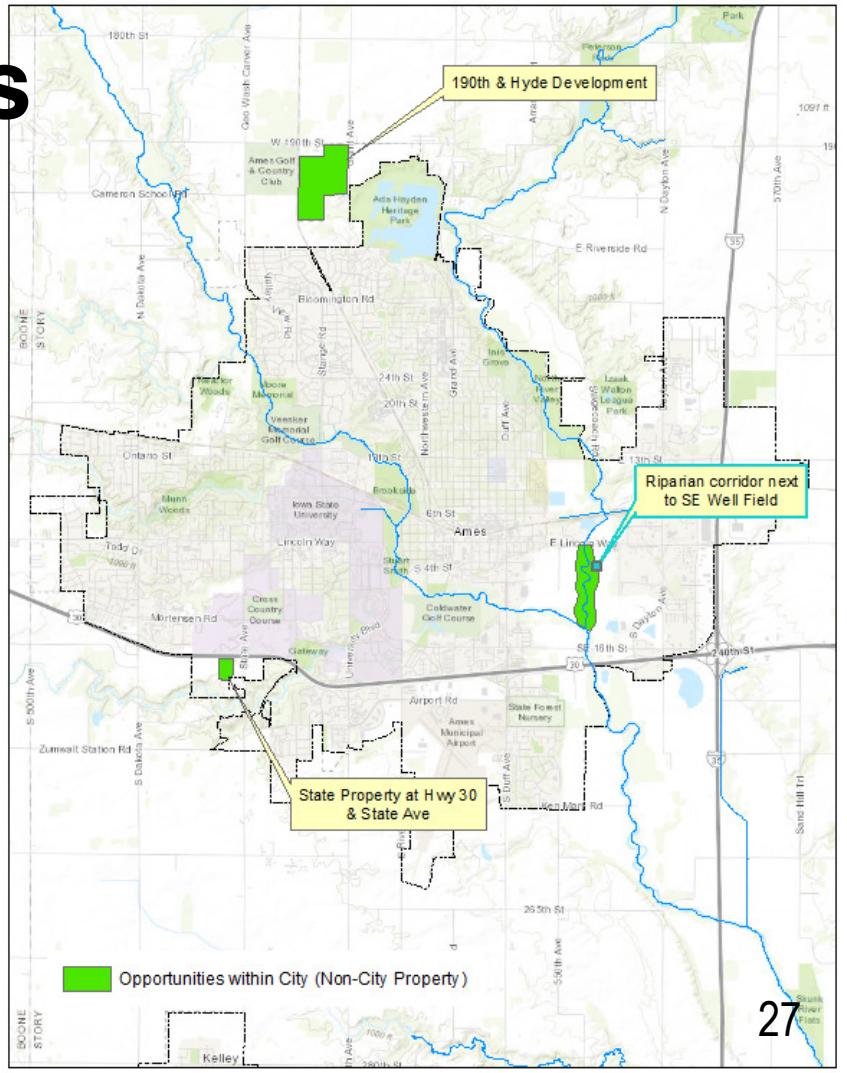
- Biosolids Land Application Sites
- Airport
- I-35 Well Field/ISU Research Facility
- City Parks
- Squaw Creek Property
- Moore Memorial Park
- Gunder Nutty Woods/Drain Ditch flowing into low head dam



Watershed Alternatives

Potential Sites/Projects Within City

- **Simply Examples to Convey Concepts**
- 190th and Hyde Development
- Riparian Corridor next to SE Well Field
- State Property at Hwy 30 & State Avenue

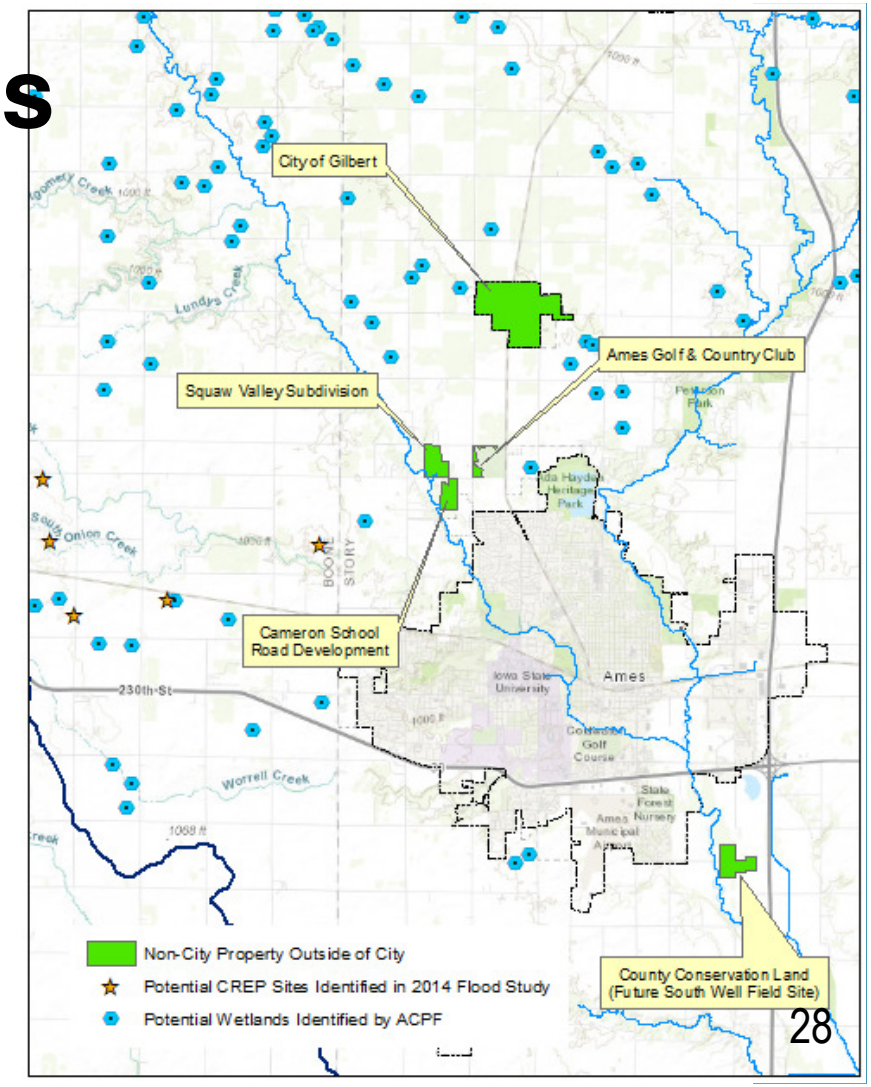


Watershed Alternatives

Potential Sites/Projects Upstream

- **Simply Examples to Convey Concepts**

- Ames Golf & Country Club
- Cameron School Road Development
- Squaw Valley Subdivision
- County Conservation Land (Future South Well Field)
- City of Gilbert
- CREP Sites (2014 Flood Study)
- Potential Wetlands (ACPF)



Ancillary Benefits

		Potential Project	Nutrient Reduction	Flood Mitigation	Erosion Control	Habitat Restoration	Water Quality	Recreation
City Property	Biosolids Land Application Sites	Bioreactor, Constructed wetlands	X	X	X	X		
	Airport	Bioreactor	X					
	I-35 Well Field	CRP/Potential ISU Research	X		X	X	X	
	City Parks	Native grasses. Reduced fertilizer. Green SW infrastructure	X	X	X	X		X
	Squaw Creek Property	Storm sewer interceptor/constructed wetland	X	X	X	X		
	Moore Memorial Park	Bioreactor, Constructed wetlands	X	X	X	X		X
	Gunder Nutty Woods/Drain Ditch	Bioreactor, Constructed wetlands	X	X	X	X		X
Within City	190th & Hyde Development	Regional SW facility	X	X	X	X		X
	Riparian Corridor next to SE Well Field	Bike trail/riparian restoration	X		X	X	X	X
	State Property at Hwy 30 & State Ave	Bioreactor, Constructed wetlands	X	X	X	X		X
Upstream	Ames Golf & Country Club	Stormwater detention basins	X	X	X	X		X
	Cameron School Road Development	Regional SW facility	X	X	X	X		X
	Squaw Valley Subdivision	Interceptor/hook up with City sewer	X					
	County Conservation Land (Future South Well Field)	CRP	X		X	X		
	City of Gilbert	Interceptor/hook up with City sewer	X					
	Potential CREP/Wetland Sites	Constructed wetlands	X	X	X	X		X

Select/Implement Based on Priorities

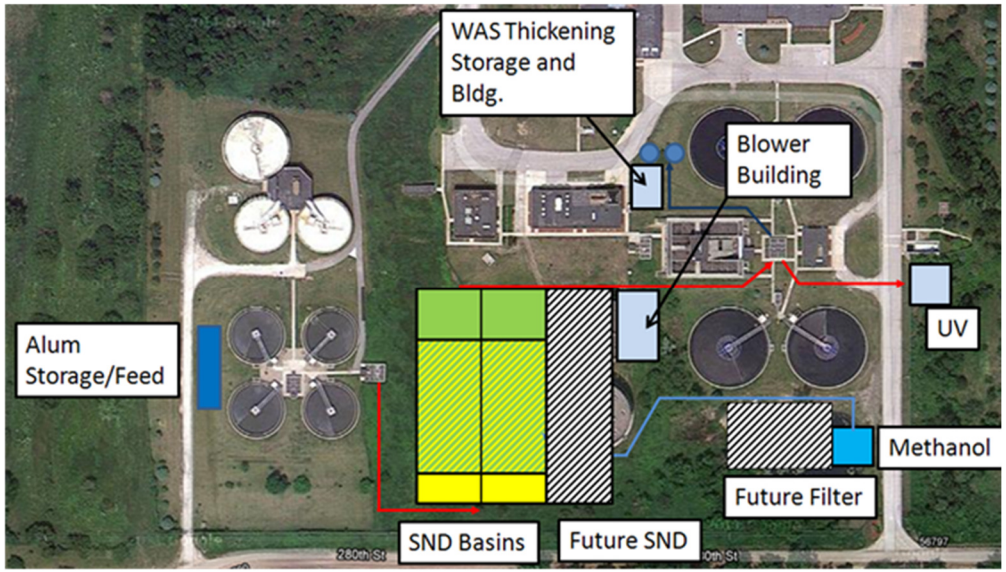
Demonstrate Leadership, Make Progress, and Offset Future Requirements

- **Location**
  - City-owned land
  - Within City limits
  - Land in Upstream Watersheds
- **Ancillary Benefits**
  - Flood mitigation
  - Drinking Source Water Protection
  - Increased Wildlife Habitat
  - Improved Water Quality
  - Increased Recreational Opportunities
  - Increased hunting opportunities
  - Other benefits
- **Nutrient Reduction Cost/Benefit**
  - Lower $/pound Removed than WPCF
  - Lowest $/pound Removed
  - Highest Pounds Removed
- **Life Cycle**
  - Number of Years Provided
  - Lowest Annual Maintenance Costs
  - Lowest Life Cycle Cost

WPCF Alternatives

WPCF Alternative Technologies

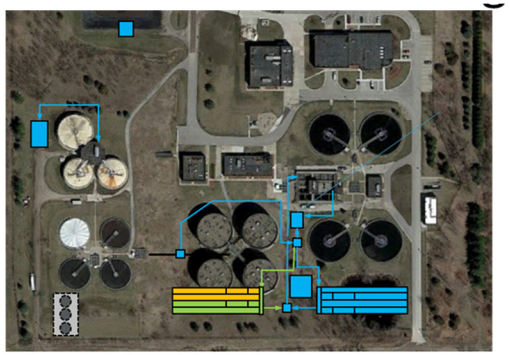
Prior 2012 Long Range Facility Plan Recommendation



- Prior to Iowa Nutrient Reduction Strategy
- Replace Trickling Filters
- Incorporate Simultaneous Nitrification Denitrification (SNDN)
- In 2012 Estimated at $25 million

WPCF Alternative Technologies

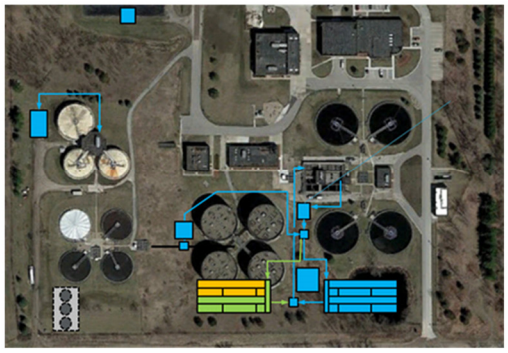
Current Study Identified Other Potential Options



Conventional Activated Sludge (CAS)

Granular Activated Sludge (GRAS)

Integrated Fixed Film Activated Sludge (IFAS)



Membrane Aerated Bioreactor (MBAR)

- Reflect Iowa Nutrient Reduction Strategy
- Replace Trickling Filters
- Incorporate Alternative Technology

WPCF Alternative Technologies

Shortlisted to Three Based on Monetary and Nonmonetary Considerations

- Capital & O&M Costs

- Performance Criteria
  - Reliability & Effectiveness
  - Amenable to Wet Weather Flows
  - Solids Handling Impacts
  - Energy Requirements
  - Adaptability to More Stringent Standards
  - Constructability and Phasing Potential

- Acceptance Criteria
  - Consistency with Current Operations
  - Safety
  - Positive Public Opinion
  - Operational Requirements
  - Maintenance Requirements
  - Operations During Construction

WPCF Alternative Technologies

Phasing Plan

Phase 1
1st 5 years

- Keep Trickling Filters in Service
- Incorporate 1st Phase of Alternative Technology
- Provides Redundant and some Growth Capacity (Current Permit Limits)
- Provides Limited, if Any, Nutrient Reduction

Phase 2
2nd 5 years

- Take Trickling Filters Out of Service as they Fail
- Incorporate 2nd Phase of Alternative Technology
- Provides Additional / Redundant Capacity
- Provides Seasonal Biological Nutrient Reduction

Phases 3
Last 10 years

- Takes Remaining Trickling Filters Out of Service
- Incorporate 3rd Phase of Alternative Technology
- Provides Forecast 2040 Treatment Capacity
- Provides Full Biological Nutrient Reduction

WPCF Alternative Technologies

Costs & Key Assumptions

- Costs are in 2018
- Phasing Reflects Flexibility Provided in Iowa Nutrient Reduction Strategy
- Supported by a Commitment to Watershed Nutrient Reductions to Demonstrate Leadership & Progress
- Could be Accomplished in One or Two Phases Instead

Strategy Summary

Potential Integrated Strategy

Watershed and WPCF – Will be Submitted to IDNR

Convert from trickling filters to alternative technology that provides additional capacity for growth and nutrient removal that achieves the goals of the Iowa Nutrient Reduction Strategy
Minimize WPCF costs and associated customer rate impacts through phased implementation of alternative technology that continues to use existing trickling filter capacity as long as condition allows
Incorporate existing WPCF optimization to the extent affordable and consistent with alternative WPCF technology.
Demonstrate commitment through continued implementation of urban best management practices with added emphasis on associated watershed nutrient reductions
Identify, prioritize, and fund watershed nutrient reduction projects consistent with location, ancillary benefits, cost/benefit, and life cycle cost criteria.
Register and bank watershed credits with the Nutrient Reduction Exchange to offset potentially more stringent future requirements
Support Iowa State University efforts to develop innovative and alternative watershed based nutrient reduction.

Stakeholder Input

Online Survey and Open House

- 20 respondents
- 90% Ames rate payers
- 70% with moderate or considerable knowledge on nutrients
- 75% consider nutrients an exceptional issue statewide
- 75% identified nonpoint sources as primary source
- 100% believe that the Utility should invest rate payer dollars to address nutrients
- 95% support Utility investment in upstream watershed projects outside City limits (35% w/out condition, 50% if ancillary benefits, 10% if less expensive than at WPCF)
- 95% support Utility investment in WPCF upgrade to address nutrients (58% immediately, 32% w/ expansion or other upgrade, 11% w/ other major environmental issue)
- 85% support rate increase (6% support 50% increase, 44% support 25% increase, 44% support 10% increase)

Path Forward

Path Forward

WPCF Nutrient Feasibility Study

Anticipated CIP

- $39.63 million over 20 years at WPCF
- $100,000 / year for Watershed BMPs
- $0 for Trickling Filters at WPCF

Objective

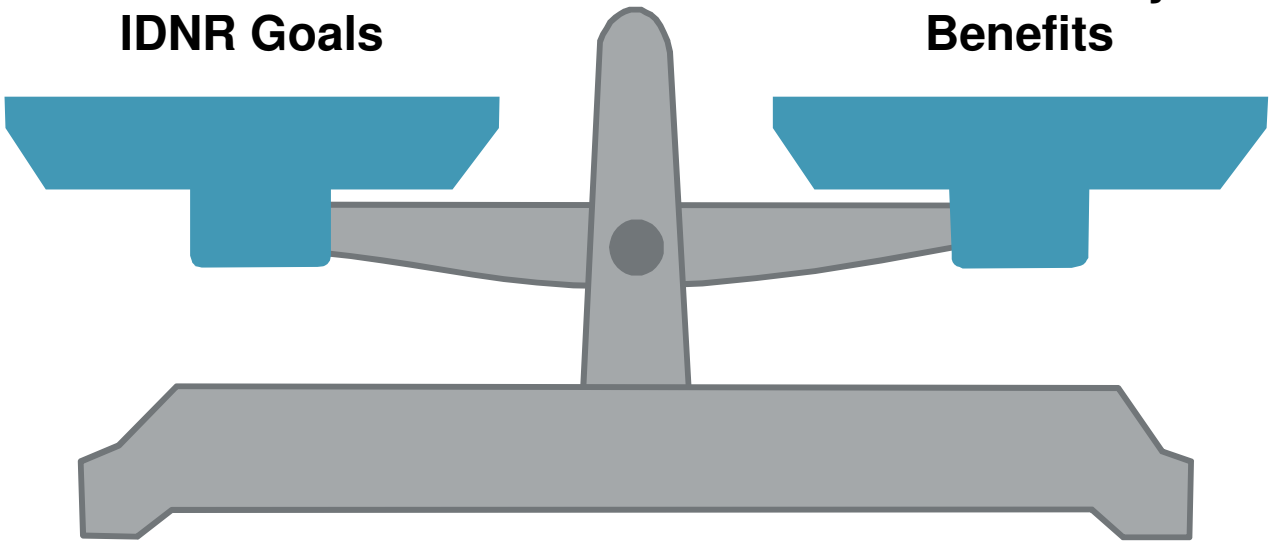
Appropriate Balance?

Cost of and timing of Nutrient Removal

IDNR Goals

Rate Impacts

Water Quality Benefits



Questions & Guidance