NEMAHA NATURAL RESOURCES DISTRICT MANAGEMENT AREA RULES AND REGULATIONS FOR GROUNDWATER QUANTITY MANAGEMENT AREAS

TABLE OF CONTENTS

CHAPTER 1 – AUTHORITY FOR ISSUING THESE RULES AND REGULATIONS

1.1. Water Management Plan – On January 1, 1986 the District's first Water Management Plan went into effect pursuant to the passage of Nebraska Revised Statute Chapter 46, Article 6, Section 73.01 enacted by the 88th Nebraska Legislature.

1.2. Groundwater Management Plan – On November 1, 1995 the District updated the Water Management Plan of 1986 with the Groundwater Management Plan pursuant to the passage of Nebraska Revised Statute Chapter 46, Article 6, Section 73.13 enacted by the 92nd Nebraska Legislature. The Statute required Natural Resources Districts to amend their groundwater management plans to identify, manage and establish goals concerning groundwater quality.

1.3. Groundwater Management Plan Rules and Regulations – On August 11, 1999 updated Groundwater Management Plan Rules and Regulations were adopted placing the entire District into a Phase I Groundwater Management Area due to elevated nitrates. The Phase I designation also required obtaining a permit for any wells designed and constructed to pump greater than 50 gallons per minute and allowing the District to collect a water sample to establish a benchmark nitrate level.

1.4. Phase II Groundwater Quality Management Area Designated – On February 25th, 2003, due to elevated nitrate concentrations in groundwater a 73 square mile area was designated a Phase II Groundwater Quality Management Area as set forth by the triggering mechanism established within the District's Groundwater Management Plan Rules and Regulations.

1.5. Groundwater Management Plan Rules and Regulations – On May 15th, 2006 new Groundwater Management Plan Rules and Regulations were adopted placing a two-year temporary closure to the issuance of well permits for wells designed and constructed to pump greater than 50 gallons per minute District-wide. The two-year closure allowed the District time to update the Groundwater Management Plan to address groundwater quantity issues and develop Rules and Regulations accordingly.

1.6. Groundwater Management Plan Rules and Regulations – On May 15th, 2008 the expiration date to the temporary closure to the issuance of well permits for wells designed and constructed to pump greater than 50 gallons per minute was extended to October 15th, 2008.

1.7. Groundwater Management Plan Rules and Regulations – On October 9th, 2008 the District Board of Directors approved a resolution placing an immediate temporary 180 day stay on the construction of any new water well designed to pump greater than 50 gallons per minute.

1.8. Groundwater Management Plan Rules and Regulations – On December 11th, 2008 the District Board of Directors adopted the revisions to the District's Groundwater Management Plan Rules and Regulations and issued an administrative order establishing

the effective date of the rules as February 1st, 2009. The Board also approved a termination date of February 1st, 2009 for the temporary 180 day stay on the construction of new water wells.

1.9. Groundwater Management Plan Rules and Regulations – On January 10th, 2013 the District Board of Directors approved a resolution placing an immediate temporary 180 day stay on the construction of any new water well designed to pump greater than 50 gallons per minute. On April 11th, 2013 the District Board of Directors adopted the revisions to the District's Groundwater Management Plan Rules and Regulations and issued an administrative order establishing the effective date of the rules as May 9th, 2013. The Board also approved a termination date of May 9th, 2013 for the temporary 180 day stay on the construction of new water wells.

1.10. Groundwater Management Plan Rules & Regulations – On November 13th, 2014 the District Board of Directors adopted the revisions to the District's Groundwater Management Plan Rules and Regulations and issued an administrative order establishing the effective date of the rules as December 15th, 2014. Specifically, the updated rules and regulations addressed minimum well spacing for new high-capacity water from existing water wells as well as updated definitions, increased late well permit fee, allocation amounts, amount of transfer acres allowable, minimum well score, well density calculation criteria, points for irrigation methods and requiring a minimum aquifer thickness for well permits.

1.11. Groundwater Management Plan Rules & Regulations – On October 8th, 2015, the District Board of Directors adopted a resolution increasing the well permit ranking system methodology minimum approval score to 231 points for any well permit application received, excluding public water supply wells, located east of US Highway 75 and north of 705 Road in Richardson County.

1.12. Groundwater Management Plan Rules & Regulations – On September 8th, 2016, the District Board of Directors approved a motion to require 300 points as the minimum score for well permit approval using the well permit ranking system methodology for any well permit application received, excluding public water supply wells, located in that area of Richardson County which is east of Highway 75 and north of 705 Road.

1.13. Groundwater Management Plan Rules & Regulations – On February 13th, 2020, the District Board of Directors approved a motion revising the rules and regulations to include definition updates, increasing well spacing protection for public water supply wells to one half mile, additional well permit application requirements and limiting the number of acres and requiring a minimum well permit score for groundwater transfers.

CHAPTER 2 – APPLICATION OF THESE RULES AND REGULATIONS

2.1. Rules and Regulations for Groundwater Quantity Management Areas (GWQMA) – Chapters 3 through 20 of these rules and regulations shall apply to District determined

GWQMA.

CHAPTER 3 – EFFECTIVE DATE OF THESE RULES AND REGULATIONS

3.1. Effective date – These rules and regulations shall become effective on March 12th, 2026 and shall remain in full force and effect until revised, repealed, amended or superseded.

3.2. Previous rules and regulations superseded – All previous GWQMA Rules and Regulations are hereby superseded.

CHAPTER 4 – DEFINITIONS THAT APPLY TO THESE RULES AND REGULATIONS

4.1. Abandoned water well – Abandoned water well shall mean any water well (1) the use of which has been accomplished or permanently discontinued, (2) which has been decommissioned as described in the rules and regulations of the Nebraska Department of Health and Human Services Regulation and Licensure, and (3) for which the notice of abandonment required by Neb Rev. Stat. §46-602(2) has been filed with the Nebraska Department of Water, Energy, and Environment by the licensed water well contractor or pump installation contractor who decommissioned the water well or by the water well owner if the owner decommissioned the water well.

4.2. Acre-inch – Acre-inch shall mean the amount of water necessary to cover one (1) surface acre of land to a depth of one (1) inch (twenty-seven thousand one hundred fifty-four (27,154) gallons.

4.3. Active well permit – Active well permit shall be defined as a well permit application that has been approved by the NRD Board of Directors that has not expired, been canceled or withdrawn and the proposed construction of the well has not been completed.

4.4. Allocation – Allocation shall mean the apportioning of groundwater. For irrigation purposes – the allotment of a specified total number of acre-inches of irrigation water per irrigated acre per year or an average number of acre-inches of irrigation water per irrigated acre over a groundwater use period.

4.5. Aquifer region – Aquifer region shall mean areas of the District as identified in Chapter 18 as paleovalley alluvial, Big Nemaha alluvial, Missouri River alluvial, shallow or bedrock aquifers

4.6. Board or Board of Directors – Board or Board of Directors shall mean the Board of Directors of the Nemaha Natural Resources District acting in its official capacity.

4.7. Certified groundwater use acre – Certified groundwater use acre shall mean any acre of land that has been certified by the Board for the application of groundwater pursuant to these rules and regulations.

4.8. Commercial/Industrial water well – Commercial/Industrial water well shall mean a water well that is designed and constructed to supply groundwater for manufacturing, cooling, heating, sanitation and other beneficial commercial or industrial uses.

4.9. Confined aquifer – Confined aquifer shall mean groundwater that is confined under pressure greater than atmospheric by overlying, relatively impermeable strata. Confined aquifers are also known as artesian or pressure aquifers.

4.10. Consumptive use – Consumptive use shall mean the amount of groundwater that is lost or otherwise made unavailable after its application by a water user.

4.11. Decommission – Decommission shall mean the act of filling, sealing and plugging of a water well cavity in accordance with the rules and regulations adopted pursuant to the Nebraska Water Well Standards and Contractors' Licensing Act.

4.12. Department – Department shall mean the Nebraska Department of Water, Energy and Environment.

4.13. District – District shall mean the Nemaha Natural Resources District, or the staff.

4.14. Domestic Groundwater User - Domestic groundwater user shall mean a person that uses groundwater well water required for human needs as it relates to health, fire control, and sanitation or for domestic livestock as related to normal farm and ranch operations, or for irrigation of lands not exceeding a total of two acres in area.

4.15. Flowmeter – Flowmeter or meter shall mean a device of type and design approved by the District and installed in connection with the use of a groundwater well that, when properly installed, measures the total quantity and rate of groundwater withdrawn.

4.16. Government survey section – Government survey section shall mean a section of land approximately one (1) square mile in size as defined by the United States Government Department of Interior Bureau of Land Management Public Land Survey System (PLSS) of townships, ranges, sections, quarter sections, etc.

4.17. Groundwater – Groundwater shall mean water that occurs, moves, seeps, filters or percolates through the ground under the surface of the land.

4.18. Groundwater user – Groundwater user shall mean a person or entity, who at any time, extracts, withdraws or confines groundwater for any use. The term “groundwater user” shall mean both the landowner and the operator.

4.18.1. Agricultural users shall mean a groundwater user that uses groundwater for the irrigation of agricultural crop land.

4.18.2. Municipal users shall mean a groundwater user that is an incorporated city or village, a rural water district or a sanitary improvement district that withdraws groundwater from a water well to serve its customers for domestic purposes as it relates to human needs of health, fire control and sanitation.

4.18.3. Other users shall mean a groundwater user that uses groundwater for purposes other than those described in the definitions of agricultural and municipal users for purposes such as domestic uses, recreation, wildlife, wetlands, lake supply, fountains, geothermal and vapor monitoring.

4.19. Groundwater withdrawal – For purposes of this chapter, groundwater withdrawal shall mean the total groundwater pumped, less any water returned to the aquifer through an injection well within one thousand (1,000) feet of the source.

4.20. High-capacity well – High-capacity well shall refer to any water well designed and constructed to pump greater than 50 gallons per minute.

4.21. Historically irrigated acres – Historically irrigated acres shall mean any acre of land watered for the purposes of agricultural irrigation from a registered irrigation water well(s) or a Department permitted surface water appropriation that:
4.21.1. Is classified as irrigated land by the local County Assessor; or
4.21.2. Is classified as irrigated land by the United States Department of Agriculture Farm Service Agency; or
4.21.3. For acres irrigated with surface water, the acres must also have a valid associated appropriation from the Department for beneficial use under Neb. Rev. Stat. §46-229.

4.22. Hydrologically connected area – Hydrologically connected area means the area delineated by the Department pursuant to the Nebraska Groundwater Management and Protection Act.

4.23. Illegal water well – Illegal water well shall mean A water well not in compliance with any other applicable laws of the State of Nebraska or with any provisions of these rules and regulations.

4.24. Irrigated acre – Irrigated acre shall mean an acre of land that is capable of being supplied with groundwater and/or surface water through irrigation works, mechanisms, or facilities for the purpose of watering crops.

4.25. Marginal aquifer – Marginal aquifer shall mean any type aquifer where the saturated thickness of the principal aquifer is less than 10 feet and has a calculated effective transmissivity of less than 10,000 gallons per day per foot.

4.26. Monitoring well – Monitoring well shall mean a water well that is designed and constructed to provide the District ongoing hydrologic and groundwater quality information. A monitoring well may have a permanent pump installed to withdraw groundwater samples for analysis but is not intended for consumptive use.

4.27. Nitrogen fertilizer – Nitrogen fertilizer shall mean a chemical compound in which the percentage of nitrogen is greater than the percentage of any other nutrient in the compound or, when applied, results in an average application rate of more than twenty

(20) pounds of nitrogen per acre over the field to which it is being applied.

4.28. Nonpoint source pollution (NPS) – NPS pollution shall mean pollution that results from land runoff, precipitation, atmospheric deposition, drainage, seepage or hydrologic modification.

4.29. Notice of Intent – Notice of intent shall mean a document filed with the Department by a public water supply system for protection of encroachment from other water wells while the system conducts an evaluation as to whether such land is suitable for a public water supply wellfield. No person may drill or construct a water well within 1,000 feet of the boundaries of the land described in the notice of intent.

4.30. Observation well – Observation well shall mean a water well monitored by the District or other public agency to measure fluctuations in the static water level of groundwater within an aquifer.

4.31. Operator – Operator shall mean a person, partnership, association, corporation, municipality or other entity which operates irrigated or dryland properties to produce agricultural, horticultural, silvicultural, nursery products or aquaculture.

4.32. Other water well – Other water well shall mean a water well that is designed and constructed to supply groundwater for purposes such as recreation, wildlife, wetlands, lake supply, fountains, geothermal and vapor monitoring.

4.33. Permit – Permit shall mean a document obtained, in accordance with the Nebraska Groundwater Management and Protection Act and these rules and regulations, authorizing the construction or modification of a water well or its use.

4.33.1. A permit may be issued for construction or modification of a water well for which a permit was not previously issued.

4.34. Person – Person shall mean a natural person, personal representative, trustee, guardian, conservator, partnership, association, corporation, municipality, irrigation district, agency or political subdivision of the State of Nebraska, or a department, agency or bureau of the United States.

4.35. Phase I Groundwater Quantity Management Area – Phase I Groundwater Quantity Management Area (GWQMA) shall mean all areas of the District designated for Phase I management and regulation activities related to groundwater quantity.

4.35.1. GWQMA Phase I includes all areas of the Nemaha Natural Resources District that are not designated as Phase II or Phase III GWQMAs.

4.35.2. Maps showing the geographic areas and the legal descriptions of the District's GWQMA are attached hereto as Appendix A and B respectively and incorporated herein by reference.

4.36. Phase II Groundwater Quantity Management Area– Phase II Groundwater Quantity Management Area (GWQMA) Phase shall mean an area designated for Phase II

management and regulation activities related to groundwater quantity.

4.36.1. Phase II GWQMA includes all management and regulation activities of Phase I GWQMAs.

4.36.2. Phase II GWQMA includes only portions of the Nemaha Natural Resources District as designated.

4.37. Phase III Groundwater Quantity Management Area Phase – Phase III Groundwater Quantity Management Area (GWQMA) Phase shall mean an area designated for Phase III management and regulation activities related to groundwater quantity.

4.37.1. Phase III GWQMA includes all management and regulation activities of Phase I and Phase II GWQMAs.

4.37.2. Phase III GWQMA includes only portions of the Nemaha Natural Resources District as designated.

4.38. Pivot plan – a pivot plan shall mean a map and document received from certified pivot dealer depicting the number of acres that will be irrigated by a center pivot system. The plan must include the latitude and longitude of the pivot center as well as the length of the system, number of spans, feet of overhang, end gun throw distance and the total number of acres irrigated.

4.39. Public water supply well – Public water supply well shall mean a water well that supplies or intends to supply water to inhabitants of cities, villages, or rural areas for domestic or municipal purposes, has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days per year and is supplied by a city, village, municipal corporation, metropolitan utilities district, rural water district, natural resources district, irrigation district, reclamation district or sanitary improvement district.

4.40. Registered well – Registered well shall mean a water well that has been registered with the Department by the well driller or owner.

4.41. Replacement well – Replacement well shall mean a water well which, if the purpose is for irrigation, delivers water to the same tract of land served by the original water well and is (a) constructed to provide water for the same purpose as the original water well; (b) operating in accordance with any applicable permit from the Department and any applicable rules and regulations of the District; (c) such replacement well is not designed or constructed to pump more water than the well it replaces; (d) such replacement well irrigates the same number of acres; (e)(i) replaces a decommissioned water well within one hundred eighty (180) days after the decommissioning of the original water well; (ii) replaces a water well that has not been decommissioned but will not be used after construction of the new water well and the original water well will be decommissioned within one hundred eighty (180) days after such construction, except that in the case of a municipal water well, the original municipal water well may be used after construction of the new water well but shall be decommissioned within one year after completion of the replacement water well; or (iii) the original water well will continue to be used but will be modified and equipped within one hundred eighty (180) days after such construction of the replacement water well to pump fifty (50) gallons per minute or less and will be

used only for range livestock, monitoring, observation, or any other non-consumptive or de minimis use approved by the District.

4.42. Saturated thickness – Saturated thickness shall mean the vertical height of a hydrogeological defined aquifer unit in which the pore spaces are 100% saturated with water. For unconfined, unconsolidated aquifers, the saturated thickness is equal to the difference in elevation between the bedrock surface or underlying impermeable layer and the water table.

4.43. Static Water Level (SWL) – Static water level shall mean the level at which water stands in a water well under atmospheric pressure and no water is being withdrawn from the aquifer. SWL is expressed as the distance from the ground surface or measuring point near the ground surface to the water level in the well.

4.44. Testhole – Testhole shall mean a hole or shaft, usually vertical, excavated in the earth for subsurface exploration to determine and record or log the depth to water, and the depth, color, character, thickness, size of material of the various geologic formations encountered.

4.45. Test Well – a test well shall mean a temporary water well that is constructed and pumped for the purpose of determining water quality, the capacity at which a well can be pumped, the amount of drawdown that occurs when a well is pumped and the rate of recovery of the groundwater after pumping ceases.

4.46. Thickness of Principal Aquifer Map - Thickness of Principal Aquifer Map shall mean the Nebraska Department of Environmental Control and the University of Nebraska – Conservation Survey Division – map titled “Thickness of Principal Aquifer, 1979, Lincoln and Nebraska City Quadrangle, Nebraska.”

4.47. Variance – Variance shall mean (a) the approval to act in a manner contrary to the existing rules or regulations of the District, (b) an approval to deviate from restrictions imposed under a determination by the Department that a river basin, sub basin, or reach has become fully or over appropriated.

4.48. Water Well or Well – Water well or well shall mean (a) any artificial opening or excavation made in the ground that is drilled, cored, bored, washed, driven, dug, jetted or otherwise constructed for the purpose of exploring for groundwater, monitoring groundwater, utilizing the geothermal properties of the ground, obtaining hydrogeologic information, or extracting water from or injecting fluid as defined in Neb. Rev. Stat. § 81-1502 into an underground water reservoir. (b) Water well includes any excavation made for any purpose if groundwater flows into the excavation under natural pressure and a pump or other device is placed in the excavation for the purpose of withdrawing water from the excavation for irrigation. For such excavations, construction means placing a pump or other device into the excavation for the purpose of withdrawing water for irrigation, and the legal location of the well is the location of the pump itself. (c) Water well shall not include (i) any excavation made for obtaining or prospecting for oil or

natural gas or for inserting media to repressure oil or natural gas bearing formations regulated by the Nebraska Oil and Gas Conservation Commission or (ii) any structure requiring a permit by the Department used to exercise a surface water appropriation. (d) The terms "Water Well" and "Well" are used in these Rules, and the definition for both terms is identical.

CHAPTER 5 – WATER WELL PERMITS

5.1. Any person that owns or controls land upon which the construction, decommissioning or temporary capping of a water well is to be accomplished, shall accomplish such tasks in accordance with the Water Well Standards and Contractor Licensing Act and the regulations adopted pursuant thereto.

5.2. Any person who intends to construct any new or replacement water well(s) that falls within the following categories on land which he or she owns or controls within the District shall, before commencing such activity, apply for a permit from the District on forms provided by the District and receive approval from the District:

5.2.1. Any water well designed and constructed or modified to pump greater than fifty (50) gallons per minute.

5.2.2. Any water well designed and constructed to pump fifty (50) gallons per minute or less if such water well is commingled, combined, clustered, or joined with any other water well(s) or other water source serving a single purpose, other than a water source used to water range livestock.

5.2.3. Any existing well pumping less than 50 gpm that is sought to be modified to pump greater than 50 gpm then a well permit is required and is subject to the Well Permit Ranking System Methodology and subsequent minimum score for approval. If the well to be modified is not registered and/or does not have a geologic log, then a testhole is required to be completed within 25 feet of the well to be modified. The testhole will be used to determine the aquifer thickness and transmissivity value and the location of the well to be modified will be used in the well density calculation portion of the Well Permit Ranking System Methodology.

5.2.4. Any person who has failed or in the future fails to obtain a permit shall submit an application for a late permit on forms provided by the District. The late permit application shall contain the same information as required by Chapter 5.4. The application for a late permit shall be accompanied by a two hundred- and fifty-dollar ($250.00) fee payable to the District.

5.3. No water well requiring a permit under this chapter shall be constructed within one thousand (1,000) feet of any domestic or livestock well, one thousand (1,000) feet of any other registered irrigation, commercial/industrial or "other" type wells and two thousand six hundred forty feet (2,640') of any registered public water supply wells under separate ownership or any non-constructed wells with an active well permit. No public water supply well shall be constructed within two thousand six hundred forty feet (2,640') of any registered irrigation, commercial/industrial or "other" type well under separate

ownership or any non-constructed wells with an active well permit. If a public water supply system files a Notice of Intent with the Department, no water well requiring a permit under this chapter shall be constructed closer than 1,000 feet from the boundaries of the land described in a notice of intent filed by a public water supply system.

5.3.1. If any registered well falling within 6,000 feet of a proposed well is known to be incorrectly located in the Department's registered well database based upon the District's GPS well database, the District's GPS location will be used in the well density calculation portion of the Well Permit Ranking System Methodology. The District will assist well owners with updating the well location with the Department.

5.3.2. A replacement well may not be constructed any closer to a water well under separate ownership if the original well is located less than the spacing set forth in Chapter 5.3.

5.3.3. Illegal water wells are not protected by the provisions of this Rule. The failure of a person to update water well registration information, ownership and irrigated acres records shall not jeopardize his or her well spacing protection provided under this Rule unless:

5.3.3.1. The District determines that said person has knowingly attempted to deceive the District or State of Nebraska.

5.3.3.2. The well owner was notified by the District that the water well was identified as unregistered and constructed after such date in which registration was required and said person failed to act in good faith to register the water well. If the well owner agrees to comply with registering the water well, the District will provide assistance as needed.

5.3.3.3. The District determines that said person has failed to act in good faith in matters pertaining to these rules and regulations.

5.3.4. Water wells that are commingled, combined, clustered, or joined and have a combined total capacity greater than fifty (50) gallons per minute then each water well shall comply with all provisions of Chapter 5.3.

5.4. An application for a new, replacement or late well permit shall be made available on forms provided by the District.

5.4.1. A fifty dollar ($50.00) filing fee shall accompany each well permit application and a two hundred and fifty dollar ($250.00) filing fee shall accompany each late well permit application received.

5.4.2. All well permit applications submitted must be signed by the landowner, a person with power of attorney or a pending landowner as evidenced by an instrument such as a signed purchase agreement, a copy of which shall be provided to the District at the time the application is submitted.

5.4.3. Each application for a permit or late permit must be accompanied by documentation that a testhole was drilled with the following information included:

5.4.3.1. A detailed geologic/lithologic log of materials encountered with depth clearly detailing the depth, color, thickness, and size of the various geologic formations encountered and if possible, the measured depth to groundwater from the ground surface. Testholes must be logged by a licensed well driller, professional geologist or someone under their

supervision. The District has the right to reject a testhole log if evidence suggests the log is not representative of the area geology.

5.4.3.2. The testhole must be drilled to bedrock when possible and indicated on the geologic log submitted.

5.4.3.3. Geographic coordinates of the testhole location in either degrees minutes seconds or decimal degrees using North American Datum 1983 (NAD83).

5.4.3.4. The proposed well must be constructed within a fifty (50) foot radius of the testhole location submitted with the well permit application.

5.4.3.5. During the construction of a newly approved well, the well driller encounters geology significantly different from the thicknesses and material sizes of the previously submitted testhole geologic log, the well driller will contact the District before completing the well.

5.4.4. An application for an irrigation well permit or late permit must also be accompanied by a detailed pivot plan and map based on the expected well capacity, site conditions and chosen irrigation system. Specifications from a qualified irrigation specialist or sales technician depicting the number and location of acres of land to be irrigated, the latitude & longitude coordinates of the pivot center, length of the pivot span, overhang and end gun throw distance, if applicable. The total number of irrigated acres included on the plan will be the total number of irrigated acres entered on the well permit application. The number of acres to be irrigated cannot exceed 25% of the acres within the government survey section of land.

5.4.4.1. If a portion of the irrigated acres shown on the pivot plan are under separate land ownership, the applicant must provide a written agreement signed by all parties confirming they agree to allow their property to be irrigated. The corresponding County Assessor's office(s) will be notified of the number of acres to be irrigated.

5.4.5. An application for a permit or late permit shall include any additional information deemed necessary by the District to determine compliance with these rules and regulations. Additional information may include, but is not limited to, geologic sieve analysis of testhole drilling cuttings, a testhole geophysical log, a hydrogeologic evaluation and/or groundwater modeling analysis.

5.4.6. If the District finds that the application for a permit or late permit is incomplete or needs corrections, it shall return the application to the applicant for any necessary corrections. Corrections must be made within sixty (60) days, or the application will be cancelled. No refund of any application fees shall be made. A well permit application may be withdrawn by the applicant up to the close of business the day before the Board meeting date and the filing fee shall be refunded.

5.5. Wells designed to pump greater than 50 gpm but less than 150 gpm singularly or comingled or more than one well designed to pump less than 50 gpm but has a combined flowrate greater than 50 gpm require well permit applications but are not subject to the Well Permit Ranking System Methodology minimum scoring approval requirement. These types of wells are not allowed to be for the irrigation of crops on ground greater than two (2) acres in size or for the irrigation of crops from groundwater pumped into a

surface water reach and/or surface water storage impoundment.

5.5.1. Allowable uses include agricultural spray tank filling, fire suppression, wetland flooding as part of a Wetland Reserve Program requirement, geothermal type applications, and the filling of ponds for livestock watering & recreation.

5.5.1.1. Proposed uses not listed may also not be subject to the Well Permit Ranking System Methodology minimum scoring approval requirement.

5.5.1.2. A flowmeter(s) measuring all the groundwater pumped is required.

5.5.2. Livestock operations such as chicken, turkey & swine confinements will need to submit one geologic testhole log, a water use plan detailing the number of head to be watered, the number of days the well(s) will be used throughout a year, an estimated annual volume to be pumped, a facility site plan/layout and any other pertinent information requested by the District.

5.5.2.1. A flowmeter(s) measuring all the groundwater pumped is required.

5.6. District staff will review the applications received and compile all pertinent hydrogeologic data, information provided by the applicant and any other information that is readily available. The information will be brought forth to the Programs & Projects Sub-Committee for consideration where upon a motion will be made to approve, deny, or table the application. The motion made in the Sub-Committee meeting will be brought forth to the entire Board for consideration. An application may be tabled until the next Board meeting if the Sub-Committee and/or Board feel additional information is needed for a decision. Applications received after 4:30 pm on the first Thursday prior to the regularly scheduled monthly Board meeting on the second Thursday of each month shall be considered at the following monthly Board meeting.

5.7. Using the best data available to the District, including any information submitted by the applicant as part of the well permit application, evidence must show that the proposed well has the ability to meet or exceed the flow volume indicated on the permit application and produce enough water to support the purpose shown on the permit application. Data must also show that the well will not have a significant negative impact to the long term sustainability of the aquifer that serves as the primary source of water for the proposed well and the proposed well will not negatively impact the ability of pre-existing properly constructed, maintained and operated registered wells served by the same principal aquifer to operate in a reasonable manner. Permit applications meeting all the criteria set forth in this section shall be approved by the District and those failing to meet the criteria shall be denied or approved with conditions established by the District.

5.8. The District has developed a standardized method for evaluating and ranking well permit applications based upon criteria set forth in the District's Well Permit Ranking System (See Appendix D). The six criteria considered are 1) the thickness of principal aquifer formation, 2) the calculated effective transmissivity of the principal aquifer formation, 3) the density of registered irrigation wells, 4) the density of registered public water supply and 5) the density of domestic, livestock, commercial/industrial and other type wells located within 6,000 feet of the proposed well location and 6) the method of applying groundwater to land if the well permit application is for irrigation.

5.9. The Board shall set the minimum ranking score required for permit approval by motion and has the ability to change the minimum score required as needed to maintain the groundwater reservoir life goal. The minimum ranking score required for approval may vary from one aquifer region of the District to another.

5.9.1. Well permit applications received that are located within the Missouri River alluvial aquifer region shall not be subject to Chapters 5.8 and 5.9.

5.9.2. Well permit and late well permit applications will be date stamped upon arrival to the District and are scored using the Well Permit Ranking System based upon the date the application is received and the wells registered in the Department's database through that date.

5.9.3. Wells registered with the Department as observation, monitoring, ground heat exchanger, heat pump, injection, geothermal and any other de minimis uses will not be accounted for in the well density calculations.

5.9.4. Replacement wells require a well permit or late well permit, however a testhole is not required and the permit does not require a minimum score as set forth in Chapter 5.9

5.9.5. Public water supply wells are exempt from the requirements of Chapters 5.8 and 5.9, however Chapters 5.2, 5.3 and 5.4 will remain applicable;

5.9.6. No more than one irrigation well will be approved to apply water through any irrigation delivery system.

5.9.7. Active well permit applications will be accounted for in the well density calculations of the well permit ranking system.

5.9.8. Well permit applications will not be approved for any well designed to conduct groundwater into surface water conveyances such as rivers, streams, creeks & ditches with intent to capture the water downstream for irrigation purposes.

5.9.9. Well permit applications will be accepted for wells designed to pump into storage reservoirs for recreation, livestock watering, and irrigation as long as the reservoir is located on the applicant's property. The well permit application shall be subject to Chapters 5.2, 5.3, 5.4 and 5.9.

5.10. An application for a permit or late permit for a water well in a management area shall be denied only if the District finds:

5.10.1. application fails to meet the criteria set forth in Chapter 5.7.;

5.10.2. that the location or operation of the proposed water well or other work would conflict with any regulations or controls adopted by the District or of other applicable laws of the State of Nebraska;

5.10.3. that a well permit application, testhole log or irrigated acres plan includes any intentionally misleading or falsified data;

5.10.4. the well permit application fails to meet the minimum score from the District's Well Permit Ranking System Methodology as established by the Board of Directors;

5.10.5. that the proposed use would not be a beneficial use of water for domestic, agricultural, manufacturing or industrial purpose;

5.10.6. that the proposed use would create or exacerbate groundwater conflicts with existing users;

5.10.7. all permits shall be issued with or without conditions attached and approved or

denied not later than sixty (60) days after receipt by the District of a complete and properly prepared application.

5.11. Any person who intends to modify any existing water well(s) or construct any new or replacement water well(s) with an annual groundwater withdrawal of greater than or equal to five hundred (500) acre-feet, such person shall, in addition to the information and requirements for the well permit application in Chapter 5.2, 5.3 and 5.4, provide the District with a hydrogeologic evaluation illustrating the impact, if any, from the intended withdrawal on the static water level of the aquifer and on local groundwater users within a 2 to 5 mile radius as dictated by the hydrogeologic evaluation equations and/or models.

5.11.1. Construction/withdrawal prohibited – The NRD Board of Directors may deny any well permit application under this section based upon any of the following:

5.11.2. the proposed water well is shown by the hydrogeologic evaluation and/or other data and information to have a reasonable short or long-term probability of adversely impacting the local aquifer and surrounding groundwater wells with a higher preference of use, or

5.11.3. the proposed water well is shown by the hydrogeologic evaluation and/or other data and information to have a reasonable short or long-term probability of adversely impacting existing water users, or

5.11.4. the hydrogeologic evaluation does not conform with accepted methods, or the data used does not adequately represent actual hydrologic and/or hydrogeologic conditions, or

5.11.5. the District conducts a peer review of the hydrogeologic evaluation submitted and the results are conflicting, or

5.11.6. the construction of the water well or increased groundwater withdrawal would violate any other provisions of these rules and regulations, or

5.11.7. the proposed well is located less than the minimum setback distance as set forth in Chapter 5.3, or

5.11.8. the application meets any of the criteria set forth in Ch. 5.10.

5.11.9. If Chapter 5.11.5 occurs, no permit shall be issued with or without conditions and approved or denied until litigation is resolved between the parties.

5.12. All new and replacement water wells designed and constructed to pump greater than fifty (50) gallons per minute or existing water wells modified to pump greater than fifty (50) gallons per minute shall be equipped with a fully functioning flowmeter with an accuracy rate of plus or minus two percent (2%) prior to groundwater withdrawal if any of the following conditions are met:

5.12.1. Any new or replacement high-capacity wells approved after May 1st, 2013.

5.12.2. Allocations as outlined by Chapters 14, 15 and 16 become effective.

5.12.3. Any person with an approved permit that owns or controls land upon which a water well is proposed to be constructed or the groundwater withdrawal amount increased as provided in Chapter 5.11.

5.12.4. Any well with an approved Department permit to conduct water into a reservoir for the purpose of irrigation.

5.12.5. Any well meeting criteria as outlined in Chapter 9.4.

5.12.6. Any irrigation well increasing the number of acres to be irrigated.

5.13. All new and replacement water wells with an approved well permit shall be equipped with an operable faucet/spigot for the collection of water samples.

5.14. No permit shall be required for test holes or dewatering wells with an intended use of ninety (90) days or less, or for single water wells designed and constructed to pump fifty (50) gallons per minute or less.

5.15. The applicant shall have a licensed well contractor commence construction of the water well within one (1) year after the permit approval date to complete construction of the well. If the applicant fails to complete the well under the terms of the permit, the District will cancel the permit, and it will be considered expired. An applicant of an expired permit will have to reapply, and the application will be rescored as if the permit were a new application should the applicant choose to reapply. Any new wells constructed and registered within six thousand (6,000) feet of the proposed location will be included in the density criteria portion of the scoring system. Once an active well permit has expired, been withdrawn or canceled, a 90-day waiting period is required before a well permit application can be resubmitted for a well on the same parcel of land or for a well in an adjacent parcel that will irrigate all or a portion of the acres included on the irrigation plan outlined in Chapter 5.4.4.

5.15.1. After the water well registration filing date with the Department, the applicant shall allow District staff:

5.15.1.1. to collect a GPS (global positioning satellite) point of the well;

5.15.1.2. to collect and analyze a water sample from the well, to establish a benchmark nitrate-nitrogen concentration;

5.15.1.3. to measure the pumping rate from the well under normal operating conditions;

5.15.1.4. to verify that a flowmeter has been installed as provided in Chapter 5.12.

5.15.2. The applicant shall allow the District to add the approved well or wells to the District's observation and/or monitoring well network for collecting static water level measurement and groundwater quality data as deemed necessary.

5.16. A permit issued shall specify all regulations and controls adopted by the District relevant to the construction or utilization of the proposed water well. The District shall transmit one copy of each permit issued to the Department, the permit applicant, the indicated well contractor and the corresponding County Assessor's office.

CHAPTER 6 – REQUEST FOR SPACING VARIANCE

6.1. Any person who intends to construct any new or replacement water well(s) or modify an existing water well on land which he or she owns or controls that would meet the criteria set forth in Chapter 5.2 but is unable to meet the spacing requirements set forth in Chapter 5.3 may apply to the District for a request for a variance. A well permit application shall accompany the request for a variance.

6.2. An application for a variance shall be made on forms provided by the District.

6.3. The applicant applying for a variance or his or her representative may appear before the District's Programs & Projects Sub-Committee to present the reasons for the variance request.
6.3.1. Written testimony may be provided if the applicant cannot be present to meet with the committee.

6.4. If a variance is granted, the grantee may be required to sign an affidavit agreeing to all terms and conditions of the variance.
6.4.1. The affidavit will be recorded with the Register of Deeds by the District.
6.4.2. The recorded affidavit will be attached to all properties affected by the variance.

CHAPTER 7 – ENFORCEMENT OF RULES AND REGULATIONS

7.1. These rules and regulations will be enforced by cease-and-desist orders entered by the Board, in accordance with the Nebraska Groundwater Management and Protection Act, and by bringing an appropriate action in the district court in the county where the violation occurs.

CHAPTER 8 – PHASE I GROUNDWATER QUANTITY MANAGEMENT AREA DETERMINATION AND REQUIRMENTS

8.1. Upon establishment of these rules and regulations, the entire District shall be designated as a Phase I Groundwater Quantity Management Area (GWQMA) except for the areas as determined by Chapter 9.4.

CHAPTER 9 – PHASE II GROUNDWATER QUANTITY MANAGEMENT AREA DETERMINATION AND REQUIREMENTS

9.1. A Phase II GWQMA shall be initiated when the Determination of District Groundwater Levels indicates the static water level elevation has decreased by fifteen percent (15%) or more for any District observation well in an established Aquifer Region as defined in Chapter 17 or designated observation well monitoring area for a two (2) consecutive year period. When this trigger is actuated, the NRD will take the following actions:
9.1.1. Increase the number of wells monitored in the area to determine the extent of the problem, to serve as a basis for triggering a Phase II GWQMA, and to obtain the hydrogeologic information necessary to delineate a Phase II GWQMA. The intensified monitoring program described below applies to the entire District. The actual monitoring program for each problem area may vary according to the local hydrogeologic characteristics of the area.
9.1.2. The District will determine an initial area to be monitored. The shape and size of the area will change as more information is gathered. A minimum area of nine (9) square miles will be monitored.

9.1.3. The minimum number of monitoring sites will be fifty percent (50%) of the number of registered irrigation wells in the area that are suitable for use as groundwater level observation wells (considering criteria such as quality of well construction, total well depth and screened intervals). The District may use registered industrial, livestock, monitoring, observation, public water supply, and domestic wells as suitable monitoring sites.

9.1.4. Develop a localized groundwater model, as deemed necessary, to further delineate the area to be monitored.

9.1.5. Install dedicated observation wells as deemed necessary to collect additional geological and static water level data.

9.2. All permitted wells approved and constructed that are within the initial area to be monitored, as set forth by Chapter 9.1.2, will be added to the District's Observation Well Monitoring Network as deemed necessary.

9.3. All registered irrigation wells that are within the area delineated by Chapter 9.1.2. are required to have a fully functioning flowmeter installed. The Board will establish a date for having meters installed not to exceed 2 years following Phase II designation.

9.3.1. The flowmeter must be equipped with a totalizer gauge that reads in acre-inches or gallons and a flowrate gauge that reads in gallons per minute. The flowmeter selected must have a published accuracy rate of plus or minus two percent (2%).

9.3.2. Total annual groundwater withdrawal reports will be required by January 31st for the past calendar year's growing season.

9.4. Automatic Phase II GWQMA Designation – Based upon the Thickness of Principal Aquifer map (Chapter 4.46), the areas designated as "Absent or Very Thin" are hereby designated as automatic Phase II GWQMAs (see Appendix A map) unless testhole or geophysical data proves otherwise.

9.4.1. In order to easily define these areas due to their irregular shapes, the areas have been squared off using one-mile square sections as defined by the government survey section.

9.4.2. Any survey section in which the aquifer was not mapped as "Absent or Very Thin", but which is surrounded on by at least three sides by survey sections that are mapped as "Absent or Very Thin", shall also be included in the Phase II GWQMA designation.

9.4.2.1. Testholes received for well permit application approval in the Phase II GWQMA will be reviewed and approved if the well permit ranking system score meets the minimum number of points for approval as set forth by the Board.

9.5. The closure to the issuance of any new well permits or increase in irrigated acres will be in effect for the entire Phase II area unless geophysical or testhole geologic data confirms viable aquifer material is present, the use of the well would not negatively impact existing wells, the permit meets all criteria set forth by the District for approval and/or hydrogeologic evaluation equations and models indicates the well will not increase groundwater level declines within the area. Permits will be approved or denied on a case-

by-case basis.

CHAPTER 10 – PHASE III GROUNDWATER QUANTITY MANAGEMENT AREA DETERMINATION AND REQUIREMENTS

10.1. A Phase III GWQMA shall be initiated when the Determination of District Groundwater Levels indicates the static water level elevation has decreased by twenty-five (25%) or more for any District observation well within in an established Aquifer Region as defined in Chapter 18 or designated observation well monitoring are for a two (2) consecutive year period. When this trigger is actuated, the NRD will take the following actions:

10.1.1. All Phase I GWQMA as set forth in Chapter 8 and all Phase II GWQMA Requirements as set forth in Chapter 9 shall apply.

10.1.2. A Phase III GWQMA can only be designated from all or a portion of a previously designed Phase II GWQMA.

10.1.3. Annual groundwater use allocations as determined by the NRD Board of Directors and set forth by Chapters 14, 15, and 16 of these rules and regulations will be in effect.

10.1.4. The closure to the issuance of any new well permits will be in effect for the entire Phase III area.

10.1.5. Replacement wells will be allowed; however, the replacement well shall not pump an amount greater than the registered pumping capacity of the original well or increase the number of acres historically irrigated.

10.1.6. A replacement well can be relocated out of a Phase III GWQMA into a lesser Phase area; however, Phase III rules will remain in effect until the Phase III area is dissolved by the Board of Directors.

CHAPTER 11 - GROUNDWATER TRANSFER PERMITS

11.1. Any person who desires to transfer groundwater off the overlying land for domestic, municipal and remediation purposes, before commencing construction, must apply for a transfer permit on forms provided by the District.

11.2. Any person who withdraws groundwater for any purpose pursuant to a groundwater remediation plan as required under the Environmental Protection Act, Clean Water Act or Nebraska State Statutes including providing of water for domestic purposes, from aquifers located within the District may transfer the use of the groundwater off the overlying land if the groundwater is put to reasonable and beneficial use within the State and if such withdrawal, transfer and use will not significantly adversely affect any other water user and is consistent with all applicable State statutes and District rules and regulations.

11.3. Any person may transfer groundwater off the overlying land for the purpose of domestic use of groundwater required for human needs as it relates to health, fire control, sanitation, and irrigation on less than two acres of land if:

11.3.1. the location and use of the water and any pipeline or other means of conveyance are authorized by easement or other adequate property interest on all land on which such water well and pipeline or other means of conveyance are located and

11.3.2. the capacity of the water well or series of water wells connected for such purposes does not exceed fifty (50) gallons per minute.

11.4. A public water supply system may transfer groundwater off the overlying land for the purpose of municipal use of groundwater required for human needs as it relates to health, fire control, sanitation, and irrigation on less than two acres of land if:

11.4.1. the location and use of the water and any pipeline or other means of conveyance are authorized by easement or other adequate property interest on all land on which such water well and pipeline or other means of conveyance are located.

CHAPTER 12 – CERTIFICATION OF GROUNDWATER USE ACRES AND WATER WELL USE REPORTING

12.1. The District shall issue a public notice warning groundwater users that water use restrictions will be implemented as groundwater level declines trigger Chapter 9 criteria.

12.2. Agricultural users in the effective area shall report by January 31st each year, after the issuance of the public notice described in Chapter 12.1, well use amounts and acres irrigated on forms provided by the District.

12.2.1. The Board will certify the number of groundwater use acres for each agricultural user within the effective area based on the best information available from aerial imagery, remotely sensed data, USDA Farm Service Agency data and County Assessor's records.

12.2.2. The Board shall consider adjustment to certified groundwater use acres based on evidence presented by the groundwater user.

12.3. Municipal groundwater suppliers within the effective area shall report by January 31st each year, after the issuance of the public notice described in Chapter 12.1, well use amounts on forms provided by the District.

12.4. Commercial, Industrial & Other groundwater users within the effective area shall report by January 31st each year, after the issuance of the public notice described in Chapter 12.1, well use amounts on forms provided by the District.

12.5. The failure to report any information required by this Rule shall result in the issuance of a cease-and-desist order denying the withdrawal of groundwater.

CHAPTER 13 – FLOWMETER MEASUREMENT REQUIREMENTS

13.1 Groundwater withdrawals from water wells that are connected by a common pipeline may be measured using one flowmeter, provided the total groundwater withdrawal is

measured.

13.2 All flowmeters installed must have a published accuracy rate of plus or minus two (2) percent.

13.3 The groundwater user shall report the installation of a water flowmeter within thirty (30) days after installation and the flowmeter must be installed according to the manufacturer's specifications.

13.4 A malfunctioning flowmeter must be reported to the District within three (3) business days after discovery.

13.5 The District will inspect flowmeters for proper installation and operation.

13.5.1 The groundwater user shall be responsible for maintenance, repair and/or replacement of an improperly installed or malfunctioning flowmeter.

13.5.2 A record of the flowmeter reading must be kept by the groundwater user when a flowmeter is removed for offsite service or replacement.

13.5.3 When a flowmeter is removed for repair at a time when the groundwater user desires to withdraw groundwater, the District may install a temporary flowmeter. District approved methods of determining groundwater consumption may be used if a flowmeter is not available or cannot be readily installed.

13.5.4 The flowmeter service provider shall certify in writing that a flowmeter meets the manufacturer's specifications following repairs or calibration. The groundwater user shall provide the District with a copy of the certification.

13.6 The District shall have access at all reasonable times to inspect installed flowmeters.

13.7 A groundwater user that fails to install, report, or falsely reports groundwater withdrawal, damages or interferes with the operation of a flowmeter, neglects to perform required maintenance, tampers with automated recording devices or allows another person to do so, shall be subject to forfeiture of allocation amounts and the revocation of certified acres.

CHAPTER 14 - ALLOCATION TO AGRICULTURAL USERS

14.1 The allocation for the first 3-year groundwater use period shall be eight (8) acre inches per acre per year for each certified groundwater use acre.

14.2 The Board will continue with Chapter 14.1 or set a new allocation for the next groundwater use period by December 1st after the end of the previous groundwater use period.

14.2.1 The new allocation will be set by amendments to these rules and regulations in accordance with the requirements of state law.

14.3 If an agricultural user does not withdraw all of his or her allocation of groundwater

during a groundwater use period, the unused carryover amount shall be added to his or her next groundwater use period allocation.

14.3.1 The maximum accumulated carry-over shall not exceed one-eighth (1/8) of the allocation amount for the current allocation period.

14.4 Groundwater withdrawn in excess of agricultural user's allocation shall be deducted by two times the number of inches used over the groundwater use period allocation from his or her next groundwater use period allocation. Continued overuse will result in the loss allocation over the next groundwater use period.

14.5 Transfer of groundwater use acres to a different groundwater user – When the control of certified groundwater use acres is transferred to a different agricultural user during a groundwater use period, the remaining allocation balance for said acres shall remain with the land.

CHAPTER 15 – ALLOCATION TO MUNICIPAL USERS

15.1 A municipal water supplier shall limit groundwater users to fifty-four thousand, seven hundred and fifty (54,750) gallons (150 gallons per day) per person served per calendar year.

15.2 The Board will continue with Chapter 15.1 or set a new allocation for the next groundwater use period by December 1st.

15.2.1 The new allocation will be set by amendments to these rules and regulations in accordance with the requirements of state law.

15.3 After implementation of this Rule, the municipal water supplier shall submit to the District an adopted administrative procedure that allows the municipal water supplier to require water conservation practices and restrict the water use of its customers by December 1st.

15.3.1 The municipal water supplier shall provide the District documentation of such passed ordinances and/or resolutions.

15.4 The most recent population census information available from the United States Bureau of Census will be used to determine total per person groundwater use.

15.4.1 When a municipal water supplier provides evidence that it delivers water to new customers not counted as part of the most recent census or to lands that had not previously been considered, the District shall adjust the municipal water supplier's allocation to compensate for these added water requirements.

15.5 Groundwater withdrawn in excess of municipal water suppliers' allocation shall be deducted from its next groundwater use period allocation.

CHAPTER 16 – ALLOCATION TO COMMERCIAL, INDUSTRIAL & "OTHER" USERS

16.1 Any commercial, industrial and other groundwater user shall limit his or her groundwater withdrawal during the groundwater use period to one hundred (100) percent of his or her average annual withdrawal from the three (3) year period prior to the first groundwater use period.

16.2 The Board will determine a new allocation for the next groundwater use period by December 1st.

16.2.1 The new allocation will be set by amendments to these rules and regulations in accordance with the requirements of state law.

16.3 Any commercial, industrial or other groundwater user desires to start a new operation or modify an existing operation that will require a new or additional allocation, he or she shall request such an allocation on forms provided by the District.

16.4 When a commercial, industrial or other groundwater user does not withdraw all his or her allocation of groundwater during a groundwater use period, the unused amount shall be added to his or her next groundwater use period allocation.

16.4.1 The maximum accumulated carry-over shall not exceed one-eighth (1/8) of the allocation amount for the current allocation period.

16.5 Groundwater withdrawn in excess of a commercial, industrial or other groundwater user's allocation shall be deducted from his or her next groundwater use period allocation.

16.6 When the control of a commercial, industrial or other groundwater user's withdrawal is transferred to a different groundwater user during a groundwater use period, the remaining allocation balance for the groundwater use period shall also be transferred to the new groundwater user.

CHAPTER 17 – AQUIFER REGION IDENTIFICATION

17.1 The District is composed of five principal aquifers regions: (see Appendix C for a map of the aquifer regions)

17.1.1 Paleovalley Alluvial

17.1.1.1 This area of the District includes portions of Lancaster, Gage, Johnson, Otoe and Nemaha Counties as well as a smaller region in southeast Johnson, northeast Pawnee, southern Nemaha and northern Richardson Counties.

17.1.2 Paleovalley Sub Regions – The paleovalley alluvial aquifer is further divided into the following sub regions:

17.1.2.1 Paleovalley West includes all the delineated areas extending west of 626 Avenue from 735 Road to 737 Road in Johnson County.

17.1.2.2 Paleovalley East includes all the delineated areas extending east of 626 Avenue from 735 Road to 737 Road in Johnson County.

17.1.2.3 Paleovalley South includes all the areas delineated extending into southeast Johnson, northeast Pawnee, southern Nemaha and northern Richardson Counties.

17.1.3 Big Nemaha Alluvial

17.1.3.1 This area of the District includes the southeastern portion of Richardson County bordering the Big Nemaha River from the confluence of the Big Nemaha and the Missouri Rivers. The area extends upstream of the Big Nemaha to the Village of Salem.

17.1.4 Missouri River Alluvial

17.1.4.1 This area of the District includes all the eastern portions of Otoe, Nemaha and Richardson Counties bordering the west side of the Missouri River and the east side of the bluffs.

17.1.5 Shallow

17.1.5.1 This area of the District includes all areas of the District where the depth to bedrock is generally less than 100 feet and water bearing sands and gravels are absent or very thin.

17.1.6 Bedrock

17.1.6.1 This area of the District includes all remaining areas of the District not included within the Paleovalley Alluvial, Big Nemaha Alluvial, Missouri River Alluvial and Shallow Aquifer Regions

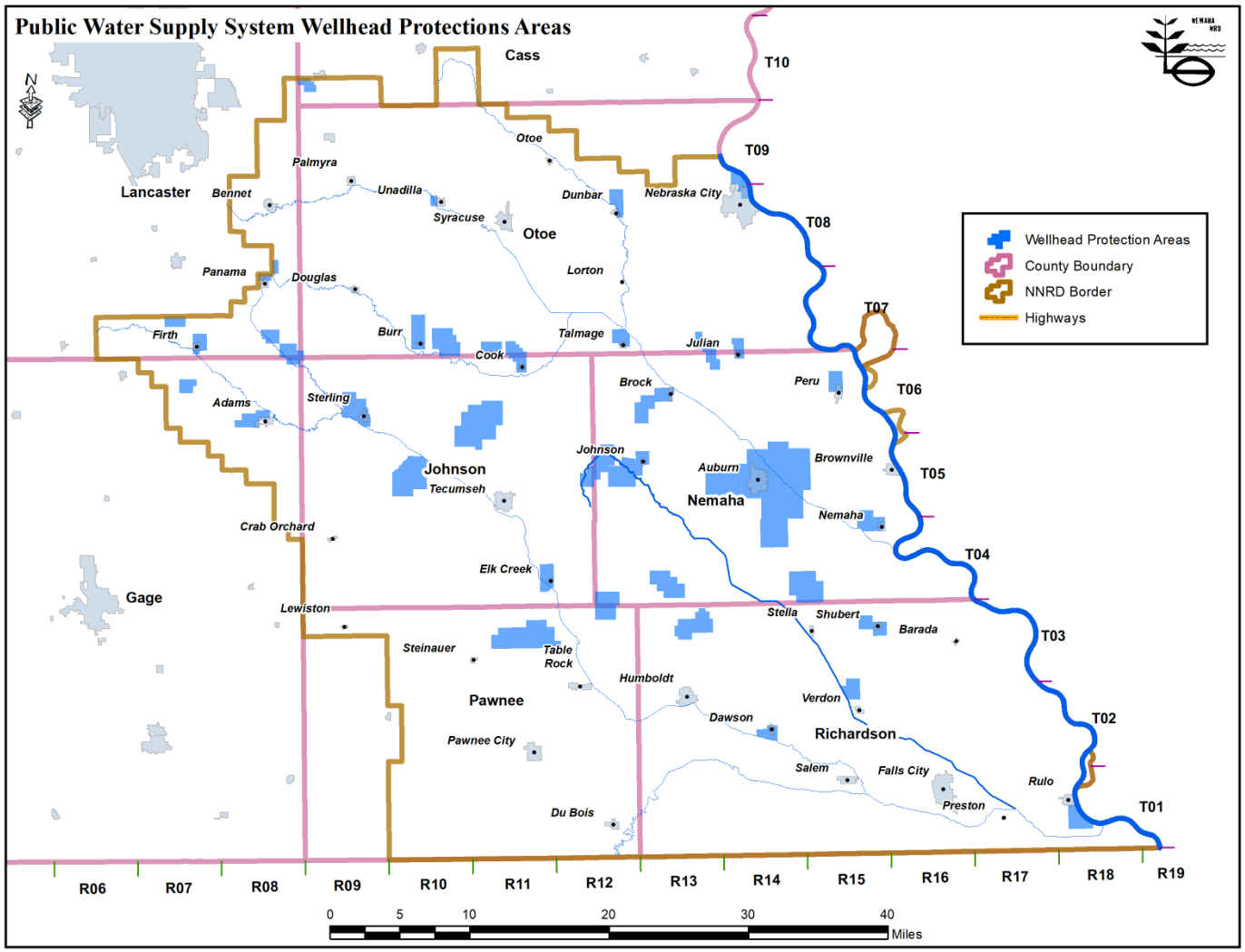
CHAPTER 18 – WELLHEAD PROTECTION AREAS

18.1 Every public water supply system wellfield within the District has a Department delineated Wellhead Protection Area map. The District will provide technical assistance and well abandonment cost-share assistance as requested and necessary to protect the water quality and quantity of each system's wellhead protection area within the District. A map of the District's public water supply systems wellhead protection areas is shown on page 25.

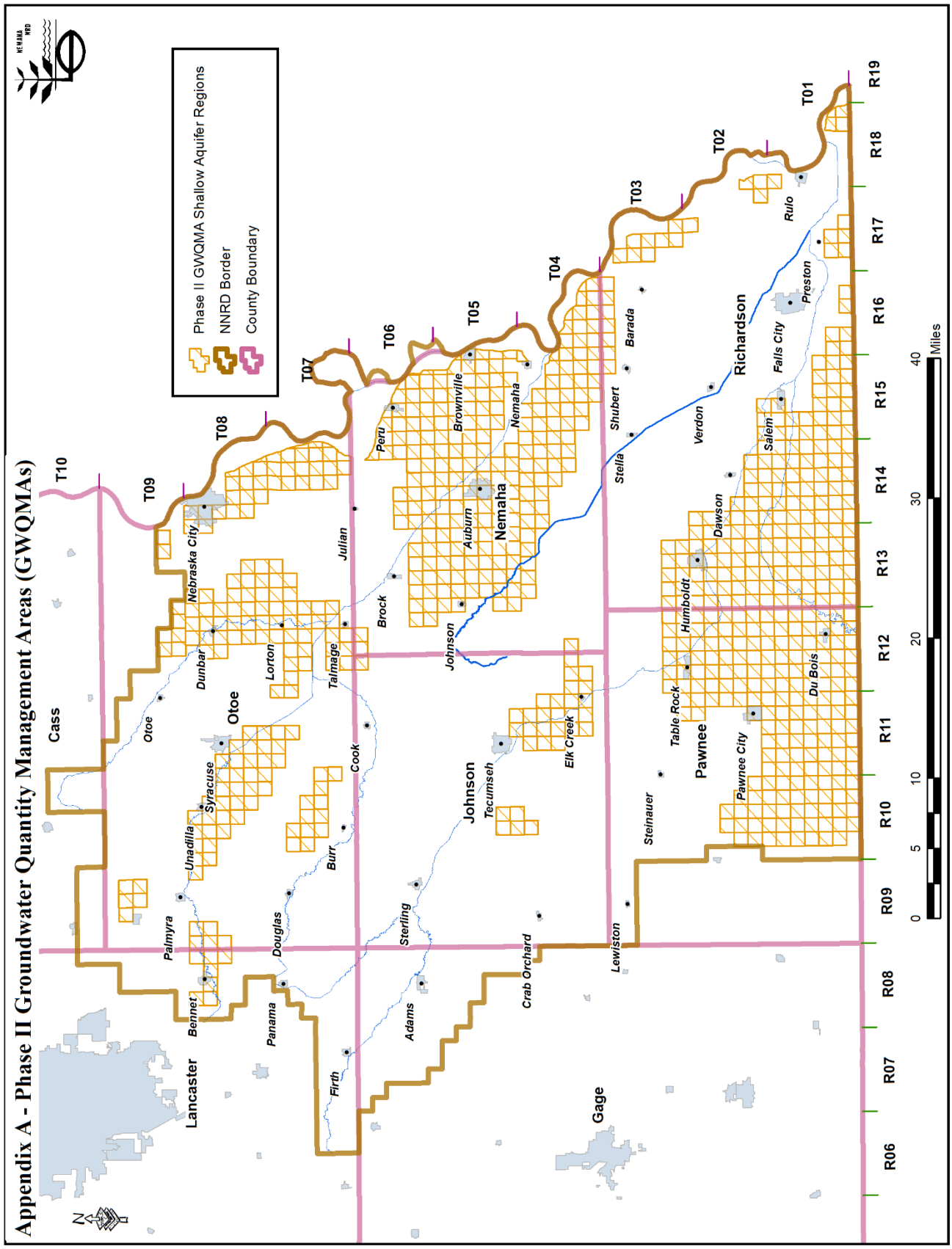
CHAPTER 19 – ANGLED AND HORIZONTAL HIGH-CAPACITY WELLS

19.1 Well permit applications received for angled or horizontal high-capacity wells will be subject to the well permit ranking system and required minimum score and may be subject to analysis by a consulting engineering firm to determine potential impacts to other groundwater users.

19.1.1 Angled or horizontal high-capacity wells cannot extend beyond the vertical property plane of adjacent landowners.


Public Water Supply System Wellhead Protections Areas
N
Cass
Otoe
Palmyra
Lancaster
Bennet
Unadilla
Dunbar
Nebraska City
Syracuse
Otoe
Panama
Douglas
Lorton
Firth
Burr
Talmage
Julian
Cook
Brock
Peru
Adams
Sterling
Johnson
Tecumseh
Johnson
Auburn
Brownville
Nemaha
Nemaha
Crab Orchard
Elk Creek
Gage
Lewiston
Stella
Shubert
Barada
Steinauer
Table Rock
Humboldt
Pawnee
Verdon
Dawson
Richardson
Pawnee City
Salem
Falls City
Rulo
Preston
Du Bois
T10
T09
T08
T07
T06
T05
T04
T03
T02
T01
R06
R07
R08
R09
R10
R11
R12
R13
R14
R15
R16
R17
R18
R19
0
5
10
20
30
40
Miles
Wellhead Protection Areas
County Boundary
NNRD Border
Highways

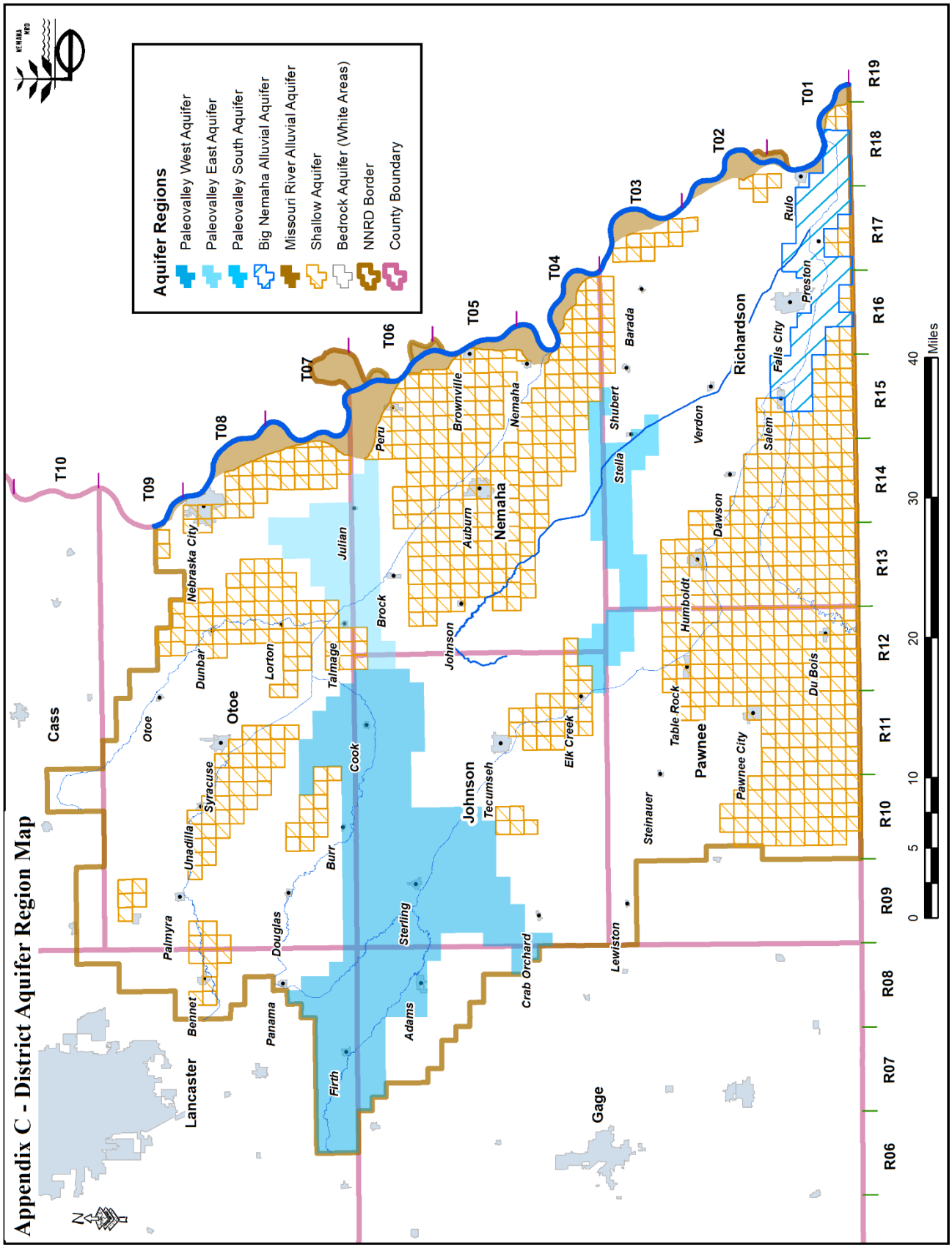
APPENDIX A – PHASE II GROUNDWATER QUANTITY MANAGEMENT AREAS



APPENDIX B – LEGAL DESCRIPTION OF PHASE II GROUNDWATER QUANTITY MANAGEMENT AREAS – ALL OR PORTIONS OF THE FOLLOWING:

Township	Range	Sections
01	10	01 02 03 04 05 08 09 10 11 12 13 14 15 16 17 20 21 22 23 24 25 26 27 28 29 33 34 35 36
01	11	01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
01	12	01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
01	13	01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
01	14	01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
01	15	04 05 06 07 08 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
01	16	29 30 31 32 34 35
01	17	28 29 32 33 34
01	18	06 25 26 35 36
02	10	15 16 20 21 22 23 25 26 27 28 29 32 33 34 35 36
02	11	01 02 12 13 24 25 26 31 32 33 34 35 36
02	12	01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
02	13	01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
02	14	06 07 18 19 20 26 27 28 29 30 31 32 33 34 35 36
02	15	31 32 33
02	17	03 36
02	18	30 31
03	11	35 36
03	12	25 26 27 28 29 30 31 32 33 34 35 36
03	13	26 27 28 29 30 31 32 33 34 35
03	15	01
03	16	01 02 03 04 05 06
03	17	08 16 17 20 21 28 33 34
04	10	10
04	11	02 03 04 09 10 11 12 13 14 15 16 22 23 24 25 26 27
04	12	19 20 21 22 29 30
04	13	01 02 03 04 05
04	14	01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 23 24
04	15	04 05 06 07 08 09 10 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 34 35 36
04	16	06 18 19 20 21 22 25 26 27 28 29 30 31 32 33 34 35 36
05	10	27 28 33 34
05	11	34 35
05	13	01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
05	14	01 02 03 04 06 07 08 10 11 12 13 14 16 17 18 19 20 21 22 24 26 27 28 29 30 31 32 33 34 35 36
05	15	01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 35
05	16	07 18 19 30 31
06	12	02 03 04 25 36
06	13	26 27 28 29 30 31 32 33 34 35 36
06	14	12 13 19 20 21 24 25 26 27 28 29 30 31 32 33 34 35 36
06	15	07 08 15 16 17 18 19 20 21 22 23 25 27 28 29 30 31 32 33 34 35 36
07	10	08 09 14 15 16 17 21 22 23 24
07	11	03 04 05 10 19 30
07	12	01 02 06 07 08 09 10 11 12 13 14 15 16 24 25 26 27 28 33 34 35
07	13	03 04 05 06 07 08 09 18 19 30
07	14	01 02 03 10 11 12 13 14 15 22 23 24 25 26 27 35 36
07	15	19 30
08	08	01 04 09 10 11 12 13
08	09	01 05 06 07 08 18
08	10	03 04 05 06 07 08 09 10 11 13 14 15 16 22 23 24 25 26 36
08	11	17 18 19 20 21 27 28 29 30 31 32 33 34
08	12	01 02 10 11 12 13 14 15 23 24 25 26 35 36
08	13	05 06 07 08 18 19 20 21 27 28 29 30 31 32 33 34
08	14	05 06 07 08 17 20 21 22 23 26 27 28 29 33 34 35 36
09	09	09 10 11 14 15
09	12	26 27 34 35 36
09	13	25 26 31

APPENDIX C – DISTRICT AQUIFER REGION MAP



APPENDIX D – WELL PERMIT RANKING SYSTEM METHODOLOGY

Goal: To continue to allow high-capacity well development while limiting impacts, conflicts, or interference with neighboring groundwater well users.

The following criteria will be used in the District's Well Permitting Ranking System Methodology:

Main Criteria

1. Thickness of Principal Aquifer Formation
2. Calculated Effective Transmissivity
3. Irrigation Well Density
4. Public Water Supply Well Density
5. Domestic, Livestock & "Other" Well Density
6. Irrigation Method

1. Thickness of Principal Aquifer Formation

a. A minimum of 10 feet of principal aquifer thickness is required for any proposed well to be considered for approval.
b. 1 point shall be awarded for each foot of principal aquifer thickness beginning with 0 points at 10 feet of thickness.
c. Example – 18 feet of aquifer thickness equals 8 points (18ft – 10 ft).
d. Maximum point value of 100.

2. Calculated Transmissivity

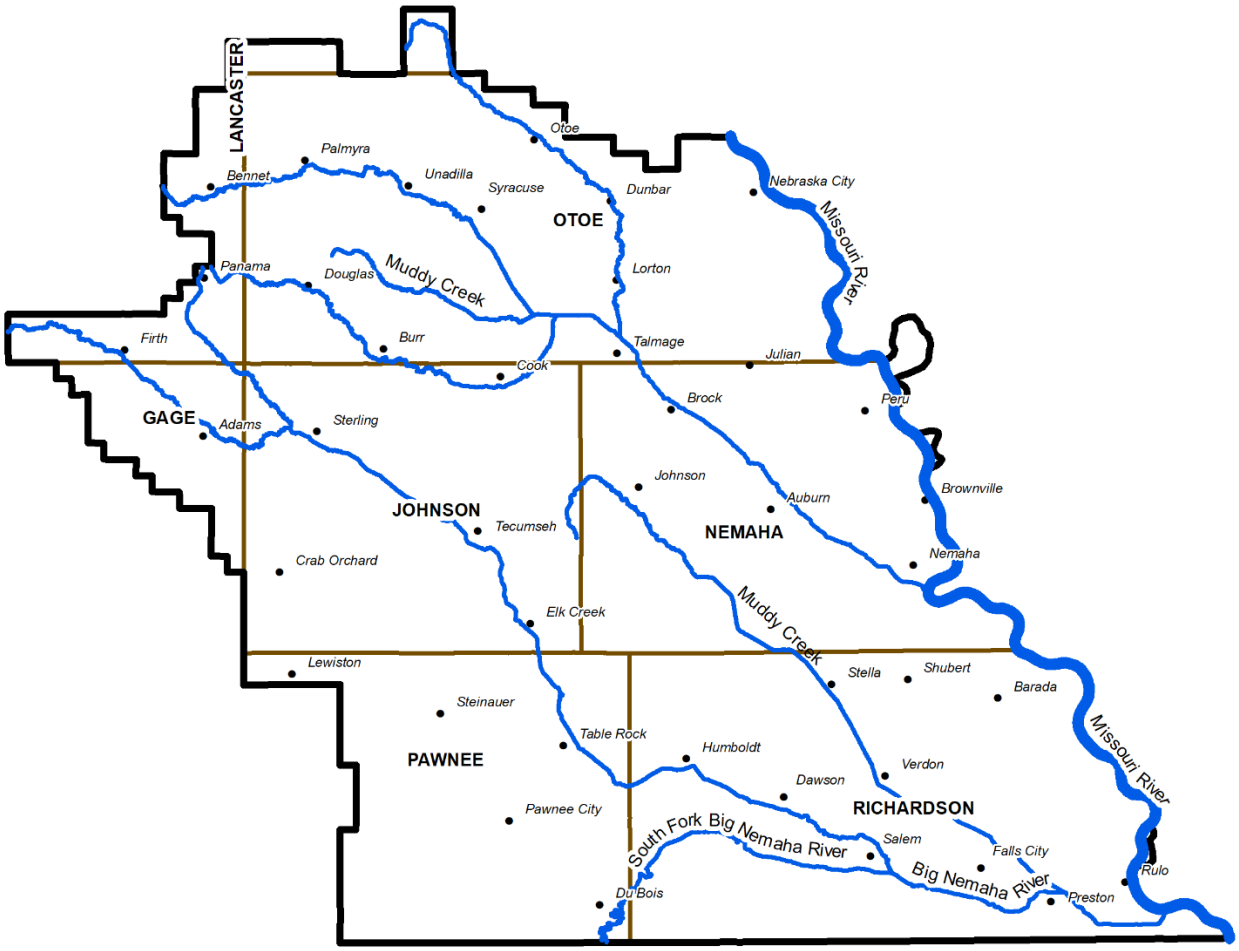
a. The testhole geologic log submitted will be reviewed and scored by comparing each log entry to the "Estimated Hydraulic Conductivity from Particle Size Descriptions" table based upon work at the University of Nebraska Conservation and Survey by E.C. Reed and R. Piskin. (see Estimated Hydraulic Conductivity table on page 51).
b. The "Poor" degree of sorting column will be used by default for the hydraulic conductivity values in the transmissivity calculation.
c. The "Moderate" or "High" degree of sorting column will be used for the hydraulic conductivity values in the transmissivity calculation if a sieve analysis is provided indicating a particle-size distribution of sand or gravel with a moderate or high degree of sorting.
d. The hydraulic conductivity value for each geologic entry is then multiplied by the number of feet of thickness of the material as shown in equation (1).
   i. $T_{eff} = K * b * 7.48$ (1)

   where T_{eff} = effective transmissivity, gpd/ft
   K = hydraulic conductivity, ft/day
   b = saturated thickness, ft
e. The corresponding "T" values for each layer of material are then added together and multiplied by 7.48 gal/ft^3 to get T_{eff}, the effective transmissivity in gallons per day per foot.
f. 1 point shall be awarded for each 1,000 gpd/ft of transmissivity rounded to the nearest integer.

g. Maximum point value of one hundred (100) points.
h. Minimum point value of zero (0) points.
i. A minimum calculated value of 10,000 gallons per day per foot is required for any proposed well to be considered for approval.

3. Well Density

a. Active permitted and registered wells used in the Well Density calculations listed below that are within 6,000 feet of the testhole location submitted and located on the opposite side of a major perennial river body will not be included. The following major perennial river bodies within the District are:
   i. North Fork of the Little Nemaha River
   ii. Muddy Creek
   iii. Little Nemaha River
   iv. South Fork of the Little Nemaha River
   v. North Fork of the Big Nemaha River
   vi. Middle Branch of the Big Nemaha River
   vii. South Fork of the Big Nemaha River
   viii. Big Nemaha River
   ix. Missouri River



4. Irrigation (IRR) Well Density

a. The irrigation well density score is derived by measuring the distance from the proposed well's testhole in relation to all active permitted or registered irrigation wells located within a 6,000-foot radius inside or outside District boundaries. Each active permitted or registered irrigation well within the radius contributes to a reduction in the number of points out of one hundred (100) points possible. A 1,000-foot minimum spacing is required between the proposed well's testhole and any active permitted or registered irrigation well.

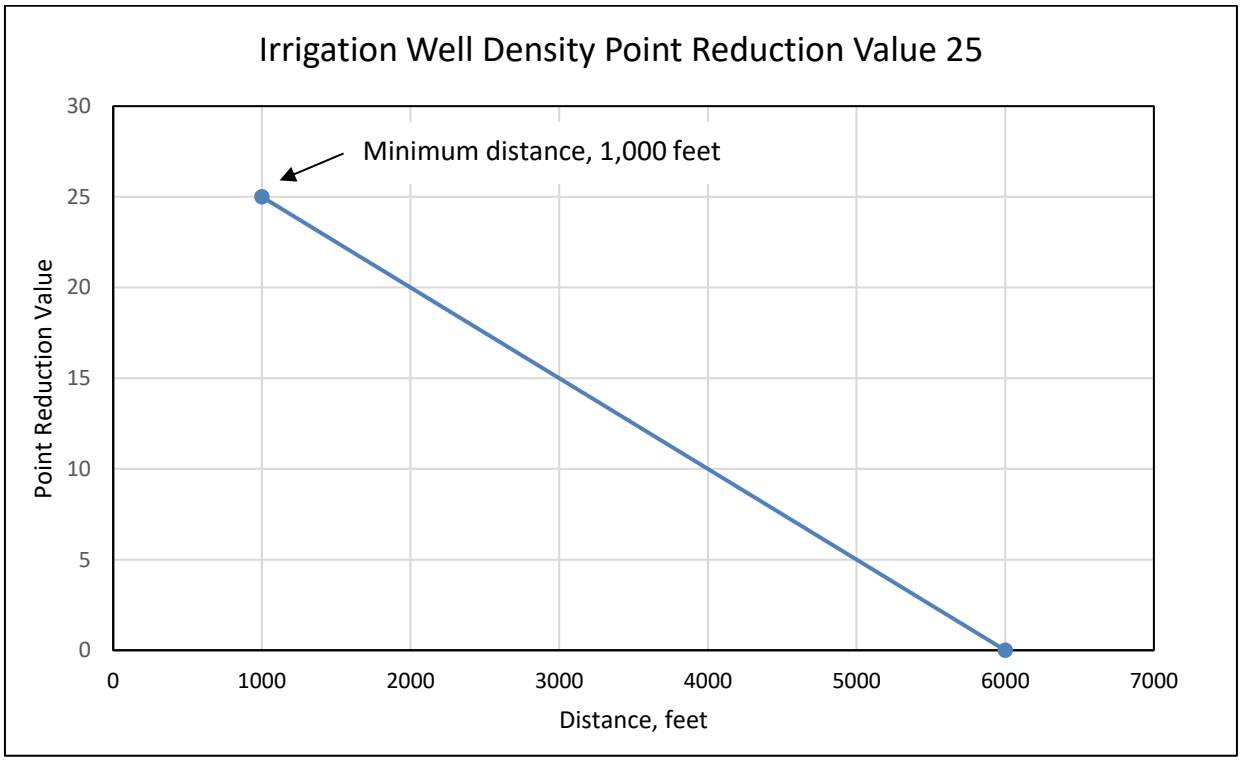
b. The irrigation well density score is calculated by using the following equation:

i. Irrigation Well Density Score = $100 - \sum (-0.005 * d_n + 30)$ (2)

where d_n = distance of each irrigation well located within 6,000 feet of the proposed well's testhole location.

ii. The irrigation well density score is limited to a maximum of one hundred (100) and a minimum of zero (0) points.

iii. Graphical representation of Equation (2)



5. Public Water Supply (PWS) Well Density

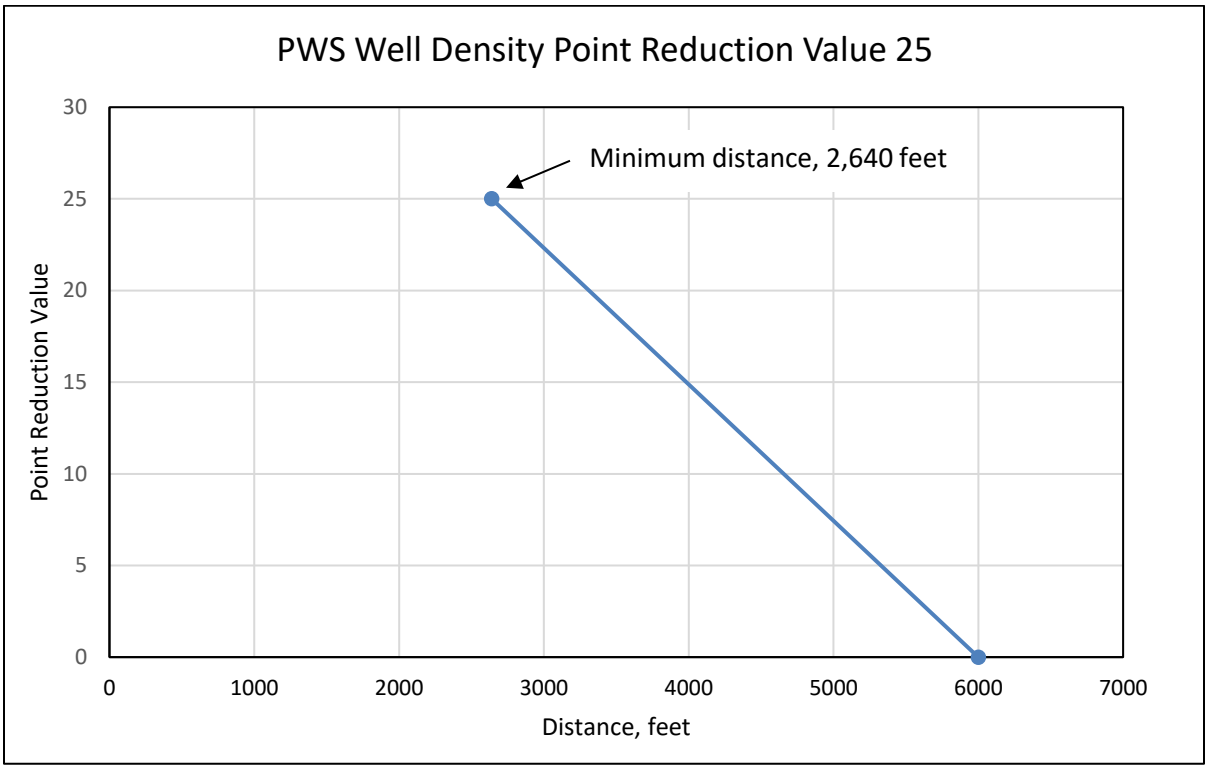
a. The PWS well density score is derived by measuring the distance from the proposed well's testhole in relation to all active permitted or registered PWS wells located within a 6,000-foot radius inside or outside District boundaries. Each active permitted or registered PWS well within the radius contributes to a reduction in the number of points out of fifty (50) points possible. A 2,640-foot minimum spacing is required between the proposed well's testhole and any active permitted or registered public water supply well.

b. The PWS well density score is calculated by using the following equation:

i. PWS Well Density Score = $50 - \sum (-0.0074405 * d_n + 44.6428571)$ (3)
where d_n = distance of each public water supply well located within 6,000 feet of the proposed well location.

ii. The PWS well density score is limited to a maximum of fifty (50) and a minimum of a negative fifty (-50) points.

iii. Graphical representation of Equation (3)



6. Domestic, Livestock & "Other" (DLO) Well Density

a. The DLO well density score is derived by measuring the distance from the proposed well's testhole in relation to all active registered domestic, livestock, commercial/industrial, and other type wells located within a 6,000-foot radius inside or outside District boundaries. Each active registered domestic, livestock, commercial/industrial, and other type wells within the radius contributes to a reduction in the number of points out of fifty (50) points possible. A 1,000-foot minimum spacing is required between the proposed well's testhole and any active permitted or registered irrigation well.

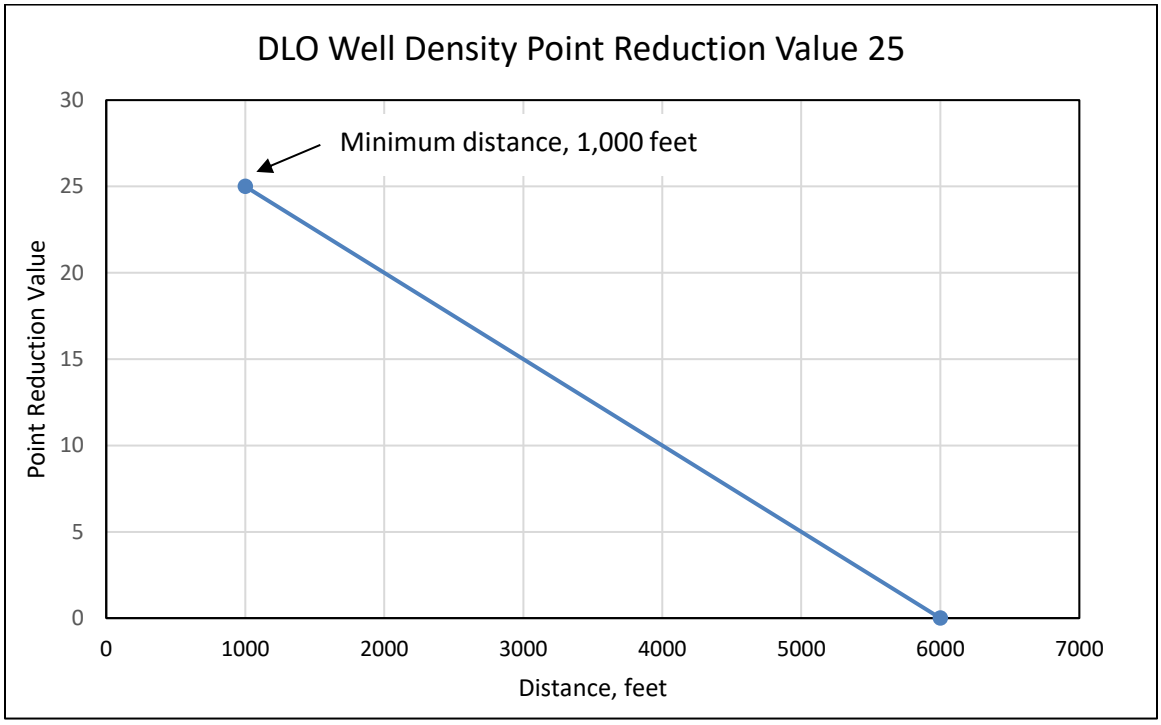
b. The DLO well density score is calculated by using the following equation:

i. DLO Well Density Score = $50 - \sum (-0.005 * d_n + 30)$ (4)

where d_n = distance of each public water supply well located within 6,000 feet of the proposed well.

ii. The PWS well density score is limited to a maximum of 50 and a minimum of -50 points.

iii. Graphical representation of Equation (4)



7. Irrigation Method

a. Additional ranking system points based upon the irrigation method:

i. Irrigation Method

- Gravity -25
- Pivot/Sprinkler 0
- Subsurface Drip 25

b. If subsurface drip is indicated as the Irrigation Method and the total Well Permit Ranking System score is between the minimum score for approval and the minimum score for approval plus the points given for subsurface drip, then a signed and

notarized affidavit will be filed with the corresponding County courthouse indicating subsurface drip will be implemented.

c. If subsurface drip is indicated as the Irrigation Method and the total Well Permit Ranking System score is greater than the sum of the minimum score for approval plus the points given for subsurface drip, then a notarized affidavit is not required.
d. If more than one method of irrigation is to be used, then points will be assigned based on the percentage of acres of each method multiplied by the score of each method:
    i. Example – 140 total acres irrigated, 120 pivot and 20 gravity, then the score would equal (120/140) * 0 pts + (20/140) *-25 pts = -4 points

Example testhole geologic log (see below) and well permit system ranking calculator worksheet (see following page) on how a well permit application will be scored according to the above methodology.

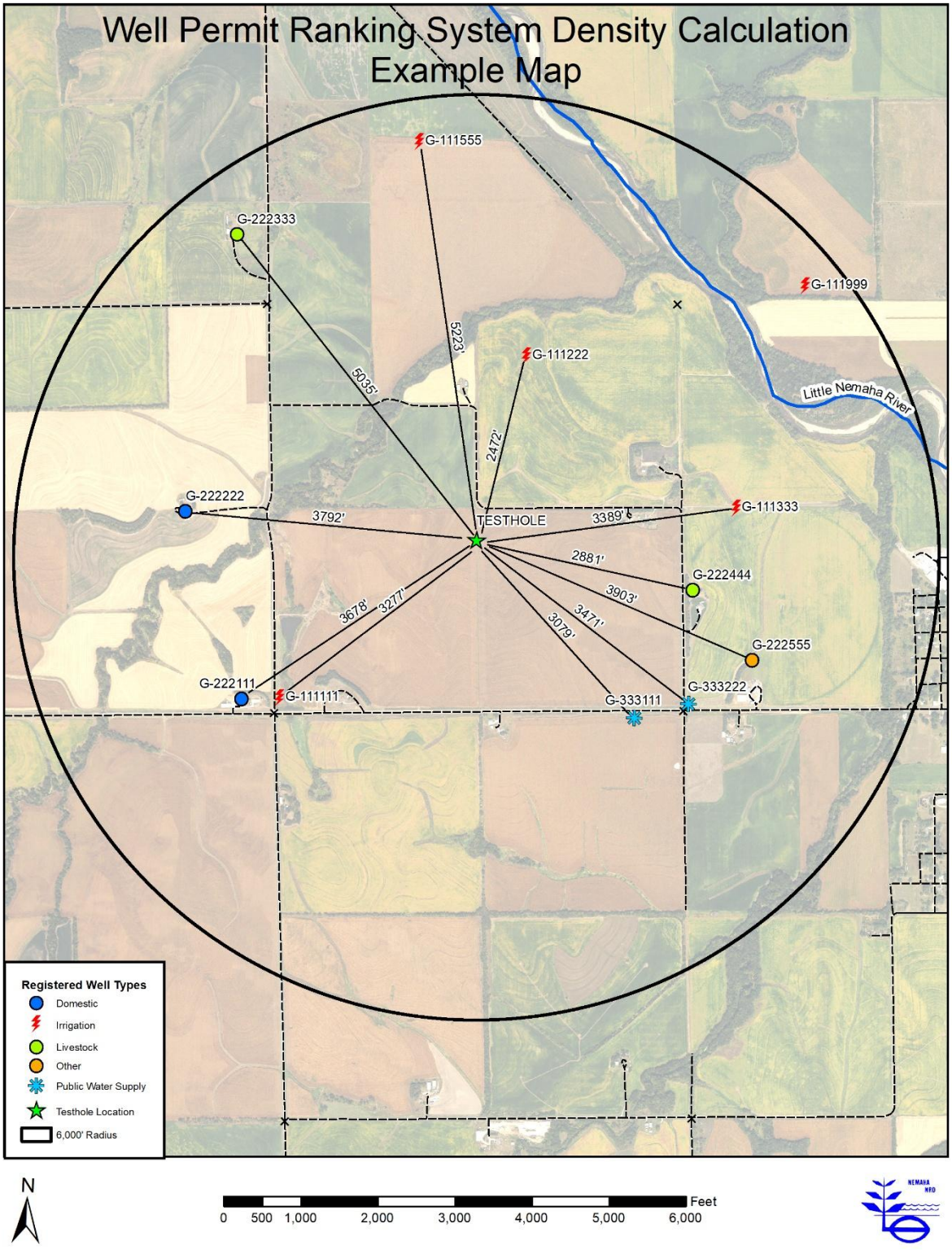
Example Testhole Geologic Log

Testhole Log 2025-01 40.00236789° -96.55669889° Green Acres Farms LLC

Material		From, ft	To, ft	b, ft	K, ft/day	T, gpd/ft
Soft black topsoil		0	4			
Loose sandy clay, brown		4	10			
Brown clay		10	16			
Sandy gray clay		16	21			
Silty sand with clay strips		21	26			
Brown clay with fine sand strips		26	38			
Stiff blue clay		38	57			
Loose gray fine to coarse sand	*(Principal*	57	87	30	58	13,015
Loose gray fine to coarse gravel	*Aquifer)*	87	91	4	245	7,330
Coarse gravel & boulders		91	95	4	334	9,993
Gray shale		95	100			
Limestone		100	110			

Thickness, b = 38 feet

$T_{effective}$ = 30,338 gpd/ft


Well Permit Ranking System Density Calculation
Example Map
G-111555
G-222333
G-111999
5223'
G-111222
5035'
Little Nemaha River
2472'
G-222222
3792'
TESTHOLE
3389'
G-111333
2881'
G-222444
3903'
3678'
3277'
3471'
3079'
G-222555
G-222111
G-111111
G-333111
G-333222
Registered Well Types
Domestic
Irrigation
Livestock
Other
Public Water Supply
Testhole Location
6,000' Radius
N
0 500 1,000 2,000 3,000 4,000 5,000 6,000
Feet

Example Ranking System Worksheet

Nemaha NRD Well Permit Ranking System Calculator					
Name:	Example Map Farms LLC				
Testhole ID:	2026-01		**Drill Date:**	**01/01/2026**	
Latitude:	40.12345678°		**Received:**	**01/07/2026**	
Longitude:	-96.12345678°		**Scored:**	**01/08/2026**	
Legal Location:	SE¼ of SE¼ of Section 01-Township 01 North-Range-01 East				
County:	Example				
Criteria	**Max Pts**		**Value**	**Units**	**Points**
1. Thickness of Principal Aquifer	**100**		38	Feet	**28.0**
2. Transmissivity	**100**		30,338	gpd/ft	**30.0**
		Reg #	**Dist., ft**	**PRV25**	
3. Irrigation Well Density	**100**	G-111222	2,472	17.6	**51.8**
		G-111333	3,277	13.6	
		G-111111	3,389	13.1	
		G-111555	5,223	3.9	
		Total Point Reduction =		48.2	
4. Public Water Supply Density	**50**	G-333111	3,079	21.7	**9.4**
		G-333222	3,471	18.8	
		Total Point Reduction =		40.5	
5. Domestic, Livestock, Other Density	**50**	G-222444	2,881	15.6	**-3.6**
		G-222111	3,678	11.6	
		G-222222	3,792	11.0	
		G-222555	3,903	10.5	
		G-222333	5,035	4.8	
		Total Point Reduction =		53.5	
6. Irrigation Method					
Gravity	**-25**				
Center Pivot	**0**				**0**
Subsurface Drip	**+25**				
Maximum Points Possible	**425**		**Total Score**		**116**

Estimated Hydraulic Conductivity from Particle Size Descriptions						
	Degree of Sorting			Silt Content		
Grain Size	**Poor**	**Moderate**	**High**	**Slight**	**Moderate**	**Very**
Clay and silt:						
Clay	0.0			2		
Silt, slightly clayey	1.3			18		
Silt, moderately clayey	2.7			11		
Silt, very clayey				7		
Silt; loess; sandy silt				20		
Sand and gravel						
Very fine sand	13	20	27	23	19	13
Very fine to fine sand	27	27		24	20	13
Very fine to medium sand	36	41-47		32	27	21
Very fine to coarse sand	48			40	31	24
Very fine to very coarse sand	59			51	40	29
Very fine sand to fine gravel	76			67	52	38
Very fine sand to medium gravel	99			80	66	49
Very fine sand to coarse gravel	128			107	86	64
Fine sand	27	40	53	33	27	20
Fine to medium sand	53	67		48	39	30
Fine to coarse sand	58	67-72		53	43	32
Fine to very coarse sand	70			60	47	35
Fine sand to fine gravel	88			74	59	44
Fine sand to medium gravel	114			94	75	57
Fine sand to coarse gravel	145			107	87	72
Medium sand	67	80	94	64	51	40
Medium to coarse sand	74	94		72	57	42
Medium to very coarse sand	84	98-111		71	61	49
Medium sand to fine gravel	103			84	68	52
Medium sand to medium gravel	131			114	82	66
Medium sand to coarse gravel	164			134	108	82
Coarse sand	80	107	134	94	74	53
Coarse to very coarse sand	94	134		94	75	57
Coarse sand to fine gravel	116	136-156		107	88	68
Coarse sand to medium gravel	147			114	94	74
Coarse sand to coarse gravel	184			134	100	92
Very coarse sand	107	147	187	114	94	74
Very coarse sand to fine gravel	134	214		120	104	84
Very coarse sand to medium gravel	170	199-227		147	123	99
Very coarse sand to coarse gravel	207			160	132	104
Gravel						
Fine gravel	160	214	267	227	140	107
Fine to medium gravel	201	334		201	167	134
Fine to coarse gravel	245	289-334		234	189	144
Medium gravel:	241	321	401	241	201	160
Medium to coarse gravel	294	468		294	243	191
Coarse gravel	334	468	602	334	284	234

The table above shows the estimated hydraulic conductivities values from an unpublished and undated paper by E.C. Reed and R. Piskin as it was published in “Hydrogeology of Parts of the Twin Platte and Middle Republican Natural Resources Districts, Southwestern Nebraska” by J. W. Goeke, J. M. Peckenpaugh, R. E. Cady, and J. T. Dugan, Nebraska Water Survey Paper No. 70, April 1992, published through the Conservation and Survey Division, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Hydraulic Conductivity & Transmissivity

The ability of rocks to transmit water is indicated quantitatively by their hydraulic conductivity and transmissivity. The hydraulic conductivity of a rock is the volume of water that will move in unit time under a unit hydraulic gradient through a unit cross-sectional area of the rock perpendicular to the direction of flow. The transmissivity of an aquifer is the rate at which water is transmitted through a unit width of the aquifer under a unit hydraulic gradient. The transmissivity can be approximated by summing the products of the hydraulic conductivity and thickness for each different lithology that occurs in a section of the aquifer. Transmissivity differs from place to place and can vary with time. Differences in transmissivity in space are related to lateral changes in the thickness of the aquifer and to lateral changes in the textural composition of the sediments comprising the aquifer. As the water table rises or declines, the saturated thickness also changes and thereby causes transmissivity to change with time.

The equivalent hydraulic conductivity values for the transmissivity calculation were estimated based upon work at the University of Nebraska Conservation and Survey Division by E.C Reed and R. Piskin. They assigned permeability values to various unconsolidated materials based on grain size, particle size, degree of sorting and silt content. This work has been used by several authors as the basis for estimating hydraulic conductivity of the sedimentary deposits of Nebraska. Due to the well driller's personal interpretation of particle size descriptions and the District's glaciated aquifer system, the "Poor" Degree of Sorting column of values will be used by default to estimate the hydraulic conductivity, K, values, unless otherwise indicated through sieve analysis.

Therefore, the method used to determine the hydraulic conductivity and transmissivity is as previously stated: each layer(s) of principal aquifer material recorded in the testhole lithologic log is classified and assigned a value for hydraulic conductivity based upon the table by Reed and Piskin. The hydraulic conductivity is then multiplied by the thickness, in feet, of that material to get a transmissivity value for the layer(s). The sum of the transmissivity of the principal aquifer layer(s) is the effective transmissivity of the aquifer(s) at the testhole location.

REFERENCES

Nebraska Department of Environmental Control – State of Nebraska and Conservation and Survey Division – Institute of Agriculture and Natural Resources, University of Nebraska - Lincoln, 1980, "Configuration of Base of Principal Aquifer, 1979, Lincoln and Nebraska City Quadrangle, Nebraska", Map Scale 1:250,000, 1 sheet.