Proposed Reservoir Life Goal (Accepted January 2005)

To sustain a balance between water uses and water supplies so that the economic viability, social and environmental health, safety and welfare of the river basin can be achieved and maintained for both the near term and the long term.

46-709. Ground water management plan; required; contents. Each district shall maintain a ground water management plan based upon the best available information and shall submit amendments to such plan to the Director of Natural Resources for review and approval.

The plan shall include, but not be limited to, the identification to the extent possible of:

(1) Ground water supplies within the district including transmissivity, saturated thickness maps, and other ground water reservoir information, if available;

(2) Local recharge characteristics and rates from any sources, if available;

(3) Average annual precipitation and the variations within the district;

(4) Crop water needs within the district;

(5) Current ground water data-collection programs;

(6) Past, present, and potential ground water use within the district;

(7) Ground water quality concerns within the district;

(8) Proposed water conservation and supply augmentation programs for the district;

(9) The availability of supplemental water supplies, including the opportunity for ground water recharge;

(10) The opportunity to integrate and coordinate the use of water from different sources of supply;

(11) Ground water management objectives, including a proposed ground water reservoir life goal for the district. For management plans adopted or revised after July 19, 1996, the ground water management objectives may include any proposed integrated management objectives for hydrologically connected ground water and surface water supplies but a management plan does not have to be revised prior to the adoption or implementation of an integrated management plan pursuant to section 46-718 or 46-719;

(12) Existing subirrigation uses within the district;

(13) The relative economic value of different uses of ground water proposed or existing within the district; and

(14) The geographic and stratigraphic boundaries of any proposed management area.

If the expenses incurred by a district preparing or amending a ground water management plan exceed twenty-five percent of the district's current budget, the district may make application to the Nebraska Resources Development Fund for assistance.

Each district's ground water management plan shall also identify, to the extent possible, the levels and sources of ground water contamination within the district, ground water quality goals, long-term solutions necessary to prevent the levels of ground water contaminants from becoming too high and to reduce high levels sufficiently to eliminate health hazards, and practices recommended to stabilize, reduce, and prevent the occurrence, increase, or spread of ground water contamination.

Source: Laws 1982, LB 375, § 3; Laws 1983, LB 378, § 3; Laws 1984, LB 1106, § 37; R.S.1943, (1993), § 46-673.01; Laws 1996, LB 108, § 18; Laws 2000, LB 900, § 191; Laws 2003, LB 619, § 12; R.S.Supp.,2003, § 46-656.12; Laws 2004, LB 962, § 49.
Operative date July 16, 2004.

46-710. Ground water management plan preparation or modification; district; solicit and utilize information. During preparation or modification of a ground water management plan, the district shall actively solicit public comments and opinions and shall utilize and draw upon existing research, data, studies, or any other information which has been compiled by or is in the possession of state or federal agencies, natural resources districts, or any other subdivision of the state. State agencies, districts, and other subdivisions shall furnish information or data upon the request of any district preparing or modifying such a plan. A district shall not be required to initiate new studies or data-collection efforts or to develop computer models in order to prepare or modify a plan.

Source: Laws 1982, LB 375, § 4; R.S.1943, (1993), § 46-673.02; Laws 1996, LB 108, § 19; R.S.1943, (1998), § 46-656.13; Laws 2004, LB 962, § 50.
Operative date July 16, 2004.

46-711. Ground water management plan; director; review; duties. (1) The Director of Natural Resources shall review any ground water management plan or plan modification submitted by a district to ensure that the best available studies, data, and information, whether previously existing or newly initiated, were utilized and considered and that such plan is supported by and is a reasonable application of such information. If a management area is proposed and the primary purpose of the proposed management area is protection of water quality, the director shall consult with the Department of Environmental Quality regarding approval or denial of the management plan. The

director shall consult with the Conservation and Survey Division of the University of Nebraska and such other state or federal agencies the director shall deem necessary when reviewing plans. Within ninety days after receipt of a plan, the director shall transmit his or her specific findings, conclusions, and reasons for approval or disapproval to the district submitting the plan.

(2) If the Director of Natural Resources disapproves a ground water management plan, the district which submitted the plan shall, in order to establish a management area, submit to the director either the original or a revised plan with an explanation of how the original or revised plan addresses the issues raised by the director in his or her reasons for disapproval. Once a district has submitted an explanation pursuant to this section, such district may proceed to schedule a hearing pursuant to section 46-712.

Source: Laws 1982, LB 375, § 5; Laws 1986, LB 894, § 27; Laws 1993, LB 3, § 12; R.S.1943, (1993), § 46-673.03; Laws 1996, LB 108, § 20; Laws 2000, LB 900, § 192; R.S.Supp.,2002, § 46-656.14; Laws 2004, LB 962, § 51.
Operative date July 16, 2004.

INTEGRATED MANAGEMENT PLAN
Jointly Developed by the
DEPARTMENT OF NATURAL RESOURCES
And the
MIDDLE REPUBLICAN NATURAL RESOURCES DISTRICT

AUTHORITY

This integrated management plan was prepared by the Board of Directors of the Middle Republican Natural Resources District (MRNRD) and the Nebraska Department of Natural Resources (NDNR) in accordance with Sections 46-715, 46-716, 46-717, and 46-720, R.S.Supp., 2004.

BACKGROUND

In 1943 the States of Colorado, Kansas and Nebraska entered into the Republican River Compact (hereinafter the Compact) with the approval of Congress. The Compact provides for the equitable apportionment of the "virgin water supply" of the Republican River Basin. Following several years of dispute about Nebraska's consumptive use of water within the basin, Kansas filed an original action in the United States Supreme Court against the states of Nebraska and Colorado in 1998. After several rulings by the Court and it's Special Master and several months of negotiation, all three states entered into a comprehensive Settlement Agreement. That Agreement was approved by the Court on May 19, 2003 and the Special Master's final report approving the Joint Groundwater Model developed by all three states for use in computing stream flow depletions resulting from groundwater use was submitted to the Court on September 17, 2003.

In July, 1996, the MRNRD and the other three Natural Resources Districts in the Republican River Basin, pursuant to then Section 46-656.28 of the Nebraska statutes, initiated a joint action planning process with the Department of Water Resources (DWR), the predecessor agency to NDNR. In accordance with that process, DWR first made a preliminary determination in 1996 that "there was reason to believe that the use of hydrologically connected ground water and surface water resources is contributing to or is in the reasonably foreseeable future likely to contribute to disputes over the Republican River Compact." When the studies required by Section 46-656.28 had been completed, NDNR issued its conclusions on May 20, 2003 in the form of a report entitled: "Republican River Basin, Report of Preliminary Findings." Those conclusions included the following determination:

Pursuant to Section 46-656.28 and the preliminary findings in this report, the Department determines that present and future Compact disputes arising out of

the use of hydrologically connected ground water and surface water resources in the Republican River Basin can be eliminated or reduced through the adoption of a joint action plan.

Following four hearings on that report, NDNR made final the preliminary conclusions in the report and the four basin Natural Resources Districts were so informed. The MRNRD and the other three Districts each then adopted orders to proceed with developing a joint action plan for integrated management of hydrologically connected surface water and ground water resources in the basin; preparation of a joint action plan for the MRNRD began soon thereafter.

The 2004 Nebraska Legislature adopted LB962 in April of 2004 and it was signed by Governor Johanns on April 15, 2004 and became operative on July 16, 2004. That bill repealed Section 46-656.28 and replaced it with legislation providing for a revised process for addressing hydrologically connected surface water and ground water resources. In order to avoid the need to begin anew the integrated management planning processes that had been commenced but not completed under Section 46-656.28, LB962 provided for the transition of those ongoing planning processes into the newly enacted process codified now as Sections 46-713 to 46-719, R.S. Supp., 2004. The MRNRD and NDNR agreed that preparation of a joint action plan had not been completed prior to July 16, 2004; therefore, subsection (3) of what is codified as Section 46-720, R.S. Supp., 2004, governs that transition. Completion of this plan proceeded under the new process and this plan is being proposed for adoption in accordance with Section 46-718, R.S. Supp., 2004.

GOALS AND OBJECTIVES

Pursuant to Section 46-715, R.S.Supp., 2004, the goals and objectives of an integrated management plan must have as a purpose "sustaining a balance between water uses and water supplies so that the economic viability, social and environmental health, safety, and welfare of the Republican River Basin can be achieved and maintained for both the near term and the long term". The following goals and objectives are adopted by the MRNRD and the NDNR to achieve that purpose:

Goals:

1. To assist the State of Nebraska, in cooperation with the other basin Natural Resources Districts, in maintaining compliance with the Republican River Compact as adopted in 1943 and as implemented in accordance with the settlement approved by the United States Supreme Court on May 19, 2003.
2. Ensure that ground water and surface water users within the MRNRD assume their share of the responsibility to keep Nebraska in compliance with the Republican River Compact. Neither the MRNRD

or NDNR will require the integrated management plan to be amended solely for the purpose of changing the responsibility of water users within the MRNRD based on the failure of the other basin NRDs to implement or enforce an integrated management plan to meet their share of the responsibility to keep Nebraska in compliance with the Republican River Compact.

3. Provide that MRNRD's share of that responsibility be distributed in an equitable manner and, by minimizing to the extent possible, adverse economic, social and environmental consequences.

Objectives:

1. With limited exceptions, prevent the initiation of new or expanded uses of water that increase Nebraska's computed beneficial consumptive use of water within the MRNRD.

2. Ensure that administration of surface water appropriations in the Basin is in accordance with the Compact and in full compliance with Nebraska law.

3. Reduce existing ground water use within the MRNRD by five (5) percent from the baseline of use that is established by utilizing 1998 to 2002 ground water pumping estimates and the associated streamflow depletions as computed through use of the RRCA Ground Water Model.

4. After taking into account any reduction in beneficial consumptive use achieved through basinwide incentive programs, make such additional reductions in ground water use in water short years as are necessary to achieve a reduction in beneficial consumptive use in the MRNRD in an amount proportionate to the total reduction in consumptive use that is needed in Nebraska above Guide Rock in such years.

5. Cause the required reductions in water use to be achieved through a combination of regulatory and incentive programs designed to reduce beneficial consumptive use, relying to the extent available funds allow, on incentive programs that are made available to as many MRNRD water users as possible.

6. The MRNRD and the NDNR will investigate or explore methods to manage the impact of vegetative growth on streamflow.

MAP - see map 1.

The area subject to this integrated management plan is the geographic area within the boundaries of the Middle Republican Natural Resources District.

GROUND WATER CONTROLS

The authority for the ground water component of this integrated management plan is Section 46-715 and Section 46-739, R.S.Supp., 2004. The ground water controls that will be adopted and implemented by the Middle Republican Natural Resources District are those found in Chapters 1 through 5 Rules and Regulations – Ground Water Management Area in the Middle Republican Natural Resources District

SURFACE WATER CONTROLS - Department of Natural Resources

The authority for the surface water component of this integrated management plan is Section 46-715 and Section 46-716 R.S.Supp., 2004. The surface water controls that will be continued and/or begun by the NDNR are as follows:

1. NDNR will do the following additional surface water administration as required by the Settlement Agreement:
    - To provide for regulation of natural flow between Harlan County Lake and Superior-Courtland Diversion Dam, Nebraska will recognize a priority date of February 26, 1948 for Kansas Bostwick Irrigation District, the same priority date as the priority date held by the Nebraska Bostwick Irrigation District's Courtland Canal water right.
    - When water is needed for diversion at Guide Rock and the projected or actual irrigation supply is less than 130,000 acre feet of storage available for use from Harlan County Lake as determined by the Bureau of Reclamation using the methodology described in Harlan County Lake Operation Consensus Plan attached as Appendix K to the Settlement Agreement, Nebraska will close junior, and require compliance with senior, natural flow diversions of surface water between Harlan County Lake and Guide Rock.
    - Nebraska will protect storage water released from Harlan County Lake for delivery at Guide Rock from surface water diversions.
    - Nebraska, in concert with Kansas and in collaboration with the United States, and in the manner described in Appendix L to the Settlement Agreement, will take actions to minimize the bypass flows at Superior-Courtland Diversion Dam.

2. Metering of all surface water diversions at the point of diversion from the stream will continue to be required. For surface water canals that are not part of a Bureau of Reclamation project, farm turnouts also will be required to be metered by the start of the 2005 irrigation season. All meters shall have a totalizer and shall meet Department standards for installation, accuracy and maintenance. All appropriators will be monitored closely to ensure that neither the rate of diversion nor the

annual amount diverted exceeds that allowed by the applicable permit or by statute.

3. The Department's moratorium on the issuance of new surface water permits was made formal by order of the Director dated July 15, 2004 and will be continued. Exceptions may be granted to the extent permitted by Section 46-714(3) or to allow issuance of permits for existing reservoirs that currently do not now have such permits. Such reservoirs may be identified through the Settlement required inventory of over 15 acre-feet reservoirs or otherwise.

4. All proposed transfers of surface water rights shall be subject to the revised criteria for such transfers as found in Sections 46-290 to 46-294.04 or the criteria found in Sections 46-2,120 to 46-2,130.

5. The Department completed the adjudication process for the individual appropriators in the Republican River Basin in 2004. The results of that adjudication provide up-to-date records of the number and location of acres irrigated with surface water by such appropriators. Those records will be used by the Department to monitor use of surface water and to make sure that unauthorized irrigation is not occurring. The Department also will be proactive in initiating subsequent adjudications whenever information available to the Department indicates that there are water rights that are not being used and for which no known sufficient cause for such non-use exists.

6. At this time, due to the already limited availability of surface water supplies, the Department will not require that surface water appropriators apply or utilize additional conservation measures or that they be subject to other new restrictions on surface water use. However, the Department reserves the right to request, in the future, that this integrated management plan be modified to require any such additional measures. In the event such a request is made, the Department will "allow the affected surface water appropriators and surface water project sponsors a reasonable amount of time, not to exceed one hundred eighty days, unless extended by the Department, to identify the conservation measures to be applied or utilized, to develop a schedule for such application and utilization, and to comment on any other proposed restrictions." (46-716(2))

INCENTIVE PROGRAMS

The MRNRD and NDNR intend to establish and implement financial or other incentive programs to reduce beneficial consumptive use of water within the MRNRD. As a condition for participation in an incentive program, water users or landowners may be required to enter into and perform such agreements or

covenants concerning the use of land or water as are necessary to produce the benefits for which the incentive program is established.

Such incentive programs may include any program authorized by state law and/or Federal programs such as the Conservation Reserve Enhancement Program (CREP) and Environmental Quality Incentives Program (EQIP) operated by the U.S. Department of Agriculture.

INFORMATION CONSIDERED

Information used in the preparation and to be used in the implementation of this integrated management plan can be found in the simulation runs of the Republican River Compact Administration Ground Water Model, the data tables of the Final Settlement Stipulation for the Republican River Compact, Chapters 2 and 3 of the 1994 Middle Republican NRD Ground Water Management Plan and additional data on file with the District and the Department of Natural Resources.

Map1. Management Area Boundaries

Map 2. Critical Unit

Table 1. Municipal Allocation

Table 2. Livestock operation allocations

Middle Republican Natural Resources District
GROUNDWATER MANAGEMENT PLAN
Ground Water Quality Policy Supplement

MRNRD'S GOAL FOR WATER QUALITY: To maintain an adequate supply of groundwater of acceptable quality to meet the overall needs essential to the general welfare of citizens and present and future development of agriculture. Water of a quality that is safe for human consumption, using standards established by the Nebraska Department of Environmental Quality must be considered as the minimum standard for all uses.

QUALITY CONCERNS

Natural Resources Districts have significant legal authority to regulate activities which contribute to nonpoint source contamination of ground water. Contamination is defined as material which enters the ground water due to action of any person and causes degradation of the quality of ground water sufficient to make such ground water unsuitable for present or reasonably foreseeable beneficial uses. The regulatory to for point sources of contamination rest with the Department of Environmental quality.

Nitrate nitrogen currently appears to the greatest water quality concern in the district. The Red Willow – Hitchcock Counties Quality Management Area represents one area of increased levels of nitrate nitrogen contamination. Several communities in the district have been placed on administrative order for elevated levels of nitrates and others communities have sought new well fields for their community supply because on nitrate contamination. Isolated incidents of high levels of nitrate have been found in nearly all areas of the district but in most cases these were considered as faulty well construction rather than nonpoint source contamination.

Historical records of municipal water tests and the creation of a rural domestic and irrigation water analysis program have indicated that groundwater nitrate levels are on the rise. Within recent years several village public water supply systems have exceeded the Maximum Contaminate Level (MCL) of 10 ppm (parts per million) for nitrates. Numerous farm and irrigation wells in some areas of the District have tested in excess of the MCL.

Health concerns associated with nitrates are most often related with infants less than six months of age or pregnant women. Excessive nitrate levels can lead to methemoglobinemia a condition commonly known as “blue baby syndrome”. Health risks to adults are still under study. Very high nitrate levels also pose potential health risks to livestock.

Although nitrate contamination currently appears to pose the greatest water quality concern in the LRNRD, the four levels established in this Plan relate to any contaminate found in the groundwater which could prove detrimental to the health of the District's humans and animals.

References
Hydrology Model
Special Protection Area Report-Link
Special Protection Area – Gottula
USGS Report SPA –

USGS reports Rep model

GROUNDWATER QUALITY MANAGEMENT PROVISIONS

Levels of Control Due to Quality

Level 1

The LRNRD will establish a Level 1 control area over the entire District that is not previously included under a management area. It will be the goal of the District to establish at least two monitoring wells per township for Level 1 data collection. These monitoring locations will utilize pre-existing irrigation wells unless there are not two suitable locations. If such a condition exists, it will be the Board's discretion if new monitoring wells will be installed. The following will be Level 1 controls:

- Provide voluntary training sessions on water management practices, new technologies, fertilizer management, etc.
- Sponsor and participate in district wide demonstration projects
- Provide public information and education
- Establish water conservation, lawn care and management programs with communities
- Encourage both urban and rural Best Management Practices (BMPs) of conservation of water
- Provide technical assistance in improving irrigation efficiency
- Maintain an ongoing program of sampling wells for groundwater quality district wide

Level 2

When sampling results show 55% of MCL has been reached for any sampled water contaminant in 70% or more of the sampled wells within a sub-area, the LRNRD Board will take the actions to further identify the problem area, establish sub-area boundaries, and determine the controls to be implemented. A sub-area is defined as an area containing at least 5 wells within the LRNRD's well sampling program around which a logical boundary can be drawn. The minimum size of a sub-area shall be eighteen (18) square miles if a community well field is within the sub-area; otherwise the minimum size of a sub-area shall be thirty-six (36) square miles.

In addition to Level 1 requirements and activities, Level 2 will consist of:

- Increased information and education in target areas.
- Work with local producers to establish demonstration sites within target areas to promote the use of BMPs.

Level 3

When sampling results show 75% of MCL has been reached for any sampled water contaminant in 70% or more of the sampled wells within a sub-area, Level 3 will be initiated.

Along with previously required activities, Level 3 will also include:

- All operators farming within a Level 3 area must be certified in irrigation/nitrogen management. This certification can be obtained by attending LRNRD Board approved training workshops. This certification will be good for a four-year period of time. Although at this time there is no data to show that contaminants other than nitrogen are at or near the triggers, monitoring for other contaminants will continue. If in the future the monitoring program establishes the existence of other contaminants reaching the trigger levels, the NRD will require best management practices as recommended by the appropriate state or federal agency.
- Prohibit fall applications of commercial nitrogen fertilizer for spring crops of the following year.

Each operator is required to take soil samples to a minimum depth of 36" for residual nitrate-nitrogen on a demonstration field. Demonstration field shall mean an operator's largest irrigated field, as delineated in the FSA cropping plans records, in which the operator intends to apply livestock waste or commercial nitrogen fertilizer for the ensuing crop year. If the operator does not have any irrigated fields, the demonstration field shall mean the largest dry land field as delineated in the FSA cropping plan records, in which the operator intends to apply livestock waste or commercial nitrogen fertilizer for the ensuing crop year.

- Operators will be required to apply no more than the LRNRD approved lab's recommendation for demonstration field. (A list of LRNRD approved labs can be found in Appendix A.)
- Annual reporting for operator's demonstration field is required on forms provided by the District. The reports must be submitted to the LRNRD prior to December 31st of each year.

Level 4

When sampling results show that 95% MCL has been reached for any sampled water contaminant in 70% or more of the sampled wells in a sub-area, Level 4 will be initiated.

Requirements in addition to previous levels will include:

- Required Level 3 soil sampling procedure on <u>all</u> fields.
- No greater than the LRNRD approved lab nitrogen fertilizer recommendations followed on all fields.
- Required reporting on forms provided by the District on <u>all</u> fields.
- Require irrigation scheduling.

Optional Requirements that may be initiated if the LRNRD Board deems necessary:

- Flow meters or other approved water measuring devices may be required to measure the amount of water applied to each irrigated field.
- Irrigation water allocation may be required.
- Split application of commercial nitrogen fertilizer may be required.
- Nitrogen credits may be required to be reported on annual report.

CHEMIGATION INSPECTION AND PERMIT ADMINISTRATION

The LRNRD will continue to administer (in cooperation with the Nebraska Department of Environmental Quality) an inspection and permit program as directed by the Nebraska Chemigation Act. Persons applying fertilizer or chemicals through irrigation systems that can backflow into the groundwater must meet certain provisions under the act. These provisions require certification training, the use of proper equipment and obtaining a permit. The equipment must be inspected by the NRD before a permit is issued. Permits must be renewed each year. The NRD conducts site inspections annually on existing permits to see if equipment is in satisfactory condition. Each system will be checked at least once every three years. Other existing site inspections will be made as time and circumstances dictate. The LRNRD will notify the Department of Environmental Quality of leaking storage tanks discovered while inspecting a chemigation system.

ABANDONED WELL PROGRAM

The District will continue to offer cost-share assistance to the public to encourage the proper decommissioning of wells which are no longer in use and the plans of the landowner do not include future use of the well.

In addition to this cost-share assistance, the District will make an effort to locate sites of abandoned wells. Available funding will impact this effort.

POINT SOURCE POLLUTION

The Lower Republican NRD is concerned about the possible contamination of our groundwater resource by point source pollutants. These contaminants often make it difficult to discern whether the groundwater sample is contaminated from a source that the NRD has the legislative authority to address with a management system--since NRDs only have authority to manage for a non-point source problem. Two sources of point source contamination that fall in

this category of specific concern to the District are chemical and fertilizer storage at chemigation sites and large livestock containment facilities. There are two maps included in this Plan, one showing the chemigation sites where the District performs scheduled inspections (figure 29 page 6-29) and the other map showing the livestock confinement facilities registered in the LRNRD through the Department of Environmental Quality (figure 25 page 6-25).

It is the opinion of the District that NRDs have neither the capability nor authority to address point source contamination. The LRNRD will therefore rely on agencies such as the Nebraska Department of Environmental Quality and others to address point source contamination. This is in compliance with Section 46-674.05 of the Nebraska Groundwater and Management Protection Act.

Nevertheless, the District is willing to assist the Nebraska Oil & Gas Commission, the Nebraska Department of Environmental Quality and the Nebraska Department of Health and Human Services by channeling complaints and inquiries, relating to various forms of point source contamination, to the appropriate agency. The District is unaware of any groundwater contamination problems resulting from the few oil field activities located in this NRD. A map showing the general locations of the oil fields in the LRNRD is found on figure 30 page 6-30.

Other potential point source contaminants within the District include leaking underground storage tanks, fumigants from grain storage sites, solid and liquid waste disposal sites, salvage or industrial operations and fertilizer or agricultural chemical storage facilities. It is the continued policy of the LRNRD to report any known incident or complaint regarding point source contamination, from the above-mentioned list, to the Nebraska Department of Environmental Quality or other appropriate agency.

WELLHEAD PROTECTION AREAS

RED WILLOW - HITCHCOCK QUALITY MANAGEMENT AREA