



**LEAGUE OF WOMEN VOTERS®  
OF NEBRASKA**

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## **STUDY OF QUALITY OF DRINKING WATER IN NEBRASKA**

**FOCUS:** To review the Safe Drinking Water Act and the Clean Water Act as they apply in Nebraska to protect drinking water.

**SCOPE:** To analyze Nebraska compliance with and enforcement of current regulations by the Nebraska Department of Environmental Quality (NDEQ) and various other State agencies and their ability to meet Nebraska Department of Health and Human Services (NDHHS) standards of quality for public and private drinking water. This may include:

- \* agricultural-related issues, including protection from herbicide, pesticide and solid waste runoff
- \* industrial discharge
- \* urban sanitary and storm-water overflow
- \* food processing, including discharge of waste water
- \* medical, veterinary and pharmaceutical contaminants
- \* pipeline construction/location
- \* fracking and mining operations
- \* wellhead protection
- \* coal-fired power plant particulate emissions

**GOAL:** To provide a basic overview of the current state of drinking water quality in Nebraska. To provide resources for citizens' use at local levels. To develop recommendations as basis for testimony at local and state government levels.

**EXECUTIVE SUMMARY:** This study of water quality in Nebraska is an addendum to the previous water quantity study completed by LWVNE in 1997. It is a review of the threats to drinking water in Nebraska and the protections currently in place. Nebraska has a unique system of water management through our Natural Resource Districts that are defined by watersheds to major rivers. The committee reviewed regulations, responsibilities of the various agencies, and their monitoring activities, enforcement and permitting processes, as well as water quality reports from those entities. This report is a summary of that research.

This report is divided into two main sections. The first outlines **RECOMMENDATIONS** for LWVNE PROGRAM (pp. 2-3) related to quality of drinking water in Nebraska. Each recommendation includes a brief description of the rationale for the statement.

The second section outlines a **DESCRIPTION OF WATER QUALITY OVERSIGHT AND REGULATIONS IN NEBRASKA** (pp. 4-8). This section includes a brief overview of the agencies tasked with monitoring and protecting water quality and the state and federal regulations that govern their actions. We also included a summary of the major sources of contamination of concern in Nebraska.

This report covers issues related to drinking water, and we did not include recreational waterway contamination, as we felt that was too broad for the scope of this effort.

## **SECTION 1: RECOMMENDATIONS for LWVNE PROGRAM**

1. The League of Women Voters of Nebraska (LWVNE) supports Legislative action that outlines a process for Nebraska Department of Health and Human Services (NDHHS), Nebraska Department of Natural Resources (NeDNR), and Nebraska Department of Environmental Quality (NDEQ) to proactively identify and manage emerging threats to human health including, but not limited to chemicals, pathogens, steroids, antibiotics, hormones and nutrient contaminants in drinking water.

Rationale: Nebraska has historically waited for guidance from the Federal government to take action on new threats to water quality. With the recent findings that elected officials are liable for harm done to populations when drinking water is contaminated, it is prudent that Nebraska maintain a proactive position on monitoring of contaminants. Globalization and climate change have increased the risk of contamination from emerging pathogens, water scarcity and flooding.

2. The LWVNE supports exclusion of pipeline siting in areas covered by the State Wellhead Protection Program, areas around municipal and private household wells without Wellhead Protection designation and in areas where the water table is at a level that rises near to the subsurface pipeline or to the surface beneath elevated pipelines. We encourage all municipalities to protect their wellhead protection areas through local ordinances.

Rationale: It has been recognized by major corporate interests that it is important to avoid wellhead protection areas when applicable and practicable as recommended by the NDEQ. National and international corporations are required to follow recommendations from the NDEQ and will recognize local and State ordinances.

3. The LWVNE supports a Legislative Task Force for further study on the management of both point source and non-point source contamination to both surface and groundwater sources to assure that Nebraska's current regulations are appropriate and adequate to protect water quality. The task force should include both agricultural and municipal representatives and consider specifically nutrients such as nitrates, as well as herbicides, pesticides, human and veterinary pharmaceuticals, hormones and particulate pollutants including mercury.

Rationale: Changes in concentrated agricultural practices and confinement operations, tillage of grasslands, urban landscape management, roadway runoff, and proliferation of pharmaceutical use have increased contaminants in our surface water. There is an interrelationship between surface and groundwater. Many Nebraska waterways are designated as having unsafe levels of mercury for fish consumption.

4. The LWVNE supports funding of NDHHS, NeDNR, NRDs (Natural Resource Districts) and NDEQ at a level that adequately allows for staffing and programming to monitor water quality, investigate complaints, thoroughly assess permitting requests and follow-up on violations to protect Nebraskans from contamination of both surface and groundwater. Budget shortfalls should not reduce essential water quality monitoring programs. Nebraska should assure that EPA regulations are implemented immediately with staffing levels adequate to assure compliance.

Rationale: While there is much concern about excessive regulations at the State level, these agencies provide critical protections to both surface water and groundwater. Nebraska was historically the last to implement EPA regulations under the Clean Water Act and has one of the smallest staff allotments in the country.

5. The LWVNE supports a robust educational program for private household drinking well owners in Nebraska and expansion of testing for contaminants which is currently limited to bacteria and nitrates. Local Health Departments should actively seek out property owners with private wells and provide both education and assistance with testing.

Rationale: The Safe Drinking Water Act does not apply to private drinking water supplies. DHHS and the UN-L Extension office has a series of NebGuides for private well owners that outlines procedures for testing for contaminants in drinking water and measures to take if levels exceed acceptable concentrations.  
[http://dhhs.ne.gov/publichealth/Pages/enh\\_brochures.aspx](http://dhhs.ne.gov/publichealth/Pages/enh_brochures.aspx).

## **SECTION 2: DESCRIPTION OF WATER QUALITY OVERSIGHT AND REGULATIONS IN NEBRASKA**

In 1997, the League of Women Voters of Nebraska (LWVNE) completed a water study that addressed issues related to water quantity.<sup>1</sup> In that study, there was a chapter briefly outlining “Quality Issues Relating to Water Quantity”. This study builds on that information as it relates to drinking water.

### **OVERVIEW OF THE SAFE DRINKING WATER ACT (SDWA)**

#### **NDHHS and EPA responsibilities**

NDHHS is responsible for monitoring of water quality with oversight by the EPA. According to the Nebraska Department of Health and Human Services website last updated 1/5/2017, <http://dhhs.ne.gov/publichealth/> ,

“the National Safe Drinking Water Act (SDWA), signed into law Dec. 16, 1974 and strengthened by amendments in 1986 and 1996, protects human health by regulating the nation’s public drinking water supply. The responsibility for ensuring safe drinking water is divided among the Federal EPA, states, tribes, water systems, and the public. The SDWA requires the U.S. EPA to set standards on drinking water contaminants that public water systems are required to meet. This included about 10 standards in the 1970s, but more than 90 standards today.”

“The Nebraska Safe Drinking Water Act mimics this federal regulation. Nebraska’s drinking water program has 1,375 public water systems, serving most of its 1.7 million residents. Ground water is the source for most of Nebraska’s drinking water. Only five public water systems in the state get their drinking water from surface water sources.” Those water systems are Beaver Lake, Blair, Cedar-Knox Rural Water District, Chadron, and Metro Utilities District (MUD).<sup>6</sup>

#### **Wellhead Protection**

“The State Wellhead Protection program is a voluntary program, which assists communities and other public water suppliers in preventing contamination of their water supplies. The Nebraska Legislature passed LB 1161 in 1998 (Neb. Rev. Stat. §46-1501 - 46-1509), authorizing the Wellhead Protection Area Act. This Act sets up a process for public water supply systems to use if they choose to implement a local Wellhead Protection plan. One hundred eleven community water supplies have approved Wellhead Protection Plans as of October 1, 2016” (p. 69)<sup>3</sup>. NDEQ has recommended that major crude oil pipelines avoid wellhead protection areas.

### **REGULATION OF NEBRASKA WATERS**

#### **Nebraska Department of Natural Resources (NeDNR) and the Natural Resource Districts (NRDs)**

In March 2015, Dr. Ann Bleed, former Director of NeDNR, and Nebraska State hydrologist, outlined the current responsibility for water quality in Nebraska’s Natural Resources: An Assessment of a Large-Scale Locally Controlled Water Governance Framework:

For the management of water quality, the Legislature also gave authority to the NRDs to implement rules and regulations to prevent groundwater contamination from non-point sources of pollution, but at the same time, to comply with the federal Environmental Protection

Act, the Legislature gave authority to the State Department of Environmental Quality to determine whether an area needs to be designated for the protection of groundwater quality (Peterson et al. 1993).

If protection is needed, the State Department of Environmental Quality is to work with the affected Natural Resource District (NRD) to develop an acceptable groundwater quality management plan and rules to implement the plan. The law also authorizes the State Department of Environmental Quality to specify and implement rules on their own if the state and the NRD cannot agree on an acceptable plan (Neb. Rev. Stat. §46722-734).

Today in Nebraska, surface water is administered by the State DNR under the appropriative rights doctrine. Groundwater is administered by 23 locally elected Natural Resources District Boards (NRDs) under a modified correlative rights/reasonable use legal framework. Where surface water and groundwater are hydrologically connected and either fully or over appropriated, the State Department of Natural Resources (DNR) and the NRD collaborate on an integrated management plan for the district. The NRDs are also to work with the State Department of Environmental Quality to prevent groundwater contamination. (p.40).<sup>2</sup>

#### **Overview of water quality rules by the NRDs**

“There is a great deal of variation in the rules for managing water quality among the NRDs. All NRDs have monitoring programs for the detection of water quality contamination. In many cases, if there is an indication of a rise in contamination, the level of monitoring will be increased.

All NRDs have established a contaminant level, which if exceeded, will trigger the development of a special management area. The actual trigger is usually defined as a certain percentage of the wells tested that are at or above a certain percentage of the maximum contaminant limit (MCL) that has been established by the federal government. In Nebraska, the major contaminant of concern is nitrate nitrogen, which has an MCL of 10 parts per million. When a special management area is developed, the NRD implements rules to address the problem.” (p. 136-137).<sup>2</sup>

#### **NDEQ Responsibilities**

Legislation passed in 2001 directed NDEQ to issue an annual report concerning the quality of groundwater in Nebraska. These reports can be found on the NDEQ’s website <http://deq.ne.gov>. Data from the Nebraska Department of Agriculture, University of Nebraska-Lincoln and NDEQ that are used in this report are accessible on the Department of Natural Resources Website, <http://dnr.ne.gov>.

Section 319 Federal grants are used to address both surface water and groundwater quality concerns through watershed treatment and lake renovation. “Beginning in SFY2004, funds were set aside from the Drinking Water State Revolving Fund (DWSRF) to finance source water protection projects statewide. Funds are provided to political subdivisions that operate a public water system serving a population of 10,000 or less. Eligible activities address drinking water quality, quantity, and/or education within the source water protection area” (p. 72).<sup>3</sup>

## **SOURCES OF WATER CONTAMINATION**

### **Point and Non-Point Source Pollution**

Water contamination may be defined as Point Source or Non-Point Source. Point Source pollution is any single identifiable source from which pollutants are discharged. These include superfund cleanup sites, waste dumps, as well as sanitary and storm sewers. Additionally, this could include hazardous waste and agricultural chemical storage sites, pipelines and livestock sewage lagoons. Non-Point Source pollution originates from diffuse area, without well-defined sources such as nutrients and chemicals washed off of fields and urban landscapes.

Point source pollution is well regulated by NDEQ, while non-point source contamination is more difficult to detect and regulate.

### **Superfund Site Cleanup**

Nebraska has ongoing interest in the status of Superfund cleanup by the State and Federal Government. "The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) became federal law in 1980. CERCLA established what has commonly become known as Superfund to deal with known or suspected contamination at inactive commercial/ industrial/military facilities or so-called 'uncontrolled hazardous waste or abandoned sites'. The nation's most contaminated sites are listed on the Superfund National Priorities List. Nebraska has 16 active and one proposed National Priorities List sites" (p. 32).

### **Nitrate pollution**

In a 2017 report, the Nebraska Water Center outlined the risks and possible solutions posed for Nebraska from increased Nitrates in our drinking water.

"Consumption of groundwater with nitrate-N above the U.S. Environmental Protection Agency (EPA) maximum contaminant level of 10 parts per million has been linked to a number of human health concerns, including blue baby syndrome (methemoglobinemia), which can reduce the ability of blood to carry oxygen in infants, unborn children, and the elderly."

"Previous groundwater quality studies, including those conducted by the University of Nebraska-Lincoln's Conservation and Survey Division that began more than 25 years ago, noted area aquifers are particularly vulnerable to contamination, primarily from agricultural sources of nitrogen. Historical use, and in some cases overapplication of fertilizer, has led to increased concentrations of groundwater nitrates. Increased groundwater nitrate is a common problem throughout Nebraska."

"With a recent EPA grant and support from the U.S. Department of Agriculture/Natural Resource Conservation Service through the National Water Quality Initiative some NRDs will provide cost sharing assistance to producers who implement best management practices (BMPs)."

"Nitrates are not the only chemical that may end up in drinking water where sandy soils, heavy water use or improper/outdated well construction can allow pesticides, bacteria, and other contaminants such as uranium and arsenic to enter water supplies at levels threatening human health." <sup>5</sup>

Northeast Nebraska's Upper and Lower Elkhorn, Lewis and Clark, and Lower Niobrara Natural Resources Districts are Participating in the EPA grant program. The area "is a 756 square mile region covering portions of Antelope, Knox, and Pierce counties. The area has a population of more than 7,000 and a complex mixture of heavily farmed, well drained sandy soils and shallow water tables that contribute to a "perfect storm" for groundwater nitrate contamination." <sup>5</sup>

### **Chemical Containment**

Title 198 - Rules and Regulations Pertaining to Agricultural Chemical Containment outlines regulations for the Agricultural Chemical Containment program regulating the construction and use of commercial and private facilities for the storage, loading, and rinsing activities of bulk liquid fertilizers and bulk liquid and dry pesticides. Although no permit or registration is required, the operation must have a construction plan for the facility and a management program. The NDEQ and the Nebraska Department of Agriculture have a cooperative agreement that outlines the procedure for coordinating inspection activities between the two agencies. The agreement enhances the communication between the agencies and provides specific protocols to be followed when investigating Agricultural Chemical Containment complaints. In FY2016, [NDEQ] Agriculture Section staff conducted a total of 13 complaint investigations of suspected releases related to agricultural chemical containment systems. (p. 61).<sup>3</sup>

### **Livestock Waste Control**

Nebraska Department of Environmental Quality has implemented the Livestock Waste Control Program (LWC). NDEQ "is charged with the overall responsibility to protect Nebraska's surface water and groundwater from discharge of livestock waste from any of the thousands of Animal Feeding Operations (AFOs) in Nebraska. The LWC program primarily focuses on the 733 active large Concentrated Animal Feeding Operations (CAFOs) required to have permits, but also works with approximately 2,000 Medium AFOs. The LWC Program uses inspections, permitting, and periodic monitoring to fulfill this responsibility." (p. 57)<sup>3</sup>.

### **Chemigation or Direct Application of Nutrients and Chemicals**

The NDEQ also manages a "Chemigation program, which functions in cooperation with Nebraska's 23 Natural Resources Districts (NRDs). The two agencies work to ensure that users of irrigation systems applying fertilizers and pesticides do not contaminate the sources of irrigation water. These regulations are contained in Title 195 – Chemigation Regulations.

The NRDs inspect irrigation systems and issue site permits for specific safety equipment that is required to be installed on systems that chemigate. [Chemigation is the injection of any chemical such as nitrogen, phosphorus or a pesticide into irrigation water and applied to the land using the irrigation system.] Chemigation permits for chemigation sites are issued annually, and are reported to the Department on a calendar year basis. Since permitting began in 1987, the total number of annual permits issued has followed an upward trend with NRDs issuing 29,457 chemigation permits in 2015, a two percent increase over 2014 permits issued." (p. 61). <sup>3</sup>

### **Grassland Conversion to Cropland**

Not directly related to water quality, but certainly contributing to nonpoint source runoff issues is grassland conversion to cropland. Responding to a USDA Farm Services Agency (FSA) study the

National Wildlife Federation reported in 2013 that “Nebraska had by far the largest amount of land converted to cropland production. Researchers have previously reported high rates of land conversion, driven by high crop prices in the last few years. For instance, 1.3 million acres of grassland and wetland were converted to cropland in the Dakotas, Nebraska and parts of Minnesota and Iowa between 2006 and 2011 – land conversion rates that haven’t been seen since before the Dust Bowl. Indeed, USDA’s data show that Nebraska had more land converted to cropland (54,876 acres) between 2011 and 2012 than any other state.”<sup>4</sup>

### **DEQ and NRD Management of Groundwater**

A joint effort of the NDEQ and the NRDs is the Groundwater Management Area program that “focuses on assessing areas where groundwater problems from nonpoint source contaminants (such as agricultural chemicals) exist or are likely to exist. Public outreach and Best Management Practices are a large component of this plan” (p.68).<sup>3</sup> Additionally, “The Nebraska Nonpoint Source Management Program is an integrated statewide effort to protect and improve water quality impacted by nonpoint source pollution. The program is of particular significance because nonpoint source pollution is the most prevalent, widespread cause of water quality degradation in Nebraska. Nonpoint source pollutants of particular concern in Nebraska include those associated with runoff and percolation from agricultural and urban areas”. (p. 71)<sup>3</sup>

### **FUTURE ISSUES**

#### **Lead in water lines.**

According to the CDC, the state of Nebraska currently does not receive funding from the Centers for Disease Control and Prevention for lead poisoning prevention programmatic activities.

### **REFERENCES**

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- (2) Nebraska’s Natural Resources Districts: An Assessment of a Large-Scale Locally Controlled
- (3) Nebraska Good Life. Great Environment. Dept. of Environmental Quality Annual Report to the Legislature 2016
- (4) USDA Data: Grasslands, Forests Being Converted to Cropland at Alarming Rates  
USDA Farm Service Agency Stats: 600+ Square Miles Plowed/Cleared in 2011-12  
9-18-2013 // Ben Larson <http://www.nwf.org/News-and-Magazines/Media-Center/News-by-Topic/Wildlife/2013/9-18-13-USDA-Data-Grasslands-Forests-Being-Converted-to-Cropland-at-Alarming-Rates.aspx>
- (5) Nebraska Water Center, 6/6/2017 <http://watercenter.unl.edu/0606-nrds-team-bazile-groundwater-management-area>
- (6) NebGuide 1539 Intro to Drinking Water, revised January 2011, University of Nebraska-Lincoln, Institute of Agriculture and Natural Resources  
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