KANSAS-NEBRASKA
BIG BLUE RIVER COMPACT

FORTY SIXTH
ANNUAL REPORT

FISCAL 2019

Manhattan, KS
May 15, 2019

KANSAS – NEBRASKA BIG BLUE RIVER

COMPACT ADMINISTRATION

May 13, 2020

The Honorable Donald J. Trump
President of the United States of America

The Honorable Laura Kelly
Governor of Kansas

The Honorable Pete Ricketts
Governor of Nebraska

Pursuant to Article VIII, Section 1 of the Rules and Regulations of the Kansas-Nebraska Big Blue River Compact Administration, I submit the Forty Sixth Annual Report. The report covers the activities of the Administration of the Compact for the Fiscal Year 2019 while I was the presiding Federal Chair.

Respectfully,

W. Don Nelson

W. Don Nelson

Federal Compact Chair

Table of Contents

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Manhattan, KS 66502
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www. agriculture.ks.gov

Kansas
Department of Agriculture

900 SW Jackson, Room 456
Topeka, KS 66612
785-296-3556

Mike Beam, Secretary

Laura Kelly, Governor

April 9, 2019

W. Don Nelson, Federal Chair
Kansas-Nebraska BBRCA
2430 S. Canterbury Lane
Lincoln, NE 68512

Gordon W. "Jeff" Fassett, NE Commissioner
Kansas-Nebraska BBRCA
301 Centennial Mall South
Lincoln, NE 68509

Sharon Schwartz, Kansas Advisor
Kansas-Nebraska BBRCA
2051 20th Road
Washington, KS 66968

Larry Moore, Nebraska Advisor
Kansas-Nebraska BBRCA
2240 A Road
Ulysses, NE 68669

Dear Compact Members:

The 2019 annual meeting of the Kansas-Nebraska Big Blue River Compact Administration will be hosted by Kansas on Wednesday May 15, 2019, at 9:30 a.m. The meeting will be held at the Kansas Department of Agriculture, located at 1320 Research Park Drive in Manhattan, KS.

A tentative agenda is enclosed with this meeting notice.

Sincerely,

David W. Barfield
KS Commissioner

Enclosures or Attachments (1)

cc: Budget Committee – Amy Zoller, Chris Beightel
Legal Committee – LeRoy Sievers, Kenneth Titus
Engineering Committee – Jeremy Gehle, Chris Beightel, Katie Tietsort
Water Quality Committee – Tom Stiles, Annette Kovar, Craig Romary, Dan Howell, Marty Link
NRD Managers – Kyle Hauschild, David Clabaugh, David Eigenberg, John Thorburn
Add'l – Jim Macy, Jason Lambrecht

Kansas-Nebraska Big Blue River Compact Administration
46th Annual Meeting

May 15, 2019
9:30 a.m.
Kansas Department of Agriculture
1320 Research Park Drive
Manhattan, KS 66502

AGENDA

1. Call to Order
2. Introductions and Announcements
3. Minutes and Report of the 45th Annual Meeting
4. Chair's Report
5. Kansas Report
    a. State Overview Report
    b. Topeka Field Office Report
6. Nebraska Report
    a. State Overview Report
    b. Water Administration Report
    c. Reports of the NRDs
7. Secretary's Report
8. Treasurer and Budget Report
9. United States Geological Survey Report
10. Legal Committee Report
11. Engineering Committee Report
12. Water Quality Report
13. Advisor Comments
14. Unfinished Business
15. New Business
16. Committee Membership and Special Assignments
17. Adjourn

MINUTES OF THE 46th ANNUAL MEETING
OF THE
KANSAS-NEBRASKA BIG BLUE RIVER COMPACT ADMINISTRATION

Call to Order

The Forty-Sixth Annual Meeting of the Kansas-Nebraska Big Blue River Compact Administration was held on May 15th, 2019 at the Kansas Department of Agriculture in Manhattan, KS. The meeting was called to order at 9:30 a.m. by W. Don Nelson, Compact Chair.

Mr. Nelson introduced himself and asked those in attendance to introduce themselves.

Introductions

Those in attendance were:

W. Don Nelson	Compact Chair
David Barfield	Kansas Compact Commissioner; Chief Engineer, Kansas Department of Agriculture, Division of Water Resources
Sharon Schwartz	Kansas Compact Advisor
Larry Moore	Nebraska Compact Advisor
Chris Beightel	Compact Secretary; Kansas Department of Agriculture, Division of Water Resources
Amy Zoller	Compact Treasurer; Nebraska Department of Natural Resources, Water Planning Division
Jeremy Gehle	Compact Engineering Committee Chair; Nebraska Department of Natural Resources, Water Administration Division Head
Kenneth Titus	Kansas Department of Agriculture, Chief Counsel
Tim McCoy	Kansas Department of Agriculture, Division of Conservation
Katie Tietsort	Kansas Department of Agriculture, Division of Water Resources, Topeka Field Office Water Commissioner
Karen Hunter	Kansas Department of Agriculture, Division of Water Resources
Desiree Smith	Kansas Department of Agriculture, Legal Intern
Trevor Flynn	Kansas Department of Health and Environment, Bureau of Water
Ben Pinkston	Kansas Farm Bureau, Advocacy Division
Pam Dankenbring	Kansas Farm Bureau, Field Staff
Angie Danner	Kansas Farm Bureau, Field Staff
Matt Unruh	Kansas Water Office, Water Resource Planning Section Chief
Kirk Tjelmeland	Kansas Water Office, Water Resource Planning Section
Kyle Hauschild	Little Blue Natural Resources District, General Manager
Dave Clabaugh	Lower Big Blue Natural Resources District, General Manager
Marty Link	Nebraska Department of Environmental Quality, Water Quality Division
Jesse Bradley	Nebraska Department of Natural Resources, Assistant Director
Emily Rose	Nebraska Department of Natural Resources, Legal Counsel
Jim Ostdiek	Nebraska Department of Natural Resources, Lincoln Field Office Supervisor
Isabella Peterson	Nebraska Department of Natural Resources, Water Planning Division
Andy Pedley	Nebraska Department of Natural Resources, Water Planning Division
Rachael Herpel	Nebraska Water Center, Assistant Director
James Kelly	Office of US Senator Jerry Moran
Dave Eigenberg	Upper Big Blue Natural Resources District, General Manager

Doug Bruns	Upper Big Blue Natural Resources District, Director
John Miller	Upper Big Blue Natural Resources District, Director
Lynn Yates	Upper Big Blue Natural Resources District, Director
Jack Wergin	Upper Big Blue Natural Resources District, Projects Department Manager
Marie Krausnick	Upper Big Blue Natural Resources District, Water Department Manager
Jason Lambrecht	US Geological Survey, Nebraska Water Science Center, Acting Director and Hydrologic Data Section Chief
Larry Klocke	Member of the Public

Chair's Report

W. Don Nelson, Compact Chair, reported that nothing had occurred within the Compact area in the past year which required him to fulfill more than his ordinary duties. Mr. Nelson attended the 2019 Water Quality Committee Meeting, the contents of which would be covered later in the meeting.

Kansas Report

State Overview Report

David Barfield, Kansas Compact Commissioner, began the Kansas report (Attachment A). Kansas has a new administration as a result of the 2018 election. After Governor Laura Kelly took office, Mike Beam was appointed and confirmed as the new Secretary of Agriculture.

Sharon Schwartz, Kansas Compact Advisor, has one year left in her current term and would like to discuss stepping down soon.

In the past year, the Kansas Legislature passed no new water legislation, beyond budget allowances for various state water programs.

Kansas law requires that all non-domestic water users annually report their water use. About five years ago, the Kansas Department of Agriculture, Division of Water Resources (DWR) developed an online water use reporting system. About 27% of water users reported their 2017 use online. During the reporting period for 2018 water use, water users were given two options: report their water use online for free or pay $20 per water right to file paper reports. As a result, about 91% of water users reported their 2018 use online.

Kansas previously reported on two water management tools intended to address declining Ogallala Aquifer levels in western Kansas. Local Enhanced Management Areas (LEMAs) allow a local Groundwater Management District (GMD) to request implementation of enhanced management within a defined area. The Sheridan County 6 (SD6) LEMA was created in northwest Kansas in 2013 and is now in its second 5-year period. During its first 5-year period, the SD6 LEMA aimed for a 20% water use reduction but reduced water use by over 30% while maintaining agricultural profits. Based on the success of the SD6 LEMA, Northwest Kansas GMD No. 4 initiated a district-wide LEMA, which was approved in 2017 for a 5-year period of 2018-2022. A group of local water users challenged the district-wide LEMA in an action which is currently in district court. Western Kansas GMD No. 1 is considering use of a LEMA in Wichita County, where groundwater resources are highly depleted.

Water right holders have access to a tool they can initiate without GMD involvement. Water Conservation Areas (WCAs) are consent agreements between water users and the Chief Engineer of DWR which restrict water use in exchange for greater flexibility in the use of a suite of water rights. 24 WCAs are currently in place, conserving about 8,000 ac-ft of water per year. Several WCAs with significant water use reduction targets are currently in the approval process.

DWR and Big Bend GMD No. 5 are working to remedy a water right impairment on behalf of Quivira National Wildlife Refuge in south-central Kansas. An augmentation project is anticipated, along with water use reductions to stabilize streamflow declines. GMD No. 5 wants to use a LEMA to accomplish those reductions, but DWR and GMD No. 5 have been unable to reach an agreement on the required LEMA parameters.

In the mid-1990s, the City of Hays, KS purchased a ranch about 80 mi to the south, along with its associated water rights. DWR is working with the Cities of Hays and Russell, KS to change those water rights from irrigation to municipal use, which also requires a water transfer approval. In March 2019, DWR provisionally approved the water right changes, subject to the water transfer approval. Local water users near the ranch filed a request for administrative review of the water right change approval, which was denied. They have until June 3, 2019 to petition for judicial review.

The City of Wichita, KS has Kansas's only Aquifer Storage and Recovery (ASR) project and are seeking to change some of the terms and conditions. Formal hearings are scheduled to begin in September 2019.

Topeka Field Office Report

Katie Tietsort, Water Commissioner for the DWR Topeka Field Office, finished the Kansas report (Attachment B). 2018 was much wetter than 2017, and the beginning of 2019 has been wetter still. In 2018, the Big Blue River basin received up to 15 in more precipitation than average. So far, in 2019, there have been 3.5 to 8 in of precipitation, concentrated in the north of the basin. 2019 temperatures are within the average range.

The Big Blue River did not require Minimum Desirable Streamflow (MDS) administration in 2018, while the Little Blue River fell below its MDS criteria, initiating the administration of 20 water rights junior to the MDS priority date of April 12, 1984. Streamflow in the Big Blue and Little Blue Rivers will be covered in more detail in the US Geological Survey (USGS) report.

In eastern Kansas, diversions by 126 water users were curtailed to protect releases from federal reservoir storage that were purchased by Water Assurance Districts (WADs) and water marketing customers.

The Lake Level Management Plans followed by Kansas in conjunction with the US Army Corps of Engineers (USACE) were suspended. Tuttle Creek Reservoir water levels are currently being managed for Missouri River flood control. The top of conservation storage in Tuttle Creek Reservoir is 1,075 ft, and the top of flood storage is 1,136 ft. As of May 15, 2019, the water level was 1,123 ft, the third highest on record. The USACE was working on repairs to the reservoir before the water level began rising.

Some of Kansas's civil penalty regulations for overpumping were updated to invoke stricter fines and suspensions, targeted at large water users with a habit of serial overpumping. DWR worked with the smaller users who were also caught to find long-term solutions to their overpumping problems. Within the Compact area, three civil penalties were issued in 2018, while none have yet been issued in 2019.

The number of new water right applications filed with DWR decreased in 2018 following a downturn in the agricultural economy. However, the number of new applications filed within the Big Blue River basin was slightly higher than the Kansas average. All new applications filed within the Big Blue River basin were approved. Most were for irrigation use.

The DWR Topeka Field Office began scanning their active water right files into DocuWare, the state-approved file archiving system. About 12-15% of active water right files have been scanned and archived.

Nebraska Report

State Overview Report

Jesse Bradley began the Nebraska report (Attachment C), having been designated to act on behalf of Jeff Fassett, Nebraska Compact Commissioner, who was unable to attend the meeting.

Water supply in the Big Blue and Little Blue River basins in 2018 was average or slightly above average, although there was a period of reduced supply in the Little Blue River basin in July and August. Beginning in March 2019, the combination of precipitation with the spring thaw caused historic flood events in central, north-central, and northeast Nebraska. A new record high stage reading of over 24 ft was recorded at the Big Blue River gage at Seward, NE.

The Nebraska Department of Natural Resources (DNR) is concluding basin-wide planning projects across the state. The basin-wide plan for the Republican River basin went into effect on March 1, 2019. The basin-wide plan for the Upper Platte River basin, developed with local stakeholders and five Natural Resources Districts (NRDs), is nearing completion. All five NRDs within the Upper Platte River basin will adopt new Integrated Management Plans (IMPs) in the fall. The Lower Platte River basin has a voluntary basin-wide plan which was developed with seven NRDs. DNR is developing drought contingency plans in parts of the state, and drought planning is a significant component of the new basin-wide plans for the Republican River and Upper Platte River basins.

Each NRD in the Big Blue River basin is working with DNR to develop a voluntary IMP. The Board of Directors of the Little Blue NRD finalized their IMP in May 2019. The Tri-Basin NRD is nearing completion on an IMP for the Little Blue River basin. In the Upper Big Blue NRD, DNR collaborated with the Nebraska Department of Environmental Quality (DEQ), Water Quality Division to establish a framework to communicate plan development to the public to facilitate stakeholder participation. Later this year, the IMP development process will begin in the Lower Big Blue NRD.

Like Kansas, Nebraska has an online water use reporting system, although water use reporting in Nebraska is not mandatory in all regions. About a third of water users report their use on the online system. Online water use reporting has been launched across the entire state, and DNR plans to leverage it in support of IMP goals which require detailed water use data collection.

The Nebraska Legislature is currently in session. It appears that DNR's budget will not be reduced, and project funding resources will remain available. There was one piece of water legislation, which enables surface water right holders to retain their rights for more than 15 years of non-use if they are participating in a conservation program such as a Conservation Reserve Enhancement Program (CREP).

The Water Sustainability Fund (WSF) is about to enter its fifth cycle, and project applications will be accepted in July. In 2018, the Nebraska Natural Resources Commission (NRC) approved 10 applications for just under $8 million. Projects funded within the Compact area include three groundwater recharge projects conducted by the Little Blue NRD and a project by the City of Hastings, NE to mitigate nitrate and uranium concentrations in their municipal water supply. In 2019, the NRC could potentially allocate up to $15 million for WSF-funded projects.

On June 19-20, 2018, a significant rainfall event occurred within the Compact area, in which an estimated 8 in of rain fell within 24 hours. DNR deployed the Dam Safety Section to investigate for potential dam failures, but no significant damage resulted from the event.

DNR hosted the 2019 Conference of the American Water Resources Association in Omaha, NE. The conference focus was "Setting Conditions for Success in Integrated Water Resource Management."

Water Administration Report

Jim Ostdiek provided the Nebraska Water Administration report (Attachment D) for the Big Blue and Little Blue River basins. From May through September 2018, there was above average precipitation in the Big Blue River basin, an increase from 2017. 257 water rights in the Little Blue River basin were administered in order to meet the Compact minimum target streamflow at the Kansas state line. Administration lasted 18 days spanning two periods: July 26-31 and August 9-20, 2018. Big Blue River streamflow at the Barneston, NE gage exceeded the minimum target streamflow for the entirety of 2018, marking a fourth consecutive year without Compact-driven administration for the Big Blue River.

Lower Big Blue Natural Resources District (NRD) Report

Dave Clabaugh presented the Lower Big Blue NRD (District) report (Attachment E). Groundwater levels in monitoring wells across the District have risen by about 1 ft. Groundwater levels in the District's own monitoring wells have risen by about 1 ft from their 2016 baseline measurements. The District also measures Compact monitoring wells, which also show increased groundwater levels.

The 75,000-ac Turkey Creek watershed near Wilber, NE was selected by the US Department of Agriculture, Natural Resources Conservation Service (NRCS) for a new National Water Quality Initiative (NWQI) project. There are about 300 producers within the watershed. A stakeholder advisory group identified bacteria, atrazine, and nitrates as water quality focus issues.

About 300 dams within the District are nearing the end of their design lives. The District is collaborating with DNR to solve dam maintenance issues and complete repairs.

The District has not received much spring 2019 flooding, as streamflow in the District was decreasing when flooding began to the north.

The District manages a small reservoir in Wilber, NE and is improving the surrounding area for recreation. A watershed dam north of Beatrice, NE recently had its hazard classification increased to high hazard due to its proximity to a four-lane highway. The District is working with the NRCS and DNR to upgrade the dam to meet high hazard structure standards.

Per the Nebraska report, the District will soon begin developing a voluntary IMP with DNR.

The District plans to install more groundwater monitoring wells and is developing updates to their groundwater management rules and regulations.

Little Blue Natural Resources District (NRD) Report

Kyle Hauschild provided the Little Blue NRD (District) report (Attachment F). The District Board of Directors recently voted to approve their IMP and submitted it to DNR for approval.

The District has been measuring groundwater levels over the past month. So far, groundwater levels within most of the District appear to have risen about 0.5 ft in the past year and are currently higher than 2016 baseline measurements. 2018 average groundwater withdrawals ranged from 5 to 9 in/ac across the District's sub-areas. Reported irrigation water use decreased for a second consecutive year.

Six of eight sub-areas within the District show increased groundwater nitrate concentration, including in municipal water supplies. The District is planning a water quality sampling project for the fall, which will be compared to a similar study from 2013-14.

The District is working to certify irrigated acres and irrigation wells and is about 95% complete. By the end of 2018, flow meters were installed on all irrigation wells within the District.

A series of in-stream weirs which were recently installed through a WSF-funded project were severely damaged in the spring 2019 flooding. The District is currently seeking NRCS funding for weir repairs.

The WSF-funded Crystal Lake project is nearing completion and was not damaged by recent floods.

Upper Big Blue Natural Resources District (NRD) Report

Dave Eigenberg thanked the Upper Big Blue NRD (District) Directors who were in attendance, and then Jack Wergin began the District report (Attachment G).

Through the District's Land Treatment Program, the District, together with the Nebraska Soil and Water Conservation Program, funds 75%, up to $7,500, for conservation projects. In 2018, the District funded 51 projects for a total of $190,000. Construction on many of these projects was delayed due to wet conditions, so fewer applications are anticipated in 2019.

The District administers the Nebraska Buffer Strip Program with the Nebraska Department of Agriculture. In 2018, the District funded 21 buffer strips for about $23,500.

In 2017, the District launched a variable rate irrigation (VRI) pilot program, which cost-share funds the installation of VRI equipment to improve water application efficiency using speed or zonal control. In 2018, the District cost-share funded three VRI projects for just over $18,000.

In 2017, the District began developing a voluntary IMP and a Water Quality Management Plan in conjunction with DNR and DEQ, respectively. The different requirements of the two agencies posed challenges, but the creation of joint technical and stakeholder advisory committees facilitated simultaneous progress on both plans. The District hopes to finalize the Water Quality Management Plan in June 2019 and submit it to the US Environmental Protection Agency (EPA) for approval.

In 2017, the District launched the Private Dams Program, which funds 75%, up to $50,000, for private landowners to reconstruct failed dams. In 2018, the District funded the rebuilding of seven dams for just over $130,000. In summer 2019, reconstruction is scheduled to begin on the first two dams large enough for District funding to be capped at the $50,000 limit.

The City of Seward, NE approached the District seeking funding for levee recertification when the Federal Emergency Management Agency (FEMA) and DNR began updating the local 100-year flood maps The District agreed to provide 50% funding for the study, which is nearing completion. The levee appears to be in good condition and withstood spring 2019 flood events.

Marie Krausnick finished the District report (Attachment G). From 2017 to 2018, there was an overall decrease of 9 irrigation wells within the District. Spring 2019 groundwater level measurements are complete. Groundwater levels have increased by an average of 1.22 ft over the past year.

The District has over a decade of certification data for irrigated acres. There are 1.2 million irrigated acres within the District, 2,206 of which were added in 2018. Water use reporting is mandatory for all non-domestic water users within the District. The 2018 average irrigation withdrawal was only 3.7 in/ac due to abundant precipitation during the growing season.

The District continues to monitor for groundwater nitrates, with just under 50% of the District in a Phase 2 or 3 Management Area for groundwater quality. The District works with the University of Nebraska to monitor arsenic, uranium, and selenium concentrations in dedicated groundwater quality monitoring wells. The District also regularly samples from Dakota Aquifer water quality monitoring wells.

In 2017, the District launched Project GROW (Growing Rotational crops On Wellfield) on the municipal water supply wellfield of the City of York, NE. Project GROW is currently funded under a 2-year DEQ Source Water Protection Grant, with a main goal of improving drinking water quality and providing locally-sourced produce, along with education and outreach efforts.

The District has been part of the Nebraska Agricultural Water Management Demonstration Network for over 10 years. About 700-800 producers within the District are using Watermark irrigation scheduling, which the District sells to producers at a 50% discount.

The District and DNR are developing a regional transient groundwater model for the Big Blue River basin, to be used in making management decisions. Once the program contracts are approved, it should take a little over a year to develop and calibrate a model.

The District continues its wellhead protection planning projects.

Approval of the Minutes of the 45th Annual Meeting

Chris Beightel, Compact Secretary, provided print copies of the 45th Annual Report to the Compact Commissioners. The Report had been reviewed by Kansas and Nebraska staff. Mr. Beightel briefly reviewed the approval process for the Report and noted that, per last year's recommendation from the Legal Committee, the Compact bylaws were included as an appendix to the Report.

David Barfield moved that the minutes of the 45th Annual Meeting be approved. Jesse Bradley seconded the motion. There was no discussion. The motion passed unanimously.

Secretary's Report

Chris Beightel, Compact Secretary, described the current procedure for creating the Report and requested that those who had presented reports during the meeting provide him with electronic copies to be included as attachments to the 46th Annual Report.

Treasurer's Report

Amy Zoller, Compact Treasurer, provided copies of the Treasurer's Report (Attachment H), which tracked income and expenses over Fiscal Year 2019. Expenses included USGS state line gages, groundwater monitoring wells in the Lower Big Blue NRD, and a financial review. The Treasurer's Report also analyzed project income and expenses for the next two years based on past year's finances.

Because the most recent financial review was ordered for 2017 instead of 2015-16, an expense to cover the 2015-16 financial review was included in the proposed budget for Fiscal Year 2020. Also included in the proposed budget was an expense to cover the 2018-19 financial review. Ms. Zoller proposed that, in the future, financial reviews be ordered biannually as soon as the second of the two fiscal years ends.

David Barfield reminded those in attendance that the financial reviews serve as a simplified version of an audit, a legal requirement of the Compact intended to maintain fiscal accountability. Chris Beightel suggested that the Compact Commissioners could choose to forego the 2015-16 financial review because a review had already been completed for 2017. Kenneth Titus noted that the Compact rules and regulations require that all receipts and disbursements undergo a review examination and recommended that the Commissioners order the 2015-16 financial review.

Mr. Barfield moved to approve the proposed budget for Fiscal Year 2020 as presented in the Treasurer's Report. Jesse Bradley seconded the motion. There was no further discussion. The motion passed unanimously.

US Geological Survey (USGS) Report

Jason Lambrecht presented the USGS report (Attachment I). The USGS operates two state line gages for the Compact: The Big Blue River at Barneston, NE and the Little Blue River at Hollenberg, KS. Across the entire Big Blue River basin, the USGS operates six gages on the Big Blue River and five on the Little Blue River. The USGS also produces an annual mean discharge from each state line gage each water year

(October 1 – September 30). In water year 2018, the USGS made about 17 discharge measurements at each state line gage, and streamflow in both rivers was lower than average.

Legal Report

There was no report from the Compact Legal Committee, as they received no assignments from the Compact over the past year.

Engineering Report

Jeremy Gehle, Compact Engineering Committee Chair, submitted the Engineering Report (Attachment J). The Engineering Committee received no assignments from the Compact over the past year. Streamflow in the Big Blue River at the Barneston, NE gage was above the Compact minimum target streamflow throughout the year. Streamflow in the Little Blue River at the Hollenberg, KS gage fell below the Compact minimum target streamflow for a total of 20 days. No new wells were drilled within the regulatory reaches over the past year, nor were any wells decommissioned.

Water Quality Report

Trevor Flynn, Compact Water Quality Committee Member, presented the Water Quality Reports for Nebraska (Attachment K) and Kansas (Attachment L). The biannual Integrated Water Quality Report was submitted to and approved by the EPA in 2018. The Integrated Report includes a list of the 24 NPDES discharge facilities within the Compact area, as well as highlights from 319 Nonpoint Source Programs in both states.

Kansas will soon be developing stream Total Maximum Daily Load (TMDL) criteria for total phosphorous above Tuttle Creek Reservoir. The EPA recently approved a chlorophyll *a* water quality standard of 10 µg/L for Tuttle Creek Reservoir, where the chlorophyll *a* level has increased to 15 µg/L as the secchi depth increased to 1.25 m. Generally, in Kansas streams, total phosphorous is increasing, while total suspended solids (TSS) and bacteria are decreasing, and total nitrogen is stable. The yearly percentage of atrazine samples which exceed the water quality standard is decreasing, although it remains stable during the application season (April – July). Spring 2019 flooding in the Missouri River basin may lead to harmful algal blooms in Kansas lakes in 2019 as they receive nutrient runoff from rainfall events but are unable to release them downstream. The Tuttle Creek Watershed Restoration and Protection Strategy (WRAPS) Project has funded 30 streambank stabilization projects for $937,000 in the past five years, preventing 99,000 tons of sediment and 99,000 lb of phosphorous from reaching Tuttle Creek Reservoir. The Tuttle Creek WRAPS Project has a new Watershed Coordinator, Carla Greisen. Funding to reduce sedimentation in Tuttle Creek Reservoir was included in the State Water Plan through the efforts of the Kansas Reservoir Protection Initiative. Any potential water-injection project to remove sediment from Tuttle Creek Reservoir is strictly in the conceptual planning stages, as there is currently no state funding available.

Water quality updates for Nebraska waters were already covered in the NRD reports. The Little Blue NRD has a district-wide Water Quality Management Plan. The Upper Big Blue NRD recently finalized their district-wide Water Quality Management Plan, developed simultaneously with their voluntary IMP. The Lower Big Blue NRD has had a Water Quality Management Plan in place since 2013, and it is slated for revision in 2020. The Turkey Creek watershed within the Lower Big Blue NRD has been selected by the NRCS for a new NWQI Project.

Old Business

All old business was covered over the course of the meeting.

New Business

There was no new business to be addressed.

Committee Membership and Special Assignments

Emily Rose was appointed to the Compact Legal Committee as a Nebraska representative, replacing LeRoy Sievers, who had retired. Committee membership is now as follows:

Budget Committee – Amy Zoller (NE), Chris Beightel (KS)
Legal Committee – Emily Rose (NE), Kenneth Titus (KS)
Engineering Committee – Jeremy Gehle (NE), Katie Tietsort (KS), Chris Beightel (KS)
Water Quality Committee – Dan Howell (NE), Annette Kovar (NE), Marty Link (NE), Craig Romary (NE), Tom Stiles (KS)

No special assignments were given.

Adjournment

David Barfield moved to adjourn. Jesse Bradley seconded. There was no discussion. The motion passed unanimously.

Christopher W. Beightel, Kansas Commissioner

Jesse Bradley, Nebraska Commissioner

W. Don Nelson

W. Don Nelson, Compact Chair

Attachment A

Report of the Kansas Commissioner
to the
BIG BLUE RIVER COMPACT ADMINISTRATION

2019 Annual Meeting
Manhattan, Kansas
May 15, 2019

1. New administration – Democrat Governor Laura Kelly was elected Governor of Kansas during November. Michael Beam has been appointed and confirmed as Secretary of Agriculture.

2. Legislation: Once again, this year's legislature session was dominated by issues related to taxation and budget, including additional funding for public schools. There was no substantive water legislation this year.

3. Water management activities (for information visit http://www.agriculture.ks.gov/dwr)

- **On-line wateruse** Kansas requires all non-domestic water users to annually report water use. Over the past 5 years, we have developed an on-line system to report use as an alternative to paper reporting. To incentivize on-line reporting, KDA implemented a $20 per water right paper fee for those water right holders that reported their water use using the paper forms, while the online reporting option was free to the water users. KDA-DWR also initiated a statewide effort to assist water users in online filing of water use reports, all in an effort to save resources and improve efficiency. As the March 1 deadline to file the 2018 annual water use reports passed, KDA–DWR found that 86 percent of all total water use reports were completed online, representing 91 percent of all water rights in the state. Last year only 27 percent of water use reports were filed online.
- **Local Enhanced Management Areas (LEMAs).** We continue to make progress in use of legislation passed in 2012, allowing Kansas Groundwater Management Districts (GMDs) to initiate the creation of these special management areas in over-appropriated areas, providing a two-hearing process for their consideration.
    - As reported last year, the state's first LEMA, the Sheridan 6 LEMA was extended for another 5 years, for the period 2018-22. Two recent studies on the effectiveness of the LEMA have been added to KDA-DWR web page at: www.agriculture.ks.gov/SD6LEMA.
        - An NSF-funded study by Michigan State researchers, was published, titled "Quantifying irrigation adaptation strategies in response to stakeholder-driven groundwater management in the US High Plains Aquifer." The study found the LEMA reduced water use by 31% over the five-year period, with early indications of stabilizing groundwater levels. Farmers were able to largely maintain irrigated area and achieved the majority of pumping reductions (72%) from improvements in irrigation efficiency, followed by expansion of crops with lower water demand (19%).

        - Dr. Golden of KSU issued his final report, "Monitoring the Impacts of Sheridan County 6 Local Enhanced Management Area," finding the irrigated area within the LEMA was largely maintained despite the reduced wateruse with some changes in cropping, although corn is still dominate. The study included voluntary reporting on farm income. The limited number of responses received indicate irrigation operations remain as profitable as before, apparently due to reduced input costs.
    - As reported last year, the state's second LEMA we approved, a District-wide LEMA for Northwest Kansas GMD No. 4, providing 5-year allocations in a township where the average rate of decline is greater than 0.5% per year. The allocations are based on the rate of decline in the township. The LEMA is currently under judicial review. We expect the Court's decision this summer.
    - Western Kansas GMD No. 1 is developing a LEMA proposal, starting with a plan for the highly depleted Wichita County.
- **Water Conservation Areas (WCAs) –** In 2015, the Legislature amended our Water Appropriation Act to allow for the development of WCAs, which allows a water right owner or group of owners the opportunity to develop a management plan to reduce withdrawals to extend the usable life of the Ogallala-High Plains Aquifer, typically with increased flexibility to manage the reduced use. There are currently 24 approved WCAs saving over 8,000 acre-feet of water per year with additional plans in process. A WCA in Wichita County covers the entire, highly depleted county, with approx. 20% of the eligible acres of the county enrolled. A WCA northwest of Garden City has 17,000 acres enrolled and is expected to be expanded to 30,000 by year's end.
- **Quivira National Wildlife Refuge Impairment Complaint** - The U.S. Fish and Wildlife Service (Service) owns and operates the Quivira National Wildlife Refuge (Quivira), a wetland of international significance and part of the central U.S. flyway. Water is a critical component of its operations with a water right priority date in 1957. In 2013, the Service filed an impairment complaint with KDA-DWR. KDA-DWR published its final impairment investigation report during 2016, finding that upstream junior groundwater pumping is regularly impairing the Service's senior water right. Since then, we have been working with GMD No. 5 to develop a remedy that is envisioned to include an augmentation project and groundwater pumping reductions of approx. 15% to stabilize streamflows. GMD 5 desires to use a LEMA to implement required pumping reductions but GMD 5 and DWR have been unable to reach agreement to date. This may require initiation of proceedings for an Intensive Groundwater Use Control Area (IGUCA).
- **Cities of Hays and Russell / R9 Ranch Water Right Changes and Water Transfer** - The Cities of Hays and Russell purchased the approximately 7,000-acre R9 Ranch and its thirty water rights in southwestern Edwards County in 1995 with the intention of someday using the water as part of the city's water supply. During June 2015, the Cities submitted applications to change the use made of water from irrigation to municipal use for the R9 Ranch water rights. As these proposed changes envision moving greater than 2,000 acre-feet more than 35 miles, during January 2016, the Cities submitted an application to transfer water from Edwards County to the Cities pursuant to the Water Transfer Act (K.S.A. 82a-

1501, et seq.). After a significant public process, the change applications were contingently approved on March 28, 2019. The Secretary of Agriculture recently declined administrative review. If judicial review is not sought by June 3, the water transfer process will be initiated.

- **Aquifer Storage and Recovery Project, City of Wichita** – The City of Wichita has requested changes to the permit conditions of its ASR project to meet the City's current objectives for the project (as a source of water for long-term drought). The changes include reducing the bottom of the "basin storage area" and allowing for a new means to accumulate credits when the aquifer is full. A formal hearing on the City's requested changes will start on September 24.

Katie Tietsort will provide Kansas report with specifics with respect to the Big Blue Basin.

Attachment B

Kansas
Department of Agriculture
Division of Water Resources

Kansas- Nebraska Big Blue River Compact Meeting 2019

Prepared By:

Kansas Department of Agriculture
Division of Water Resources
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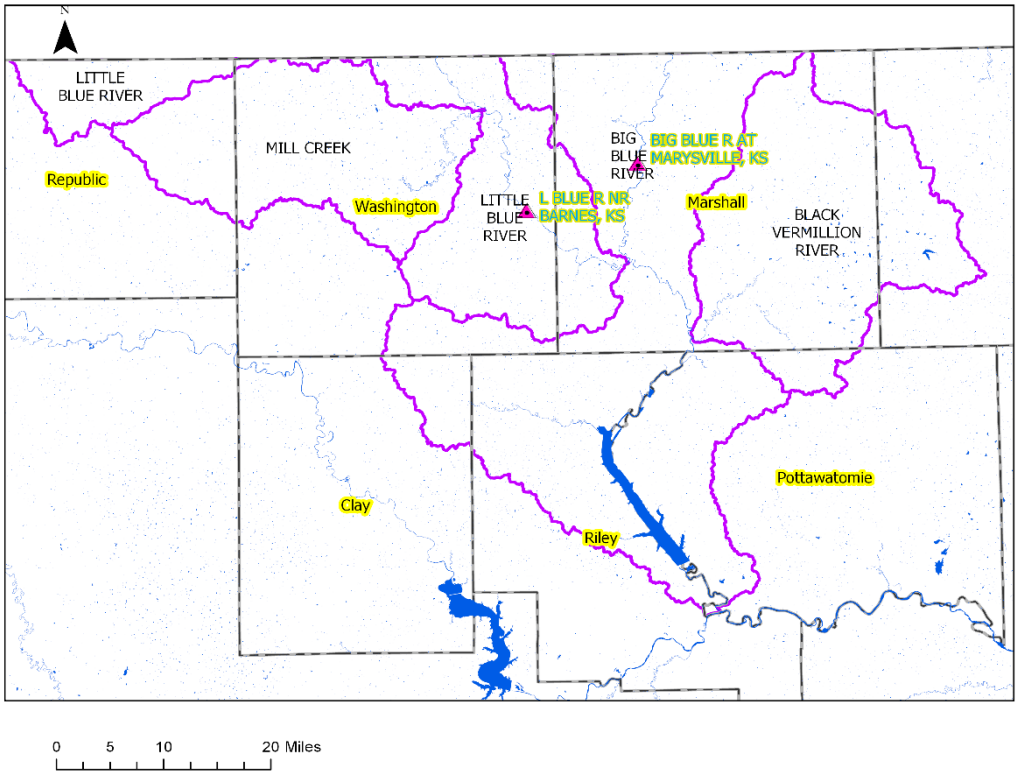
CONTENTS



1. Background and Objective

The Kansas Nebraska Big Blue River Compact (hereinafter, "BBRC") was enacted in 1971. The purpose of the compact is to promote interstate comity, achieve equitable apportionment of the waters of the Big Blue River Basin and promote the orderly development thereof, and to encourage an active pollution abatement program in each state. In Kansas, the BBRC spatial extent encompasses the entire Big and Little Blue River basin areas, including their tributary basins, the Mill Creek and Black Vermillion River (see below). The Big Blue River and Little Blue River are the focal streams within the BBRC. The Little Blue River is located within Washington County and intersects the Big Blue River within Marshall County. The Big Blue River is located within Marshall County and Riley County. Tuttle Creek Reservoir is located on the Riley County and Pottawatomie County line within the Big Blue River Basin.

Key objectives for this report are to summarize the following conditions within the Kansas BBRC area for calendar year 2018 and thus far in 2019

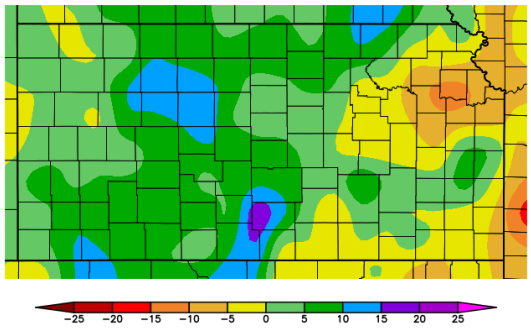
- climatic conditions;
- streamflow;
- administration activities;
- compliance and enforcement activities;
- new applications; and,
- other updates

2. Climatic Conditions

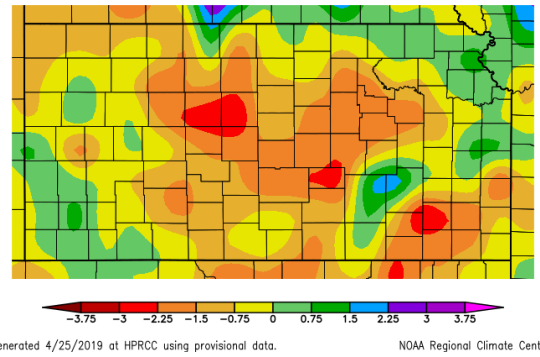
A. Precipitation

The High Plains Regional Climate Center (HPRCC) reported between 30 and 45 inches of precipitation in calendar year 2018 across the "BBRC" and reported 3.5 to 8 inches thus far through April 24, 2019.

Departure from Normal Precipitation (in)
1/1/2018 – 12/31/2018



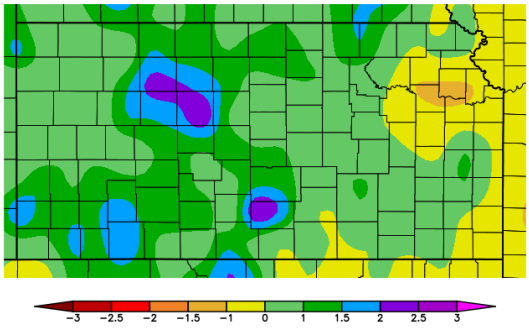
Departure from Normal Precipitation (in)
1/1/2019 – 4/24/2019



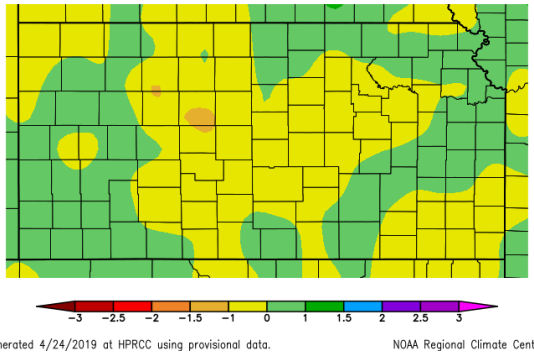
We saw significantly wetter conditions in the Kansas BBRC in 2018 and thus far in 2019. In 2018, precipitation ranged from normal to as much as 15 inches greater than normal (northern counties) and 5 inches more to 5 inches less than normal (far southern area). So far in calendar year 2019, conditions range from -1.5 to 0.75 inches from normal.

The Standardized Precipitation Index (SPI) is like the Palmer Drought Index (PDI) but considers only precipitation and no other factors. The SPI generally showed a wetter trend for 2018, and so far, this spring, it shows a trend that indicates more normal precipitation for the Basin.

12-Month SPI
1/1/2018 – 12/31/2018



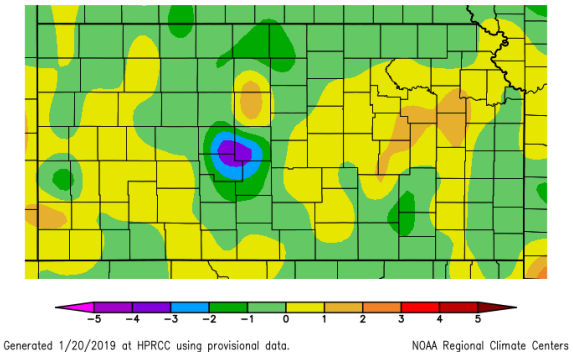
Year-to-Date SPI
1/1/2019 – 4/23/2019



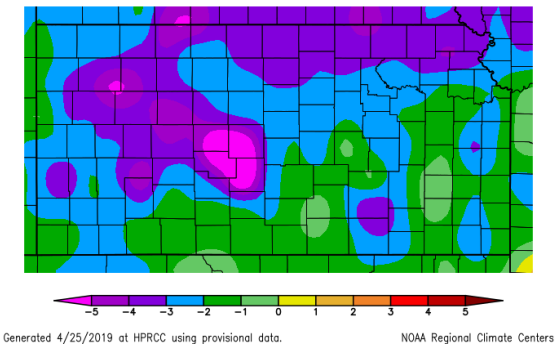
B. Temperature

Temperatures for the calendar year 2018 were right about normal with the northern portion of the Basin about a degree cooler and the southern part of the Basin about a degree warmer than normal. This spring has been a bit cooler than normal by about 3 to 5 degrees.

Departure from Normal Temperature (F)
1/1/2018 – 12/31/2018



Departure from Normal Temperature (F)
1/1/2019 – 4/24/2019



3. Streamflow and Administration

A. Compact Compliance

The Compact provides for minimum target flows to reach the Stateline of Kansas on both the Big and Little Blue Rivers measured by river gages at Barneston, NE on the Big Blue and Hollenberg, KS on the Little Blue from May through September. When the flow falls below these target values, Nebraska Department of Natural Resources (DNR) administers surface water rights and associated alluvial groundwater use located within the regulatory reaches of either river

junior to 1968, until the target value is exceeded.

The compact sets forth the following stream flow targets:

Month	Big Blue River at Barneston, NE	Little Blue River at Hollenberg, KS
May	45 cfs	45 cfs
June	45 cfs	45 cfs
July	80 cfs	75 cfs
August	90 cfs	80 cfs
September	65 cfs	60 cfs

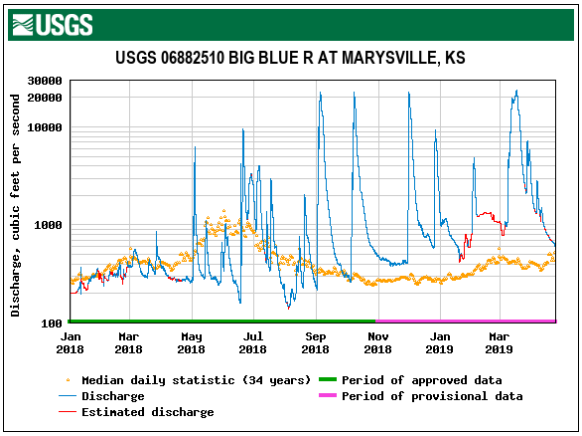
B. Kansas MDS Administration

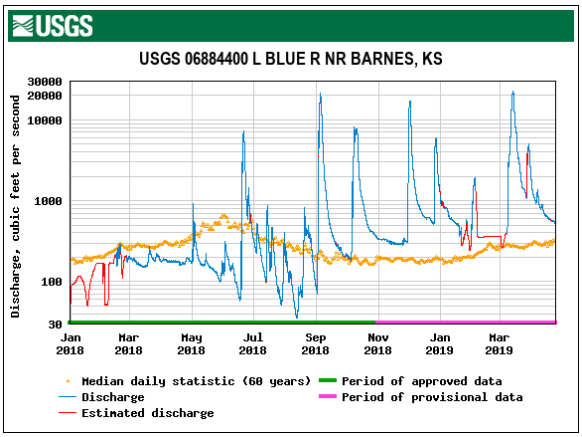
Minimum desirable streamflow (MDS) requirements were made part of the Kansas Water Appropriation Act by the Kansas Legislature to ensure base flows in certain streams to protect existing water rights and to meet in-stream water uses related to water quality, fish and wildlife and recreation. The Division monitors 23 streams and rivers at 33 locations for MDS. Within the BBRC, the Kansas Department of Agriculture (KDA) Division of Water Resources (DWR) monitors MDS gages located on the Big Blue River at Marysville, KS and on the Little Blue River near Barnes, KS (see Figure, page 3). When flows drop below the following established threshold, pumping restrictions are imposed on permits or water rights granted after the MDS provision was made into law (April 12, 1984).

Watercourse	Month											
	J	F	M	A(a)	M(a)	J(a)	J	A	S	O	N	D
Big Blue												
Marysville	100	100	125	150	150(d)	150(d)	80	90	65	80	80	80
Little Blue												
Barnes	100	100	125	150	150(d)	150(d)	75	80	60	80	80	80

(d) Subject to the stateline flows contained in the Blue River Compact.

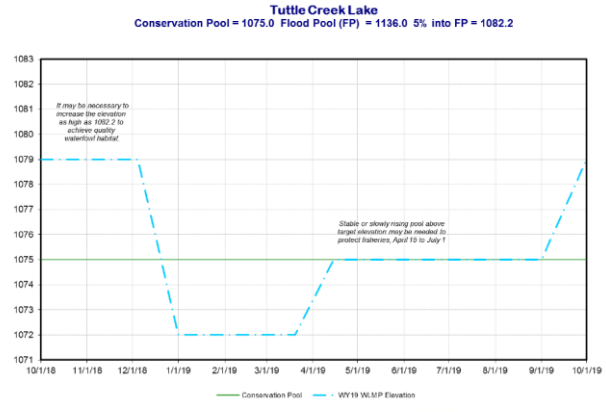
The United States Geological Survey (USGS), in partnership with Federal, State, Tribal, and local agencies, operates and maintains stream gages on waterways nationwide. The stream gages electronically record streamflow measures in near real-time. The following summarizes streamflow compared to the statistical median flows at MDS gages located on the Big Blue (Marysville, KS) and Little Blue (Barnes, KS) for the calendar year 2018 through present (April 2019).





The streamflows in the Big Blue and the Little Blue were generally below the median streamflows for these basins during the dry spring and conditions changed to greater than median flows after the significant rainfall experienced in late July and September across the Basin. We restricted the owners of 20 water rights from diversions by surface water users junior to April 24, 1984 on the Little Blue River with administration from June 1, 2018 through July 3, 2018.

C. Lake Level Management



U.S. Army Corps of Engineers (USACE), Kansas City District

Water level management plans may be implemented in whole or in part depending on the needs of other project purpc based on the hydrologic conditions that exist at the time. This may be critical if either drought or severely wet basin conditions occur. If wet basin conditions prevail, the retention of even a modest amount of water in the flood pool duri primary flood runoff season will have to be adjusted lower or forgone. Periods of drought may preclude targeted drawi below the top of multipurpose pool. Inflow bypass may be necessary to satisfy downstream water right demand, as rec by the Kansas Department of Agriculture, Division of Water Resources (KDA-DWR), which may prevent planned pool ris

The Kansas Water Office (KWO), in collaboration with the Army Corps of Engineer and the Kansas Department of Wildlife and Parks, prepares Lake Level Management Plans (LLMPs) on an annual basis. LLMPs provide the basis and framework for raising and drawdown of reservoir water storage, as necessary to optimize natural resources and recreational activities. In general, controlled water storage and subsequent scheduled releases are made on a seasonal basis to benefit wildlife and the quality of habitat. While each reservoir has a unique LLMP, the Tuttle Creek Lake LLMP is depicted.

Lake Level Management plans were approved for Water Year 2019 in fall of 2018. The current Tuttle Creek Lake LLMP is generally the same focus as the plans of previous years. The focus continues to be fish and other wildlife support.

TUTTLE CREEK LAKE

One of the main objectives of water level management at Tuttle Creek is to increase recruitment of crappie in the lake. The success or failure of past management plans in many cases has been out of human control due to uncontrollable inflow rates, storage of water in the flood control pool for T&E species in the summer months, and late season releases in support of navigation on the Missouri River. However, coordination between state and Federal agencies during moderate flood and drought events can minimize damage to the lake's shoreline habitat that is essential for crappie spawning success from such uncontrolled events. The request for the lake level to be lowered in the winter months is to serve primarily as additional storage for frequent spring rises in lake levels which would require untimely releases. This request was intended to lessen the probability of untimely reservoir releases that adversely impact crappie spawning success.

October 1 to December 5:	Maintain lake level at elevation 1079 NGVD for the attraction for migrating waterfowl. It may be necessary to increase the elevation as high as 1082.2 NGVD to achieve quality waterfowl habitat. The necessary elevation will be coordinated with the wildlife biologist.
December 5 to January 1:	Lower the lake level to elevation 1072 NGVD to reduce ice damage and provide additional water storage. Drawdown dates are approximate and will depend on the fall waterfowl needs and the potential for icing. The drawdown will be coordinated with the State resource managers.
January 1 to March 20:	Maintain lake level at 1072 NGVD.
March 20 to April 15:	Allow lake level to rise to conservation pool (1075 NGVD) to enhance lake boating access.
April 15 to July 1:	Coordinate evacuation of flood water to enhance potential for crappie population recruitment.

Note: Holding water above multipurpose pool level during crappie spawning and nursery periods has improved crappie recruitment into the lake fishery. Storage of water in the flood control pool in late spring has also been required due to the presence of threatened and endangered terns and plovers nesting on the Kansas River's sand bar habitat downstream of the lake. Maximum sustained pool elevation during this period will be 1082.2.

July 1 to September 1:	Maintain lake elevation at conservation pool (1075 NGVD) to allow shoreline habitat to re-vegetate. *Consideration will be given to any forecasted navigation demands before evacuating flood storage that may exist on or around July 1.*
September 1 to September 30:	Allow lake level to rise to 1079 NGVD to inundate wetland habitat and attract migrating waterfowl.

Note: When necessary, the water level management plan at Tuttle Creek Reservoir will provide support for navigation. Changes in lake levels will be coordinated to support additional reservoir uses such as fish spawning, recreation, and waterfowl management.

D. Kansas Water Administration

Administration activities include administration for Minimum Desirable Streamflow (MDS) of water rights junior to April 12, 1984 due to flows falling below MDS criteria, administration of water rights subject to statutory protection of releases from storage under water reservation rights (K.S.A. 82a-706b), and administration of water rights by priority. For the 2018 calendar year, in the Basin as mentioned above, the Little Blue River was administered for MDS from June 1, 2018 through July 3, 2018. A total of 20 files were administered during this event.

In 2018, a total of 328 water rights were administered in Kansas for MDS as follows:

MDS Stream	Administration Began	Administration Ceased	Files Administered
Whitewater River	April 12, 2018	August 27, 2018	11
Mill Creek (Wabaunsee County)	April 12, 2018	September 18, 2018	14
Little Arkansas River	August 10, 2017 (above Alta Mills)	October 18, 2018	6
Chapman Creek	June 21, 2018	August 28, 2018	11
Delaware River	March 23, 2018	September 5, 2018	41
Little Blue River	June 1, 2018	July 3, 2018	20
Republican River	April 13, 2018 (Clay Center to Concordia)	September 4, 2018	113
Republican River	April 13, 2018 (Above Concordia)	September 4, 2018	112

As of April 22, 2019, the following represents a snapshot of MDS statewide: The table below shows flows (in cfs) at selected gaging stations as of April 22, 2019, for streams where MDS remains of interest. One gage is currently not operating correctly and one gage is currently below MDS, though it has no surface water rights junior to MDS above it. The Muscotah gage was last read on April 17 at approximately 170 cfs -well above MDS.

Streamflows as of April 22, 2019			
Gaging Station	Current Flow	Apr MDS	Comment
Delaware River near Muscotah	Eqp	20	Temporarily Unavailable
Rattlesnake Creek near Macksville	7	10	No surface water diversions junior to MDS above gage
South Fork Ninnescah River near Pratt	12	8	No surface water diversions junior to MDS above gage

Pursuant to K.S.A. 82a-706b, KDA DWR protects water released from storage in Federal Reservoirs. In 2018, a total of 126 water rights were administered in Kansas for Protection as follows:

Protection Stream	Administration Began	Administration Ceased	Files Administered
Cottonwood River	July 24, 2018	September 7, 2018	9
Elk River	July 27, 2018	September 8, 2018	6
Neosho River	July 24, 2018	September 10, 2018	90
Verdigris River	July 31, 2018	September 7, 2018	21

4. Compliance and Enforcement within the BBRC

A. Civil Penalty Regulations

The KDA DWR, with support from KDA legal, enforce violations of the Kansas Water Appropriation Act through its Compliance and Enforcement Unit. The following tables summarize the civil penalties in regulation.

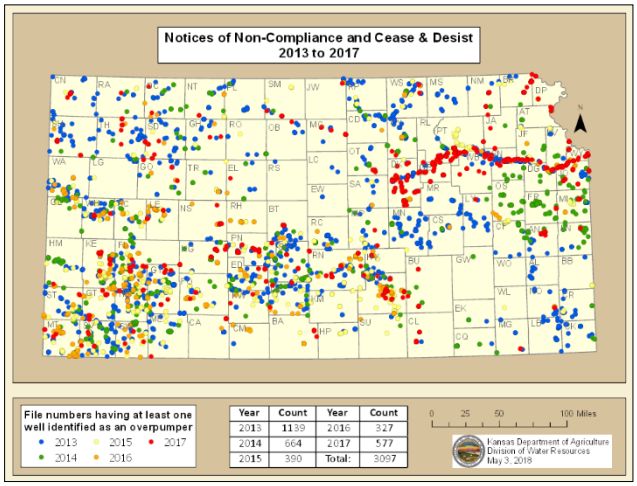
K.A.R. 5-14-10. Civil penalties for violations other than exceeding the authorized quantity of water.			
Violation	Monetary penalty	Maximum number of days monetary penalty applied	Suspension of water use
Lower-tier misc	$500 per day	20	One year
Failure to provide info	$500 per day, for each day the violation exists	20	One year
Un-authorized diversion or threat to divert	$500 per day	20	One year
Denial of access	$1,000 per day	10	Three years
Lack of water flowmeter	$1,000 per day	10	Three years
Non-compliance with a substantial order	$1,000 per day	10	Five years
Meter manipulation	$1,000 per day	10	Five years
Falsification	$1,000 per instance of falsification	Not applicable	Five years
Non-compliance with Change	$1,000 per day	10	Two years

K.A.R. 5-14-12. Civil penalties for exceeding the authorized quantity of water.			
	Severity level A < 24 hours	Severity level B 24-72 rs	Severity level C >72 hrs
1	Written notice of non-compliance	$1,000 per day and a reduction in quantity equal to 2X the quantity overpumped not to exceed the annual authorized quantity	$1,000 per day and a reduction in quantity equal to 3X the quantity overpumped, not to exceed the annual authorized quantity
2	$1,000 per day and a reduction in quantity equal to 2X the quantity overpumped, not to exceed the annual authorized quantity	$1,000 per day and a one-year suspension	$1,000 per day and three-year suspension
3	$1,000 per day and a one-year suspension	$1,000 per day and a three-year suspension	$1,000 per day and a four-year suspension
4	$1,000 per day and a three-year suspension	$1,000 per day and a four-year suspension	$1,000 per day and a five-year suspension

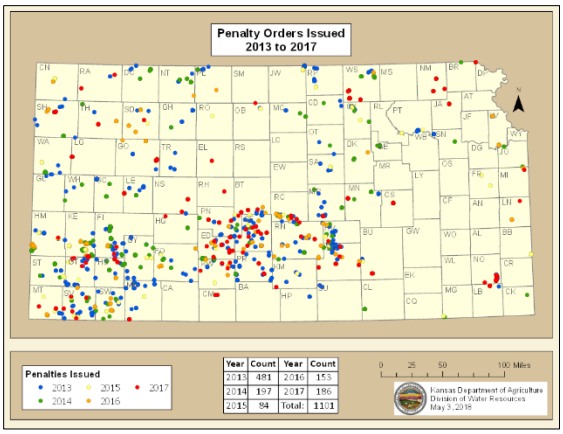
B. Compliance and Enforcement Activities

In 2018, the Division sent "*Notice of Non-Compliance/Cease & Desist Notice*" (NONC or NONC-CD) on a number of files. The Topeka Field Office sent 28 NONC/NONC-CDs, with one NONC sent to the owner of a public water supplier within the BBRC for overpumping in 2018 of less than 24 hours.

In 2018, the Topeka Field Office issued 28 penalty orders and cease and desist orders. Of these, three (3) were in the BBRC. All three were civil penalties issued for overpumping, ranging from $1000-$1500; one at a stock facility, one at a golf course, and the final one was an irrigator.



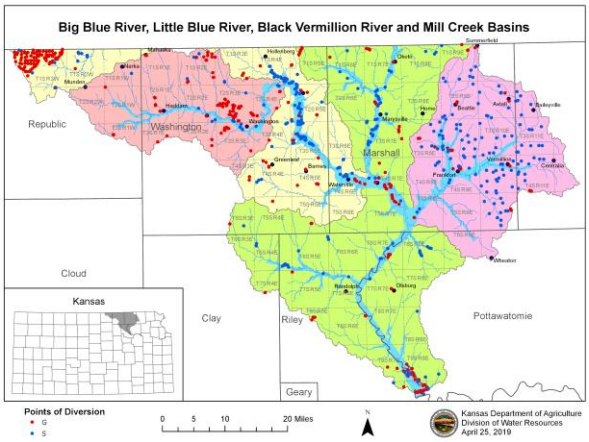
So far for 2019, no NONC's, NONC-CD's or penalty orders have been issued in the BBRC area.



releases from the lake, which is currently at 52.2% in the flood pool at elevation 1116.24 msl (normal pool 1075.00 msl).

5. New Applications

In 2018, KDA DWR received 17 new applications (16 appropriations, 2 temporary permits, 1 domestic) for the BBRC basin. This number is more than we have seen in recent years for the BBRC basin. For 2019 thus far, we have received 4 new application requests in the BBRC basin and approved all 4 requests. The following figure represents the total appropriations within the BBRC.



6. Other Items of Note

The gates were closed at Tuttle Creek Reservoir on February 21, 2018 for repairs to the Stilling Basin. This work restricts

Attachment C

Nebraska State Report
Big Blue River Compact Annual Meeting
May 15, 2019

Welcome

I would like to extend thanks to the Kansas Department of Agriculture for hosting the Big Blue River Compact annual meeting this year. I would also like to thank all of the natural resources entities, agencies, and producers who are working hard to protect the water resources of the Blue River Basin.

Water Supply Conditions

In the 2018 water year, the water supply conditions varied slightly between the Big Blue and the Little Blue River Basins in Nebraska. The precipitation was generally average or slightly above average for the year in both Basins. In the Little Blue River Basin, however, the month of July was exceptionally dry with most areas of receiving only 50 to 75 percent of normal precipitation. As a result, surface water administration occurred in this Basin, with all calls pertaining to the Blue River Compact. Our Lincoln field office supervisor, Jim Ostdiek, will have more on this in his upcoming surface water administration report.

As you all are aware, unprecedented flooding occurred in Eastern Nebraska on March 12, 2019. Almost simultaneously, blizzard conditions persisted in the west and northern portions of Nebraska. The flooding was primarily due to a combination of several weeks of freezing temperatures, ample snow still on the ground and anywhere from one to three inches of rainfall across multiple river basins. The flooding caused extensive damage along the Niobrara, Elkhorn, Loup, Lower Platte, and Missouri Rivers, but also affected the Blue River Basin. The Blue River near Seward reached a record peak stage of 24.11' on March 14, 2019 surpassing its previous record high of 22.83' on June 16, 1967. The flood also affected several communities downstream of Seward. Dave Clabaugh will have more on the community impacts in his NRD report.

Water Planning

Statewide River Basin Planning

In 2018, the Department continued to collaborate with local NRDs on three River Basin Plans. The Upper Platte Basin Plan, which addresses the over-appropriated portion of the Upper Platte Basin, will conclude its first 10-year increment in fall 2019. Thus in 2018, a large effort to develop a second 10-year increment plan was in full swing in coordination with the five Upper Platte NRDs and the Department working with a diverse stakeholder group on planning components. This effort has made considerable progress and the plan is expected to be adopted as scheduled, in September 2019.

Also in 2018, a comprehensive effort between the four Republican Basin NRDs and the Department continued towards development of the first Republican River Basin Basin-wide Plan. This plan has a 30-year planning outlook and includes a robust set of measurable hydrologic objectives to monitor progress towards goals and objectives. After extensive review and public hearings, this basin-wide plan was adopted in late 2018 and took effect in March 2019.

Also in 2018, a collaborative effort between seven Lower Platte River Basin NRDs and the Department resulted in completion of the first voluntary basin-wide water management plan in Nebraska. This plan adopted an approach to manage future water resources uses through an accounting of depletions to the basin water supplies on a sub-basin and NRD scale, which will result in managing the Lower Platte River Basin more holistically.

Statewide Integrated Water Management Planning

Integrated management planning efforts have continued to progress in the State of Nebraska. As was reported last year, the Department is now collaborating with all 23 Natural Resources Districts in order to develop and implement integrated water management plans (IMPs). These plans all have goals to achieve and sustain a balance between water uses and supplies, taking into consideration the specific and unique conditions of each NRD. IMPs have been in place for a decade in the Upper Platte and Republican River Basins, and many newer IMPs are now being developed on a voluntary basis in central and eastern Nebraska.

In conjunction with the second 10-year increment of the Upper Platte River Basin-Wide Plan, updates for the five IMPs in this region were initiated during 2018, and are expected to be complete by August 2019. Also in 2018, two new voluntary IMPs were adopted in the Lower Platte River Basin, one for the Lower Platte North NRD and one for the Lower Elkhorn NRD. In addition, progress in the development of six voluntary IMPs in the Niobrara, Big Blue and Little Blue River Basins continued.

Integrated Water Management Planning in the Blue River Basins

Regarding the Blue River Basins, four IMPs are underway. The Department worked with the Little Blue NRD throughout 2018 to develop and finalize the IMP for this region. Of note, in early 2018, results from the revised COHYST model indicated that uses of water from the portion of the Little Blue NRD that is located within the Platte River Basin contributed more to Platte River depletions than previously estimated. Thus, an update to this portion of the NRDs IMP was required to address the obligations of the Nebraska New Depletions Plan protecting the endangered and threatened species along a critical habitat area of the Platte River. A portion of the Upper Big Blue NRD is affected by these same obligations, which were included in their IMP for the sliver of their NRD within the Platte River Basin. However, instead of creating a separate IMP for this portion of the Little Blue NRD, the Department and District jointly decided to address the Platte River depletions as its own chapter of the IMP already under development. At present, this IMP, including the Platte River themed chapter has been completed, and is being reviewed by the Little Blue NRD Board of Directors. We are expecting the Board votes to approve this IMP at next month's Board meeting.

Also in 2018, the Upper Big Blue NRD, the Nebraska Department of Environmental Quality (NDEQ) and the Department undertook a joint effort to coordinate development of a water quality management plan and a voluntary IMP. This was the first time we have addressed development of a water quality and water quantity planning as one process. Through this effort, we have learned a lot about the challenges and opportunities of combining water quality and water quantity management in the State of Nebraska. These are two separate systems with water quality plans under the framework of the federal Clean Water Act, and IMPs under the framework of Nebraska State Statutes. We have been very pleased with the results so far, and are especially thankful

for the strong relationship building with our water quality counterparts at NDEQ as well as with the Upper Big Blue NRD. Dave Eigenburg will further elaborate on this planning effort.

IMP development continues for the portion of the Tri-Basin NRD within the Little Blue Basin. This IMP is nearing completion and should be adopted later this year. In addition, we are looking forward to working closely with the Lower Big Blue NRD towards development of their IMP starting this summer.

Voluntary Water Use Reporting

To compliment integrated management planning activities, the Department continues to utilize our voluntary online water use-reporting tool that is currently being used by water users throughout the State of Nebraska. In 2017, the response was 27 percent and 31 percent in the Little Blue and Big Blue River Basins, respectively. This response rate increased in 2018, with 31 percent and 32 percent of surface waters users voluntarily reporting their water use in the Little Blue and Big Blue River Basins, respectively. We are pleased with these response rates, which shows interest from the community in collaborative monitoring of surface water use. The Department will continue requesting this data across the State moving forward.

Legislative Updates

The ninety–day, First Session of the Legislature concludes June 6, 2019. Only one bill pertinent to the Basin was enacted by the Legislature so far this session and no others are pending at this time. It is Senator Stinner's LB48, changing provisions of N.R.S. 46-229.04 (2)(b), related to sufficient cause for nonuse of a water appropriation to stay forfeiture and annulment of such appropriation. The bill adds an alternative to the existing thirty-year excuse for not irrigating because of unavailability of water in a fully or over appropriated basin conditionally allowing thirty years of non-use in any basin. The new condition is if "the land subject to the appropriation is under an acreage reserve program or production quota or is otherwise withdrawn from use as required for participation in any federal, state, or natural resources district program, or such land was previously under such a program but currently is not under such a program and there have been not more than five consecutive years of nonuse on such land subsequent to when that land was last under such program." The bill was developed with the Upper Platte Basin and extension of existing fifteen-year CREP contracts in mind, but now applies to anywhere in the state. It becomes effective law September 6, 2019. The practical impact for water conservation purposes is that it allows thirty-year incentive programs with local or state assistance to utilize federal USDA program dollars.

Water Sustainability Funds

The Nebraska Water Sustainability Fund, established in 2014, accepted its fourth round of applications in July 2018. The Department reviewed all of the applications and moved sixteen forward to the Nebraska Natural Resources Commission. The Commission approved ten of those applications, which resulted in $7.8 million dollars of new funding for water sustainability projects and studies.

Sponsors of projects that were previously approved by the Commission, submit annual reports that briefly describe project status, accomplishments, and plans for the next year. The annual reports are available to the public on the Commission's website, which we will provide in our

written report (https://nrc.nebraska.gov/water-sustainability-fund-reports). The fifth round of applications for the Water Sustainability Fund must be submitted between July 16 and July 31, 2019. The Commission is anticipating that about $15 million will be available for this next set of applications.

There are three groundwater recharge projects underway in the Little Blue NRD that, when combined, will result in over half of a million dollars in Water Sustainability Funds. In addition, the Fund supports a major project for Nitrate and Uranium mitigation in the City of Hastings, Nebraska; the funded amount of this project is well over four million dollars. Our written report provides a table that summarizes these four Water Sustainability Fund projects located within the Blue River Basins.

Table 1. Summary of Water Sustainability Fund projects in the Blue River Basin

Blue River Basin Water Sustainability Fund Projects					
Year Funded	*Project Score*	*Project Number*	*Applicant*	*Project Title*	*Funded Amount*
2015	47	4117	City of Hastings (Utilities)	Aquifer Storage and Restoration Nitrate and Uranium Control Project, Hastings Nebraska	$4,410,000
2016	42	4146	Little Blue NRD	Instream Weir Stabilization/Recharge Pilot Project	$100,979
2016	42	4147	Little Blue NRD	Low-head Embankment Stabilization/Recharge Pilot Project	$100,153
2017	44	5197	Little Blue NRD	LBNRD Oxbow Reconnections for Groundwater Recharge	$389,820

Dam Safety

The Nebraska Dam Inventory contains 625 dams located within the Little Blue and Big Blue River Basins that undergo periodic inspections by the Department. In 2018, the Department conducted 108 dam inspections throughout these areas, including all 12 high hazard potential structures. The most common reoccurring problems found at dam sites were large trees and rodent holes in the embankments and rusted, corrugated metal pipe conduits running through the dams. As the average age of the dams in the Blue River Basin is 45 years, many either have reached, or are nearing the end of their original design life.

On June 19 and 20, 2018, heavy rains fell in southwestern Jefferson County in the Little Blue Basin. The highest reported 24-hour rainfall was 8.3 inches near Reynolds, Nebraska. The auxiliary spillways operated at several flood control dams in the area, but overall the dams performed well, and no damage was reported at the dams.

American Water Resources Association Conference in Omaha

Also of interest, the Department hosted the American Water Resources Association's 2019 Spring Specialty Conference in Omaha, held earlier this year. Much work in 2018 was devoted to the planning of this event. The conference theme was "Setting Conditions for Success in Integrated Water Resources Management." This conference included attendees and presenters from all over the U.S. and beyond. Nebraska agencies and organizations were well represented at the conference, comprising just under half of the 65 presenters. Nine staff members from the

Department gave eight presentations and participated on two panels. These presentations and panels highlighted the strengths and successes of various policy, planning, project, and technical aspects of Nebraska's unique approach to integrated water management.

Conclusion

I would like to thank Kansas for continuing the partnership to work together to proactively manage waters the Blue River Basin. I will now turn it over to Jim Ostdiek who will give a report on Nebraska water administration, which will be followed by the NRD reports.

Attachment D

2019 Big Blue River Compact Administration Report

2018 Water Administration Activities in Nebraska

The Little and Big Blue River Basins received above average precipitation for the months May through September 2018. Precipitation conditions in 2018 showed an increase from 2017. Surface water administration occurred only in the Little Blue River Basin this year, with all calls being required for the Blue River Compact (Compact).

Little Blue Administration

The Little Blue's headwaters are located near Minden with the river exiting the state south of Fairbury. The basin encompasses approximately 2,700 square miles in all or parts of 10 counties. It contains 249 irrigation permits and 132 storage rights.

On July 26th flows at the Hollenberg gage dropped below the Compact target, causing 119 natural flow and 138 storage rights to close. This gage reopened, along with all of the associated rights, on July 31th after flows exceeded the Compact target. This closing and reopening of the Hollenberg gage occurred one more time, August 9-20.

Big Blue Administration

The headwaters of the Big Blue River are located in Hamilton County, north of Aurora. At its farthest western extent, the Basin's headwaters extend northwest of Hastings. The Big Blue River exits the state south of Barneston and continues until it reaches its junction with the Kansas River. The Basin encompasses 4,450 square miles in all or parts of 15 counties and contains 835 surface water irrigation permits and 359 storage permits.

The flow at Barneston exceeded the target through the entire administration period.

Concluding Thoughts

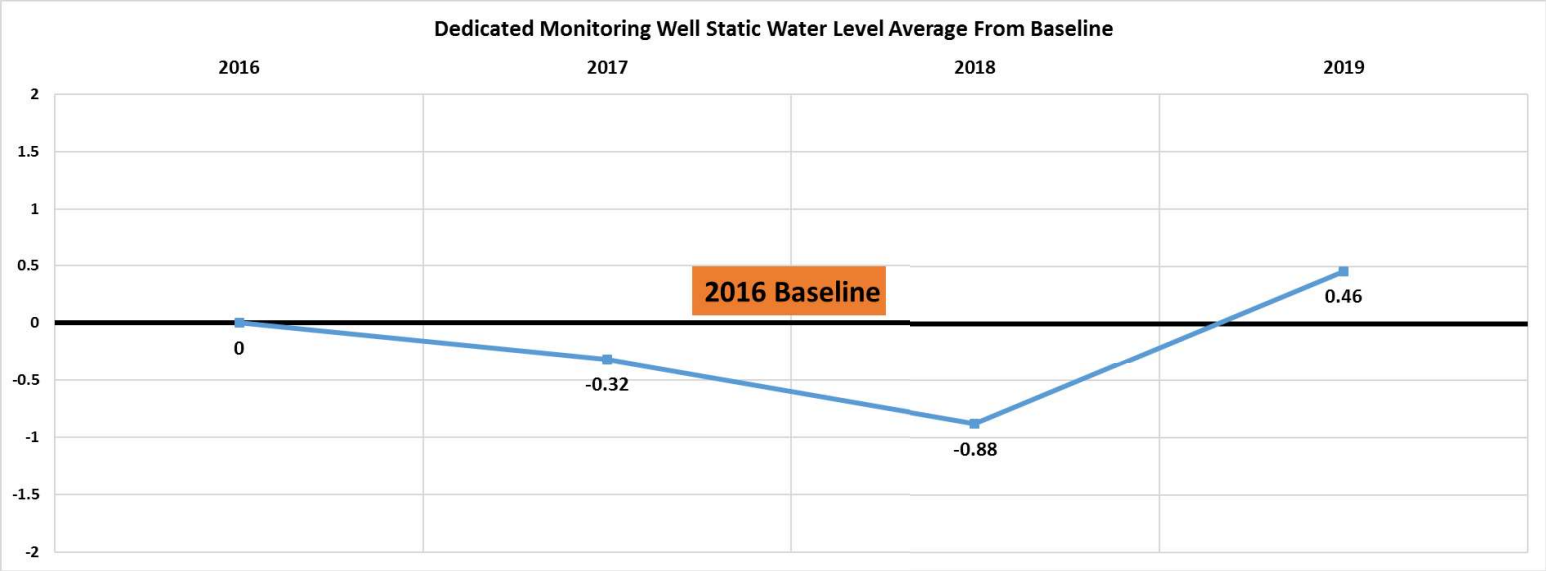
In general, the basins received above and below average rainfall depending on what part of the basins you were in and experienced average to below average summer temperatures. NeDNR issued two rounds of closing notices for Compact compliance, which totaled 18 days in the Little Blue Basin.

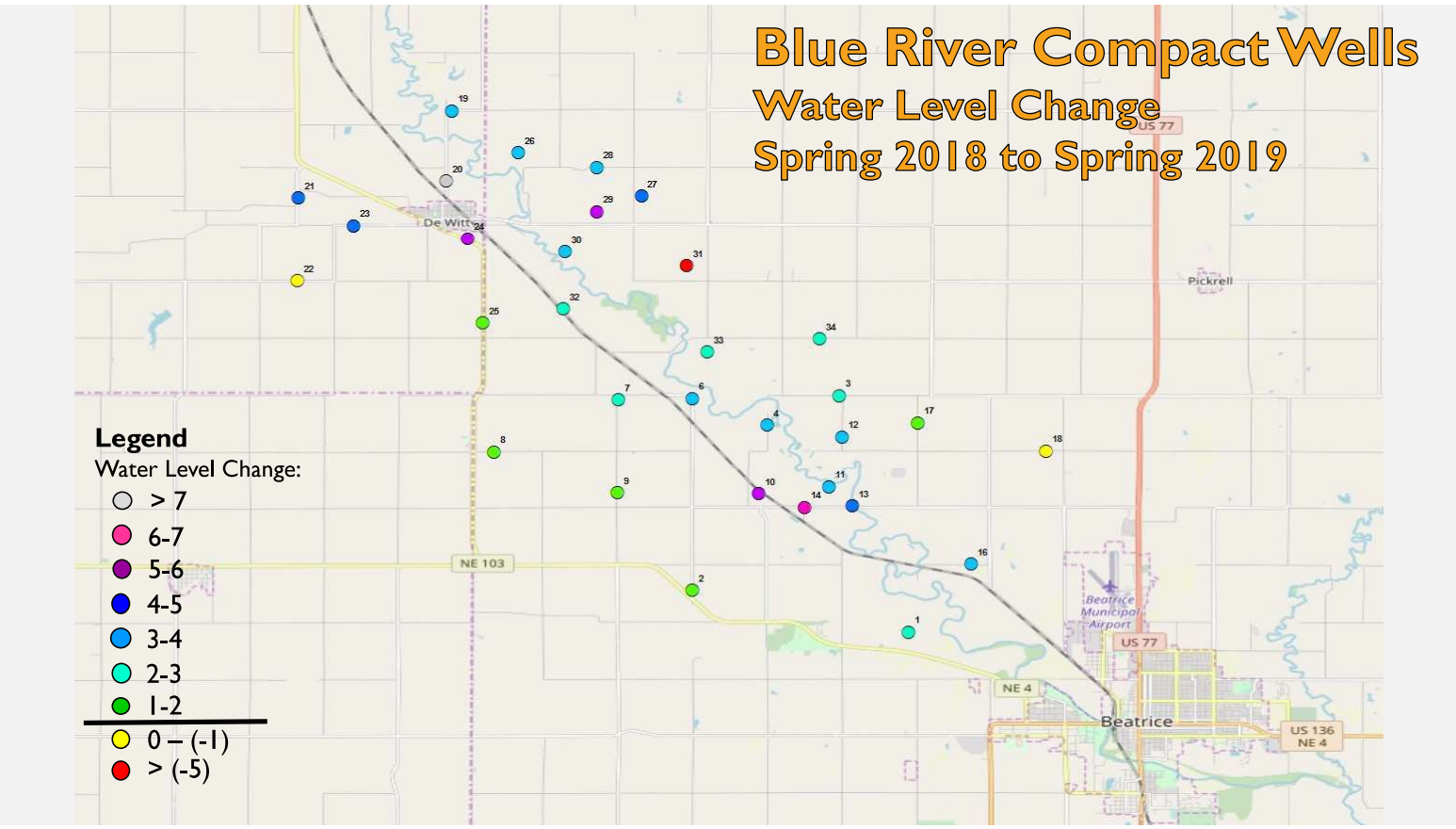
Attachment E

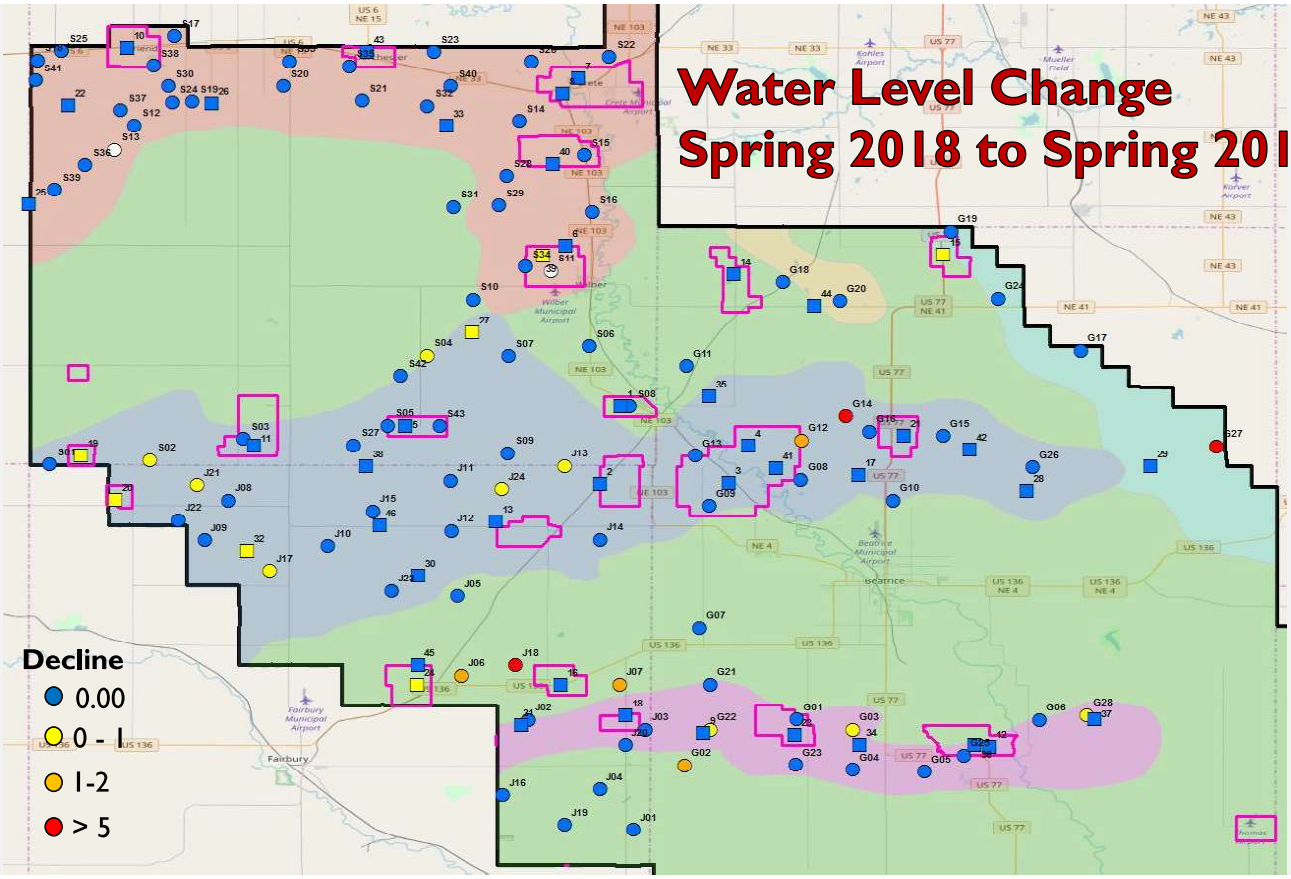
Water Levels

County	Wells	Spring 2018 to Spring 2019
Gage	27	1.04
Jefferson	24	0.86
Saline	42	1.39
District Ave.	93	1.15

County	Wells	Fall 2018 to Spring 2019
Gage	27	2.18
Jefferson	24	2.97
Saline	42	2.77
District Ave.	93	2.54


Dedicated Monitoring Well Static Water Level Average From Baseline
2016
2017
2018
2019
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
2016 Baseline
0
-0.32
-0.88
0.46


Blue River Compact Wells
Water Level Change
Spring 2018 to Spring 2019
Legend
Water Level Change:
> 7
6-7
5-6
4-5
3-4
2-3
1-2
0 – (-1)
> (-5)
De Witt
Pickrell
NE 103
US 77
NE 4
US 136
Beatrice
Beatrice Municipal Airport

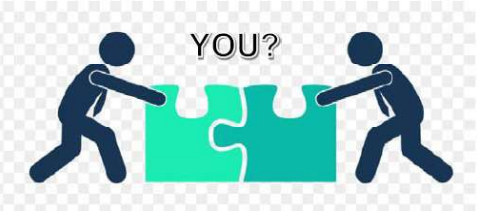


Who Are You Going To Call?

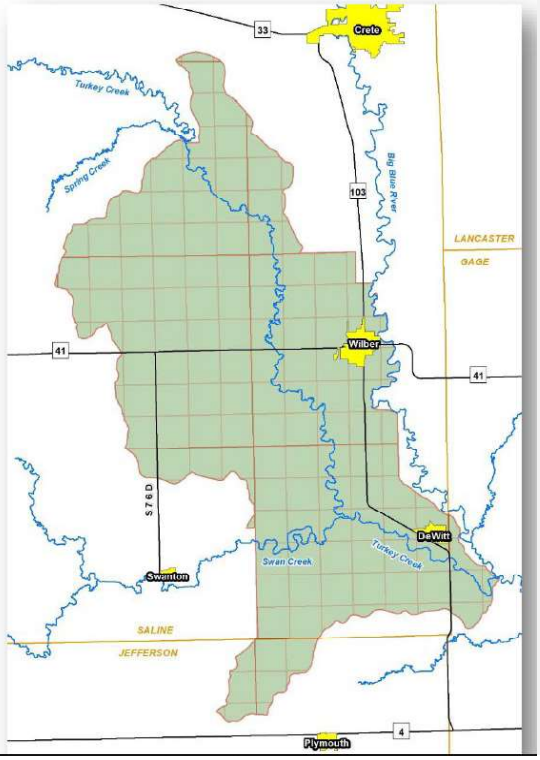
Scott Bohaty (NRCS)	402-821-3292 ext. 3
Ryan Thomas (LBB NRD)	402-230-0016
Paul Hay (LBB NRD)	402-239-1341
Randy Pryor (Extension)	402-821-2151

Project Partners

USDA Natural Resources Conservation Service
Lower Big Blue Natural Resources District
Nebraska Department of Environmental Quality
Nebraska Extension
City of Wilber



TURKEY CREEK – WILBER WATER QUALITY INITIATIVE



Turkey Creek-Wilber Water Quality Problems

BACTERIA: Concentrations of *E. coli* bacteria exceed water quality standards in Turkey Creek. Recreational use of Turkey Creek is impaired due to *E. coli*.

- *E. coli* bacteria can cause illnesses such as diarrhea, toxicity and skin infection.
- Sources of *E. coli* bacteria include livestock, wildlife and human waste.
- Management options include removing sources, controlling manure runoff and waste treatment.

ATRAZINE: Concentrations of Atrazine exceed water quality standards in Turkey Creek. Aquatic Life use is impaired in Turkey Creek due to Atrazine.

- Atrazine may disrupt the aquatic food chain and can disrupt hormone functions.
- Sources of Atrazine include runoff from cropland and spills.
- Management options include lower application rates, alternative placement and timing of application, runoff control and interception, and alternative herbicides.

NITRATE: Concentrations of nitrate in groundwater exceed the drinking water quality standard in some areas. Wilber and DeWitt drinking water sources are threatened.

- High nitrate levels can cause blue baby syndrome in infants and reproductive complications in livestock.
- Sources of nitrate include fertilizer and waste from livestock, pets and wildlife.
- Management options include efficient fertilizer application rates, alternative placement and timing of fertilizer application, runoff control, and interception.

Creating A Water Quality Improvement Plan

A water quality improvement plan will provide:

- Comprehensive assessment of watershed conditions.
- Strategies to resolve water quality problems.
- Coordinated agency technical and financial resources.
- Opportunities to try voluntary conservation practices.

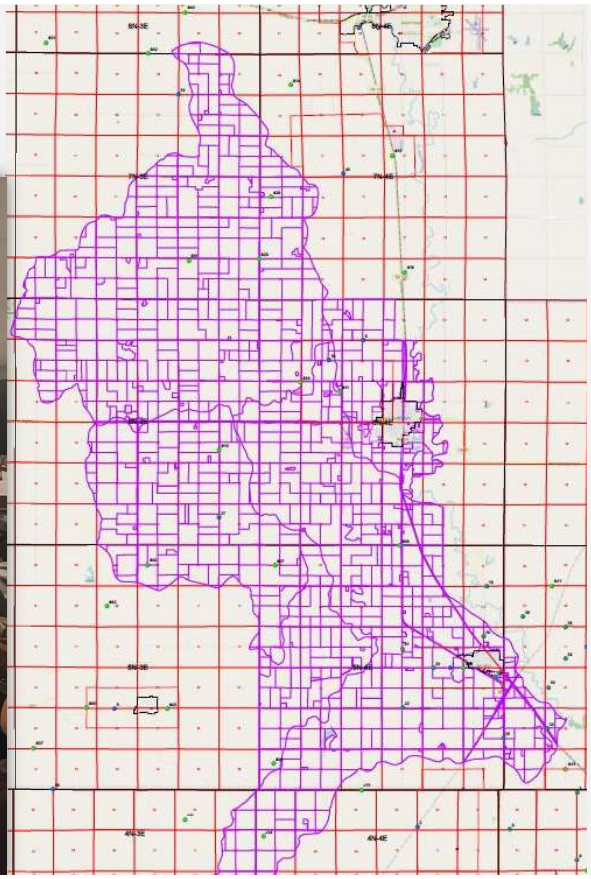
We Need Your Help!

You can help develop the plan by:

- Providing input at public meetings.
- Responding to a conservation survey.
- Serving on an advisory committee.
- Sharing your concerns about water quality issues.
- Sharing your interest in conservation practices.

Holmes Lake Watershed Planning Meeting

TURKEY CREEK-WILBER WATER QUALITY INITIATIVE



Snap-Tite Tube Installations

Sliding the Tube

Setting the Riser

Pumping Grout

Inspecting Grout

Backfilling and Packing around Riser


New Corrigated Tube with HDPE

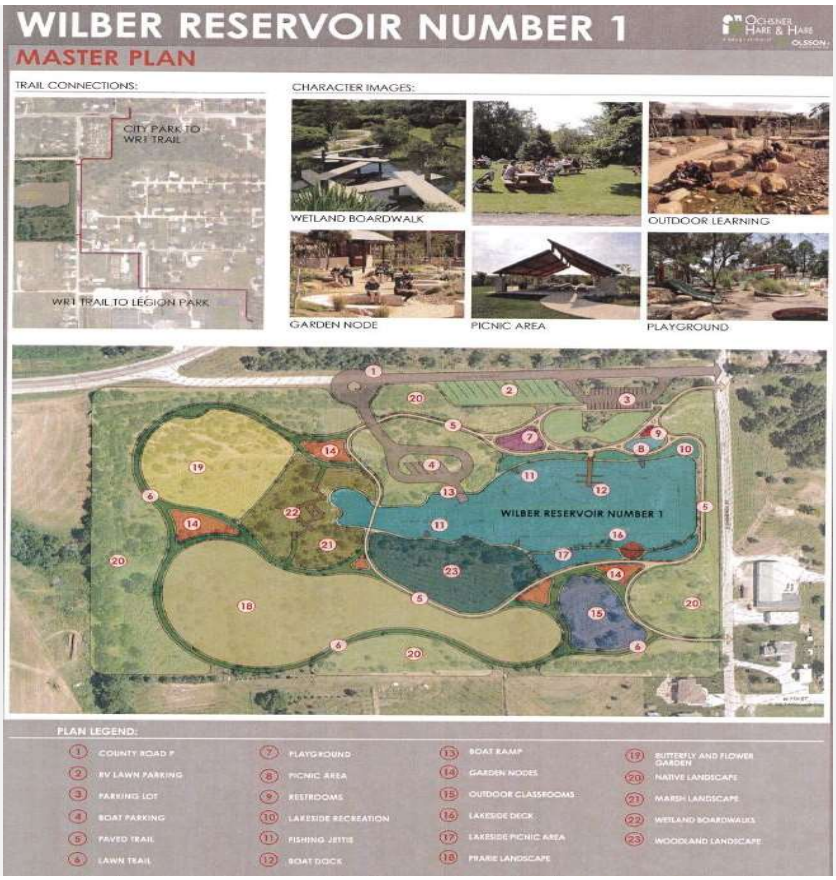
Flooding


Willard Meyer Rec. Area – Emergency Spillway


Willard Meyer Rec. Area – Beach Area
NOTICE
PLACE ALL
TRASH
INSIDE
DUMPSTER


Willard Meyer Rec. Area – Boat Ramp and Dock


West of DeWitt – Dedicated Monitoring Well


WILBER RESERVOIR NUMBER 1
MASTER PLAN
TRAIL CONNECTIONS:
CITY PARK TO WRT TRAIL
WRT TRAIL TO LEGION PARK
CHARACTER IMAGES:
WETLAND BOARDWALK
OUTDOOR LEARNING
GARDEN NODE
PICNIC AREA
PLAYGROUND
WILBER RESERVOIR NUMBER 1
PLAN LEGEND:
1 COUNTY ROAD F
2 RV LAWN PARKING
3 PARKING LOT
4 BOAT PARKING
5 PAVED TRAIL
6 LAWN TRAIL
7 PLAYGROUND
8 PICNIC AREA
9 RESTROOMS
10 LAKESIDE RECREATION
11 FISHING JETTIS
12 BOAT DOCK
13 BOAT RAMP
14 GARDEN NODES
15 OUTDOOR CLASSROOMS
16 LAKESIDE DECK
17 LAKESIDE PICNIC AREA
18 PRAIRIE LANDSCAPE
19 BUTTERFLY AND FLOWER GARDEN
20 NATIVE LANDSCAPE
21 MARSH LANDSCAPE
22 WETLAND BOARDWALKS
23 WOODLAND LANDSCAPE

Upcoming Projects

- Voluntary Integrated Management Plan with NeDNR
- 1-2 Dedicated Monitoring Wells/Equipment Upgrades
- 3 CMP Linings with Snap-Tite® Tubes
- 2 Picnic Shelters – Willard Meyer, Big Indian Rec Areas
- Cub Creek Rec Area Rehab
- Wilber Dam
- NWQI Application
- Groundwater Management Rules & Regs Updates


The End

Attachment F

May 2019

Kansas-Nebraska Big Blue River Compact Meeting

Little Blue Natural Resources District

Kyle Hauschild, General Manager

Contact Us

100 East 6th Street #100
Davenport, NE 68335

(402) 364-2145
https://littlebluenrd.org

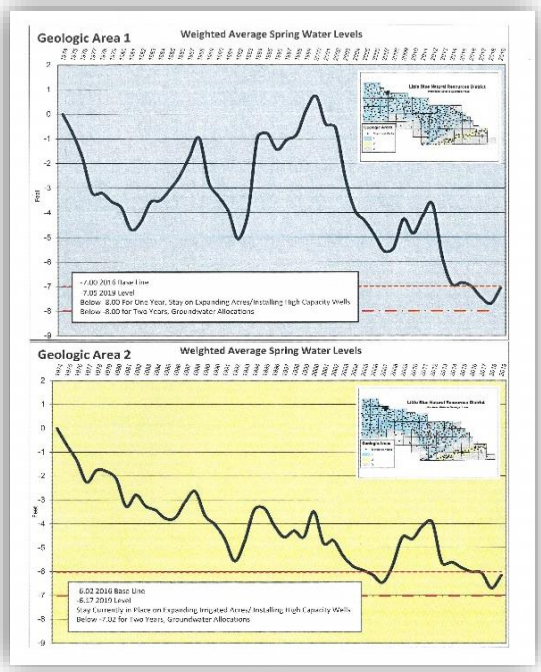
KANSAS-NEBRASKA BIG BLUE RIVER COMPACT
Nebraska Report – Little Blue Natural Resources District
May 15, 2019

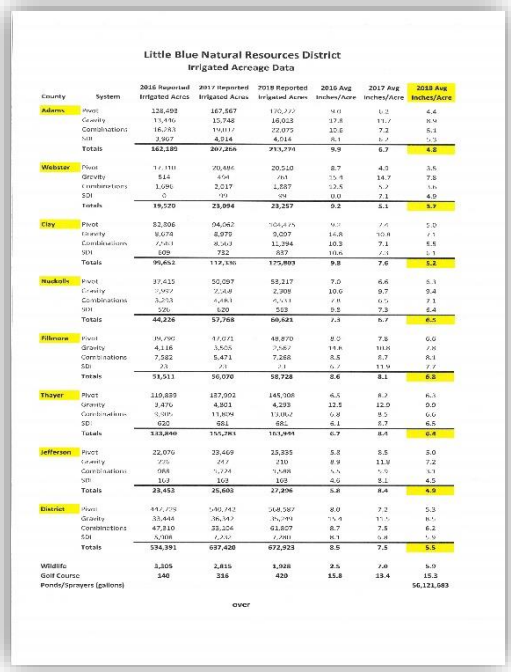
The Little Big Blue NRD Board of Directors has approved a motion to adopt the draft Voluntary Integrated Management Plan (IMP). The draft IMP was approved at the May LBNRD board, and a letter was sent today to Nebraska Department of Natural Resources informing them that the district would like to schedule a public hearing to move closer to finalizing the IMP. The Little Blue has been working on the IMP for over three years, and we feel that we are close to getting it completed.

Both aquifers were up from last spring; Geologic Area 1 by +0.64 and Geologic Area 2 by +0.53. Both graphs are about back up to the 2016 Baseline. While the info does show a rise from last spring, the District will caution groundwater users they need to be in it for the long haul as the graphs do show levels are still in a depressed state. We're continuing to do what we can with education, cost-share programs, and re-charge practices to minimize negative impacts on water levels.

All irrigation flow meters were installed for the 2018 season, acres reported have grown since 2016. Use has been down since 2016 from 8.5 inches per acre, 7.5, and then 5.5 inches per acre district-wide for 2018. For 2019 we'll be working to tie the reported acres from the pumping reports to the certified acres for accuracy.

The District adopted new Rules and Regulations in September of 2018. The weighted average graphs for tracking water levels were implemented and the 2016 water level set as the baseline for each aquifer. If levels fall 1 foot below that point for one year, there is a stay on irrigation well drilling and expansion of irrigated acres within the respective area. If levels fall 1 foot below the 2016 baseline for two consecutive years, allocations of groundwater for irrigation are implemented. Initial allocation period is set at five years and 13 inches per year.




Little Blue Natural Resources District
Irrigated Acreage Data

County	System	2016 Reported Irrigated Acres	2017 Reported Irrigated Acres	2018 Reported Irrigated Acres	2016 Avg Inches/Acre	2017 Avg Inches/Acre	2018 Avg Inches/Acre
Adams	Pivot	126,490	167,567	170,777	9.0	6.2	4.4
	Gravity	13,496	15,748	16,018	17.8	11.7	8.9
	Combinations	16,783	19,017	22,075	10.6	7.2	5.1
	SDI	2,967	4,914	4,514	8.1	6.2	5.3
	Totals	162,185	207,266	213,394	9.9	6.7	4.8
Webster	Pivot	17,710	20,486	20,510	8.7	4.0	3.6
	Gravity	514	494	760	15.8	14.7	7.8
	Combinations	1,696	2,017	1,887	12.5	5.2	3.6
	SDI	0	791	99	0.0	7.1	4.9
	Totals	19,920	23,894	23,257	9.2	5.1	3.7
Clay	Pivot	82,806	94,942	104,475	9.0	7.6	5.0
	Gravity	8,678	8,973	9,097	16.8	10.8	7.1
	Combinations	7,463	8,563	11,394	10.3	7.1	5.5
	SDI	509	732	837	10.6	7.1	5.1
	Totals	99,456	113,336	125,803	9.8	7.6	5.2
Nuckolls	Pivot	37,415	50,097	53,217	7.0	6.6	5.1
	Gravity	2,907	2,648	2,308	10.6	9.7	5.4
	Combinations	3,253	4,483	4,553	7.8	6.5	7.1
	SDI	520	520	563	9.5	7.3	6.4
	Totals	44,226	57,768	60,621	7.3	6.7	6.5
Fillmore	Pivot	39,790	47,071	48,870	8.0	7.8	6.0
	Gravity	4,116	3,505	2,582	11.9	10.8	7.8
	Combinations	7,582	5,471	7,268	8.5	8.7	8.1
	SDI	23	23	23	6.7	11.9	7.7
	Totals	51,511	56,070	58,728	8.6	8.1	6.3
Thayer	Pivot	110,889	137,902	145,508	6.5	8.2	6.3
	Gravity	2,476	4,901	4,233	12.5	12.0	9.0
	Combinations	9,995	11,809	13,082	6.8	8.5	6.6
	SDI	620	681	681	6.1	8.7	6.5
	Totals	123,840	155,293	163,504	6.7	8.4	6.4
Jefferson	Pivot	22,070	23,469	25,335	5.8	8.5	5.0
	Gravity	235	247	210	8.9	11.9	7.2
	Combinations	968	1,224	1,588	5.5	5.5	5.1
	SDI	163	163	163	4.0	8.1	4.5
	Totals	23,452	25,603	27,296	5.8	8.4	4.9
District	Pivot	447,278	540,742	568,587	8.0	7.2	5.3
	Gravity	33,444	36,343	35,209	15.4	11.5	8.5
	Combinations	47,810	53,324	61,857	8.7	7.4	6.2
	SDI	4,308	7,230	7,290	8.1	6.8	5.9
	Totals	534,391	637,420	672,923	8.5	7.5	5.5
Wildlife		3,305	2,815	1,928	9.5	7.0	5.9
Golf Course		140	336	420	15.8	13.4	15.3
Ponds/Sprayers (gallons)							56,121,683

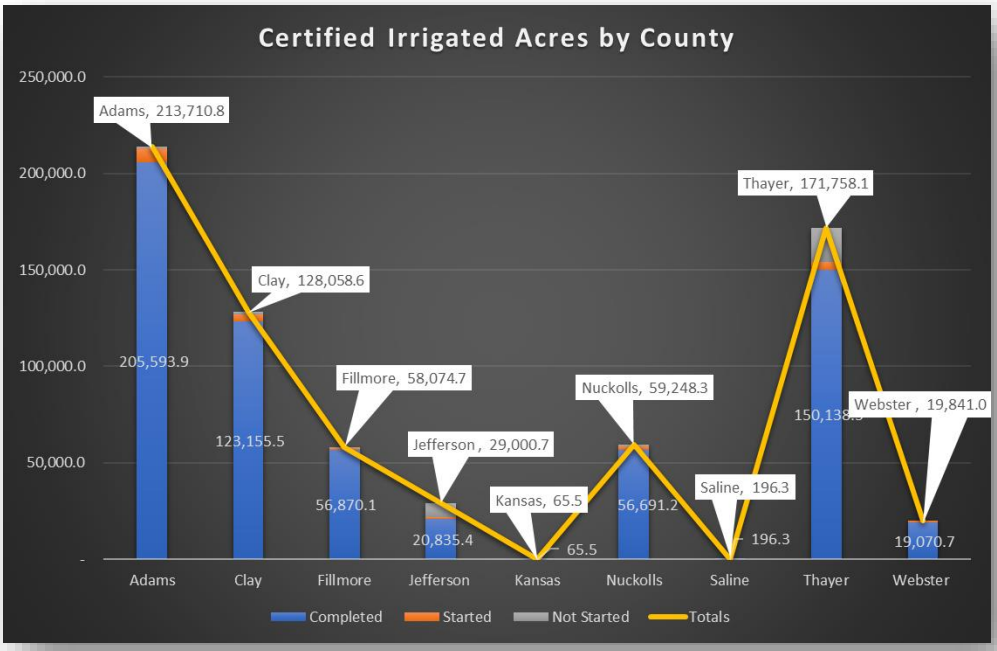
over

The District has also been working on water quality issues in the district. Currently we have identified 8 Sub-areas that we monitor regularly, and unfortunately, the nitrate levels in 6 of the eight areas are on the rise. Vadose Zone sampling is planned for this fall (2019), and the results will be compared against the results from 2013/2014 sampling results.

Hastings has also been working on reducing nitrate concentration in the cities wells with the Hastings ASR (Aquifer Storage and Restoration) project. The goal of this project is to inject water with lower nitrate levels into the aquifer to lower the nitrate concentration of the cities drinking water supply.

The District is trying to finish the construction on groundwater recharge projects. The idea behind these projects is to store excess surface water, whether it be behind weirs that in the stream itself, or to route excess water during high flow events into old oxbows to give the water a chance to infiltrate. Monitoring wells have been installed near all these projects, to see what impacts these projects have on groundwater levels.

We are also in the final stretch of getting all the districts certified acres entered. We are currently about 93% complete on getting all the acres into our Database. The graph below shows how many acres that we have certified in each county. The table shows how many acres that have been completed, the total amount acres that have not been completed yet, and the total amount of certified acres in each county. The bottom line shows the total of each column.



Irrigated Acre Information

County	Completed	Started	Not Started	Totals
Adams	205,593.9	7,247.0	869.8	213,710.8
Clay	123,155.5	3,681.0	1,222.2	128,058.6
Fillmore	56,870.1	847.6	357.0	58,074.7
Jefferson	20,835.4	1,103.1	7,062.1	29,000.7
Kansas	65.5	-	-	65.5
Nuckolls	56,691.2	1,991.7	565.3	59,248.3
Saline	196.3	-	-	196.3
Thayer	150,138.5	3,750.5	17,869.1	171,758.1
Webster	19,070.7	770.3	-	19,841.0
Total	**632,617.0**	**19,391.3**	**27,945.6**	**679,953.9**
	93%	3%	4%	

Attachment G

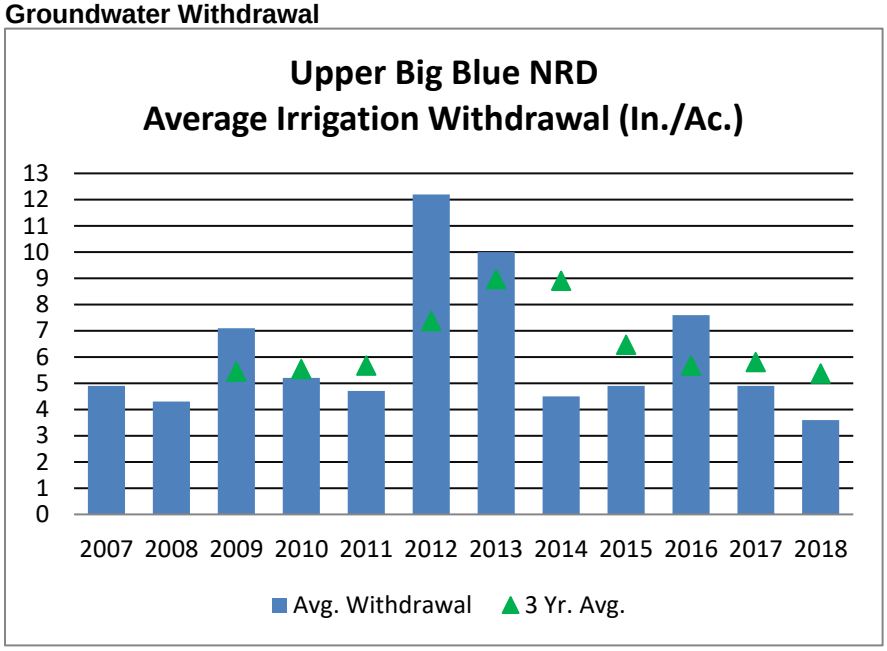
Kansas-Nebraska Big Blue River Compact
Nebraska Report - Upper Big Blue NRD (UBBNRD)
Marie Krausnick, Water Department Manager
Jack Wergin, Projects Department Manager
May 15, 2019

Well Drilling Activities
Sixty-five permits were issued for irrigation wells (39 new & 26 replacements) in 2018. At the end of 2018 there were registered 12,213 irrigation wells in the District. This is a decrease of 9 irrigation wells compared to the end of 2017.

Groundwater Level Changes
The average groundwater level change for the District from spring 2018 to spring 2019 was a rise of 1.22 feet. The spring 2019 groundwater level is 5.11 feet above the District's allocation trigger level.

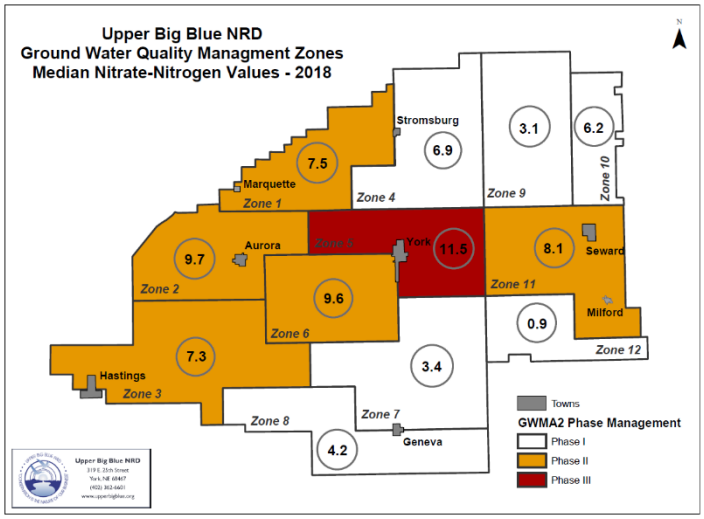
Certified Irrigated Acres
Mandatory reporting of irrigated acres and other water uses began in 2006. As of January 1, 2018, there were 1,239,362 groundwater irrigated acres certified by the NRD. This represents an increase of 2,206 acres since January 1, 2018.

Groundwater Withdrawal



Mandatory reporting of groundwater withdrawal began in 2007. 2018 was the 12th year that groundwater withdrawal reports were required in the District. Metering became mandatory on all wells effective January 1, 2016. Staff has inventoried installations and are now conducting routine inspections as needed. The average groundwater withdrawal for irrigation in 2018 was 3.7 inches per acre. The graph to the left shows the average annual withdrawal for irrigation over the past twelve years.

Groundwater Quality
Nitrate
The District is divided into twelve management zones for groundwater quality management. The primary groundwater quality management concern is nitrate. Five zones are currently designated Phase II Management Area and one (Zone 5) is designated a Phase III Management Area. Phase II & III Management Areas requires farm operators to attend a training session on best management practices related to fertilizer and irrigation management. It also requires deep soil sampling, irrigation scheduling and annual BMP reports. Farm operators in phase II & III must schedule irrigation using soil moisture sensors in at least one field. In a Phase III Management Zone anhydrous ammonia fertilizer applied from November 1st through February 29th must include a nitrification inhibitor. The timing of application of nitrogen fertilizers is restricted District wide. There are currently over 1,000 farm operators in the District required to attend nitrogen management training. The District is also working with the City of Hastings and the Little Blue NRD on a special water quality management area to address nitrate contamination in the Hastings Wellhead Protection Area.



Arsenic, Selenium and Uranium
Natural groundwater contaminants such as arsenic, selenium and uranium occur in many areas. These chemicals are associated with sediments in the aquifer as well as the unsaturated zone above the aquifer. Recent groundwater quality investigations near Hastings, Nebraska as well as other parts of the mid-west indicate that these naturally occurring contaminants may be released into the groundwater as a result of increased agriculture chemical

contamination such as nitrate. The District is working with the University of Nebraska to develop a monitoring program for arsenic, selenium and uranium.

Dakota Aquifer
In 2016 the District started a water sampling program for the Dakota aquifer. The Dakota is used in the eastern part of the District for domestic wells where other sources are very limited. High commodity prices and drought conditions in 2012 and 2013 prompted construction of irrigation wells in the Dakota. Concerns have been raised over the impact that Dakota aquifer irrigation wells may have on the domestic groundwater supply. The quality of water in the Dakota can be "hit and miss" as to suitability for domestic and irrigation uses. It is unclear to what degree further development of the aquifer could impact water quality or domestic supplies to existing wells.

Project Grow
Project GROW is a collaborative demonstration project between the City of York and the UBBNRD. It focuses on three areas of interest: a soil health demonstration, an awareness of the importance of pollinator habitat and a community garden for the citizens of York. The District is farming 140 acres of the City wellfield with a rotation of cover crops to promote soil health. This is the second growing season of the project. The District received initial funding from the NACD funding from the Nebraska Department of Environmental Quality Source Water Protection Grant to continue educational efforts surrounding Project GROW.

Nebraska Agricultural Water Management Demonstration Network
This program encourages producers to improve irrigation scheduling using Etgages and Watermark sensors to determine crop water needs. The Etgage simulates crop water use through evaporation through a ceramic and green canvas membrane. Watermark sensors are used to measure soil moisture in a nearby field to confirm the ETgage's accuracy. This program began in the UBBNRD in 2005 with a collaborative effort with the University of Nebraska Extension and 18 collaborators. The program is now being implemented in several NRDs and over 2,000 collaborators. The District sells this equipment to irrigators at a reduced cost to encourage adoption of the scheduling practices.

Soil and Water Conservation Cost-share Assistance
Through the District's Land Treatment Program, the District funded 51 soil and water conservation projects with a total cost share of $191,319.42 in FY2018. Funded projects included terraces, sediment control basins, waterways, pasture plantings, and tree plantings for windbreaks & enhancing wildlife. Funding sources for the Land Treatment Program included $74,234.28 from the Nebraska Soil and Water Conservation Program and $117,085.14 from local NRD property tax revenues.

Nebraska Buffer Strip Program
Through the Nebraska Department of Agriculture, the District administers the Nebraska Buffer Strip Program. This program provides cost share funds for landowners to establish vegetative buffer strips along shorelines of wetlands, streams, and lakes. Funding comes from a fee assessed on all pesticides registered for use in Nebraska. In FY18 the District administered 21 buffer strip contracts which provided a total cost share of $23,480.45.

Variable Rate Irrigation Pilot Program
The District began a Variable Rate Irrigation Pilot Program in 2017. With over 10,000 center pivots the District believes that VRI can have a significant impact water use efficiency and may provide water savings. In FY 2018 the District funding 3 VRI projects with a total District contribution of $18,695.99.

Divots in the Pivots
The District received a Regional Conservation Partnership Program (RCPP) grant through NRCS. Divots in the Pivots provides a variety of cost-share assistance to landowners with wetlands in the Rainwater Basin to conserve that wetland while improving profitability of the farming operation. VRI, fencing, livestock watering and conservation easements are few of the many options available. The Rainwater Basin Joint Venture is the major partner in this effort. Currently, there are three cooperators in this program. One in each of the Little Blue NRD, Tri-Basin NRD and Upper Big Blue NRD.

Groundwater Modeling
The District, in cooperation with the Lower Big Blue, Little Blue, Tri-Basin NRDs and the Department of Natural Resources are partnering in the development of a transient Blue Basin Groundwater Model that can not only answer the question of interconnection between surface and groundwater, but other management questions NRDs ask when reviewing their groundwater management plans.

Wellhead Protection Planning
The District continues to assist communities to develop Wellhead Protection Area (WHP Area) Plans. The District also assists communities with implementation of some plan components. These include water sample collection and analysis from rural wells and soil samples collected from the unsaturated zone for nitrates.

Water Quality Management/Voluntary Integrated Management Planning
The District, the Nebraska Department of Environmental Quality and the Nebraska Department of Natural Resources are wrapping up planning efforts for a Water Quality Management Plan and Voluntary Integrated Management Plan. These two planning efforts were done concurrently because all parties recognize that water quality and water quantity impact each other. This combined planning approach provides the District with a comprehensive view of its water resources in a more time-efficient and cost-effective manner. This planning process of "One District, Two Plans, One Water" is the first combined water quality and quantity planning effort in Nebraska. Combining plans allowed the District to utilize the one Technical Advisory Committee and one Stakeholder Committee for both plans. Stakeholder meetings were held focusing individually on water quality and quantity, but conjoined meetings were also held to discuss the affects of groundwater quality and quantity.

The Water Quality Management Plan is near completion before submission to EPA for final review and approval. Two Priority Areas were defined in the plan: Recharge Lake impairment for Mercury and Beaver Creek for E. Coli and Atrazine. Once the plan is approved by both the Environmental Protection Agency (EPA) and UBBNRD, District staff will be working to outline a program to address both Priority Areas and apply for 319 funding.

The Voluntary Integrated Management Plan will be drafted collaboratively between the Nebraska Department of Natural Resources and the District staff. A kickoff meeting was held on May 7 to outline the goals and objectives and begin drafting a plan.

Private Dams Program
FY2018 marked the second year of the District's Private Dams Program. Through this program the District provides planning, design, and financial assistance for the construction or reconstruction of dams located on private property. In FY2018 the District provided cost share assistance for 7 dams with a total $131,428.94 of District funds.

Visit our Website
You can learn all about the District's programs and activities at www.upperbigblue.org.

Attachment H

REPORT OF THE TREASURER TO THE
KANSAS-NEBRASKA BLUE RIVER COMPACT ADMINISTRATION
May 15, 2019

1. Current Year Overview (Attachment A)
   a. Our beginning balance for FY2018-2019 was $26,422.33. Since that time, we have had income from the State Assessments and interest which total $19,100.85.
   b. Our expenses thus far have been $16,039.00 for USGS Stateline gages, $950.00 for a Financial Review that covered FY2017, and $680.00 for the Lower Big Blue NRD observation wells.
   c. The balance today is $27,854.14.
   d. Our estimated end-of-year balance is $27,666.18; which reflects estimates of interest income and additional expenditures (printing and postage).

2. Budget Analysis of FY2016 to FY2021 (Attachment B)
   a. The first three columns show the actual expenditures and income for FY2016, FY2017 and FY2018. Our ending year balances have continued to increase.
   b. For this FY's budget, we have these divided into two columns to show actual expenditures and income to date, and what is expected for the remainder of the fiscal year, and were discussed as Attachment A.
   c. The column highlighted in yellow, is the proposed budget for FY2020. We've added roughly 3 percent to Stateline gages and Observation wells expenditures to allow for increased costs. Of note, we have included an estimated $3200 for four years of Financial Review which would cover FY's 2015, 2016, 2018 and 2019 ($800/year). There are four years budgeted due to getting off track with the previous pattern (no Reviews in 2018, and only 1 in 2019), and also to adjust the timing to remove a one year lag that we've had in the past. The following table shows the Reviews that we've had done (black) and what is proposed for the future (blue).

Fiscal Year	Financial Review was for FY's…. (blue is proposed)
2011	
2012	
2013	
2014	11 and 12
2015	
2016	13 and 14
2017	
2018	
2019	17
2020	15, 16, 18, 19
2021	
2022	20, 21

   d. The final column shows a projected budget for FY2021. Again, we have included a ~3 percent increase for Stateline Gages and Observation Wells; we did not include a line item for the Financial Review as these are to occur every other year. According to our projection, our balance would be $27,266.18 at this time.

ATTACHMENT A: Current Year Overview

May 15, 2019

BEGINNING BALANCE: July 1, 2018			**$ 26,422.33**
INCOME: as of May 15, 2019			
State Assessments	$ 19,000.00		
Interest Income	$ 100.85		
TOTAL INCOME		$	19,100.85
EXPENSES: as of May 15, 2019			
USGS - Stateline Gages	$ 16,039.00		
Printing Annual Report	$ -		
Lower Big Blue Natural Resources District - Observation Wells	$ 680.00		
Dana Cole - Accounting Review (FY2017)	$ 950.00		
TOTAL EXPENSES		$	17,669.00
BALANCE ON HAND:			**$ 27,854.18**
ESTIMATED EXPENDITURES THROUGH JUNE 30, 2019			
USGS - Stateline Gages	$ -		
Dana Cole - Review	$ -		
Printing Annual Report	$ -		
Postage and Office Supplies	$ 100.00		
Miscellaneous	$ 100.00		
TOTAL ESTIMATED ADDITIONAL EXPENDITURES		$	200.00
ESTIMATED INCOME THOUGH JUNE 30, 2019			
Interest Income		$	12.00
ESTIMATED BALANCE AS OF JUNE 30, 2019			**$ 27,666.18**

ATTACHMENT B: Big Blue River Compact Budget Analysis, FY2016 to FY2021							
	FY 2016	FY 2017	FY 2018	FY 2019		FY 2020	FY 2021
	Actual 7/1/15 to 6/30/16	Actual 7/1/16 to 6/30/17	Actual 7/1/17 to 6/30/18	Actual 7/1/18 to 5/15/19	Estimated 5/16/19 to 6/30/19	Proposed 7/1/19 to 6/30/20	Projected 7/1/20 to 6/30/21
EXPENDITURES							
Operations							
USGS - Stateline Gages	$ 15,506.00	$ 15,790.00	$ 15,925.00	$ 16,039.00		$ 16,500.00	$ 17,000.00
LBBNRD - Observation Wells	$ 680.00	$ 680.00	$ 680.00	$ 680.00	$ -	$ 700.00	$ 700.00
Water Quality Committee	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual Report - Printing	$ -	$ -	$ -	$ -	$ -		
Financial Review	$ 1,717.00	$ -	$ -	$ 950.00		$ 3,200.00	$ -
Postage and Office Supplies	$ -	$ -	$ -	$ -	$ 100.00	$ 100.00	$ 100.00
Miscellaneous Expenses	$ -	$ -	$ -	$ -	$ 100.00	$ 100.00	$ 100.00
Total Expenses	$ 17,903.00	$ 16,470.00	$ 16,605.00	$ 17,669.00	$ 200.00	$ 20,600.00	$ 17,900.00
INCOME & CARRY OVER							
Assessments (Both States)	$ 19,000.00	$ 19,000.00	$ 19,000.00	$ 19,000.00	$ -	$ 19,000.00	$ 19,000.00
Interest earned	$ 23.74	$ 38.96	$ 52.14	$ 100.85	$ 12.00	$ 50.00	$ 50.00
Carry Over from Prior Year	$ 20,285.49	$ 21,406.23	$ 23,975.19	$ 26,422.33	$ -	$ 27,666.18	$ 26,116.18
Total Income and Carry Over	$ 39,309.23	$ 40,445.19	$ 43,027.33	$ 45,523.18	$ 12.00	$ 46,716.18	$ 45,166.18
Ending Balance	$ 21,406.23	$ 23,975.19	$ 26,422.33	$ 27,854.18	$ 27,666.18	$ 26,116.18	$ 27,266.18

Attachment I

KANSAS-NEBRASKA BIG BLUE RIVER COMPACT REPORT
U.S. Geological Survey—Water Year 2018

The U.S. Geological Survey (USGS) continues to operate two streamflow gaging stations for the Compact Administration—Big Blue River at Barneston, NE (06882000), and Little Blue River at Hollenberg, KS (06884025). An electronic data logger (EDL) at each station automatically records streamflow stage every 15 minutes. Every hour, these instantaneous values are transmitted via satellite to USGS offices, where they are used to compute preliminary values of instantaneous and daily discharge that are immediately posted to the USGS National Water Information System (NWIS) website (addresses shown below). Before the data are finalized, updates and revisions are made as needed, based on a series of quality checks and reviews. Finalized values of daily discharge and daily gage height, along with associated summary statistics are published annually on a site-by-site basis on the NWIS web page (address shown below).

During water year (WY) 2018 (October 1, 2017 to September 30, 2018), periodic visits were made to the stations to maintain and calibrate the sensing and recording equipment, make discharge measurements, and download the data directly from the EDLs, as a backup to the satellite-telemetered data. The discharge measurements were used to determine shifts from the stage-discharge relations (rating curves) that were then used to convert stage values to corresponding values of discharge.

For each of the State delegations and the Compact chairman, copies of the WY 2018 published data (manuscript; discharge daily values; statistics tables; and discharge hydrograph) from the NWIS web page are attached for each station. These water-year summaries (PDF files) are available online within the NWIS site page for each of the streamgages, along with data for other streamgages for the Nation. Also attached are plots of the annual mean discharges for the periods of record, and plots of the daily discharges for WY 2018 compared to those for the median daily statistic for each day of the year.

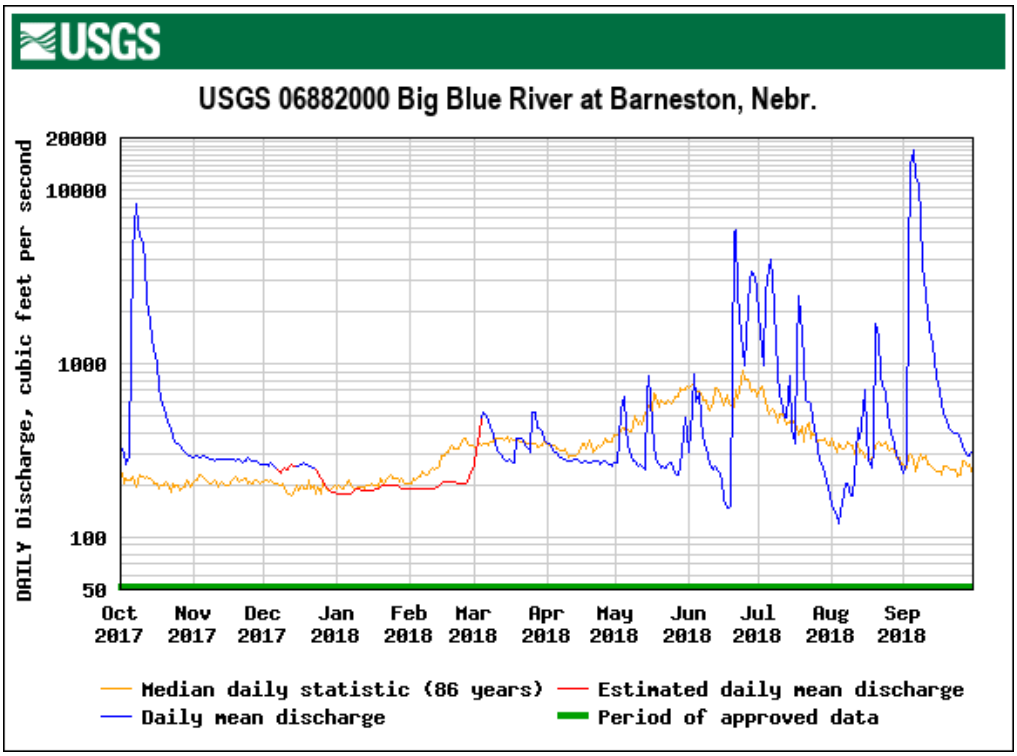
Current (real-time) and historical data on surface water, groundwater, and water quality for the Nation can be accessed and downloaded via the Water Resources of the United States website (https://www2.usgs.gov/water/) or from the Nebraska Water Science Center website (https://www.usgs.gov/centers/ne-water). All unit values of discharge data and all daily values of discharge can be accessed using the NWIS web, as well as all unit values and daily values of gage height since October 2007.

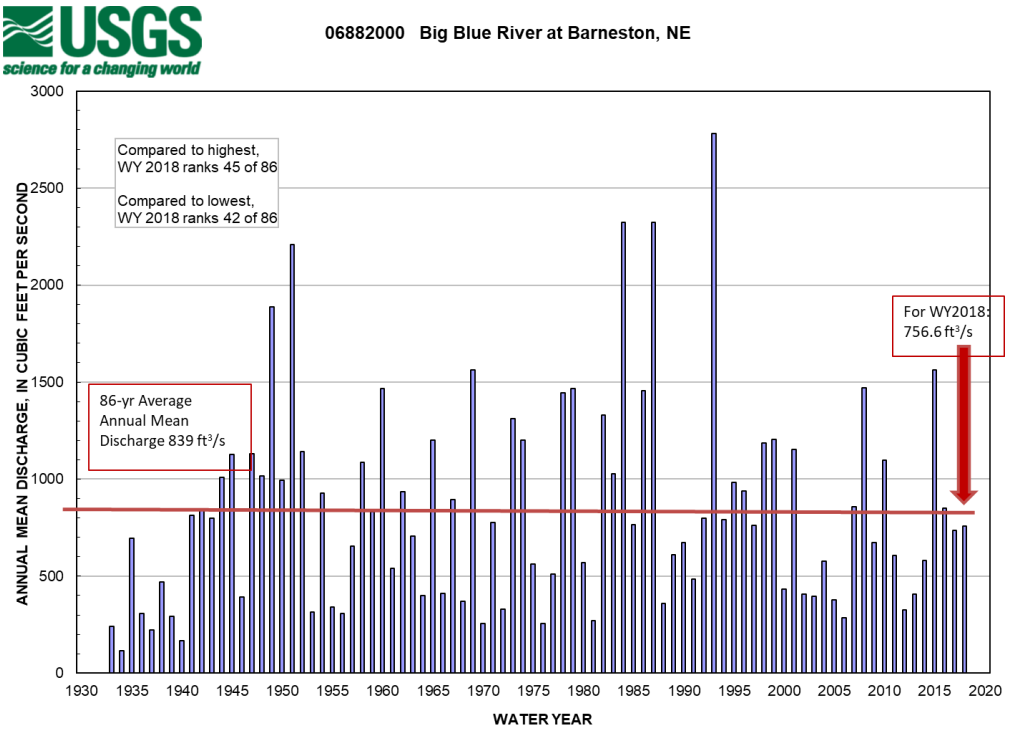
Jason Lambrecht
Assistant Director, Hydrologic Data Section Chief

U.S. Geological Survey, Nebraska Water Science Center
5231 S. 19th St., Lincoln, NE 68512-1271
(jmlambre@usgs.gov)
402-328-4124 (office), 402-416-2363 (mobile)

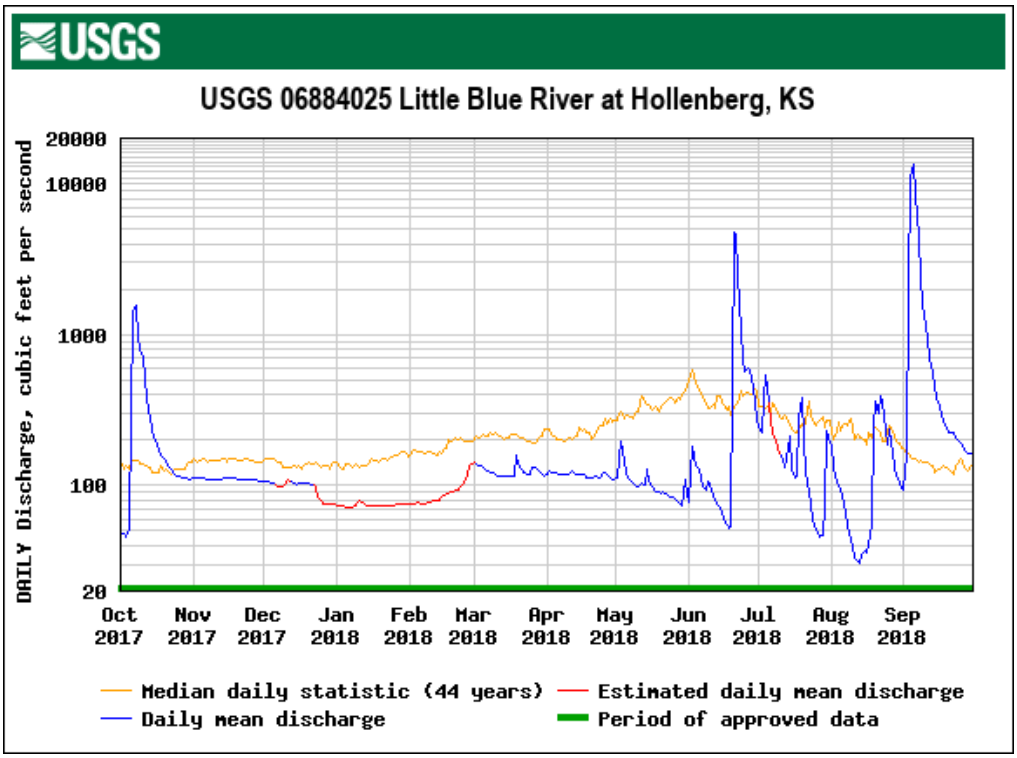
May 13, 2019

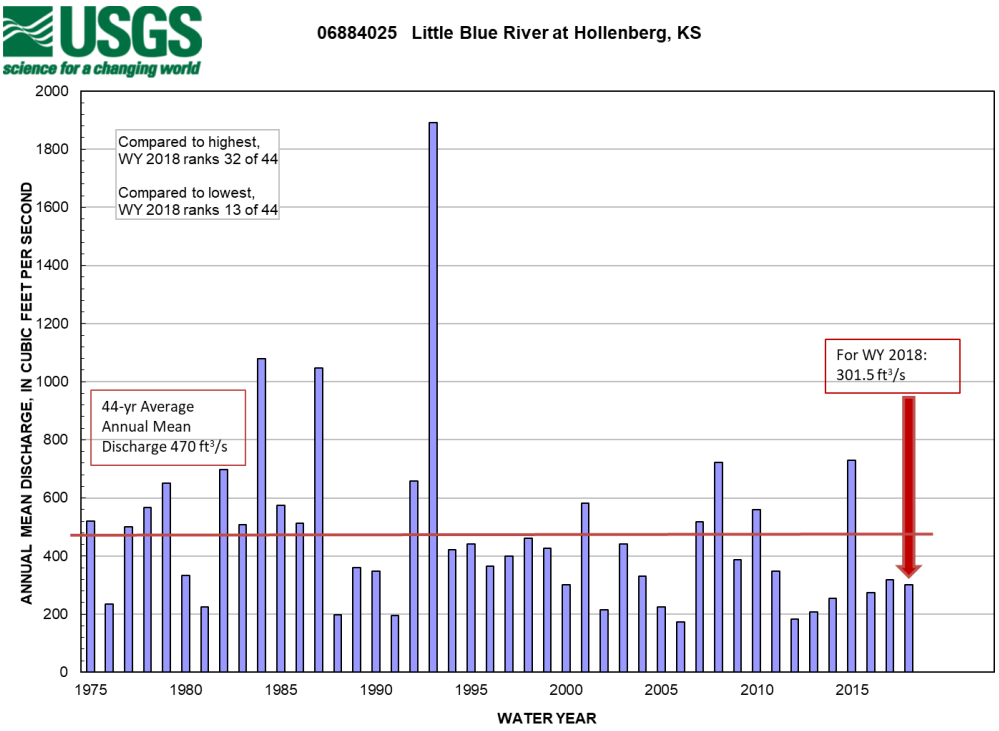
For station **06882000 Big Blue River at Barneston**, 17 discharge (and stage) measurements, ranging from 137 ft^3/s (3.50 ft stage) to 16,400 ft^3/s (21.28 ft stage), and 4 inspections were made during WY 2018. The annual mean discharge of 756 ft^3/s was 1.0 times more than that of the WY 2017 mean of 736 ft^3/s (about the same); and 1.1 times lower than the new historical mean of 839 ft^3/s for WYs 1933–2018 (86 years of record). The maximum and minimum daily discharges were 17,000 ft^3/s on September 5, 2018; and 121 ft^3/s on August 4, 2018.





For station **06884025 Little Blue River at Hollenberg**, 17 discharge (and stage) measurements, ranging from 29.6 ft^3/s (1.53 ft stage) to 10,700 ft^3/s (11.80 ft stage), and one inspection were made during WY 2018. The annual mean discharge of 301.5 ft^3/s was 1.1 times less than that of the WY 2017 mean of 319 ft^3/s; and 1.6 times less than the new historical mean of 470 ft^3/s for WYs 1975–2018 (44 years of record). The maximum and minimum daily discharges were 13,400 ft^3/s on September 5, 2018; and 30.7 ft^3/s on August 13, 2018.





USGS Water-Year Summary 2018

06882000 Big Blue River at Barneston, Nebr.

LOCATION - Lat 40°02'41", long 96°35'14" referenced to North American Datum of 1983, in NE 1/4 NW 1/4 sec.24, T.1 N., R.7 E., Gage County, NE, Hydrologic Unit 10270202, on right bank just downstream of bridge on State Highway 8, 0.6 mi southwest of Barneston, 1.3 mi upstream from Plum Creek, and 4.3 mi upstream from Nebraska-Kansas State line.

DRAINAGE AREA - 4,447 mi² of which 77 mi² probably is noncontributing.

REVISIONS HISTORY - WSP 896: 1932, 1935. WSP 1919: Drainage area.

SURFACE-WATER RECORDS

PERIOD OF RECORD - May 1932 to current year.

GAGE - Water-stage recorder with satellite telemetry. Datum of gage is 1,162.20 ft above sea level. Prior to June 9, 1941, water-stage recorder at site 0.3 mi downstream at datum 1.56 ft higher. June 9 to Nov. 17, 1941, non-recording gage, and Nov. 18, 1941 to Sept. 30, 1979, water-stage recorder at site 0.7 mi upstream at datum 2.0 ft higher.

REMARKS - Accuracy of records for water years prior to 2014 are noted in the individual Annual Data Reports for those water years. For water years 2014 onward, records fair to good except for estimated daily discharges, which are poor, unless otherwise noted.

EXTREMES FOR PERIOD OF RECORD - Maximum peak flow, 57,700 ft³/s, June 9, 1941, gage height, 34.30 ft, at site datum then in use.

U.S. Department of the Interior
U.S. Geological Survey

Suggested citation: U.S. Geological Survey, 2019, National Water Information System data available on the World Wide Web (USGS Water Data for the Nation), accessed [May 13, 2019], https://nwis.waterdata.usgs.gov/nwis/wys_rpt?dv_ts_ids=&93783&adr_begin_date=2017-10-01&adr_end_date=2018-09-30&site_no=06882000&agency_cd=USGS

Water-Data Report 2018
06882000 Big Blue River at Barneston, Nebr. -- Continued

DISCHARGE, CUBIC FEET PER SECOND
YEAR 2017-10-01 to 2018-09-30
DAILY MEAN VALUES
[e, Value has been estimated.]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	2017	2017	2017	2018	2018	2018	2018	2018	2018	2018	2018	2018
1	325	288	262	e179	e190	e265	345	266	312	1,910	151	234
2	298	292	260	e178	e190	e313	344	363	554	1,190	145	269
3	263	291	257	e177	e190	e395	333	542	863	988	135	3,470
4	287	291	270	e177	e190	480	312	648	604	2,550	121	13,800
5	1,300	293	258	e177	e189	519	305	424	675	3,540	141	17,000
6	4,340	288	253	e178	e188	505	293	338	486	4,000	176	12,100
7	8,340	285	247	e179	e188	471	285	297	377	3,100	204	10,700
8	6,230	284	e235	e183	e188	428	280	278	321	1,390	204	6,950
9	5,480	279	e246	e188	e188	390	280	274	293	873	172	3,690
10	4,900	278	e248	e191	e188	350	276	259	262	658	175	2,540
11	3,720	283	e245	e191	e190	317	278	264	245	550	219	1,950
12	2,360	282	e254	e187	e192	300	278	254	258	484	427	1,570
13	1,740	280	e262	e187	e195	291	283	244	247	494	374	1,280
14	1,370	281	257	e187	e199	283	280	662	232	853	441	1,050
15	1,210	283	258	e186	e205	276	275	845	207	415	714	843
16	991	281	258	e186	e209	279	270	457	166	350	388	695
17	747	282	263	e187	e210	274	274	337	147	1,210	284	591
18	625	283	268	e189	e210	270	274	284	148	2,450	251	518
19	551	277	263	e190	e210	369	269	264	152	1,480	322	462
20	499	279	256	e195	e209	369	266	248	5,640	1,030	1,690	427
21	460	276	257	e200	e208	372	274	256	5,970	622	1,400	419
22	415	270	252	e201	e206	356	278	252	2,520	608	843	395
23	383	278	245	e201	e206	338	272	260	1,440	594	744	395
24	354	289	e235	e201	e206	323	264	268	1,190	473	669	397
25	347	280	e217	e201	e206	309	275	250	985	378	522	359
26	336	272	e207	e201	e210	526	275	236	2,140	325	432	328
27	314	273	e197	e198	e225	524	269	230	2,940	273	372	314
28	307	273	e190	e193	e243	425	264	248	3,360	253	337	297
29	302	264	e185	e192		425	259	318	3,070	229	296	297
30	296	263	e182	e192		407	266	485	2,670	207	266	310
31	286		e180	e192		365		400		175	245	
Total	49,380	8,418	7,467	5,864	5,628	11,510	8,496	10,750	38,470	33,650	12,860	83,650
Mean	1,593	281	241	189	201	371	283	347	1,282	1,086	415	2,788
Max	8340	293	270	201	243	526	345	845	5970	4000	1690	17000
Min	263	263	180	177	188	265	259	230	147	175	121	234
Ac-ft	97,940	16,700	14,810	11,630	11,160	22,840	16,850	21,320	76,310	66,750	25,510	165,900

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1933 - 2018, BY WATER YEAR (WY)

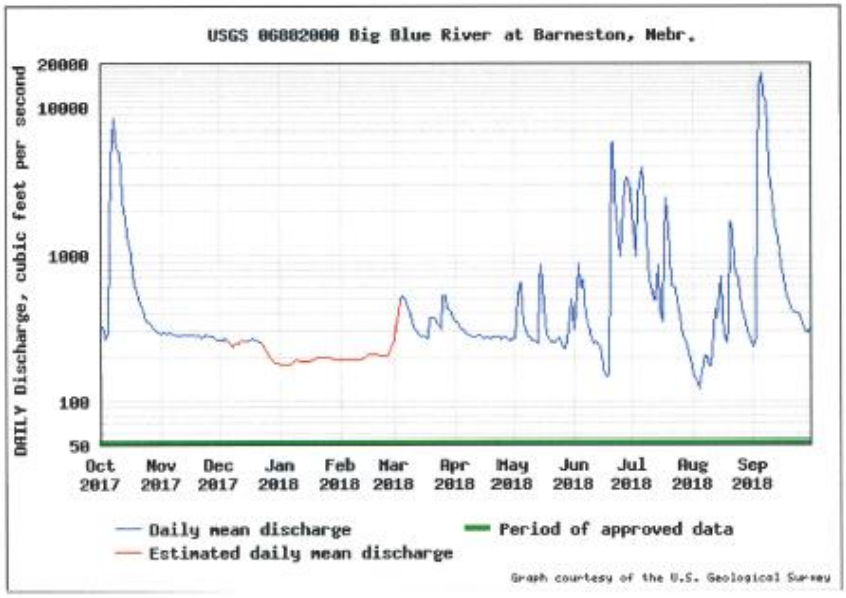
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	559	306	253	293	590	1,213	811	1,379	2,060	1,229	673	695
Max	7,451	1,526	1,579	1,596	2,876	10,560	5,280	5,207	10,460	12,270	5,227	3,420
(WY)	(1974)	(1999)	(2016)	(1973)	(1984)	(1979)	(1984)	(1995)	(1951)	(1993)	(1954)	(1989)
Min	61.5	77.5	87.4	67.6	116	137	132	96.0	69.3	30.7	21.1	50.6
(WY)	(1941)	(1937)	(1977)	(1937)	(1940)	(1968)	(1934)	(1934)	(1934)	(1934)	(1934)	(1939)

Water-Data Report 2018
06882000 Big Blue River at Barneston, Nebr. -- Continued

SUMMARY STATISTICS

	Water Year 2018		Water Years 1933 - 2018	
Annual total	276,200			
Annual mean	756.6		838.7	
Highest annual mean			2,781	1993
Lowest annual mean			115.0	1934
Highest daily mean	17,000	Sep 05	50,000	Jun 09, 1941
Lowest daily mean	121.0	Aug 04	1.00	Nov 30, 1945
Annual 7-day minimum	149.1	Jul 31	15.1	Aug 03, 1934
Maximum peak flow			57,700	Jun 09, 1941
Maximum peak stage			34.30[a]	Jun 09, 1941
Annual runoff (cfsm)	0.170		0.189	
Annual runoff (inches)	2.31		2.56	
10 percent exceeds	1,394		1,700	
50 percent exceeds	282.0		280.0	
90 percent exceeds	188.6		108.0	

[a] Gage height at different site and(or) datum



USGS Water-Year Summary 2018

06884025 Little Blue River at Hollenberg, KS

LOCATION - Lat 39°58'49", long 97°00'17" referenced to North American Datum of 1983, in NE 1/4 SW 1/4 sec.8, T.1 S., R.4 E., Washington County, KS, Hydrologic Unit 10270207, on right bank just downstream from bridge on county road, 0.6 mi west of Hollenberg, 1.8 mi downstream from Nebraska-Kansas State line, and at mile 43.1.

DRAINAGE AREA - 2,752 mi².

SURFACE-WATER RECORDS

PERIOD OF RECORD - March 1973 to February 1974 (discharge measurements only), March 1974 to current year.

GAGE - Water-stage recorder with satellite telemetry. Datum of gage is 1,216.10 ft above sea level.

REMARKS - Accuracy of records for water years prior to 2014 are noted in the individual Annual Data Reports for those water years. For water years 2014 onward, records good except for estimated daily discharges, which are poor, unless otherwise noted. Discharge measurements made prior to 1974 water year are published in table of miscellaneous sites in WDR NE-73.

EXTREMES OUTSIDE PERIOD OF RECORD - A gage height of 23.07 ft, present datum, from floodmark, discharge not determined, occurred October 12, 1973.

EXTREMES FOR PERIOD OF RECORD -

Maximum peak flow, 59,200 ft³/s, May 7, 2015, gage height, 22.97 ft, site and datum then in use.

U.S. Department of the Interior
U.S. Geological Survey

Suggested citation: U.S. Geological Survey, 2019, National Water Information System data available on the World Wide Web (USGS Water Data for the Nation), accessed [May 13, 2019], https://nwis.waterdata.usgs.gov/nwis/wys_rpt?dv_ts_ids=&93795&adr_begin_date=2017-10-01&adr_end_date=2018-09-30&site_no=06884025&agency_cd=USGS

Water-Data Report 2018
06884025 Little Blue River at Hollenberg, KS -- Continued

DISCHARGE, CUBIC FEET PER SECOND
YEAR 2017-10-01 to 2018-09-30
DAILY MEAN VALUES
[e, Value has been estimated.]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	2017	2017	2017	2018	2018	2018	2018	2018	2018	2018	2018	2018
1	47.8	112	107	e74.1	e74.5	141	118	111	78.1	246	183	93.5
2	48.0	112	106	e73.8	e74.7	138	125	151	183	226	132	161
3	45.7	112	107	e73.4	e74.9	137	123	194	155	376	105	2,020
4	51.3	113	105	e72.8	e75.5	134	123	145	136	533	97.3	10,900
5	293	112	103	e72.2	e76.5	131	121	121	127	348	94.9	13,400
6	1,410	110	101	e71.9	e76.3	124	117	112	110	e262	75.2	8,520
7	1,550	108	e99.3	e71.8	e75.9	124	117	107	99.2	e223	65.5	4,410
8	944	109	e98.6	e72.0	e75.9	123	119	104	93.2	e194	53.4	2,370
9	811	108	e98.7	e73.0	e77.1	121	119	102	107	e177	44.7	1,580
10	697	108	e101	e76.7	e78.2	118	120	99.4	102	162	38.5	1,180
11	519	109	e108	e79.7	e78.5	115	123	101	86.2	148	33.5	919
12	367	110	106	e77.5	e78.9	115	124	104	79.7	131	31.4	702
13	279	109	107	e74.9	e79.6	115	120	101	74.9	151	30.7	551
14	235	112	103	e74.1	e80.5	114	117	128	71.3	212	35.1	447
15	208	111	102	e73.7	e83.2	114	119	107	66.0	130	36.3	380
16	188	111	103	e73.1	e86.4	114	120	98.6	59.8	112	35.9	330
17	172	112	103	e72.8	e88.4	115	118	93.5	55.3	115	39.5	293
18	159	111	105	e73.2	e89.5	116	113	90.6	52.0	280	55.7	263
19	149	111	104	e73.9	e91.2	157	112	91.0	52.9	379	244	239
20	142	110	103	e73.9	e91.4	140	112	88.9	4,780	202	362	223
21	135	108	101	e73.4	e92.1	128	113	90.6	4,470	121	301	226
22	128	108	102	e72.7	e94.4	123	114	88.7	2,510	89.9	391	225
23	122	109	e96.9	e72.5	e98.1	121	112	86.1	1,060	74.4	348	208
24	117	108	e82.9	e73.0	e102	118	111	83.5	678	59.8	238	201
25	116	108	e78.5	e73.4	e108	118	121	83.0	576	50.3	186	190
26	114	108	e76.1	e73.9	e120	133	122	81.8	596	48.3	235	179
27	111	110	e75.1	e74.9	e134	132	119	78.2	568	45.3	165	171
28	111	109	e74.9	e75.7	e139	130	113	75.1	524	46.9	133	163
29	112	106	e75.0	e75.3		124	109	74.3	363	72.2	116	162
30	110	107	e74.9	e74.7		120	108	109	270	231	105	165
31	111		e74.4	e74.6		116		85.0		193	96.7	
Total	9,603	3,291	2,982	2,293	2,495	3,869	3,522	3,185	18,180	5,639	4,108	50,870
Mean	310	110	96.2	74.0	89.1	125	117	103	606	182	133	1,696
Max	1550	113	108	79.7	139	157	125	194	4780	533	391	13400
Min	45.7	106	74.4	71.8	74.5	114	108	74.3	52.0	45.3	30.7	93.5
Ac-ft	19,050	6,528	5,915	4,547	4,948	7,674	6,986	6,318	36,070	11,190	8,149	100,900

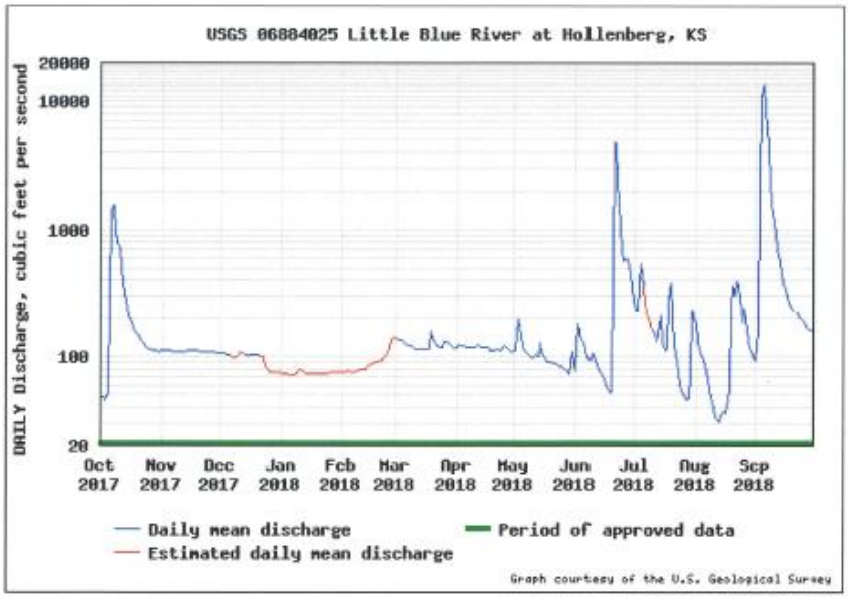
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 2018, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	316	211	167	176	285	606	453	832	969	781	462	369
Max	2,163	1,113	424	577	1,059	3,816	2,379	2,638	4,654	9,014	2,572	1,696
(WY)	(1987)	(1997)	(1993)	(1984)	(1993)	(1993)	(1987)	(2015)	(2015)	(1993)	(1985)	(2018)
Min	45.3	81.1	87.2	74.0	89.1	118	117	103	151	68.1	51.5	32.0
(WY)	(1992)	(1992)	(2013)	(2018)	(2018)	(1981)	(2018)	(2018)	(1981)	(2013)	(2012)	(1991)

Water-Data Report 2018
06884025 Little Blue River at Hollenberg, KS -- Continued

SUMMARY STATISTICS

	Water Year 2018		Water Years 1975 - 2018	
Annual total	110,000			
Annual mean	301.5		470.0	
Highest annual mean			1,891	1993
Lowest annual mean			172.9	2006
Highest daily mean	13,400	Sep 05	39,300	Jul 26, 1992
Lowest daily mean	30.7	Aug 13	24.2	Sep 12, 2012
Annual 7-day minimum	34.5	Aug 10	26.0	Sep 06, 2012
Maximum peak flow			59,200	May 07, 2015
Maximum peak stage			22.97	May 07, 2015
Annual runoff (cfsm)	0.110		0.171	
Annual runoff (inches)	1.49		2.32	
10 percent exceeds	348.0		762.8	
50 percent exceeds	111.0		185.0	
90 percent exceeds	72.9		95.5	



Water Year 2018 Discharge Measurements

Site #	Meas. #	Meas. Date & Time	Meas. Used	Meas. Party	Meas. Agency	Gage Height	Discharge	Meas. Rating	Control Condition
06882000	1455	10/12/2017 7:45	Yes	bhi	USGS	2520	7.42	Fair	Clear
06882000	1456	11/28/2017 16:28	Yes	bhi	USGS	263	3.86	Fair	Clear
06882000	1457	1/9/2018 10:21	Yes	bhi/jtc	USGS	188	3.90	Poor	IceCover
06882000	1458	3/8/2018 16:38	Yes	Jtc	USGS	436	4.24	Fair	Clear
06882000	1459	4/20/2018 10:06	Yes	bhi	USGS	260	3.86	Fair	Clear
06882000	1460	5/30/2018 13:05	Yes	Jtc	USGS	555	4.48	Fair	Clear
06882000	1461	6/18/2018 13:31	Yes	bhi	USGS	148	3.50	Fair	Clear
06882000	1462	6/20/2018 14:21	Yes	bhi	USGS	7900	12.82	Fair	Clear
06882000	1463	6/20/2018 15:31	Yes	bhi	USGS	8300	13.18	Fair	Clear
06882000	1464	7/6/2018 8:43	Yes	bhi	USGS	3900	9.11	Fair	Clear
06882000	1465	7/9/2018 11:49	Yes	Jtc	USGS	855	5.06	Fair	Clear
06882000	1466	8/3/2018 11:06	Yes	nds	USGS	137	3.50	Fair	Clear
06882000	1467	9/5/2018 9:08	Yes	bhi/jtc	USGS	16400	21.28	Fair	Clear
06882000	1468	9/5/2018 9:57	Yes	bhi/jtc	USGS	16400	21.27	Fair	Clear
06882000	1469	9/24/2018 11:58	Yes	bhi/jtc	USGS	398	4.19	Fair	Clear
06882000	1470	10/9/2018 10:35	Yes	nds/mja	USGS	8330	14.72	Fair	Clear
06882000	1471	10/22/2018 10:28	Yes	bhi	USGS	586	4.63	Fair	Clear
06884025	571	10/11/2017 14:02	Yes	bhi	USGS	518	2.86	Fair	Clear
06884025	572	11/29/2017 11:46	Yes	nds	USGS	106	1.95	Fair	Clear
06884025	573	1/9/2018 12:11	Yes	bhi/jtc	USGS	72.9	2.38	Poor	IceCover
06884025	574	3/9/2018 9:01	Yes	Jtc	USGS	118	1.92	Fair	Clear
06884025	575	4/20/2018 12:02	Yes	bhi	USGS	116	1.90	Fair	Clear
06884025	576	5/30/2018 11:33	Yes	Jtc	USGS	107	1.97	Fair	Clear

06884025	577	6/14/2018 9:37	Yes	nds	USGS	73.6	1.74	Fair	Clear
06884025	578	6/19/2018 11:10	Yes	bhi	USGS	52.7	1.64	Fair	Clear
06884025	579	6/20/2018 10:12	Yes	bhi	USGS	6180	8.83	Fair	Clear
06884025	580	7/6/2018 11:06	Yes	bhi	USGS	264	2.26	Fair	Clear
06884025	581	7/25/2018 12:06	Yes	bhi	USGS	49.7	1.61	Fair	Clear
06884025	582	8/3/2018 9:32	Yes	nds	USGS	112	1.86	Fair	Clear
06884025	583	8/13/2018 11:23	Yes	bhi/kek	USGS	29.6	1.53	Fair	Clear
06884025	584	8/27/2018 11:31	Yes	bhi	USGS	166	2.00	Fair	Clear
06884025	585	9/4/2018 12:39	Yes	jtc/bhi	USGS	10700	11.80	Fair	Clear
06884025	586	9/14/2018 9:27	Yes	bhi	USGS	461	2.90	Fair	Clear
06884025	587	10/11/2018 11:18	Yes	bhi/jtc	USGS	5650	8.58	Fair	Clear

Attachment J

REPORT OF THE ENGINEERING COMMITTEE
TO THE
KANSAS-NEBRASKA BIG BLUE RIVER COMPACT ADMINISTRATION

May 15, 2019

The engineering committee was not given any special assignments from the Compact Administration and did not meet during the past year. The 2018 data for this report were collected as provided by the United States Geological Survey (USGS) and the Lower Big Blue Natural Resources District (LBBNRD).

Review of Streamflow Data

The Compact sets forth the following streamflow targets at the stateline gaging stations:

	Big Blue River	Little Blue River
May	45 cfs	45 cfs
June	45 cfs	45 cfs
July	80 cfs	75 cfs
August	90 cfs	80 cfs
September	65 cfs	60 cfs

During the May through September time period of the 2018 water year (October 1, 2017 through September 30, 2018) only the Little Blue River Basin fell below Compact target flows. The mean daily streamflow at the Barneston gage on the Big Blue River (Exhibit A) met or exceeded target flows throughout the year. The mean daily streamflow on the Little Blue River at the Hollenberg gage (Exhibit B) was below target flows for a total of 20 days.

Real-time and historical data for these gaging stations can be found at the following websites:
Big Blue River – http://waterdata.usgs.gov/ne/nwis/uv/?site_no=06882000
Little Blue River – http://waterdata.usgs.gov/ne/nwis/uv/?site_no=06884025

Review of Groundwater Data

The Lower Big Blue Natural Resources District provided the groundwater levels (Exhibit C) for the Big Blue Basin near Beatrice.

Review of Wells in the Regulatory Reaches

Exhibit D is a listing of the active irrigation wells within the regulatory reaches. There were no new wells drilled in the Big Blue River regulatory area and no new wells drilled in the Little Blue River regulatory area during this reporting period.

Respectively Submitted,

Jeremy F. Gehle, Chair
Nebraska

Chris Beightel, P.E.
Kansas

Water-Data Report 2018

06882000 Big Blue River at Barneston, Nebr.

SUMMARY STATISTICS

	Water Year 2018		Water Years 1933 - 2018	
Annual total	276,200			
Annual mean	756.6		838.7	
Highest annual mean			2,781	1993
Lowest annual mean			115.0	1934
Highest daily mean	17,000	Sep 05	50,000	Jun 09, 1941
Lowest daily mean	121.0	Aug 04	1.00	Nov 30, 1945
Annual 7-day minimum	149.1	Jul 31	15.1	Aug 03, 1934
Maximum peak flow			57,700	Jun 09, 1941
Maximum peak stage			34.30[a]	Jun 09, 1941
Annual runoff (cfsm)	0.170		0.189	
Annual runoff (inches)	2.31		2.56	
10 percent exceeds	1,394		1,700	
50 percent exceeds	282.0		280.0	
90 percent exceeds	188.6		108.0	

[a] Gage height at different site and(or) datum

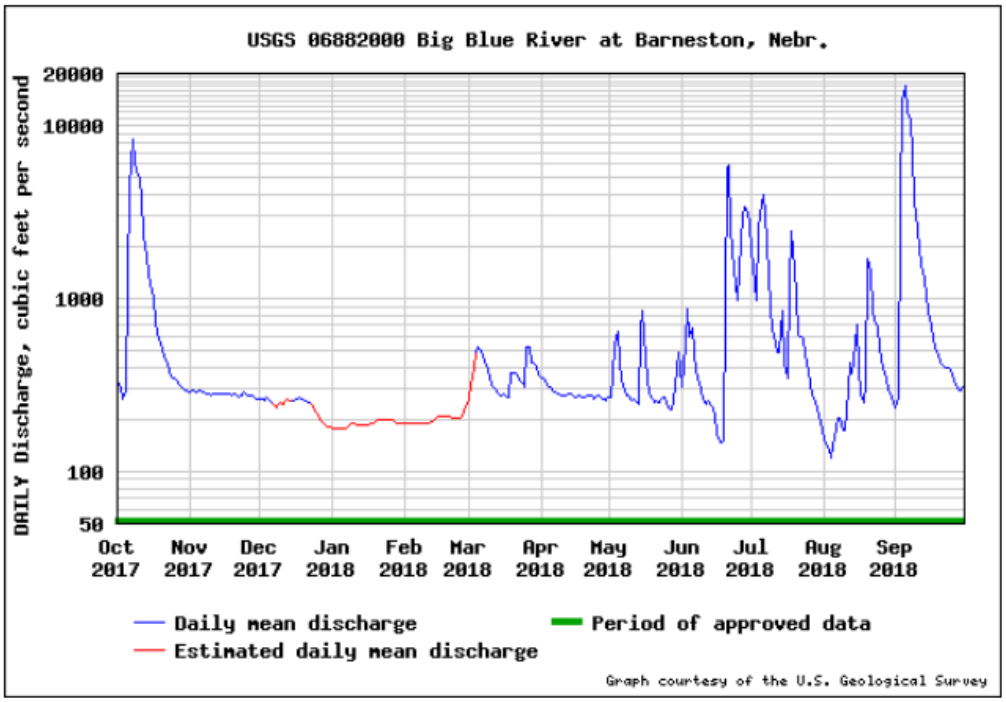


Exhibit A

Water-Data Report 2018

06884025 Little Blue River at Hollenberg, KS

SUMMARY STATISTICS

	Water Year 2018		Water Years 1975 - 2018	
Annual total	110,000			
Annual mean	301.5		470.0	
Highest annual mean			1,891	1993
Lowest annual mean			172.9	2006
Highest daily mean	13,400	Sep 05	39,300	Jul 26, 1992
Lowest daily mean	30.7	Aug 13	24.2	Sep 12, 2012
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Maximum peak flow			59,200	May 07, 2015
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Annual runoff (cfsm)	0.110		0.171	
Annual runoff (inches)	1.49		2.32	
10 percent exceeds	348.0		762.8	
50 percent exceeds	111.0		185.0	
90 percent exceeds	72.9		95.5	

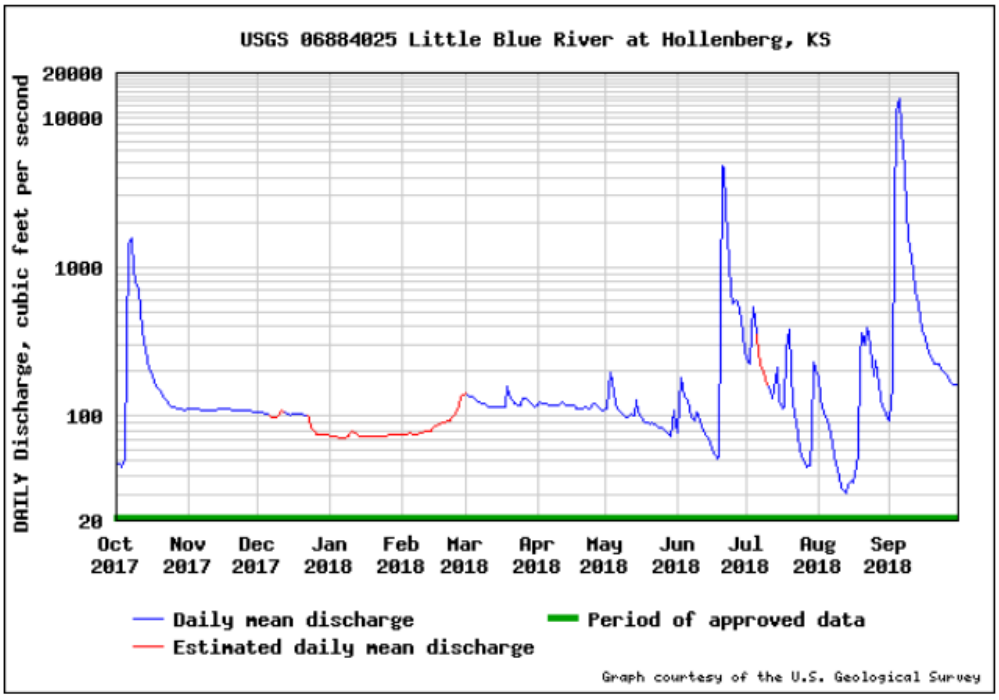


Exhibit B

BIG BLUE RIVER COMPACT STATIC WATER LEVELS 2018

LEGAL	SECT	SITE	TYPE	Spring 2018	Fall 2018
4N-5E	2	AAAA	OW	94.31	94.27
4N-5E	2	DDAA	IW	18.87	18.72
4N-5E	4	BBBC	IW	21.21	21.14
4N-5E	9	CBCC	IW	74.03	74.76
4N-5E	10	DDAA	IW	28.57	27.05
4N-5E	11	DACA	IW	17.11	15.90
4N-5E	14	ABBB	IW	14.33	11.64
4N-5E	25	AACD	IW	19.88	19.32
5N-4E	12	ABBA	IW	18.95	18.88
5N-4E	13	BADD	IW	16.56	14.84
5N-4E	23	BABB	IW	17.77	16.61
5N-4E	24	AACD	IW	18.76	16.71
5N-5E	7	CADD	IW	61.75	62.77
5N-5E	20	BCCD	IW	19.85	19.05
5N-5E	21	DDBB	IW	55.02	58.33
5N-5E	29	CBBB	IW	15.05	14.95
5N-5E	33	AADD	IW	19.36	19.11

OW - OBSERVATION WELLS IW - IRRIGATION WELLS

Exhibit C

Big Blue River Regulatory Area Wells					
Registration Number	Location T-R-S	Completion Date	Depth (FT)	Registration Pumping Capacity (GPM)	Filing Date
G-036485	4N-5E-11BC	3/28/1972	82	750	4/24/1972
G-038314	4N-5E-2DD	1/16/1973	188	1,300	1/29/1973
G-047820	4N-5E-12BB	11/1/1975	117	1,200	12/4/1975
G-050086	5N-5E-33AD	5/26/1976	123	800	6/9/1976
G-054047	4N-5E-24BB	3/1/1976	84	800	1/6/1977
G-054260	4N-5E-14AA	6/1/1974	70	800	1/14/1977
G-054261	4N-5E-14AB	5/2/1970	70	800	1/14/1977
G-056152	4N-5E-4BB	4/14/1977	91	1,000	5/11/1977
G-059128	5N-5E-29AA	4/25/1977	60	400	1/4/1978
G-059727	5N-5E-33CB	4/19/1978	91	1,200	4/20/1978
G-081769	4N-5E-13CD	4/22/1994	65	250	6/24/1994
G-100788	5N-5E-29AB	3/19/1999	65	500	6/2/1999
G-110669	4N-5E-13CC	7/12/1995	64	375	6/29/2001
G-110847	4N-5E-3DA	5/4/1979	82	800	7/2/2001
G-110849	5N-5E-29DD	4/30/1983	102	800	7/2/2001
G-151969	5N-5E-33BB	12/11/2008	112	800	1/20/2009
G-155061	4N-5E-10BB	12/4/2009	98	800	1/27/2010
G-166637	5N-5E-33BC	41353	120	1,200	3/28/2013

Little Blue River Regulatory Area Wells					
Registration Number	Location T-R-S	Completion Date	Depth (FT)	Registration Pumping Capacity (GPM)	Filing Date
G-058158	2N-2E-16AD	8/15/1977	29	650	9/6/1977

Exhibit D

Attachment K

NEBRASKA
DEPT. OF ENVIRONMENTAL QUALITY

Nebraska 303d listings, TMDL development, and 319 Activities
Blue River Basin - May 15, 2019

Assessment categories for waterbodies in the 2018 Integrated Report:

Category 1 – Waterbodies where all designated uses are met.

Category 2 – Waterbodies where some of the designated uses are met but there is insufficient information to determine if all uses are being met.

Category 3 – Waterbodies where there is insufficient data to determine if any beneficial uses are being met.

Category 4 – Waterbody is impaired, but a TMDL is not needed. Sub-categories 4A-C and R outline the rationale for the waters not needing a TMDL:

> ***Category 4a*** – Waterbody assessment indicates the waterbody is impaired, but all of the required TMDLs have been completed.
>
> ***Category 4b*** – Waterbody is impaired, but "other pollution control requirements" are expected to address the water quality impairment(s) within a reasonable period of time. Other pollution control requirements include, but are not limited to, National Pollutant Discharge Elimination System (NPDES) permits and best management practices.
>
> ***Category 4c*** – Waterbody is impaired but the impairment is not caused by a pollutant. This category also includes waters where natural causes/sources have been determined to be the cause of the impairment. In general, natural causes/sources shall refer to those pollutants that originate from landscape geology and climactic conditions. It should be noted, this definition is not inclusive.
>
> ***Category 4r*** – Waterbody data exceeds the impairment threshold however a TMDL is not appropriate at this time. The category will only be used for nutrient assessments in new or renovated lakes and reservoirs. Newly filled reservoirs usually go through a period of trophic instability – a trophic upsurge followed by the trophic decline (Holdren, et. al. 2001). Erroneous water quality assessments are likely to occur during this period. To account for this, all new or renovated reservoirs will be placed in this category for a period not to exceed eight years following the fill or re-fill process. After the eighth year monitoring data will be assessed and the waterbody will be appropriately placed into category 1, 2, or 5.

Category 5 – Waterbodies where one or more beneficial uses are determined to be impaired by one or more pollutants and all of the TMDLs have not been developed. Category 5 waters constitute the Section 303(d) list subject to EPA approval/disapproval.

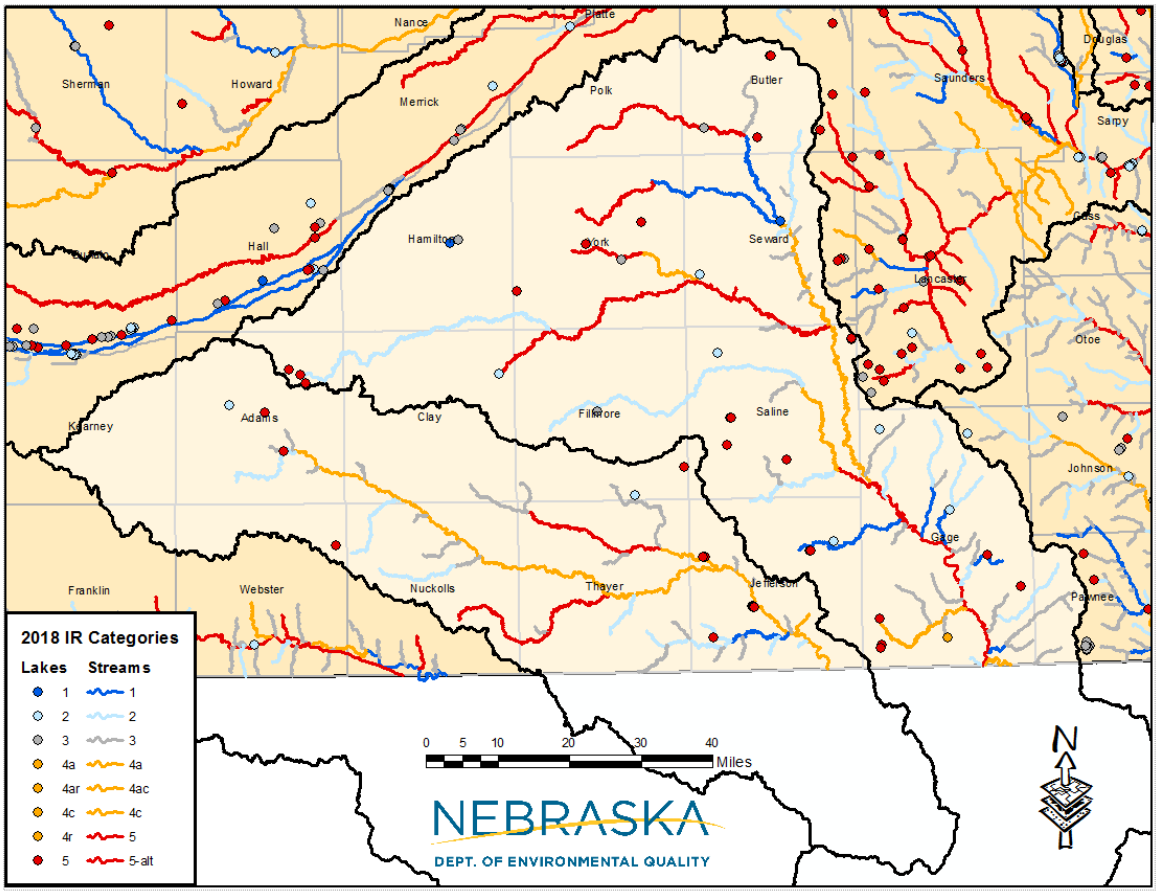
> ***Category 5alt*** – Waterbody is impaired, but "other pollution control alternatives besides a TMDL" are expected to address the water quality impairment(s) within a reasonable period of time. Other pollution control alternatives include, but are not limited to, watershed management plans and best management practices.

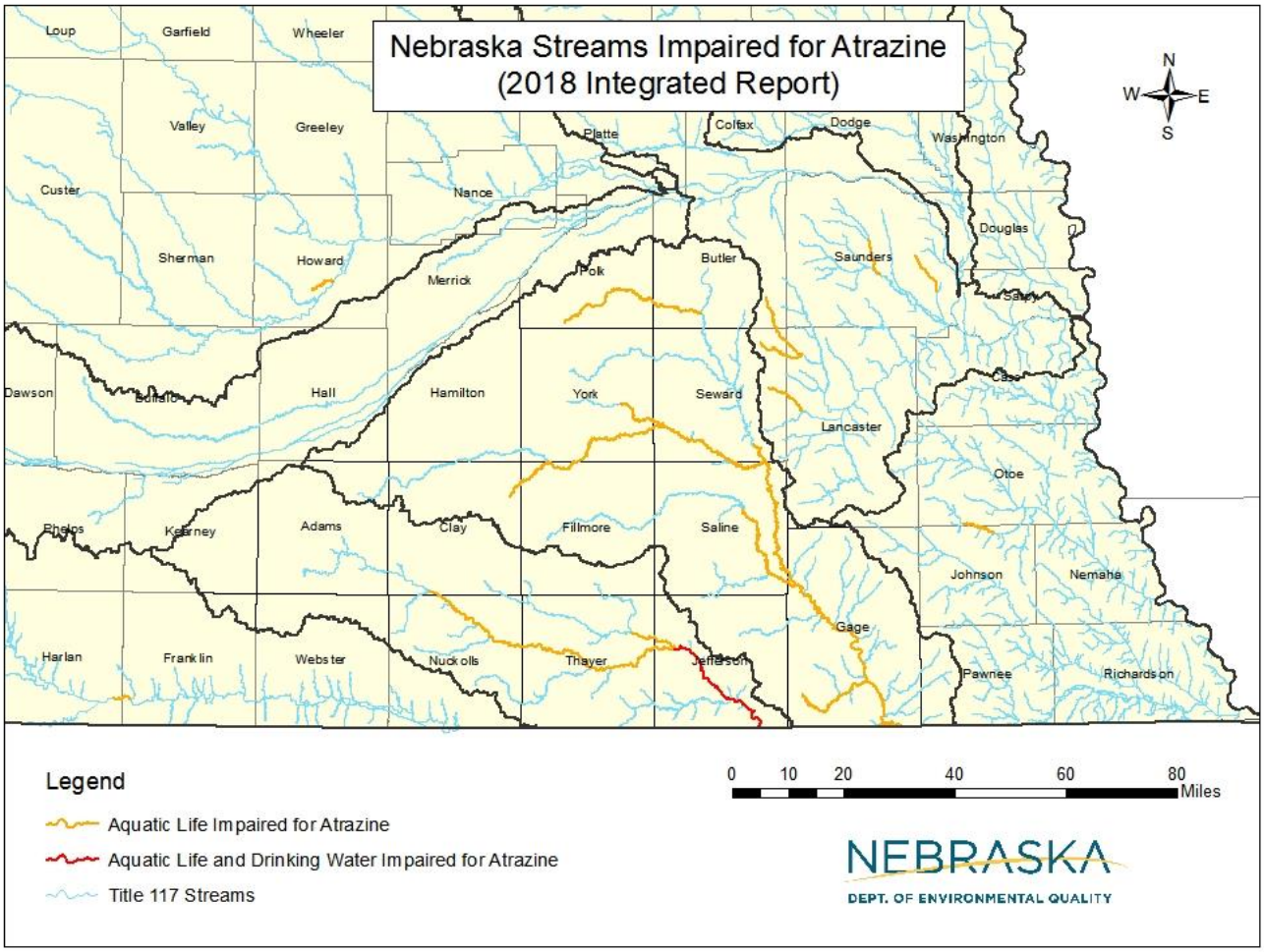
303d Listing: 2018 Integrated Report Assessment Statuses and changes from the 2018 IR.

Basin	Category								Basin Total
	1	2	3	4A	4B	4C	4R	5	
Big Blue Streams	7	15	24	8	0	0	NA	9	63
Big Blue Lakes	2	6	4	0	0	0	1	18	31
Little Blue Streams	1	9	19	6	0	0	NA	3	38
Little Blue Lakes	0	2	0	0	0	0	0	10	*12

*Big Blue River (BB1-10000), Big Sandy Creek (LB2-10100), and Little Blue River (LB2-20000) moved from category 5 to 4a. Lincoln Creek (BB4-20800) was moved from category 5 to 1 and Cub Creek (BB1-11900) was moved from category 2 to 1. No additional category 3 waters were monitored between listing cycles.

Blue River Basin Integrated Report Assessment Status, 2018




Nebraska Streams Impaired for Atrazine
(2018 Integrated Report)
N
W
E
S
Loup
Garfield
Wheeler
Valley
Greeley
Platte
Colfax
Dodge
Washington
Custer
Nance
Douglas
Sherman
Howard
Merrick
Polk
Butler
Saunders
Sarpy
Dawson
Buffalo
Hall
Hamilton
York
Seward
Lancaster
Otoe
Phelps
Kearney
Adams
Clay
Fillmore
Saline
Johnson
Nemaha
Gage
Harlan
Franklin
Webster
Nuckolls
Thayer
Jefferson
Pawnee
Richardson
Legend
Aquatic Life Impaired for Atrazine
Aquatic Life and Drinking Water Impaired for Atrazine
Title 117 Streams
0 10 20 40 60 80
Miles
NEBRASKA
DEPT. OF ENVIRONMENTAL QUALITY

TMDL Development: Blue River Basin Waterbodies with Established/Approved TMDLs

Basin	ID	Waterbody Name	Imapired Use	Impairment	WMP	Notes
BB	BB1-10000	Big Blue River	Primary Contact Recreation	E coli	Lower Big Blue River Basin	revised TMDL
			Aquatic Life	Atrazine	Lower Big Blue River Basin	
	BB1-10100	Mission Creek	Aquatic Life	Atrazine	Lower Big Blue River Basin	
			Primary Contact Recreation	E coli	Lower Big Blue River Basin	
	BB1-10800	Big Indian Creek	Aquatic Life	Atrazine	Lower Big Blue River Basin	
			Primary Contact Recreation	E coli	Lower Big Blue River Basin	
	BB1-10900	Big Indian Creek	Aquatic Life	Atrazine	Lower Big Blue River Basin	
	BB1-20000	Big Blue River	Primary Contact Recreation	E coli	Lower Big Blue River Basin	revised TMDL
			Aquatic Life	Atrazine	Lower Big Blue River Basin	
	BB1-L0030	Big Indian Lake	Aesthetics, Aquatic Life	T.Phosphorus	Big Indian Reservoir	
			Aesthetics, Aquatic Life	Sediment	Big Indian Reservoir	
	BB2-10000	Turkey Creek	Aquatic Life	Atrazine	Lower Big Blue River Basin	
			Primary Contact Recreation	E coli	Lower Big Blue River Basin	
	BB2-20000	Turkey Creek	Primary Contact Recreation	E coli	Lower Big Blue River Basin	
			Aquatic Life	Atrazine	Lower Big Blue River Basin	
	BB3-10000	West Fork Big Blue River	Primary Contact Recreation	E coli	None	revised TMDL
			Aquatic Life	Atrazine	None	
	BB3-10300	Beaver Creek	Aquatic Life	Atrazine	None	
	BB3-20000	West Fork Big Blue River	Primary Contact Recreation	E coli	None	
			Aquatic Life	Atrazine	None	
	BB4-10000	Big Blue River	Primary Contact Recreation	E coli	None	
			Aquatic Life	Atrazine	None	
	BB4-20000	Big Blue River	Primary Contact Recreation	E coli	None	
	BB4-20800	Lincoln Creek	Aquatic Life	Atrazine	None	
	BB4-40000	Big Blue River	Aquatic Life	Atrazine	None	
LB	LB1-10000	Little Blue River	Primary Contact Recreation	E coli	Draft Little Blue River Basin	revised TMDL
			Public Drinking Water Supply	Atrazine	Draft Little Blue River Basin	
			Aquatic Life	Atrazine	Draft Little Blue River Basin	
	LB1-10200	Rock Creek	Primary Contact Recreation	E coli	Draft Little Blue River Basin	
	LB2-10000	Little Blue River	Primary Contact Recreation	E coli	Draft Little Blue River Basin	revised
			Aquatic Life	Atrazine	Draft Little Blue River Basin	
	LB2-10100	Big Sandy Creek	Aquatic Life	Atrazine	Draft Little Blue River Basin	
	LB2-10100	Big Sandy creek	Primary Contact Recreation	E coli	Draft Little Blue River Basin	
	LB2-20000	Little Blue River	Aquatic Life	Atrazine	Draft Little Blue River Basin	
			Primary Contact Recreation	E coli	Draft Little Blue River Basin	
	LB2-30000	Little Blue River	Primary Contact Recreation	E coli	Draft Little Blue River Basin	

Clean Water Act Section 319 (Nonpoint Source) Activities in the Blue River Basin:

Little Blue NRD

- LBNRD has a district-wide, accepted 9-element plan in place since 2018. Priority areas where projects are either initiated or are ongoing include:
    - Crystal Lake, Ayr, NE.
        - Serve as a watershed management demonstration site, focusing on NPS.
        - Rehabilitation of Crystal Lake.
    - Big Sandy Watershed
        - Currently an NWQI area. 319 and NRD funds will supplement cost-share provided through EQIP. Focus is on impairments for *e. Coli* and atrazine, with concurrent benefits of reducing soil and nutrient loss.
    - Vadose Zone Assessment (NRD-wide)
        - Follow up with vadose zone assessment after initial study was done approximately 5 years ago. Goal is to track nitrate movement under various land use and conservation practices.

Upper Big Blue NRD

- UBBNRD is finalizing the initial draft of a district-wide 9-element plan. It is unique in the fact that they are concurrently undergoing a Voluntary Integrated Management Plan (VIMP) in conjunction with the Nebraska Department of Natural Resources which deals with water quantity and balance between surface and groundwater users of water. By coordinating both efforts between multiple agencies, the overall goal is to produce two separate plans that have complementary goals and objectives. The 9-element plan was the first to be written in this process due to time constraints of the 319 grant. The VIMP will be drafted within the next year.
- Priority areas in the draft 9-element plan include Recharge Lake near York (impaired for nutrients) and the West Fork of the Big Blue (impaired for atrazine). Special emphasis for Public Outreach will be given to nitrate in groundwater, in particular, working with individual communities on addressing NPS pollution in Wellhead Protection Areas.

Lower Big Blue NRD

- LBBNRD has a 9-element basin plan in place, effective 2013. This plan is slated to be revised in the coming year.
- LBBNRD is partnering with NDEQ, NRCS and the City of Wilber on an NWQI Pilot Project to develop water quality plans for Turkey Creek (impaired for Atrazine and *e. Coli*) and the City of Wilber's Wellhead Protection Area (groundwater, with increasing trends of nitrate, edging close to 10 ppm in recent years).
- LBBNRD initiated a 319 project to rehabilitate Cub Creek 12A reservoir in 2018. Project is scheduled to be completed by March 2020.

NPDES Permits in Big & Little Blue River Basins - 2019 FACILITY	Program/ NPDES #	Municipal, Industrial, Private or SID	NPDES or NPP	CITY	Stream Name	County
Ag Processing, Inc -aka- AGP Corn Processing, Inc.	NE0131679	I	NPP	Hastings	West Fork of the Big Blue River	Adams
Chief Ethanol Fuels Inc	NE0114243	I	NPDES	Hastings	West Fork of the Big Blue River	Adams
Dutton-Lainson Company	NE0000221	I	NPDES/NPP	Hastings	W. Fork of the Big Blue River	Adams
Eaton MDH Company, Inc	NE0132381	I	NPP	Hastings	W. Fork of the Big Blue River	Adams
Equalizer Midwest, Inc -fka- Farmland Ind Hastings	NE0000035	I	NPDES	Hastings	West Ford Big Blue River	Adams
Hastings Aquifer Storage and Restoration Water Storage Facility	NE0139343	I	NPDES	Hastings		Adams
Hastings Irrigation Pipe Co.	NE0130079	I	NPP	Hastings	West Fork Big Blue River	Adams
Hastings Maxon Avenue WWTF	NE0113298	M	NPDES	Hastings	Trib to Big Sandy Creek	Adams
Hastings North Denver Power Station	NE0000141	I	NPDES/NPP	Hastings	Lake Hastings/Heartwell Lake	Adams
Hastings Whelan Energy Center	NE0113506	I	NPDES/NPP	Hastings	Und Trib of Pawnee Creek	Adams
Hastings WWTF - Pollution Control Facility	NE0038946	M	NPDES	Hastings	West Fork Big Blue River	Adams
Juniata WWTF	NE0028100	M	NPDES	Juniata	Thirty-two Mile Creek	Adams
Kenesaw WWTF	NE0021555	M	NPDES	Kenesaw	Und Trib of Plum Creek	Adams
Nebraska Aluminum Castings, Inc.	NE0133337	I	NPP	Hastings	Big Sandy Creek via Hastings WWTF	Adams
Noah's Ark Processors, LLC -fka- Nebraska Prime Group LLC -fka- Premium Protein Products LLC	NE0132919	I	NPP	Hastings	West Fork or Big Blue River	Adams
Thermo King Corporation - Ingersoll Rand	NE0114588	I	NPP	Hastings	W Fork Big Blue River via Hastings WWTF	Adams
Well #3 Subsite Hastings GW Remediation Site (Owned by Dutton-Lainson Company)	**NE0131911**	**I**	**NPDES**	Hastings	Pawnee Creek via Hastings MS4	Adams
Bellwood WWTF	NE0046094	M	NPDES	Bellwood	Und Trib to Clear Creek	Butler
David City WWTF	NE0021199	M	NPDES	David City	North Fork of the Big Blue River	Butler
Dwight WWTF	NE0046175	M	NPDES	Dwight	Plum Creek	Butler
Henningsen Foods, Inc - David City	NE0133108	I	NPP	David City	Und Trib of N Fork Big Blue River	Butler
Rising City WWTF	NE0046299	M	NPDES	Rising City	North Fork of the Big Blue River	Butler

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GREEN background = Major discharger, > 1 MGD flow

FACILITY	Program/ NPDES #	Municipal, Industrial, Private or SID	NPDES or NPP	CITY	Stream Name	County
SID 1, Butler Co, Clear Lake Residential Association WWTF	NE0114901	SID	NPDES	Columbus	Platte River	Butler
Timpte, Inc	NE0138193	I	NPP	David City	North Fork Big Blue River	Butler
Ulysses WWTF	NE0024368	M	NPDES	Ulysses	Big Blue River	Butler
Bioiberica Nebraska, Inc	NE0133710	I	NPP	Barcelona	Turkey Creek via Geneva POTW	Fillmore
Exeter WWTF	NE0040941	M	NPDES	Exeter	Und Trib to Johnson Creek	Fillmore
Fairmont WWTF	NE0042374	M	NPDES	Fairmont	Und Trib of Indian Creek	Fillmore
Flint Hills Resources Fairmont, LLC	NE0137839	I	NPDES	Fairmont	Turkey Creek	Fillmore
Fortigen, LLC	NE0139351	I	NPDES	Geneva	Turkey Creek	Fillmore
Geneva WWTF	NE0031763	M	NPDES	Geneva	Turkey Creek	Fillmore
Grafton WWTF	NE0045217	M	NPDES	Grafton	Wetland (Big Blue)	Fillmore
IPSCO Tubulars	NE0132357	I	NPDES	Geneva	Und Trib to Turkey Creek	Fillmore
Metal-Tech Partners	NE0132829	I	NPP	Geneva	Turkey Creek via Geneva POTW	Fillmore
Milligan WWTF	NE0039853	M	NPDES	Milligan	Und Trib of Turkey Creek	Fillmore
Adams Washout - Jim Young	NE0134139	I	NPDES	Adams	Land Application (Nemaha River Basin)	Gage
Adams WWTF	NE0045055	M	NPDES	Adams	Middle Branch Big Nemaha River	Gage
Agrium U S, Inc - Homestead Terminal	NE0111805	I	NPDES	Beatrice	Big Blue River	Gage
Barneston WWTF	NE0121711	M	NPDES	Wymore	Big Blue River	Gage
Beatrice WWTF	NE0020915	M	NPDES	Beatrice	Big Blue River	Gage
Clatonia WWTF	NE0045101	M	NPDES	Clatonia	Clatonia Creek	Gage
Cortland WWTF	NE0027782	M	NPDES	Cortland	Indian Creek	Gage
Duonix Beatrice, LP - fka- Flint Hills Resources-Beatrice -fka- Beatrice Biodiesel LLC	NE0137774	I	NPP	Beatrice	Big Blue River via Beatrice POTW	Gage
E Energy Adams, LLC	NE0137804	I	NPDES	Adams	Middle Branch Big Nemaha River	Gage
Exmark Manufacturing Company Inc., The Toro Company -fka- Goossen Indus	NE0124605	I	NPP	Beatrice	Big Blue River via Beatrice WWTF	Gage

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FACILITY	Program/ NPDES #	Municipal, Industrial, Private or SID	NPDES or NPP	CITY	Stream Name	County
Koch Fertilizer Beatrice, LLC -fka- Koch Nitrogen Co LLC -fka- Koch Nitrogen Co -fka- Farmland Industries, Inc	NE0000060	I	NPDES	Beatrice	Big Blue River	Gage
Northern Natural Gas Beatrice - Beatrice Compressor Station	NE0000108	I	NPDES	Omaha	Big Blue River	Gage
NPPD Beatrice Station	NE0134236	I	NPDES	Columbus	Big Blue River	Gage
Odell WWTF	NE0040975	M	NPDES	Odell	Big Indian Creek	Gage
Pickrell WWTF	NE0045276	M	NPDES	Pickrell	Indian Creek	Gage
Wymore WWTF	NE0021130	M	NPDES	Wymore	Big Blue River	Gage
Diller WWTF	NE0129500	M	NPDES	Diller	Big Indian Creek	Jefferson
Fairbury WWTF	NE0024384	M	NPDES	Fairbury	Little Blue River	Jefferson
Harbine WWTF	NE0114171	M	NPDES	Harbine	Und Trib of Big Indian Creek	Jefferson
Jansen WWTF	NE0045233	M	NPDES	Jansen	Und Trib of Cub Creek	Jefferson
Loveland Products, Inc -fka- Agrium Advanced Technologies, Inc. & Loveland Products -fka- Tetra Micronutrients	NE0138347	I	NPDES	Fairbury	Brawner Creek	Jefferson
Plymouth WWTF	NE0040894	M	NPDES	Plymouth	Und Trib of Big Blue River	Jefferson
Westin Foods, Westin Packaged Meats -fka- Feaster Foods -fka- Fairbury Foods	NE0114081	I	NPP	Fairbury	Little Blue River	Jefferson
Archer Daniels Midland - Lincoln	NE0035157	I	NPDES/NPP	Lincoln	Salt Creek via Lincoln POTW	Lancaster
Bennet WWTF	NE0040916	M	NPDES	Bennet	Trib to Little Nemaha River	Lancaster
Bison, Inc. -fka- Source One -fka- Industrial Powder Coating	NE0128082	I	NPP	Lincoln	Salt Creek via Lincoln Theresa St POTW	Lancaster
Bosch Security System Inc -fka- Telex Communications Inc	NE0043371	I	NPDES	Lincoln	Steven's Creek	Lancaster
Cardwell Reserve Homeowners Assn WWTF	NE0137596	P	NPDES	Lincoln	Cardwell Branch	Lancaster
Cardwell Woods Homeowners Assn WWTF	NE0133841	P	NPDES	Lincoln	Cardwell Branch of Salt Creek	Lancaster
ConAgra Foods Packaged Foods Lincoln Plant -fka- Lincoln Snacks Co.	NE0001309	I	NPP	Lincoln	Salt Creek via Lincoln POTW	Lancaster
Contitech USA, Inc. -fka- Veyance Technologies Inc -fka- Goodyear Tire & Rubber Co.	NE0000400	I	NPDES	Lincoln	Salt Creek	Lancaster

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FACILITY	Program/ NPDES #	Municipal, Industrial, Private or SID	NPDES or NPP	CITY	Stream Name	County
CrossLinc Custom Coatings, LLC	NE0139262	I	NPP	Lincoln	Salt Creek	Lancaster
Dakota Springs HOA - SWL Development LLC	NE0137821	P	NPDES	Roca	Und Trib of Salt Creek	Lancaster
Davey WWTF	NE0024295	M	NPDES	Davey	Elk Creek	Lancaster
Denton WWTF	NE0046141	M	NPDES	Denton	Haines Branch	Lancaster
Firth WWTF	NE0112241	M	NPDES	Firth	Middle Branch of Big Nemaha River	Lancaster
Foreman Ridge WWTF	NE0137553	P	NPDES	Lincoln	Cardwell Branch	Lancaster
General Dynamics Ordnance & Tactical Systems, Inc - fka- General Dynamics Armament & Technical Products, Inc	NE0060062	I	NPP	Lincoln	Salt Creek via Lincoln POTW	Lancaster
GSK Consumer Health, Inc., fka Novartis Consumer Health, Inc	NE0000701	I	NPP	Lincoln	Und Trib of Salt Creek	Lancaster
Hallam WWTF	NE0028282	M	NPDES	Hallam	Clatonia Creek	Lancaster
Hickman WWTF	NE0046183	M	NPDES	Hickman	Hickman Branch	Lancaster
Hidden Valley Estates	NE0137669	P	NPDES	Lincoln	Und Trib of Stevens Creek	Lancaster
Kawasaki Motors Manufacturing Corp, USA	NE0132811	I	NPP	Lincoln	Theresa St. WWTF	Lancaster
Kiechel Fine Art	NE0139033	I	NPDES	Lincoln	Salt Creek via Lincoln Storm Sewer	Lancaster
Lester Electrical	NE0060127	I	NPP	Lincoln	Salt Creek via Lincoln POTW	Lancaster
Lincoln Cold Storage	NE0139513	i	NPP	Roca		Lancaster
Lincoln Electric System - Rokeby Generating Station	NE0123935	I	NPDES	Lincoln	Trib to Cardwell Branch	Lancaster
Lincoln Electric System - Terry Bundy Generating Station -fka- Salt Valley Generating Station	NE0133191	I	NPP	Lincoln	Salt Creek via Lincoln NE WWTF	Lancaster
Lincoln Industries	NE0114367	I	NPP	Lincoln	Salt Creek via Lincoln Theresa St POTW	Lancaster
Lincoln MS4	NE0133671	I	NPDES	Lincoln	Salt Creek & several tributaries	Lancaster
Lincoln Northeast WWTF	NE0112488	M	NPDES	Lincoln	Salt Creek	Lancaster
Lincoln Theresa Street Water Resource Recovery Facility	NE0036820	M	NPDES	Lincoln	Salt Creek	Lancaster
Malcolm WWTF	NE0024261	M	NPDES	Malcom	Elk Creek	Lancaster

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FACILITY	Program/ NPDES #	Municipal, Industrial, Private or SID	NPDES or NPP	CITY	Stream Name	County
Matheson Tri-Gas, Inc -fka- Linweld Mfg -fka- Lincoln Welding Supply Co	NE0113921	I	NPDES	Waverly	Salt Creek	Lancaster
Midlands Financial Benefits	NE0134309	I	NPDES	Lincoln	Wetlands in the Lower Platte River Basin	Lancaster
Molex, LLC	NE0131776	I	NPP	Lincoln	Salt Creek via Theresa St. WWTF	Lancaster
Nebraska Department of Correctional Services, FKA - Nebraska State Penitentiary	NE0113565	I	NPDES	Lincoln	Und Trib of Beal Slough	Lancaster
NPPD Sheldon Power Station	NE0111490	I	NPDES	Columbus	Big Blue River	Lancaster
Panama WWTF	NE0046256	M	NPDES	Panama	North Fork of Big Nemaha River	Lancaster
Prairieland Dairy, LLC	NE0139467	I	NPDES	Firth		Lancaster
Raymond WWTF	NE0046281	M	NPDES	Raymond	Oak Creek	Lancaster
Ready Mixed Concrete Co - College View Plant	NE0131571	I	NPDES	Lincoln	Beal Slough	Lancaster
Ready Mixed Concrete Co - Havelock Plant	NE0033651	I	NPDES	Lincoln	Salt Creek	Lancaster
Ready Mixed Concrete Co - Y St. Plant	NE0033642	I	NPDES	Lincoln	Antelope Creek	Lancaster
Robert V Denney Federal Building and Courthouse - General Services Administration	NE0138819	I	NPDES	Lincoln	Salt Creek	Lancaster
Schneider Electric USA, Inc. -fka- Square D Co	NE0114383	I	NPP	Lincoln	Salt Creek via City of Lincoln POTW	Lancaster
Smithfield Packaged Meats Corp - Lincoln, Nebraska - fka- Smithfield Farmland Corp Lincoln -fka- Cook's Ham, Inc, a subsidary of Smithfield Foods, Inc	NE0121428	I	NPP	Lincoln	Salt Creek	Lancaster
Source One	NE0138703	I	NPP	Lincoln	Salt Creek via Lincoln Theresa St POTW	Lancaster
Tecumseh Poultry LLC - Waverly, now owned by Tyson, fka MBA Poultry LLC - Waverly	NE0137723	I	NPP	Waverly	Salt Creek	Lancaster
Teledyne ISCO -fka- ISCO, Inc	NE0060011	I	NPP	Lincoln	Salt Creek via Lincoln Theresa St WWTF	Lancaster
The Preserve at Cross Creek WWTF	NE0139076	P	NPDES	Lincoln	Tributary of Hickman Branch	Lancaster
TMCO Inc.	NE0133752	I	NPP	Lincoln	Salt Creek via Lincoln POTW	Lancaster

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FACILITY	Program/ NPDES #	Municipal, Industrial, Private or SID	NPDES or NPP	CITY	Stream Name	County
Vertiv Corporation dba Geist Manufacturing - Liebert Corporation, formally owned by P.C.E., Inc.	NE0138142	I	NPP	Lincoln	Salt Creek via Lincoln POTW	Lancaster
Waverly WWTF	NE0024406	M	NPDES	Waverly	Und Trib to Salt Creek	Lancaster
Yankee Hill Brick Mfg Co, Pacific Clay Products, Inc.	NE0046507	I	NPDES	Lincoln	Haines Branch	Lancaster
Zoetis, LLC -fka- Pfizer, Inc Lincoln	NE0132110	I	NPDES/NPP	Lincoln	Und Trib of Oak Creek	Lancaster
Superior WWTF	NE0023809	M	NPDES	Superior	Republican River	Nuckolls
Osceola WWTF	NE0046230	M	NPDES	Osceola	Davis Creek	Polk
Shickley WWTF	NE0030767	M	NPDES	Shickley	Und Trib of Dry Sandy Creek	Polk
Stromsburg WWTF	NE0024325	M	NPDES	Stromsburg	Big Blue River	Polk
Americold Logistics Inc	NE0134104	I	NPDES	Crete	Big Blue River	Saline
Crete Core Ingredients, LLC - Omaha Industries, Inc - fka- Crete Cold Storage LLC	NE0138746	I	NPP	Omaha	Big Blue river via Crete POTW	Saline
Crete Municipal Power Plant	NE0111384	I	NPDES	Crete	Big Blue River	Saline
Crete WWTF	NE0034304	M	NPDES	Crete	Big Blue River	Saline
DeWitt WWTF	NE0024341	M	NPDES	DeWitt	Big Blue River	Saline
Doane University	NE0128775	I	NPDES	Crete	Und trib of Big Blue River & Miller Pond	Saline
Dorchester WWTF	NE0021539	M	NPDES	Dorchester	Squaw Creek	Saline
Friend WWTF	NE0024007	M	NPDES	Friend	Und Trib of Turkey Creek	Saline
Malco Products SBC, Inc. - DeWitt	NE0139378	I	NPDES	DeWitt	Big Blue River	Saline
Nestle Purina PetCare Co	NE0000116	I	NPDES	Crete	Big Blue River	Saline
Smithfield Fresh Meats Corp -fka- Smithfield Farmland Corp Crete -fka- Farmland Foods, Inc-Crete	NE0032191	I	NPDES	Crete	Big Blue River	Saline
Western WWTF	**NE0042501**	**M**	**NPDES**	Western	Und Trib N. Fork of Swan Cr	Saline
Wilber WWTF	NE0045373	M	NPDES	Wilber	Big Blue River	Saline
Beaver Crossing WWTF	NE0023981	M	NPDES	Beaver Crossing	West Fork Big Blue River	Seward
Bee WWTF	NE0123200	M	NPDES	Bee	Trib to Plum Creek	Seward
Concordia University	NE0133124	I	NPDES	Seward	Plum Creek	Seward

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FACILITY	Program/ NPDES #	Municipal, Industrial, Private or SID	NPDES or NPP	CITY	Stream Name	County
Garland WWTF	NE0023931	M	NPDES	Garland	Und Trib of Middle Oak Creek	Seward
Milford WWTF	NE0024333	M	NPDES	Milford	Big Blue River	Seward
NDOT Blue River Eastbound Rest Area	NE0031992	I	NPDES	Lincoln	Big Blue River	Seward
Seward Corrosion Control Plant	NE0134252	I	NPDES	Seward	Und Trib	Seward
Seward WWTF	NE0023876	M	NPDES	Seward	Plum Creek	Seward
Staplehurst WWTF	NE0040959	M	NPDES	Staplehurst	Big Blue River	Seward
Utica WWTF	NE0045365	M	NPDES	Utica	Und Trib of Beaver Creek	Seward
Alexandria WWTF	NE0029238	M	NPDES	Alexandria	Big Sandy Creek	Thayer
Bruning WWTF	NE0045071	M	NPDES	Bruning	Und Trib to Big Sandy Creek	Thayer
Deshler WWTF	NE0039802	M	NPDES	Deshler	Spring Creek	Thayer
Hebron WWTF	NE0024252	M	NPDES	Hebron	Little Blue River	Thayer
Reinke Manufacturing, Inc	NE0139092	I	NPDES	Deshler	Land Application (Little Blue River Basin)	Thayer
Guide Rock WWTF	NE0021601	M	NPDES	Guide Rock	Republican River	Webster
Benedict WWTF	NE0114944	M	NPDES	Benedict	Lincoln Creek	York
Bradshaw WWTF	NE0121321	M	NPDES	Bradshaw	Trib to Beaver Creek	York
Collins Aerospace, a UTC Aerospace Systems Company fka Hamilton Sundstrand Corporation, a UTC Aerospace Systems Company	NE0134066	I	NPP	York	Beaver Creek via York WWTF	York
DuPont Pioneer Hi-Bred Int., Inc. York Production - fka- Pioneer Hi-Bred Int, Inc	NE0137936	I	NPDES	York	Land Application (Big Blue)	York
Green Plains -York LLC-fka- bengoa Bioenergy Corp	NE0131539	I	NPDES/NPP	York	Beaver Creek via York WWTF	York
Gresham WWTF	NE0027359	M	NPDES	Gresham	Lincoln Creek via wetland, via und. trib.	York
Ply Gem Industries, Kroy Building Products -dba- Ply Gem Fence and Railing	NE0133213	I	NPP	York	Beaver Creek	York
Waco WWTF	NE0045004	M	NPDES	Waco	Und Trib of Beaver Creek	York
York Cold Storage Co	NE0111317	I	NPDES	York	Und Trib of Beaver Creek	York
York Water Reclamation Facility (WRF)	NE0040932	M	NPDES	York	Beaver Creek	York

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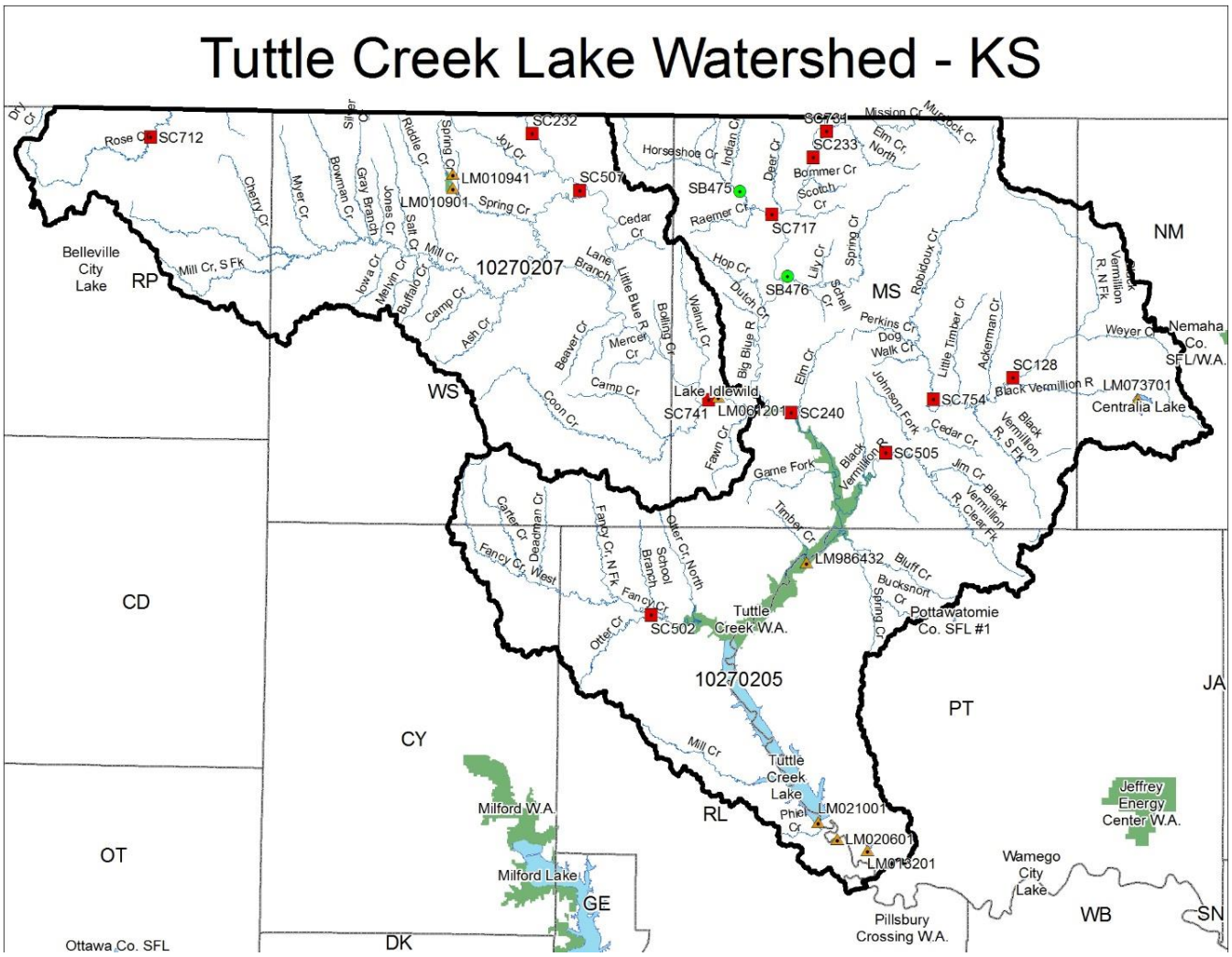
Attachment L

2019 Big Blue River Compact – Kansas Water Quality Summary
May 15, 2019

Prepared by the Kansas Department of Health and Environment
Bureau of Water, Watershed Planning, Monitoring, and Assessment Section and
the Bureau of Environmental Field Services, Watershed Management Section



Kansas Monitoring Stations:

Lower Big Blue, HUC8: 1270205

STATION	NAME_PROPER	HUC8_CODE	Waterbodies
LM013201	Pottawatomie Co. SFL #2	10270205	1
LM020601	Rocky Ford W.A.	10270205	1
LM021001	Tuttle Creek Lake	10270205	1
LM073701	Centralia Lake	10270205	1
LM986432	Tuttle Creek W.A.	10270205	1
SB475	Horseshoe Creek	10270205	1
SB476	Spring Creek	10270205	1
SC128	North Fork Black Vermillion River Near Vliets	10270205	2
SC233	Big Blue River Near Oketo	10270205	3
SC240	Big Blue River Near Blue Rapids	10270205	14
SC502	Fancy Creek Near Randolph	10270205	6
SC505	Black Vermillion River Near Frankfort	10270205	19
SC717	Horseshoe Creek Near Marysville	10270205	5
SC731	North Elm Creek Near Oketo	10270205	1
SC754	Robidoux Creek near Frankfort	10270205	3

Lower Little Blue, HUC8: 10270207

STATION	NAME_PROPER	HUC8_CODE	Waterbodies
LM010901	Washington Co. SFL	10270207	1
LM010941	Washington W.A.	10270207	1
LM061201	Lake Idlewild	10270207	1
SC232	Little Blue River Near Hollenberg	10270207	5
SC507	Mill Creek Near Hanover	10270207	20
SC712	Rose Creek Near Narka	10270207	1
SC741	Little Blue River Near Waterville	10270207	14

Kansas 2018 303(d) Listings:

Waterbody Name	CATEGORY	SITE_TYPE	IMPAIRMENT	STATION
Big Blue River Near Oketo	5	P	Total Phosphorus	SC233
Big Blue River Near Oketo	5	P	Total Suspended Solids	SC233
Big Blue River Near Oketo	5	P	Arsenic	SC233
Big Blue River Near Oketo	5	P	Biology	SC233
Big Blue River Near Oketo	5	P	pH	SC233
Fancy Creek Near Randolph	5	R	Sulfate	SC502
Black Vermillion River Near Frankfort	5	P	Total Suspended Solids	SC505
Black Vermillion River Near Frankfort	5	P	Total Phosphorus	SC505
Black Vermillion River Near Frankfort	5	P	Biology	SC505
Horseshoe Creek Near Marysville	5	R	Total Phosphorus	SC717
Horseshoe Creek Near Marysville	5	R	Sulfate	SC717
North Elm Creek Near Oketo	5	P	Total Phosphorus	SC731
Robidoux Creek near Frankfort	5	R	Total Phosphorus	SC754
Horseshoe Creek	5	B	Biology	SB475
Spring Creek	5	B	Biology	SB476
North Fork Black Vermillion River Near Vliets	5	R	Biology	SC128
Big Blue River Near Blue Rapids	5	P	Total Suspended Solids	SC240
Big Blue River Near Blue Rapids	5	P	pH	SC240
Big Blue River Near Blue Rapids	5	P	Total Phosphorus	SC240
Big Blue River Near Blue Rapids	5	P	Copper	SC240

Waterbody Name	CATEGORY	SITE_TYPE	IMPAIRMENT	STATION
Washington Co. SFL	5	L	Eutrophication	LM010901
Washington W.A.	5	W	Lead	LM010941
Little Blue River Near Hollenberg	5	P	Total Suspended Solids	SC232
Little Blue River Near Hollenberg	5	P	Total Phosphorus	SC232
Little Blue River Near Hollenberg	5	P	pH	SC232
Little Blue River Near Hollenberg	5	P	Copper	SC232
Little Blue River Near Hollenberg	5	P	Biology	SC232
Mill Creek Near Hanover	5	P	Total Suspended Solids	SC507
Mill Creek Near Hanover	5	P	Total Phosphorus	SC507
Rose Creek Near Narka	5	R	Arsenic	SC712
Rose Creek Near Narka	5	R	Total Phosphorus	SC712
Little Blue River Near Waterville	5	P	Total Suspended Solids	SC741
Little Blue River Near Waterville	5	P	Total Phosphorus	SC741

Kansas Approved TMDLs:

Lower Big Blue				
HUC8: **10270205**				
TMDLs - Category 4a				
Waterbody Name	CATEGORY	SITE_TYPE	IMPAIRMENT	STATION
Tuttle Creek Lake	4a	L	Eutrophication	LM021001
Tuttle Creek Lake	4a	L	Atrazine	LM021001
Tuttle Creek Lake	4a	L	Alachlor	LM021001
Tuttle Creek Lake	4a	L	Siltation	LM021001
Big Blue River Near Oketo	4a	P	E. coli	SC233
Big Blue River Near Oketo	4a	P	Atrazine	SC233
Fancy Creek Near Randolph	4a	R	Atrazine	SC502
Fancy Creek Near Randolph	4a	R	E. coli	SC502
Black Vermillion River Near Frankfort	4a	P	E. coli	SC505
Black Vermillion River Near Frankfort	4a	P	Atrazine	SC505
Horseshoe Creek Near Marysville	4a	R	Atrazine	SC717
Horseshoe Creek Near Marysville	4a	R	E. coli	SC717
North Elm Creek Near Oketo	4a	P	Atrazine	SC731
Centralia Lake	4a	L	pH	LM073701
Centralia Lake	4a	L	Eutrophication	LM073701
Centralia Lake	4a	L	Aquatic Plants	LM073701
Big Blue River Near Blue Rapids	4a	P	Atrazine	SC240
Big Blue River Near Blue Rapids	4a	P	E. coli	SC240

Lower Little Blue				
HUC8: **10270207**				
TMDLs - Category 4a				
Waterbody Name	CATEGORY	SITE_TYPE	IMPAIRMENT	STATION
Washington Co. SFL	4a	L	Aquatic Plants	LM010901
Washington Co. SFL	4a	L	Dissolved Oxygen	LM010901
Washington W.A.	4a	W	Eutrophication	LM010941
Washington W.A.	4a	W	Siltation	LM010941
Lake Idlewild	4a	L	Eutrophication	LM061201
Little Blue River Near Hollenberg	4a	P	E. coli	SC232
Little Blue River Near Hollenberg	4a	P	Atrazine	SC232
Mill Creek Near Hanover	4a	P	E. coli	SC507
Mill Creek Near Hanover	4a	P	Atrazine	SC507
Rose Creek Near Narka	4a	R	Atrazine	SC712
Little Blue River Near Waterville	4a	P	E. coli	SC741
Little Blue River Near Waterville	4a	P	Atrazine	SC741

Kansas Delistings:

Lower Big Blue				
HUC8: **10270205**				
Delistings - Category 2				
Waterbody Name	CATEGORY	SITE_TYPE	IMPAIRMENT	STATION
Centralia Lake	2	L	Atrazine	LM073701
Big Blue River Near Oketo	2	P	Copper	SC233
Big Blue River Near Oketo	2	P	Lead	SC233
Big Blue River Near Blue Rapids	2	P	Lead	SC240
Big Blue River Near Blue Rapids	2	P	Berylium	SC240
Black Vermillion River Near Frankfort	2	P	Lead	SC505
Black Vermillion River Near Frankfort	2	P	Copper	SC505
Horseshoe Creek Near Marysville	2	R	Copper	SC717
Horseshoe Creek Near Marysville	2	R	Total Suspended Solids	SC717
Horseshoe Creek Near Marysville	2	R	Lead	SC717

Kansas TMDL Development Schedule:

In accordance with the *Kansas TMDL Prioritization Framework,* Kansas has chosen to address excessive nutrients in state waters through a strategy of load reduction ahead of pursing numeric nutrient criteria. This strategy is being implemented with the development of nutrient TMDLs, which primarily address Total Phosphorus stream impairments in the highest priority HUC 8s in the state. There are 16 HUC8s that were designated as top priority for 303(d) purposes addressing nutrient impairments, with the Lower Big Blue HUC8 being designated within these top priority HUC8s.

The development of Total Phosphorus (TP) TMDLs for watersheds above Tuttle Creek Lake is scheduled to begin Fall of 2019. Three TMDL documents covering the Little Blue, Big Blue, and Black Vermillion River watersheds from the Nebraska state line to Tuttle Creek Reservoir are expected to be submitted to USEPA Region 7 for approval in Spring 2020. This will result in TP TMDL establishment for 80 stream segments in 10 impaired watersheds.

TP TMDLs scheduled for development in 2019 in the Lower Big and Little Blue River sub-basins:

Waterbody Name	Category	Site Type	Impairment	Station	Stream Segments
Big Blue River near Oketo	5	P	TP	SC233	3
Big Blue River near Blue Rapids	5	P	TP	SC240	12
Horseshoe Creek near Marysville	5	R	TP	SC717	5
North Elm Creek near Oketo	5	R	TP	SC731	1
Little Blue River near Hollenberg	5	P	TP	SC232	5
Mill Creek near Hanover	5	P	TP	SC507	20
Rose Creek near Narka	5	R	TP	SC712	1
Little Blue River near Waterville	5	P	TP	SC741	13
Black Vermillion River near Frankfort	5	P	TP	SC505	17
Robidoux Creek near Frankfort	5	R	TP	SC754	3

Current Kansas TMDL Activities:

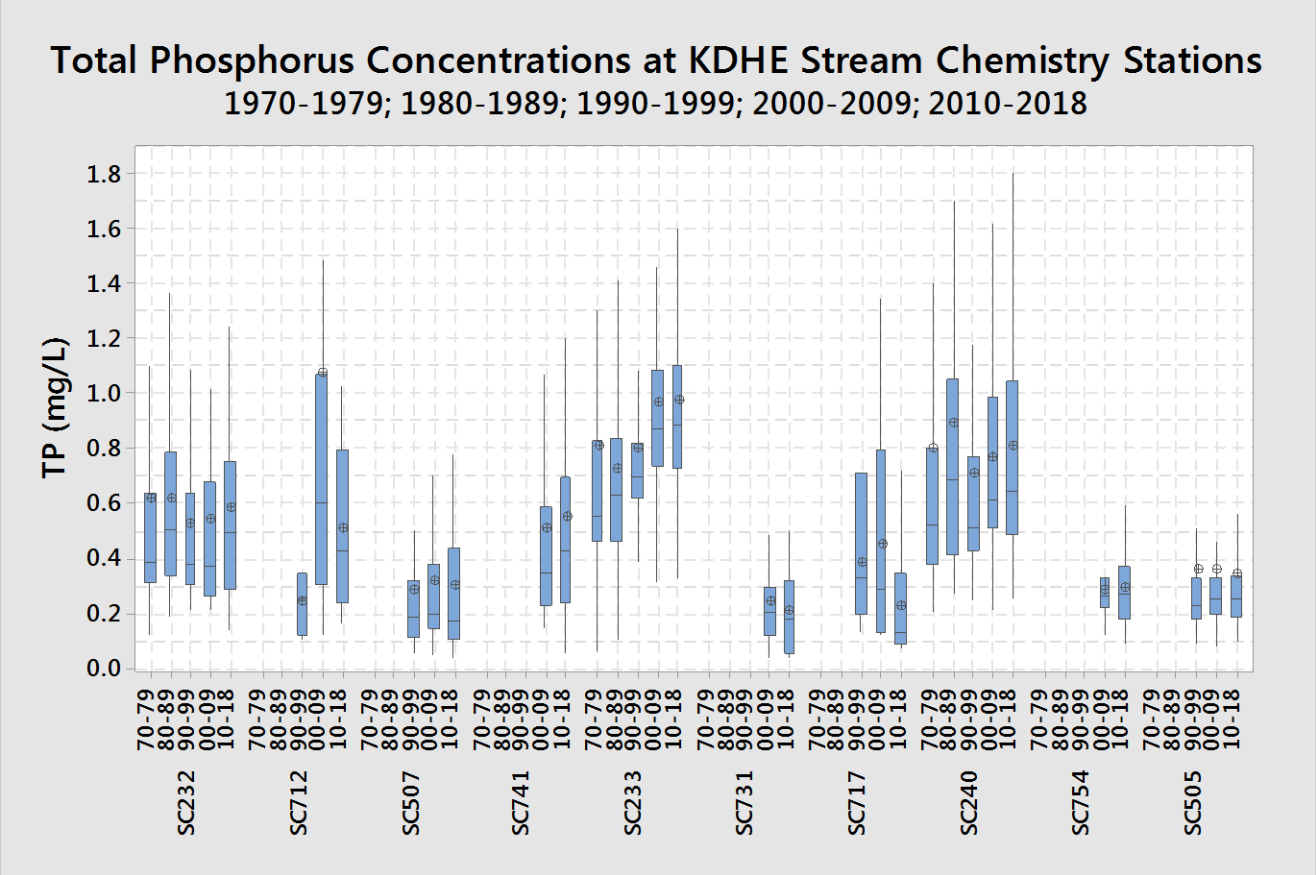
Approvals for TP TMDLs for the Arkansas River from Hutchinson to Wichita and Wichita to Arkansas City were received in December 2018 and February 2019, respectively. Additionally, approvals for TP TMDLs for the Sharps Creek and Mud Creek watersheds in the Smoky Hill River Basin have been received and approval for TMDL documents covering the TP and Nitrate impairments on the main stem Smoky Hill River near Salina and the TP impairments on a portion of the Saline River watershed and the Mulberry Creek watersheds are pending. Current development activities are centered on two watersheds establishing TP TMDLs for impaired streams above Milford and Perry Reservoirs with submission expected in Fall 2019.

Tuttle Creek Lake Chlorophyll-*a* Water Quality Standard

EPA recently approved the chlorophyll *a* water quality standard of 10 µg/L for Tuttle Creek Lake in March 2017 as part of the approval of 81 site-specific chlorophyll-*a* criteria established for the protection of the domestic water supply use for Kansas Lakes serving as primary or secondary public water supply lakes.

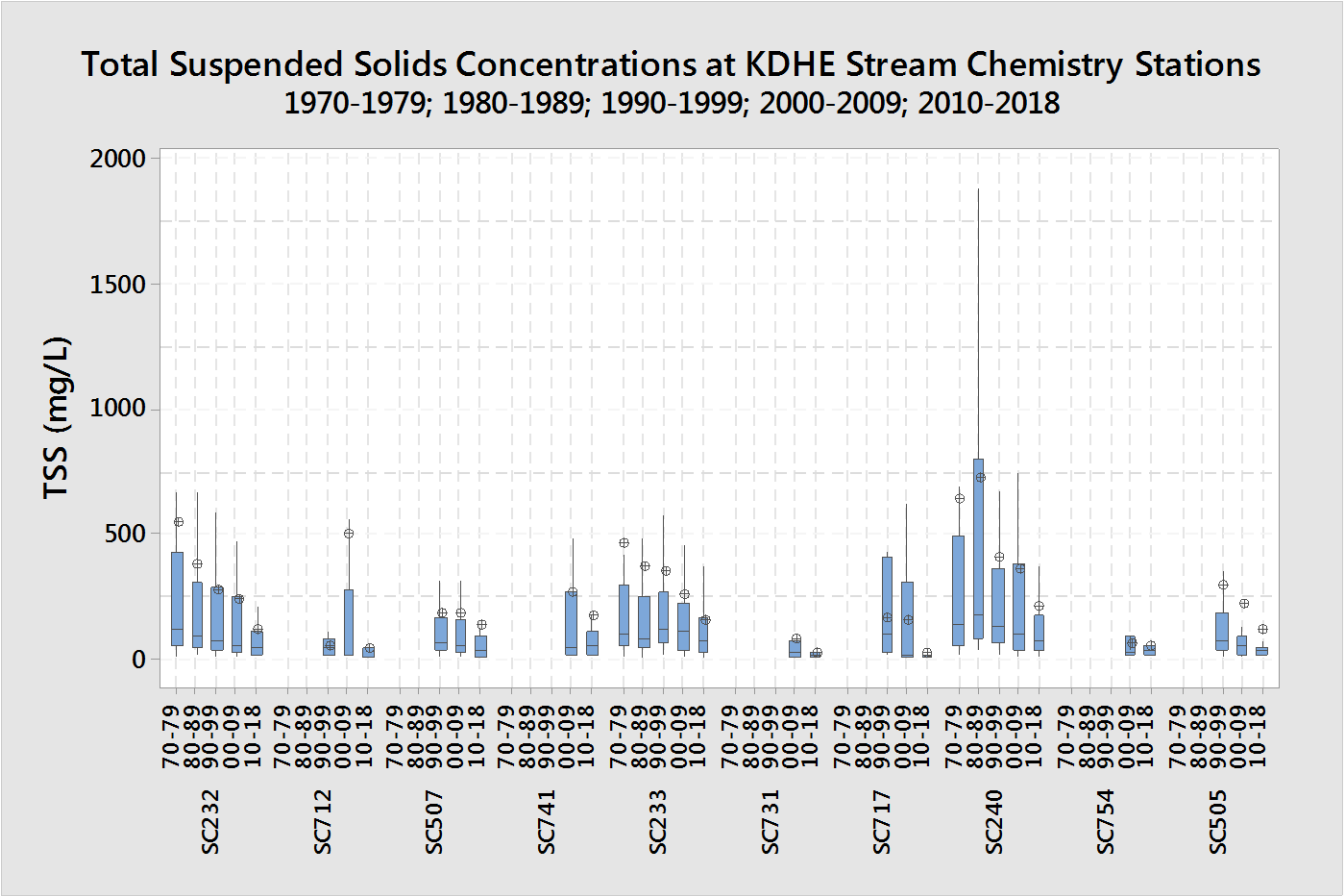
Kansas Water Quality Summary:

Kansas Lower Blue River Watershed Data Summary for Total Phosphorus (TP):



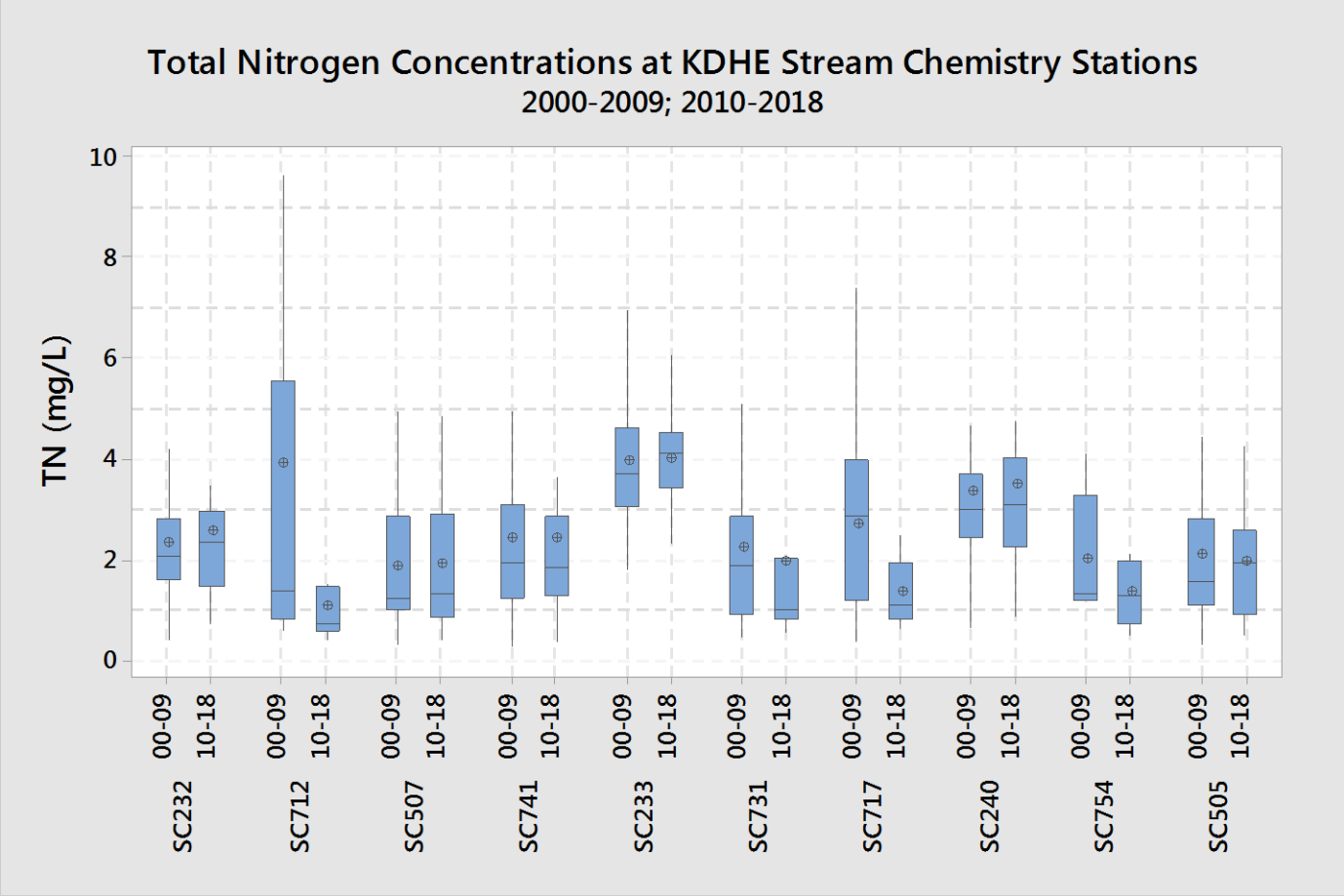
Total Phosphorus (mg/L)																	
Stream	SC Site	Period of Record															
		1970-1979			1980-1989			1990-1999			2000-2009			2010-2018		
		#	Mean	Median	#	Mean	Median	#	Mean	Median	#	Mean	Median	#	Mean	Median
Little Blue R nr Hollenberg	SC232	73	0.619	0.390	41	0.614	0.500	61	0.525	0.380	55	0.543	0.370	36	0.579	0.497
Rose Cr nr Narka	SC712	No Data			No Data			6	0.238	0.252	18	1.076	0.599	8	0.504	0.425
Mill Cr nr Hanover	SC507	No Data			No Data			59	0.282	0.190	54	0.319	0.194	36	0.303	0.170
Little Blue R nr Waterville	SC741	No Data			No Data			No Data			43	0.506	0.342	40	0.548	0.430
Big Blue R nr Oketo	SC233	70	0.805	0.550	119	0.720	0.630	57	0.798	0.694	54	0.967	0.867	36	0.976	0.889
North Elm Cr nr Oketo	SC731	No Data			No Data			No Data			48	0.241	0.205	13	0.204	0.180
Horseshoe Cr nr Marysville	SC717	No Data			No Data			7	0.379	0.329	13	0.448	0.287	8	0.226	0.125
Big Blue R nr Blue Rapids	SC240	45	0.798	0.520	26	0.891	0.685	63	0.705	0.510	56	0.766	0.615	36	0.805	0.648
Robidoux Cr nr Frankfort	SC754	No Data			No Data			No Data			6	0.280	0.262	8	0.288	0.270
Black Vermillion R nr Frankfort	SC505	No Data			No Data			57	0.357	0.230	57	0.360	0.254	36	0.342	0.253

Kansas Lower Blue River Watershed Data Summary for Total Suspended Solids (TSS):



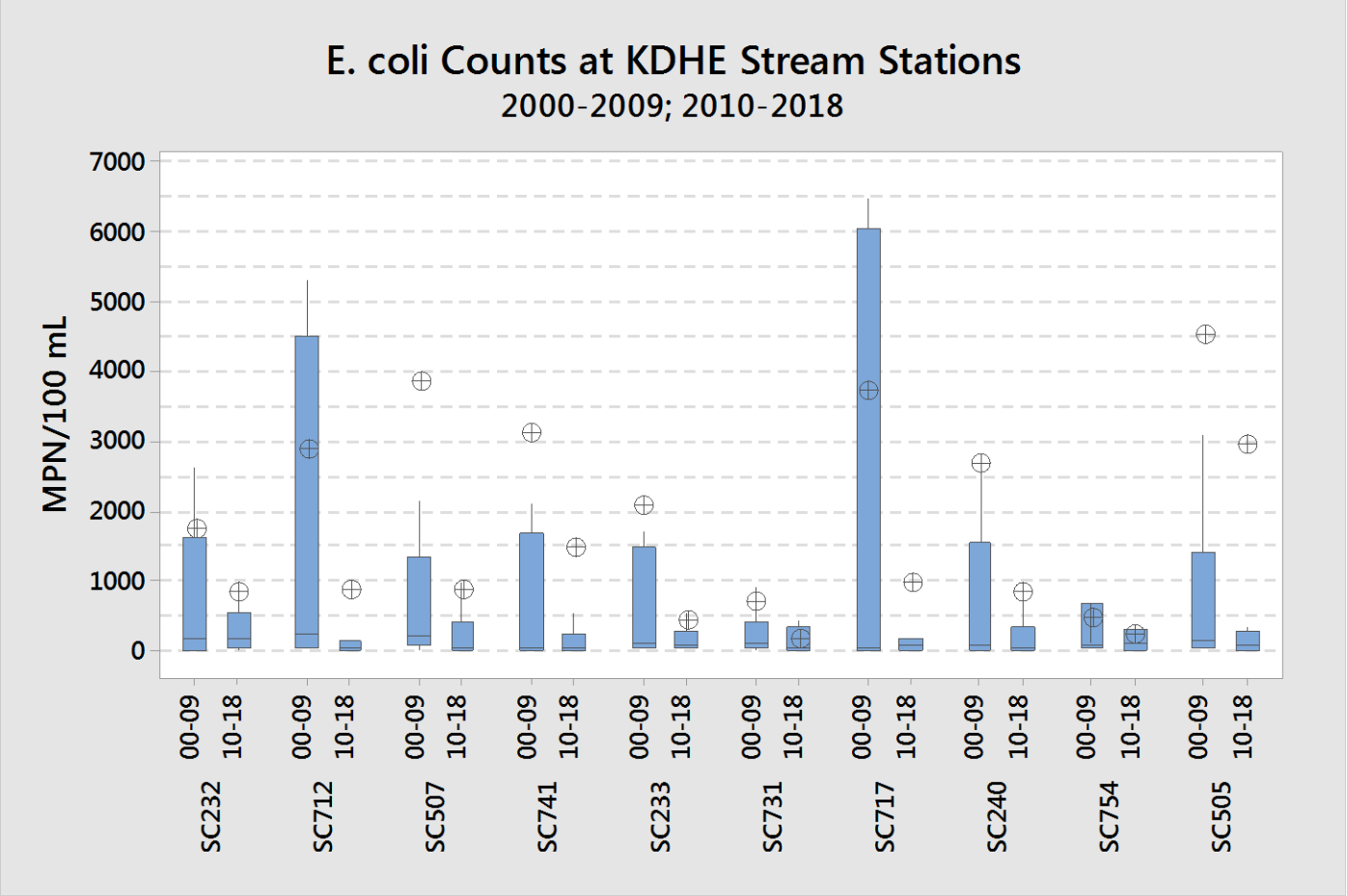
Total Suspended Solids (mg/L)																	
Stream	SC Site	Period of Record															
		1970-1979			1980-1989			1990-1999			2000-2009			2010-2018		
		#	Mean	Median	#	Mean	Median	#	Mean	Median	#	Mean	Median	#	Mean	Median
Little Blue R nr Hollenberg	SC232	51	545	114	33	378	92	61	273	72	55	233	53	36	116	46
Rose Cr nr Narka	SC712	No Data			No Data			6	49.8	42.5	18	496	20	8	36	10
Mill Cr nr Hanover	SC507	No Data			No Data			59	175	63	54	182	52	36	131	31
Little Blue R nr Waterville	SC741	No Data			No Data			No Data			43	265	44	40	166	54
Big Blue R nr Oketo	SC233	51	463	96	103	363	80	57	345	120	54	255	109	36	150	68
North Elm Cr nr Oketo	SC731	No Data			No Data			No Data			48	75	27	13	22	15
Horseshoe Cr nr Marysville	SC717	No Data			No Data			7	162	102	13	152	15	8	16	12
Big Blue R nr Blue Rapids	SC240	45	634	140	23	725	172	61	404	126	56	357	103	36	207	69
Robidoux Cr nr Frankfort	SC754	No Data			No Data			No Data			6	62	23	8	44	31
Black Vermillion R nr Frankfort	SC505	No Data			No Data			57	292	69	57	219	49	36	114	31

Kansas Lower Blue River Watershed Data Summary for Total Nitrogen (TN):



Total Nitrogen (mg/L)							
Stream	SC Station	Period of Record					
		2000-2009			2010-2018		
		#	Mean	Median	#	Mean	Median
Little Blue R nr Hollenberg	SC232	55	2.31	2.08	32	2.58	2.38
Rose Cr nr Narka	SC712	18	3.92	1.36	8	1.09	0.72
Mill Cr nr Hanover	SC507	54	1.88	1.24	37	1.94	1.35
Little Blue R nr Waterville	SC741	43	2.41	1.94	41	2.45	1.83
Big Blue R nr Oketo	SC233	54	3.96	3.69	37	4.03	4.12
North Elm Cr nr Oketo	SC731	48	2.24	1.88	14	2.18	1.44
Horseshoe Cr nr Marysville	SC717	13	2.70	2.87	8	1.34	1.09
Big Blue R nr Blue Rapids	SC240	56	3.36	3.02	37	3.48	3.10
Robidoux Cr nr Frankfort	SC754	6	2.01	1.31	8	1.34	1.29
Black Vermillion R nr Frankfort	SC505	57	2.09	1.58	37	2.02	1.93

Kansas Lower Blue River Watershed Data Summary for E. coli:



E. coli (MPN/100 mL)							
Stream	SC Station	Period of Record					
		2000-2009			2010-2018		
		#	Mean	Median	#	Mean	Median
Little Blue R nr Hollenberg	SC232	34	1,734	163	37	833	175
Rose Cr nr Narka	SC712	12	2,880	231	8	857	42
Mill Cr nr Hanover	SC507	34	3,856	222	37	872	52
Little Blue R nr Waterville	SC741	37	3,116	52	41	1,466	52
Big Blue R nr Oketo	SC233	33	2,082	95	37	421	86
North Elm Cr nr Oketo	SC731	34	684	122	14	161	52
Horseshoe Cr nr Marysville	SC717	13	3,710	31	8	966	64
Big Blue R nr Blue Rapids	SC240	34	2,686	68	37	843	31
Robidoux Cr nr Frankfort	SC754	6	445	69	8	214	95
Black Vermillion R nr Frankfort	SC505	57	2.09	1.58	37	2.02	1.93

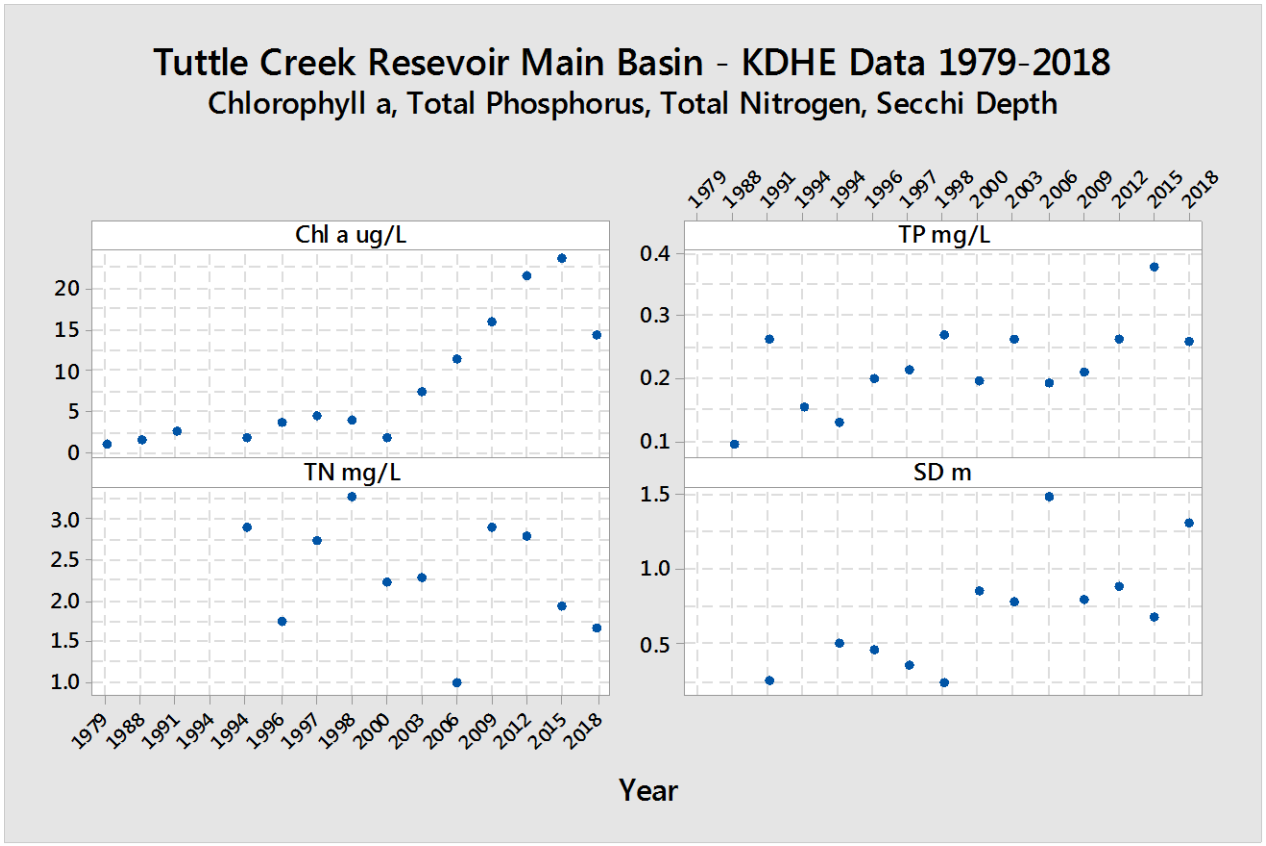
Lower Blue River Watershed Atrazine Data Summary for all samples:

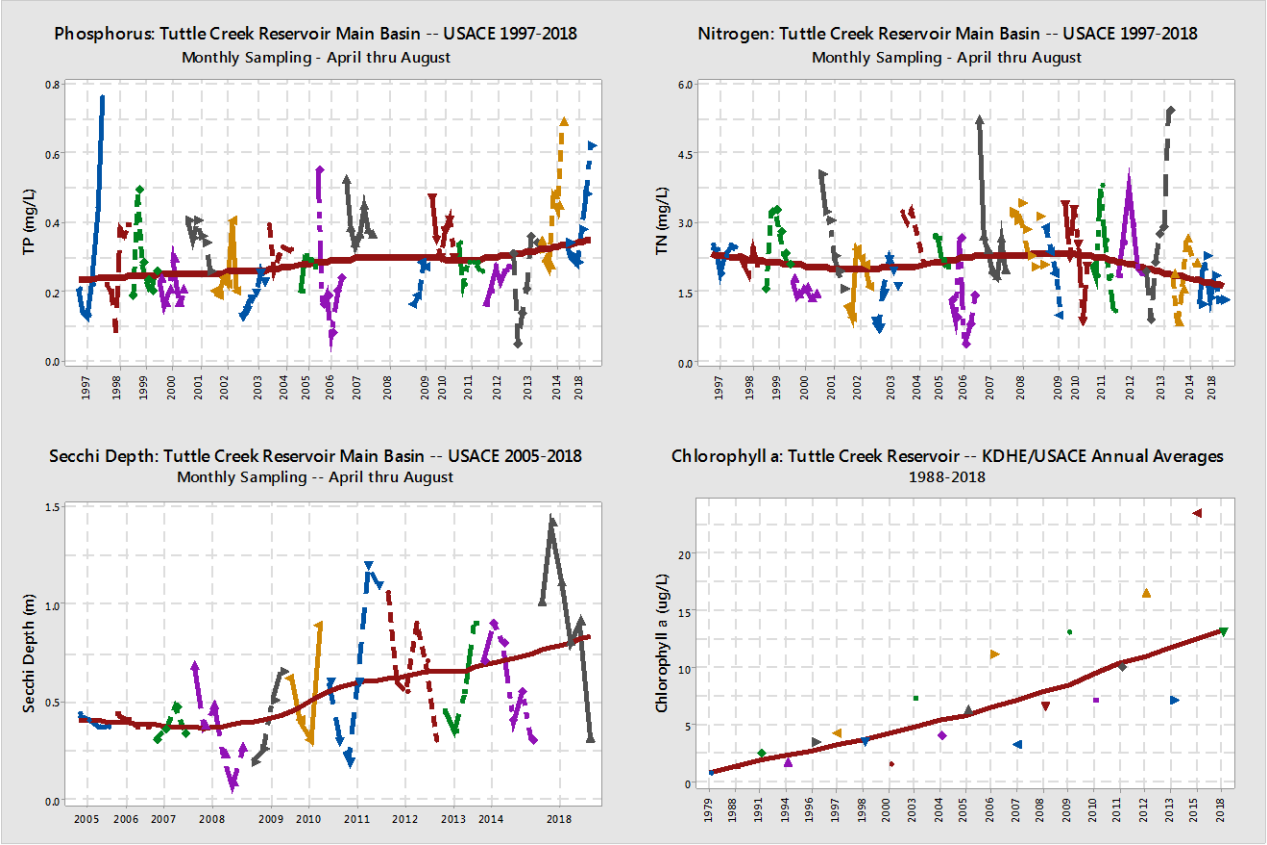
Year-Round Atrazine Samples							
Stream	SC Station	Period of Record					
		2000-2009			2010-2018		
		# of Atrazine Samples	# > 3 ppb	% > 3 ppb	# of Atrazine Samples	# > 3 ppb	% > 3 ppb
Little Blue R nr Hollenberg	SC232	29	11	38%	23	8	35%
Rose Cr nr Narka	SC712	10	7	70%	6	3	50%
Mill Cr nr Hanover	SC507	30	17	57%	24	8	33%
Little Blue R nr Waterville	SC741	23	18	78%	27	11	41%
Big Blue R nr Oketo	SC233	28	11	39%	24	9	38%
North Elm Cr nr Oketo	SC731	24	8	33%	11	3	27%
Horseshoe Cr nr Marysville	SC717	8	3	38%	6	3	50%
Big Blue R nr Blue Rapids	SC240	29	16	55%	24	8	33%
Robidoux Cr nr Frankfort	SC754	4	1	25%	6	3	50%
Black Vermillion R nr Frankfort	SC505	30	17	57%	24	12	50%
Total		**215**	**109**	**51%**	**175**	**68**	**39%**

Lower Blue River Watershed Atrazine Data Summary for April-July Samples:

April – July Atrazine Samples							
Stream	SC Station	Period of Record					
		2000-2009			2010-2018		
		# of Atrazine Samples	# > 3 ppb	% > 3 ppb	# of Atrazine Samples	# > 3 ppb	% > 3 ppb
Little Blue R nr Hollenberg	SC232	10	2	20%	8	3	38%
Rose Cr nr Narka	SC712	4	0	0%	1	0	0%
Mill Cr nr Hanover	SC507	10	1	10%	8	1	13%
Little Blue R nr Waterville	SC741	9	0	0%	9	2	22%
Big Blue R nr Oketo	SC233	10	1	10%	6	1	17%
North Elm Cr nr Oketo	SC731	10	3	30%	3	0	0%
Horseshoe Cr nr Marysville	SC717	3	0	0%	2	0	0%
Big Blue R nr Blue Rapids	SC240	11	0	0%	6	1	17%
Robidoux Cr nr Frankfort	SC754	1	0	0%	2	0	0%
Black Vermillion R nr Frankfort	SC505	10	1	10%	6	1	17%
Total		**78**	**8**	**10%**	**51**	**9**	**18%**

Tuttle Creek Lake Water Quality Glance – Surface Water Samples





Kansas - NPDES Permitted Facilities

Lower Big Blue: 10270205								Nutrient Loading Potential
Permit Number	Facility Name	Facility Type	NPDES No.	Treatment Type	Design Flow	Receiving Stream	COUNTY	
M-BB13-OO02	MARYSVILLE, CITY OF	MUNICIPAL	KS0092142	Lagoon Discharging	0.6	Big Blue R	Marshall	Yes
M-BB07-OO01	FRANKFORT, CITY OF	MUNICIPAL	KS0024881	Lagoon Discharging	0.204	Black Vermillion R	Marshall	Yes
M-BB04-OO01	BLUE RAPIDS, CITY OF	MUNICIPAL	KS0024775	Lagoon Discharging	0.16	Big Blue R	Marshall	Yes
M-BB05-OO01	CENTRALIA, CITY OF	MUNICIPAL	KS0081418	Lagoon Discharging	0.0784	Black Vermillion River via Unnamed Tributary	Nemaha	Yes
M-BB01-OO01	AXTELL, CITY OF	MUNICIPAL	KS0047228	Lagoon Discharging	0.0625	Big Blue R via North Fork Black Vermillion R	Marshall	Yes
M-BB18-OO01	OLSBURG, CITY OF	MUNICIPAL	KS0093297	Lagoon Discharging	0.0304	Tuttle Cr Reservoir via Carnahan Cr via Booth Cr via Unnamed Trib	Pottawatomie	Yes
M-BB25-OO04	UNIVERSITY PARK	MUNICIPAL	KS0079243	Mechanical	0.03	Tuttle Cr Reservoir	Riley	Yes
M-BB19-OO01	RANDOLPH, CITY OF	MUNICIPAL	KS0031721	Lagoon Discharging	0.024	Tuttle Cr Reservoir Via Fancy Cr via Unname Trib	Riley	Yes
M-BB23-OO01	SUMMERFIELD, CITY OF	MUNICIPAL	KS0025500	Lagoon Discharging	0.0217	Black Vermillion River via Robidoux Creek	Marshall	Yes
M-BB03-OO01	BEATTIE, CITY OF	MUNICIPAL	KS0047236	Lagoon Discharging	0.0215	Robidoux Cr via Wolf Cr	Marshall	Yes
M-BB20-OO01	VERMILLION, CITY OF	MUNICIPAL	KS0085529	Lagoon Discharging	0.021	Black Vermillion River	Marshall	Yes
M-BB27-OO01	HOME CITY SEWER DIS. 1 - MARSHALL CO.	MUNICIPAL	KS0095435	Lagoon Discharging	0.02	Big Blue River via Spring Creek via Unnamed Tributary	Marshall	Yes
M-BB26-OO02	BAILEYVILLE IMPROVEMENT DISTRICT #1	MUNICIPAL	KS0081442	Lagoon Discharging	0.0178	Black Vermillion R via N Fork Black Vermillion R via Unnamed Trib	Nemaha	Yes
M-KS79-OO01	WHEATON, CITY OF	MUNICIPAL	KS0094013	Lagoon Discharging	0.016	Clear Fork of the Black Vermillion River	Pottawatomie	Yes
M-BB25-OO05	TERRA HEIGHTS - RILEY CO.	MUNICIPAL	KS0086118	Lagoon Discharging	0.0135	Big Blue R via Unnamed Trib	Riley	Yes
I-BB07-PO02	FRANKFORT GROUNDWATER REMEDIATION	INDUSTRIAL	KS0099104	Mechanical	0.101	Black Vermillion River via Little Timber Cr via Unnamed Trib	Marshall	No
I-BB07-PO03	FRANKFORT, CITY OF -PWS #4 SOURCE WATER	INDUSTRIAL	KS0099775	Mechanical	0.036	Timber Cr via Unnamed Trib	Marshall	No
I-BB04-PO01	GP INDUSTRIAL PLASTERS - BLUE RAPIDS	INDUSTRIAL	KS0002135	Mechanical		Big Blue R via Unnamed Trib	Marshall	No
I-BB07-PO01	HAMM - LILLIS-GARDNER QUARRY #115	INDUSTRIAL	KS0098094	Quarry		Tuttle Cr Reservoir via Black Vermillion R via Clear Fk Cr	Marshall	No
I-BB19-PO04	BAYER CONSTRUCTION-STEVENS QUARRY	INDUSTRIAL	KS0098078	Quarry		Big Blue R via Tuttle Creek Reservoir via Mill Cr via unnamed tributary	Riley	No
I-BB13-PR01	MARYSVILLE READY MIX CO., INC.	INDUSTRIAL	KSG110114	Ready Mix		Lilly Creek via Unnamed Trib	Marshall	No
C-BB25-OO04	ROCKY FORD TRAILER COURT	COMMERCIAL	KS0079201	Lagoon Discharging	0.0163	Big Blue R via Cedar Cr	Pottawatomie	Yes
M-BB25-NO05	RILEY COUNTY SD - LONGHORN SUBDIVISION	MUNICIPAL	KSJ000622	Lagoon Nondischarging			Riley	No
M-KS38-NO01	KDWP&T - TUTTLE CREEK (RIVER POND AREA)	MUNICIPAL	KSJ000405	Lagoon Nondischarging			Riley	No
I-KS38-CO01	MCCALL PATTERN COMPANY, INC	INDUSTRIAL	KS0091286	Lagoon Nondischarging			Riley	No
C-BB18-NO01	LIVING WATERS RANCH	COMMERCIAL	KSJ000590	Lagoon Nondischarging			Pottawatomie	No
C-BB18-NO02	BROKEN ARROW RANCH	COMMERCIAL	KSJ000591	Lagoon Nondischarging			Pottawatomie	No
C-BB25-NO02	LAKESIDE ASSOCIATION	COMMERCIAL	KSJ000592	Lagoon Nondischarging			Riley	No
C-KS38-NO09	TUTTLE TERRACE TRAILER COURT	COMMERCIAL	KSJ000576	Lagoon Nondischarging			Riley	No
C-KS62-NO01	SEDALIA MOBILE HOME COURT	COMMERCIAL	KSJ000201	Lagoon Nondischarging			Riley	No

Lower Little Blue: 10270207								Nutrient Loading Potential
Permit Number	Facility Name	Facility Type	NPDES No.	Treatment Type	Design Flow	Receiving Stream	COUNTY	
M-BB21-OO01	WASHINGTON, CITY OF	MUNICIPAL	KS0089991	Lagoon Discharging	0.18	Mill Creek via Plum Creek	Washington	Yes
M-BB22-OO01	WATERVILLE, CITY OF	MUNICIPAL	KS0048429	Lagoon Discharging	0.0925	Little Blue River	Marshall	Yes
M-BB06-OO01	CUBA, CITY OF	MUNICIPAL	KS0027120	Lagoon Discharging	0.024	South Fork Mill Creek	Republic	Yes
M-BB10-OO02	HANOVER, CITY OF	MUNICIPAL	KS0095745	Lagoon Discharging	0.08	Little Blue R	Washington	Yes
M-BB08-OO01	GREENLEAF, CITY OF	MUNICIPAL	KS0048411	Lagoon Discharging	0.072	Coon Creek via Unnamed Tributary	Washington	Yes
IA27:L27-BB22-PO01	OR-AL QUARRIES, INC - HANOVER QUARRY	INDUSTRIAL	KS0095125	Quarry		Tuttle Cr Reservoir via Little Blue R via Fawn Cr	Marshall	No
I-BB21-PR01	MIDWEST PRODUCTS - WASHINGTON PLANT	INDUSTRIAL	KSG110133	Ready Mix		Ashe Cr via Unnamed Trib	Washington	No
I-BB10-PR01	MIDWEST PRODUCTS - HANOVER PLANT	INDUSTRIAL	KSG110131	Ready Mix		Little Blue River via Cottonwood Cr via Unnamed Trib	Washington	No
M-BB16-NO01	NARKA, CITY OF	MUNICIPAL	KSJ000430	Lagoon Nondischarging			Republic	No
M-BB24-NO01	CHESTER (NE), VILLAGE OF	MUNICIPAL	KSJ000202	Lagoon Nondischarging			Republic	No
M-BB15-NO01	MUNDEN, CITY OF	MUNICIPAL	KSJ000429	Lagoon Nondischarging			Republic	No
M-BB12-NO01	MAHASKA, CITY OF	MUNICIPAL	KSJ000427	Lagoon Nondischarging			Washington	No
M-BB14-NO01	MORROWVILLE, CITY OF	MUNICIPAL	KSJ000428	Lagoon Nondischarging			Washington	No
M-BB09-NO01	HADDAM, CITY OF	MUNICIPAL	KSJ000665	Lagoon Nondischarging			Washington	No
M-BB02-NO01	BARNES, CITY OF	MUNICIPAL	KSJ000436	Lagoon Nondischarging			Washington	No
M-BB22-NO01	USD #498 VALLEY HEIGHTS	MUNICIPAL	KSJ000431	Lagoon Nondischarging			Marshall	No
C-BB10-NO01	PONY EXPRESS SERVICE CENTER	COMMERCIAL	KSJ000589	Lagoon Nondischarging			Washington	No

Tuttle Creek WRAPS / 319 Nonpoint Source Program Update:

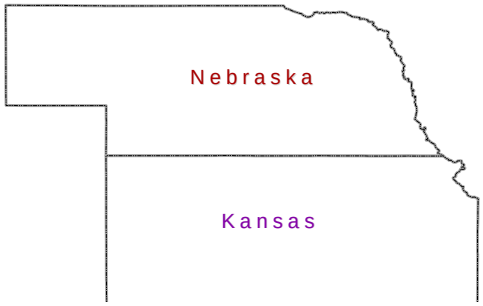
- **Streambank Projects on Big Blue and Little Blue Rivers**
  - **30 projects costing $937,117 over last 5 years has reduced 99,169 tons of sediment and 99,174 lbs of phosphorus from reaching Tuttle Creek Reservoir**
  - **KS Interagency Streambank Team with diversified funding sources continues to implement projects**
- **Kansas Reservoir Protection Initiative**
  - **KS State funding to reduce reservoir sedimentation**
  - **In 2018 ~$600,000 was spent in Tuttle Creek Watershed to reduce sediment loading, primarily on Cover Crop projects**
- **Tuttle Creek WRAPs:**
  - **Watershed Coordinator - Carla Greisen**
  - **BMP focus**
    - **Soil Health – Cover Crops**
    - **Livestock Relocation**
    - **Precision Nutrient Management**
  - **Tuttle Creek WRAPs allocates $125,000 per/year on BMP cost share**

Tuttle Creek WRAPS Plan Summary (attached)

Tuttle Creek WRAPS 2020-2022 Strategic Plan (attached)

Tuttle Creek Reservoir – Lower Big Blue River and Lower Little Blue River Watersheds

9 Element Watershed Plan Overview



Directly addressing High Priority TMDLs for:

- Bacteria – Big Blue River above Tuttle Creek
- Bacteria- Little Blue River
- Bacteria – Black Vermillion River
- Atrazine – Tuttle Creek Lake Watershed
- Atrazine – Tuttle Creek Lake and Watershed
- Atrazine – Tuttle Creek Lake
- Siltation – Tuttle Creek Lake
- Eutrophication – Tuttle Creek Lake

Directly addressing many 303d listed impairments throughout the project area for Phosphorus, Total Suspended Solids, and pH

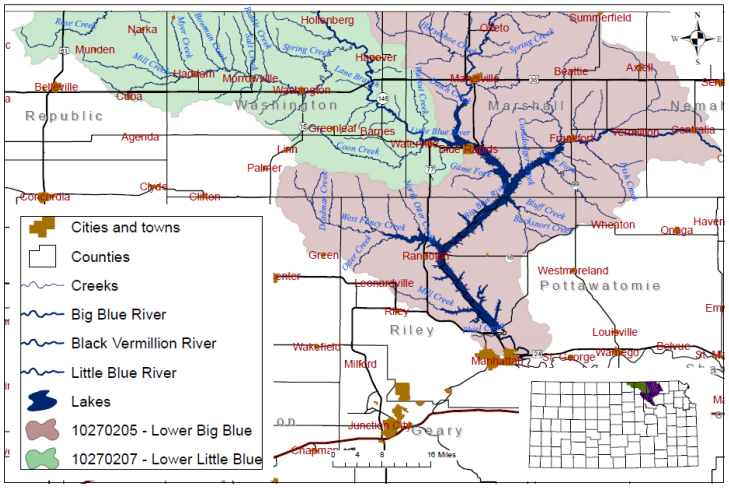
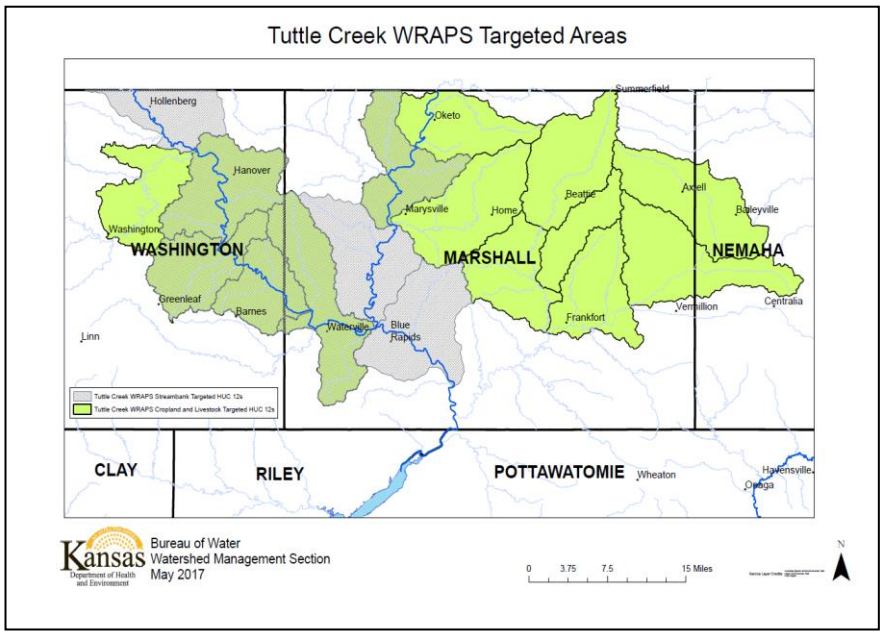


Figure 1. Map of Lower Big Blue/Lower Little Blue Rivers Watershed.

Targeting Determinations



- Cropland BMP Targeted areas were identified through SWAT (Soil and Water Assessment Tool) modeling to determine areas of high overland runoff contributing sediment and nutrients to the watershed and Tuttle Creek Lake.

- Livestock BMP Targeted areas were identified through analysis of Aerial Assessments, Stakeholder Input, and correlation with SWAT identified areas for high phosphorus runoff potential and the locations of existing High Priority Bacteria TMDLs.

- Streambank Targeted areas were identified through GIS analyses of the main stem of the Big Blue and Little Blue Rivers targeting

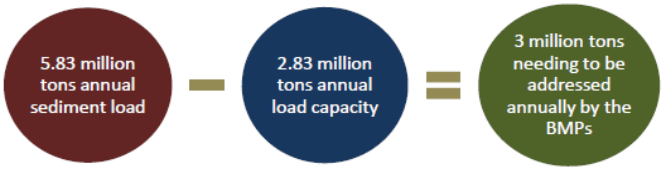
Best Management Practices and Load Reduction Goals

Best Management Practices (BMPs) to address nutrients, sediment, atrazine, and bacteria in the watershed were chosen by the SLT based on local acceptance/adoption rate and amount of load reduction gained per dollar spent.

Sediment Reducing Cropland

- Buffers
- Continuous No-till
- Cover Crops
- Grassed Waterways
- Streambank Stabilization
- Terraces

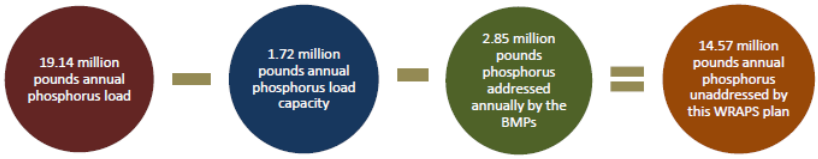
The total load reduction needed to meet the sediment TMDL is 3,000,000 tons of sediment.



Phosphorus Reducing Cropland, Streambank and Livestock BMPs:

- Buffers
- Continuous No-till
- Cover Crops
- Nutrient Management Plans
- Grassed Waterways
- Streambank Stabilization
- Terraces
- Relocation of small feeding operations away from streams
- Relocation of pasture feeding sites away from streams
- Extended Grazing via cover crops
- Promotion of alternative watering sites away from streams

A 95% reduction would be needed to meet the TMDL. At the end of this forty year plan, if all BMPs have been implemented, 2,850,393 pounds will have been reduced from the watershed.



Atrazine Reducing Cropland BMPs:

- Promotion of the Use of Alternative Herbicides
- Vegetative Buffers
- Split Application
- Apply before April 15

The current estimated pollutant load for atrazine is 63,145 pounds in the months of May and June in Tuttle Creek Lake. **The load needs to be reduced by 55,883 pounds to meet the TMDL.**

Bacteria Reducing Livestock BMPs:

- Vegetative filter strips between small feeding operations and streams
- Relocation of small feeding operations away from streams
- Relocation of pasture feeding sites away from streams
- Extended Grazing via cover crops
- Promotion of alternative watering sites away from streams

Strategic Plan FY20-22

Tuttle WRAPS

WRAPS Coordinator: Carla Greisen
KDHE Project Officer: Andy Lyon

Grant Start: July 1, 2019
Grant End: December 31, 2022
Total Allocation: $600,000

Strategy	Action Steps	Year	Needed Resources
Black Vermillion Soil BMPs	Project will continue to work in Black Vermillion targeted watershed to implement soil health best management practice systems. KDHE will begin evaluating the water quality information to determine delisting potential.	Yr 1	N/A
		Yr 2	N/A
		Yr 3	N/A
		Total	N/A

Nutrient Management in Elm Creek and Robidoux Creek	Coordinator will facilitate meetings with partners such as NRCS, industry, service providers, and local producers and meet on a yearly basis to discuss and evaluate strategies. Project will market nutrient management in targeted areas of Elm Creek and Robidoux Creek Watersheds to implement BMPs in conjunction with current soil health related practices. Workshops and field days will be utilized to demonstrate nutrient management practices. Load Reductions per year • Phosphorus – 500 lbs.	Yr 1	$20,000
		Yr 2	$20,000
		Yr 3	$20,000
		Total	$60,000

Mill, Black Vermillion, and Little Blue livestock related water quality impairments	Coordinator will work to identify livestock producers in targeted areas above monitoring stations in Mill Creek, Black Vermillion, and Little Blue watersheds. Coordinator will inventory producers, contact strategies, locations, and potential livestock practices in the watersheds to assist in the implementation of future livestock related efforts. Implementation of best management practices including alternative water systems, relocation of feeding areas, grazing cover crops/new sources of forage, or other	Yr 1	$0
		Yr 2	$25,000
		Yr 3	$25,000

	innovative practices to remove and lessen the impact of livestock in riparian areas. Load Reductions Year 2 • Phosphorus – 3,000 lbs. Year 3 • Phosphorus – 3,000 lbs.		
		Total	$50,000

Demonstration Farm	The project will work with partners to develop a demonstration farm in the Tuttle Lake watershed. The farm will demonstrate the benefits of proper land management such as no-till, nutrient management, soil health principles, and proper buffers. The area will be used for educational purposes as well as a case study to follow the economic, time, and labor needs of the entire system. Any comparison fields not implementing proper management systems will be buffered to ensure all potential pollutant loading is mitigated.	Yr 1	$5,000
		Yr 2	$5,000
		Yr 3	$5,000
		Total	$15,000

Information/Education	Facilitate information/educational opportunities in the watershed for producers to include topics in soil health, nutrient management, livestock management, and other relevant information. Coordinator will lead the development and implementation of at least one event while providing support to other partners throughout the grant cycle for events. Marketing to producers on events, available resources, and other pertinent information will be utilized to reach various audiences in the watershed.	Yr 1	$5,000
		Yr 2	$5,000
		Yr 3	$5,000
		Total	$15,000

RCPP and SRF Facilitation & Implementation	The project will work with KDHE to facilitate a Tuttle Creek RCPP proposal as well as develop SRF program to demonstrate/coordinate equipment to improve soil health in the watershed. Implement BMPs in target areas that would stack WRAPS funds on top of RCPP funding.	Yr 1	$0
		Yr 2	$25,000
		Yr 3	$25,000
		Total	$50,000

Technical Assistance		Yr 1	$10,000
		Yr 2	$10,000

	Coordinator will work with Kansas State University watershed specialist to implement strategies identified in the PIP.	Yr 3	$10,000
		Total	$30,000

Best Management Practices	Implement BMPs identified in 9-Element Watershed Plan in targeted areas. Yr1 WRAPS Funded BMPs Cropland • Buffer, 184 acres • No-Till, 306 acres • Nutrient Management, 306 acres • Grassed Waterways, 123 acres • Subsurface Fertilizer, 61 acres Livestock • 1 Relocated pasture feeding site (native) • 1 Off stream watering system (native) Streambank • 3,754 feet Non-WRAPS Funded BMPs Cropland • Buffer, 2,555 acres • No-Till, 4,258 acres • Nutrient Management, 4,258 acres • Grassed Waterways, 1,703 acres • Subsurface Fertilizer, 862 acres Livestock • 1 Vegetative filter strip • 1 Relocate Feedlot • 1 Relocated pasture feeding site (native) • 1 Off stream watering system (native) Streambank • 52,153 feet Load Reductions WRAPS Funded BMPs • Phosphorus – 4,796 lbs. • Sediment – 5,198 tons Non-WRAPS Funded BMPs • Phosphorus – 66,624 lbs. • Sediment – 72,207 lbs.	Yr 1	$66,000
	Yr2 WRAPS Funded BMPs Cropland	Yr 2	$13,000

	• Buffer, 35 acres • No-Till, 58 acres • Nutrient Management, 58 acres • Grassed Waterways, 23 acres • Subsurface Fertilizer, 12 acres Livestock • 1 Off stream watering system (cool season) • 1 Off stream watering system (cropland) Streambank • 712 feet Non-WRAPS Funded BMPs Cropland • Buffer, 2,704 acres • No-Till, 4,506 acres • Nutrient Management, 4,506 acres • Grassed Waterways, 1,803 acres • Subsurface Fertilizer, 901 acres Livestock • 1 Vegetative filter strip • 2 Relocated pasture feeding sites (native) • 1 Relocated pasture feeding sites (cool season) • 2 Off stream watering systems (native) Streambank • 55,195 feet Load Reductions WRAPS Funded BMPs • Phosphorus – 927 lbs. • Sediment – 986 tons Non-WRAPS Funded BMPs • Phosphorus – 71,858 lbs. • Sediment – 76,419 tons		
	Yr3 WRAPS Funded BMPs Cropland • Buffer, 26 acres • No-Till, 44 acres • Nutrient Management, 44 acres • Grassed Waterways, 18 acres • Subsurface Fertilizer, 9 acres Livestock • 1 Relocated pasture feeding site (native) • 1 Off stream watering system (native) Streambank • 536 feet	Yr 3	$10,000

	Non-WRAPS Funded BMPs Cropland • Buffer, 2,713 acres • No-Till, 4,520 acres • Nutrient Management, 4,520 acres • Grassed Waterways, 1,808 acres • Subsurface Fertilizer, 904 acres Livestock • 1 Vegetative filter strip • 1 Relocated pasture feeding site (native) • 1 Off stream watering system (native) Streambank • 55,371 feet Load Reductions WRAPS Funded BMPs • Phosphorus – 685 lbs. • Sediment – 742 tons Non-WRAPS Funded BMPs • Phosphorus – 70,735 lbs. • Sediment – 76,663 tons		
		Total	$89,000