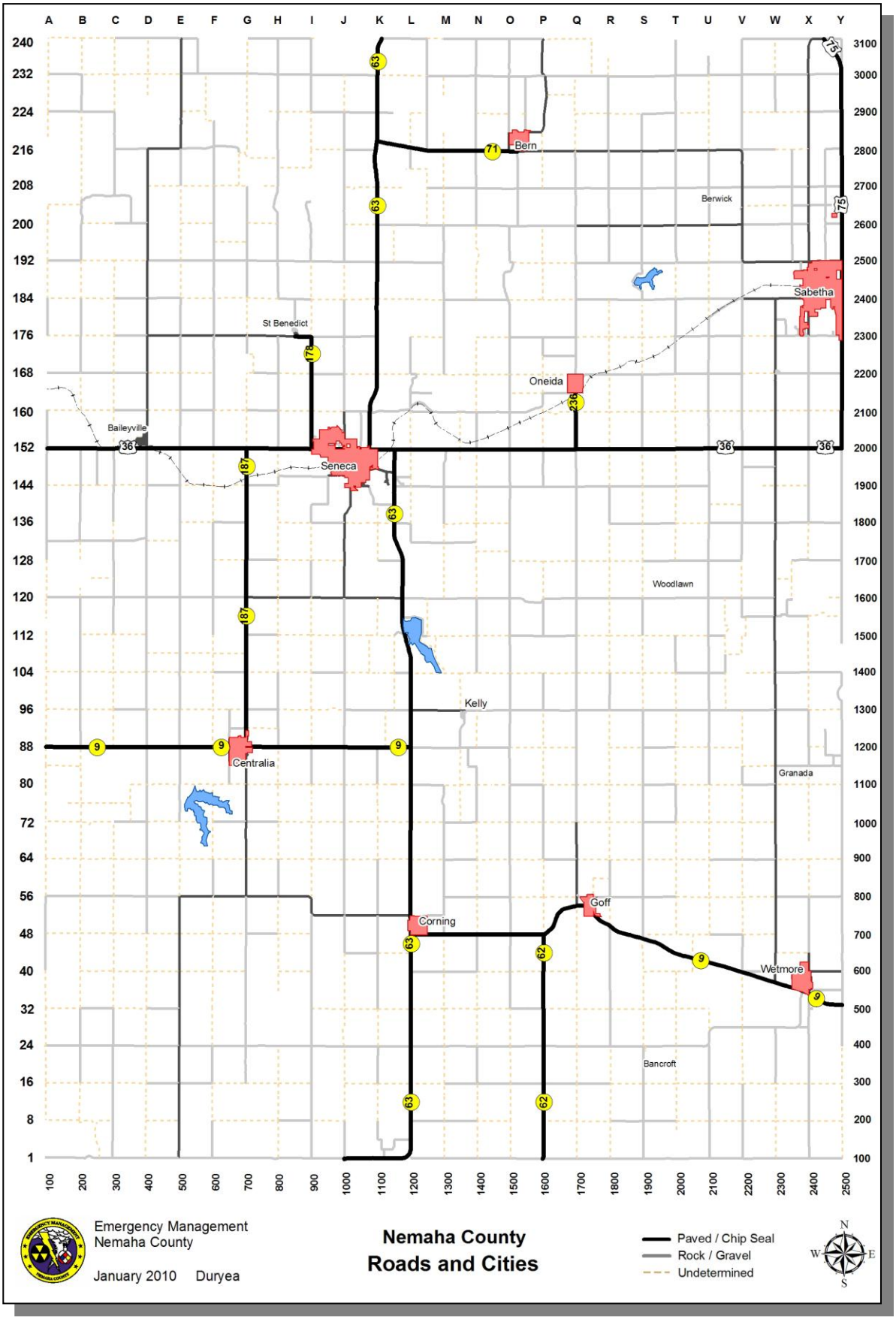

Bern
Berwick
Sabetha
St Benedict
Oneida
Baileyville
Seneca
Woodlawn
Kelly
Centralia
Granada
Goff
Corning
Wetmore
Bancroft
Emergency Management
Nemaha County
January 2010 Duryea
Nemaha County
Roads and Cities
Paved / Chip Seal
Rock / Gravel
Undetermined
N
W
E
S

Appendix B
Nemaha County Plan Adoption

RESOLUTION 2011 - 8

A RESOLUTION OF INTENT TO PARTICIPATE IN HAZARD MITIGATION AND TO WORK TOWARD BECOMING A SAFER COMMUNITY

WHEREAS, Nemaha County recognizes that no community is immune from natural or man-made hazards whether it be tornado, severe thunderstorm, flood, severe winter weather, drought, heat wave, earthquake, dam failure or wildfire, and

WHEREAS, Nemaha County recognizes the importance of enhancing its ability to withstand natural hazards as well as the importance of reducing the human suffering, property damage, interruption of public services and economic losses caused by those hazards; and

WHEREAS, Nemaha County may have previously pursued measures such as building codes, fire codes, floodplain management regulations, and zoning ordinances to minimize the impact of natural or man-made hazards; and

WHEREAS, the Federal Emergency Management Agency and the Kansas Division of Emergency Management have developed a hazard mitigation program that assists communities in their efforts to become Disaster-Resistant Communities that focus, not just on disaster relief, but also on recovery and reconstruction that brings the community to at least pre-disaster conditions in an accelerated, orderly and preplanned manner; and

WHEREAS, Nemaha County will implement the Nemaha County Hazard Mitigation Plan in cooperation with community partners and by incorporation of relevant information into other community plans and mechanisms where appropriate; and

WHEREAS, by participating in the hazards mitigation program, Nemaha County will be eligible to apply for post-disaster mitigation funds; and

WHEREAS, Nemaha County will participate in the evaluation and review of the Nemaha County Hazard Mitigation Plan after a disaster as well as complete a mandated five-year update submitted to the Kansas Division of Emergency Management Agency and the Federal Emergency Management Agency for review and approval; and

NOW, THEREFORE BE IT RESOLVED by the Board of County Commissioners of Nemaha County Kansas, that Nemaha County hereby approves and adopts the Nemaha County Hazard Mitigation Plan attached hereto for the purpose of building a safer community by reducing vulnerability to natural hazards.

ADOPTED BY THE BOARD OF COUNTY COMMISSIONERS THIS 12TH DAY OF SEPTEMBER 2011.

Gary Scoby, District 1

Tim Burdiek, District 2

Mark Wessel, District 3

ATTEST:

Mary Kay Schultejans, County Clerk

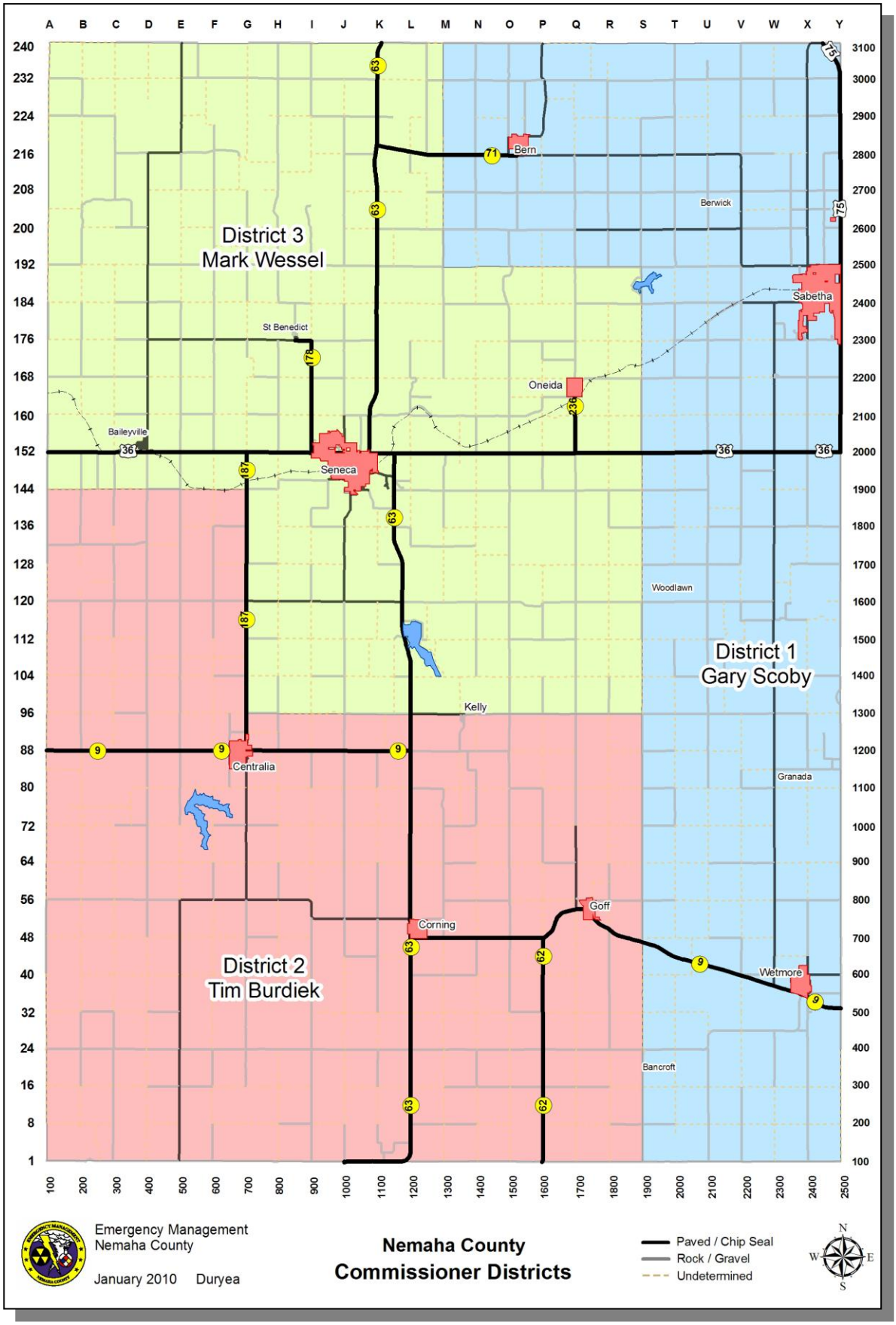
COUNTY CLERK SEAL

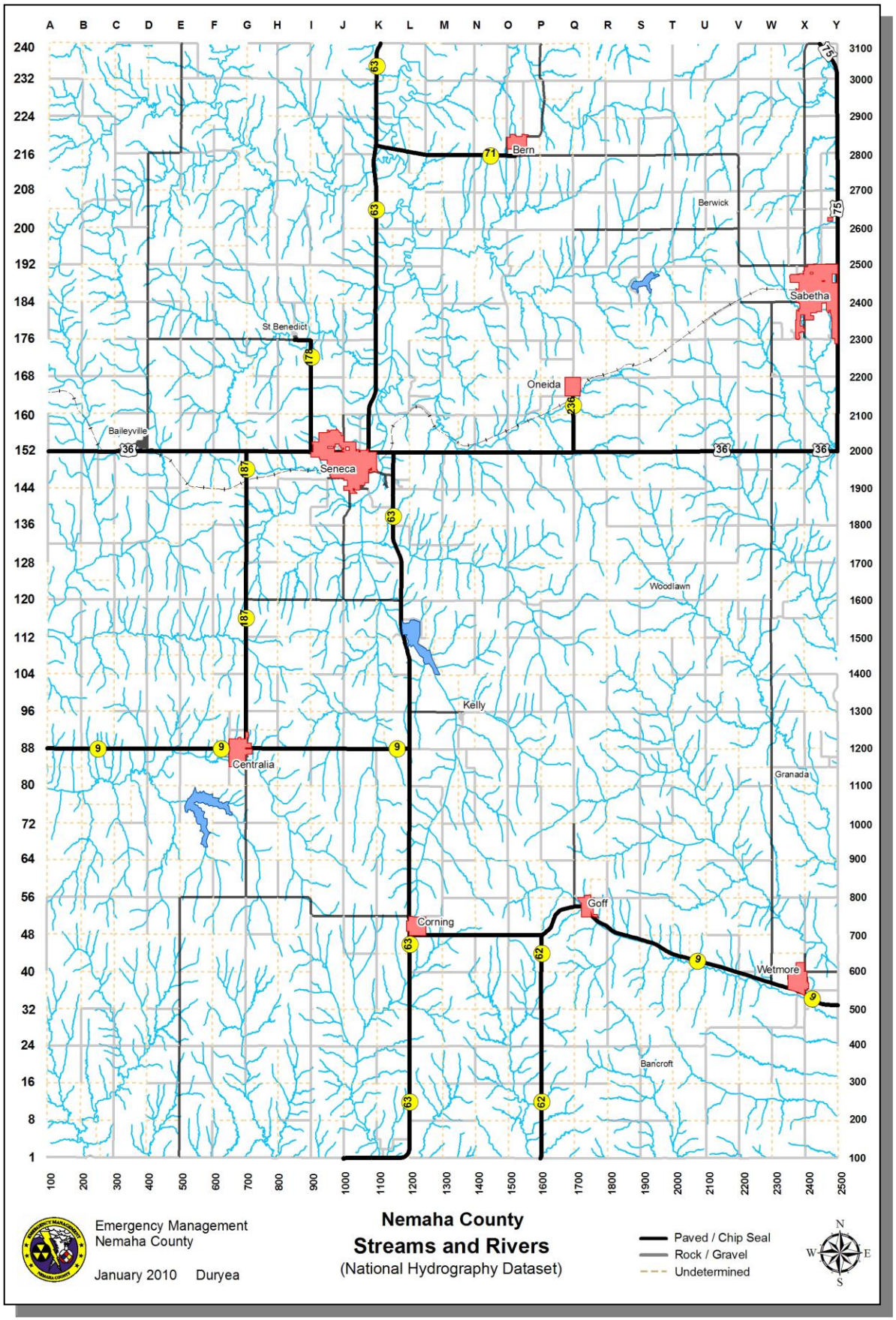
VOTE: YES 3 NO 0

Appendix C
Adoption by Participating Jurisdictions

(Appendix C will contain the records of Nemaha County Hazard Mitigation Plan adoption by the participating jurisdictions.)

Appendix D
Nemaha County Maps


District 3
Mark Wessel
District 1
Gary Scoby
District 2
Tim Burdiek
Bern
Berwick
Sabetha
St Benedict
Oneida
Baileyville
Seneca
Woodlawn
Kelly
Centralia
Granada
Goff
Corning
Wetmore
Bancroft
Emergency Management
Nemaha County
January 2010 Duryea
Nemaha County
Commissioner Districts
Paved / Chip Seal
Rock / Gravel
Undetermined


Bern
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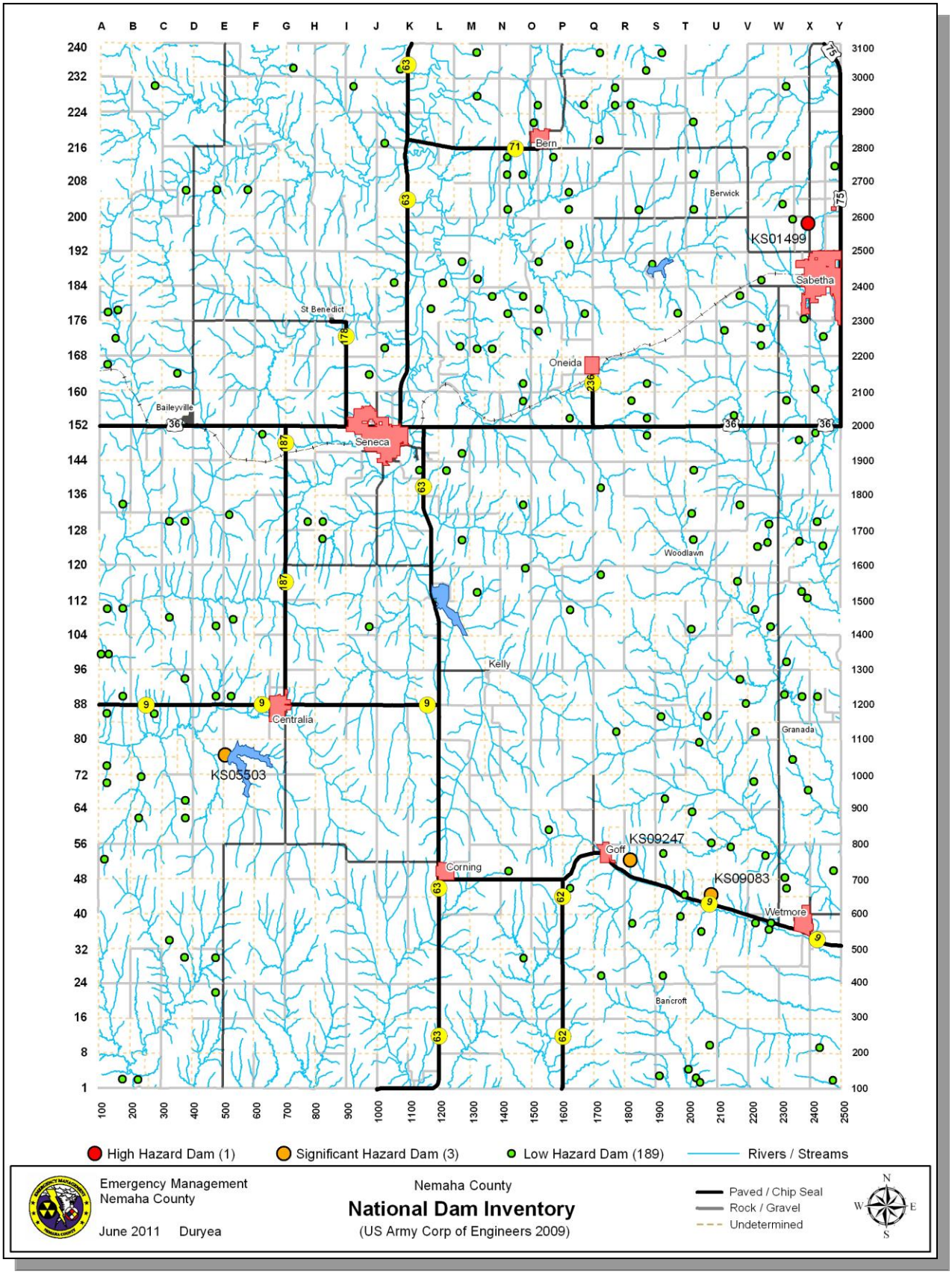
Sabetha
St Benedict
Oneida
Baileyville
Seneca
Woodlawn
Kelly
Centralia
Granada
Goff
Corning
Wetmore
Bancroft
Emergency Management
Nemaha County
January 2010 Duryea
Nemaha County
Streams and Rivers
(National Hydrography Dataset)
Paved / Chip Seal
Rock / Gravel
Undetermined
N
W
E
S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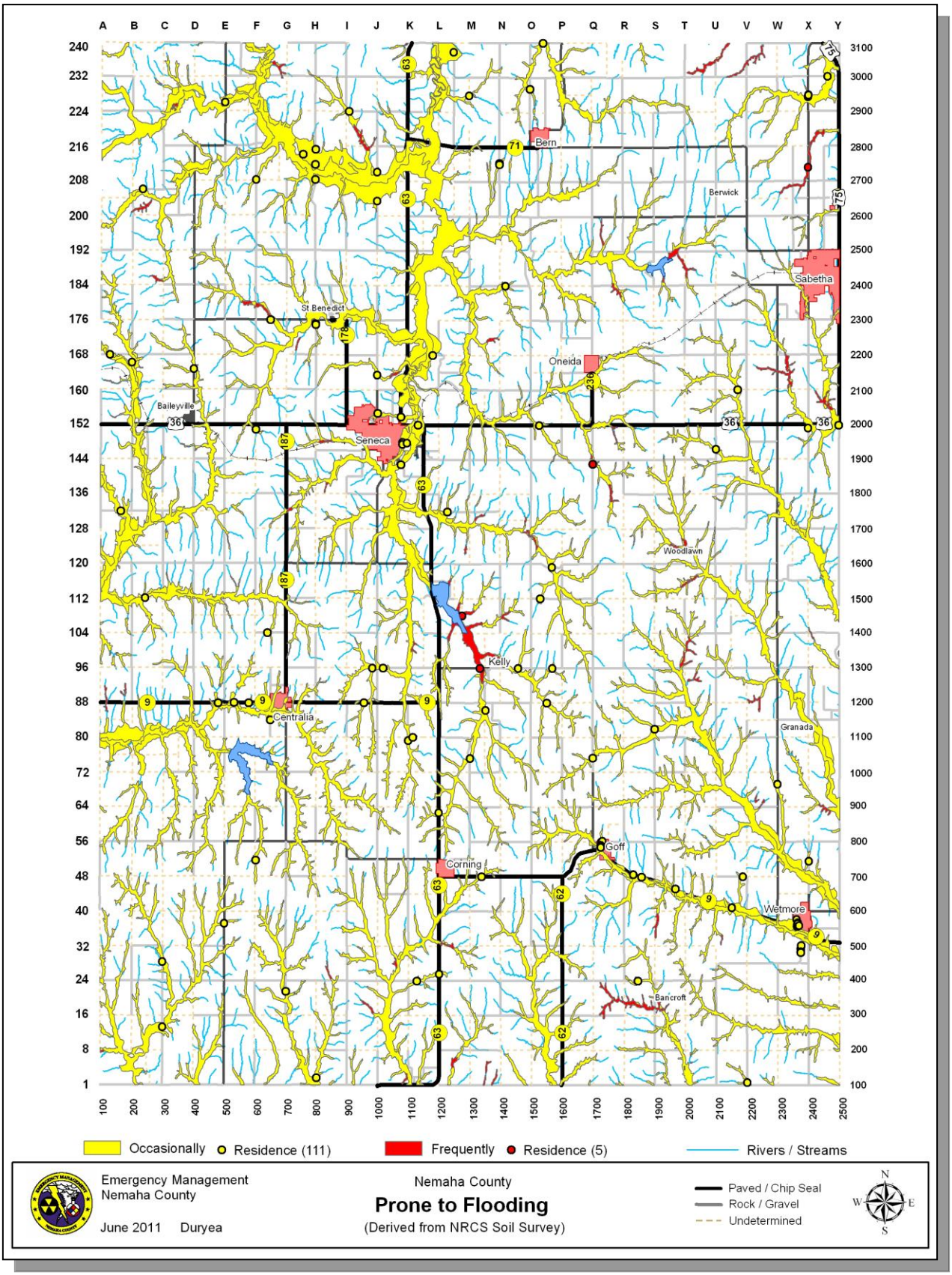
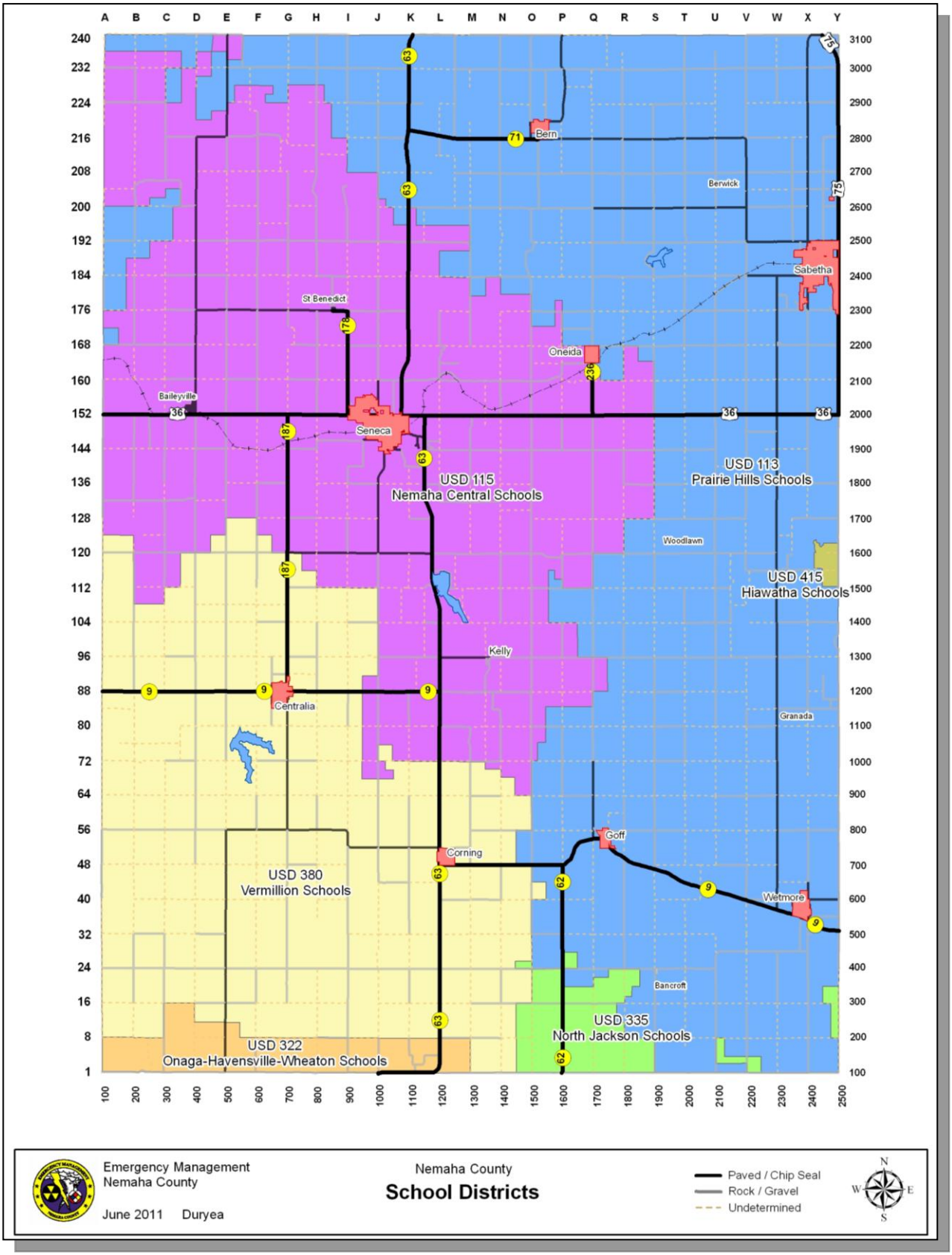
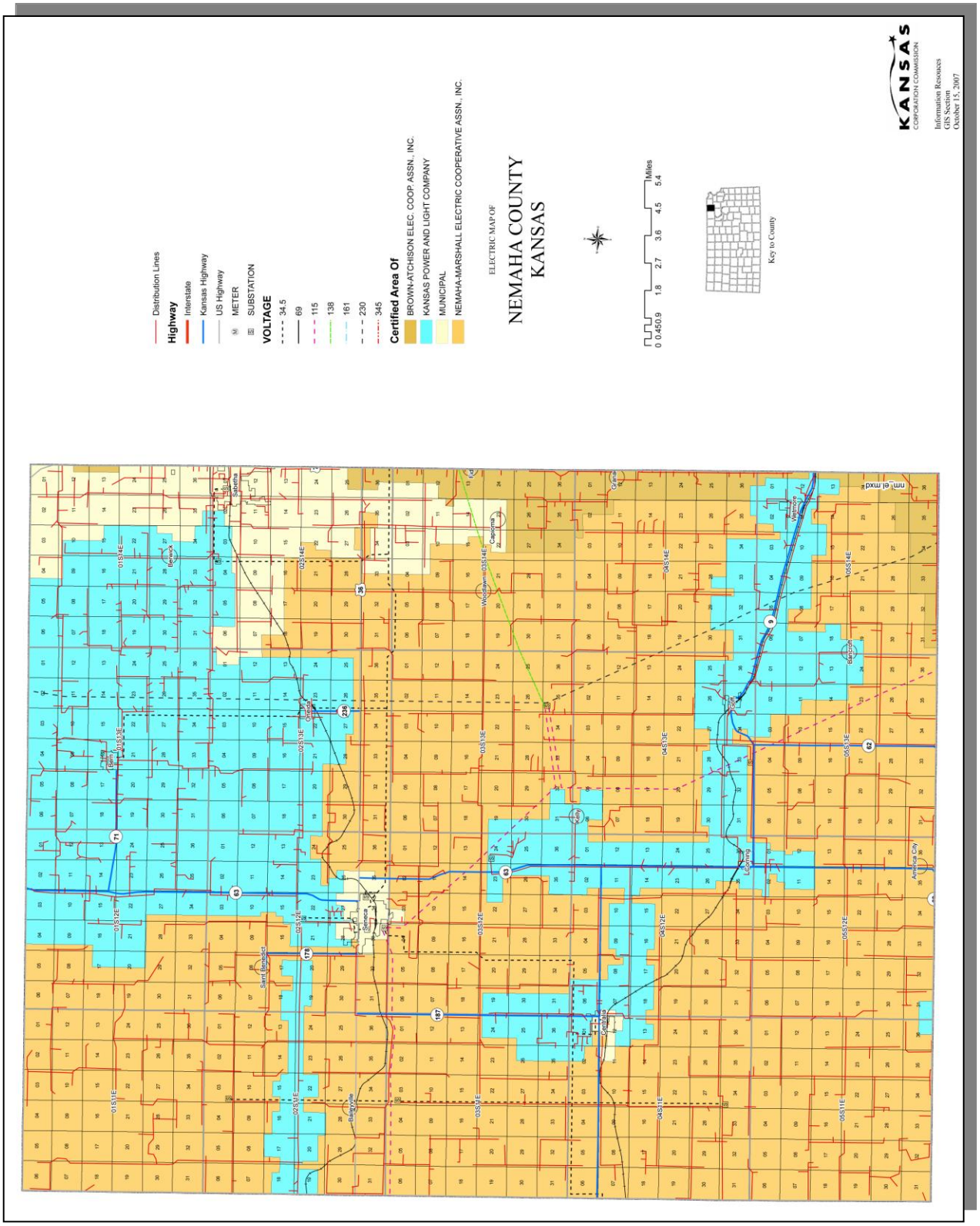
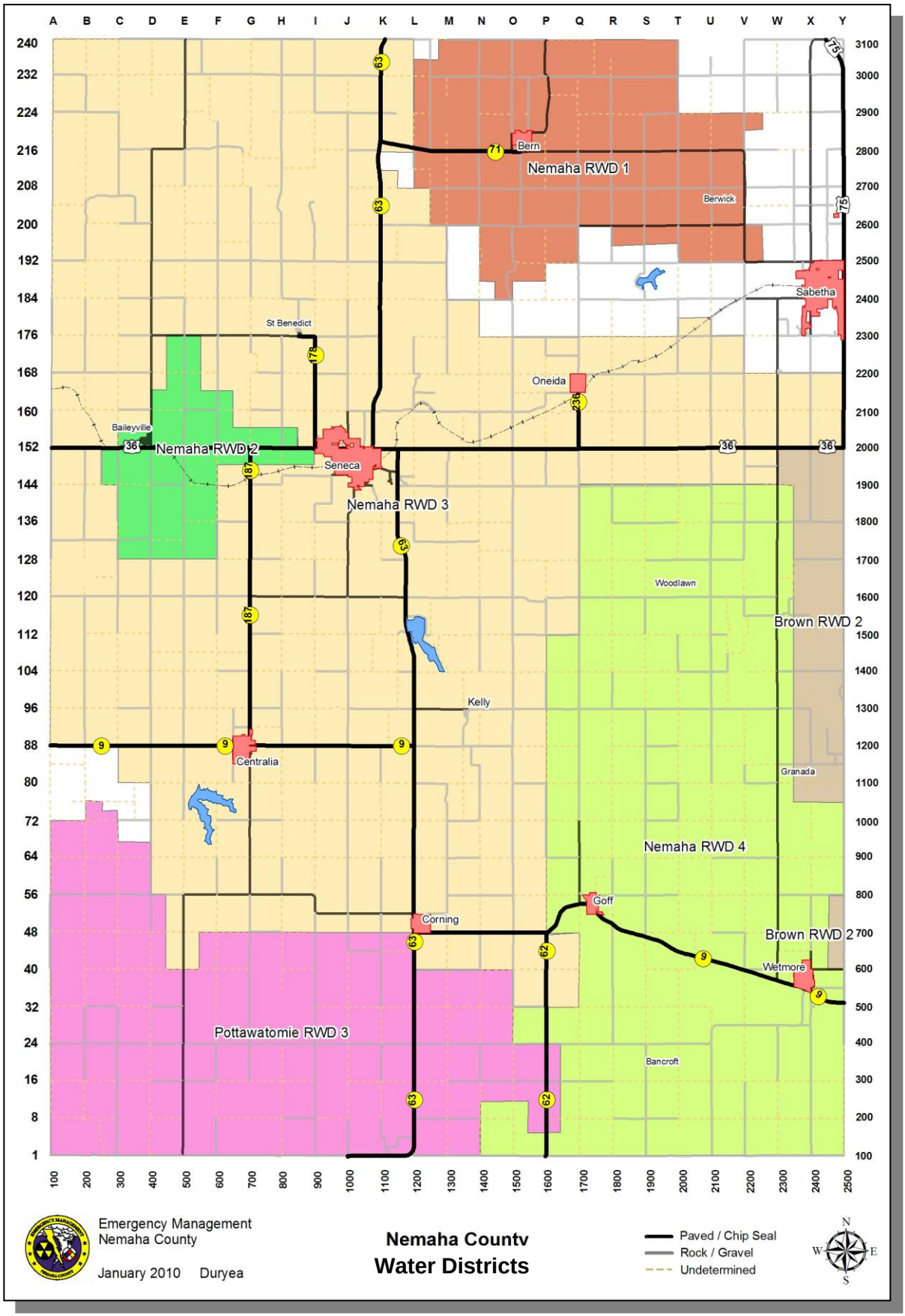
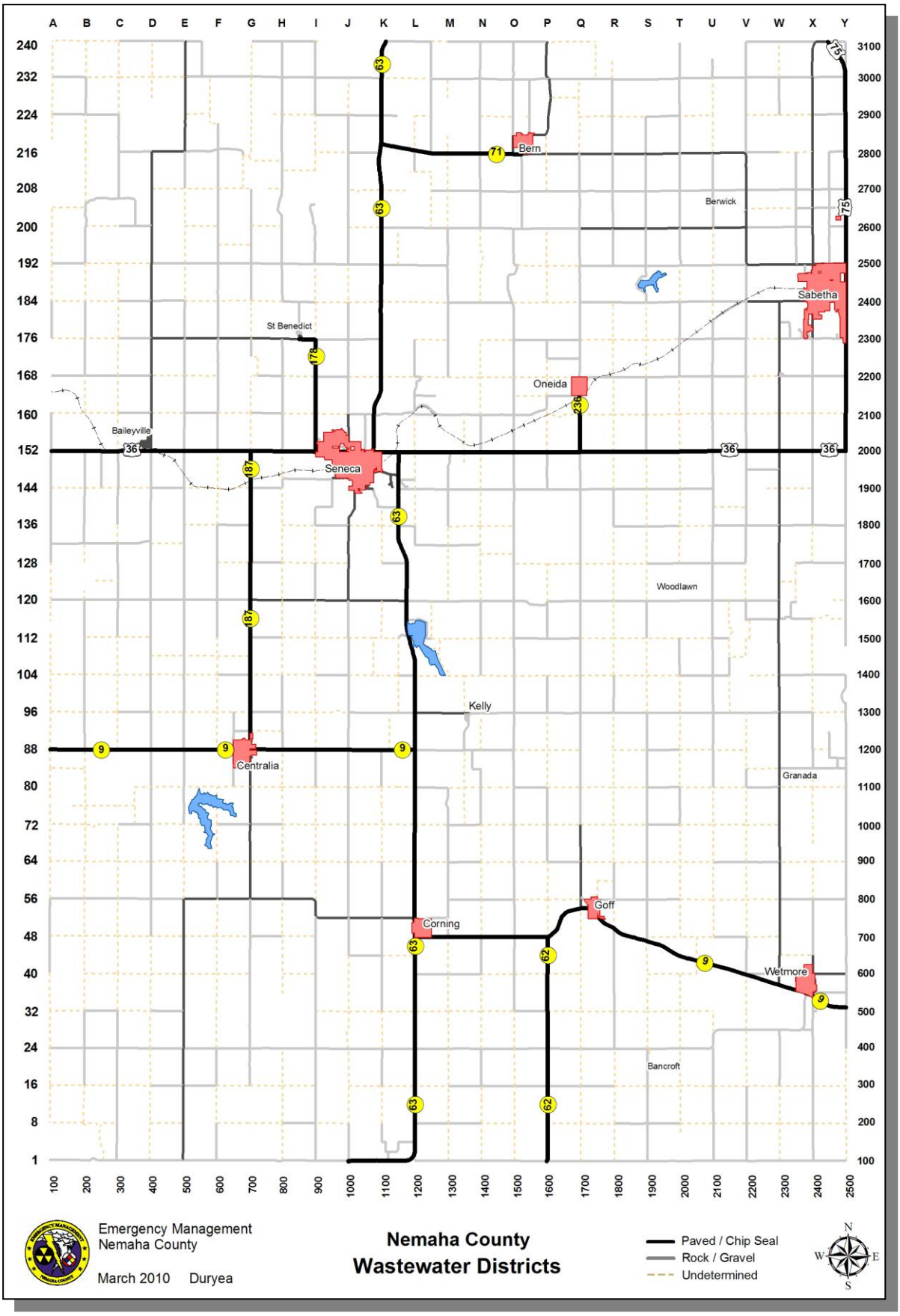
Berwick
KS01499
Sabetha
St Benedict
Oneida
Baileyville
Seneca
Woodlawn
Kelly
Centralia
Granada
KS05503
KS09247
Goff
Corning
KS09083
Wetmore
Bancroft
High Hazard Dam (1)
Significant Hazard Dam (3)
Low Hazard Dam (189)
Rivers / Streams
Emergency Management
Nemaha County
June 2011 Duryea
Nemaha County
National Dam Inventory
(US Army Corp of Engineers 2009)
Paved / Chip Seal
Rock / Gravel
Undetermined

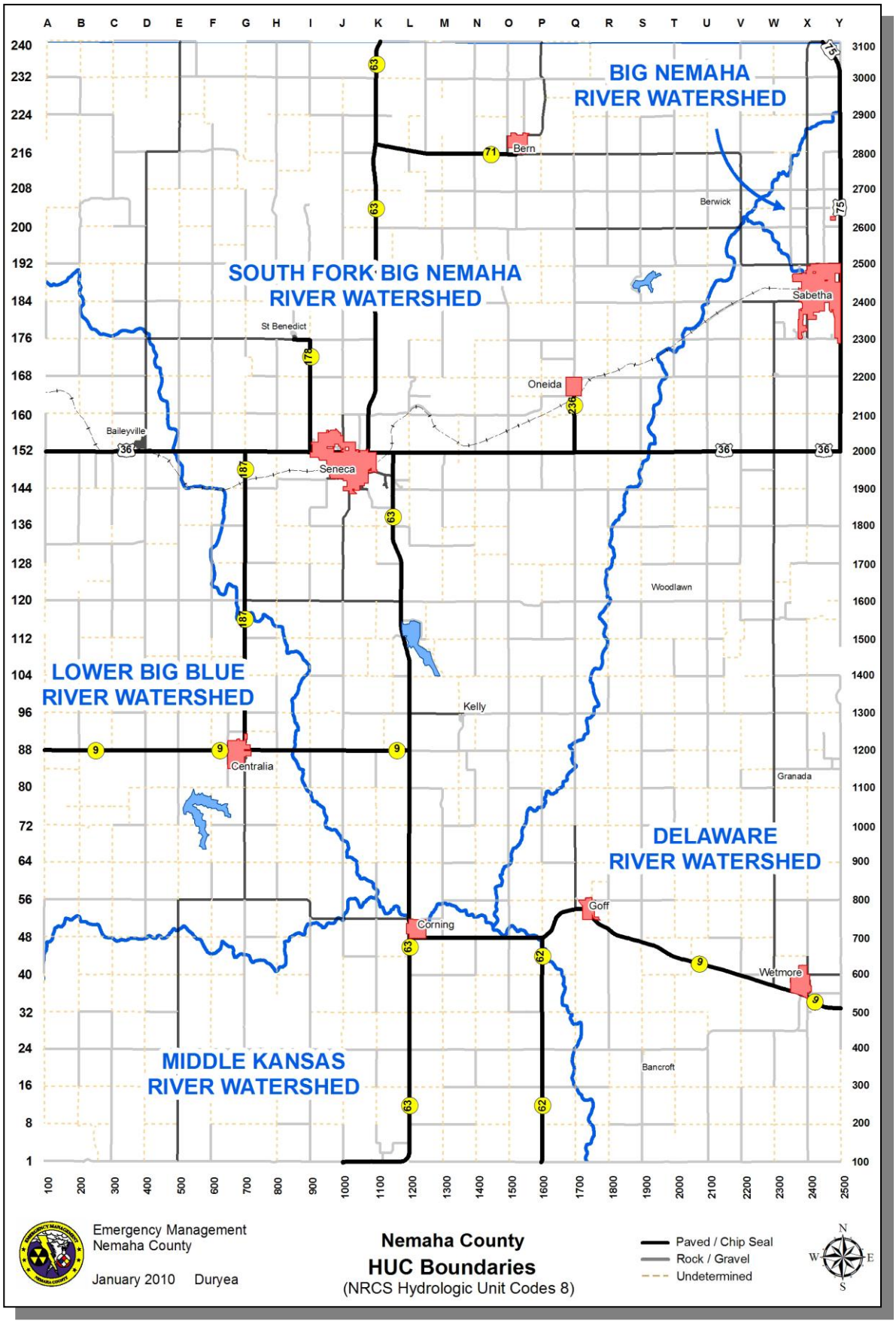

Bern
Berwick
Sabetha
St Benedict
Oneida
Baileyville
Seneca
Woodlawn
Kelly
Centralia
Granada
Goff
Corning
Wetmore
Bancroft
Occasionally
Residence (111)
Frequently
Residence (5)
Rivers / Streams
Emergency Management
Nemaha County
June 2011 Duryea
Nemaha County
Prone to Flooding
(Derived from NRCS Soil Survey)
Paved / Chip Seal
Rock / Gravel
Undetermined
N
W
E
S

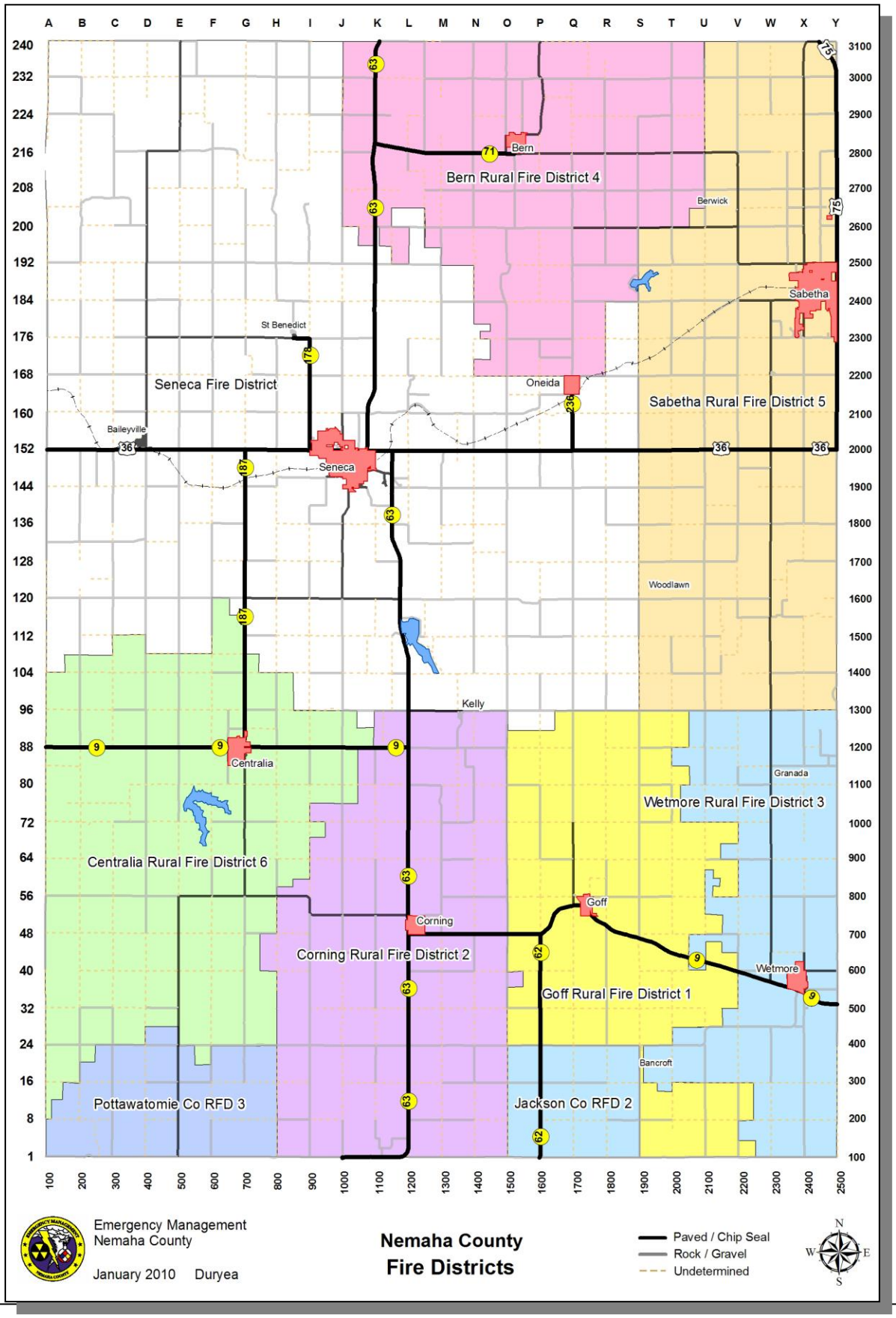

Emergency Management
Nemaha County
June 2011 Duryea
Nemaha County
School Districts
Paved / Chip Seal
Rock / Gravel
Undetermined
USD 115
Nemaha Central Schools
USD 113
Prairie Hills Schools
USD 415
Hiawatha Schools
USD 380
Vermillion Schools
USD 322
Onaga-Havensville-Wheaton Schools
USD 335
North Jackson Schools
Bern
Berwick
Sabetha
St Benedict
Oneida
Baileyville
Seneca
Woodlawn
Kelly
Centralia
Granada
Goff
Corning
Wetmore
Bancroft

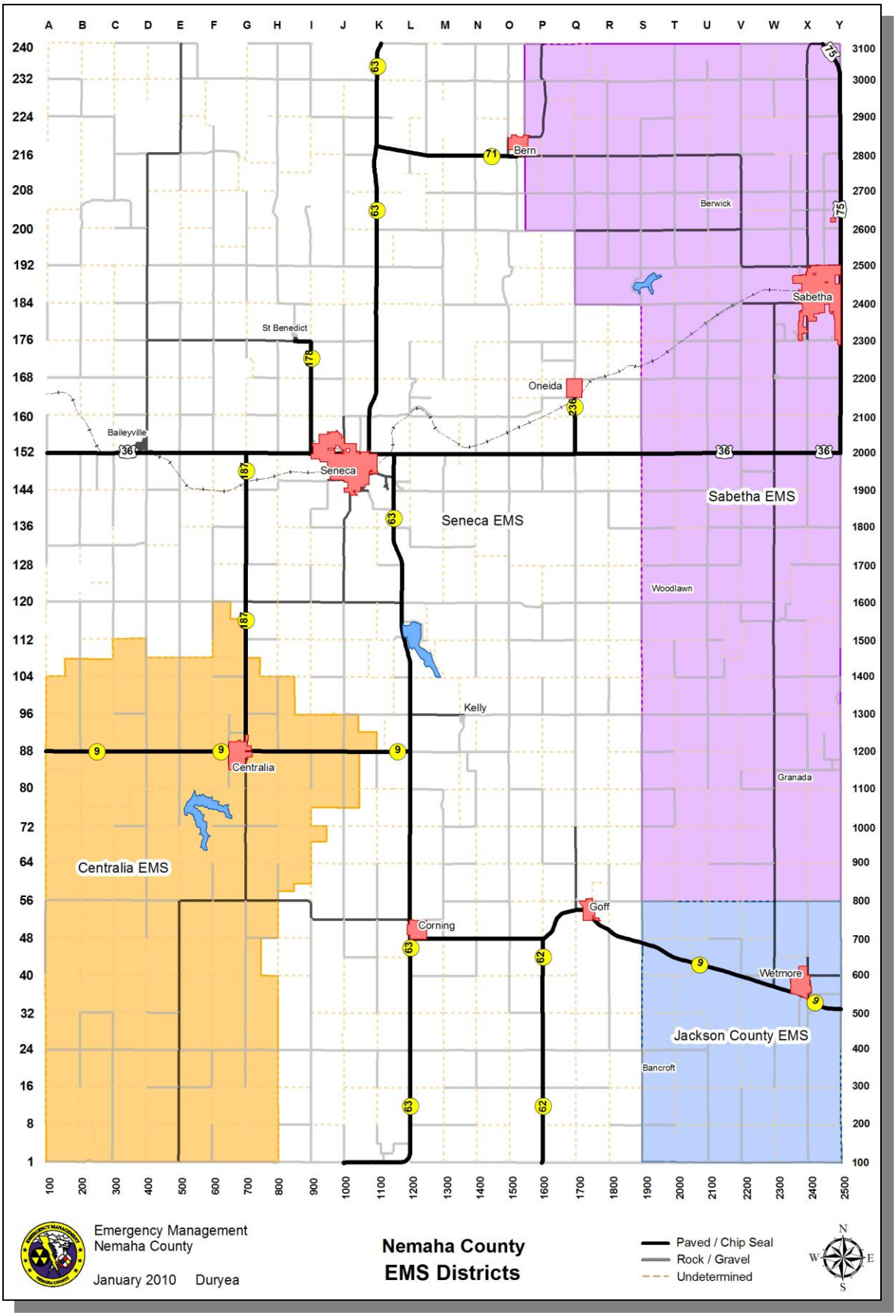

Distribution Lines
Highway
Interstate
Kansas Highway
US Highway
METER
SUBSTATION
VOLTAGE
34.5
69
115
138
161
230
345
Certified Area Of
BROWN-ATCHISON ELEC. COOP. ASSN., INC.
KANSAS POWER AND LIGHT COMPANY
MUNICIPAL
NEMAHA-MARSHALL ELECTRIC COOPERATIVE ASSN., INC.
ELECTRIC MAP OF
NEMAHA COUNTY
KANSAS
0 0.45 0.9 1.8 2.7 3.6 4.5 5.4
Miles
Key to County
KANSAS
CORPORATION COMMISSION
Information Resources
GIS Section
October 17, 2007
nm_el_mxd


Nemaha County
Water Districts
Emergency Management
Nemaha County
January 2010 Duryea
Paved / Chip Seal
Rock / Gravel
Undetermined
Nemaha RWD 1
Nemaha RWD 2
Nemaha RWD 3
Nemaha RWD 4
Brown RWD 2
Pottawatomie RWD 3
Bern
Berwick
Sabetha
St Benedict
Oneida
Baileyville
Seneca
Woodlawn
Kelly
Centralia
Granada
Goff
Corning
Wetmore
Bancroft


Bern
Berwick
Sabetha
St Benedict
Oneida
Baileyville
Seneca
Woodlawn
Kelly
Centralia
Granada
Goff
Corning
Wetmore
Bancroft
Emergency Management
Nemaha County
March 2010 Duryea
Nemaha County
Wastewater Districts
Paved / Chip Seal
Rock / Gravel
Undetermined
N
W
E
S


BIG NEMAHA
RIVER WATERSHED
SOUTH FORK BIG NEMAHA
RIVER WATERSHED
LOWER BIG BLUE
RIVER WATERSHED
DELAWARE
RIVER WATERSHED
MIDDLE KANSAS
RIVER WATERSHED
Bern
Berwick
Sabetha
St Benedict
Oneida
Baileyville
Seneca
Woodlawn
Kelly
Centralia
Granada
Goff
Corning
Wetmore
Bancroft
Emergency Management
Nemaha County
January 2010 Duryea
Nemaha County
HUC Boundaries
(NRCS Hydrologic Unit Codes 8)
Paved / Chip Seal
Rock / Gravel
Undetermined


Bern
Bern Rural Fire District 4
Berwick
Sabetha
St Benedict
Seneca Fire District
Oneida
Sabetha Rural Fire District 5
Baileyville
Seneca
Woodlawn
Kelly
Centralia
Granada
Wetmore Rural Fire District 3
Centralia Rural Fire District 6
Goff
Corning
Corning Rural Fire District 2
Wetmore
Goff Rural Fire District 1
Bancroft
Pottawatomie Co RFD 3
Jackson Co RFD 2
Emergency Management
Nemaha County
January 2010 Duryea
Nemaha County
Fire Districts
Paved / Chip Seal
Rock / Gravel
Undetermined
N
W
E
S


Bern
Berwick
Sabetha
St Benedict
Oneida
Baileyville
Seneca
Seneca EMS
Sabetha EMS
Woodlawn
Kelly
Centralia
Granada
Centralia EMS
Goff
Corning
Wetmore
Jackson County EMS
Bancroft
Emergency Management
Nemaha County
January 2010 Duryea
Nemaha County
EMS Districts
Paved / Chip Seal
Rock / Gravel
Undetermined

City of Bern

The City of Bern is located in northeast Nemaha County at 39.9608^{O} N and 95.9725^{O} W and encompasses 0.27 square miles at an average elevation of 1,281 feet above sea level. Bern is also located in the South Fork Big Nemaha River Watershed and, according to the NRCS Soil Survey, Bern is located on primarily Wymore Silty Clay Loam with 1 to 3 percent slopes. The US Postal Code for Bern is 66408 and the FIPS Code is 20-06275.

Population and Demographics

According to the US Census Bureau, the city had a 1990 population of 190, a 2000 population of 204, and an estimated 2008 population of 192. The US Census Bureau also reports that in the 2000 Census, population density was 748.7 persons per square mile with 102 housing units, 86 households, and 56 families residing in the city. The 2000 population is 100.0% White with a median age of 40.3, a median income of $40,417, a median household value of $34,300, and 7.1% of its residents with income below the poverty level.

Land Uses and Development Trends

Bern is not zoned, primarily residential, and houses the following industries registered as Tier II Facilities: Lortscher Ag Service (agri-service), Bern Oil Company (fuel wholesaler), and Doane Pet Foods (manufacturing). There are currently no active areas of residential, commercial, or industrial development.

Technical and Fiscal Resources

The City of Bern has a five-member elected council and includes the following departments:

	Position
City Council	elected
City Mayor	elected
City Clerk	appointed

Bern also has few personnel resources available for mitigation projects. They rely on Nemaha County officials for emergency management and other functions. The Bern Rural Fire Department 4 and Seneca EMS provide emergency services. The main electrical provider is the Westar Energy Corporation. Like many rural areas there is no access to natural gas so the residents use propane provided by local contractors. Water and wastewater utilities are provided by the city. Local contractors provide solid waste services.

Bern does have access to Community Development Block Grant funds, capital improvements project funding, and collects fees for water and wastewater services. Bern is able to incur debt through general obligation bonds and is able to withhold spending in hazard-prone zones.

Existing Plans and Documents

The City of Bern is not zoned. It has no zoning, subdivision, erosion, or stream management ordinances in place. Floodplain management ordinances are in effect at the county level. Bern's membership in the National Flood Insurance Program is not applicable and the city has not been mapped. No existing plans were provided for incorporation into the Nemaha County Hazard Mitigation Plan.

City of Centralia

The City of Centralia is located in southwest Nemaha County at 39.7244^{O} N and 96.1308^{O} W and encompasses 0.45 square miles at an average elevation of 1,300 feet above sea level. Centralia is also located in the Lower Big Blue River Watershed and, according to the NRCS Soil Survey, Centralia is located on primarily Wymore Silty Clay Loam with 1 to 3 percent slopes. The Black Vermillion River flows west through the southern edge of the city. The Centralia City Lake is a 400-acre lake two miles south and one mile west of Centralia. The lake facilities include multiple ramps, picnic tables, plenty of camping pads and many sites with electricity. It is listed as a community lake utilized for recreational use including fishing, boating, and camping. The US Postal Code for Centralia is 66415 and the FIPS Code is 20-12425.

Population and Demographics

According to the US Census Bureau, the city had a 1990 population of 452, a 2000 population of 534, and an estimated 2008 population of 486. The US Census Bureau also reports that in the 2000 Census, population density was 1,186.0 persons per square mile with 235 housing units, 216 households, and 127 families residing in the city.

The 2000 population is 98.1% White with a median age of 43.6, a median income of $22,240, a median household value of $44,400, and 14.5% of its residents with income below the poverty level.

Land Uses and Development Trends

Centralia is not zoned, primarily residential, and houses the following industries registered as Tier II Facilities: Nemaha County COOP (agri-service), Nemaha Valley Aerial (agri-service), Haverkamp Grocery (fuel retailer), and Wanklyn Oil Company (fuel wholesaler). There are currently no active areas of residential, commercial, or industrial development.

Technical and Fiscal Resources

The City of Centralia has a five-member elected council and includes the following departments:

	Position
City Council	elected
City Mayor	elected
City Clerk	appointed

Centralia also has few personnel resources available for mitigation projects. They rely on Nemaha County officials for emergency management and other functions. The Centralia Rural Fire Department 6 and Centralia EMS provide emergency services. Water, wastewater, and electrical utilities are provided by the city. Kansas Natural Gas provides access to natural gas via a pipeline. Local contractors provide solid waste services.

Centralia does have access to Community Development Block Grant funds, capital improvements project funding, and collects fees for water, wastewater, and electrical services. Centralia is able to incur debt through general obligation bonds and is able to withhold spending in hazard-prone zones.

Existing Plans and Documents

The City of Centralia is not zoned. It has no zoning, subdivision, erosion, or stream management ordinances in place. Floodplain management ordinances are in effect at the county level. Centralia, community number 200238, joined the National Flood Insurance Program on September 1, 1986 and its current effective map is dated September 1, 1986. No existing plans were provided for incorporation into the Nemaha County Hazard Mitigation Plan.

City of Corning

The City of Corning is located in south-central Nemaha County at 39.6564^{O} N and 96.0292^{O} W and encompasses 0.28 square miles at an average elevation of 1,350 feet above sea level. Corning is also located in the Middle Kansas River Watershed and, according to the NRCS Soil Survey, Corning is located on primarily Pawnee Clay Loam with 1 to 3 percent slopes. The US Postal Code for Corning is 66417 and the FIPS Code is 20-15725.

Population and Demographics

According to the US Census Bureau, the city had a 1990 population of 142, a 2000 population of 170, and an estimated 2008 population of 160. The US Census Bureau also reports that in the 2000 Census, population density was 614.4 persons per square mile with 70 housing units, 64 households, and 42 families residing in the city. The 2000 population is 96.5% White, 1.8% American Indian and Alaska Native, 1.2% Native Hawaiian and Other Pacific Island, with a median age of 28.5, a median income of $27,250, a median household value of $19,200, and 10.2 of its residents with income below the poverty level.

Land Uses and Development Trends

Corning is not zoned, primarily residential, and houses the following industries registered as Tier II Facilities: Nemaha County COOP (agri-service) and Nemaha County Shop 40294 (maintenance/supply). There are currently no active areas of residential, commercial, or industrial development.

Technical and Fiscal Resources

The City of Corning has a five-member elected council and includes the following departments:

	Position
City Council	elected
City Mayor	elected
City Clerk	appointed
City Maintenance	appointed

Corning also has few personnel resources available for mitigation projects. They rely on Nemaha County officials for emergency management and other functions. The Corning Rural Fire Department 2 and Seneca EMS provide emergency services. Water and wastewater utilities are provided by the city. The main electrical provider is the Westar Energy Corporation. Like many rural areas there is no access to natural gas so the residents use propane provided by local contractors. Local contractors provide solid waste services.

Corning does have access to Community Development Block Grant funds, capital improvements project funding, and collects fees for water and wastewater services. Corning is able to incur debt through general obligation bonds and is able to withhold spending in hazard-prone zones.

Existing Plans and Documents

The City of Corning is not zoned. It has no zoning, subdivision, erosion, or stream management ordinances in place. Floodplain management ordinances are in effect at the county level. Corning's membership in the National Flood Insurance Program is not applicable and the city has not been mapped. No existing plans were provided for incorporation into the Nemaha County Hazard Mitigation Plan.

City of Goff

The City of Goff is located in southeast Nemaha County at 39.6656^{O} N and 95.9319^{O} W and encompasses 0.21 square miles at an average elevation of 1,250 feet above sea level. Goff is also located in the Delaware River Watershed and, according to the NRCS Soil Survey, Goff is located on primarily Burchard-Steinauer Clay Loam with 6 to 12 percent slopes. Spring Creek flows east through the southern half of the city. The US Postal Code for Goff is 66428 and the FIPS Code is 20-26775.

Population and Demographics

According to the US Census Bureau, the city had a 1990 population of 156, a 2000 population of 181, and an estimated 2008 population of 164. The US Census Bureau also reports that in the 2000 Census, population density was 855.4 persons per square mile with 72 housing units, 60 households, and 44 families residing in the city. The 2000 population is 95.6% White, 3.9% Black or African American, 4.4% American Indian and Alaska Native, with a median age of 25.9, a median income of $35,781, a median household value of $22,900, and no record of the percentage of its residents with income below the poverty level.

Land Uses and Development Trends

Goff is not zoned, primarily residential, and houses the following industries registered as Tier II Facilities: E&L Service (fuel retailer), Henry Brothers Implement (fuel retailer), and Zwonitzer Propane (fuel wholesaler). There are currently no active areas of residential, commercial, or industrial development.

Technical and Fiscal Resources

The City of Goff has a five-member elected council and includes the following departments:

	Position
City Council	elected
City Mayor	elected
City Clerk	appointed
City Maintenance	appointed

Goff also has few personnel resources available for mitigation projects. They rely on Nemaha County officials for emergency management and other functions. The Goff Rural Fire Department 1 and Seneca EMS provide emergency services. Water and wastewater utilities are provided by the city. The main electrical provider is the Westar Energy Corporation. Like many rural areas there is no access to natural gas so the residents use propane provided by local contractors. Local contractors provide solid waste services.

Goff does have access to Community Development Block Grant funds, capital improvements project funding, and collects fees for water and wastewater services. Goff is able to incur debt through general obligation bonds and is able to withhold spending in hazard-prone zones.

Existing Plans and Documents

The City of Goff is not zoned. It has no zoning, subdivision, erosion, or stream management ordinances in place. Floodplain management ordinances are in effect at the county level. Goff is not a member of the National Flood Insurance Program and was sanctioned November 8, 1975. No existing plans were provided for incorporation into the Nemaha County Hazard Mitigation Plan.

City of Oneida

The City of Oneida is located in central Nemaha County at 39.8661^{O} N and 95.9389^{O} W and encompasses 0.23 square miles at an average elevation of 1,213 feet above sea level. Oneida is also located in the South Fork Big Nemaha River Watershed and, according to the NRCS Soil Survey, Oneida is located on primarily Pawnee Clay Loam with 1 to 3 percent slopes. The US Postal Code for Oneida is 66522 and the FIPS Code is 20-52900.

Population and Demographics

According to the US Census Bureau, the city had a 1990 population of 79, a 2000 population of 70, and an estimated 2008 population of 67. The US Census Bureau also reports that in the 2000 Census, population density was 302.1 persons per square mile with 36 housing units, 25 households, and 18 families residing in the city. The 2000 population is 97.1% White, 2.9% Black or African American, with a median age of 33.0, a median income of $45,417, a median household value of $23,800, and 6.7% of its residents with income below the poverty level.

Land Uses and Development Trends

Oneida is not zoned, primarily residential, and houses no industries registered as Tier II Facilities. There are currently no active areas of residential, commercial, or industrial development.

Technical and Fiscal Resources

The City of Oneida has a five-member elected council and includes the following departments:

	Position
City Council	elected
City Mayor	elected
City Clerk	appointed

Oneida also has few personnel resources available for mitigation projects. They rely on Nemaha County officials for emergency management and other functions. The Seneca Fire Department and Seneca EMS provide emergency services. Water and wastewater utilities are provided by the city. The main electrical provider is the Westar Energy Corporation. Like many rural areas there is no access to natural gas so the residents use propane provided by local contractors. Local contractors provide solid waste services.

Oneida does have access to Community Development Block Grant funds, capital improvements project funding, and collects fees for water and wastewater services. Oneida is able to incur debt through general obligation bonds and is able to withhold spending in hazard-prone zones.

Existing Plans and Documents

The City of Oneida is not zoned. It has no zoning, subdivision, erosion, or stream management ordinances in place. Floodplain management ordinances are in effect at the county level. Oneida's membership in the National Flood Insurance Program is not applicable and the city has not been mapped. No existing plans were provided for incorporation into the Nemaha County Hazard Mitigation Plan.

City of Sabetha

The City of Sabetha is located in northeast Nemaha County at 39.9042^{O} N and 95.7961^{O} W and encompasses 3.24 square miles at an average elevation of 1,318 feet above sea level. The north half of Sabetha is located in the Big Nemaha River Watershed, the south half of Sabetha is located in the Delaware River Watershed, and, according to the NRCS Soil Survey, Sabetha is located on primarily Wymore Silty Clay Loam with 1 to 3 percent slopes. The Delaware River flows south across southwestern Sabetha. The Sabetha City Lake is a 100-acre community lake

about five miles west of Sabetha. The lake is utilized for recreational activities including fishing, and hunting is not allowed. The US Postal Code for Sabetha is 66534 and the FIPS Code is 20-62025.

Population and Demographics

According to the US Census Bureau, the city had a 1990 population of 2,341, a 2000 population of 2,589, and an estimated 2008 population of 2,482. The US Census Bureau also reports that in the 2000 Census, population density was 798.8 persons per square mile with 1,049 housing units, 958 households, and 611 families residing in the city. The 2000 population is 98.5% White, 1.2% Black or African American, with a median age of 43.0, a median income of $36,450, a median household value of $55,300, and 7.0% of its residents with income below the poverty level.

Land Uses and Development Trends

Sabetha is zoned, primarily half residential and half commercial. The following table illustrates the breakdown of current zoning classifications.

City of Sabetha Zoning Feb 2010

Zoning Classification	Zoning Type	Percentage of Community
Rural Residential	Residential	8%
Suburban Residential	Residential	6%
Single Family Residential	Residential	30%
Planned Medium Density Residential	Residential	3%
Planned General Commercial	Commercial	30%
Planned Central Business	Commercial	5%
Planned Light Business	Commercial	6%
Planned Medium Industrial	Commercial	10%
Future Industrial	Commercial	2%

The percentages are estimates drawn from maps in early 2010. Community area at that time was 3.24 sq miles.

Sabetha is also home to the following industries registered as Tier II Facilities.

	Type
Midwest Ready Mix	Construction
Sabetha Power Plant	Electric Generation
Sabetha Airport	Aviation Fuel
Agee's Service	Fuel Retailer
Casey's General Store	Fuel Retailer
Sabetha City Shop	Fuel Station
USD 441 Bus Barn	Fuel Station
Berwick COOP Oil Company	Fuel Wholesaler
Farmer's COOP Elevator	Grain Milling
Edelman Lumber, Inc	Lumber Yard
Argabright Welding, Inc	Manufacturing
Bachelor Controls, Inc	Manufacturing
Brockhoff Manufacturing, Inc	Manufacturing
CW Mill Equipment Co, Inc	Manufacturing
International Media and Cultures	Manufacturing
MAC Equipment	Manufacturing
McClain Welding	Manufacturing
NorthWind Technical Services, Inc	Manufacturing
Triple C, Inc	Manufacturing
Wenger Manufacturing	Manufacturing
Hacksaw's Meat Processing	Meat Processing
Crosswind Industries, Inc	Pet Food Manufacturing
Extru-Tech, Inc	Pet Food Manufacturing
Printing Impressions	Printing
The Sabetha Herald	Printing
Southwestern Bell Telephone	Telecommunications
Keim TS, Inc	Transportation

Residential development is active in southwest Sabetha. There are currently no active areas of commercial or industrial development.

Technical and Fiscal Resources

The City of Sabetha has a four-member elected council and includes the following departments:

	Position
City Mayor	elected
Commissioner of Finance	elected
Commissioner of Parks	elected
Commissioner of Streets	elected
Commissioner of Utilities	elected
City Administrator	appointed
City Clerk	appointed
City Attorney	appointed
Municipal Judge	appointed
City Treasurer	appointed
Electrical Production	appointed
Electrical Distribution	appointed
Water and Wastewater	appointed
Police Department	appointed
General Services	appointed
Fire Department	appointed
Sabetha EMS	appointed
Recreation and Parks	appointed
Purchasing / Safety / Code Enforcement	appointed

Sabetha also has few personnel resources available for mitigation projects. They rely on Nemaha County officials for emergency management and other functions. The Sabetha Community Hospital, the Sabetha Rural Fire Department 5, and Sabetha EMS provide emergency services. Water, wastewater, and electrical utilities are provided by the city. Kansas Natural Gas provides access to natural gas via a pipeline. Local contractors provide solid waste services.

Sabetha does have access to Community Development Block Grant funds, capital improvements project funding, and collects fees for water, wastewater, and electrical services. Sabetha is able to incur debt through general obligation bonds and is able to withhold spending in hazard-prone zones.

Existing Plans and Documents

The City of Sabetha is zoned. It has zoning, subdivision, and storm water management ordinances in place. No erosion or stream management ordinances are in place. Floodplain management ordinances are in effect at the county level. Sabetha, community number 200523, joined the National Flood Insurance Program on August 3, 1984. No Flood Insurance Rate Maps are available; there are no special flood hazard areas within the city. The city Zoning Plan was provided for incorporation into the Nemaha County Hazard Mitigation Plan.

City of Seneca

The City of Seneca is the county seat, is located in central Nemaha County at 39.8364^{O} N and 96.0636^{O} W, and encompasses 1.54 square miles at an average elevation of 1,131 feet above sea level. Seneca is located in the South Fork Big Nemaha River Watershed, and, according to the NRCS Soil Survey, Seneca is located on primarily Wymore Silty Clay Loam with 1 to 3 percent slopes. The US Postal Code for Seneca is 66538 and the FIPS Code is 20-63950.

Population and Demographics

According to the US Census Bureau, the city had a 1990 population of 2,027, a 2000 population of 2,122, and an estimated 2008 population of 2,013. The US Census Bureau also reports that in the 2000 Census, population density was 1,375.0 persons per square mile with 978 housing units, 897 households, and 540 families residing in the city. The 2000 population is 99.4% White, with a median age of 42.3, a median income of $31,288, a median household value of $71,900, and 7.1% of its residents with income below the poverty level.

Land Uses and Development Trends

Seneca is zoned, primarily half residential and half commercial. The following table illustrates the breakdown of current zoning classifications.

City of Seneca Zoning Feb 2010

Zoning Classification	Zoning Type	Percentage of Community
Agricultural District (A-1)	Agricultural	1%
Single Family Dwelling District (R-1)	Residential	50%
Single Family Dwelling District (R-1A)	Residential	1%
Two Family Dwelling District (R-2)	Residential	1%
Multiple Family Dwelling District (R-3)	Residential	1%
Manufactured Home District (M-H)	Residential	1%
Office and Institutional District (O-1)	Commercial	5%
Central Business District (C-1)	Commercial	3%
Neighborhood Commercial District (C-2)	Commercial	1%
General Commercial District (G-3)	Commercial	30%
Light Industrial District (I-1)	Commercial	3%
General Industrial District (I-2)	Commercial	3%

The percentages are estimates drawn from maps in early 2010. Community area at that time was 1.54 sq miles.

Seneca is also home to the following industries registered as Tier II Facilities.

	Type
Nemaha County COOP	Agri Service
Seneca Fertilizer	Agri Service
Log Cabin	Fuel Retailer
One Stop	Fuel Retailer
Nemaha County COOP	Fuel Retailer
The Travel Shop	Fuel Retailer
Tank It Food and Fuel	Fuel Retailer
Nemaha County COOP	Fuel Wholesaler
Fairview Mills	Grain Milling
Nemaha County Highway Dept	Maintenance/Supply
Nemaha County Shop 40068	Maintenance/Supply
SKF Industries	Manufacturing
National By-Products	Rendering
Southwestern Bell Telephone	Telecommunications

Commercial development is active in western Seneca. There are currently no active areas of residential or industrial development.

Technical and Fiscal Resources

The City of Seneca has a six-member elected council and includes the following departments:

	Position
City Council	elected
City Mayor	elected
City Administrator	appointed
City Clerk	appointed
Municipal Judge	appointed
Police Department	appointed
Fire Department	appointed
Public Works	appointed

Seneca also has few personnel resources available for mitigation projects. They rely on Nemaha County officials for emergency management and other functions. The Nemaha Valley Community Hospital, the Seneca Fire Department, and Seneca EMS provide emergency services. Water, wastewater, and electrical utilities are provided by the city. Kansas Natural Gas provides access to natural gas via a pipeline. Local contractors provide solid waste services.

Seneca does have access to Community Development Block Grant funds, capital improvements project funding, and collects fees for water, wastewater, and electrical services. Seneca is able to incur debt through general obligation bonds and is able to withhold spending in hazard-prone zones.

Existing Plans and Documents

The City of Seneca is zoned. It has zoning, subdivision, and storm water management ordinances in place. No erosion or stream management ordinances are in place. Floodplain management ordinances are in effect at the county level. Seneca, community number 200240, joined the National Flood Insurance Program on September 27, 1985 and its current effective map date is September 27, 1985. The city Zoning Plan was provided for incorporation into the Nemaha County Hazard Mitigation Plan.

City of Wetmore

The City of Wetmore is located in southeast Nemaha County at 39.6342^{O} N and 95.8106^{O} W and encompasses 0.38 square miles at an average elevation of 1,150 feet above sea level. Wetmore is also located in the Delaware River Watershed and, according to the NRCS Soil Survey, Wetmore is located on primarily Pawnee Clay Loam with 3 to 7 percent slopes. Spring Creek flows east through the southern edge of the city. The US Postal Code for Wetmore is 66550 and the FIPS Code is 20-77550.

Population and Demographics

According to the US Census Bureau, the city had a 1990 population of 284, a 2000 population of 362, and an estimated 2008 population of 341. The US Census Bureau also reports that in the 2000 Census, population density was 943.6 persons per square mile with 156 housing units, 139 households, and 97 families residing in the city. The 2000 population is 99.4% White, with a median age of 35.9, a median income of $38,438, a median household value of $37,500, and 8.6% of its residents with income below the poverty level.

Land Uses and Development Trends

Wetmore is not zoned, primarily residential, and houses the following industries registered as Tier II Facilities: The City Pump (fuel retailer). There are currently no active areas of residential, commercial, or industrial development.

Technical and Fiscal Resources

The City of Wetmore has a five-member elected council and includes the following departments:

	Position
City Council	elected
City Mayor	elected
City Clerk	appointed

Wetmore also has few personnel resources available for mitigation projects. They rely on Nemaha County officials for emergency management and other functions. The Wetmore Rural Fire Department 3 and Jackson County EMS provide emergency services. Water and wastewater utilities are provided by the city. The main electrical provider is the Westar Energy Corporation. Like many rural areas there is no access to natural gas so the residents use propane provided by local contractors. Local contractors provide solid waste services.

Wetmore does have access to Community Development Block Grant funds, capital improvements project funding, and collects fees for water and wastewater services. Wetmore is able to incur debt through general obligation bonds and is able to withhold spending in hazard-prone zones.

Existing Plans and Documents

The City of Wetmore is not zoned. It has no zoning, subdivision, erosion, or stream management ordinances in place. Floodplain management ordinances are in effect at the county level. Wetmore's membership in the National Flood Insurance Program is not applicable and the city has not been mapped. No existing plans were provided for incorporation into the Nemaha County Hazard Mitigation Plan.

Nemaha County Schools

There are three unified school districts and 12 academic centers active in Nemaha County. District boundaries are shown in “Appendix D – Nemaha County Maps”.

School	Business Address	Enrollment	Mitigation Activities
USD 113 – Prairie Hills			
Bern Academic Center	416 Jilson Street Bern, Kansas 66408		Routine fire, tornado, and evacuation drills.
Sabetha Elementary	101 Oregon Street Sabetha, Kansas 66534		Routine fire, tornado, and evacuation drills.
Sabetha Middle School	751 Bluejay Boulevard Sabetha, Kansas 66534		Routine fire, tornado, and evacuation drills.
Sabetha High School	1011 South 75 Highway Sabetha, Kansas 66534		Routine fire, tornado, and evacuation drills.
Wetmore Academic Center	321 Sixth Street Wetmore, Kansas 66550		Routine fire, tornado, and evacuation drills.
USD 115 – Nemaha Central			
Baileyville Academic Center	P.O. Box 69 Baileyville, Kansas 66404		Routine fire, tornado, and evacuation drills.
St Benedict Elementary	P.O. Box 69 St Benedict, KS 66538		Routine fire, tornado, and evacuation drills.
Seneca High School	214 North Eleventh Street Seneca, Kansas 66538		Routine fire, tornado, and evacuation drills.
Seneca Grade School	110 North Eleventh Street Seneca, Kansas 66538		Routine fire, tornado, and evacuation drills.
USD 380 Centralia/Frankfort/Vermillion			
Centralia Academic Center	507 John Riggins Centralia, Kansas 66415		Routine fire, tornado, and evacuation drills.
Additional Schools			
Sts Peter & Paul	401 Pioneer Seneca, Kansas 66538		Routine fire, tornado, and evacuation drills.
NEK-CAP Head Start	1500 Community Drive Seneca, Kansas 66538		Routine fire, tornado, and evacuation drills.

Nemaha County Electrical Utilities

Nemaha County is serviced by five electrical utilities. The following table includes information about each utility. Utility service areas are shown in “Appendix D – Nemaha County Maps”.

Nemaha County Electrical Utilities

	Headquarters	Population Served	System Type	Energy Source	System ID
Brown-Atchison Electric COOP	Horton, Kansas	3,280	distribution	grid	KS0013
Nemaha-Marshall Electric COOP	Axtell, Kansas	3,358	distribution	grid	KS0030
City of Sabetha	Sabetha, Kansas		generation / distribution	diesel, grid	
City of Seneca	Seneca, Kansas		distribution	grid	
Westar Energy Corporation	Topeka, Kansas	684,000	generation / distribution	coal, diesel, grid, natural gas, uranium, wind	

Nemaha County Water/Wastewater Utilities

Nemaha County is comprised of four rural water districts, numbered 1 through 4, and eight domestic water utilities. Brown County Rural Water District 2 and Pottawatomie County Rural Water District 3 also service portions of the county. The following table includes information about each water utility/district. District boundaries are shown in "Appendix D – Nemaha County Maps".

Nemaha County Water Districts

System Name	Community Served	Population Served	Source Type	Status	System ID
Nemaha RWD 1	Nemaha County	350	Groundwater	Active	KS2013105
Nemaha RWD 2	Nemaha County	300	Purchased groundwater	Active	KS2013109
Nemaha RWD 3	Nemaha County	2,500	Groundwater	Active	KS2013110
Nemaha RWD 4	Nemaha County	448	Groundwater	Active	KS2013112
City of Bern	Bern	200	Groundwater	Active	KS2013104
City of Centralia	Centralia	504	Purchased groundwater	Active	KS2013106
City of Corning	Corning	167	Purchased groundwater	Active	KS2013107
City of Goff	Goff	175	Purchased groundwater	Active	KS2013108
City of Oneida	Oneida	69	Groundwater	Active	KS2013103
City of Sabetha	Sabetha	2,523	Surface water	Active	KS2013101
City of Seneca	Seneca	2,068	Groundwater	Active	KS2013102
City of Wetmore	Wetmore	356	Groundwater	Active	KS2013111

Nemaha County is comprised of nine wastewater utilities. The following table includes information about each wastewater utility. District locations are shown in "Appendix D – Nemaha County Maps".

Nemaha County Wastewater Districts

	Type	Location	Effluent Discharge
City of Bern	Lagoon system	north of town	unnamed creek
City of Centralia	Lagoon system	west of town	tributary of Black Vermillion
City of Corning	Lagoon system	south of town	unnamed creek
City of Goff	Lagoon system	southeast of town	
City of Oneida	Lagoon system	south of town	unnamed creek
City of Sabetha	Aero-Mod system	south of town	tributary of Delaware River
City of Seneca	Lagoon system	southeast of town	Nemaha River
City of Wetmore	Lagoon system	east ½ mile	unnamed creek
Baileyville Improvement District	Lagoon system	east ¼ mile	unnamed creek

Nemaha County Watershed Districts

Nemaha County is comprised of five watershed districts. The following table includes information about each watershed district. District boundaries are shown in "Appendix D – Nemaha County Maps".

Nemaha County Watershed Districts

District Name	District Office	Total Area in …		Status	System ID
		Nemaha County (sq mi)	Kansas (sq mi)		
Lower Big Blue River Watershed		106	1555		
Delaware River Watershed	Holton, KS	177	1157		
Middle Kansas River Watershed		99	2181		
Big Nemaha River Watershed		8	243		
South Fork Big Nemaha River Watershed		329	362		

Nemaha County Emergency Services

Nemaha County emergency services include Nemaha County Emergency Management along with two hospitals, three ambulance services, and seven volunteer fire departments. The Nemaha Valley Community Hospital and Sabetha Community Hospital and are located in Seneca and Sabetha respectively. The EMS services and rural fire departments are located in their respective cities. Fire and EMS District boundaries are shown in "Appendix D – Nemaha County Maps".

Nemaha County Emergency Services

Agency	ISO Rating	Agency Type	911 System	Access to Funding	Mitigation Activities
Bern RFD 4		volunteer	Yes	No	
Centralia RFD 6		volunteer	Yes	No	
Centralia EMS		volunteer	Yes	No	
Corning RFD 2		volunteer	Yes	No	
Goff RFD 1		volunteer	Yes	No	
Sabetha EMS		volunteer	Yes	No	
Sabetha RFD 5		volunteer	Yes	No	
Seneca EMS		private	Yes	No	
Seneca Fire Dept		volunteer	Yes	No	
Wetmore RFD 3		volunteer	Yes	No	

Agricultural Infestation

A Definition for Agricultural Infestation

Agricultural infestation is the naturally occurring infection of crops or livestock with insects, vermin, or diseases that render the crops or livestock unfit for consumption or use. Some level of agricultural infestation is normal, but the concern is when the level of an infestation escalates suddenly, or a new infestation appears, overwhelming normal control efforts. Problems resulting from an outbreak could cause continuous and severe economic losses, widespread unemployment, and potential civil disorder. It would affect not only on farmers and ranchers, but also support and related industries.

B Probability for Agricultural Infestation

While some degree of agricultural infestation occurs on regular basis, the event as previously described is considered probable within the next five years. The rating assigned by the NCHMT for Probability is a 2, the event is considered possible.

C Previous Occurrences for Agricultural Infestation

While there are previous occurrences on the state level, Nemaha County has yet to experience extraordinary agricultural infestation.

D Geographic Location for Agricultural Infestation

The rural areas of Nemaha County will be involved directly and more developed areas and municipalities will be involved indirectly. A majority of the land area in Nemaha County is utilized for agricultural purposes and all areas used are susceptible to this hazard. According to the 2009 Kansas Farm Facts, there were approximately 1,054 farms in Nemaha County encompassing 450,508 acres, almost 98%of the 460,160 acres within the county.

E Extent for Agricultural Infestation

The rating assigned by the NCHMT for Extent (Magnitude / Severity) is a 2, the event is considered limited; more than 10% of property is severely damaged.

F Warning Time and Duration for Agricultural Infestation

The rating assigned by the NCHMT for Warning Time is a 1, for 24+ hours. The rating assigned by the NCHMT for Duration is a 4, more than I week.

G Calculated Priority Risk Index for Agricultural Infestation

The CPRI factors the elements of risk: Probability, Magnitude/Severity, Warning Time, and Duration to create an index, which allows for the prioritization of mitigation activities based on the level of risk.

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
2 x .45	+	2 x .30	+	1 x .15	+	4 x .10	=	2.05

H Hazard Summary for Agricultural Infestation

Calculated Priority Risk Index	2.05
Rank by Calculated Priority Risk Index	9 / 22
Planning Significance	Moderate

I Vulnerability Overview for Agricultural Infestation

Nemaha County all of its jurisdictions are vulnerable to agricultural infestation either directly in the rural areas or indirectly in the more developed areas and municipalities.

A majority of the land area in Nemaha County is utilized for agricultural purposes and all areas used are susceptible and vulnerable to this hazard. According to the 2009 Kansas Farm Facts, there were approximately 1,054 farms in Nemaha County encompassing 450,508 acres, almost 98%of the 460,160 acres within the county. Of those acres,

248,234 acres were harvested for a total market value of crops harvested at $67,091,000 and a total market value in livestock of $ 79,805,000.

J Identifying Structures and Estimating Potential Losses

Buildings, infrastructure, and critical facilities are not vulnerable to this hazard as it affects only crop or livestock based products of agriculture. The impacts and potential losses are largely economic and are dependent on the type, extent, and duration of the infestation. An estimated potential loss would be to inventory the value of crops and livestock exposed to the hazard and apply an appropriate percentage. For example, according to the 2009 Kansas Farm Facts the total market value of the crops harvested in Nemaha County was $ 67,091,000 and the total market value of livestock was of $ 79,805,000. While it is difficult to estimate how many crops and livestock would be damaged or destroyed in any event, a 10 percent loss would result in $ 6,709,100 in crops and $ 7,980,500 in livestock damaged or destroyed.

K Future Development

Growth in the agricultural industry is currently limited, although an increase in the number of livestock operations would increase the potential for losses.

Dam Failure

A Definition for Dam Failure

Kansas is a state with many dams, impoundments, and levees. The failure of these structures could result in loss of life, injuries, and property, environmental, and economic damage. While levees are built solely for flood protection, dams often serve multiple purposes, one of which may be flood control. Severe flooding and other storms can increase the potential that dams and levees will be damaged and fail as a result of the physical force of the flood waters or overtopping. Kansas dams are classified as:

Low Hazard (Class A) Dam - a dam located in an area where failure could damage only farm or other uninhabited buildings, agricultural or undeveloped land including hiking trails, or traffic on low-volume roads that meet the requirements for low hazard dams.

Significant Hazard (Class B) Dam - a dam located in an area where failure could endanger a few lives, damage an isolated home, damage traffic on moderate volume roads that meet certain requirements, damage low-volume railroad tracks, interrupt the use or service of a utility serving a small number of customers, or inundate recreation facilities, including campground areas intermittently used for sleeping and serving a relatively small number of persons.

High Hazard (Class C) Dam - a dam located in an area where failure could result in any of the following: extensive loss of life, damage to more than one home, damage to industrial or commercial facilities, interruption of a public utility serving a large number of customers, damage to traffic on high-volume roads that meet the requirements for hazard class C dams or a high-volume railroad line, inundation of a frequently used recreation facility serving a relatively large number of persons, or two or more individual hazards described for significant hazard dams.

B Probability for Dam Failure

The probability of a Dam Failure within Nemaha County is unlikely based upon the past performances of these structures during flood events. However, calculating the probability of an event based upon the lack of past occurrences does not necessarily reflect the risk of future occurrences. The rating assigned by the NCHMT for Probability is a 1, the event is considered unlikely but is possible of occurring.

C Previous Occurrences for Dam Failure

While there are previous occurrences on the state level, no data is available on occurrences within Nemaha County or participating jurisdictions.

D Geographic Location for Dam Failure

The unincorporated areas of Nemaha County and the City of Wetmore are susceptible to the effects of a High Hazard or Significant Hazard Dam failure. Data from the National Dam Inventory 2009 indicates that Nemaha County has 193 state-regulated dams. Of those, one is a High Hazard Dam, three are Significant Hazard Dams, and the remaining 189 are Low Hazard Dams. There are no emergency action plans in place or inundation maps available for either the High Hazard Dam or the three Significant Hazard Dams.

NIDID	STATEID	Hazard	River	Downstream City	Distance	EAP
KS01499	DNM-0180	H	Pony Creek Tributary	Preston, NE	19 miles	N
KS05503	DNM-0286	S	Black Vermillion River Tributary	Vermillion, KS	6 miles	N
KS09083	DNM-0341	S	Spring Creek Tributary	Wetmore, KS	4 miles	N
KS09247	DNM-0359	S	Spring Creek Tributary	Wetmore, KS	6 miles	N

See “Appendix D – Nemaha County Maps” for county dam locations. Nemaha County has no known levees.

E Extent for Dam Failure

The majority of dams in Nemaha County are low hazard and present small risk to the people and property of Nemaha County; however, increasing development behind these dams would elevate their hazard ranking and level of risk. The rating assigned by the NCHMT for Extent (Magnitude / Severity) is a 2, the event is considered limited, more than 10% of the property affected will be severely damaged.

F Warning Time and Duration for Dam Failure

The rating assigned by the NCHMT for Warning Time is a 1, for 24+ hours. The rating assigned by the NCHMT for Duration is a 1, less than 6 hours.

G Calculated Priority Risk Index for Dam Failure

The CPRI factors the elements of risk: Probability, Magnitude/Severity, Warning Time, and Duration to create an index, which allows for the prioritization of mitigation activities based on the level of risk.

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
1 x .45	+	2 x .30	+	1 x .15	+	1 x .10	=	1.30

H Hazard Summary for Dam Failure

Calculated Priority Risk Index	1.30
Rank by Calculated Priority Risk Index	20 / 22
Planning Significance	Low

I Vulnerability Overview for Dam Failure

The vulnerability profile for this hazard has not been completed. As stated in Section 4.2 page 14, “In order to focus on the most critical hazards, those assigned a level of high or moderate planning significance were given more attention in the remainder of this analysis, while those with a low planning significance were addressed in a general manner.”

Drought

A Definition for Drought

A drought is a period of drier-than-normal conditions that results in water-related problems. Precipitation (rain or snow) falls in uneven patterns across the country. When no rain or only a small amount of rain falls, soils can dry out and plants can die. When rainfall is less than normal for several weeks, months, or years; the flow of streams and rivers declines, the water levels in lakes and reservoirs fall, and the depth to water in wells increase. If dry weather persists and water supply problems develop, the dry period can become a drought.

Some areas of the United States are more likely to have droughts than other areas. In humid, or wet, regions, a drought of a few weeks is quickly reflected in a decrease in soil moisture and in declining flow in streams. In arid, or dry, regions, people rely on ground water and water in reservoirs to supply their needs. They are protected from short-term droughts, but may have severe problems during long dry periods because they may have no other water source if wells or reservoirs go dry.

B Probability for Drought

The forecasting of future weather conditions is becoming more accurate, but the variability of weather patterns makes it difficult to predict long-term precipitation levels, thus difficult to determine the probability of drought. According to the Palmer Drought Severity Index 1895-1995, Nemaha County experienced severe and extreme drought 10 to 14.9 percent of the time during that 100 year period. The rating assigned by the NCHMT for Probability is a 2, the event is considered possible, likely to occur within the next five years.

C Previous Occurrences for Drought

The following table from the National Climactic Data Center summarizes the previous occurrences, impacts, and costs of this hazard.

Date	Jurisdiction	Class	Deaths	Injuries	Property Damage	Crop Damage
11/1/1999	Nemaha County	Drought	0	0	0	0
9/1/2002	Nemaha County	Drought	0	0	0	0
11/1/2002	Nemaha County	Drought	0	0	0	0
12/1/2002	Nemaha County	Drought	0	0	0	0

Event(s) as recorded in Nemaha County and its jurisdictions by the National Climatic Data Center.

D Geographic Location for Drought

The entire Nemaha County geographical area is subject to drought conditions, but the impact is most significant in agricultural areas of the county. According to the 2009 Kansas Farm Facts, there were approximately 450,508 acres farmed (crop and livestock) within Nemaha County, almost 98%of the 460,160 acres within the county.

E Extent for Drought

The Palmer Drought Index, sometimes called the Palmer Drought Severity Index and often abbreviated PDSI, is a measurement of dryness based on recent precipitation and temperature. It was developed by meteorologist Wayne Palmer, who first published his method in the 1965 paper Meteorological Drought for the Office of Climatology of the U.S. Weather Bureau.

The Palmer Drought Index is based on a supply-and-demand model of soil moisture. Supply is comparatively straightforward to calculate, but demand is more complicated as it depends on many factors - not just temperature and the amount of moisture in the soil but hard-to-calibrate factors including evapotranspiration and recharge rates. Palmer tried to overcome these difficulties by developing an algorithm that approximated them based on the most readily available data — precipitation and temperature.

The impacts of drought may be economic, environmental, and/or societal. The most significant impacts associated with drought are those related to agriculture. According to the 2009 Kansas Farm Facts, there were approximately 1,054 farms in Nemaha County encompassing 450,508 acres, almost 98%of the 460,160 acres within the county. Of those acres, 248,234 acres were harvested for a total market value of crops harvested at $67,091,000 and a total market value in livestock of $ 79,805,000. A prolonged drought could severely impact the economic base of Nemaha County.

Drought impacts and the potential for indirect hazards increase with the length of drought. An ongoing drought may lead to an increase in the risks of flooding, soil erosion and dust, and wildfires. The rating assigned by the NCHMT for Extent (Magnitude / Severity) is a 1, the event is considered negligible, less than 10% of property is severely damaged.

F Warning Time and Duration for Drought

The rating assigned by the NCHMT for Warning Time is a 1, for 24+ hours. The rating assigned by the NCHMT for Duration is a 4, more than I week.

G Calculated Priority Risk Index for Drought

The CPRI factors the elements of risk: Probability, Magnitude/Severity, Warning Time, and Duration to create an index, which allows for the prioritization of mitigation activities based on the level of risk.

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
2 x .45	+	1 x .30	+	1 x .15	+	4 x .10	=	1.75

H Hazard Summary for Drought

Calculated Priority Risk Index	1.75
Rank by Calculated Priority Risk Index	13 / 22
Planning Significance	Moderate

I Vulnerability Overview for Drought

Nemaha County and its jurisdictions are vulnerable to drought, either directly or indirectly. Nearly all acreage in Nemaha County is used for agricultural purposes, such as pasture for livestock grazing or fields planted with crops. The agricultural economy of Nemaha County is vulnerable to periods of drought which can affect the water supply and water quality in the County. Drought also increases the impacts of soil erosion and dust and the risk of wildfire hazards.

J Identifying Structures and Estimating Potential Losses

Drought normally does not impact structures and it can be difficult to identify specific hazard areas. Data is not available to estimate potential losses to structures in identified hazard areas.

K Future Development

As the population grows, so do the water needs for household, commercial, industrial, recreational, and agricultural uses.

Earthquake

A Definition for Earthquake

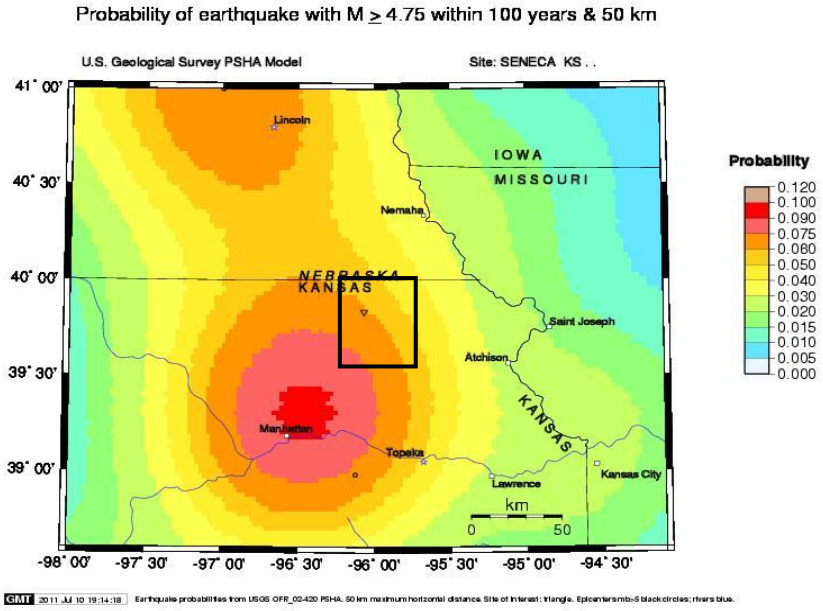
An earthquake is a sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of the earth's tectonic plates. The severity of these effects is dependent on the amount of energy released from the fault or epicenter.

Ground shaking from earthquakes can collapse buildings and bridges; disrupt gas, electric, and phone service; and sometimes trigger landslides, avalanches, flash floods, fires, and huge, destructive ocean waves (tsunamis). Buildings with foundations resting on unconsolidated landfill and other unstable soil, and trailers and homes not tied to their foundations are at risk because they can be shaken off their mountings during an earthquake. When an earthquake occurs in a populated area, it may cause deaths and injuries and extensive property damage.

B Probability for Earthquake

Kansas experiences small earthquakes on a routine basis, but few are of a magnitude that causes damage to buildings or the infrastructure. According to a 2001 FEMA report, Kansas ranks 45th among the states in the amount of damage caused by earthquakes in an average year.

The probability of an earthquake with a magnitude greater than or equal to 4.75 in Nemaha County in a 100-year time period is 4.0% to 9.0% (0.040-0.090); 4.0% in the northeast to 9.0% in the southwest.

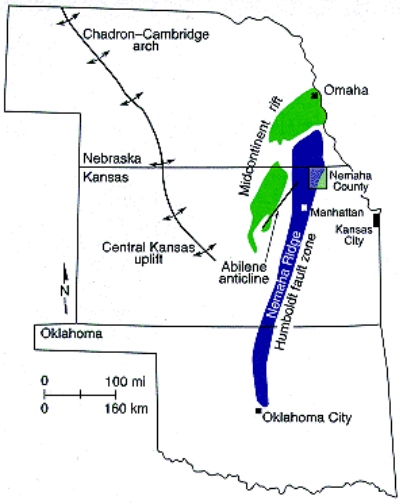


The rating assigned by the NCHMT for Probability is a 1, the event is considered unlikely and there is less than a 1 in 10 years chance of occurring (1/10 = 10%).

C Previous Occurrences for Earthquake

Small earthquakes (micro-earthquakes) may be experienced on a routine basis, but few are of a magnitude that causes damage to buildings or the infrastructure.

D Geographic Location for Earthquake



Nemaha County and all of its jurisdictions are susceptible to earthquakes. In Kansas, earthquakes occur along the Humboldt Fault Zone/ Nemaha Uplift (see illustration at right). The Nemaha Uplift is a buried granite mountain range that extends from roughly Omaha, Nebraska, to Oklahoma City. This mountain range was formed about 300 million years ago, and the faults that bound it are still slightly active today, especially the Humboldt fault zone that forms the eastern boundary of the Nemaha Uplift, passing near Wamego, east of Manhattan, and near El Dorado, east of Wichita. Nemaha County is the locality where the Nemaha Uplift was discovered by drilling in the early 1900's (Kansas Geological Survey, 1989, Bulletin 226).

E Extent for Earthquake

The Richter magnitude of an earthquake is determined from the logarithm of the amplitude of waves recorded by seismographs (adjustments are included to compensate for the variation in the distance between the various seismographs and the epicenter of the earthquake).

Because of the logarithmic basis of the scale, each whole number increase in magnitude represents a tenfold increase in measured amplitude; in terms of energy, each whole number increase corresponds to an increase of about 31.6 times the amount of energy released, and each increase of 0.2 corresponds to a doubling of the energy released.

Events with magnitudes greater than about 4.6 are strong enough to be recorded by a seismograph anywhere in the world, so long as its sensors are not located in the earthquake's shadow. The following describes the typical effects of earthquakes of various magnitudes near the epicenter. The values are typical only and should be taken with extreme caution, since intensity and thus ground effects depend not only on the magnitude, but also on the distance to the epicenter, the depth of the earthquake's focus beneath the epicenter, and geological conditions (certain terrains can amplify seismic signals).

Magnitude	Description	Earthquake effects	Frequency of occurrence
Less than 2.0	Micro	Micro earthquakes, not felt.[12]	About 8,000 per day
2.0–2.9	Minor	Generally not felt, but recorded.	About 1,000 per day
3.0–3.9		Often felt, but rarely causes damage.	49,000 per year (est.)
4.0–4.9	Light	Noticeable shaking of indoor items, rattling noises. Significant damage unlikely.	6,200 per year (est.)
5.0–5.9	Moderate	Can cause major damage to poorly constructed buildings over small regions. At most slight damage to well-designed buildings.	800 per year
6.0–6.9	Strong	Can be destructive in areas up to about 160 kilometres (100 mi) across in populated areas.	120 per year
7.0–7.9	Major	Can cause serious damage over larger areas.	18 per year
8.0–8.9	Great	Can cause serious damage in areas several hundred kilometres across.	1 per year
9.0–9.9		Devastating in areas several thousand kilometres across.	1 per 20 years
10.0+	Massive	Never recorded, widespread devastation across very large areas; see below for equivalent seismic energy yield.	Extremely rare (Unknown)

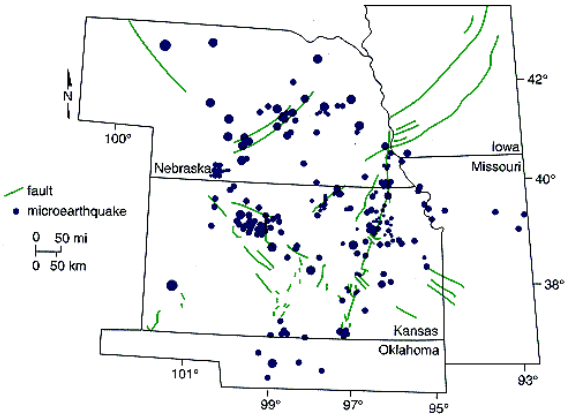
(Based on U.S. Geological Survey documents.)[13]

Micro-earthquakes recorded by the Kansas Geological Survey between August 1977 and August 1989 are size-coded by local magnitude (see the following image). The largest event had a magnitude of 4.0 and the smallest had a magnitude of 0.8 on the Richter Scale.

A damaging earthquake in Nemaha County is unlikely. No data is available regarding previous earthquake events in the area. The rating assigned by the NCHMT for Extent (Magnitude / Severity) is a 1, the event is considered negligible, less than 10% of the property affected will be severely damaged.

F Warning Time and Duration for Earthquake

Earthquakes strike suddenly and without warning and can occur at any time of the year and at any time of the day or night. The rating assigned by the NCHMT for Warning Time is a 4, for less than 6 hours. The rating assigned by the NCHMT for Duration is a 1, for less than 6 hours.



G Calculated Priority Risk Index for Earthquake

The CPRI factors the elements of risk: Probability, Magnitude/Severity, Warning Time, and Duration to create an index, which allows for the prioritization of mitigation activities based on the level of risk.

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
1 x .45	+	1 x .30	+	4 x .15	+	1 x .10	=	1.45

H Hazard Summary for Earthquake

Calculated Priority Risk Index	1.45
Rank by Calculated Priority Risk Index	16 / 22
Planning Significance	Low

I Vulnerability Overview for Earthquake

The vulnerability profile for this hazard has not been completed. As stated in Section 4.2 page 14, “In order to focus on the most critical hazards, those assigned a level of high or moderate planning significance were given more attention in the remainder of this analysis, while those with a low planning significance were addressed in a general manner.”

Expansive Soils

A Definition for Expansive Soils

A relatively widespread geologic hazard for Kansas is the presence of soils that expand and shrink in relation to their water content. Expansive soils can cause physical damage to building foundations, roadways, and other components of the infrastructure when clay soils swell and shrink due to changes in moisture content. For Kansas, the vulnerability to this hazard most frequently is associated with soils shrinking during periods of drought.

B Probability for Expansive Soils

Although there will continue to be some damage to paved areas and foundations in Nemaha County due to swelling soils, it is unlikely that these damages will become greater in the future unless new development occurs in areas where the hazard is more severe. Certain buildings and construction practices could be put in place to lessen these impacts. The rating assigned by the NCHMT for Probability is a 1, a significant event is possible but unlikely to occur.

C Previous Occurrences for Expansive Soils

Streets and parking lots throughout the county are damaged every year by the effects of expansive soils as well as underground water lines that are damaged as the soil expands and contracts at varying levels along a water line. The frequency of damage from expansive soils can be associated with the cycles of drought and heavy rainfall, which reflect changes in moisture content. There is no available data for the planning area specific to damages resulting from expansive soils. These damages are largely isolated incidents and affected property owners make any necessary repairs.

D Geographic Location for Expansive Soils

Nemaha County and all of its jurisdictions are susceptible to expansive soils. According to the Kansas Hazard Mitigation Plan 2007, all of Nemaha County is located in an area where soils are generally less than 50% clay and

have a slight to moderate swelling potential. Therefore, for the purposes of this plan, the hazard is considered to affect all jurisdictions.

E Extent for Expansive Soils

According to the Kansas Hazard Mitigation Plan 2007, Nemaha County soils are generally less than 50% clay and have a slight to moderate swelling potential. The impacts from these soils are minor in damage and handled by individual property owners. The rating assigned by the NCHMT for Extent (Magnitude / Severity) is a 1, the event is considered negligible.

F Warning Time and Duration for Expansive Soils

The rating assigned by the NCHMT for Warning Time is a 1, for more than 24 hours. The rating assigned by the NCHMT for Duration is a 4, more than I week.

G Calculated Priority Risk Index for Expansive Soils

The CPRI factors the elements of risk: Probability, Magnitude/Severity, Warning Time, and Duration to create an index, which allows for the prioritization of mitigation activities based on the level of risk.

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
1 x .45	+	1 x .30	+	1 x .15	+	4 x .10	=	1.30

H Hazard Summary for Expansive Soils

Calculated Priority Risk Index	1.30
Rank by Calculated Priority Risk Index	18 / 22
Planning Significance	Low

I Vulnerability Overview for Expansive Soils

The vulnerability profile for this hazard has not been completed. As stated in Section 4.2 page 14, “In order to focus on the most critical hazards, those assigned a level of high or moderate planning significance were given more attention in the remainder of this analysis, while those with a low planning significance were addressed in a general manner.”

Extreme Temperatures

A Definition for Extreme Temperatures

Extreme temperatures are defined simply as temperatures that are unusually high or low. Extreme temperatures can have significant impacts on the public health, livestock, and the economy. The danger from high temperatures, over 100 degrees, includes heat exhaustion and heat stroke with economic losses through higher cooling bills and the effect on agriculture. The dangers from extremely low, sub zero, temperatures include frostbite and hypothermia. Economic loss from very low temperatures involves frozen pipes, heating expense, school closings, curtailed business activity, and the effect on agriculture.

B Probability for Extreme Temperatures

The forecasting of future weather conditions is becoming more accurate, but the variability of weather patterns often causes these forecasts to fail. Periods of extreme temperatures occur on an annual basis, but events that cause significant risk occur less often. The rating assigned by the NCHMT for Probability is a 3, the event is considered likely to occur in the next three years.

C Previous Occurrences for Extreme Temperatures

Since 1995 there have been a number of extreme temperature events within Nemaha County resulting in one death, 17 injuries, $25.0 million in property damage, and $500 thousand in crop damages. The following table summarizes the previous occurrences, impacts, and costs of this hazard.

Date	Jurisdiction	Class	Deaths	Injuries	Property Damage	Crop Damage
9/22/1995	Nemaha County	Extreme Temperatures	0	0	25.0M	0
2/1/1996	Nemaha County	Extreme Temperatures	0	0	0	0
1/2/1999	Nemaha County	Extreme Temperatures	0	0	0	0
7/15/1999	Nemaha County	Extreme Temperatures	1	0	0	0
8/1/2000	Nemaha County	Extreme Temperatures	0	14	0	0
9/1/2000	Nemaha County	Extreme Temperatures	0	0	0	0
12/11/2000	Nemaha County	Extreme Temperatures	0	0	0	0
1/1/2001	Nemaha County	Extreme Temperatures	0	0	0	0
7/1/2002	Nemaha County	Extreme Temperatures	0	0	0	0
2/17/2006	Nemaha County	Extreme Temperatures	0	0	0	0
7/16/2006	Nemaha County	Extreme Temperatures	0	3	0	0
7/29/2006	Nemaha County	Extreme Temperatures	0	0	0	0
8/1/2006	Nemaha County	Extreme Temperatures	0	0	0	0
4/4/2007	Nemaha County	Extreme Temperatures	0	0	0	500K
8/6/2007	Nemaha County	Extreme Temperatures	0	0	0	0
8/20/2007	Nemaha County	Extreme Temperatures	0	0	0	0

Event(s) as recorded in Nemaha County and its jurisdictions by the National Climatic Data Center.

D Geographic Location for Extreme Temperatures

Nemaha County and all of its jurisdictions are susceptible to extreme temperatures.

E Extent for Extreme Temperatures

Due to the potential for fatalities, the loss of electric power, and damages to property and crops, periods of extreme temperatures can severely affect Nemaha County and its jurisdictions. The rating assigned by the NCHMT for Extent (Magnitude / Severity) is a 2, the event is considered limited, injuries and/or illnesses do not result in permanent disability.

F Warning Time and Duration for Extreme Temperatures

The rating assigned by the NCHMT for Warning Time is a 1, for 24+ hours. The rating assigned by the NCHMT for Duration is a 3, less than I week.

G Calculated Priority Risk Index for Extreme Temperatures

The CPRI factors the elements of risk: Probability, Magnitude/Severity, Warning Time, and Duration to create an index, which allows for the prioritization of mitigation activities based on the level of risk.

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
3 x .45	+	2 x .30	+	1 x .15	+	3 x .10	=	2.40

H Hazard Summary for Extreme Temperatures

Calculated Priority Risk Index	2.40
Rank by Calculated Priority Risk Index	5 / 22
Planning Significance	High

I Vulnerability Overview for Extreme Temperatures

The elderly and low-income are the most vulnerable to extreme temperatures. The percentage of elderly within Nemaha County is 20.6%, above the state average of 13.1% and the national average of 12.8%. The percentage of those below the poverty level is 9.3%, below the state average of 11.3% and the national average of 13.2%. These individuals may be at increased risk due to extreme temperatures if heating or air conditioning is not available. The electrical infrastructure is also vulnerable to brownouts due to the increased strain on power generation and transmission.

J Identifying Structures and Estimating Potential Losses

Extreme temperatures normally do not impact structures and data is currently not available to estimate potential losses during extreme temperature events. The electrical infrastructure is known to be at risk for brownouts and outages during extreme temperatures, but no data is available to estimate potential losses as a result of infrastructure brownouts or outages.

K Future Development

As the population of Nemaha County grows and ages, the vulnerability to extreme temperatures is likely to increase.

Flooding

A Definition for Flooding

Most communities in the United States have experienced some kind of flooding, after spring rains, heavy thunderstorms, or winter snow thaws. Floods can be slow or fast rising but generally develop over a period of days. The standard for flooding is the "100-year flood"; a benchmark used by the Federal Emergency Management Agency to establish a standard of flood control in communities throughout the country. Thus, the 100-year flood is also referred to as the "regulatory" or "base" flood. The term 100-year flood is often incorrectly used and can be misleading. It does not mean that only one flood of that size will occur every 100 years. What it actually means is that there is a one percent chance of a flood of that intensity and elevation happening in any given year. In other words, it is the flood elevation that has a one percent chance of being equaled or exceeded each year.

Flash flooding events usually occur within minutes or hours of heavy amounts of rainfall, from a dam or levee failure, or from a sudden release of water held by an ice jam. Most flash flooding is caused by slow-moving thunderstorms in a local area or by locally heavy rains. Although flash flooding occurs often along bodies of water, it is also common in urbanized areas where much of the ground is covered by impervious surfaces and/or the land mass is extremely flat.

B Probability for Flooding

The forecasting of future weather conditions is becoming more accurate, but the variability of weather patterns often causes these forecasts to fail. The rating assigned by the NCHMT for Probability is a 4, the event is considered highly likely to occur; the event is probable within the calendar year.

C Previous Occurrences for Flooding

Two significant flooding events were reported in Nemaha County during the last 17 years. The first event began on May 10, 1993 and ended May 14, 1993. During this period, there were numerous reports across central Kansas of mainly agricultural and low land flooding. Many wheat fields were underwater as well as numerous county roads closed. Most rivers and creeks in this area remained at or above bank full as heavy rains continued to fall. The second event began on 5/6/2007 and ended the following day. Rounds of heavy rain producing thunderstorms caused flash flooding during the evening with water reported flowing over rural roads north of Sabetha. The flooding persisted in a few spots into the following afternoon. The following table summarizes the previous occurrences, impacts, and costs of this hazard.

Date	Jurisdiction	Class	Deaths	Injuries	Property Damage	Crop Damage
5/10/1993	Nemaha County	Flooding	0	0	500K	500K
5/7/1997	Sabetha	Flooding	0	0	10K	0
7/29/1998	Centralia	Flooding	0	0	0	0
6/13/1999	Seneca	Flooding	0	0	0	0
6/27/1999	Nemaha County	Flooding	0	0	20K	10K
6/27/1999	Seneca	Flooding	0	0	5K	45K
6/3/2001	Seneca	Flooding	0	0	0	0
6/5/2001	Nemaha County	Flooding	0	0	0	0
7/19/2001	Oneida	Flooding	0	0	0	0
7/19/2001	Sabetha	Flooding	0	0	0	0
7/19/2001	Sabetha	Flooding	0	0	0	0
5/12/2005	Centralia	Flooding	0	0	1K	0
5/12/2005	Seneca	Flooding	0	0	1K	0
5/6/2007	Sabetha	Flooding	0	0	450K	0
9/6/2007	Bern	Flooding	0	0	0	0
9/6/2007	Centralia	Flooding	0	0	0	0
5/22/2008	Nemaha County	Flooding	0	0	0	0

Event(s) as recorded in Nemaha County and its jurisdictions by the National Climatic Data Center.

D Geographic Location for Flooding

Low lying riverine areas of the Nemaha County geographical area are subject to flooding. To provide greater detail, a flood plain study was conducted based upon unique soil types and characteristics delineated by the NRCS's Soil Survey 2005 for Nemaha County. According to the Soil Survey, the types Chase (Ch), Kennebec (Ke), and Wabash (Wa) were prone to occasional flooding; and the types Calco (Cc) and Kennebec (Kn) were prone to frequent flooding. These two categories account for approximately 94.0 and 3.2 square miles respectively.

The areas considered "prone to frequent flooding", encompass 3.2 square miles and include 5 residences; one near Oneida, one near Sabetha, and three near the Nemaha State Fishing Lake south of Seneca. All 5 residences are rural farming locations. See "Appendix D – Nemaha County Maps" for details.

The areas considered "prone to occasional flooding", encompass 94.0 square miles and include 110 locations, 105 residences and 5 commercial locations including the Wetmore Wastewater Treatment Plant. Of the 111 locations, eight are in the Baileyville area (all rural), seven are in the Bern area (all rural), fifteen are in the Centralia area, (one urban and fourteen rural), seven are in the Corning area (all rural), thirteen are in the Goff area (five urban and eight rural), nine in the Sabetha area (all rural), twenty-five in the Seneca area (3 urban and 22 rural), and twenty-six in the Wetmore area (14 urban and 12 rural). See "Appendix D – Nemaha County Maps" for details.

A model of the 100-year floodplain using HAZUS MH, FEMA's loss estimation software is in the works.

E Extent for Flooding

Past flood events in Nemaha County have caused damage to property and crops. The rating assigned by the NCHMT for Extent (Magnitude / Severity) is a 1, the event is considered negligible, less than 10% of property is severely damaged.

F Warning Time and Duration for Flooding

The rating assigned by the NCHMT for Warning Time is a 2, for 12-24 hours. The rating assigned by the NCHMT for Duration is a 3, less than 1 week.

G Calculated Priority Risk Index for Flooding

The CPRI factors the elements of risk: Probability, Magnitude/Severity, Warning Time, and Duration to create an index, which allows for the prioritization of mitigation activities based on the level of risk.

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
4 x .45	+	1 x .30	+	2 x .15	+	3 x .10	=	2.70

H Hazard Summary for Flooding

Calculated Priority Risk Index	2.70
Rank by Calculated Priority Risk Index	4 / 22
Planning Significance	High

I Vulnerability Overview for Flooding

The primary method for identifying potential flood areas includes a flood plain study that was conducted based upon unique soil types and characteristics delineated by the NRCS's Soil Survey 2005 for Nemaha County. According to the Soil Survey, the types Chase (Ch), Kennebec (Ke), and Wabash (Wa) were prone to occasional flooding; and the types Calco (Cc) and Kennebec (Kn) were prone to frequent flooding.

J Identifying Structures and Estimating Potential Losses

The best available data was created using a study based upon soil types and characteristics. There has been no flood insurance rate map created for Nemaha County as a whole, but the cities of Centralia, Sabetha, and Seneca are members of the National Flood Insurance Program and Centralia and Seneca have had maps created in 1986 and 1985 respectively.

The primary method for identifying structures and estimating potential losses was the use of a model based upon soil types and characteristics, a listing of the residential addresses across the county, and residential replacement cost estimates based upon the median residential value from the US Census 2000.

Jurisdictions	Median Residential Value	Number of Structures	Value of Structures	Number of Structures	Value of Structures
		"prone to frequent flooding"		"prone to occasional flooding"	
Nemaha County	$ 58,200	5	$ 291,000	87	$ 5,063,400
City of Bern	$ 34,300	0	$ 0	0	$ 0
City of Centralia	$ 44,400	0	$ 0	1	$ 44,400
City of Corning	$ 19,200	0	$ 0	0	$ 0
City of Goff	$ 22,900	0	$ 0	5	$ 114,500
City of Oneida	$ 23,800	0	$ 0	0	$ 0
City of Sabetha	$ 55,300	0	$ 0	0	$ 0
City of Seneca	$ 71,900	0	$ 0	3	$ 215,700
City of Wetmore	$ 37,500	0	$ 0	14	$ 525,000
Cumulative		5	$ 291,000	110	$ 5,963,000

A model of the 100-year floodplain using HAZUS MH, FEMA's loss estimation software is in the works.

National Flood Insurance Program

The following table provides detailed information on National Flood Insurance Program (NFIP) participation within Nemaha County. Nemaha County and the cities of Centralia, Sabetha, and Seneca do participate in NFIP. The cities of Bern, Corning, Goff, Oneida, and Wetmore do not participate in NFIP.

Jurisdiction	Flood Hazard	NFIP Member	NFIP Number	Date Joined	Effective FIRM
Nemaha County	Yes	Yes	200237	Aug 19, 1985	Aug 19, 1985
City of Bern	No	Not Applicable			
City of Centralia	Yes	Yes	200238	Sept 1, 1986	Sept 1, 1986
City of Corning	No	Not Applicable			
City of Goff	Yes	No	Sanctioned	Nov 8, 1975	Not Applicable
City of Oneida	No	Not Applicable			
City of Sabetha	No	Yes	200523	Aug 3, 1984	Not Applicable
City of Seneca	Yes	Yes	200240	Sept 27, 1985	Sept 27, 1985
City of Wetmore	No	Not Applicable			

K Future Development

The impact of flooding on any future development would be related to the location of the structure that was involved.

Fog

A Definition for Fog

Fog results when air is cooled to the point where it can no longer hold all of the water vapor it contains. For example, rain can cool and moisten the air near the surface until fog forms (precipitation fog). A cloud-free, humid air mass at night can lead to fog formation, where land and water surfaces that have warmed up during the summer are still evaporating a lot of water into the atmosphere (radiation fog). A warm moist air mass blowing over a cold surface can also cause fog to form (advection fog).

Fog is principally a threat to public safety. Of particular concern is the potential for multi-vehicle accidents on major highways. These accidents can cause injuries and deaths and can have serious implications for health, safety, and environment if a hazardous or nuclear waste shipment is involved.

B Probability for Fog

Generally, fog is a relatively common occurrence in Kansas, but fog events with significant adverse impacts are relatively rare. The rating assigned by the NCHMT for Probability is a 2, the event is considered possible, the event has up to 1 in 5 year chance of occurring.

C Previous Occurrences for Fog

There were eight fog events recorded for Nemaha County and its jurisdictions since 2003. The following table summarizes the previous occurrences, impacts, and costs of this hazard.

Date	Jurisdiction	Class	Deaths	Injuries	Property Damage	Crop Damage
1/10/2003	Nemaha County	Fog	0	0	0	0
2/17/2004	Nemaha County	Fog	0	0	0	0
7/1/2005	Nemaha County	Fog	0	0	0	0
9/16/2005	Nemaha County	Fog	0	0	0	0
12/25/2005	Nemaha County	Fog	0	0	0	0
12/29/2005	Nemaha County	Fog	0	0	0	0
1/23/2006	Nemaha County	Fog	0	0	0	0
11/6/2006	Nemaha County	Fog	0	0	0	0

Event(s) as recorded in Nemaha County and its jurisdictions by the National Climatic Data Center.

D Geographic Location for Fog

Nemaha County and all of its jurisdictions are susceptible to fog. If conditions are present, low lying areas are at an increased risk due to the nature of fog to settle in these areas.

E Extent for Fog

The rating assigned by the NCHMT for Extent (Magnitude / Severity) is a 1, the event is considered negligible, shutdown of critical facilities and services for 24 hours or less, and less than 10% of property is severely damaged.

F Warning Time and Duration for Fog

The rating assigned by the NCHMT for Warning Time is a 1, 24+ hours. The rating assigned by the NCHMT for Duration is a 1, less than 6 hours.

G Calculated Priority Risk Index for Fog

The CPRI factors the elements of risk: Probability, Magnitude/Severity, Warning Time, and Duration to create an index, which allows for the prioritization of mitigation activities based on the level of risk.

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
2 x .45	+	1 x .30	+	1 x .15	+	1 x .10	=	1.45

H Hazard Summary for Fog

Calculated Priority Risk Index	1.45
Rank by Calculated Priority Risk Index	17 / 22
Planning Significance	Low

I Vulnerability Overview for Fog

The vulnerability profile for this hazard has not been completed. As stated in Section 4.2 page 14, “In order to focus on the most critical hazards, those assigned a level of high or moderate planning significance were given more attention in the remainder of this analysis, while those with a low planning significance were addressed in a general manner.”

Hailstorm

A Definition for Hailstorm

Hail is frozen water droplets formed inside a thunderstorm cloud. They are formed during the strong updrafts of warm air and downdrafts of cold air, when the water droplets are carried well above the freezing level to temperatures below 32 deg F, and then the frozen droplet begins to fall, carried by cold downdrafts, and may begin to thaw as it moves into warmer air toward the bottom of the thunderstorm. This movement up and down inside the cloud, through cold then warmer temperatures, causes the droplet to add layers of ice and can become quite large, sometimes round or oval shaped and sometimes irregularly shaped, before it finally falls to the ground as hail. The size ranges from smaller than a pea to as large as a softball, and can be very destructive to buildings, vehicles and crops. Even small hail can cause significant damage to young and tender plants. Take cover immediately in a hailstorm, and protect pets and livestock, which are particularly vulnerable to hail, and should be under shelter as well.

B Probability for Hailstorm

The forecasting of future weather conditions is becoming more accurate, but the variability of weather patterns often causes these forecasts to fail. Historically there have been 55 individual hailstorms since 1995, approximately 3.7 events per year. The rating assigned by the NCHMT for Probability is a 4, the event is considered highly likely, the event is probable within the calendar year.

C Previous Occurrences for Hailstorm

There were 170 hailstorm events recorded for Nemaha County and its jurisdictions since 1955, the last 55 years. Of the 170 events recorded, 135 events were since 1995 or the last 15 years. Are hailstorms becoming more prolific or is the recording of such events becoming more specific? Likely the reporting is becoming more specific. Of the later 135 events, 80 of the recorded events were multiple reports of the same event differing only by jurisdiction or magnitude or not differing at all. This leaves 55 unique hailstorm events since 1995. The following table summarizes the previous 55 unique events and the impacts and costs of these events.

Year	Hailstorm Events	Multiple Jurisdictions	Largest Magnitude	Deaths	Injuries	Property Damage	Crop Damage
1995	3	Yes	1.50 in	0	0	0	0
1996	2	Yes	0.75 in	0	0	0	0
1997	5	Yes	4.00 in	0	0	$112K	$750K
1998	5	Yes	2.00 in	0	0	0	0
1999	3	Yes	1.00 in	0	0	0	0
2000	6	Yes	1.75 in	0	0	0	0
2001	2	Yes	1.00 in	0	0	0	0
2002	4	Yes	1.00 in	0	0	0	0
2003	2	Yes	1.75 in	0	0	0	0
2004	2	Yes	1.00 in	0	0	0	0
2005	6	Yes	1.75 in	0	0	0	0
2006	5	Yes	2.00 in	0	0	0	0
2007	1	No	0.88 in	0	0	0	0
2008	4	Yes	1.75 in	0	0	0	0
2009	5	Yes	3.00 in	0	0	0	0

Event(s) as recorded in Nemaha County and its jurisdictions by the National Climatic Data Center.

D Geographic Location for Hailstorm

Nemaha County and all of its jurisdictions are susceptible to hailstorms.

E Extent for Hailstorm

The largest hail officially recorded for Nemaha County is 4.00" in diameter, which caused approximately $112K in property damage and $750K in crop damage on July 1, 1997. This hailstorm was the costliest of its type. No other hailstorms caused any reported damage. The rating assigned by the NCHMT for Extent (Magnitude / Severity) is a 1, the event is considered negligible, injuries or illness are treatable with first aid, shutdown of critical facilities for 24 hours or less, and less than 10% of property is severely damaged.

F Warning Time and Duration for Hailstorm

The rating assigned by the NCHMT for Warning Time is a 3, for 6-12 hours. The rating assigned by the NCHMT for Duration is a 1, less than 6 hours.

G Calculated Priority Risk Index for Hailstorm

The CPRI factors the elements of risk: Probability, Magnitude/Severity, Warning Time, and Duration to create an index, which allows for the prioritization of mitigation activities based on the level of risk.

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
4 x .45	+	1 x .30	+	3 x .15	+	1 x .10	=	2.65

H Hazard Summary for Hailstorm

Calculated Priority Risk Index	2.65
Rank by Calculated Priority Risk Index	4 / 22
Planning Significance	High

I Vulnerability Overview for Hailstorm

All of Nemaha County is vulnerable to hail storms.

J Identifying Structures and Estimating Potential Losses

Damage to structures as a result of a hailstorm can be devastating. If hail is large in diameter, damage to roofs, windows, and siding is common but is usually covered by private insurance. Personal injury can also occur if individuals are outdoors during the storm. No method is currently available for estimating loss from hailstorms.

K Future Development

The impact of hailstorms on any future development would be related to the type of asset or structure that was involved.

Hazardous Materials

A Definition for Hazardous Materials

Hazardous materials and waste are a concern because a sudden accidental or intentional release of such materials can be dangerous to human health and safety, to property, and to the quality of the environment. Such releases may come from both fixed sources, such as a manufacturing or storage facility, or from a transportation source, such as a truck or pipeline.

Agricultural facilities are likely to have dangerous materials present that could pose a threat to surrounding populations in the event of an emergency or disaster. Facilities that store or use chemicals considered unusually dangerous to human safety are required by Section 112R of the Clear Air Act Amendments to assess the potential impacts of an accidental release of the chemical at their facility and to prepare risk management plans (RMP).

B Probability for Hazardous Materials

The rating assigned by the NCHMT for Probability is a 2, the event is considered possible, the event is probable within the next 5 years.

C Previous Occurrences for Hazardous Materials

According to the Kansas Hazard Mitigation Plan 2007, from 1990 through 2006, there were nine reported hazardous materials incidents within Nemaha County. The incidents were small, with relatively little safety or environmental consequences.

D Geographic Location for Hazardous Materials

Nemaha County and all of its jurisdictions are susceptible to hazardous materials. Hazardous materials pose a threat to communities where hazardous materials are fabricated, processed, and stored as well as where hazardous waste is treated, stored, and disposed. Additionally, localities along transportation corridors that carry these materials to their final destinations are also at risk.

E Extent for Hazardous Materials

The rating assigned by the NCHMT for Extent (Magnitude / Severity) is a 2, the event is considered limited, complete shutdown of critical facilities for less than one week, injuries and illnesses do not result in permanent disability.

F Warning Time and Duration for Hazardous Materials

The rating assigned by the NCHMT for Warning Time is a 3, for 6-12 hours. The rating assigned by the NCHMT for Duration is a 1, less than 6 hours.

G Calculated Priority Risk Index for Hazardous Materials

The CPRI factors the elements of risk: Probability, Magnitude/Severity, Warning Time, and Duration to create an index, which allows for the prioritization of mitigation activities based on the level of risk.

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
2 x .45	+	2 x .30	+	3 x .15	+	1 x .10	=	2.05

H Hazard Summary for Hazardous Materials

Calculated Priority Risk Index	2.05
Rank by Calculated Priority Risk Index	10 / 22
Planning Significance	Moderate

I Vulnerability Overview for Hazardous Materials

Hazardous materials pose a threat to all jurisdictions within Nemaha County. The materials may not be fabricated, processed, or stored in each jurisdiction, but each jurisdiction is located along a transportation route that may be used in carrying these materials through that jurisdiction to their destination.

J Identifying Structures and Estimating Potential Losses

The structures and people likely to be affected by a hazardous materials event depend largely on the type of hazardous material and the size of the release. According to the Kansas Hazard Mitigation Plan 2007, from 1990 through 2006, there were nine reported hazardous materials incidents within Nemaha County. These incidents were small, with relatively little safety or environmental consequences. No data is available to estimate potential losses from future releases.

K Future Development

Future industrial development would likely increase the potential for a hazardous materials event.

Land Subsidence

A Definition for Land Subsidence

Subsidence is caused when the ground above manmade or natural voids collapses. Subsidence can be related to mine collapse, water and oil withdrawal, or natural causes such as shrinking of expansive soils, salt dissolution (which may also be related to mining activities), cave collapses, or areas of karsts. Karsts are a terrain or type of topography generally underlain by soluble rocks, such as limestone, gypsum, and dolomite, in which dissolving the rock forms the topography. The surface depression is known as a sinkhole. If sinkholes appear beneath developed areas, damage or destruction of buildings, roads and rails, or other infrastructure can result. The rate of subsidence, which ranges from gradual to catastrophic, correlates to its risk to public safety and property damage.

B Probability for Land Subsidence

The probability of land subsidence is unlikely as there are limited petroleum and water withdrawals within Nemaha County as well as no karsts formations. The rating assigned by the NCHMT for Probability is a 1, the event is considered unlikely, history of events is less than or equal to 10% likely per year.

C Previous Occurrences for Land Subsidence

There are no records of land subsidence within Nemaha County. Soil loss issues are typically erosion related.

D Geographic Location for Land Subsidence

The entire Nemaha County geographical area is subject to very limited if any exposure to land subsidence.

E Extent for Land Subsidence

The rating assigned by the NCHMT for Extent (Magnitude / Severity) is a 1, the event is considered negligible, shutdown of critical facilities and services for 24 hours or less.

F Warning Time and Duration for Land Subsidence

The rating assigned by the NCHMT for Warning Time is a 1, for more than 12 hours. The rating assigned by the NCHMT for Duration is a 4, more than I week.

G Calculated Priority Risk Index for Land Subsidence

The CPRI factors the elements of risk: Probability, Magnitude/Severity, Warning Time, and Duration to create an index, which allows for the prioritization of mitigation activities based on the level of risk.

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
1 x .45	+	1 x .30	+	1 x .15	+	4 x .10	=	1.30

H Hazard Summary for Land Subsidence

Calculated Priority Risk Index	1.30
Rank by Calculated Priority Risk Index	19 / 22
Planning Significance	Low

I Vulnerability Overview for Land Subsidence

The vulnerability profile for this hazard has not been completed. As stated in Section 4.2 page 14, "In order to focus on the most critical hazards, those assigned a level of high or moderate planning significance were given more attention in the remainder of this analysis, while those with a low planning significance were addressed in a general manner."

Landslide

A Definition for Landslide

Landslides are natural phenomena. A landslide is the downhill movement of masses of soil and rock by gravity. The basic ingredients for landslides are gravity, susceptible soil or rock, sloping ground, and water. Types of landslides that occur in Kansas are rock falls; block slides, slumps, earth flows, and creep. Creep is widespread on hillsides throughout Kansas.

B Probability of Landslide

The risk posed by landslide to Nemaha County is low. The rating assigned by the NCHMT for Probability is a 1, the event is considered unlikely, history of events is less than or equal to 10% likely per year.

C Previous Occurrences for Landslide

There are no records of significant landslides within Nemaha County. Soil loss issues are typically erosion related.

D Geographic Location for Landslide

The entire Nemaha County geographical area is subject to very limited if any exposure to landslide.

E Extent for Landslide

The rating assigned by the NCHMT for Extent (Magnitude / Severity) is a 1, the event is considered negligible, shutdown of critical facilities and services for 24 hours or less.

F Warning Time and Duration for Landslide

The rating assigned by the NCHMT for Warning Time is a 1, for 24+ hours. The rating assigned by the NCHMT for Duration is a 2, less than 1 day.

G Calculated Priority Risk Index for Landslide

The CPRI factors the elements of risk: Probability, Magnitude/Severity, Warning Time, and Duration to create an index, which allows for the prioritization of mitigation activities based on the level of risk.

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
1 x .45	+	1 x .30	+	1 x .15	+	2 x .10	=	1.10

H Hazard Summary for Landslide

Calculated Priority Risk Index	1.10
Rank by Calculated Priority Risk Index	21 / 22
Planning Significance	Low

I Vulnerability Overview for Landslide

The vulnerability profile for this hazard has not been completed. As stated in Section 4.2 page 14, "In order to focus on the most critical hazards, those assigned a level of high or moderate planning significance were given more attention in the remainder of this analysis, while those with a low planning significance were addressed in a general manner."

Lightning

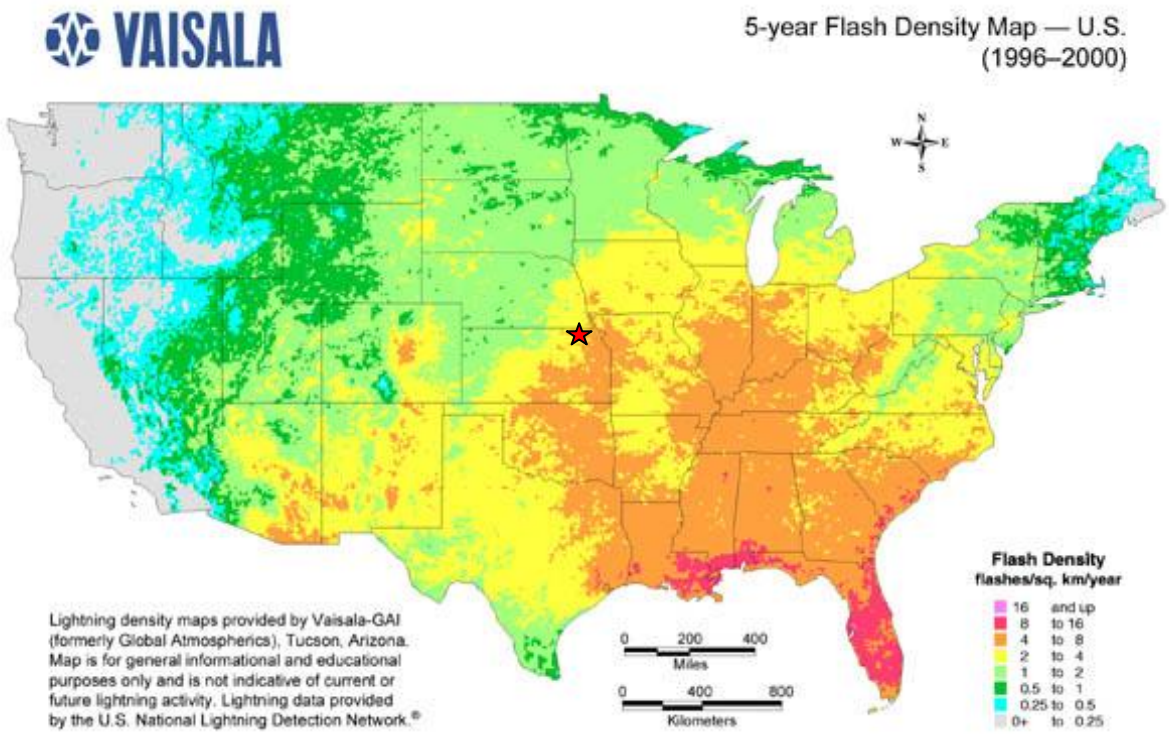
A Definition for Lightning

According to the National Weather Service, lightning is one of the most underrated severe weather hazards. The second deadliest weather killer in the United States, it ranks above hurricanes or tornadoes with an average of 73 deaths and 300 injuries each year.

Severe thunderstorms strike Kansas on a regular basis. In addition to the heavy rains that cause floods, high winds, tornadoes, and thunderstorms, lightning often accompanies thunderstorms and can cause injury, death, property damage, and wildland fires. The widespread and frequent nature of thunderstorms makes lightning a relatively common occurrence. Of particular concern to Kansas is protection of facilities and communications systems that are important to emergency response operations, protection of public health, and maintenance of the state's economy. The threat to communications systems includes tornado sirens, which could get knocked out just when they are needed most.

B Probability for Lightning

The forecasting of future weather conditions is becoming more accurate, but the variability of weather patterns often causes these forecasts to fail. The following map, courtesy of the National Weather Service, indicates that Nemaha County is located in an area that receives 4 to 8 lightning strikes per square kilometer per year. The rating assigned by the NCHMT for Probability is a 4, the event is considered highly likely, the event is probable within the calendar year.



C Previous Occurrences for Lightning

The following table summarizes the previous occurrences, impacts, and costs of this hazard.

Date	Jurisdiction	Class	Deaths	Injuries	Property Damage	Crop Damage
6/27/1998	Seneca	Lightning	0	0	0	0
7/18/2001	Sabetha	Lightning	0	0	4K	0
9/16/2001	Sabetha	Lightning	0	0	6K	0

Event(s) as recorded in Nemaha County and its jurisdictions by the National Climatic Data Center.

D Geographic Location for Lightning

Nemaha County and all of its jurisdictions are susceptible to lightning.

E Extent for Lightning

Although the frequency and probability of lightning strikes is high, the extent of the area damaged is negligible to the area of the county as a whole. Strikes are usually limited to single buildings and personal insurance usually covers cost. The rating assigned by the NCHMT for Extent (Magnitude / Severity) is a 1, the event is considered negligible, less than 10% of property is severely damaged.

F Warning Time and Duration for Lightning

The rating assigned by the NCHMT for Warning Time is a 1, for 24+ hours. The rating assigned by the NCHMT for Duration is a 1, less than 6 hours.

G Calculated Priority Risk Index for Lightning

The CPRI factors the elements of risk: Probability, Magnitude/Severity, Warning Time, and Duration to create an index, which allows for the prioritization of mitigation activities based on the level of risk.

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
4 x .45	+	1 x .30	+	1 x .15	+	1 x .10	=	2.35

H Hazard Summary for Lightning

Calculated Priority Risk Index	2.35
Rank by Calculated Priority Risk Index	6 / 22
Planning Significance	High

I Vulnerability Overview for Lightning

All of Nemaha County is vulnerable to lightning.

J Identifying Structures and Estimating Potential Losses

Severe thunderstorms, accompanied by lightning, strike Nemaha County on a regular basis. Lightning can cause injury, death, and property damage. Of particular concern is the threat to facilities and communications systems that are important to emergency response operations and the protection of public health. The threat to communications systems includes tornado sirens, which could get knocked out just when they are needed most. No data is available to estimate potential losses from lightning.

K Future Development

The impact of lightning on any future development would be related to the degree of protection designed into the structure that was involved.

Major Disease Outbreak

A Definition for Major Disease Outbreak

While there are a number of biological diseases/agents that are of concern to Nemaha County, the one being followed most closely and addressed in this plan is pandemic influenza.

A pandemic is a global disease outbreak. A pandemic flu is a virulent human flu that causes a global outbreak, or pandemic, of serious illness. Flu pandemic occurs when a new influenza virus emerges for which people have little or no immunity, and for which there is no vaccine. This disease spreads easily person-to-person, causes serious illness, and can sweep across the country and around the world in very short time. The Centers for Disease Control and Prevention has been working closely with other countries and the World Health Organization to strengthen systems to detect outbreaks of influenza that might cause a pandemic and to assist with pandemic planning and preparation.

Influenza (flu) is a viral infection of the nose, throat, bronchial tubes, and lungs. It is highly contagious and is easily transmitted through contact with droplets from the nose and throat of an infected person during coughing and sneezing. Typical symptoms include headache, fever, chills, cough, and body aches. Although most people are ill for only a few days, some have a more serious illness, such as pneumonia, and may need to be hospitalized. Anyone can get influenza, but it is most serious in the elderly and people with chronic illnesses such as cancer, emphysema, or diabetes or weak immune systems. Thousands of people die each year in the United States from flu or related complications.

B Probability for Major Disease Outbreak

Although influenza occurs annually in Nemaha County, pandemic proportions are not likely. The rating assigned by the NCHMT for Probability is a 1, the event is considered unlikely, history of events is less than or equal to 10% likely per year.

C Previous Occurrences for Major Disease Outbreak

According to historic records, there have been no previous occurrences of major disease outbreak in Nemaha County.

D Geographic Location for Major Disease Outbreak

Although the entire Nemaha County geographical area is subject to major disease outbreak, several places and populations are at an increased risk to infectious disease. Communicable diseases are most likely to spread quickly in institutional settings such as long- term care facilities, day care facilities, etc.

E Extent for Major Disease Outbreak

The rating assigned by the NCHMT for Extent (Magnitude / Severity) is a 2, the event is considered limited, injuries and/or illnesses do not result in permanent disability.

F Warning Time and Duration for Major Disease Outbreak

The rating assigned by the NCHMT for Warning Time is a 1, for 24+ hours. The rating assigned by the NCHMT for Duration is a 4, more than I week.

G Calculated Priority Risk Index for Major Disease Outbreak

The CPRI factors the elements of risk: Probability, Magnitude/Severity, Warning Time, and Duration to create an index, which allows for the prioritization of mitigation activities based on the level of risk.

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
1 x .45	+	2 x .30	+	1 x .15	+	4 x .10	=	1.60

H Hazard Summary for Major Disease Outbreak

Calculated Priority Risk Index	1.60
Rank by Calculated Priority Risk Index	14 / 22
Planning Significance	Moderate

I Vulnerability Overview for Major Disease Outbreak

All of Nemaha County's population is at risk to a major disease outbreak. Communicable diseases are most likely to spread quickly in institutional settings such as long-term care facilities, day care facilities, etc. In Nemaha County, the following special populations exist which are especially susceptible to the spread of infectious disease.

Population	Number of Persons
Residents in Assisted Living Facilities*	34
Residents in Residential Health Care Facilities*	56
Residents in Long Term Nursing Facilities*	268
Children in Licensed Day Care 2005 (36 facilities)**	414
Population without Health Care Insurance*** (from a total 2005 population of 8,253)	1,360

* from the Kansas Department on Aging 2010, ** from the Kansas Department of Health and Environment, *** from census.gov "Small Area Health Insurance Estimates"

J Identifying Structures and Estimating Potential Losses

Buildings, infrastructure, and critical facilities are not vulnerable to a major disease outbreak. It affects only persons susceptible to the illness. The impacts and potential losses are largely economic and are dependent on the type, extent, and duration of the illness. There is no data currently available on the economic impact of illness in Nemaha County.

K Future Development

As the population of Nemaha County grows and ages, the vulnerability to major disease outbreak is likely to increase.

Radiological

A Definition for Radiological

A radiological event involving radioactive materials could occur from a variety of sources: nuclear reactors, transportation accidents, industrial and medical uses, and lost or stolen sources where the public could be exposed, or contaminated, with a high level of radiation. Radiological accidents could cause injury or death, contaminate property and valuable environmental resources, as well as disrupt the functioning of communities and their economies.

B Probability of Radiological

The rating assigned by the NCHMT for Probability is a 1, the event is considered unlikely, history of events is less than or equal to 10% likely per year.

C Previous Occurrences for Radiological

According to historic records, there have been no previous occurrences of a radiological event in Nemaha County.

D Geographic Location for Radiological

The entire Nemaha County geographical area is at risk to a radiological event. Diagnostic and therapy medical sources are used on a daily basis and it is common for materials, including pharmaceuticals, industrial sources, and nuclear fuel rods destined to nuclear reactors, to be transported across highways and rail.

The entire northern three-quarters of the Nemaha County geographical area is especially subject to radiological hazards; the area contains a major highway, the only rail line in the county, and it falls within the 50-mile emergency planning zone of the Cooper Nuclear Station in Brownville, NE.

E Extent for Radiological

The rating assigned by the NCHMT for Extent (Magnitude / Severity) is a 3, the event is considered critical, injuries and/or illnesses result in permanent disability, complete shutdown of critical facilities for at least two weeks.

F Warning Time and Duration for Radiological

The rating assigned by the NCHMT for Warning Time is a 1, for 24+ hours. The rating assigned by the NCHMT for Duration is a 4, more than I week.

G Calculated Priority Risk Index for Radiological

The CPRI factors the elements of risk: Probability, Magnitude/Severity, Warning Time, and Duration to create an index, which allows for the prioritization of mitigation activities based on the level of risk.

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
1 x .45	+	3 x .30	+	1 x .15	+	4 x .10	=	1.90

H Hazard Summary for Radiological

Calculated Priority Risk Index	1.90
Rank by Calculated Priority Risk Index	12 / 22
Planning Significance	Moderate

I Vulnerability Overview for Radiological

Radiological materials pose a threat to all jurisdictions within Nemaha County. The materials may not be fabricated, processed, stored, or even used within in each jurisdiction, but each jurisdiction is located along a transportation route that may be used in carrying these materials through that jurisdiction to their destination. In addition, the northern majority of Nemaha County, including all the cities in Nemaha County, falls within the 50-mile radius of the Cooper Nuclear Station located near Brownville, Nebraska.

J Identifying Structures and Estimating Potential Losses

The structures and people likely to be affected by a radiological event depend largely on the severity of the release. Radiological events could cause injury or death, contaminate property and valuable environmental resources, as well as disrupt the functioning of communities and their economies. There is no data currently available on the economic impact of radiological events in Nemaha County.

K Future Development

Future growth and development would likely increase the potential for effect from a radiological event.

Soil Erosion and Dust

A Definition for Soil Erosion and Dust

Soil erosion and dust are both ongoing problems. Both can cause significant loss of valuable agricultural soils, damage crops, harm environmental resources, and have adverse economic impacts. Soil erosion is largely associated with periods of drought, when winds are able to move tremendous quantities of exposed dry soil (wind erosion), and flooding (stream bank erosion). Improper agricultural and grazing practices can also contribute to soil erosion.

B Probability for Soil Erosion and Dust

While soil erosion and dust occur annually as part of natural processes, the adverse effects of erosion are usually only fully realized as a cumulative function. The cumulative effects of annual events are unlikely to reach notable levels. The probability of a significant soil erosion and dust episode is unlikely. The rating assigned by the NCHMT for Probability is a 1, the event is considered unlikely, history of events is less than or equal to 10% likely per year.

C Previous Occurrences for Soil Erosion and Dust

According to historic records, there have been no previous occurrences of significant soil erosion and dust in Nemaha County.

D Geographic Location for Soil Erosion and Dust

Nemaha County has some sections of land that are considered highly erodible and some sections that are not, but the entire Nemaha County geographical area is subject to soil erosion and dust.

E Extent for Soil Erosion and Dust

The rating assigned by the NCHMT for Extent (Magnitude / Severity) is a 1, the event is considered negligible, and less than 10% of property is severely damaged.

F Warning Time and Duration for Soil Erosion and Dust

The rating assigned by the NCHMT for Warning Time is a 1, for 24+ hours. The rating assigned by the NCHMT for Duration is a 2, less than I day.

G Calculated Priority Risk Index for Soil Erosion and Dust

The CPRI factors the elements of risk: Probability, Magnitude/Severity, Warning Time, and Duration to create an index, which allows for the prioritization of mitigation activities based on the level of risk.

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
1 x .45	+	1 x .30	+	1 x .15	+	2 x .10	=	1.10

H Hazard Summary for Soil Erosion and Dust

Calculated Priority Risk Index	1.10
Rank by Calculated Priority Risk Index	22 / 22
Planning Significance	Low

I Vulnerability Overview for Soil Erosion and Dust

The vulnerability profile for this hazard has not been completed. As stated in Section 4.2 page 14, “In order to focus on the most critical hazards, those assigned a level of high or moderate planning significance were given more attention in the remainder of this analysis, while those with a low planning significance were addressed in a general manner.”

Terrorism and Civil Disorder

A Definition for Terrorism and Civil Disorder

The Federal Bureau of Investigation defines terrorism as “the unlawful use of force or violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives.” The threat of terrorism, both international and domestic, is ever present, and an attack is likely to occur when least expected. Agri-terrorism consists of acts to intentionally contaminate, ruin, or otherwise make agricultural products unfit or dangerous for consumption or further use.

In the United States, civil disorder has been most commonly associated with urban areas and college campuses, particularly in the1960s around the issues of civil rights and the Vietnam War. According to U.S. Code (18 U.S.C. §232), civil disorder is “any public disturbance involving acts of violence by a group of three or more persons causing immediate danger, damage, or injury to the property or person of another individual. In Kansas, civil disorder is recognized as a societal hazard because of the associated potential for injury, loss of life, property damage, and economic disruption.

B Probability for Terrorism and Civil Disorder

While difficult to estimate, the probability for a terrorism or civil disorder event is unlikely due to the lack of significant populations and population centers in Nemaha County. The rating assigned by the NCHMT for Probability is a 1, the event is considered unlikely.

C Previous Occurrences for Terrorism and Civil Disorder

According to historic records, there have been no previous occurrences of terrorism and civil disorder in Nemaha County.

D Geographic Location for Terrorism and Civil Disorder

The entire Nemaha County geographical area is subject to terrorism and civil disorder. Terrorism and civil disorder are mostly associated with metropolitan areas, but extremist groups and actions have occurred in rural areas else where in the United States.

E Extent for Terrorism and Civil Disorder

The rating assigned by the NCHMT for Extent (Magnitude / Severity) is a 3, the event is considered critical; complete shutdown of critical facilities for at least two weeks and more than 25% of property is severely damaged.

F Warning Time and Duration for Terrorism and Civil Disorder

The rating assigned by the NCHMT for Warning Time is a 2, for 12-24 hours. The rating assigned by the NCHMT for Duration is a 3, less than I week.

G Calculated Priority Risk Index for Terrorism and Civil Disorder

The CPRI factors the elements of risk: Probability, Magnitude/Severity, Warning Time, and Duration to create an index, which allows for the prioritization of mitigation activities based on the level of risk.

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
1 x .45	+	3 x .30	+	2 x .15	+	3 x .10	=	1.95

H Hazard Summary for Terrorism and Civil Disorder

Calculated Priority Risk Index	1.95
Rank by Calculated Priority Risk Index	11 / 22
Planning Significance	Moderate

I Vulnerability Overview for Terrorism and Civil Disorder

The entire Nemaha County geographical area is subject to terrorism and civil disorder. Terrorism and civil disorder are mostly associated with metropolitan areas, but extremist groups and actions have occurred in rural areas else where in the United States.

J Identifying Structures and Estimating Potential Losses

Buildings, infrastructure, and critical facilities are vulnerable to this hazard; they would be the most likely “target” in an event of this nature. Means of agricultural production would be “targeted” as well.

The impacts and potential losses in agricultural production are largely economic and are dependent on the type, extent, and duration of the event. An estimated potential loss would be to inventory the value of crops and livestock exposed to the hazard and apply an appropriate percentage. For example, according to the 2009 Kansas Farm Facts the total market value of the crops harvested in Nemaha County was $ 67,091,000 and the total market value of livestock was of $ 79,805,000. While it is difficult to estimate how many crops and livestock would be damaged or destroyed in any event, a 10 percent loss would result in $ 6,709,100 in crops and $ 7,980,500 in livestock damaged or destroyed.

K Future Development

Future growth and development would likely increase the potential for effect from a terrorism and civil disorder event.

Tornado

A Definition for Tornado

Tornadoes are defined as violently rotating columns of air extending from thunderstorms to the ground. A tornado is spawned by a thunderstorm, produced when cool air overrides a layer of warm air, forcing the warm air to rise rapidly. While most tornadoes (69%) have winds of less than 100 miles per hour, those with winds greater than 205 mph, 2% of all tornadoes, cause 70% of all tornado deaths.

Tornado season is generally April through June, although tornadoes can occur at any time of year. They tend to occur in the afternoons and evenings; over 80 percent of all tornadoes strike between 3 PM and 9 PM, but they can occur at any time of day or night. Tornadoes are found most frequently in the United States east of the Rocky Mountains.

B Probability for Tornado

The forecasting of future weather conditions is becoming more accurate, but the variability of weather patterns often causes these forecasts to fail. Based upon the history of 15 events in the last 16 years, the event is probable within the next three years. The rating assigned by the NCHMT for Probability is a 3, the event is considered likely.

C Previous Occurrences for Tornado

According to the National Climatic Data Center, there have been 21 confirmed tornado events in Nemaha County since 1950, which have resulted in one injury, approximately $9.56 million in property damages, and $75 thousand in crop damages. The strongest tornado ever recorded in Nemaha County is an F2, which occurred on two separate occasions, 1993 and 1998.

On May 6, 1993 an F2 tornado moved southwest to northeast across Nemaha County miraculously producing no deaths or injuries, but causing significant damage to about 20 different farms or farmsteads and related business, machinery and buildings. The tornado just missed populated areas and remained generally in fields and farm areas. In some areas the tornado was about 1/2 mile wide while in other areas damage was only about 100 yards wide and at times the tornado had multiple vortices.

On June 13, 1998 an F2 tornado ripped through downtown Sabetha causing extensive structural damage to buildings in a two block area, as well as downing power lines and several large trees. The tornado's path extended from one-half mile west to one-half mile east of the City Hall building. Eighteen buildings in downtown sustained damage with five buildings including City Hall damaged close to the point of loss. The tornado caused 2 million in damage to City Hall alone as it destroyed half the roof and walls of the building. Away from downtown several homes and vehicles were damaged from fallen trees and limbs on the fringes of the tornado or from strong straight-line winds.

The following table summarizes the previous occurrences, impacts, and costs of this hazard.

Date	Jurisdiction	Class	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
11/17/1952	Nemaha County	Tornado	F1	0	0	0	0
6/1/1960	Nemaha County	Tornado	F0	0	0	25K	0
7/20/1961	Nemaha County	Tornado	F0	0	0	0	0
6/22/1964	Nemaha County	Tornado	F0	0	0	0	0
12/13/1975	Nemaha County	Tornado	F1	0	0	250K	0
5/6/1993	Centralia	Tornado	F2	0	0	5.0M	50K
5/9/1996	Nemaha County	Tornado	F1	0	0	95K	25K
7/20/1996	Centralia	Tornado	F0	0	0	0	0
7/1/1997	Nemaha County	Tornado	F1	0	0	20K	0
7/27/1997	Seneca	Tornado	F1	0	0	15K	0
6/13/1998	Sabetha	Tornado	F2	0	0	3.5M	0
6/20/1998	Seneca	Tornado	F0	0	0	0	0
4/5/1999	Seneca	Tornado	F1	0	1	450K	0
4/25/2000	Seneca	Tornado	F0	0	0	0	0
4/21/2005	Corning	Tornado	F0	0	0	0	0
3/30/2006	Sabetha	Tornado	F1	0	0	200K	0
5/26/2007	Nemaha County	Tornado	F0	0	0	0	0
9/6/2007	Centralia	Tornado	N/A	0	0	0	0
6/11/2008	Nemaha County	Tornado	F1	0	0	0	0
3/23/2009	Oneida	Tornado	F1	0	0	0	0
7/28/2009	Centralia	Tornado	F0	0	0	0	0

Event(s) as recorded in Nemaha County and its jurisdictions by the National Climatic Data Center.

D Geographic Location for Tornado

The entire Nemaha County geographical area may be affected by tornadoes.

E Extent for Tornado

The Fujita scale (F-Scale), or Fujita-Pearson scale, is a scale for rating tornado intensity, based primarily on the damage tornadoes inflict on human-built structures and vegetation. The official Fujita scale category is determined by meteorologists (and engineers) after a ground and/or aerial damage survey; and depending on the circumstances, ground-swirl patterns (cycloidal marks), radar tracking, eyewitness testimonies, media reports and damage imagery, as well as photogrammetry/videogrammetry if motion picture recording is available.

The Enhanced Fujita Scale (EF Scale) rates the strength of tornadoes in the United States based on the damage they cause. Implemented in place of the Fujita scale introduced in 1971 by Ted Fujita, it began operational use on February 1, 2007. The scale has the same basic design as the original Fujita scale: six categories from zero to five representing increasing degrees of damage. It was revised to reflect better examinations of tornado damage surveys, so as to align wind speeds more closely with associated storm damage. Better standardizing and elucidating what was previously subjective and ambiguous, it also adds more types of structures, vegetation, expands degrees of damage, and better accounts for variables such as differences in construction quality.

Nine of the 21 reported tornado events in Nemaha County have caused property and crop damage; two of the events were in the millions. The rating assigned by the NCHMT for Extent (Magnitude / Severity) is a 3, the event is considered critical; more than 25% of property is severely damaged.

Scale	Wind speed (Estimated)[2]		Example of damage
	mph	km/h	
EF0	65–85	105–137	
EF1	86–110	138–178	
EF2	111–135	179–218	
EF3	136–165	219–266	
EF4	166–200	267–322	
EF5	>200	>322	

F Warning Time and Duration for Tornado

The rating assigned by the NCHMT for Warning Time is a 4, less than 6 hours. The rating assigned by the NCHMT for Duration is a 1, less than 6 hours.

G Calculated Priority Risk Index for Tornado

The CPRI factors the elements of risk: Probability, Magnitude/Severity, Warning Time, and Duration to create an index, which allows for the prioritization of mitigation activities based on the level of risk.

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
3 x .45	+	3 x .30	+	4 x .15	+	1 x .10	=	2.65

H Hazard Summary for Tornado

Calculated Priority Risk Index	2.65
Rank by Calculated Priority Risk Index	1 / 22
Planning Significance	High

I Vulnerability Overview for Tornado

The entire Nemaha County geographical area is subject to the effects of a tornado. A tornado is likely based on historical events and all above-ground buildings, infrastructure, and critical facilities are at risk of damage.

J Identifying Structures and Estimating Potential Losses

To assess the vulnerability of structures to a tornado, the NCHMT applied a Greensburg type scenario to Nemaha County. Greensburg, Kansas was hit by an EF5 tornado on May 4, 2007. The tornado was 1.7 miles wide and traveled approximately 22 miles. It completely destroyed 95% of the town of Greensburg and left the rest severely damaged.

If a tornado event similar to that of Greensburg occurred anywhere in the populated sections of Nemaha County, it is conceivable that a similar level of destruction would occur. Any city hit would be completely destroyed. Fortunately, a tornado of that magnitude in Nemaha County is highly unlikely.

K Future Development

Future residential and commercial buildings built to code should be less vulnerable to a tornado; however the only areas within the county that have building codes are the cities of Sabetha and Seneca. Fortunately, most of the growth within the county occurs within these two cities.

Utility/Infrastructure Failure

A Definition for Utility/Infrastructure Failure

Utility/infrastructure involves several different types of facilities and systems: transportation, power systems, natural gas and oil pipelines, water and sewer systems, storage networks, and telecommunications facilities. State and locally designated critical facilities, such as hospitals, government centers, etc., are also considered critical infrastructure. Failure of utilities or other components of the infrastructure in Nemaha County can seriously impact public health, the functioning of communities, and the county's economy. Disruption of any of these services could result from the majority of the natural, technological, and manmade hazards described in this plan (water systems are particularly vulnerable to drought).

B Probability for Utility/Infrastructure Failure

Utility failures occur several times annually in conjunction with a variety hazards, such as tornados, windstorms, and winter storms. The rating assigned by the NCHMT for Probability is a 4, the event is considered highly likely, and an event is probable within the calendar year.

C Previous Occurrences for Utility/Infrastructure Failure

Utility failures occur several times annually within Nemaha County, usually in conjunction with a variety hazards, such as tornados, windstorms, and winter storms.

D Geographic Location for Utility/Infrastructure Failure

The entire Nemaha County geographic area may be affected by utility/infrastructure failure.

E Extent for Utility/Infrastructure Failure

Utility failures occur several times annually within Nemaha County and vary in duration from a few minutes to days depending on the magnitude of the initiating event. The rating assigned by the NCHMT for Extent (Magnitude / Severity) is a 1; the event is considered negligible, shutdown of critical facilities and services for 24 hours or less.

F Warning Time and Duration for Utility/Infrastructure Failure

The rating assigned by the NCHMT for Warning Time is a 1, for 24+ hours. The rating assigned by the NCHMT for Duration is a 1, for less than 6 hours typically.

G Calculated Priority Risk Index for Utility/Infrastructure Failure

The CPRI factors the elements of risk: Probability, Magnitude/Severity, Warning Time, and Duration to create an index, which allows for the prioritization of mitigation activities based on the level of risk.

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
4 x .45	+	1 x .30	+	1 x .15	+	1 x .10	=	2.35

H Hazard Summary for Utility/Infrastructure Failure

Calculated Priority Risk Index	2.35
Rank by Calculated Priority Risk Index	7 / 22
Planning Significance	High

I Vulnerability Overview for Utility/Infrastructure Failure

In Nemaha County, electric utilities and infrastructure are the most vulnerable to damage by natural hazards. The events that cause the most damage are windstorms and winter storms. The electric utilities are located almost entirely above ground and it is not unusual for outages to last for extended periods.

J Identifying Structures and Estimating Potential Losses

With most electrical utilities located above ground, it follows that power lines and power poles are the structures most likely to be affected and create a utility/infrastructure failure. No method currently exists for determining the potential losses from utility/infrastructure failure, but economic losses are expected if electrical power cannot be restored to industrial operations. Nemaha County is currently served by five electrical utilities. There is no method in place to determine potential losses.

K Future Development

Future growth and development would likely increase the potential for utility/infrastructure failure.

Wildfires

A Definition for Wildfires

Wild fires in Kansas typically originate in pasture or prairie areas following the ignition of dry grasses (by natural or human sources). About 75 percent of Kansas wildfires start during spring due to dry weather conditions. Since protecting people and structures takes priority, a wildfire's cost to natural resources, crops, and pastured livestock can be ecologically and economically devastating. In addition to the health and safety impacts to those directly affected by fires, the state is also concerned about the health effects of smoke emissions to surrounding areas.

Wildfires in Kansas are frequently associated with lightning and drought conditions, as dry conditions make vegetation more flammable. As new development encroaches into the wildland-urban interface (areas where development occurs within or immediately adjacent to wildlands, near fire-prone trees, brush, and/or other vegetation), more and more structures and people are at risk. On occasion, ranchers and farmers intentionally ignite vegetation to restore soil nutrients or alter the existing vegetation growth. These fires have the potential to erupt into wildfires.

B Probability for Wildfires

The risk of wildfires varies based on season, drought conditions, and location in the county, but overall a significant uncontrolled wildfire is unlikely. The rating assigned by the NCHMT for Probability is a 1, the event is considered unlikely; history of events is less than or equal to 10% likely per year.

C Previous Occurrences for Wildfires

According to historical records, there are minimal occurrences of minor uncontrolled wildfires.

D Geographic Location for Wildfires

The entire Nemaha County rural geographical area may be affected by wildfires, but there is an increased risk in agricultural areas where Conservation Reserve Program (CRP) land is burned. During high wind conditions, these small fires can get out of control and spread to other dry vegetation.

E Extent for Wildfires

According to historical records, there are minimal occurrences of minor uncontrolled wildfires. These minor uncontrolled fires usually do not result in significant threat to life or property. The rating assigned by the NCHMT for Extent (Magnitude / Severity) is a 1, the event is considered limited; more than 10% of property is severely damaged.

F Warning Time and Duration for Wildfires

The rating assigned by the NCHMT for Warning Time is a 4, for less than 6 hours. The rating assigned by the NCHMT for Duration is a 1, less than 6 hours.

G Calculated Priority Risk Index for Wildfires

The CPRI factors the elements of risk: Probability, Magnitude/Severity, Warning Time, and Duration to create an index, which allows for the prioritization of mitigation activities based on the level of risk.

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
1 x .45	+	1 x .30	+	4 x .15	+	1 x .10	=	1.45

H Hazard Summary for Wildfires

Calculated Priority Risk Index	1.45
Rank by Calculated Priority Risk Index	15 / 22
Planning Significance	Low

I Vulnerability Overview for Wildfires

The vulnerability profile for this hazard has not been completed. As stated in Section 4.2 page 14, “In order to focus on the most critical hazards, those assigned a level of high or moderate planning significance were given more attention in the remainder of this analysis, while those with a low planning significance were addressed in a general manner.”

Windstorm

A Definition for Windstorm

Relatively frequent strong winds are a characteristic of Kansas. Kansas is located in Wind Zones III and IV, the highest inland categories. Nemaha County is located in Zone IV, susceptible to winds up to 250 mph. High winds can result from thunderstorm inflow and outflow, or downburst winds when the storm cloud collapses, and can result from strong frontal systems, or gradient winds (high or low pressure systems). High winds are speeds reaching 50 mph or greater, either sustained or gusting.

B Probability for Windstorm

The forecasting of future weather conditions is becoming more accurate, but the variability of weather patterns often causes these forecasts to fail. Based upon the history of 55 unique events in the last 15 years, an event is probable within the calendar year. The rating assigned by the NCHMT for Probability is a 4, the event is considered highly likely.

C Previous Occurrences for Windstorm

There were 122 windstorm events recorded for Nemaha County and its jurisdictions since 1956, the last 54 years. Of the 122 events recorded, 98 events were since 1994 or the last 16 years. Are windstorms becoming more prolific or is the recording of such events becoming more specific? Likely the reporting is becoming more specific. Of the later 98 events, 43 of the recorded events were multiple reports of the same event differing only by jurisdiction or magnitude or not differing at all. This leaves 55 unique windstorm events since 1994.

The highest wind speed officially recorded for Nemaha County is 74 knots, which caused approximately $4.0 million in regional property damage April 11, 2001. This windstorm was the costliest of its type. Strong winds were associated with an intense low pressure system reaching speeds over 85 mph at times and causing extensive damage over the area that was estimated in the millions of dollars. Most of the damage occurred to homes, power lines and businesses. Large trees were severely damaged, vehicles were overturned on area roads, and power outages occurred from downed power lines. It was the worst windstorm over a widespread area in many years.

The following table summarizes the previous 55 unique events and the impacts and costs of these events.

Year	Windstorm Events	Multiple Jurisdictions	Largest Magnitude	Deaths	Injuries	Property Damage	Crop Damage
1994	1	Yes	65 kts	0	0	$600K	$55K
1995	0	No	0 kts	0	0	0	0
1996	1	No	65 kts	0	0	$50K	$30K
1997	5	Yes	61 kts	0	0	$40K	0
1998	4	Yes	50 kts	0	0	$10K	0
1999	3	Yes	70 kts	0	0	$99K	0
2000	5	Yes	70 kts	0	0	$6K	0
2001	5	Yes	74 kts	0	0	$4.0M	0
2002	5	Yes	65 kts	0	0	$7K	0
2003	4	Yes	61 kts	0	0	0	0
2004	3	Yes	61 kts	0	0	$35K	0
2005	2	Yes	65 kts	0	0	0	0
2006	5	Yes	70 kts	0	0	$2K	0
2007	4	Yes	56 kts	0	0	0	0
2008	2	Yes	61 kts	0	0	0	0
2009	6	Yes	70 kts	0	0	$1K	0

Event(s) as recorded in Nemaha County and its jurisdictions by the National Climatic Data Center.

D Geographic Location for Windstorm

The entire Nemaha County area may be affected by windstorms. It is located in wind zone IV, susceptible to winds up to 250 mph.

E Extent for Windstorm

The rating assigned by the NCHMT for Extent (Magnitude / Severity) is a 2, the event is considered limited; more than 10% of property is severely damaged.

F Warning Time and Duration for Windstorm

The rating assigned by the NCHMT for Warning Time is a 2, for 12-24 hours. The rating assigned by the NCHMT for Duration is a 1, less than 6 hours.

G Calculated Priority Risk Index for Windstorm

The CPRI factors the elements of risk: Probability, Magnitude/Severity, Warning Time, and Duration to create an index, which allows for the prioritization of mitigation activities based on the level of risk.

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
4 x .45	+	2 x .30	+	2 x .15	+	1 x .10	=	2.80

H Hazard Summary for Windstorm

Calculated Priority Risk Index	2.80
Rank by Calculated Priority Risk Index	3 / 22
Planning Significance	High

I Vulnerability Overview for Windstorm

Windstorms in Nemaha County disrupt daily activities and can cause damage to buildings, trees, and utilities.

J Identifying Structures and Estimating Potential Losses

Windstorms affect the entire county including all above-ground structures and utilities. There are no specific hazard areas or available data to identify specific structures at risk or estimate potential losses.

K Future Development

Future residential and commercial buildings built to code should be less vulnerable to a windstorm; however the only areas within the county that have building codes are the cities of Sabetha and Seneca. Fortunately, most of the growth within the county occurs within these two cities.

Winter Storm (Snow, Ice, Sleet)

A Definition for Winter Storm (Snow, Ice, Sleet)

Winter storms in Nemaha County usually come in the form of heavy snow or freezing rain (ice storms). Regardless of the form they take, they can have significant impacts to the county and its residents for days, weeks, or even months. They can immobilize a region, blocking roads and railways and closing the airport, which can disrupt emergency and medical services, hamper the flow of supplies, and isolate homes and farms, possibly for days. Heavy snow can collapse roofs and knock down trees and power lines. Unprotected livestock may be lost. Economic impacts include cost of snow removal, damage repair, business and crop losses, and power failures. It is these impacts that Nemaha County is most concerned about.

B Probability for Winter Storm (Snow, Ice, Sleet)

The forecasting of future weather conditions is becoming more accurate, but the variability of weather patterns often causes these forecasts to fail. There have been 42 unique events in the last 16 years. The rating assigned by the NCHMT for Probability is a 4, the event is considered highly likely; event is probable within the calendar year.

C Previous Occurrences for Winter Storm (Snow, Ice, Sleet)

There were 64 winter storm events recorded for Nemaha County and its jurisdictions since 1993, the last 17 years. Of these 64 events, they can be grouped by date into 42 groups of events since 1993. The following table summarizes the previous occurrences, impacts, and costs of this hazard.

Date	Jurisdiction	Class	Events	Deaths	Injuries	Property Damage	Crop Damage
Jan 1993	Nemaha County	Winter Storm	3	0	0	0	0
Feb 1993	Nemaha County	Winter Storm	1	0	0	0	0
Dec 1994	Nemaha County	Winter Storm	2	0	0	100K	0
Mar 1995	Nemaha County	Winter Storm	2	0	0	0	0
Dec 1995	Nemaha County	Winter Storm	1	0	0	0	0
Jan 1996	Nemaha County	Winter Storm	1	0	0	0	0
Oct 1996	Nemaha County	Winter Storm	1	0	0	3.5M	0
Feb 1997	Nemaha County	Winter Storm	1	0	0	10K	0
Apr 1997	Nemaha County	Winter Storm	1	7	0	207K	0
Dec 1997	Nemaha County	Winter Storm	5	2	19	210K	0
Jan 1998	Nemaha County	Winter Storm	1	1	2	40K	0
Mar 1998	Nemaha County	Winter Storm	1	1	9	150K	0
Feb 1999	Nemaha County	Winter Storm	1	0	0	0	0
Jan 2000	Nemaha County	Winter Storm	1	0	0	0	0
Feb 2000	Nemaha County	Winter Storm	1	0	0	0	0
Jan 2001	Nemaha County	Winter Storm	1	0	0	0	0
Feb 2001	Nemaha County	Winter Storm	2	0	0	0	0
Mar 2001	Nemaha County	Winter Storm	1	0	0	0	0
Jan 2002	Nemaha County	Winter Storm	3	1	0	8.0M	0
Feb 2002	Nemaha County	Winter Storm	1	0	0	0	0
Mar 2002	Nemaha County	Winter Storm	1	0	2	0	0
Jan 2003	Nemaha County	Winter Storm	2	0	0	23K	0
Feb 2003	Nemaha County	Winter Storm	1	0	0	0	0
Mar 2003	Nemaha County	Winter Storm	1	2	8	0	0
Dec 2003	Nemaha County	Winter Storm	1	0	0	0	0
Jan 2004	Nemaha County	Winter Storm	3	0	0	35K	0
Feb 2004	Nemaha County	Winter Storm	2	2	1	0	0

Nov 2004	Nemaha County	Winter Storm	1	0	0	0	0
Jan 2005	Nemaha County	Winter Storm	1	0	0	6.2M	0
Feb 2005	Nemaha County	Winter Storm	2	0	0	0	0
Dec 2005	Nemaha County	Winter Storm	2	0	0	0	0
Jan 2006	Nemaha County	Winter Storm	1	0	0	0	0
Feb 2006	Nemaha County	Winter Storm	1	0	0	0	0
Mar 2006	Nemaha County	Winter Storm	1	0	0	0	0
Dec 2006	Nemaha County	Winter Storm	1	0	0	0	0
Jan 2007	Nemaha County	Winter Storm	2	0	0	0	0
Feb 2007	Nemaha County	Winter Storm	2	0	0	0	0
Mar 2007	Nemaha County	Winter Storm	1	0	0	0	0
Nov 2007	Nemaha County	Winter Storm	1	0	0	0	0
Dec 2007	Nemaha County	Winter Storm	3	0	0	0	0
Feb 2008	Nemaha County	Winter Storm	1	0	0	0	0
Apr 2009	Nemaha County	Winter Storm	1	0	0	0	0

Event(s) as recorded in Nemaha County and its jurisdictions by the National Climatic Data Center.

D Geographic Location for Winter Storm (Snow, Ice, Sleet)

The entire Nemaha County geographical area may be affected by winter storms; recorded snowfall averages 30 inches each year.

E Extent for Winter Storm (Snow, Ice, Sleet)

The rating assigned by the NCHMT for Extent (Magnitude / Severity) is a 2, the event is considered limited, complete shutdown of critical facilities for more than one week and more than 10% of property is severely damaged.

F Warning Time and Duration for Winter Storm (Snow, Ice, Sleet)

The rating assigned by the NCHMT for Warning Time is a 1, for 24+ hours. The rating assigned by the NCHMT for Duration is a 3, less than I week.

G Calculated Priority Risk Index for Winter Storm (Snow, Ice, Sleet)

The CPRI factors the elements of risk: Probability, Magnitude/Severity, Warning Time, and Duration to create an index, which allows for the prioritization of mitigation activities based on the level of risk.

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
4 x .45	+	2 x .30	+	1 x .15	+	3 x .10	=	2.85

H Hazard Summary for Winter Storm (Snow, Ice, Sleet)

Calculated Priority Risk Index	2.85
Rank by Calculated Priority Risk Index	2 / 22
Planning Significance	High

I Vulnerability Overview for Winter Storm (Snow, Ice, Sleet)

Overall vulnerability to winter storms is considered high, with significant potential impact to the general population and/or built environment and significant exposure of assets. Winter storms typically involve snow and ice, occasionally accompanied by high winds, which can cause downed trees and power lines, power outages, accidents, and road closures. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets in the planning area. The most significant damage during winter storm events occurs when freezing rain and drizzle accumulate on utility poles and power lines causing widespread power outages.

During heavy snow and ice events, the threat to public safety is typically the greatest concern. Lower income and elderly populations are more at risk in cases of power outages during winter storms. These storms also impact the local economy by disrupting transportation, school and commercial activities. Travelers on roadways and highways in Crawford County, particularly along remote stretches of road, can become stranded, requiring search and rescue

assistance and shelter provisions. Agriculture and livestock are also vulnerable to extreme cold temperatures and heavy snow.

J Identifying Structures and Estimating Potential Losses

Buildings that have tree limbs hanging over them are more vulnerable to damage by falling tree limbs. Utility power poles and lines are the critical facilities that are most vulnerable. Potential losses to the electric line infrastructure are difficult to quantify. Roads and bridges covered with ice make travel treacherous and slow emergency vehicles. Businesses experience losses as a result of closure during power outages. Schools also often must close. Other losses as a result of winter storm are not quantifiable at this time. In December 2007, a severe winter storm resulted in downed utility poles and power lines and fallen trees damaged many structures. The resulting power outages affected nearly the entire region and lasted nearly a week in some areas. Loss of power was particularly problematic.

K Future Development

Future residential and commercial buildings built to code should be less vulnerable to a winter storm; however the only areas within the county that have building codes are the cities of Sabetha and Seneca. Fortunately, most of the growth within the county occurs within these two cities. There is also a need for investment in the electrical utility infrastructure, including burial of electric utilities and the addition of poles in areas prone to ice accumulation. These actions should decrease future losses.

Calculated Priority Risk Index (CPRI) Element Definitions

The CPRI factors the elements of risk: Probability, Magnitude/Severity, Warning Time, and Duration to create an index, which allows for the prioritization of mitigation activities based on the level of risk. Each hazard is assigned a likelihood rating based on the criteria and methods described below.

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
3 x .45	+	3 x .30	+	0 x .15	+	4 x .10	=	2.65

The following table provides Probability definitions. Based on history, using the definitions given, the likelihood of future events is quantified which results in a classification within one of the four ranges of likelihood.

Probability	Characteristics
4 - Highly Likely	Event is probable within the calendar year. Event has up to 1 in 1 year chance of occurring (1/1=100%). History of events is greater than 33% likely per year. Event is “Highly Likely” to occur.
3 - Likely	Event is probable within the next three years. Event has up to 1 in 3 years chance of occurring (1/3=33%). History of events is greater than 20% but less than or equal to 33% likely per year. Event is “Likely” to occur.
2 - Possible	Event is probable within the next five years. Event has up to 1 in 5 years chance of occurring (1/5=20%). History of events is greater than 10% but less than or equal to 20% likely per year. Event could “Possibly” occur.
1 - Unlikely	Event is possible within the next ten years. Event has up to 1 in 10 years chance of occurring (1/10=10%). History of events is less than or equal to 10% likely per year. Event is “Unlikely” but is possible of occurring.

The following table provides Magnitude/Severity definitions. Based on history, using the definitions given, the extent of future events is quantified which results in a classification within one of four ranges of extent.

Magnitude / Severity	Characteristics
4 - Catastrophic	Multiple deaths Complete shutdown of facilities for 30 or more days More than 50% of property is severely damaged
3 - Critical	Injuries and/or illnesses result in permanent disability Complete shutdown of critical facilities for at least two weeks More than 25% of property is severely damaged
2 - Limited	Injuries and/or illnesses do not result in permanent disability Complete shutdown of critical facilities for more than one week More than 10% of property is severely damaged
1 - Negligible	Injuries and/or illnesses are treatable with first aid Shutdown of critical facilities and services for 24 hours or less Less than 10% of property is severely damaged

The following table provides Warning Time and Duration definitions. Based on history, using the definitions given, the warning time and duration of future events is quantified which results in a classification within one of four ranges.

Rating	Warning Time	Duration
4	Less Than 6 Hours	More Than 1 Week
3	6-12 Hours	Less Than 1 Week
2	12-24 Hours	Less Than 1 Day
1	24+ Hours	Less Than 6 Hours

Appendix G
Evaluation Guidelines

With regard to evaluating mitigation actions, the STAPLEE method is a technique for identifying and evaluating mitigation actions based upon existing conditions. Each letter in the acronym designates an area of evaluation.

Social -- Evaluates public support of the overall implementation strategy and specific mitigation actions.

a. Will the action adversely affect one segment of the population?
b. Will the action disrupt established neighborhoods or cause the relocation of lower income people?
c. Is the action compatible with present and future community values?

Technical -- Evaluates the technical feasibility of the proposed action.

a. How effective is the action in avoiding or reducing future losses?
b. Will the proposal create more problems than it solves?
c. Does it solve the problem?

Administrative -- Evaluates the community's staffing, funding, and maintenance capabilities.

a. Does the community have the staff, technical experts, and/or funding to implement the action?
b. Can the community provide the necessary maintenance?
c. Can it be accomplished in a timely manner?

Political--Evaluates the political acceptability of the action.

a. Is there political support to implement and maintain the action?
b. Have political leaders participated in the planning process.
c. Have all stakeholders been provided with an opportunity to participate in the planning process.

Legal -- Evaluates the community's legal authority to implement the action.

a. Does the community have authority to implement the action?
b. Are the proper laws, ordinances and resolution in place to implement the action?

Economic -- Evaluates economic feasibility and cost-effectiveness of the action.

a. Are there current sources of funds to implement the action?
b. What benefits will the action provide?
c. Does the cost seem reasonable for the size of the problem and likely benefits?
d. What burden will be placed on the tax base or local economy to implement the action?
e. Does the action contribute to other community economic goals?
f. What proposed actions should be considered but be "tabled" for implementation until outside sources of funding are available?

Environmental -- Evaluates the impact on the environment.

a. How will the action affect the environment (land, water, endangered species)?
b. Will the action comply with local, state, and federal environmental laws or regulations?

Actions are then prioritized by a "Modified Score". The "Modified Score" is determined by dividing the "STAPLEE Score" by the "Cost per Person"; which is the "Cost" of implementation divided by the "Population Affected".

Appendix H
Analysis of Hazard Mitigation Actions

Action 1.1.1 Establish an annual Spring Severe Weather Week.

Supporting Goal 1: Awareness

Supporting Objective 1.1: To provide education programs for the citizens of Nemaha County regarding threats faced from natural hazards and the ways and means to mitigate them.

Action Alternatives: Provide information regarding hazard mitigation via the county website or the public library.

Jurisdictions Covered by Action 1.1.1: Nemaha County (unincorporated), Bern, Centralia, Corning, Goff, Oneida, Sabetha, Seneca, and Wetmore

Hazards Mitigated:

Agricultural Infestation
Dam Failure
Drought
Earthquake
Expansive Soils
Extreme Temperatures
Flooding
Fog
Hailstorm
Hazardous Materials
Land Subsidence
Landslide
Lightning
Major Disease Outbreak
Radiological
Terrorism and Civil Disorder
Soil Erosion and Dust
Tornado
Utility/Infrastructure Failure
Wildfires
Windstorm
Winter Storm (Snow, Ice, Sleet)

Lead Agency: Nemaha County Emergency Management

Local Priority: High

Cost of Implementation: $6,000

Funding Source: Grant Funds

Funding Description: The National Weather Service provides severe weather spotter training free of charge. Mitigation publications may be ordered free of charge from Kansas Division of Emergency Management and the Federal Emergency Management Agency.

STAPLEE Evaluation:

	STAPLEE Scoring						
Social Constraints	LO	1	2	3	4	5	HI
Technical Constraints	LO	1	2	3	4	5	HI
Administrative Constraints	LO	1	2	3	4	5	HI
Political Constraints	LO	1	2	3	4	5	HI
Legal Constraints	LO	1	2	3	4	5	HI
Economic Constraints	LO	1	2	3	4	5	HI
Environmental Constraints	LO	1	2	3	4	5	HI

Cost/Benefit Review:

This action will cost approximately $6,000 to implement, will affect Nemaha County and all jurisdictions within Nemaha County, will affect all hazards identified by the NCHMT, will be managed by Emergency Management, and is contingent on funding.

Summary of Mitigation Action 1.1.1

Cost of Implementation	STAPLEE Score	Population Affected	Cost Per Person	Jurisdictions Affected	Modified Score (STAPLEE/CPP)
$ 6,000	35	10,112	$ 0.59	9	**59**

The "Modified Score" is determined by dividing the "STAPLEE Score" by the "Cost per Person" of implementation.

Schedule for Completion: On-going

Action 1.1.2 Conduct training and public outreach to Nemaha county citizens, businesses and local government regarding ways to protect against and mitigate hazards.

Supporting Goal 1: Awareness

Supporting Objective 1.1: To provide education programs for the citizens of Nemaha County regarding threats faced from natural hazards and the ways and means to mitigate them.

Action Alternatives: Provide information regarding hazard mitigation via the county website or the public library.

Jurisdictions Covered by Action 1.1.1: Nemaha County (unincorporated), Bern, Centralia, Corning, Goff, Oneida, Sabetha, Seneca, and Wetmore

Hazards Mitigated:

Agricultural Infestation
Dam Failure
Drought
Earthquake
Expansive Soils
Extreme Temperatures
Flooding
Fog
Hailstorm
Hazardous Materials
Land Subsidence
Landslide
Lightning
Major Disease Outbreak
Radiological
Terrorism and Civil Disorder
Soil Erosion and Dust
Tornado
Utility/Infrastructure Failure
Wildfires
Windstorm
Winter Storm (Snow, Ice, Sleet)

Lead Agency: Nemaha County Emergency Management

Local Priority: High

Cost of Implementation: $6,000

Funding Source: Grant Funds

Funding Description: The National Weather Service provides severe weather spotter training free of charge. Mitigation Publications may be ordered free of charge from Kansas Division of Emergency Management and the Federal Emergency Management Agency.

STAPLEE Evaluation:

	STAPLEE Scoring						
Social Constraints	LO	1	2	3	4	5	HI
Technical Constraints	LO	1	2	3	4	5	HI
Administrative Constraints	LO	1	2	3	4	5	HI
Political Constraints	LO	1	2	3	4	5	HI
Legal Constraints	LO	1	2	3	4	5	HI
Economic Constraints	LO	1	2	3	4	5	HI
Environmental Constraints	LO	1	2	3	4	5	HI

Cost/Benefit Review:

This action will cost approximately $6,000 to implement, will affect Nemaha County and all jurisdictions within Nemaha County, will affect all hazards identified by the NCHMT, will be managed by Emergency Management, and is contingent on funding.

Summary of Mitigation Action 1.1.2

Cost of Implementation	STAPLEE Score	Population Affected	Cost Per Person	Jurisdictions Affected	Modified Score (STAPLEE/CPP)
$ 6,000	35	10,112	$ 0.59	9	**59**

The "Modified Score" is determined by dividing the "STAPLEE Score" by the "Cost per Person" of implementation.

Schedule for Completion: On-going

Action 1.1.3 Allow the public to examine the Nemaha County Hazard Mitigation Plan and give written comment on concerns, changes or suggestions.

Supporting Goal 1: Awareness

Supporting Objective 1.1: To provide education programs for the citizens of Nemaha County regarding threats faced from natural hazards and the ways and means to mitigate them.

Action Alternatives: Provide information regarding hazard mitigation via the county website or the public library.

Jurisdictions Covered by Action 1.1.1: Nemaha County (unincorporated), Bern, Centralia, Corning, Goff, Oneida, Sabetha, Seneca, and Wetmore

Hazards Mitigated:

Agricultural Infestation
Dam Failure
Drought
Earthquake
Expansive Soils
Extreme Temperatures
Flooding
Fog
Hailstorm
Hazardous Materials
Land Subsidence
Landslide
Lightning
Major Disease Outbreak
Radiological
Terrorism and Civil Disorder
Soil Erosion and Dust
Tornado
Utility/Infrastructure Failure
Wildfires
Windstorm
Winter Storm (Snow, Ice, Sleet)

Lead Agency: Nemaha County Emergency Management

Local Priority: High

Cost of Implementation: $6,000

Funding Source: Grant Funds

Funding Description: The National Weather Service provides severe weather spotter training free of charge. Mitigation Publications may be ordered free of charge from Kansas Division of Emergency Management and the Federal Emergency Management Agency.

STAPLEE Evaluation:

	STAPLEE Scoring						
Social Constraints	LO	1	2	3	4	5	HI
Technical Constraints	LO	1	2	3	4	5	HI
Administrative Constraints	LO	1	2	3	4	5	HI
Political Constraints	LO	1	2	3	4	5	HI
Legal Constraints	LO	1	2	3	4	5	HI
Economic Constraints	LO	1	2	3	4	5	HI
Environmental Constraints	LO	1	2	3	4	5	HI

Cost/Benefit Review:

This action will cost approximately $6,000 to implement, will affect Nemaha County and all jurisdictions within Nemaha County, will affect all hazards identified by the NCHMT, will be managed by Emergency Management, and is contingent on funding.

Summary of Mitigation Action 1.1.3

Cost of Implementation	STAPLEE Score	Population Affected	Cost Per Person	Jurisdictions Affected	Modified Score (STAPLEE/CPP)
$ 6,000	35	10,112	$ 0.59	9	**59**

The "Modified Score" is determined by dividing the "STAPLEE Score" by the "Cost per Person" of implementation.

Schedule for Completion: On-going

Action 2.1.1 Assure that all citizens are equipped with NOAA Weather Radios.

Supporting Goal 2: Health and Safety

Supporting Objective 2.1: To ensure adequate systems for notifying the public at risk and providing emergency instruction during a disaster are available in all identified hazard areas.

Action Alternatives: Utilization of outdoor tornado warning devices.

Jurisdictions Covered by Action 2.1.1: Nemaha County (unincorporated), Bern, Centralia, Corning, Goff, Oneida, Sabetha, Seneca, and Wetmore

Hazards Mitigated:

Agricultural Infestation
Dam Failure
Drought
Earthquake
Expansive Soils
Extreme Temperatures
Flooding
Fog
Hailstorm
Hazardous Materials
Land Subsidence
Landslide
Lightning
Major Disease Outbreak
Radiological
Terrorism and Civil Disorder
Soil Erosion and Dust
Tornado
Utility/Infrastructure Failure
Wildfires
Windstorm
Winter Storm (Snow, Ice, Sleet)

Lead Agency: Nemaha County Emergency Management

Local Priority: High

Cost of Implementation: $130,000

Funding Source: Grant Funds

Funding Description: Funding will be investigated for the purchase of weather radios to distribute to citizens.

STAPLEE Evaluation:

	STAPLEE Scoring						
Social Constraints	LO	1	2	3	4	**5**	HI
Technical Constraints	LO	1	2	3	**4**	5	HI
Administrative Constraints	LO	1	2	3	**4**	5	HI
Political Constraints	LO	1	2	3	4	**5**	HI
Legal Constraints	LO	1	2	3	4	**5**	HI
Economic Constraints	LO	1	2	**3**	4	5	HI
Environmental Constraints	LO	1	2	3	4	**5**	HI

Cost/Benefit Review:

This action will cost approximately $130,000 to purchase 4,340 units (one for every residence), will affect Nemaha County and all jurisdictions within Nemaha County, will affect all hazards identified by the NCHMT, will be managed by Emergency Management, and is contingent on funding.

Summary of Mitigation Action 2.1.1

Cost of Implementation	STAPLEE Score	Population Affected	Cost Per Person	Jurisdictions Affected	Modified Score (STAPLEE/CPP)
$ 130,000	31	10,112	$ 12.86	9	**2**

The "Modified Score" is determined by dividing the "STAPLEE Score" by the "Cost per Person" of implementation.

Schedule for Completion: 2012 (contingent on funding)

Action 2.1.2 Install outdoor emergency warning systems that allow for voice communications.

Supporting Goal 2: Health and Safety

Supporting Objective 2.1: To ensure adequate systems for notifying the public at risk and providing emergency instruction during a disaster are available in all identified hazard areas.

Action Alternatives: Utilization of outdated outdoor tornado warning devices.

Jurisdictions Covered by Action 2.1.2: Nemaha County (unincorporated), Bern, Centralia, Corning, Goff, Oneida, Sabetha, Seneca, and Wetmore

Hazards Mitigated:

Agricultural Infestation
Dam Failure
Drought
Earthquake
Expansive Soils
Extreme Temperatures
Flooding
Fog
Hailstorm
Hazardous Materials
Land Subsidence
Landslide
Lightning
Major Disease Outbreak
Radiological
Terrorism and Civil Disorder
Soil Erosion and Dust
Tornado
Utility/Infrastructure Failure
Wildfires
Windstorm
Winter Storm (Snow, Ice, Sleet)

Lead Agency: Nemaha County Emergency Management

Local Priority: High

Cost of Implementation: $700,000

Funding Source: Grant Funds

Funding Description: Grants for the purchase of outdoor emergency warning systems will be pursued through the Department of Agriculture – Rural Utility Service.

STAPLEE Evaluation:

	STAPLEE Scoring						
Social Constraints	LO	1	2	3	4	**5**	HI
Technical Constraints	LO	1	2	3	**4**	5	HI
Administrative Constraints	LO	1	2	3	4	**5**	HI
Political Constraints	LO	1	2	3	4	**5**	HI
Legal Constraints	LO	1	2	3	4	**5**	HI
Economic Constraints	LO	1	2	3	**4**	5	HI
Environmental Constraints	LO	1	2	3	4	**5**	HI

Cost/Benefit Review:

This action will cost approximately $700,000 (approximately $50,000 for each of 14 existing sirens), will affect primarily the jurisdictions within Nemaha County, will affect all hazards identified by the NCHMT, will be managed by Emergency Management, and is contingent on funding.

Summary of Mitigation Action 2.1.2

Cost of Implementation	STAPLEE Score	Population Affected	Cost Per Person	Jurisdictions Affected	Modified Score (STAPLEE/CPP)
$ 700,000	33	5,905	$ 118.54	8	**1**

The "Modified Score" is determined by dividing the "STAPLEE Score" by the "Cost per Person" of implementation.

Schedule for Completion: 2012 (contingent on funding)

Action 3.1.1 A study will be conducted to ascertain the vulnerability to hazards affecting government and emergency services structures and facilities, and how these can be mitigated.

Supporting Goal 3: Continuity of Operations

Supporting Objective 3.1: To have all buildings and facilities used for the operation of government and emergency services retrofitted or relocated from hazard areas in order to withstand the impacts of disasters.

Action Alternatives: Rely on mobile command vehicles and interim relocation to alternate structures and facilities.

Jurisdictions Covered by Action 3.1.1: Nemaha County (unincorporated), Bern, Centralia, Corning, Goff, Oneida, Sabetha, Seneca, and Wetmore

Hazards Mitigated:

Agricultural Infestation
Dam Failure
Drought
Earthquake
Expansive Soils
Extreme Temperatures
Flooding
Fog
Hailstorm
Hazardous Materials
Land Subsidence
Landslide
Lightning
Major Disease Outbreak
Radiological
Terrorism and Civil Disorder
Soil Erosion and Dust
Tornado
Utility/Infrastructure Failure
Wildfires
Windstorm
Winter Storm (Snow, Ice, Sleet)

Lead Agency: Nemaha County Emergency Management

Local Priority: Medium

Cost of Implementation: $36,000

Funding Source: Grant Funds

Funding Description: currently unknown

STAPLEE Evaluation:

	STAPLEE Scoring						
Social Constraints	LO	1	2	3	4	5	HI
Technical Constraints	LO	1	2	3	4	5	HI
Administrative Constraints	LO	1	2	3	4	5	HI
Political Constraints	LO	1	2	3	4	5	HI
Legal Constraints	LO	1	2	3	4	5	HI
Economic Constraints	LO	1	2	3	4	5	HI
Environmental Constraints	LO	1	2	3	4	5	HI

Cost/Benefit Review:

This action will cost approximately $36,000 to implement, will affect Nemaha County and all jurisdictions within Nemaha County, will affect all hazards identified by the NCHMT, will be managed by Emergency Management, and is contingent on funding.

Summary of Mitigation Action 3.1.1

Cost of Implementation	STAPLEE Score	Population Affected	Cost Per Person	Jurisdictions Affected	Modified Score (STAPLEE/CPP)
$ 36,000	35	10,112	$ 3.56	9	**10**

The "Modified Score" is determined by dividing the "STAPLEE Score" by the "Cost per Person" of implementation.

Schedule for Completion: 2013 (contingent on funding)

Action 4.1.1 Act as a sub-grantee for the Hazard Mitigation Grant Program to assist in constructing Storm Safe Rooms in Nemaha County schools.

Supporting Goal 4: Funding of Initiatives

Supporting Objective 4.1: To promote the construction of Storm Safe Rooms in Nemaha County schools.

Action Alternatives: Utilize existing structural components in schools for protection against high winds.

Jurisdictions Covered by Action 4.1.1: USD 113 – Prairie Hills, USD 115 – Nemaha Central, USD 380 – Centralia/Frankfort.

Hazards Mitigated:

Lightning	Earthquake
Hailstorm	Radiological
Terrorism and Civil Disorder	Tornado
Windstorm	Winter Storm (Snow, Ice, Sleet)

Lead Agency: Nemaha County Emergency Management

Local Priority: High

Cost of Implementation: $500,000

Funding Source: Grant Funds

Funding Description: Hazard Mitigation Grant Program (75%), USD (25%)

STAPLEE Evaluation:

	STAPLEE Scoring						
Social Constraints	LO	1	2	3	4	**5**	HI
Technical Constraints	LO	1	2	3	4	**5**	HI
Administrative Constraints	LO	1	2	3	**4**	5	HI
Political Constraints	LO	1	2	3	**4**	5	HI
Legal Constraints	LO	1	2	3	**4**	5	HI
Economic Constraints	LO	1	2	3	4	**5**	HI
Environmental Constraints	LO	1	2	3	4	**5**	HI

Cost/Benefit Review:

This action will cost approximately $500,000 (10 schools $50,000 each), will affect Nemaha County and all jurisdictions within Nemaha County, will affect 8 hazards identified by the NCHMT, will be managed by Emergency Management, and is contingent on funding.

Summary of Mitigation Action 4.1.1

Cost of Implementation	STAPLEE Score	Population Affected	Cost Per Person	Jurisdictions Affected	Modified Score (STAPLEE/CPP)
$ 500,000	32	10,112	$ 49.45	3	**1**

The "Modified Score" is determined by dividing the "STAPLEE Score" by the "Cost per Person" of implementation.

Schedule for Completion: 2012 (contingent on funding)

Action 4.2.1 Utilize the Hazard Mitigation Grant Program and other funding means, Nemaha County and its local jurisdictions will implement a buy-out program to demolish or remove structures from hazardous areas.

Supporting Goal 4: Funding of Initiatives

Supporting Objective 4.2: To identify structures and facilities located within the 100-year floodplain, in order to mitigate the effects of flooding.

Action Alternatives: Utilize the Hazard Mitigation Grant Program and other funding means, Nemaha County and its local jurisdictions will implement a program to elevate structures above floods.

Jurisdictions Covered by Action 4.2.1: Nemaha County (unincorporated)

Hazards Mitigated: Flooding

Lead Agency: Nemaha County Emergency Management

Local Priority: Medium

Cost of Implementation: $291,000

Funding Source: Grant Funds

Funding Description: currently unknown

STAPLEE Evaluation:

	STAPLEE Scoring						
Social Constraints	LO	1	2	3	**4**	5	HI
Technical Constraints	LO	1	2	3	**4**	5	HI
Administrative Constraints	LO	1	2	3	**4**	5	HI
Political Constraints	LO	1	2	**3**	4	5	HI
Legal Constraints	LO	1	2	3	**4**	5	HI
Economic Constraints	LO	1	2	**3**	4	5	HI
Environmental Constraints	LO	1	2	3	4	**5**	HI

Cost/Benefit Review:

This action will cost approximately $291,000 (5 structures), will affect just two areas in rural Nemaha County, will affect flooding hazards identified by the NCHMT, will be managed by Emergency Management, and is contingent on funding.

Summary of Mitigation Action 4.2.1

Cost of Implementation	STAPLEE Score	Population Affected	Cost Per Person	Jurisdictions Affected	Modified Score (STAPLEE/CPP)
$ 291,000	27	4,207	$ 69.17	1	**1**

The "Modified Score" is determined by dividing the "STAPLEE Score" by the "Cost per Person" of implementation.

Schedule for Completion: 2014 (contingent on funding)

Action 5.1.1 Review or develop and promote plans and ordinances for restrictions to construction in flood hazard areas.

Supporting Goal 5: Flood Prevention

Supporting Objective 5.1: To prevent and protect against the effects of flooding upon all citizens of Nemaha County.

Action Alternatives: Review and approve/disapprove building permits for construction within flood hazard areas.

Jurisdictions Covered by Action 5.1.1: Nemaha County (unincorporated), Bern, Centralia, Corning, Goff, Oneida, Sabetha, Seneca, and Wetmore

Hazards Mitigated: Flooding

Lead Agency: Nemaha County Emergency Management

Local Priority: Medium

Cost of Implementation: $12,000

Funding Source: Grant Funds

Funding Description: currently unknown

STAPLEE Evaluation:

	STAPLEE Scoring						
Social Constraints	LO	1	2	3	4	5	HI
Technical Constraints	LO	1	2	3	4	5	HI
Administrative Constraints	LO	1	2	3	4	5	HI
Political Constraints	LO	1	2	3	4	5	HI
Legal Constraints	LO	1	2	3	4	5	HI
Economic Constraints	LO	1	2	3	4	5	HI
Environmental Constraints	LO	1	2	3	4	5	HI

Cost/Benefit Review:

This action will cost approximately $12,000 to implement, will affect Nemaha County and all jurisdictions within Nemaha County, will affect flooding hazards identified by the NCHMT, will be managed by Emergency Management, and is contingent on funding.

Summary of Mitigation Action 5.1.1

Cost of Implementation	STAPLEE Score	Population Affected	Cost Per Person	Jurisdictions Affected	Modified Score (STAPLEE/CPP)
$ 12,000	35	10,112	$ 1.19	9	**30**

The "Modified Score" is determined by dividing the "STAPLEE Score" by the "Cost per Person" of implementation.

Schedule for Completion: 2012 (contingent on funding)

Action 5.1.2 Continue participation for communities already in National Flood Insurance Program. Promote participation for communities not in the program.

Supporting Goal 5: Flood Prevention

Supporting Objective 5.1: To prevent and protect against the effects of flooding upon all citizens of Nemaha County.

Action Alternatives: none

Jurisdictions Covered by Action 5.1.2: Nemaha County (unincorporated), Bern, Centralia, Corning, Goff, Oneida, Sabetha, Seneca, and Wetmore

Hazards Mitigated: Flooding

Lead Agency: Nemaha County Emergency Management

Local Priority: High

Cost of Implementation: $12,000

Funding Source: Grant Funds

Funding Description: currently unknown

STAPLEE Evaluation:

	STAPLEE Scoring						
Social Constraints	LO	1	2	3	4	5	HI
Technical Constraints	LO	1	2	3	4	5	HI
Administrative Constraints	LO	1	2	3	4	5	HI
Political Constraints	LO	1	2	3	4	5	HI
Legal Constraints	LO	1	2	3	4	5	HI
Economic Constraints	LO	1	2	3	4	5	HI
Environmental Constraints	LO	1	2	3	4	5	HI

Cost/Benefit Review:

This action will cost approximately $12,000 to implement, will affect Nemaha County and all jurisdictions within Nemaha County, will affect flooding hazards identified by the NCHMT, will be managed by Emergency Management, and is contingent on funding.

Summary of Mitigation Action 5.1.1

Cost of Implementation	STAPLEE Score	Population Affected	Cost Per Person	Jurisdictions Affected	Modified Score (STAPLEE/CPP)
$ 12,000	35	10,112	$ 1.19	9	**30**

The "Modified Score" is determined by dividing the "STAPLEE Score" by the "Cost per Person" of implementation.

Schedule for Completion: On-going (contingent on funding)

Appendix I
Hazard Mitigation Plan Endorsements

U.S. Department of Homeland Security
FEMA Region VII
9221 Ward Parkway, Suite 300
Kansas City, MO 64114-3372

FEMA

September 13, 2011

Angee Morgan, Deputy Director
Kansas Division of Emergency Management
2800 SW Topeka Boulevard
Topeka, Kansas 66611-1287

Subject: Review of the Nemaha County, Kansas Multi-Jurisdictional Multi-Hazard Mitigation Plan

Funding Source: HMGP 1675

Dear Ms. Morgan:

The purpose of this letter is to provide the status of the above referenced Local Hazard Mitigation Plan, pursuant to the requirements of 44 CFR Part 201 - Mitigation Planning and the Local Multi-Hazard Mitigation Planning Guidance. The Local Hazard Mitigation Plan Review Crosswalk documents the Region's review and compliance with all required elements of 44 CFR Part 201.6, as well as identifies the jurisdictions participating in the planning process. FEMA's approval will be for a period of five years effective starting the date of this letter.

Prior to the expiration of the plan the community will be required to review and revise their plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval in order to continue to be eligible for mitigation project grant funding.

Local Jurisdiction	Date Resolution Submitted	Date Completed	Date of Plan Adoption	Date of Plan Expiration	Review Status
Nemaha County	September 13, 2011	August 26, 2011	September 12, 2011	September 13, 2016	Approved

If you have any questions or concerns, please contact Joe Chandler, Planning Team Lead, at (816) 283-7071.

Sincerely,

Robert G. Bissell, Director
Mitigation Division

Enclosure

www.fema.gov