

WATER QUALITY Stronger Together

CONTENT

on the cover

lowa Farmer holds up cover crop sample to show the great root system that holds the soil in place.





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|---------------------|---------------------------------|
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QUENCH Magazine is published 2 times per year by the Iowa Rural Water Association (IRWA). The magazine is distributed by mail to IRWA members' consumers.

The IRWA Mission: To provide the highest leadership in the support of Iowa's water and wastewater industries through the provision of technical assistance, training and education, legislative, regulatory and public affairs, and financing activities.

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20 Einancial Summary for RRWA

he number of water meters that RRWA customers had in service increased by 375 throughout the year and totaled 20,800 by the end of 2020. Water usage during the year from these meters increased by 40 million gallons or roughly 1% from 2019 numbers and totalled 2.9 billion gallons for 2020. This increased water usage was primarily due to the drier weather conditions experienced toward the end of 2020 and the new water connection to the City of Donnellson in Lee County.

The 2.9 billion gallons in water sales generated revenues of almost \$16.5 million for the Association and when combined with \$250,000 collected from 750 Waste Water customers, accounted for almost 80% of the total cash received during 2020. Another \$700,000 in excise tax associated with water sales was collected for the State. A connection fee from the Wapello Rural Water Association of \$1 million was received during 2020 as reimbursement for expenditures required to serve them water and construction income and hookup fees charged for all other new additions to the distribution system brought in almost \$900,000 while additional construction services and material sales provided to members, customers and other entities added \$435,000. Income from RRWA's cash investments generated just over \$265,000 in interest income throughout the year and all other cash received from miscellaneous sources during 2020 totalled \$935,000.

Daily operating expenses of the company during 2020 required \$6.6 million in cash and included in this segment was everything from the chemicals and electricity used to purify and pump the water to the fuel and repair costs associated with RRWA's trucks and construction equipment, or the office supplies and postage expenditures incurred throughout the year. Operating expenses in this segment decreased 4% or \$300,000 from the prior year. Another \$5.3 million was spent on salaries, fringe benefits and payroll taxes for the company's 68 full-time employees. The next segment of cash expenditures was loan payments which required \$3.7 million of cash. Interest payments totalled \$1.5 million on an average loan balance of roughly \$41 million throughout the year with principal payments making up the remaining \$2.2 million. Construction projects and improvements required almost \$4.4 million throughout the year for the funding of costs associated with new individual customer hookups and the infrastructure needed to finish the connection to Wapello Rural Water and the start of a project to serve the City of Unionville and Putnam County in Missouri. New capital purchases required another \$695,000; payments made to the State for excise tax totalled \$717,250; and all other uses of cash totalled \$50,250.

Total cash expenditures for the year added up to \$21,540,500, which when compared with total cash receipts of \$20,961,500, resulted in a negative cash flow during the year of \$579,000. This cash shortfall had been anticipated for the year and was largely due to unusual construction activity and capital infrastructure improvements. Even with this negative cash flow, adequate cash reserves were in place and the company's balance sheet and financial ratios continued to remain strong in 2020 with the company's net worth or members equity increasing by over \$2.7 million when compared to numbers reported the previous year while long term debt and liabilities decreased by \$2 million.

The 44th Annual Membership meeting

was held at the RRWA Treatment Plant, 16166 Hwy J29, Centerville, IA on February 27, 2020 at 7:00 p.m.

Two directors were re-elected to serve a three-year term on the RRWA Board:

District 5 Charla Warner – PO Box 37 – Bonaparte, IA 52620

District 6 Garry Schiller – 1798 255th Street – Donnellson, IA 52625 RRWA would like to thank all of those members of the nominating committee for their willingness to serve. Members of the nominating committee appointed by the Board of Directors were: Dan Furlin, Jr-Numa, Gary Dustin-Albia, Richard Breckenridge-Keosauqua, Leroy Perkins-Corydon, Darrell Krehbiel-Donnellson, Susan Knapp-Bloomfield, and Bill Hillyard-Burlington.

Other items discussed at the meeting were:

• The 2020 Financial Report of RRWA • Tours of the Original and New RRWA Treatment Plants

RRWA BOARD OF DIRECTORS

Randy Eddy, Chairman Denny Amoss, Vice Chairman Doug Goben, Secretary & Treas. Curt Frank Garry Schiller Charla Warner Ken Wuthrich

Rate Increase

Maintaining dependable service at the most affordable price possible remains one of our top priorities as an organization. While accomplishing this goal, we must also protect the integrity and financial stability of the Association. Even though our financial condition remains strong, inflationary cost increases are starting to negatively impact our operations. And as a member-owned utility company, we are requesting your help in sharing with these costs to enable us to continue to provide our customers with safe, high quality drinking water and related services.

With this in mind, the RRWA board of directors has found it necessary to implement an increase of roughly 5% to your water rate. This new rate structure would increase the typical RRWA customer's water bill (using 5,000 gallons of water per month) by less than \$3 per month. The last time RRWA had a rate increase was in July of 2017 by a similar amount. The rate increase will go into effect on water used after July 1st, 2021, and will be due on the payment you make August 1st, 2021.

While virtually all aspects of our operations have experienced steady cost increases (with the majority in the double-digit range) over this four-year time period, we pride ourselves on avoiding routine or annual price adjustments. RRWA has been able to offset most of these increases with continued growth opportunities and improvements in efficiencies of service. Additionally, we wanted to let you know that these adjustments in our pricing structure will affect our community bulk users and all residential customers and livestock producers by similar percentage increases.

We remain committed to protecting our water sources and being proactive in planning for all your future water needs. Please feel free to contact our offices if you have any questions regarding the new water rate increase during the hours of 8:00 am and 4:30 pm at 641-647-2416 or 1-800-233-8849.

To the right are the new rates charts. Using the first two digits of your account number choose the rate chart associated with it and please cut it out and affix it to your book. Thank you.

MONTHLY WATER RATE CHART

Rathbun System - All Other Counties

Service Area number (first 2 numbers in account) 01 through 30

All Amounts include Excise Tax of 6%

| Gallons Used | Amount Due | Late Payment Charge Amount Due if Not Paid by 15th |
|--------------|------------|--|
| | | |
| Minimum Bill | 28.62 | 31.48 |
| 2,000 | 28.62 | 31.48 |
| 3,000 | 36.57 | 40.23 |
| 4,000 | 44.52 | 48.97 |
| 5,000 | 52.47 | 57.72 |
| 6,000 | 58.83 | 64.71 |
| 7,000 | 65.19 | 71.71 |
| 8,000 | 71.55 | 78.71 |
| 9,000 | 77.91 | 85.70 |
| 10,000 | 84.27 | 92.70 |
| 11,000 | 89.31 | 98.24 |
| 12,000 | 94.34 | 103.77 |
| 13,000 | 99.38 | 109.32 |
| 14,000 | 104.41 | 114.85 |
| 15,000 | 109.45 | 120.40 |
| 16,000 | 114.48 | 125.93 |
| 17,000 | 119.52 | 131.47 |
| 18,000 | 124.55 | 137.01 |
| 19,000 | 129.59 | 142.55 |
| 20,000 | 134.62 | 148.08 |
| 21,000 | 138.44 | 152.28 |
| 22,000 | 142.25 | 156.48 |
| 23,000 | 146.07 | 160.68 |
| 24,000 | 149.88 | 164.87 |
| 25,000 | 153.70 | 169.07 |
| | | |
| 26,000 | 157.52 | 173.27 |
| 27,000 | 161.33 | 177.46 |
| 28,000 | 165.15 | 181.67 |
| 29,000 | 168.96 | 185.86 |
| 30,000 | 172.78 | 190.06 |
| 31,000 | 176.60 | 194.26 |
| 32,000 | 180.41 | 198.45 |
| 33,000 | 184.23 | 202.65 |
| 34,000 | 188.04 | 206.84 |
| 35,000 | 191.86 | 211.05 |
| 36,000 | 195.68 | 215.25 |
| 37,000 | 199.49 | 219.44 |
| 38,000 | 203.31 | 223.64 |
| 39,000 | 207.12 | 227.83 |
| 40,000 | 210.94 | 232.03 |
| 41,000 | 214.76 | 236.24 |
| 42,000 | 218.57 | 240.43 |
| 43,000 | 222.39 | 244.63 |
| 44,000 | 226.20 | 248.82 |
| 45,000 | 230.02 | 253.02 |
| 46,000 | 233.84 | 257.22 |
| | | |
| 47,000 | 237.65 | 261.42 |
| 48,000 | 241.47 | 265.62 |
| 49,000 | 245.28 | 269.81 |
| 50,000 | 249.10 | 274.01 |

MONTHLY WATER RATE CHART

Lee County System

Service Area number (first 2 numbers in account) 33, 34, 42, 70, 71 and 72

All Amounts include Excise Tax of 6%

| Gallons Used | Amount Due | Late Payment Ch Amount Due if I Paid by 15th |
|--------------|------------|--|
| | | |
| Minimum Bill | 29.68 | 32.65 |
| 2,000 | 29.68 | 32.65 |
| 3,000 | 37.84 | 41.62 |
| 4,000 | 46.00 | 50.60 |
| 5,000 | 54.17 | 59.59 |
| 6,000 | 60.79 | 66.87 |
| 7,000 | 67.42 | 74.16 |
| 8,000 | 74.04 | 81.44 |
| 9,000 | 80.67 | 88.74 |
| 10,000 | 87.29 | 96.02 |
| 11,000 | 92.59 | 101.85 |
| 12,000 | 97.89 | 107.68 |
| 13,000 | 103.19 | 113.51 |
| 14,000 | 108.49 | 119.34 |
| 15,000 | 113.79 | 125.17 |
| 16,000 | 119.09 | 131.00 |
| 17,000 | 124.39 | 136.83 |
| 18,000 | 129.69 | 142.66 |
| 19,000 | 134.99 | 148.49 |
| 20,000 | 140.29 | 154.32 |
| 21,000 | 144.27 | 158.70 |
| 22,000 | 148.24 | 163.06 |
| 23,000 | 152.22 | 167.44 |
| 24,000 | 156.19 | 171.81 |
| 25,000 | 160.17 | 176.19 |
| 26,000 | 164.14 | 180.55 |
| 27,000 | 168.12 | 184.93 |
| 28,000 | 172.09 | 189.30 |
| 29,000 | 176.07 | 193.68 |
| 30,000 | 180.04 | 198.04 |
| 31,000 | 184.02 | 202.42 |
| 32,000 | 187.99 | 206.79 |
| 33,000 | 191.97 | 211.17 |
| 34,000 | 195.94 | 215.53 |
| 35,000 | 199.92 | 219.91 |
| 36,000 | 203.89 | 224.28 |
| 37,000 | 207.87 | 228.66 |
| 38,000 | 211.84 | 233.02 |
| 39,000 | 215.82 | 237.40 |
| 40,000 | 219.79 | 241.77 |
| 41,000 | 223.77 | 246.15 |
| 42,000 | 227.74 | 250.51 |
| 43,000 | 231.72 | 254.89 |
| 44,000 | 235.69 | 259.26 |
| 45,000 | 239.67 | 263.64 |
| | 243.64 | 268.00 |
| 46,000 | 243.64 | 268.00 |
| 47,000 | | |
| 48,000 | 251.59 | 276.75 |
| 49,000 | 255.57 | 281.13 |
| 50,000 | 259.54 | 285.49 |

All water over 50,000 Gallons

If Paid by the 15th -- \$259.54 + \$4.77 per 1,000 Gal over 50,000

If Paid after the 15th -- \$285.49 + \$5.25 per 1,000 Gal over 50,000

All water over 50,000 Gallons

Rathbun - 27.00 [6%] (07/01/2021)

 If Paid by the 15th - \$249.10 + \$4.61 per 1,000 Gal over 50,000

 If Paid after the 15th - \$274.01 + \$5.07 per 1,000 Gal over 50,000

Lee - 28.00 [6%] (07/01/2021)

MONTHLY WATER RATE CHART

Des Moines & Henry County System

Service Area number (first 2 numbers in account) 35, 36, 37, 38, 39, 40, 41 and 74

All Amounts include Excise Tax of 6%

| Gallons Used | Amount Duo | Late Payment Cha Amount Due if N Paid by 15th |
|------------------|------------|---|
| | Amount Due | Paid by 15th |
| Minimum Bill | 33.92 | 37.31 |
| 2,000 | 33.92 | 37.31 |
| 3,000 | 42.56 | 46.82 |
| 4,000 | 51.20 | 56.32 |
| 5,000 | 59.84 | 65.82 |
| 6,000 | 67.26 | 73.99 |
| 7,000 | 74.68 | 82.15 |
| 8,000 | 82.10 | 90.31 |
| 9,000 | 89.52 | 98.47 |
| 10,000 | 96.94 | 106.63 |
| 11,000 | 102.82 | 113.10 |
| 12,000 | 108.70 | 119.57 |
| 13,000 | 114.59 | 126.05 |
| 14,000 | 120.47 | 132.52 |
| 15,000 | 126.35 | 138.99 |
| 16,000 | 132.24 | 145.46 |
| 17,000 | 138.12 | 151.93 |
| 18,000 | 144.00 | 158.40 |
| 19,000 | 149.88 | 164.87 |
| 20,000 | 155.77 | 171.35 |
| 21,000 | 159.80 | 175.78 |
| 22,000 | 163.82 | 180.20 |
| 23,000 | 167.85 | 184.64 |
| 24,000 | 171.88 | 189.07 |
| 25,000 | 175.91 | 193.50 |
| 26,000 | 179.94 | 197.93 |
| 27,000 | 183.96 | 202.36 |
| 28,000 | 187.99 | 202.30 |
| 29,000 | 192.02 | 211.22 |
| | 196.05 | 211.22 |
| 30,000 | | |
| 31,000 32,000 | 200.08 | 220.09 |
| | | - |
| 33,000 | 208.13 | 228.94 |
| 34,000 | 212.16 | 233.38 |
| 35,000 | 216.19 | 237.81 |
| 36,000 | 220.22 | 242.24 |
| 37,000 | 224.24 | 246.66 |
| 38,000 | 228.27 | 251.10 |
| 39,000 | 232.30 | 255.53 |
| 40,000 | 236.33 | 259.96 |
| 41,000 | 240.36 | 264.40 |
| 42,000 | 244.38 | 268.82 |
| 43,000 | 248.41 | 273.25 |
| 44,000 | 252.44 | 277.68 |
| 45,000 | 256.47 | 282.12 |
| 46,000 | 260.50 | 286.55 |
| 47,000 | 264.52 | 290.97 |
| 48,000 | 268.55 | 295.41 |
| 49,000 | 272.58 | 299.84 |
| 50,000 | 276.61 | 304.27 |

All water over 50,000 Gallons

 If Paid by the 15th - \$276.61 + \$4.82 per 1,000 Gal over 50,000

 If Paid after the 15th - \$304.27 + \$5.31 per 1,000 Gal over 50,000

DSM/Henry - 32.00 [6%] (07/01/2021)

Call RRWA for Your FREE Smart Meter!

Sign Up for Automatic or Online Bill Payment

Receive Water Leak Notifications

Monitor Water Use on a Secure Website

No More Reading Remotes or Mailing Payments

No Cost for Installation

Thousands of RRWA customers already enjoy the benefits of smart meters.

Call Now for Your FREE Smart Meter! 1-800-233-8849

2020 CONSUMER CONFIDENCE REPORT

The Rathbun Regional Water Association, Inc. 2020 Water Quality Reports (CCR) coming soon: Starting July 01, 2021 you will be able to view your RRWA system 2020 Annual Water Quality Report (also known as a Consumer Confidence Report, CCR) online.

If your account number begins with **01 – 30** log on to https://www.rrwa.net/CMDocs/RRWA/ WaterQuality/0400900_2020_CCR_1_Final-Rathbun.pdf

If your account number begins with 33 – 34, 42 – 43, 71 – 72 log on to https://www.rrwa.net/CMDocs/RRWA/ WaterQuality/0400901_2020_CCR_1_Final-Ft-Madison.pdf

If your account number begins with **35 – 38, 40 – 41, 74** log on to https://www.rrwa.net/CMDocs/RRWA/ WaterQuality/0400902_2020_CCR_1_Final-Burlington.pdf

If your account number begins with **39** log on to https://www.rrwa.net/CMDocs/RRWA/ WaterQuality/4453901_2020_CCR_1_Final-Mt-Pleasant.pdf

Your 2020 Consumer Confidence Report contains important information about the source and quality of your drinking water. If you would like a paper copy of the CCR mailed to your home or sent as an attachment to an email, please call 641.647.2416 or email jbuckingham@rrwa.net.

RATHBUN LAKE Celebrates 50 Years!

ut July 31, 2021 on your calendar! That date marks the 50th anniversary of the dedication of Rathbun Lake. The Rathbun Lake Association and partners have planned a series of activities for the public to commemorate this special event and to recognize the importance of Rathbun Lake. For more information on the day's activities, see the flyer on page 7. Please join us on July 31, 2021!

Rathbun Lake is one of the most important water resources in Iowa. Rathbun Regional Water Association relies on Rathbun Lake as the source of water for the Association's two water treatment plants. Rathbun Lake also provides recreation for one million visitors annually and is the home of Iowa's Honey Creek Resort State Park. In addition, Rathbun Lake provides fish and wildlife habitat, flood damage reduction, storage for navigational flows, and water for the Iowa Department of Natural Resources' Rathbun Fish Hatchery. The US Army Corps of Engineers developed the lake in the late 1960s. Today, the Corps of Engineers manages Rathbun Lake, lake facilities, and more than 20,000 acres of adjacent public land.

The significance of Rathbun Lake has led many organizations and individuals to take actions that will ensure the lake continues to benefit future generations. The Rathbun Land and Water Alliance and its partners coordinate and support these actions. As a result, hundreds of landowners have installed conservation practices on their farms in the Rathbun Lake watershed to protect water quality in the lake. Additional conservation measures such as shoreline stabilization and wetlands have been installed on adjacent and upstream public land to protect Rathbun Lake. For more information about Rathbun Lake protection efforts, visit www.rlwa.org.







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The Rathbun Lake Association presents

JULY 31, 2021 RATHBUN LAKE 50TH ANNIVERSARY CELEBRATION

RUN/WALK/BIKE THE DAM 8AM-10AM

apart is and is the

STRUUT DE

DEDICATION SITE CEREMONY 10AM

LIGHTED BOAT DISPLAY 8:30PM

FIREWORKS 9PM Parking on the Dam will begin at 8pm, enter on the north end of dam

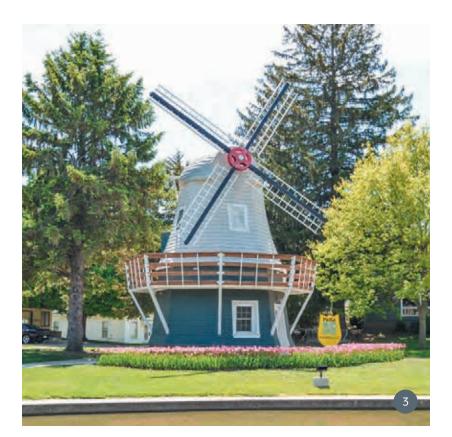
Learn more at https://www.facebook.com/usacerathbunlake



- July 31, 1971 Rathbun Lake dedication ceremony with President Richard Nixon
- 2–3 Construction of the Rathbun Lake dam and control tower.
 - **4** RRWA's water treatment plants below Rathbun Lake

Community Projects Across Iowa

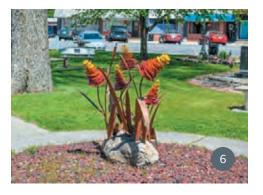
very town strives to make their community a better place to live. It is an ongoing project. Here are a few examples from different lowa communities that you may want to try in your town. Many towns use art as a way of decorating their community. Others combine structures highlighting a community history with entertainment. Below are a few examples of community art and community beautification from around lowa.















Based on my recent travels, lowa knows how to beautify a community. Community projects are hard work, not to mention costly, but they are ALWAYS worth the effort. Historical information, heritage and beautiful art pieces really do generate a pleasant living atmosphere. Take pride in what your community has created and maybe even pitch in to help sometime. Community projects usually generates people working together as a team and "Working Together Works". Enjoy your community, enjoy fellowship with each other and enjoy the fun it generates! One more thing: Remember to always drink plenty of Quality on Tap water when doing any community or personal projects!

- 1 | The City of Muscatine has an interactive Mississippi Mist Fountain Splash Pad in Riverside Park.
- 2 | Artist Ray "Bubba" Sorenson has painted "Freedom Rocks" in all 99 counties of Iowa. This Freedom Rock can be found on the outskirts of Oskaloosa's east side in Mahaska County. The south side of the rock features the faces of seven generals, all from Mahaska County. The east side image is "The Bugler" Harry L. Anderson.
- **3** Dutch Heritage is the highlight in Pella, lowa. This windmill and tulip gardens are located right off the town's square in "Sunken Gardens Park".
- 4 | Prairie City Community has highlighted one of their best features – The Neal Smith National Wildlife Refuge – with this statue of a Buffalo. And also the statue below of "Prairie Grass".
- 5 | The City of Newton recently placed "Views of Historic Newton" on the town's utility boxes for the street lights.
- 6 Bondurant has various seating areas with nice trash receptacles and perennial gardens throughout their downtown.
- 7 | A recent project in the City of Grinnell was to beatify there street corners with brick inlay designs.
- 8 New Sharon recently completed a new playground upgrade featuring the local North Mahaska school colors of Red and White.



WATER QUALITY Stronger Together

- We are **#StrongerTogether** in lowa ·

armers who grow lowa's corn know how fortunate we are to have such fertile soils and how important our state's water is as we depend on every drop, and not just for the crops we grow. We have families too and just like you, we want to be sure the water we drink is pure and clean.

Iowans truly are #StrongerTogether when we support one another. Just like how you support local shops, businesses, and restaurants, you can support local lowa farmers every day! One way to do this is by filling up your water bottle from the tap.

Farmers care about the water we share here in lowa, and we are giving back to our communities. In May, lowa Corn awarded nine lowa schools across the state a water bottle filling station to encourage students to fill up their glass from the tap.

THE WINNING SCHOOLS ARE AS FOLLOWS:

Sioux Central Community Schools, Sioux Rapids; Hancock Elementary, Britt; Union High School, La Port City; West Monona, Onawa; Morris Elementary, Bondurant; North Scott, Eldridge; Tri-Center, Neola; Lincoln Center, Albia; Cardinal Middle School, Eldon.

The water bottle filling stations will be installed before the 2021/2022 school year. Additionally, lowa Corn will be part of the first week of school by donating lowa Corn water bottles, signage on the filling station and work with the winning schools to organize a day for the lowa Corn Mobile Education Center to come out to the school.

Iowa Corn Farmers Care About the Water We Share

When you drink tap water you are showing your trust for clean, pure water. Iowa farmers are implementing the best practices and using the best technology to protect Iowa's water supply. One of the practices farmers are implementing are called cover crops. In the fall after the corn crop is harvested, farmers plant another crop known as a cover crop. It adds organic matter to the soil and holds it in place, because when soil is covered by plant material the risk of erosion is greatly reduced.

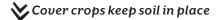
"Cover crops keep the soil in place, and in the long run, I know they are contributing to healthier soil and better water quality for all Iowans,"

said Mark Mueller a fourth generation Iowa farmer from Waverly and director of the Iowa Corn Grower Association.

Farmers like Mueller and the Golightly's use a variety of conservation practices to ensure the best use of soil and water resources to reduce nutrients in water and safeguard their long-term ability to farm. To learn about the many other best practices farmers use visit iowacorn.org/H20.

For more information visit iowacorn.org

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Anna and Randy Golightly looking at cover crops in their field near Van Meter, Iowa

TO THE WINNING IOWA SCHOOLS

IOWAL CORN



4.10

To Course pourse visit WWW.IOWACORN.ORG/WATERFOUNTAIN



Rathbun Regional Water Association, Inc. 16166 Hwy J29 Centerville, IA 52544



WATER MATTERS – Flooding & Rainfall Patterns

Rainfall events that generate flooding are occurring more often throughout lowa. This seems to be the projected trend for the future. Communities need to develop more resilient strategies to address flooding issues. A starting point is to clarify the common misperception about probabilities of rainfall events.

Types of Flooding

A floodplain is the channel of a river and adjacent land areas that are reserved or protected from development. Some communities are required to regulate development in these floodways. Regulation is meant to ensure that there are no increases in upstream flood elevations.

Floodplains are nature's storage areas for heavy rains that help reduce the likelihood or extent of downstream flooding. Every waterbody has a floodplain, from the smallest creek to the largest river. When flooding occurs rain saturates the urban drainage system, which causes flooding. There are two main types of flooding to consider with respect to storm water.

Flash Floods are caused by an extreme, localized storm where a lot of rain falls in a short amount of time. It typically affects a small area within the watershed. Floods of this type are particularly dangerous because of the suddenness and speed with which they occur. Consequently, they are often difficult to predict. Flash flooding in urban areas is an increasingly serious problem. It can be due to removal of vegetation and the increase in impervious surface area. It is also a factor of how of drainage systems are designed to simply convey runoff as quickly as possible.

Extreme Floods are caused by large-scale weather systems that generate prolonged rainfall over wide watershed areas. Floods of this nature are still dangerous, however they are easier to predict. In fact, the lowa Flood Center, is working hard to help communities with mapping, monitoring and responding to potential floods. Starting in

the early 90's, most of Iowa's urban communities began requiring flood control practices, such as detention and retention basins, to address downstream flooding.

This "one-size fits all" approach may not be all that is needed to reduce flooding caused by urban development, especially in watersheds that have agriculture development.

Flood Frequency

Rainfall events can be estimated through recurrence intervals. The interval expresses the likelihood (as a percentage) that a storm of the same duration and volume will be exceeded in one year. This is known as the Annual Exceedance Probability. A flood event with the duration and volume of a "2-year storm", which is 2.91 inches of rain over 24 hours, has a 50 percent chance of occurring in any given year. Likewise, a "100-year storm", which is equivalent to 6.61 inches of rain over a 24-hour period, has the likelihood of a 1 percent chance annually.

The "100-year storm" should not be mistaken with a storm that would only occur once in 100 years. Rather the phrase is used to illustrate storms of the 100-year magnitude and have a 1 percent chance of occurring in any given year.

| Time Period | Annual Exceedance Probability |
|-------------|-------------------------------|
| 2 years | 50% |
| 5 years | 20% |
| 10 years | 10% |
| 25 years | 4% |
| 50 years | 2% |
| 100 years | 1% |
| 500 years | 0.20% |

https://iowastormwater.org/stormwater-runoff/flooding/