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INTEGRATED MANAGEMENT PLAN

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Approved by the Lower Niobrara
Natural Resources District Board of Directors: XX XX, 2013/2014

Approved by the Department of Natural Resources: XX XX, 2013/2014

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INTEGRATED MANAGEMENT PLAN
Jointly Developed by the
LOWER NIOBRARA NATURAL RESOURCES DISTRICT
and the
DEPARTMENT OF NATURAL RESOURCES

1. AUTHORITY

This Integrated Management Plan (IMP) was prepared voluntarily by the Board of Directors of the Lower Niobrara Natural Resources District (District) and the Nebraska Department of Natural Resources (Department) in consultation with the Lower Niobrara Stakeholders Committee and in accordance with *Neb. Rev. Stat.* §§ 46-715, 46-716, 46-717, and 46-720.

2. PURPOSE

The Lower Niobrara Natural Resources District, in collaboration with the Nebraska Department of Natural Resources, will implement this voluntary IMP to attain and/or maintain a desired balance between water uses and water supplies of both surface water and groundwater sources so that economic viability, as well as social and environmental health, safety, and welfare, can be achieved and maintained in the District for both the near-term and long-term, while also considering effects on existing surface water appropriators and groundwater users. Should the Department subsequently determine an affected river basin, subbasin, or reach within the District to be fully appropriated, the Department and the District may amend this IMP.

3. BACKGROUND

The 1960's and 1970's, saw a sizeable increase in the number of wells being drilled and the rate at which groundwater was being pumped. In 1972, a law passed by the Nebraska Legislature became effective, which combined 154 special purpose entities into what are now 23 Natural Resources Districts (NRDs). The boundaries of the NRDs generally follow major river basins, enabling local Districts to respond best to local needs. The Lower Niobrara NRD contains all or portions of the Burton Creek Basin, Keya Paha Creek Basin, Ponca Creek Basin, Eagle Creek Basin, Blackbird and Redbird Creek Basins, Verdigre Creek Basin, and Niobrara River Basin.

Unique to Nebraska, NRDs are local government entities, governed by an elected board of directors, with broad responsibilities to protect Nebraska's natural resources. NRDs are charged with 12 areas of responsibility, including: (1) development, management, use, and conservation of groundwater and surface water; (2) soil conservation; (3) erosion prevention and control; (4) flood prevention and control; (5) pollution control; (6) water supply for any beneficial uses; (7) prevention of damages from flood water and sediment; (8) development and management of recreational and park facilities; (9) forestry and

range management; (10) development and management of fish and wildlife habitat; (11) drainage improvement; and (12) solid waste management. In particular, NRDs are responsible for the planning, monitoring, and regulation of groundwater in the District, while the Department, a state entity, manages and regulates surface waters within the state.

The beneficial use of groundwater and surface water in the state of Nebraska is governed by two separate, distinct, and very different laws: (1) the common law concept of correlative rights for groundwater, and (2) the prior appropriation doctrine for surface water. The correlative rights rule allows owners to drill wells and extract groundwater from an underlying aquifer for beneficial purposes, subject to management by the public. To execute this right, land owners must first obtain a permit to drill a well from their local NRD. If approved, the well permit allows the land owner to drill and extract as much groundwater as needed, as long as the use is deemed beneficial. When construction is completed, the well permit is registered with the Department, which places the information in a statewide database. The correlative groundwater rights rule is essentially a "share and share alike" system. Under the prior appropriation doctrine, surface waters of the state are allowed to be diverted based upon the date that the water right was obtained. Surface water rights entitle land owners or organizations to remove a set amount of water from a specific location. During periods when the overall water supply is insufficient to meet all appropriated water rights, this system protects those who received their water rights first. Thus, the water right with the earliest date is entitled to their full appropriation before a later priority date water right receives any water.

The passage of LB 962 in July of 2004 allows the Department and the NRDs to work together to manage groundwater and surface water as a single resource, replacing the previous system that treated them as two separate and un-related resources. Further, LB 962 called for a proactive and integrated approach to management of the state's hydrologically connected groundwater and surface water. With the increasing demand on water resources, it is necessary to recognize the importance of hydrologically connected groundwater and surface water and the difficulties entailed in the management thereof, because of their properties, distribution, and the interconnection between surface water and the underlying groundwater aquifers.

Under LB 962, an IMP must be developed if the Department determines that a river basin, subbasin, or reach is fully appropriated. A river basin, subbasin, or reach is deemed fully appropriated if the Department determines that current uses of hydrologically connected surface water and groundwater in the river basin, subbasin, or reach cause or will in the reasonably foreseeable future cause: (a) the surface water supply to be insufficient to sustain over the long-term the beneficial or useful purposes for which existing natural flow or storage appropriations were granted and the beneficial or useful purposes for which, at the time of approval, any existing instream appropriation was granted, (b) the streamflow to be insufficient to sustain over the long-term the beneficial uses from wells constructed in aquifers dependent on recharge from the river or stream involved, or (c) reduction in the flow of a river or stream sufficient to cause

noncompliance by Nebraska with an interstate compact or decree, other formal state contract or agreement, or applicable state or federal laws *Neb. Rev. Stat.* § 46-713(3).

Furthermore, under LB 962, in the absence of a fully or overappropriated designation by the Department, a NRD may still enter into an IMP voluntarily under *Neb. Rev. Stat.* § 46-715(1)(b). The process is initiated when the District notifies the Department of its intention to develop a voluntary IMP. The objective of a voluntary IMP is to manage the river basins, subbasins, or reaches within the District to attain and/or sustain a desired balance between water uses and water supplies for the long-term, while protecting existing users. If a District develops a voluntary IMP and the Department subsequently determines the affected river basin, subbasin, or reach to be fully appropriated, the Department and the affected NRD may amend the IMP.

On October 17, 2007, the Department made a preliminary determination that a portion of the Lower Niobrara River Basin, below Mirage Flats and above the Spencer Hydropower facility, was fully appropriated. This preliminary determination included lands within the District, in Boyd, Holt, Keya Paha, and Rock counties, which had not previously been determined to be fully appropriated. As a result of this preliminary determination, temporary stays on the issuance of water well construction permits and additional groundwater irrigated acres went into effect in this portion of the District. Stays also went in effect on the issuance of new surface water appropriations and on the increase of surface water irrigated acres.

On January 25, 2008, the Department made a final determination that the area preliminarily determined to be fully appropriated in Boyd, Holt, Keya Paha, and Rock counties was fully appropriated. On February 8, 2008 the Middle Niobrara, Lower Niobrara, Upper Loup, and Upper Elkhorn NRDs filed a contested case challenging the final fully appropriated determination. On December 17, 2009, the Director of the Department upheld the determination. On December 31, 2009, the Middle Niobrara, Lower Niobrara, Upper Loup, and Upper Elkhorn NRDs filed a notice of appeal with the Department. In an opinion dated June 3, 2011, the Nebraska Supreme Court held the Department's 2008 fully appropriated determination invalid and reversed the December 17, 2009, Order. On June 16, 2011, the Department received the mandate from the Clerk of the Supreme Court.

On December 16, 2008, the Department made a preliminary determination that the Lower Platte River Basin was fully appropriated. This preliminary determination included lands within the District, in Holt and Rock counties, which had not previously been determined to be fully appropriated. As a result of this preliminary determination, temporary stays on the issuance of water well construction permits and additional groundwater irrigated acres went into effect in this portion of the District. Stays also went into effect on the issuance of new surface water appropriations and on the increase of surface water irrigated acres. On March 13, 2009, the Department made a final determination that the area preliminarily determined to be fully appropriated in Holt and Rock counties was not fully appropriated.

On April 6, 2009, *Neb. Rev. Stat.* § 46-714(12) (LB 483) became effective, allowing for the development of a limited number of total new irrigated acres annually, over a four-year period. Rules and Regulations for implementation of LB 483, in accord with *Neb. Rev. Stat.* §§ 46-714(12) and 46-707(1) for lands within the District, were adopted on September 3, 2009, to allow up to 10,000 acres to be developed in the Lower Platte Basin, which overlaps the District in Holt county: an area that was previously designated as fully appropriated. Furthermore, Rules and Regulations for implementation of LB 483 in accordance with *Neb. Rev. Stat*. §§ 46-714(12) and 46-707(1) were adopted on September 12, 2011, for lands within the Lower Niobrara Basin, which was declared fully appropriated in 2008, but revised in the spring of 2011.

Based on the Department's determination that no river basin, subbasin, or reach within the District was overappropriated nor determined to be fully appropriated, and in accordance with *Neb. Rev. Stat*. § 46-715(1)(b), the District decided to prepare a voluntary IMP. On September 30, 2011, the District submitted a letter of intent to develop a voluntary IMP to the Department. In the summer of 2012, the District, the Department, and the Stakeholders Committee began meeting to develop the IMP. Stakeholder meetings were held on August 21, 2012; October 16, 2012; December 11, 2012; February 5, 2013; and March 26, 2013 to develop the goals and objectives of the plan. Community meetings were held throughout the District on March 26-27, 2013. The development of this voluntary IMP progressed collaboratively between the District, the Department, and the Stakeholders Committee. The Stakeholders Committee is comprised of individuals within the District who represent a variety of interests, such as agricultural, municipal, commercial, environmental, and recreational.

4. APPROACH

The IMP planning process utilizes an adaptive management approach. Thus, it is a work in progress for either attaining or maintaining the desired balance of the hydrologic system. As an affected area or subarea of the District changes and more data becomes available, the IMP goals and objectives will be reassessed and changes will be made, as necessary, to accommodate changing circumstances such as hydrology, economics, water demands, and supplies. The IMP will evolve in incremental phases as elements of the plan are achieved and additional elements to the IMP are sought by the District, its Stakeholders Committee, and/or the Department. The IMP will be reviewed annually and changes may be made to the goals and objectives for the next year, keeping in mind the purpose of the IMP. The Department will seek to ensure that in the first phase of the voluntary IMP, the goals and objectives incorporate the following elements: hydrologic models, data, and analyses on water supplies, uses, availability, and shortages. Additional elements to the IMP may be incorporated by the District.

This voluntary IMP will focus on hydrologically connected surface water and groundwater, but may also incorporate many aspects that mutually benefit other actions of the District, as set forth in the District's Ground Water Management Plan, the Bazile Groundwater Management Area Plan, and findings from other District projects and studies. The integrated management planning process will allow for: (1) a more complete

inventory of all water supplies and water uses; (2) increased collaboration between the entities that manage water resources; (3) increased public awareness of water resources issues; and (4) increased opportunities to provide input on short and long-term management of the District's water resources.

Data, analyses, models, and the best available science are the tools that will provide the information critical for implementing water management activities and meeting IMP goals. Among other things, these tools will be used to assess water supplies, water uses, water availability, water shortages for existing water users, and to identify future water needs at the basin and subbasin level within the District. The District and the Department will seek to ensure that agreed upon methodologies for data collection and analyses, and processes for greater transparency in all decision-making activities, are used.

In accordance with the Nebraska Ground Water Management and Protection Act, an IMP shall provide a process for economic development opportunities and economic sustainability/maintenance within a river basin, subbasin, or reach, and shall include clear and transparent procedures to track depletions and gains to streamflows resulting from new, retired, or other changes in water uses. The procedures shall: (a) utilize generally accepted methodologies based on the best available information, data, and science; (b) include a generally accepted methodology to estimate depletions and gains to streamflows—including data on location, time, and amount—regarding gains to streamflows as offsets to new water uses; (c) identify a means to minimize the impacts new water users will have upon existing surface and groundwater users; (d) identify procedures the District and the Department will use to report, consult, and otherwise share information on new water uses, changes in uses, or other activities affecting water use in the river basin, subbasin, or reach; (e) identify, to the extent feasible, potential water available to mitigate new uses, including, but not limited to, water rights leases, interference agreements, augmentation projects, conjunctive use management, and use retirement; (f) after consultation with, and an opportunity to provide input from irrigation districts, public power districts, reclamation districts, municipalities, other political subdivisions, and other water users; develop, to the extent feasible, an outline of plans to make water available for offset to enhance and encourage economic development opportunities and economic sustainability in the river basin, subbasin, or reach; and (g) clearly identify procedures that applicants for new uses shall follow to apply for approval of a new water use and corresponding offset. As this is a voluntary IMP, no designation of fully appropriated or overappropriated has been made and a requirement for the offset of all new uses is not mandated. Therefore, there is not currently a need to identify the water available to mitigate new uses or develop a plan for the availability of offset water; however, the adaptive nature of the IMP means this need, and others as specified in *Neb. Rev. Stat.* § 46-715(3), will be addressed if they arise.

Pursuant to *Neb. Rev. Stat*. § 46-715,the IMP shall include the following: (a) clear goals and objectives with a purpose of sustaining a balance between water uses and water supplies so the economic viability, social and environmental health, safety and welfare of the river basin, subbasin, or reach can be achieved and maintained for both the near-term and long-term; (b) a map clearly delineating the geographic area subject to the IMP; (c)

one or more of the groundwater controls authorized for adoption by NRDs pursuant to *Neb. Rev. Stat.* § 46-739; (d) one or more of the surface water controls authorized for adoption by the Department pursuant to *Neb. Rev. Stat.* § 46-716; and (e) a plan to gather and evaluate data, information, and methodologies that could be used to implement *Neb. Rev. Stat.* §§ 46-715 to 46-717, increase understanding of the surface water and hydrologically connected groundwater system, and test the validity of the conclusions and information upon which the IMP is based. The plan may also provide for utilization of any applicable incentive program authorized by law.

The groundwater and surface water controls proposed for adoption in the IMP shall: (a) be consistent with the goals and objectives of the plan; (b) be sufficient to ensure the state will remain in compliance with applicable state and federal laws, any applicable interstate water compact or decree, or other formal state contract or agreement pertaining to surface water or groundwater use or supplies; and (c) protect the groundwater users whose water wells are dependent on recharge from the river or stream involved, and the surface water appropriators on such river or stream, from streamflow depletion caused by surface water uses and groundwater uses begun, in the case of a river basin, subbasin, or reach designated as overappropriated or preliminarily determined to be fully appropriated in accordance with *Neb. Rev. Stat*. §46-713, after the date of such designation or preliminary determination. To accomplish the economic development objectives set forth in *Neb. Rev. Stat*. §46-715(3), this plan provides a process that allows for utilization of the best available science to estimate impacts of new uses and explore the potential for new water uses, as it currently does not place any limitation on new development.

5. MAPS

See Appendix I for the following maps: (1) Lower Niobrara Natural Resources District Integrated Management Plan Management Area; (2) Lower Niobrara Natural Resources District Phase II Groundwater Management Area; (3) Lower Niobrara Natural Resources District Previously Designated Fully Appropriated Area of the Lower Niobrara River Basin; (4) Lower Niobrara Natural Resources District Previously Designated Fully Appropriated Area of the Lower Platte River Basin; (5) Lower Niobrara Natural Resources District Bazile Groundwater Management Area; (6) Lower Niobrara Natural Resources District Detail View of Bazile Groundwater Management Area.

6. GOALS & OBJECTIVES

For the District, the ultimate goal of the integrated management process is to protect existing investments and interests while facilitating economic growth and well-being across the District. For the first phase/increment of the integrated planning process for the District's voluntary IMP, the goals and objectives will focus on developing the utilization of hydrologic models to determine the interconnectivity of surface and groundwater within the boundaries of the District, and an understanding of: (1) water supplies and uses; (2) water availability and shortages; and (3) hydrologic characteristics of the District's groundwater basins, subbasins, and reaches. These fundamental elements of water management planning will allow for refinement of the goals and objectives in

the following phases of the IMP process, and provide the framework for water management decisions going forward. The District, its stakeholders, and the Department identified many more long-term goals and objectives that will be reviewed annually and added in subsequent phases of the IMP process if the data and analysis support them.

A goal is a desired outcome of actions taken in support of achieving the overall purpose of the IMP. An objective is an achievable and measurable action taken to attain the desired end result stated in the goal it supports. Goals provide a broad picture of intentions, whereas objectives define more specific ways to achieve these goals. The objectives are then supported by detailed action items that will get the necessary work accomplished. The action items may be regulatory or non-regulatory in nature. Regulatory action items (controls) are legal mandates, whereas non-regulatory action items are voluntary actions on the part of the groundwater user or surface water appropriator. In order to implement the regulatory action items (controls), they must be written as explicit procedures for implementing the control(s), approved by the Board, and then recorded in the District's Rules and Regulations. Rules and Regulations can be changed with only Board approval and a public hearing. In order to make changes in the IMP, the Department and the Board are required to hold a joint public hearing.

The IMP goals and their supporting objectives and action items will be accomplished sequentially, in that Goal 2 requires input of data and analyses from the completion of Goal 1. Goal 3 will begin upon completion of Goal 2. Goal 4, related to education and outreach, will necessarily be ongoing from beginning to completion of this phase of the IMP. However, it may also be helpful at times to work on all four goals together as their respective objectives and action items support each other, and considered together, may improve data collection, analyses, and decision-making going forward.

The District and the Department agree on and adopt the following goals, objectives, action items, and controls for the first generation of this IMP.

Goal 1

1. To develop and implement processes for the adequate collection of hydrologic and other related data to assess water resources within the District.

Goal 1 Objectives

1.1. To conduct data collection and analyses of water supplies and demands, utilizing the best available information, data, and science.

1.2. To conduct studies to identify hydrologically distinct sub-areas within the District for the purposes of integrated management.

1.3. To monitor changes in water uses within the District.

Goal 2

2. To develop systematic approaches for the development and sustainability of water resources within the District.

Goal 2 Objectives

2.1. To assess the potential impact of new surface water and groundwater uses on existing surface water and groundwater users within the District

2.2. To determine allowable levels of water development for the District, and by subbasin when designated.

Goal 3

3. To prevent, resolve, and minimize water related conflicts among and between surface water and groundwater users.

Goal 3 Objectives

3.1. To establish procedures for securing water for sustained future growth of domestic, municipal, agricultural, commercial, and industrial water users within the District.

3.2. To establish rules and regulations regarding transfers, variances, water banking, water leasing, or other actions of water management within the District, if necessary, to enhance equitable water use management, mitigate new uses, or to avoid conflicts.

Goal 4

4. To develop and provide educational opportunities and outreach materials about hydrologically connected surface water and groundwater, water conservation, and to keep the constituents of the District informed about the IMP as it is implemented.

Goal 4 Objectives

4.1. To develop and disseminate water conservation guidelines for individuals to achieve sustainable water use.

4.2. To identify cost-share opportunities that may include collaborating with other agencies and other NRDs to implement plan objectives.

4.3. To encourage participation in information sharing with other organizations and agencies to conserve resources and prevent duplication of work.

7. REGULATORY & NON-REGULATORY ACTION ITEMS

This voluntary IMP includes both regulatory and non-regulatory action items. The regulatory actions are mandatory. The non-regulatory actions are encouraged to be implemented voluntarily by water users. The groundwater controls authorized for adoption by the District are set forth in *Neb. Rev. Stat.* §§ 46-715 and 46-739; the surface water controls authorized for adoption by the Department are in *Neb. Rev. Stat.* §46-716 of the Ground Water Management and Protection Act.

A. Non-regulatory Action Items to Achieve Goals & Objectives

1. The District and the Department will utilize available groundwater models and hydrologic tools to achieve the following:

   (a) To assist in identifying critical hydrologic areas in the District;
   (b) Collaborate with municipalities, water suppliers, and other entities to identify current water uses and future water demands;
   (c) Determine subbasins or sub-regions for the purposes of water management through the development of hydrogeological maps of the District;
   (d) Assess potential impacts to existing users consistent with Nebraska Administrative Code Title 457, Chapter 24;
   (e) Assess potential impacts to users by subbasins or sub-regions, once additional data and tools become available;
   (f) Identify regions where additional data may be needed;
   (g) Locate and confirm irrigated acres through the use of infrared photography of the District;
   (h) Measure additional surface water flows during periods of water shortages through the implementation of streamgages.

2. Water Use Reporting and Data Exchange

   (a) Irrigation water use reporting. The District will implement a voluntary program on all high capacity wells to annually report the total quantity pumped, rate of pumping, and acres irrigated, in accordance with a system and format developed by the District. In addition, the Department will implement a voluntary reporting program for surface water irrigation permit holders in the District to identify the quantity of water pumped, the acres irrigated, and the type of irrigation system (e.g., gravity, pivot, etc.) used.
   (b) Municipal, commercial, and industrial water usage reporting. The District will implement a voluntary program for all municipal, industrial, and commercial establishments with high capacity wells to report annually their water use characteristics and well pumping data to the District, in accordance with a system and format implemented by the District. Once a database of water usage is collected and the water usage characteristics are known, the reporting requirements may change.

(c) Data exchange. The District and the Department will develop a system to exchange water related information and share with other agencies if warranted.

3. Information and Education Programs

(a) The District and the Department will provide educational materials, such as pamphlets or website pages, or carry out educational activities, such as public meetings. This information may include topics such as hydrologically connected waters, integrated management plans, the planning process, or best management practices.
(b) Contingent on budget and staff resources, the District and the Department will jointly pursue opportunities for public outreach efforts, such as news releases, in order to support water education or programs.
(c) The District and the Department will jointly identify and study opportunities for the development of transfers, variances, water banking, water leasing, and other actions of water management to potentially be used in the District.

B. Groundwater Action Items (Controls) to Achieve Goals & Objectives

The District's Rules and Regulations will contain procedural details for the controls listed in this IMP. Persons desiring to apply for a new groundwater use or to alter an existing use should contact the District.

1. Certification of groundwater irrigated acres. The District will certify all irrigated acres within the District boundaries within two years (time will begin when the IMP is approved and goes into effect). The District is in the process of certifying all groundwater irrigated acres utilizing a GIS-based data system in conjunction with County Assessors and aerial photographs of historically irrigated acres.
2. Ranking system for the addition of wells. The District will develop controls for well permit ranking for the addition of new and/or helper irrigation wells on new and/or existing irrigated acres. In order for a well permit to be approved, the District will set a minimum score that all wells must meet before a permit will be approved. The purpose of the ranking system is to be able to continue to allow high capacity well development without creating negative impacts, conflicts, or interferences with neighboring water users. A maximum number of wells per system will be established using the following criteria: (1) thickness of primary aquifer formation; (2) calculated transmissivity; (3) irrigation well density; (4) public water supply well density; (5) domestic, livestock, and other well densities; (6) irrigation best management practice and stream depletion factors; and (7) certification by a hydrologist and/or a professional engineer the existing well has failed and a new well is necessary to continue pumping an adequate volume of irrigation water to the existing irrigated acres.
3. Flow metering. The District will require the mandatory installation of water flow meters on all new high capacity wells and/or modified irrigation wells and/or irrigation systems, commercial, industrial, or municipal water supply systems.

This includes installation of a water flow meter prior to the addition of a helper well/s. The District will encourage the voluntary installation of water flow meters on all existing high capacity well systems.

4. Restriction on addition of irrigated acres. The District will establish a set number of new irrigated acres which can be applied for on an annual basis. The new acres will meet a minimum score set by the Board. The following criteria will be used: (1) irrigation type; (2) land capability class rating using USDA Natural Resources Conservation Service Web Soil Survey; (3) stream depletion factors; (4) groundwater quantity; (5) groundwater quality (nitrates) and compliance with the Nitrogen Certification Guidelines in the District's Ground Water Management Plan; and (6) irrigation concentration (well spacing requirements). These restrictions will be made mandatory throughout the entire District.

It is the intent of the District to utilize qualified projects described in *Neb. Rev. Stat.* § 2-3226.04 to provide river-flow enhancement in order to achieve the goals and objectives of the District, and to achieve the goals and objectives of the Department under the Ground Water Management and Protection Act. The District may pay for such projects by using the occupation tax provided in *Neb. Rev. Stat.* § 2-3226.05, funds granted to the District by the state or federal government, or the levy authority authorized by *Neb. Rev. Stat.* § 2-3225.

C. Surface Water Action Items (Controls) to Achieve Goals & Objectives

The Department's Rules and Regulations contain procedural details for these controls. Persons desiring to develop a new surface water project or to alter an existing project should contact the Department to determine which controls, rules, and regulations may apply to their project.

1. Tracking of surface water irrigated acres. The Department will continue to map and track irrigated acres and require that project maps be submitted and approved for the purposes of obtaining a surface water permit.
2. Flow metering and reporting. The Department will continue to evaluate the necessity for mandatory installation of water flow meters and/or reporting on all surface water pumps for irrigation, commercial, industrial, and municipal uses.
3. Moratorium or restriction on addition of surface water irrigated acres. Should the District issue a moratorium on any increase in groundwater irrigated acres, the Department will issue a similar moratorium to limit development of additional acres for surface water irrigation. Should the District issue a restriction on the number of additional acres irrigated from groundwater, the Department will issue a similar restriction on the development of additional acres for surface water irrigation per year to 1/3 of the amount the District will allow for additional groundwater irrigated acres. The Department will utilize the District's number of additional groundwater acres as of January 1st of each year for determining the number of additional acres for surface water irrigation in each calendar year.
4. Notice on surface water applications. The Department will continue to post notices in the local newspaper and on the Department website of all new surface

water appropriation applications within the borders of the District, with the exception of small domestic withdrawals, in order to allow the District the opportunity to review and provide comment on the applications pursuant to option one of the Department's "Opportunities for Participation in the Permitting Process" document.

8. INCENTIVE PROGRAMS

The District will explore grant programs to supplement the annual budgeting process for funding of action items and to implement cost-share incentives for encouraging voluntary installation of flow meters on all high capacity wells for irrigation systems, municipal, commercial, and/or industrial applications. Cost share programs may include water conservation devises such as soil probes, rain interrupters, and moisture sensors. Educational training, programs, and brochures are expected to be promoted with cost sharing and grant funding sources.

9. MONITORING PLAN

The overall objective of the monitoring plan is to gather and evaluate data, information, and methodologies that could be used to accomplish the purpose of this IMP in accordance with *Neb. Rev. Stat.* §§ 46-715 to 46-717 of the Ground Water Management and Protection Act. The District and the Department have agreed to complete the following actions set forth in this monitoring plan as required by *Neb. Rev. Stat.* § 46-715(2)(e): (1) annually track and report water use activities within the District; (2) increase understanding of the hydrologically connected surface and groundwater within the District; and (3) test the validity of the information and conclusions upon which this IMP is based.

A. Track and Report Water Uses

To the extent feasible, the District will be responsible for collecting, tracking, evaluating, and reporting on the number, location, amount, and timing of the following water use activities within the District on an annual basis: (1) groundwater level measurements; (2) certification of groundwater uses and any changes to these certifications; (3) municipal, commercial, and industrial annual water uses; (4) irrigation water use data required mandatorily or voluntarily by the District, such as metered high capacity well flow data; (5) water well construction permits issued; (6) the number of well permits denied; (7) variances granted by the District and/or the Department that allow an action contrary to an existing rule or regulation, including the purpose, the location, any required offset, the length of time for which the variance is applicable, and the reasoning behind approval of the variance; (8) transfer permits granted by the District and/or the Department allowing the point of withdrawal, location of use, type of use, addition of a type of use, or location of certified irrigated acres to be altered, including all information provided with the application and used in the approval of the transfer; (9) offsets granted and quantity of water used to compensate for groundwater that has been either withdrawn or consumptively used for any new or expanded use; and (10) water banking transactions

completed by the District (should the District decide to establish a water bank) for tracking reductions in, and additions to, consumptive water use within the District. The water bank could allow the District to acquire irrigated acres for permanent retirements as offsets.

The Department will be responsible for collecting, tracking, evaluating, and reporting the following activities within the District on an annual basis: (1) streamgage measurements; (2) any surface water permits issued and/or denied, (3) surface water usage data, such as voluntary water use reports, flow meter data, crops irrigated, and acreage irrigated; (4) any groundwater transfers approved; and (5) any offsets provided for depletions resulting from increased consumptive use related to any of the above listed items.

The District and the Department will jointly evaluate the data and information gathered for accuracy, identify anomalies therein and probable causes for them, and flag data and information that may require closer inspection and review. In addition, the District and the Department will compare annual water use data to historically reported water usage data and information, and perform analyses to determine the impacts of new water users on existing water users within the District. To the extent feasible, such an evaluation of the data and information will help identify potential water available to mitigate new uses, including, but not limited to, water rights leases, interference agreements, augmentation projects, conjunctive use management, and use retirement. Furthermore, after consultation with, and an opportunity to provide input from irrigation districts, public power districts, reclamation districts, municipalities, other political subdivisions, and other water users; such an evaluation, to the extent feasible, will allow for an outline of plans to make water available for offset to enhance and encourage economic development opportunities and economic sustainability in the river basin, subbasin, or reach.

Through a review by the District and the Department of the data and information described above, an annual report will be developed to evaluate the progress being made toward achieving the goals and objectives of this IMP. This information will be shared between the District and the Department and will be presented at a District-wide annual meeting. These reports should be made available at least four (4) weeks prior to the annual meeting. The format of the reports will be standardized as agreed by the District and the Department. At the end of the first five year increment of this IMP, the District and Department will prepare a summary of all data analyzed from the annual reports and provide an interpretation that will guide the development of future IMP increments.

B. Increase Understanding of Hydrologically Connected Surface and Groundwater

The groundwater and surface water data generated annually and contained in the annual reports prepared by the District and the Department, as well as historical data of the same parameters, will be used in groundwater computer models that are based upon the best available science and may be developed by the Department and/or other entities. Computer modeling of the groundwater aquifer characteristics is essentially the only means of detecting and documenting the hydrological interconnectivity of the surface water and underlying groundwater. The groundwater model(s) used will be calibrated to

baseflows and groundwater static water levels for the river basins, subbasins, and reaches in the District with sufficient temporal variability to assess the depletions and gains to baseflow annually. The models will be updated periodically to simulate the management practices that have been implemented to date. The Department will be responsible for updating and using the model(s). However, the District will work with the Department to determine when the District should consider adding a groundwater model analyst to its staff who can be actively and meaningfully engaged in running the models, interpreting the forecasts, and improving the input data for the model(s).

Another key focus of the computer generated analyses will be to determine the impact of new water users on existing water users. The District and the Department will work with other NRDs, other agencies, and interested parties with expertise in modeling to identify data gaps in the analyses and determine whether studies should be undertaken to address these gaps.

The Department, in conjunction with several of the Platte Basin NRDs, has developed a methodology to quantitatively assess hydrologically connected water supplies and water uses. The process and methodologies developed over the course of this four-year study will be utilized to monitor the near-term and long-term balance of water supplies within the District. The District and the Department will collaborate to ensure that the best available science is utilized in conducting this assessment.

C. Test the Validity of the Information and Conclusions upon which the IMP is Based

In addition to the annual review, reporting, modeling and interpretation of results, a more robust review of the progress being made toward achieving the goals and objectives of the IMP will be accomplished after the first 10 years of implementing the IMP. The District and Department will establish computer model runs which will be conducted for the ten year review.

10. INFORMATION CONSIDERED IN PREPARING THIS INTEGRATED MANAGEMENT PLAN

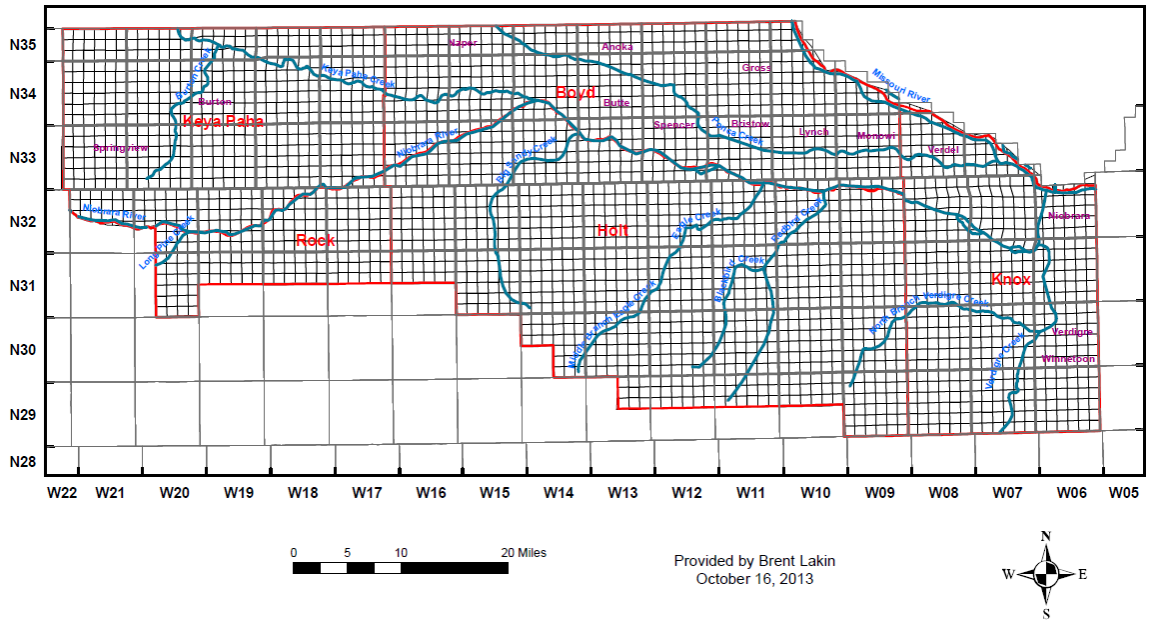
Information used in the preparation of this IMP and to be used in the subsequent implementation of this IMP, can be found in the following: Nebraska Ground Water Management and Protection Act; the Order of Final Determination that a Portion of the Lower Niobrara River Basin is Fully Appropriated; the report on Hydrologically Connected Groundwater and Surface Water in the Upper Niobrara White Natural Resources District; the Upper Niobrara White NRD Groundwater Management Plan; Central Platte NRD Groundwater Management Plan and Integrated Management Plan; the Department's Annual Fully Appropriated Basin Reports; the District's Ground Water Management Plan; the District's Crop Protection Planner; UNL Cooperative Extension EC 98-786-S Managing Irrigation and Nitrogen to Protect Water Quality; and G1850 Irrigation Management for Corn; as well as additional data acquired by either the Department or the District and additional data on file with the District and Department.

11. MODIFICATIONS TO THE INTEGRATED MANAGEMENT PLAN

The District and the Department will jointly determine whether amendments to this plan are necessary. Modifications to this IMP will require an agreement by both the District and the Department as to the proposed changes. Upon agreement of changes, both parties are subsequently required to hold a joint hearing and issue pertinent orders to formally adopt the revised IMP.

APPENDIX I: MAPS

Figure 1: Lower Niobrara Natural Resources District Integrated Management Plan Management Area



Note: This area also includes the Department of Natural Resources surface water limitation area.

Figure 2: Lower Niobrara Natural Resources District Phase II Groundwater Management Area

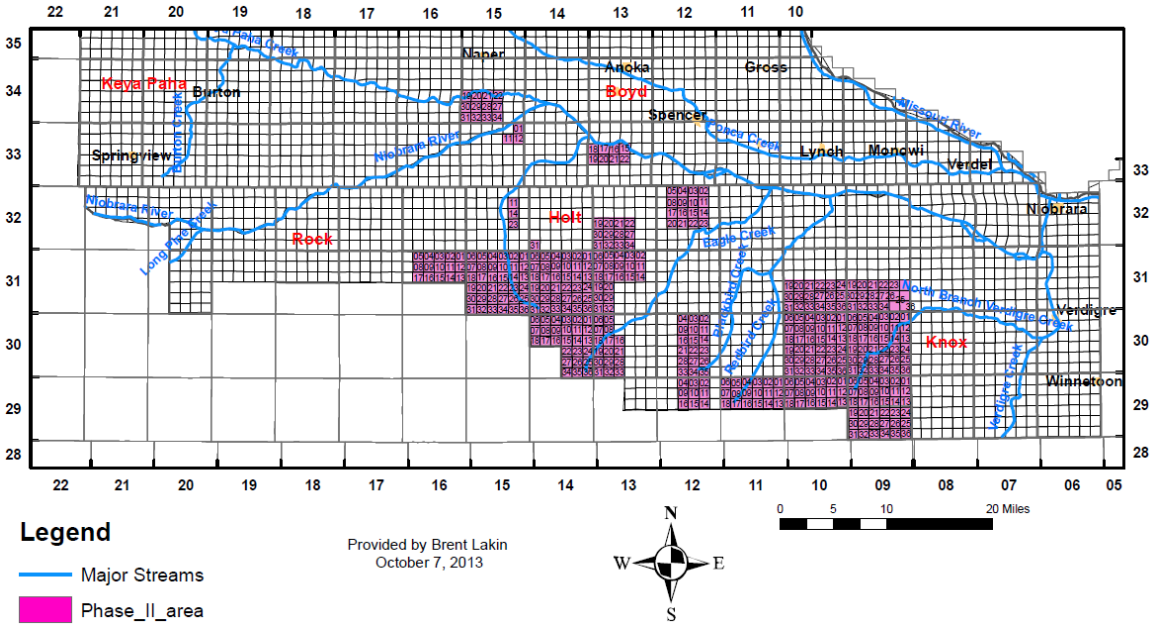


Figure 3: Lower Niobrara Natural Resources District Previously Designated Fully Appropriated Area of the Lower Niobrara River Basin

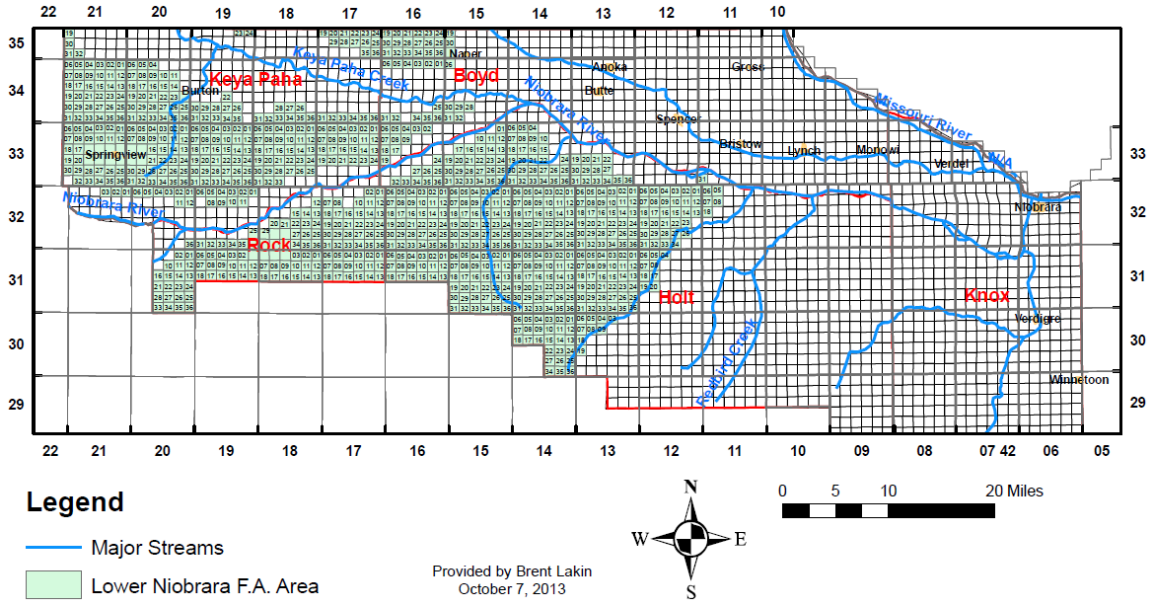


Figure 4: Lower Niobrara Natural Resources District Previously Designated Fully Appropriated Area of the Lower Platte River Basin

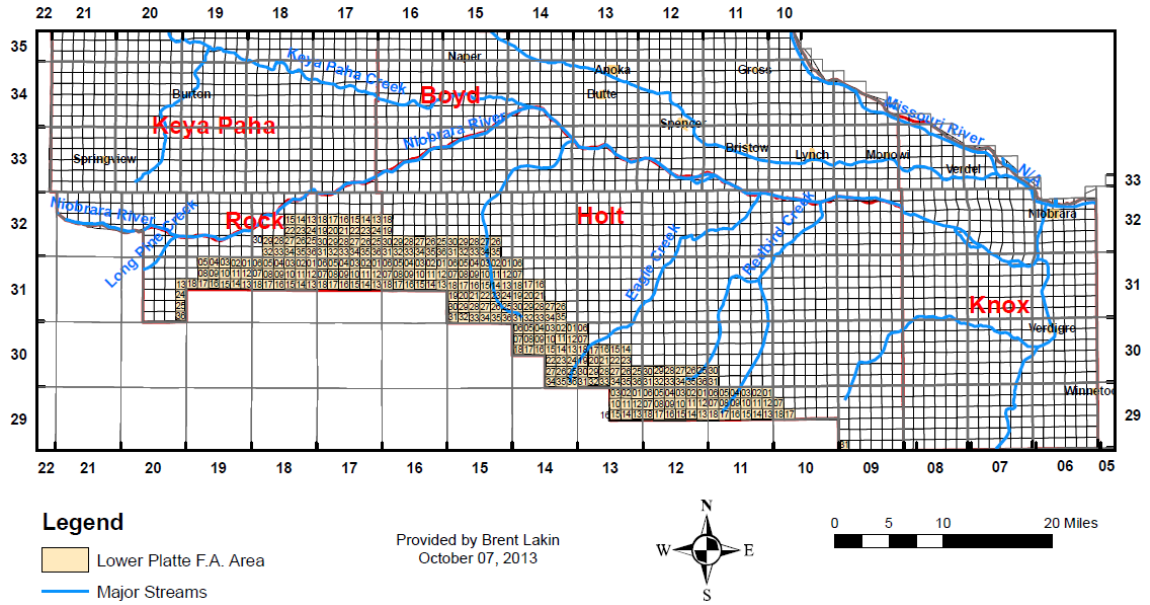


Figure 5: Lower Niobrara Natural Resources District Bazile Groundwater Management Area

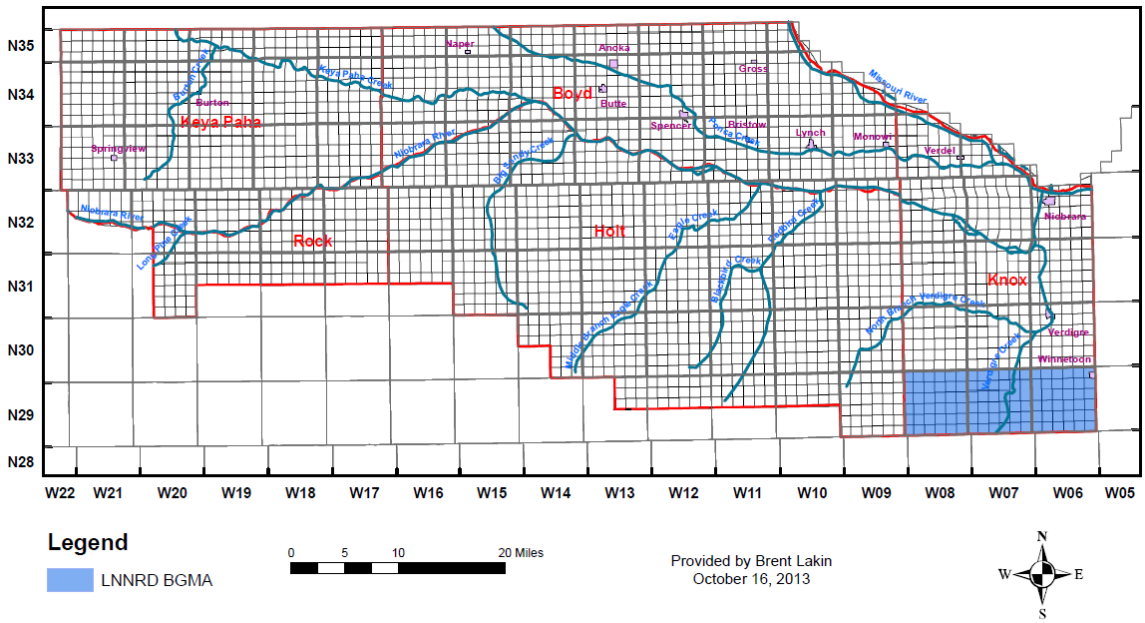
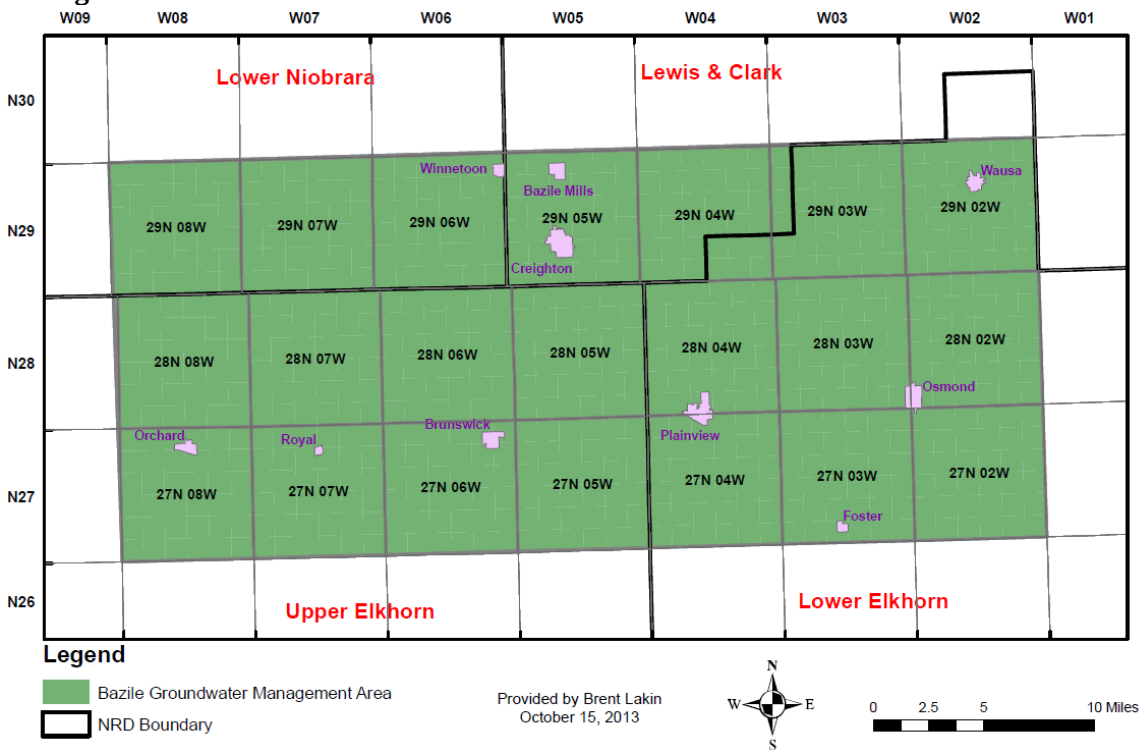



Figure 6: Lower Niobrara Natural Resources District Detail View of Bazile Groundwater Management Area