

CHAPTER 7

STORMWATER MANAGEMENT, FLOODPLAIN MANAGEMENT, STORMWATER POLLUTION PREVENTION

ARTICLE I. STORMWATER MANAGEMENT

This article shall hereinafter be known, cited, and referred to as the "STORMWATER MANAGEMENT ORDINANCE of the City of Merriam, Kansas," Said article establishes the stormwater run-off management criteria and standards for the city's secondary or major drainage system and its components. (Ord. No. 1400, §1, 3-26-01).

The secondary or major system shall include the primary/minor system, its overflow elements and all Turkey Creek tributaries and drainage structures both public and private that are not identified as part of the Turkey Creek regulatory floodplain located within the City of Merriam, Kansas. The primary or minor system shall include all enclosed drainage facilities designed to collect, convey and/or store return frequency storm events in accordance with land use and zoning as provided for in Sec. 7-2 of this Article. (Ord. No. 1400, §1, 3-26-01).

The Turkey Creek regulatory floodplain in the City of Merriam shall include the Turkey Creek channel and all contiguous land lying within the floodplain boundaries shown in the most recent Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS) and Flood Insurance Rate Maps (FIRM), and as defined in Chapter 7, Article II in the City's Code of Ordinances. (Ord. No. 975, § 1, 11-19-84, Ord. No. 1400, §1, 3-26-01)

Sec. 7-1. General provisions for a stormwater management system.

These criteria for the design of stormwater management systems are based on the STANDARD SPECIFICATIONS AND DESIGN CRITERIA, Section 5600, "Storm Drainage Systems" (Kansas City Metropolitan Chapter, American Public Works Association, 1990) and the URBAN DRAINAGE DESIGN MANUAL, "Hydraulic Engineering Circular No. 22" (HEC 22-FHWA-SA-96-078, U. S. Department of Transportation, Federal Highway Administration, 1996) as amended in this article. (Ord. No. 1400, §1, 3-26-01).

This article establishes the standards and criteria, which form the regulatory context for the design and review of storm drainage systems in the City of Merriam. The design for all such systems shall be accomplished under the direction of a registered professional engineer licensed in the state of Kansas. (Ord. No. 1400, §1, 3-26-01).

- (1) *Purpose and objectives.* This Stormwater Management Ordinance is enacted for the general purpose of promoting the health, safety, and welfare of the citizens of Merriam by achieving an equitable balance between man's use of the land and the preservation of a safe and beneficial environment. The provisions of this article and its amendments are intended to reduce property damage and to minimize the impact

of development on existing stormwater management facilities and affected adjacent properties.

- (2) *Applicability.* The provisions of this article shall extend to all land within the corporate limits of the City of Merriam. Any persons, firm, corporation, business, or other government entity proposing to construct improvements or develop land within the city shall submit a drainage study and stormwater management plan to the community development director. The director will issue a drainage permit for the construction of the proposed improvements upon review and approval of said study and plan.
- (3) *Relationship to other agencies and regulations.* This article shall not abrogate the authority or jurisdiction of the Merriam Drainage Board or any other agencies with legal standing to promulgate regulations pertaining to drainage systems within the city. Such standards shall be considered mutually complimentary to those delineated herein, but in the event of conflicts, the more rigorous criteria shall govern.
 - (a) Federal Emergency Management Administration - floodplain management. Drainage systems to be constructed within the boundaries of the regulatory 100-year floodplain as shown on the applicable Turkey Creek Flood Insurance Rate Maps (FIRM) shall be designed in accordance with the provisions of Article II, of this Chapter of the City of Merriam Code of Ordinances. As provided for in the article, all development permit applications for the construction of improvements within said boundaries will be reviewed and approved by the local floodplain administrator.
 - (b) United States Army Corps of Engineers 404 permit, Kansas Department of Health and Environment - 401 (water quality) permit. Those seeking to place "discharges of dredged or fill material" including storm drainage system appurtenances into channels and wetlands, which may convey or contain "waters of the United States" as defined in Section 404 of the Clean Water Act (33 USC 1344) and pertinent implementing regulations (33 CFR 320-330) shall seek a jurisdictional ruling from the United States Army Corps of Engineers, Kansas City District and will obtain any permits required accordingly.
 - (c) Division of Water Resources, Kansas Department of Agriculture - DWR permit. Permit applications for the construction of any drainage improvements within the City of Merriam at or downstream of a point in a watershed draining 240 acres or more shall be submitted to the Division of Water Resources, Department of Agriculture in conformance with "Obstructions in Streams" (K.S.A. 82a-301 - 305a), "Approval of Levee" (K.S.A. 24-126), and/or the "Water Projects Environmental Coordination Act" (K.S.A. 82a-325 - 327, as amended).
 - (d) United States Environmental Protection Agency (EPA), Kansas Department of Health and Environment (KDHE) - National Pollution Discharge Elimination System (NPDES) permit. A Notice of Intent (NOI) "For

Stormwater Discharge Associated with Construction Activity" must be submitted to KDHE for any drainage or other improvements associated with construction activities which will disturb one (1) or more acres of land. If certain conditions are met, activities disturbing only one (1) to five (5) acres of land may qualify for a waiver from the NPDES permitting requirements.

- (4) *Design methodology.* In general the methods and procedures described in the URBAN DRAINAGE DESIGN MANUAL, "Hydraulic Engineering Circular No.22" and Section 5600 of the APWA STANDARD SPECIFICATIONS AND DESIGN CRITERIA as modified or amended in this article, shall be used for storm drainage design in the City of Merriam. However, any computational method and/or computer program based on fundamental hydrologic and hydraulic principles and currently accepted engineering practice may be used in design. Methods and procedures, which deviate from those of HEC 22 and/or those described in this article shall be reviewed and approved by the city prior to their use. (Ord. No. 1400, §1, 3-26-01).
- (5) *Disclaimer of liability.*
 - (a) Performance standards and design criteria. The hydrological and hydraulics criteria set forth in this article are minimum design standards based on the current state of the art as propounded by local, regional and national engineering authorities and agencies. Their intention is not to eliminate the possibility of storm related damage occurring, but rather to manage the risk associated with the probability of such damage occurring. Their implementation must be accomplished under the direction of a registered professional engineer using sound engineering judgment and practices; who will assume full professional responsibility for his/her work. The city, its officers, and employees offer no guarantee or warranty with respect to said design criteria and assume no liability for their implementation by others.
 - (b) Drainage permit. City review and approval of the drainage study and stormwater management plan are for conformance with these criteria only and are not intended as an endorsement or a quality assurance/control check of the design. The city, its officers and employees assume no liability with respect to the approval of said drainage study and stormwater management plan or any lawfully made related legislative or administrative decision.
- (6) *Separability.* If any part or provision of this article or application thereof to any person or circumstance is adjudged invalid by any court of competent jurisdiction, such judgment shall be confined in its operation to that part, provision, or application directly involved in the controversy in which such judgment shall have been rendered and shall not affect or impair the validity of the remainder of the provisions of this article or the application thereof to other persons or circumstances. The governing body hereby declares that it would have enacted the remainder of these sections of the article even without any such part, provision, or application found to be unlawful or invalid.
- (7) *Definitions.*

1. Bank line. The line of intersection (above the design hydraulic grade line) of the side slope of an open channel and the adjacent ground.
2. Community development director. The municipal official authorized by the governing body to review and approve the drainage study and stormwater management plan, and to issue the drainage permit.
3. Controlled area. That part of the tributary area for which a detention facility is designed to control peak discharge rates.
4. Detention storage. The volume occupied by water above the level of the spillway crest or invert during operation of a stormwater detention facility.
5. Developer. Any person, partnership, association, corporation, public agency, or governmental unit proposing to or engaged in "development" as defined below; except the widening, resurfacing, or other improvement to existing public streets, alleys, and sidewalks.
6. Development. Any activity, including subdivision, that alters the surface of the land to create additional impervious surfaces. Such activities include, but are not limited to, pavements, buildings, and structures; except:
 - (a) Additions to, improvements, and repair of existing single-family and duplex dwellings.
 - (b) Construction of any buildings, structures, and/or appurtenant service roads, drives, and walks on a site having previously provided stormwater control as part of a larger unit of development.
 - (c) Remodeling, repair, replacement, and improvements to any existing structure or facility and appurtenances that does not cause an increased area of impervious surface on the site in excess of ten (10) percent of that previously existing.
 - (d) Improvement on any site having a gross land area of one acre or less, regardless of land use.
 - (e) Construction of any one new single-family or duplex dwelling unit, irrespective of the site area on which the same may be situated.
7. Drainage permit. A permit issued by the community development director authorizing the construction of storm drainage system facilities following the review and approval of a final drainage study and stormwater management plan.
8. Drainage permit fee. The fee paid in order to obtain a drainage permit authorizing the construction of storm drainage system facilities following review and approval of a drainage study and final stormwater management plan. Said fee is a percentage of the total value of the construction work.

9. Dry detention facilities. Stormwater detention facilities, which are normally dry except during wet weather and do not permanently impound water.
10. Emergency spillway. A device or devices such as an orifice, weir, pipe, or other outlet structure, which supplements the principal spillway and discharges water from a detention facility during storms of lower frequency than its usual design event. Its purpose is to prevent damage to the detention facility, which might result in the sudden release of impounded water.
11. Freeboard. The difference in elevation between the top of a dam, channel bank, or other structure and the adjacent water surface. A stipulated design freeboard provides a margin of safety against overtopping or flooding.
12. Floodplain. The Turkey Creek regulatory floodplain as shown in the most recent FEMA Flood Study and Flood Insurance Rate Maps.
13. General area detention facility. A publicly or privately owned detention facility satisfying the detention requirements of two or more developments and/or land available for future development.
14. Hydraulics. That branch of science and technology concerned with the mechanics of fluids.
15. Hydrology. The earth science concerned with the circulation of water through the environment.
16. Improved channel. Any channel constructed by excavation or dredging, or a natural channel altered by grading or lining.
17. Multiple ownership detention facility. Any detention facility designed and constructed to satisfy the detention requirements of two or more legal lots, the owners of which have or will have an equity interest in and obligation to operate and maintain said facility either individually or jointly as a legally constituted association.
18. Natural channel. A channel or drainage course that has not been physically altered by human activity.
19. Owner. The owner of record of real property.
20. Primary or minor system. All public and private drainage facilities designed to collect, convey and store a high to moderate frequency statutory design storm within defined structural boundaries without overflowing.

21. Principal spillway. A device such as an orifice, pipe, weir, or other outlet structure, which discharges water from a detention facility during its design and more frequent storms.
22. Return frequency. The statistical average recurrence interval (in years) between rainfalls of equal magnitude and duration.
23. Secondary or major system. The primary or minor system, its overflow elements and all public and private Turkey Creek tributaries and drainage structures not identified as part of the regulatory floodplain.
24. Sediment storage. The volume in a detention facility allocated to the storage of sediments.
25. Single ownership detention facility. Any detention facility located on and satisfying the detention requirements of a single legal lot. Such a facility might include, but not be limited to:
 - (a) Roofs of buildings or structures also used for other purposes.
 - (b) Paved or surfaced areas also used for other purposes.
 - (c) Enclosed underground pipes or structures on private property when the surface is used for other purposes.
 - (d) Lakes and ponds.
26. Site. A tract or continuous tracts of land owned and/or controlled by a developer or owner. Platted subdivisions, industrial and/or office-commercial parks, and other planned unit developments shall be considered a single site.
27. Storm drainage system. All of the natural and man-made facilities and appurtenances such as drainage swales, open channels, street gutters, pipes, culverts, bridges, inlets, and detention facilities that collect, convey and/or store surface runoff.
28. Stormwater detention facilities. A reservoir or storage structure and its outlet devices the purpose of which is to reduce peak stormwater discharges by attenuating the runoff hydrograph. It functions by temporarily storing runoff and then releasing it at a controlled uniform outflow rate lower than that of the inflow rate.
29. Tributary area. All land draining to a point of interest, regardless of ownership (Also: watershed, drainage basin, catchment, sub-basin, etc.).
30. Wet detention facility. Stormwater detention facilities normally featuring a permanent pool, as well as temporary stormwater storage capacity.

Sec. 7-2.

Performance criteria.

(1) *Secondary or major system protective levels.* Regardless of land use, the secondary or major system shall be designed to limit water surface elevations from runoff produced by the 100-year storm in the vicinity of buildings or structures to the lowest elevation at which water may enter the structure less one (1) foot of freeboard (i.e. low entry elevation minus one foot). Regardless of street classification, the maximum 100-year flood ponding elevation at the low point in streets (measured at the crown) shall be seven (7) inches or 0.58 feet. Primary system collection and conveyance elements shall be proportioned as required to maintain the foregoing secondary system protective levels. (Ord. No. 1400, §1, 3-26-01).

(2) *Primary or minor system design.* Primary or minor system collection and conveyance elements including inlets and conduits shall be proportioned to limit the design storm in-system hydraulic grade line (HGL) to an elevation no less than six (6) inches or 0.5 feet below any opening to the surface. A minimum of one (1) foot of freeboard shall be maintained between the top of bank of open channels and the design storm water surface elevation; and between the right-of-way line low point and the design storm headwater pool at culverts. Primary system collection and conveyance elements (including open channels) shall be sized for design storms according to land use or function as indicated below: (Ord. No. 1400, §1, 3-26-01).

(a)	Residential districts	10-year storm
(b)	Commercial districts	25-year storm
(c)	Industrial districts	25-year storm
(d)	Government and Institutional districts	25-year storm
(e)	Bridges, Culverts or Pipes crossing arterial streets	50-year storm
(f)	100-year Floodway	100-year storm

(3) *Detention.* Unless adverse downstream conditions dictate a lower rate, detention facilities shall be designed to limit the total site discharge from the 100-year storm to no more than 1.8 cfs per acre with a minimum of 0.5 feet of freeboard to the crest of the emergency spillway. The full 100-year storm discharge from offsite tributary areas may be added to the allowable onsite release rate if downstream conditions permit. In addition to the water storage volume needed to meet detention requirements, facilities shall be designed to provide for sedimentation storage as determined by the following formula: $S = 15YIA$

Where: S = sediment storage in cubic feet.

Y = number of years before sediment is removed.

I = ratio of impervious surface to total tributary area based on land use.

A = total area tributary to the detention facility.

The number of years of sediment storage to be provided will be based on a maintenance plan and agreement giving the city the right to enter the property and remove sediment at the owner's expense in the event of failure to maintain. The agreement will run with the land and will be a condition of stormwater management plan and final plat approval.

- (4) *Existing drainage system components.* Existing drainage system collection, conveyance and storage elements may be retained as elements of an improved system providing:
- (a) They are in sound structural condition.
 - (b) Their hydraulic capacity, including surcharge, is not less than eighty (80) percent of the capacity required for the land use and function stipulated in Sect. 7-2.3 above.
 - (c) Adequate easements exist or will be provided for their operation and maintenance.
- (5) *Existing upstream drainage systems.* In determining discharges from offsite sources, it shall be assumed that upstream collection and conveyance elements function in accordance these design criteria, regardless of their actual condition and performance. However, should the designer elect to use lower flows from an upstream detention system: that system's operating characteristics for each design storm considered; physical condition; maintenance history; and long term viability must be evaluated and reported in the drainage study.
- (6) *Existing downstream drainage systems.* The impact of the development and proposed drainage system on downstream improvements will be evaluated and made part of the drainage study. The city may at its discretion require lower onsite detention facility release rates and/or participation in improvements to the downstream system including a regional detention facility to relieve existing flooding conditions.
- (7) *Detention waivers.* Detention may be waived at the discretion of the Community Development Director in the event that the developer demonstrates in the drainage study that the delayed release rate will increase a downstream peak discharge from the larger overall drainage basin concentrating at a later time than the included subject sub-basin. However, the developer will be required to either propose or participate in alternate mitigating measures if the increase in runoff from the development will cause or aggravate downstream flooding or overtax existing inadequate or obsolete drainage facilities.
- (7) *Curb inlets and street gutter capacity.* Curb inlets shall be located to control street spread ("T" width of water surface normal to the gutter as measured from a point in the gutter 0.5 ft from the back of curb) for discharges calculated at the curb inlet's sub-basin time of concentration according to the following:

<u>Street Width</u> <u>(back of curb to back of curb-ft.)</u>	<u>Spread</u> <u>(0.5 ft from back of curb-ft.)</u>	<u>Depth of Flow</u> <u>(ft.)</u>
28 or less	10.0	0.20
28 + to 36	11.0	0.22
36 +	11.5	0.23
Divided Roadways as above for each direction		
Arterial and Collector Intersections	5.5	0.12
Pedestrians Crosswalks	5.5	0.12

Spread shall be determined at the beginning of the gutter flare to the curb inlet using Izzard's equation or appropriate nomographs. Spread at the ends of flares to sump inlets located in the low point of sag vertical curves shall be calculated using a minimum street grade (S) of 0.3 %. Curb inlet capacity shall be determined using the methods and formulas and/or appended nomographs found in any of the following: and/or appended nomographs Chapter 4 of HEC 22; HYDRAULIC PERFORMANCE OF SETBACK CURB INLETS (Report No. K-TRAN: KU-98-3, Bruce M. McEnroe, and Reuben P. Wade, University of Kansas, Lawrence, Kansas, June 1998); and HYDRAULIC PERFORMANCE OF CURB AND GUTTER INLETS (Report No. K-TRAN: KU-99-1, Bruce M. McEnroe, Reuben P. Wade, and Andrew K. Smith, University of Kansas, Lawrence, Kansas). Curb inlets shall be rated at 80 % of their calculated capacity as a clogging allowance.

- (9) *Field or area inlets.* Field or area inlets shall be designed as a broad crested weir ($Q=CLH^{3/2}$, where $C=2.8$) to a depth equal to the top of the opening and as an orifice ($Q=Ca(2gh)^{1/2}$, where $C=0.6$) when the opening is submerged. Field or area inlets shall be rated at 50 % of their calculated capacity as a clogging allowance. Although steel frames and/or bars spaced at no less than 4-inch intervals may be placed in the inlet throats for safety purposes, grates will not be permitted.

Sec. 7-3. System Location.

Storm drainage system components may be comprised of any combination of collection, conveyance and storage elements, which will meet the stipulated design criteria for primary/minor and secondary/major drainage systems. (Ord. No. 1400, §1, 3-26-01).

- (1) *Open channels (public and private).* Drainage may be conveyed by natural or improved open channels in unimproved street rights-of-way; where an enclosed system is not specifically required; and/or where the hydraulic grade line for the 100-year storm meets appropriate protective levels in the vicinity of buildings.
- (2) *Enclosed systems (public and private).* Generally, enclosed systems shall be used in improved street rights-of-way (extending at least to the right-of-way limits); commercial, industrial, government, and institutional development site drainage; along side property lines to a point at least sixty (60) feet to the rear of the front building line in residential developments; in cases where open channel banks are unstable and present or future erosion may damage property; and where an open channel may be hazardous to the public. However, the Director of Community Development may waive the requirement for an enclosed system in cases where flooding, erosion, safety and water quality concerns are otherwise adequately addressed.

Sec. 7-4. Easements.

Easements of a size and configuration adequate to afford access for inspection, operation and maintenance of all public and private storm drainage system components shall be provided. (Ord. No. 1400, §1, 3-26-01).

- (1) Public stormwater projects.
 - (a) Easements located on city property shall be maintained by the city.
 - (b) Easements located on private property shall be maintained as for private stormwater projects.
- (2) Private stormwater projects.
 - (a) Single ownership. The owner or developer, and his grantees and successors in title, shall be responsible for the perpetual maintenance of all easements dedicated to the city for a stormwater project, and any and all conveyances shall contain a covenant to such effect.
 - (b) Multiple ownerships. The owner or developer of a stormwater project developed on a tract of land which is or will be subdivided into more than one ownership shall give a covenant to be filed with the subdivision plat providing perpetual maintenance of all easements dedicated to the city by the owners of record.
- (3) Easements shall run continuously between streets and shall be sized as follows:
 - (a) Pipe and culverts. Fifteen (15) feet minimum or outside width of the conduit plus ten (10) feet, whichever is greater.
 - (b) Improved open channels. Fifteen (15) feet minimum or top of bank plus ten (10) feet on one side and five (5) feet on the opposite side, whichever is greater.
 - (c) Detention facilities. The area bounded by a twenty-foot wide strip around the perimeter of the facility as measured from the top of bank, plus an access easement twenty (20) feet in width between the site and a public street.
 - (d) Natural open channels. Thirty (30) feet or an area enclosed by the design hydraulic grade line contour plus ten (10) feet measured on each side, whichever is greater. However, the easement shall be increased as required to permit access by truck along its entire length.

Sec. 7-5. Hydrology.

The following methods of runoff computation shall be used depending upon the size of the watershed and the type and use of the facility: (Ord. No. 1400, §1, 3-26-01).

- (1) The Rational Method formula may be used to determine peak discharges for the design of enclosed and open channel collection and conveyance elements tributary to watersheds of two hundred (200) acres or less.
 - (a) Rational Method $Q=KCIA$, where:
Q = discharge in cubic feet per second

K = dimensionless antecedent precipitation coefficient
 C = dimensionless runoff coefficient
 I = intensity in inches per hour
 A = tributary area in acres

- (b) The value of K shall vary with the frequency of the storm event according to the following schedule:

<u>Storm Frequency (years)</u>	<u>K</u>
10	1.0
25	1.1
50	1.2
100	1.25

Note: the product of K and C in the rational formula shall not exceed 1.

The value of C shall vary according to land use or surface type as indicated below:

<u>Land Use</u>	<u>C</u>
Business:	
Downtown	0.85
Neighborhood	0.80
Residential:	
Single-Family	0.50
Duplex and Quadplex	0.60
Town Houses and Apartments	0.70
Churches and Schools	0.75
Industrial and Institutional:	
Light Industry	0.80
Heavy Industry	0.90
Railroad Yards	0.35
Parks and Cemeteries	0.30
Playgrounds	0.35
Undeveloped Areas and Greenbelts	0.30
Surfaces:	
Pavements and Roofs	0.95
Detention Basins	0.95
Vegetated	0.30

In watersheds with multiple land use areas, the designer shall select the C value corresponding to the highest use representing an area greater than 10% of the watershed or he/she may develop a composite "C" based on the surface type and/or land use mix. Undeveloped property will be assigned C values in accordance with the City's adopted land use plan or if not included in the plan shall be assigned a value of 0.50.

- (c) The time of concentration corresponding to the storm duration shall equal the sum of the inlet time (sheet flow) and travel time (concentrated flow) through the watershed. Time of concentration shall be calculated using the methods given in APWA “Standard Specifications and Design Criteria” Sect. 5600 or in Chapter 3 of the “Urban Drainage Design Manual” (HEC-22). However, the designer should use one approach or the other and should not mix the different elements of the two together.

Inlet time shall not be less than 5 minutes nor greater than 15 minutes and shall be determined using either the inlet time formula given in Sec. 5602.5, the nomograph in Fig. 2 of Sec. 5608 of the APWA criteria or the “Sheet Flow Travel Time Formula” (3-3) given in Chapter 3 of HEC-22. Inlet times shall not be calculated using a flow distance of greater than 200 feet nor a land slope of less than 2%.

Travel time shall be calculated directly using Manning’s Formula for the size and type of conveyance involved and/or using the nomograph in Fig. 3 of the APWA Sec. 5608. Travel time may also be determined from travel time velocities corresponding to average land slope percentages as indicated in Sec. 5602.5 of the APWA criteria or using the “Shallow Concentrated Flow Velocity” (3-4) and “Open Channel and Pipe Flow Velocity”(3-5) equations in Chapter 3 of HEC-22.

- (d) Intensity shall be determined from the rainfall intensity formulas given in Table C or the Intensity-Duration-Frequency Curves shown in Fig. 1 of Sec. 5608 of the APWA criteria, or from the Johnson County "Rainfall Intensity Table" contained in "Rainfall Intensity Tables For Counties In Kansas" as developed for the Kansas Department of Transportation by Bruce M. McEnroe and John P. Jones of the Department of Civil Engineering, University of Kansas.

- (2) *Computational methods approved for peak discharge* determination for the design of collection and conveyance elements tributary to watersheds greater in size than 200 acres include: the U.S.G.S. Regression Equations as described in “Estimation of Peak Streamflows for Unregulated Rural Streams in Kansas” – Water-Resources Investigations Report 00-4079, as modified by the U.S.G.S. seven-parameter Nationwide Urban regression equations; and the SCS (NRCS) Peak Flow Method as described in the “National Engineering Handbook”, Section 4, “Hydrology” and in Chapter 3 of the “Urban Drainage Design Manual” (HEC-22). Other methods may be proposed, but must be approved by the Director of Community Development prior to their use.
- (3) *Inflow hydrographs* for the design of detention and retention basins shall be developed using the SCS (NCRS) Tabular Hydrograph Method as described in “Urban Hydrology For Small Watersheds”, Technical Release No. 55 (latest edition). Calculations shall be based on CN values derived for average antecedent runoff conditions (AMC II), hydrologic soil group "C", and land use according to the following schedule:

<u>Land Use</u>	<u>CN</u>
Business:	
Downtown	96
Neighborhood	94
Residential:	
Single-Family	83
Duplex and Quadplex	86
Town Houses and Apartments	90
Churches and Schools	92
Industrial and Institutional:	
Light Industry	88
Heavy Industry	93
Railroad Yards	80
Parks and Cemeteries	77
Playgrounds	80
Undeveloped Areas and Greenbelts	77
Surfaces:	
Pavements and Roofs	98
Detention Basins	99
Vegetated	77

Sec. 7-6. Hydraulics

The hydraulic design of stormwater management facilities shall be performed to accomplish two objectives: (Ord. No. 1400, §1, 3-26-01).

- (a) Convey the design storm as designated in Sec. 7-2.2 (primary or minor system design) with resulting water surface elevations or hydraulic grade lines (HGL) that are at or below the stipulated six (6) inch distance to surface openings in enclosed systems, and/or provide one (1) foot of freeboard in open channels.
- (b) Establish 100-year storm water surface elevations or hydraulic grade lines in accordance with Sec. 7-2.1 (secondary or major system design) that are one (1) foot below low entries into buildings or structures, and/or limit the 100-year storm depth at low points in streets to no more than seven (7) inches (measured at the centerline).

Both the design storm and the 100-year storm shall be routed through the system and the corresponding water surface elevations and hydraulic grade lines shall be plotted on the plan and profile drawings.

- (1) *Collection and Conveyance Elements.* These shall be designed using the energy loss method after Bernoulli in accordance with procedures described in the "Urban Drainage Design Manual", HEC No.22 particularly Chapters 4, 5, 6, and 7:

Bernoulli equation: $H_1 = Z_2 + p/w + V^2/2g + h_f + h_L$
 where: H_1 = an upstream water surface or hydraulic grade line (HGL) elevation, ft.

Z_2 = a downstream channel invert elevation, ft.

p/w = pressure head (pressure “p”, lbs/ft² divided by specific weight “w”, lbs/ft³), or water depth in open channel flow, ft.

$V^2/2g$ = velocity head (flow velocity “V” squared divided by twice g, the acceleration due to gravity), ft.

h_f = head losses from point 2 to point 1 due to friction, ft.

h_L = form or “minor” head losses due to transitions, bends, junctions, structures, etc.

(a) Collection Elements:

1. Pipe storm drain entrances, end sections, and culverts shall be investigated for the governing inlet or outlet control condition using the procedures described in "Hydraulic Design of Highway Culverts", HDS-5 (Houghtalen and Johnston, Hydraulic Design Series No. 5, Federal Highway Administration). Any nomographs, formulas and/or computer programs based on FHWA techniques are acceptable. These would include but are not limited to: Figures 7-1 to 7-14 in Sec. 5608 of the APWA criteria; the FHWA culvert analysis computer program HY8; the U. S. Army Corps of Engineers Hydrologic Engineering Center HEC-RAS River Analysis System culvert modeling routines; and similar proprietary programs based on FHWA methodology.
2. Curb inlets on grades shall be analyzed using the techniques and equations described in Chapter 4 of HEC No. 22 (as modified in this code for use with City of Merriam standard curb, gutter and inlet configurations). The capacity of such curb inlets shall be evaluated using a variant of equation 4-25 $\{L_T = K_T Q^{0.42} S_L^{0.3} [1/(n S_e)]^{0.6}\}$:

$$Q_{cap} = C_{red} \{L_T / [K_T S_L^{0.3} (1/n S_e)^{0.6}]\}^{2.381}$$

where: L_T = curb opening length, ft

K_T = a dimensionless constant of proportionality, 0.6

S_L = longitudinal gutter slope, ft/ft

C_{red} = capacity reduction factor for clogging, 0.8

Q_{cap} = capacity of the inlet, cfs

n = Manning's coefficient, 0.016

$S_e = S_x + S'_w E_o$, equivalent cross slope, ft/ft

where: S_x = street section cross slope

S'_w = gutter cross slope at the inlet measured from the gutter lip to

the front face of the inlet opening, ft

E_o = ratio of frontal flow to total gutter and street section flow

$$Q_w/Q = 1 - (1 - W/T)^{2.67}$$

where: Q_w = flow in width W, cfs

$$Q = C C_{red} A [2 g (d - h/2)]^{0.5}$$

where: Q = discharge, cfs
 C = coefficient of discharge, 0.67
 C_{red} = capacity reduction factor for clogging, 0.8 for curb inlets,
 0.5 for field or area inlets
 A = area of opening, ft²
 g = acceleration due to gravity, 32.2, ft/sec²
 d = as defined above
 h = as defined above

Curb inlets in sumps may also be evaluated using the methods described in Reports No. K-TRAN: KU-98-3 and KU-99-1.

(b) Conveyance Elements:

1. Curb and gutter flow shall be evaluated using variants of Izzard's equation as in the following from Chapter 4 of HEC No. 22: $Q = S_x^{1.67} S_L^{0.5} T^{2.67} K_c/n$
 where: Q = discharge, cfs
 S_x = street cross slope, ft/ft
 S_L = street longitudinal slope, ft/ft
 T = width of flow (spread), ft
 K_c = a dimensionless constant of proportionality, 0.56
 n = Manning's coefficient, 0.016

Note: flow depth may be determined using the equation $d = T S_x$ as previously indicated for curb inlets.

2. Natural and improved open channels shall be evaluated using variants of Manning's equation: $Q = 1.49 A R^{2/3} S_o^{1/2} /n$
 where: Q = discharge, cfs
 1.49 = a dimensionless constant of proportionality
 A = flow area ft²
 R = hydraulic radius (flow area divided by the wetted perimeter), ft
 S_o = channel slope, ft/ft
 n = Manning's coefficient for open channels as shown in Table A in Section 5608 of the APWA design criteria or the maximum values shown in Table 3-4 in Chapter 3 of HEC No. 22.
3. Conveyance through enclosed conduits shall be evaluated for open channel, full flow and pressure flow conditions using Manning's equation as defined above and in accordance with Chapter 7, of HEC No. 22. Manning's coefficient for closed conduits shall be taken from the aforementioned Tables A and 3-4 with the following exceptions: helical corrugated pipe n values may be those

published in the “Handbook of Steel Drainage & Highway Construction Products”, American Iron and Steel Institute, 1994; and published values based on experimental results from research sponsored by manufacturers may be used for other pipe materials. However, no value less than 0.013 may be used for any conduit.

4. Flow through nodal structures including curb inlets, field or area inlets, junction boxes, etc. shall be evaluated pursuant to the provisions of Chapter 7 of HEC No. 22. Energy losses and hydraulic grade line (HGL) elevations in such structures shall be determined according to the flow regime, type of structure, and vertical and horizontal configuration of the conduits.

Super-critical flow: When flow in the downstream pipe is super-critical, no special assessment of energy losses at the node is required. The HGL in the structure will be assumed to be the normal depth in the downstream pipe and energy loss calculations may proceed upstream assuming a free outfall or low tail-water condition in the structure.

Sub-critical and pressurized flow: When flow in the downstream pipe is sub-critical or under pressure and the inverts of the upstream pipes are below the HGL in the structure, then the energy loss through the node shall be determined as a proportion of the velocity head: $H = K (V_o^2 / 2g)$

where: H = energy loss, ft

K = adjusted loss coefficient which varies as indicated below

V_o = velocity in downstream conduit

g = acceleration due to gravity, 32.2 fps

The value of K for specific nodal cases may be determined using the formula shown below in connection with procedures described in Chapter 7 of HEC No. 22 or the generally more conservative values contained in the table which follows:

$$K = K_o C_D C_d C_Q C_P C_B$$

Where: K_o = initial loss coefficient based on relative structure size.

C_D = correction factor for pipe diameter (pressure flow only).

C_d = correction factor for flow depth

C_Q = correction factor for relative flow

C_P = correction factor for plunging flow

C_B = correction factor for benching

Note: where the determination of the above factors requires the use of circular pipe and/or manhole relative diameters, the hydraulic radius may be substituted when rectangular, arch or elliptical junction boxes and conduits are being evaluated. The

hydraulic radius should also be used for circular pipes and structures if they are to be used in conjunction with other shapes.

Structure Configuration	K
Inlets	
straight run	0.50
90 deg. and multiple pipe junctions	1.50
60 deg	1.25
45 deg	1.10
22.5 deg	0.70
Manholes and Junction Boxes	
straight run	0.15
90 deg and multiple pipe junctions	1.00
60 deg	0.85
45 deg	.75
22.5 deg	0.45

Culverts and enclosed system structures with upstream pipe inverts above the nodal HGL: These structures shall be investigated for the governing inlet or outlet control condition using the procedures described in "Hydraulic Design of Highway Culverts", HDS-5 as indicated in the collection element design section of this code. When using outlet control entrance loss K values as published in Table B of Sec. 5608 of the APWA criteria or Table 7-5b of Chapter 7, HEC No. 22, the designer should note that the values are for entrance losses only and do not account for the energy of motion in the pipe. When hand calculations are being performed, the designer should include the downstream pipe kinetic energy as well as the entrance loss in determining the nodal HGL.

(c) Erosion control:

Conveyance system velocities shall fall within the following ranges for the channel linings listed:

<u>Lining</u>	<u>Allowable Design Flow Velocity</u>
Seed and mulch	2 to 3 fps
Sod and stake	2 to 5 fps
Erosion control blanket	2 to 7 fps
Riprap (15" thickness)	3 to 10 fps
Grouted riprap, gabion revetment	3 to 15 fps
Concrete pavement or competent insitu bedrock	3 to 20 fps
Enclosed conduits	3 to 20 fps

Energy dissipation shall be provided at conveyance system outlets to reduce velocities as required to meet receiving channel limits.

Sec. 7-7 Stormwater detention.

In general stormwater detention and retention facilities shall be designed in accordance with the provisions of Sec. 5606 of the APWA criteria and Chapter 8 of HEC 22 as modified in this code. (Ord. No. 1400, §1, 3-26-01).

- (1) As discussed in the hydrology section of this code the 100-year storm detention basin inflow hydrograph shall be determined using methods described in SCS (NCRS) TR No. 55.
- (2) The principal spillway shall be a weir, pipe, or orifice and shall be designed to release no more than 1.8 cfs per acre during the 100-year 24-hour storm unless otherwise stipulated by the director of community development. It shall be capable of functioning without an attendant, and shall not require the use of tools, equipment or mechanical devices.
- (3) The principal spillway shall be capable of discharging at least 80% of the detention storage volume within 24 hours.
- (4) Either the principal spillway or other outlet works in the case of retention basins shall be capable of draining the facility within 72 hours.
- (5) The emergency spillway may be combined with the principal spillway or may be a separate structure. It shall be designed to operate at an elevation 0.5 ft above the level of the 100-year storage volume.
- (6) The principal spillway, outlet works, and conveyance system entrances to the detention basin shall be provided with energy dissipation devices as required to control erosion in accordance with the provisions of the hydraulics section of this code.
- (7) The inflow hydrograph shall be routed through the basin using the storage indication or modified Puls method as expressed by the equation: $\Delta S / \Delta t = (I_1 + I_2) / 2 - (O_1 + O_2) / 2$
where: ΔS = change in storage, ft³
 Δt = time interval, min
 I = inflow, ft³
 O = outflow, ft³
- (8) The following design information shall be submitted as part of the drainage study and/or stormwater management plan:
 - a. Detention basin stage-storage-volume curves with indications of volumes allocated to detention, sediment and permanent pool storage in the case of wet basins.
 - b. Superimposed inflow and outflow hydrographs for the enclosed system design-year and 100-year 24-hour storms.
 - c. Stage discharge rating curves for the principal and emergency spillways, and wet basin outlet works.

- d. Cumulative inflow volume, cumulative storage volume, cumulative discharge and stage elevation versus time routing curves for the design year and 100-year 24 hour storms.
- (9) Detention and retention basin dams greater than 10 feet in height shall be designed as Class C structures in accordance with the policies and procedures of the Water Resources Division of the Kansas Department of Agriculture.
- (10) Underground or oversized storm sewer storage may be provided subject to the foregoing design criteria. However, rooftop storage and parking storage are not encouraged, but will be evaluated by the Director of Community Development on a case by case basis.
- (11) The developer shall enter into a legally enforceable agreement with the City of Merriam providing for the perpetual maintenance of the detention facilities and authorizing the City to enter the property for maintenance purposes at the owner's expense in the case of default.

Sec. 7-8. Grading, sedimentation and erosion control plans.

Site grading, sedimentation and erosion control plans shall be submitted to the community development director for review and approval before final subdivision or land development plan and plat approval. No stripping or grading shall take place nor will building permits be issued prior to approval of this plan. (Ord. No. 1400, §1, 3-26-01).

- (1) Subdivision site grading plan.
The grading plan shall be prepared by a licensed professional engineer in the State of Kansas and shall be accompanied by a detailed sedimentation and erosion control plan. The contents of the plan shall include but not be limited to the following information:
 - (a) Existing grade contours drawn at two (2) feet maximum intervals.
 - (b) Existing and proposed property lines with lot and block numbers.
 - (c) Elevation and location of nearest bench mark (U.S.G.S. datum).
 - (d) Final grade contours drawn at two (2) feet intervals depicting major subdivision drainage patterns and indicating final grade spot elevations at each lot corner.
 - (e) The 100-year flood limit and elevation in the vicinity of buildings along with the building low entry elevation.
 - (f) All existing easements and rights of way of record and proposed easements and rights-of-way including drainage easements.
 - (g) Existing and proposed utilities.
- (2) Single lot site grading plan.

Applications for single lot building permits shall be accompanied by a plot and grading plan which shall include the following:

- (a) Existing and proposed property lines with lot and block numbers.

- (b) Proposed building location.
 - (c) Proposed type of structure (i.e. bi-level, split-level, etc.)
 - (d) Top of foundation elevations, low entry elevation and proposed grade at principal structure corners and lot corners.
 - (e) Approximate locations of proposed drainage swales indicated with spot elevations and directional arrows depicting flow patterns.
 - (f) Additional information as required by the community development director to assure protection of the proposed improvement and adjacent property.
- (3) The following minimum site grading criteria shall apply to all permit applications:
- (a) The minimum slope for the first five (5) feet away from structures in paved areas shall be 2% (1/4" per ft.).
 - (b) The minimum slope in paved areas beyond the five feet (5) building zone, including parking lot valley gutters shall be 1% (1/8" per ft.).
 - (c) The minimum slope in unpaved areas for the first five (5) feet away from structures in unpaved areas shall be 4% (1/2" per ft.).
 - (d) The minimum slope in unpaved areas beyond the five (5) feet building zone, including drainage swales shall be 2% (1/4" per ft.).
 - (e) The minimum slope in drainage swales in unpaved areas may be 1% if a concrete paved trickle channel is provided.

Sec. 7-9 Procedure for the submission, review, and approval of stormwater runoff management plans.

No land development shall increase stormwater runoff over previously existing conditions except through an approved stormwater management plan as provided for in this code. The plans shall be prepared by a licensed professional engineer in the State of Kansas in accordance with the Kansas City Metropolitan Chapter of the American Public Works Association "Standard Specifications and Design Criteria" Section 5600 and as provided for in this code. No grading or construction permits will be issued prior to its approval by the community development director.

(1) Preliminary stormwater management plan.

A preliminary stormwater management plan shall accompany all initial applications for land development. The plan shall include the following:

- (a) A drainage map based on the data available through the Johnson County, Kansas "Automated Information Mapping System (AIMS)" showing existing improvements, proposed improvements, and topographical features including contours of the development site and adjoining land. The map shall show the preliminary drainage system layout ; the areas of the drainage basins and sub-basins tributary to each collection element; the runoff coefficient (C) for each drainage basin; local and system time of concentration (Tc) for each collection element; design and 100-year storm intensity for both the local and system Tc; design and 100-year storm antecedent moisture coefficient (K); design and 100-year stormwater discharges (Q) for each system element at both the local and system Tc; the location of proposed detention facilities; and the 100-year flood boundary if the site is in or adjacent to a FEMA regulated floodplain.
- (b) A preliminary stormwater management plan and general layout drawing or drawings showing existing improvements, topographical features, and contours; and proposed improvements including structures, paving, the drainage system, detention facilities, and grading concepts. The drawings shall also indicate preliminary collection and conveyance element locations and sizes; and anticipated building low entry and 100-year flood water surface elevations.
- (c) A written stormwater management summary or report including descriptions of the site and surrounding watershed; existing and proposed land use status; existing topography and surface conditions and proposed changes. The report will also discuss stormwater detention requirements; 100-year storm protective level constraints; the location and capacity of existing downstream stormwater management facilities; and any other issues or considerations which may affect the design.

(2) Final stormwater management plan.

Upon approval of the preliminary stormwater management plan and report, a final stormwater management plan shall be submitted for review and approval with the final development plan application. The final plan submittal shall include the following:

- (a) Final Drainage Map, Stormwater Management Plan/General Layout and Stormwater Management Report incorporating preliminary plan review comments and final design development. Drainage easements will be delineated on the stormwater management plan/general layout and/or on separate ownership/right-of-way drawings if necessary for clarity.
- (b) Plan and profile drawings (or separate profile drawings when overall plan views of the project are provided) showing collection and conveyance element locations and stationing; sizes and lengths; invert elevations and conduit slopes; existing and proposed surface grade; ties to baselines and property lines; subdivision names, lot numbers and ownerships; and material types and specifications (eg. conduit shape, RCP class - wall type, CSP corrugation dimensions - wall thickness, Manning's n, etc.); existing and proposed utility crossings and alignments; and geotechnical test borings. The design storm and 100-year storm hydraulic grade lines in conduits and structures and at surface collection and conveyance elements shall be shown on the profile view. The 100-year water surface elevation in streets shall be shown on the profile view at all road crossings and on the plan view in sag vertical curve low points. The low entry elevation of all structures shall also be shown on the plan view.
- (c) Cross sections at 50 feet maximum intervals and at other locations as needed to convey the intent of the design shall be provided for all open channels and significant overflow channels in yards (generally where the design of the overflow channel is critical to meeting the 100-year flood protective level requirement).
- (d) Drawings showing details and schedules of all special structures which do not conform to City standards.
- (e) Design storm and 100-year storm hydraulics information for all collection elements shall be shown including:
 1. Discharge - $Q_{(\text{design year})}$ and Q_{100} (cfs).
 2. Method of calculation (eg. weir formula, orifice formula, nomographs, etc.).
 3. Bypassed Flow - Q_{bypass} (cfs).
 4. Depth or Head (H_{weir} or h_{orifice} , H or HW - culvert outlet or inlet control, etc.).
 5. Velocity - V (fps) where applicable.
 6. Velocity Head - $V^2/2g$ (ft) where applicable.
 7. Discharge coefficient "C" or "K" where applicable.

The above information may be shown on the plan and profile drawings or in a schedule on the stormwater management/general layout drawings.

(f) Design storm and 100-year storm hydraulics information for all conveyance elements including:

1. Full flow capacity - Q_{full} (cfs).
2. Full flow velocity - V_{full} (fps).
3. Discharge - $Q_{(design\ year)}$ and Q_{100} (cfs).
4. Normal depth - d_n (ft) for open channel flow conditions.
5. Froude number - F_r for open channel flow conditions.
6. Friction slope - S_f (%) for pressurized flow conditions.
7. Pressurized flow friction head loss through conduit reach - h_f (ft).
8. Velocity - V (fps).
9. Velocity head - $V^2/2g$ (ft).
10. Velocity head loss coefficient at structure - "K".
11. Head loss at structure - h_L (ft).

The above information may be shown on the plan and profile drawings or in a schedule on the stormwater management/general layout drawings.

(g) Detention basin design drawings shall include the following information:

1. Elevation-area-volume curves for the storage facility including notation of the storage volumes allocated to runoff, sediment and permanent residual water storage for other uses (wet basins only).
2. Inflow hydrographs for the 10-year and 100-year recurrence interval design storms.
3. Stage-discharge rating curves for each spillway and for combined spillway discharges.
4. Routing curves for the 10-year and 100-year recurrence interval design storms with time plotted as the abscissa and the following plotted as ordinances:
 - a. Cumulative inflow volume.
 - b. Cumulative discharge.
 - c. Stage elevation.
 - d. Cumulative storage.
5. Provisions shall be made to permit emergency access to the detention basin and for the access of auxiliary equipment for emptying, cleaning and maintenance purposes.
6. Underground detention facilities shall be provided with access for maintenance and sediment removal, and shall have positive gravity outlets. Venting shall be provided to prevent gas accumulation.

(3) Construction Specifications.

Stormwater management construction materials and installation shall meet or exceed the provisions of Sections 2100 "Grading and Site Preparation", 2400 "Seeding and Sodding", 2600 "Storm Sewers", and 2700 "Structures" of the APWA Standard Specifications and Design Criteria. Stormwater management structures shall be designed in accordance with the provisions of Section 2604 "Structures" of Section 2700, and 5710.3 "Curb Inlets, Field Basins and Junction Boxes" and 5710.5 "Reinforced Concrete Box Culverts" of Section 5700 "Structures".

Sec. 7-10. Method of financing drainage projects.

(1) New drainage projects.

The developer, owner, or his agent of new commercial or industrial development projects, shall assume one hundred (100) per cent of the cost of stormwater management plan approved for the proposed development. Ord. No. 1400, §1, 3-26-01

(2) Drainage projects for existing developments.

The governing body may create stormwater drainage projects in established residential, commercial or industrial areas in the City of Merriam for the purpose of stormwater management control, and designate one of the following methods of financing the project.

(a) Capital improvement program.

The governing body has established guidelines for determining properties for stormwater drainage projects to control existing or anticipated runoff which are set forth in the City of Merriam Capital Improvement Program.

1. The total cost of the project will be funded with capital improvement funds as well as available federal grants and other revenue sources providing all permanent and temporary easements for the improvement, including access to drainage control structures and facilities shall be dedicated to the city.

(b) Create a benefit district.

1. Whenever temporary or permanent easements are not dedicated to the city, for stormwater drainage improvement the governing body may create a benefit district as provided in current Kansas Statutes, and designate an equitable portion of the project cost and/or cost to acquire easements be assessed to said owners of lots or tracts of land abutting the improvement who failed or refused to dedicate or convey required easements.
2. A benefit district may also be created by a valid petition signed by fifty-one (51) percent (or as provided in current Kansas Statutes) of the property owners within the affected areas requesting stormwater drainage improvements.

3. When a benefit district is created the governing body may designate funding the city's share of the cost with capital improvement funds or by general budget, federal, state, or county grants or other revenue sources, or authorize the issuance of general obligation bonds.

Sec. 7-11. Performance bonds, maintenance assurances, and drainage permits.

Upon approval of the final stormwater management plan, but before the issuance of a drainage permit, the applicant shall be required to post a performance bond, cash escrow, certified check or other acceptable form or performance security in an amount equal to five (5) per cent of the estimated cost of the project, to assure completion of the final stormwater management plan, and shall remain in effect for one year after the date of completion of the improvement. (Ord. No. 1400, §1, 3-26-01).

(1) Stormwater control facilities.

- (a) Unimproved stormwater system. Unimproved stormwater systems located on private property shall be maintained and kept clear of trees, undergrowth, debris and litter by the property owners. No structure shall be erected which could encroach upon the normal flow of water in any stormwater system.
- (b) Improved stormwater systems constructed by the city. The City of Merriam's Public Works Department shall be responsible for the maintenance of all drainage structures and improved stormwater systems constructed by the city within public rights-of-way or dedicated and recorded easements under public ownership.
- (c) Private stormwater system. The operation and maintenance of a stormwater system constructed or improved by a private developer including open drainage swales, channels, enclosed systems and detention/retention structures on or adjacent to and abutting privately owned property including any easements dedicated to the city for access to a stormwater facility, as provided in section 7-4, shall be maintained by owner(s), occupant or agent in charge of such property. Such maintenance shall include but not be limited to keeping said facilities free and clear of weeds, brush, vegetation growth, debris and any other waste material which might impede or hinder the facility's intended use.
- (d) Failure to maintain. If the community development director determines that the owners), developer or agent in charge of any lot, piece or parcel of land on which a stormwater drainage system structure exists or abuts has failed to properly maintain such facility as previously set forth, then he shall notify the owner(s), occupant or agent in charge of the violation in writing. If within thirty (30) days from the date of the notice to comply the owner(s), developer or agent in charge fails, neglects or refuses to comply with the requirements specified in the notice, the community development director shall proceed to cause the necessary remedial work to be performed and shall report the costs

of such remedial work to the city clerk. The city clerk shall mail a statement of costs to the last known address of the owner(s), developer or agent in charge of the property and if such costs are not paid to the city within thirty (30) days of such notice, the governing body of the city shall proceed to pass an ordinance levying a special assessment for such costs against the property on which the facility exists or abuts. The city clerk shall certify such assessment to the county clerk for collection and payment to the city the same as other assessments and taxes are collected and paid.

Upon approval of the stormwater management plan and acceptance of the applicant's assurances of performance and maintenance bond as provided in these regulations, the community development director shall issue a permit for a storm drainage structure. The permit shall set forth the terms and conditions of the approved stormwater management plan.

Refer to the Uniform Building Code for regulations, permits and permit fees pertaining to site excavation and grading.

- (2) Drainage permit fees. The fee for each permit shall be half the fee required for building permits as prescribed in the Uniform Building Code. The determination of valuation shall be made by the director of inspections and planning. The value to be used in computing the drainage permit fee shall be the total value of the construction work pertaining to the complete storm drainage system.
- (3) Inspection of stormwater management improvements. Upon completion of a stormwater management facility, the community development director shall inspect the improvements to ensure that construction has been completed in compliance with the approved stormwater management plan and, if the facilities do not conform to the plan, the community development director shall issue a notice of disapproval in writing to the permittee, owner or developer.
- (4) Revocation of permits; stop orders. The community development director, after giving ten (10) days' written notice, may revoke a permit issued pursuant to these regulations for any project which is found upon inspection to be in violation of the provisions of these regulations, and for which the permittee has not agreed to make the necessary correction as recommended by the community development director. Drainage permits may also be revoked if remedial work is not completed within the time allowed. Upon revocation of a drainage permit, the community development director shall issue a stop work order. Such stop work order shall be directed to the permittee and he shall immediately notify persons owning the land, the developer, and those persons or firms actually performing the physical work of clearing, grading and developing the land. The stop work order shall direct the parties involved to cease and desist all or any portion of the work on the development or a portion thereof which is not in compliance, except such remedial work necessary to bring the project into compliance.

- (5) Enforcement. It shall be the duty of the community development director to bring to the attention of the city attorney/prosecutor any violation or lack of compliance herewith.
- (6) Appeals. Any person aggrieved by a decision of the community development director in the enforcement of this article shall have the right to appeal any such order, requirement, decisions or determination in accordance with the following procedures:
 - (a) The aggrieved person shall request, in writing, a hearing before the community development/public works committee of the governing body within thirty (30) days of the final order requirement, decision, or determination of the community development director. The committee shall consider any information offered by the aggrieved person bearing on the dispute and may recommend to the community development director an appropriate course of action: either reversal, modification or confirmation. The community development director, who shall be present at the hearing, shall act on the recommendation in a manner consistent with his/her responsibilities under this article.
 - (b) Any person aggrieved by any final decision of the community development director, following review by the community development/public works committee of the governing body must first seek review by the governing body, and, if not satisfied by the decision of the governing body, may then seek further review by a court of competent jurisdiction in the manner provided by the laws of the State of Kansas.
- (7) Amendments. For the purpose of providing for the public health, safety and general welfare, the governing body may, from time to time, amend the provisions of these regulations.
- (8) Penalty for violations; action. Any person, firm or corporation who fails to comply with, or violates any provision of these regulations shall be guilty of a misdemeanor and any person, firm, association, partnership or corporation convicted thereof shall be punished by a fine not to exceed five hundred dollars (\$500.00); and the City of Merriam, Kansas, shall further have the authority to maintain suits or actions in any court of competent jurisdiction for the purpose of enforcing any provisions of this title and to abate nuisances maintained in violation thereof; and in addition to other remedies, institute injunction, mandamus, or other appropriate action or proceeding to prevent such unlawful erection, construction, reconstruction, alteration, conversion, maintenance, or use, or to correct or abate such violation, or to prevent the occupancy of the building, structure or land. Each day any violation of any provisions of these regulations shall continue shall constitute a separate offense.

Secs. 7-12--7-15 Reserved.

**ARTICLE 1 STATUTORY AUTHORIZATION, FINDINGS OF FACT, AND
PURPOSES**

Sec 7-16. STATUTORY AUTHORIZATION

1. *Approval of Draft Ordinance by Kansas Chief Engineer Prior to Adoption*

The following floodplain management regulations, as written, were approved in draft form by the Chief Engineer of the Division of Water Resources of the Kansas Department of Agriculture May 14, 2009.

2. *Kansas Statutory Authorization*

The Legislature of the State of Kansas has in K.S.A. 12-741 *et seq*, and specifically in K.S.A. 12-766, delegated the responsibility to local governmental units to adopt floodplain management regulations designed to protect the health, safety, and general welfare. Therefore, the Governing Body of the City of Merriam, Kansas, ordains as follows:

Sec 7-17. FINDINGS OF FACT

1. *Flood Losses Resulting from Periodic Inundation*

The special flood hazard areas of Merriam, Kansas, are subject to inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base; all of which adversely affect the public health, safety and general welfare.

2. *General Causes of the Flood Losses*

These flood losses are caused by (1) the cumulative effect of development in any delineated floodplain causing increases in flood heights and velocities; and (2) the occupancy of flood hazard areas by uses vulnerable to floods, hazardous to others, inadequately elevated, or otherwise unprotected from flood damages.

3. *Methods Used To Analyze Flood Hazards*

The Flood Insurance Study (FIS) that is the basis of this ordinance uses a standard engineering method of analyzing flood hazards, which consist of a series of interrelated steps.

- a. Selection of a base flood that is based upon engineering calculations, which permit a consideration of such flood factors as its expected frequency of occurrence, the area inundated, and the depth of inundation. The base flood selected for this ordinance is representative of large floods, which are characteristic of what can be expected to occur on the particular streams subject to this ordinance. It is in the general order of a flood which could be expected to have a one percent chance of occurrence in any one year as delineated on the Federal Insurance Administrator's FIS, and illustrative materials dated August 3, 2009, as amended, and any future revisions thereto.
- b. Calculation of water surface profiles that are based on a standard hydraulic engineering analysis of the capacity of the stream channel and overbank areas to convey the regulatory flood.
- c. Computation of a floodway required to convey this flood without increasing flood heights more than one (1) foot at any point.
- d. Delineation of floodway encroachment lines within which no development is permitted that would cause any increase in flood height.
- e. Delineation of floodway fringe, i.e., that area outside the floodway encroachment lines, but still subject to inundation by the base flood.

Sec. 7-18 STATEMENT OF PURPOSE

It is the purpose of this ordinance to promote the public health, safety, and general welfare; to minimize those losses described in Article 1, Section B(1); to establish or maintain the community's eligibility for participation in the National Flood Insurance Program (NFIP) as defined in 44 Code of Federal Regulations (CFR) 59.22(a)(3); and to meet the requirements of 44 CFR 60.3(d) and K.A.R. 5-44-4 by applying the provisions of this ordinance to:

1. Restrict or prohibit uses that are dangerous to health, safety, or property in times of flooding or cause undue increases in flood heights or velocities;
2. Require uses vulnerable to floods, including public facilities that serve such uses, be provided with flood protection at the time of initial construction; and
3. Protect individuals from buying lands that are unsuited for the intended development purposes due to the flood hazard.

ARTICLE 2 GENERAL PROVISIONS

Sec 7-19 LANDS TO WHICH ORDINANCE APPLIES

This ordinance shall apply to all lands within the jurisdiction of the City of Merriam, Kansas identified as numbered and unnumbered A Zones, AE, AO, and AH Zones, on the Index Map dated August 3, 2009 of the Flood Insurance Rate Map (FIRM) as amended, and any future revisions thereto. In all areas covered by this ordinance, no development shall be permitted except through the issuance of a floodplain development permit, granted by the Governing Body of the City of Merriam, Kansas or its duly designated representative under such safeguards and restrictions as the Governing Body or the designated representative may reasonably impose for the promotion and maintenance of the general welfare, health of the inhabitants of the community, and as specifically noted in Article 4.

Sec. 7-20 COMPLIANCE

No development located within the special flood hazard areas of this community shall be located, extended, converted, or structurally altered without full compliance with the terms of this ordinance and other applicable regulations.

Sec 7-21 ABROGATION AND GREATER RESTRICTIONS

It is not intended by this ordinance to repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. However, where this ordinance imposes greater restrictions, the provisions of this ordinance shall prevail. All other ordinances inconsistent with this ordinance are hereby repealed to the extent of the inconsistency only.

Sec. 7-22 INTERPRETATION

In their interpretation and application, the provisions of this ordinance shall be held to be minimum requirements, shall be liberally construed in favor of the governing body, and shall not be deemed a limitation or repeal of any other powers granted by Kansas statutes.

Sec 7-23 WARNING AND DISCLAIMER OF LIABILITY

a. The degree of flood protection required by this ordinance is considered reasonable for regulatory purposes and is based on engineering and scientific methods of study. Larger floods may occur on rare occasions or the flood heights may be increased by man-made or natural causes, such as ice jams and bridge openings restricted by debris. This ordinance does not imply that areas outside the floodway and flood fringe or land uses permitted within such areas will be free from flooding or flood damage. This ordinance shall not create a liability on the part of the City of Merriam, Kansas, any officer, employee or agent thereof, for any flood damages that may result from reliance on this ordinance or any administrative decision lawfully made there under.

SEVERABILITY

b. If any section, clause, provision, or portion of this ordinance is adjudged unconstitutional or invalid by a court of appropriate jurisdiction, the remainder of this ordinance shall not be affected thereby.

ARTICLE 3 ADMINISTRATION

Sec. 7-24 FLOODPLAIN DEVELOPMENT PERMIT

A floodplain development permit shall be required for all proposed construction or other development, including the placement of manufactured homes, in the areas described in Article 2, Section A. No person, firm, corporation, or unit of government shall initiate any development or substantial-improvement or cause the same to be done without first obtaining a separate floodplain development permit for each structure or other development.

Sec. 7-25 DESIGNATION OF FLOODPLAIN ADMINISTRATOR

The Community Development Director of the City of Merriam, Kansas is hereby appointed to administer and implement the provisions of this ordinance.

Sec. 7-26 DUTIES AND RESPONSIBILITIES OF FLOODPLAIN ADMINISTRATOR

Duties of the Floodplain Administrator shall include, but not be limited to:

1. Review of all applications for floodplain development permits to assure that sites are reasonably safe from flooding and that the floodplain development permit requirements of this ordinance have been satisfied;
2. Review of all applications for floodplain development permits for proposed development to assure that all necessary permits have been obtained from Federal, State, or local governmental agencies from which prior approval is required by Federal, State, or local law;
3. Review all subdivision proposals and other proposed new development, including manufactured home parks or subdivisions, to determine whether such proposals will be reasonably safe from flooding;
4. Issue floodplain development permits for all approved applications;
5. Notify adjacent communities and the Division of Water Resources, Kansas Department of Agriculture, prior to any alteration or relocation of a watercourse, and submit evidence of such notification to the Federal Emergency Management Agency (FEMA);
6. Assure that the flood-carrying capacity is not diminished and shall be maintained within the altered or relocated portion of any watercourse; and
7. Verify and maintain a record of the actual elevation (in relation to mean sea level) of the lowest floor, including basement, of all new or substantially improved structures;
8. Verify and maintain a record of the actual elevation (in relation to mean sea level) that the new or substantially improved non-residential structures have been floodproofed;

9. When floodproofing techniques are utilized for a particular non-residential structure, the floodplain administrator shall require certification from a registered professional engineer or architect.

Sec. 7-27 APPLICATION FOR FLOODPLAIN DEVELOPMENT PERMIT

To obtain a floodplain development permit, the applicant shall first file an application in writing on a form furnished for that purpose. Every floodplain development permit application shall:

1. Describe the land on which the proposed work is to be done by lot, block and tract, house and street address, or similar description that will readily identify and specifically locate the proposed structure or work;
2. Identify and describe the work to be covered by the floodplain development permit;
3. Indicate the use or occupancy for which the proposed work is intended;
7. Indicate the assessed value of the structure and the fair market value of the improvement;
5. Specify whether development is located in designated flood fringe or floodway;
6. Identify the existing base flood elevation and the elevation of the proposed development;
7. Give such other information as reasonably may be required by the floodplain administrator;
8. Be accompanied by plans and specifications for proposed construction; and
9. Be signed by the permittee or his authorized agent who may be required to submit evidence to indicate such authority.

ARTICLE 4 PROVISIONS FOR FLOOD HAZARD REDUCTION

Sec. 7-28 GENERAL STANDARDS

1. No permit for floodplain development shall be granted for new construction, substantial-improvements, and other improvements, including the placement of manufactured homes, within any numbered or unnumbered A zones, AE, AO, and AH zones, unless the conditions of this section are satisfied.
2. All areas identified as unnumbered A zones on the FIRM are subject to inundation of the 100-year flood; however, the base flood elevation is not provided. Development within unnumbered A zones is subject to all provisions of this ordinance. If Flood

Insurance Study data is not available, the community shall obtain, review, and reasonably utilize any base flood elevation or floodway data currently available from Federal, State, or other sources.

3. Until a floodway is designated, no new construction, substantial improvements, or other development, including fill, shall be permitted within any unnumbered or numbered A zones, or AE zones on the FIRM, unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community.
4. All new construction, subdivision proposals, substantial-improvements, prefabricated structures, placement of manufactured homes, and other developments shall require:
 - a. Design or adequate anchorage to prevent flotation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy;
 - b. Construction with materials resistant to flood damage;
 - c. Utilization of methods and practices that minimize flood damages;
 - d. All electrical, heating, ventilation, plumbing, air-conditioning equipment, and other service facilities be designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding;
 - e. New or replacement water supply systems and/or sanitary sewage systems be designed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into flood waters, and on-site waste disposal systems be located so as to avoid impairment or contamination; and
 - f. Subdivision proposals and other proposed new development, including manufactured home parks or subdivisions, located within special flood hazard areas are required to assure that:
 - (1) All such proposals are consistent with the need to minimize flood damage;
 - (2) All public utilities and facilities, such as sewer, gas, electrical, and water systems are located and constructed to minimize or eliminate flood damage;
 - (3) Adequate drainage is provided so as to reduce exposure to flood hazards; and
 - (4) All proposals for development, including proposals for manufactured home parks and subdivisions, of five (5) acres or fifty (50) lots,

whichever is lesser, include within such proposals base flood elevation data.

5. *Storage, Material, and Equipment*

- a. The storage or processing of materials within the special flood hazard area that are in time of flooding buoyant, flammable, explosive, or could be injurious to human, animal, or plant life is prohibited.
- b. Storage of other material or equipment may be allowed if not subject to major damage by floods, if firmly anchored to prevent flotation, or if readily removable from the area within the time available after a flood warning.

6. *Nonconforming Use*

A structure, or the use of a structure or premises that was lawful before the passage or amendment of the ordinance, but which is not in conformity with the provisions of this ordinance, may be continued subject to the following conditions:

- a. If such structure, use, or utility service is discontinued for twelve (12) consecutive months, any future use of the building shall conform to this ordinance.
- b. If any nonconforming use or structure is destroyed by any means, including flood, it shall not be reconstructed if the cost is more than fifty (50) percent of the pre-damaged market value of the structure. This limitation does not include the cost of any alteration to comply with existing state or local health, sanitary, building, safety codes, regulations or the cost of any alteration of a structure listed on the National Register of Historic Places, the State Inventory of Historic Places, or local inventory of historic places upon determination.

Sec. 7-29 SPECIFIC STANDARDS

1. In all areas identified as numbered and unnumbered A zones, AE, and AH Zones, where base flood elevation data have been provided, as set forth in Article 4, Section A(2), the following provisions are required:

a. *Residential Construction*

New construction or substantial-improvement of any residential structures, including manufactured homes, shall have the lowest floor, including basement, elevated a minimum of one (1) foot above base flood elevation. The elevation of the lowest floor shall be certified by a Kansas licensed land surveyor or Professional Engineer.

b. *Non-Residential Construction*

New construction or substantial-improvement of any commercial, industrial, or other non-residential structures, including manufactured homes, shall have the lowest floor, including basement, elevated a minimum of one (1) foot above the base flood elevation or, together with attendant utility and sanitary facilities, be floodproofed to one (1) foot above base flood elevation the structure is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. A registered professional engineer or architect shall certify that the standards of this subsection are satisfied. The elevation of the lowest floor shall be certified by a Kansas licensed land surveyor. Such certification shall be provided to the floodplain administrator as set forth in Article 3, Section C(7)(8)(9).

- c. Require, for all new construction and substantial-improvements, that fully enclosed areas below lowest floor used solely for parking of vehicles, building access, or storage in an area other than a basement and that are subject to flooding shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of flood waters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or meet or exceed the following minimum criteria:
 - (1) A minimum of two (2) openings having a total net area of not less than one (1) square inch for every square foot of enclosed area subject to flooding shall be provided; and
 - (2) The bottom of all opening shall be no higher than one (1) foot above grade. Openings may be equipped with screens, louvers, valves, or other coverings or devices provided that they permit the automatic entry and exit of flood waters.

Sec. 7-30 MANUFACTURED HOMES

- 1. All manufactured homes to be placed within all unnumbered and numbered A zones, AE, and AH zones, on the community's FIRM shall be required to be installed using methods and practices that minimize flood damage. For the purposes of this requirement, manufactured homes must be elevated and anchored to resist flotation, collapse, or lateral movement. Methods of anchoring may include, but are not limited to, use of over-the-top or frame ties to ground anchors.
- 2. Require manufactured homes that are placed or substantially improved within unnumbered or numbered A zones, AE, and AH zones, on the community's FIRM on sites:
 - a. Outside of a manufactured home park or subdivision;
 - b. In a new manufactured home park or subdivision;

- c. In an expansion to an existing manufactured home park or subdivision; or
 - d. In an existing manufactured home park or subdivision on which a manufactured home has incurred substantial-damage as the result of a flood, be elevated on a permanent foundation such that the lowest floor of the manufactured home is elevated a minimum of one (1) foot above the base flood elevation and be securely attached to an adequately anchored foundation system to resist flotation, collapse, and lateral movement. The elevation of the lowest floor shall be certified by a Kansas licensed land surveyor or Professional Engineer.
3. Require that manufactured homes to be placed or substantially improved on sites in an existing manufactured home park or subdivision within all unnumbered and numbered A zones, AE and AH zones, on the community's FIRM, that are not subject to the provisions of Article 4, Section C(2) of this ordinance, be elevated so that either:
- a. The lowest floor of the manufactured home is a minimum of one (1) foot above the base flood level; or
 - b. The manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than thirty-six (36) inches in height above grade and be securely attached to an adequately anchored foundation system to resist flotation, collapse, and lateral movement. The elevation of the lowest floor shall be certified by a Kansas licensed land surveyor or Professional Engineer.

Sec. 7-31 AREAS OF SHALLOW FLOODING (AO and AH zones)

Located within the areas of special flood hazard as described in Article 2, Section A are areas designated as AO zones. These areas have special flood hazards associated with base flood depths of one (1) to three (3) feet where a clearly defined channel does not exist and where the path of flooding is unpredictable and indeterminate. The following provisions apply:

1. *AO Zones*
 - a. All new construction and substantial-improvements of residential structures, including manufactured homes, shall have the lowest floor, including basement, elevated above the highest adjacent grade at least as high as the depth number specified in feet on the community's FIRM (at least two (2) feet if no depth number is specified).
 - b. All new construction and substantial-improvements of any commercial, industrial, or other non-residential structures, including manufactured homes, shall have the lowest floor, including basement, elevated above the highest adjacent grade at least as high as the depth number specified in feet on the community FIRM (at least two (2) feet if no depth number is specified) or

together with attendant utilities and sanitary facilities be completely floodproofed to that so that the structure is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy.

c. Adequate drainage paths shall be required around structures on slopes, in order to guide floodwaters around and away from proposed structures.

2. *AH Zones*

a. The specific standards for all areas of special flood hazard where base flood elevation has been provided shall be required as set forth in Article 4, Section B.

b. Adequate drainage paths shall be required around structures on slopes, in order to guide floodwaters around and away from proposed structures.

Sec. 7-32 FLOODWAY

Located within areas of special flood hazard established in Article 2, Section A, are areas designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of floodwaters that carry debris and potential projectiles, the following provisions shall apply:

1. The community shall select and adopt a regulatory floodway based on the principle that the area chosen for the regulatory floodway must be designed to carry the waters of the base flood without increasing the water surface elevation of that flood more than one (1) foot at any point.
2. The community shall prohibit any encroachments, including fill, new construction, substantial improvements, and other development within the adopted regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base flood discharge.
3. If Article 4, Section E(2), is satisfied, all new construction and substantial-improvements shall comply with all applicable flood hazard reduction provisions of Article 4.
4. In unnumbered A zones, the community shall obtain, review, and reasonably utilize any base flood elevation or floodway data currently available from Federal, State, or other sources as set forth in Article 4, Section A(2).

Sec. 7-33 RECREATIONAL VEHICLES

Require that recreational vehicles placed on sites within all unnumbered and numbered A Zones, AE, AH, and AO Zones on the community's FIRM either:

1. Be on the site for fewer than 180 consecutive days, or
2. Be fully licensed and ready for highway use*; or
3. Meet the permitting, elevation, and anchoring requirements for manufactured homes of this ordinance.

*A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick-disconnect type utilities and security devices, and has no permanently attached additions.

ARTICLE 5 FLOODPLAIN MANAGEMENT VARIANCE PROCEDURES

Sec. 7-34 ESTABLISHMENT OF APPEAL BOARD

The Board of Zoning Appeals, as established by the City of Merriam, Kansas shall hear and decide appeals and requests for variances from the floodplain management requirements of this ordinance.

Sec. 7-35 RESPONSIBILITY OF APPEAL BOARD

Where an application for a floodplain development permit is denied by the Floodplain Administrator, the applicant may apply for such floodplain development permit directly to the Appeal Board, as defined in Article 5, Section A.

The Appeal Board shall hear and decide appeals when it is alleged that there is an error in any requirement, decision, or determination made by the Floodplain Administrator in the enforcement or administration of this ordinance.

Sec. 7-36 FURTHER APPEALS

Any person aggrieved by the decision of the Appeal Board or any taxpayer may appeal such decision to the District Court as provided in K.S.A. 12-759 and 12-760.

Sec. 7-37 FLOODPLAIN MANAGEMENT VARIANCE CRITERIA

In passing upon such applications for variances, the Appeal Board shall consider all technical data and evaluations, all relevant factors, standards specified in other sections of this ordinance, and the following criteria:

1. Danger to life and property due to flood damage;

2. Danger that materials may be swept onto other lands to the injury of others;
3. Susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner;
4. Importance of the services provided by the proposed facility to the community;
5. Necessity to the facility of a waterfront location, where applicable;
6. Availability of alternative locations, not subject to flood damage, for the proposed use;
7. Compatibility of the proposed use with existing and anticipated development;
8. Relationship of the proposed use to the comprehensive plan and floodplain management program for that area;
9. Safety of access to the property in times of flood for ordinary and emergency vehicles;
10. Expected heights, velocity, duration, rate of rise and sediment transport of the flood waters, if applicable, expected at the site; and,
11. Costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, and water systems; streets; and bridges.

Sec. 7-38 CONDITIONS FOR APPROVING FLOODPLAIN MANAGEMENT VARIANCES

1. Generally, variances may be issued for new construction and substantial-improvements to be erected on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, providing items two (2) through six (6) below have been fully considered. As the lot size increases beyond the one-half acre, the technical justification required for issuing the variance increases.
2. Variances may be issued for the reconstruction, rehabilitation, or restoration of structures listed on the National Register of Historic Places, the State Inventory of Historic Places, or local inventory of historic places upon determination, provide the proposed activity will not preclude the structure's continued historic designation.
3. Variances shall not be issued within any designated floodway if any significant increase in flood discharge would result.
4. Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.

5. Variances shall only be issued upon: (a) showing of good and sufficient cause, (b) determination that failure to grant the variance would result in exceptional hardship to the applicant, and (c) determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public, or conflict with existing local laws or ordinances.
6. A community shall notify the applicant in writing over the signature of a community official that: (a) the issuance of a variance to construct a structure below base flood level will result in increased premium rates for flood insurance up to amounts as high as \$25.00 for \$100.00 of insurance coverage and (b) such construction below the base flood level increases risks to life and property. Such notification shall be maintained with the record of all variance actions as required by this ordinance.

ARTICLE 6 PENALTIES FOR VIOLATION

Violation of the provisions of this ordinance or failure to comply with any of its requirements (including violations of conditions and safeguards established in connection with granting of variances) shall constitute a misdemeanor. Any person who violates this ordinance or fails to comply with any of its requirements shall, upon conviction thereof, be fined not more than \$500, and in addition, shall pay all costs and expenses involved in the case. Each day such violation continues, shall be considered a separate offense. Nothing herein contained shall prevent the City of Merriam, Kansas or other appropriate authority from taking such other lawful action as is necessary to prevent or remedy any violation.

ARTICLE 7 AMENDMENTS

The regulations, restrictions, and boundaries set forth in this ordinance may from time to time be amended, supplemented, changed, or appealed to reflect any and all changes in the National Flood Disaster Protection Act of 1973, provided, however, that no such action may be taken until after a public hearing in relation thereto, at which parties of interest and citizens shall have an opportunity to be heard. Notice of the time and place of such hearing shall be published in a newspaper of general circulation in Merriam, Kansas. At least twenty (20) days shall elapse between the date of this publication and the public hearing. A copy of such amendments will be provided to the FEMA Region VII office. The regulations of this ordinance are in compliance with the NFIP regulations.

ARTICLE 8 DEFINITIONS

Unless specifically defined below, words or phrases used in this ordinance shall be interpreted so as to give them the same meaning they have in common usage and to give this ordinance its most reasonable application.

"100-year Flood" *see "base flood."*

"Accessory Structure" means the same as *"appurtenant structure."*

"Actuarial Rates" *see "risk premium rates."*

"Administrator" means the Federal Insurance Administrator.

"Agency" means the Federal Emergency Management Agency (FEMA).

"Appeal" means a request for review of the Floodplain Administrator's interpretation of any provision of this ordinance or a request for a variance.

"Appurtenant Structure" means a structure that is on the same parcel of property as the principle structure to be insured and the use of which is incidental to the use of the principal structure.

"Area of Shallow Flooding" means a designated AO or AH zone on a community's Flood Insurance Rate Map (FIRM) with a one percent or greater annual chance of flooding to an average depth of one (1) to three (3) feet where a clearly defined channel does not exist, where the path of flooding is unpredictable and where velocity flow may be evident. Such flooding is characterized by ponding or sheet flow.

"Area of Special Flood Hazard" is the land in the floodplain within a community subject to a one percent or greater chance of flooding in any given year.

"Base Flood" means the flood having a one percent chance of being equaled or exceeded in any given year.

"Basement" means any area of the structure having its floor subgrade below ground level on all sides.

"Building" *see "structure."*

"Chief Engineer" means the chief engineer of the division of water resources, Kansas Department Of Agriculture.

"Chief Executive Officer" or "Chief Elected Official" means the official of the community who is charged with the authority to implement and administer laws, ordinances, and regulations for that community.

"Community" means any State or area or political subdivision thereof, which has authority to adopt and enforce floodplain management regulations for the areas within its jurisdiction.

"Development" means any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, levees, levee systems, mining, dredging, filling, grading, paving, excavation or drilling operations, or storage of equipment or materials.

"Elevated Building" means for insurance purposes, a non-basement building which has its lowest elevated floor raised above ground level by foundation walls, shear walls, posts, piers, pilings, or columns.

"Eligible Community" or "Participating Community" means a community for which the Administrator has authorized the sale of flood insurance under the National Flood Insurance Program (NFIP).

"Existing Construction" means for the purposes of determining rates, structures for which the *"start of construction"* commenced before the effective date of the FIRM or before January 1, 1975, for FIRMs effective before that date. *"Existing construction"* may also be referred to as *"existing structures."*

"Existing Manufactured Home Park or Subdivision" means a manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including, at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed before the effective date of the floodplain management regulations adopted by a community.

"Expansion to an Existing Manufactured Home Park or Subdivision" means the preparation of additional sites by the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads).

"Flood" or "Flooding" means a general and temporary condition of partial or complete inundation of normally dry land areas from: (1) the overflow of inland waters; (2) the unusual and rapid accumulation or runoff of surface waters from any source; and (3) the collapse or subsidence of land along the shore of a lake or other body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm, or by an unanticipated force of nature, such as flash flood, or by some similarly unusual and unforeseeable event which results in flooding as defined above in item (1).

"Flood Boundary and Floodway Map (FBFM)" means an official map of a community on which the Administrator has delineated both special flood hazard areas and the designated regulatory floodway.

"Flood Elevation Determination" means a determination by the Administrator of the water surface elevations of the base flood, that is, the flood level that has a one percent or greater chance of occurrence in any given year.

"Flood Elevation Study" means an examination, evaluation and determination of flood hazards.

"Flood Fringe" means the area outside the floodway encroachment lines, but still subject to inundation by the regulatory flood.

"Flood Hazard Boundary Map (FHBM)" means an official map of a community, issued by the Administrator, where the boundaries of the flood areas having special flood hazards have been designated as (unnumbered or numbered) A zones.

"Flood Hazard Map" means the document adopted by the governing body showing the limits of: (1) the floodplain; (2) the floodway; (3) streets; (4) stream channel; and (5) other geographic features.

"Flood Insurance Rate Map (FIRM)" means an official map of a community, on which the Administrator has delineated both the special flood hazard areas and the risk premium zones applicable to the community.

"Flood Insurance Study (FIS)" means an examination, evaluation and determination of flood hazards and, if appropriate, corresponding water surface elevations.

"Floodplain" or "Flood-prone Area" means any land area susceptible to being inundated by water from any source (*see "flooding"*).

"Floodplain Management" means the operation of an overall program of corrective and preventive measures for reducing flood damage, including but not limited to emergency preparedness plans, flood control works, and floodplain management regulations.

"Floodplain Management Regulations" means zoning ordinances, subdivision regulations, building codes, health regulations, special purpose ordinances (such as floodplain and grading ordinances) and other applications of police power. The term describes such state or local regulations, in any combination thereof, that provide standards for the purpose of flood damage prevention and reduction.

"Floodproofing" means any combination of structural and nonstructural additions, changes, or adjustments to structures that reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, or structures and their contents.

"Floodway" or "Regulatory Floodway" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot.

"Floodway Encroachment Lines" means the lines marking the limits of floodways on Federal, State and local floodplain maps.

"Freeboard" means a factor of safety usually expressed in feet above a flood level for purposes of floodplain management. *"Freeboard"* tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions, such as bridge openings and the hydrological effect of urbanization of the watershed.

"Functionally Dependent Use" means a use that cannot perform its intended purpose unless it is located or carried out in close proximity to water. This term includes only docking facilities and facilities that are necessary for the loading and unloading of cargo or passengers, but does not include long-term storage or related manufacturing facilities.

"Highest Adjacent Grade" means the highest natural elevation of the ground surface prior to construction next to the proposed walls of a structure.

"Historic Structure" means any structure that is (a) listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register; (b) certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district; (c) individually listed on a state inventory of historic places in states with historic preservation programs which have been approved by the Secretary of the Interior; or (d) individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either (1) by an approved state program as determined by the Secretary of the Interior or (2) directly by the Secretary of the Interior in states without approved programs.

"Lowest Floor" means the lowest floor of the lowest enclosed area, including basement. An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access, or storage, in an area other than a basement area, is not considered a building's lowest floor, **provided** that such enclosure is not built so as to render the structure in violation of the applicable floodproofing design requirements of this ordinance.

"Manufactured Home" means a structure, transportable in one or more sections, that is built on a permanent chassis and is designed for use with or without a permanent foundation when attached to the required utilities. The term *"manufactured home"* **does not include** a *"recreational vehicle."*

"Manufactured Home Park or Subdivision" means a parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.

"Map" means the Flood Hazard Boundary Map (FHBM), Flood Insurance Rate Map (FIRM), or the Flood Boundary and Floodway Map (FBFM) for a community issued by the Federal Emergency Management Agency (FEMA).

"Market Value" or "Fair Market Value" means an estimate of what is fair, economic, just and equitable value under normal local market conditions.

"Mean Sea Level" means, for purposes of the National Flood Insurance Program (NFIP), the National Geodetic Vertical Datum (NGVD) of 1929 or other datum, to which base flood elevations shown on a community's Flood Insurance Rate Map (FIRM) are referenced.

"New Construction" means, for the purposes of determining insurance rates, structures for which the *"start of construction"* commenced on or after the effective date of an initial FIRM or after December 31, 1974, whichever is later, and includes any subsequent improvements to such structures. For floodplain management purposes, *"new construction"* means structures for which the *"start of construction"* commenced on or after the effective date of the floodplain management regulations adopted by a community and includes any subsequent improvements to such structures.

"New Manufactured Home Park or Subdivision" means a manufactured home park or subdivision for which the construction of facilities for servicing the lot on which the manufactured homes are to be affixed (including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed on or after the effective date of floodplain management regulations adopted by the community.

"(NFIP)" means the National Flood Insurance Program (NFIP).

"Participating Community" also known as an *"eligible community,"* means a community in which the Administrator has authorized the sale of flood insurance.

"Permit" means a signed document from a designated community official authorizing development in a floodplain, including all necessary supporting documentation such as: (1) the site plan; (2) an elevation certificate; and (3) any other necessary or applicable approvals or authorizations from local, state or federal authorities.

"Person" includes any individual or group of individuals, corporation, partnership, association, or any other entity, including Federal, State, and local governments and agencies.

"Principally Above Ground" means that at least 51 percent of the actual cash value of the structure, less land value, is above ground.

"Recreational Vehicle" means a vehicle which is (a) built on a single chassis; (b) 400 square feet or less when measured at the largest horizontal projections; (c) designed to be self-propelled or permanently able to be towed by a light-duty truck; and (d) designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.

"Remedy A Violation" means to bring the structure or other development into compliance with Federal, State, or local floodplain management regulations; or, if this is not possible, to reduce the impacts of its noncompliance.

"Risk Premium Rates" means those rates established by the Administrator pursuant to individual community studies and investigations, which are undertaken to provide flood insurance in accordance with Section 1307 of the National Flood Disaster Protection Act of 1973 and the accepted actuarial principles. *"Risk premium rates"* include provisions for operating costs and allowances.

"Special Flood Hazard Area" *see "area of special flood hazard."*

"Special Hazard Area" means an area having special flood hazards and shown on an FHBM, FIRM or FBFM as zones (unnumbered or numbered) A, AO, AE, or AH.

"Start of Construction" includes substantial-improvements, and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition placement, or other improvements were within 180 days of the permit date. The *actual start* means either the first placement of permanent construction of a structure on a site, such as the pouring of slabs or footings, the installation of piles, the construction of columns, any work beyond the stage of excavation, or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling, the installation of streets and/or walkways, excavation for a basement, footings, piers, foundations, the erection of temporary forms, nor installation on the property of accessory structures, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial-improvement, the *actual start of construction* means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

"State Coordinating Agency" means the Division of Water Resources, Kansas Department of Agriculture, or other office designated by the governor of the state or by state statute at the request of the Administrator to assist in the implementation of the National Flood Insurance Program (NFIP) in that state.

"Structure" means, for floodplain management purposes, a walled and roofed building, including a gas or liquid storage tank, that is principally above ground, as well as a manufactured home. *"Structure"* for insurance purposes, means a walled and roofed building, other than a gas or liquid storage tank that is principally above ground and affixed to a permanent site, as well as a manufactured home on a permanent foundation. For the latter purpose, the term includes a building while in the course of construction, alteration or repair, but does not include building materials or supplies intended for use in such construction, alteration or repair, unless such materials or supplies are within an enclosed building on the premises.

"Substantial-Damage" means damage of any origin sustained by a structure whereby the cost of restoring the structure to pre-damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

"Substantial-Improvement" means any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before *"start of construction"* of the improvement. This term includes structures, which have incurred *"substantial-damage,"* regardless of the actual repair work performed. The term does not, however, include either (1) any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications that have been identified by the local code enforcement official and which are

the minimum necessary to assure safe living conditions, or (2) any alteration of a *"historic structure,"* provided that the alteration will not preclude the structure's continued designation as a *"historic structure."*

"Variance" means a grant of relief by the community from the terms of a floodplain management regulation. Flood insurance requirements remain in place for any varied use or structure and cannot be varied by the community.

"Violation" means the failure of a structure or other development to be fully compliant with the community's floodplain management regulations. A structure or other development without the elevation certificate, other certifications, or other evidence of compliance required by this ordinance is presumed to be in violation until such time as that documentation is provided.

"Water Surface Elevation" means the height, in relation to the National Geodetic Vertical Datum (NGVD) of 1929 (or other datum where specified) of floods of various magnitudes and frequencies in the floodplain.

ARTICLE 9. STORMWATER POLLUTION PREVENTION ACT

7-91. Title.

The title of Merriam Code Sections 7-91 through 7-99, inclusive, shall be known as the Stormwater Pollution Prevention Act ("Act").

7-92. Purpose and Findings.

- A. The purpose of this Act shall be to prevent the discharge of pollutants from land and activities within the City into the municipal separate storm sewer system (MS4) and/or into surface waters.
- B. The Governing Body of the City hereby finds that pollutants are discharged into surface waters, both through inappropriate non-stormwater discharges into the MS4 or the surface waters directly, and through the wash off and transport of pollutants found on the land and built surfaces by stormwater during rainfall events.
- C. Further, the Governing Body of the City hereby finds that such discharge of pollutants may lead to increased risks of disease and harm to individuals, particularly children, who come into contact with the water; may degrade the quality of such water for human uses, such as drinking, irrigation, recreation, and industry; and may damage the natural ecosystems of rivers, streams, lakes and wetlands, leading to a decline in the diversity and abundance of plants and animals.
- D. Further, the Governing Body of the City hereby finds that this ordinance will promote public awareness of the hazards involved in the improper discharge of trash, yard waste, lawn chemicals, pet waste, wastewater, oil, petroleum products, cleaning products, paint products, hazardous waste, sediment and other pollutants into the storm drainage system.

- E. Further, the Governing Body of the City hereby finds that such discharges are inconsistent with the provisions and goals of the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES), and other federal and state requirements for water quality and environmental preservation.
- F. Further, the Governing Body of the City hereby finds that a reasonable establishment of restrictions and regulations on activities within the City is necessary to eliminate or minimize such discharges of pollutants, to protect the health and safety of citizens, to preserve economic and ecological value of existing water resources within the City and within downstream communities, and to comply with the provisions of the City's responsibilities under the Clean Water Act and the NPDES program.

7-93. Abbreviations.

The following abbreviations when used in this Act shall have the designated meanings:

BMP	Best Management Practice
CFR	Code of Federal Regulations
EPA	Environmental Protection Agency
HHW	Household Hazardous Waste
KDHE	Kansas Department of Health and Environment
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
PST	Petroleum Storage Tank

7-94. Definitions.

For the purposes of this Act, the following definitions shall apply:

- A. **"Best management practices (BMPs)"** means schedules of activities, prohibitions of practices, general good house keeping practices, pollution prevention and educational practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants directly or indirectly to stormwater, receiving waters, or stormwater conveyance systems. BMPs also include treatment practices, operating procedures, and practices to control site runoff, spillage or leaks, sludge or water disposal, or drainage from raw materials storage.
- B. **"Car"** means any vehicle meeting the definition for passenger car, bus, motorcycle or recreational vehicle given in the Standard Traffic Ordinance incorporated into Chapter 27 of the Code.
- C. **"City"** means the City of Merriam, Kansas.
- D. **"Clean Water Act"** means the federal Water Pollution Control Act (33 U.S.C. Section 1251 et seq.), and any subsequent amendments thereto.

- E. "**Code**" means the Code of Ordinances, City of Merriam, Kansas, also known as the Merriam Code.
- F. "**Director**" means the Community Development Director or the Director's authorized representative.
- G. "**Discharge**" means the addition or introduction, directly or indirectly, of any pollutant, stormwater, or any other substance into the MS4 or surface waters.
- H. "**Domestic sewage**" means human excrement, gray water (from home clothes washing, bathing, showers, dishwashing, and food preparation), other wastewater from household drains, and waterborne waste normally discharged from the sanitary conveniences of dwellings (including apartment houses and hotels), office buildings, retail and commercial establishments, factories, and institutions, that is free from industrial waste.
- I. "**Extremely hazardous substance**" means any substance listed in the appendices to 40 CFR Part 355, Emergency Planning and Notification.
- J. "**Fertilizer**" means a substance or compound that contains a plant nutrient element in a form available to plants and is used primarily for its plant nutrient element content in promoting or stimulating growth of a plant or improving the quality of a crop, or a mixture of two or more fertilizers.
- K. "**Hazardous household waste (HHW)**" means any material generated in a household (including single and multiple residences) by a consumer which, except for the exclusion provided in 40 CFR Section 261.4(b)(1), would be classified as a hazardous waste under 40 CFR Part 261 or K.A.R 28-29-23b.
- L. "**Hazardous substance**" means any substance listed in Table 302.4 of 40 CFR Part 302.
- M. "**Hazardous waste**" means any substance identified or listed as a hazardous waste by the EPA pursuant to 40 CFR Part 261.
- N. "**Industrial waste**" means any waterborne liquid or solid substance that results from any process of industry, manufacturing, mining, production, trade, or business.
- O. "**Municipal separate storm sewer system (MS4)**" means the system of conveyances, (including roads with drainage systems, municipal streets, private streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) owned and operated by the City and designed or used for collecting or conveying stormwater, and which is not used for collecting or conveying sewage.
- P. "**NPDES**" means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing

pretreatment requirements under Sections 307, 402, 318 and 405 of the federal Clean Water Act.

- Q. **"NPDES permit"** means for the purpose of this chapter, a permit issued by United States Environmental Protection Agency (EPA) or the state of Kansas that authorizes the discharge of pollutants to waters of the United States, whether the permit is applicable on an individual, group, or general area-wide basis.
- R. **"Oil"** means any kind of oil in any form, including but not limited to: petroleum, fuel oil, crude oil, synthetic oil, motor oil, bio-fuel, cooking oil, grease, sludge, oil refuse, and oil mixed with waste.
- S. **"Person"** means any individual, partnership, co-partnership, firm, company, corporation, association, joint stock company, trust, estate, governmental entity, or any other legal entity; or their legal representatives, agents, or assigns, including all federal, state, and local governmental entities.
- T. **"Pesticide"** means a substance or mixture of substances intended to prevent, destroy, repel, or migrate any pest, or substances intended for use as a plant regulator, defoliant, or desiccant.
- U. **"Petroleum Product"** means a product that is obtained from distilling and processing crude oil and that is capable of being used as a fuel or lubricant in a motor vehicle, boat or aircraft including motor oil, motor gasoline, gasohol, other alcohol blended fuels, aviation gasoline, kerosene, distillate fuel oil and #1 and #2 diesel fuel.
- V. **"Pollutant"** means any substance or material which contaminates or adversely alters the physical, chemical or biological properties of the waters including changes in temperature, taste, odor, turbidity, or color of the water. Such substance or material may include but is not limited to, dredged spoil, spoil waste, incinerator residue, sewage, pet and livestock waste, garbage, sewage sludge, munitions, chemical waste, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, soil, yard waste, hazardous household wastes, oil and petroleum products, used motor oil, anti-freeze, litter, pesticides, and industrial, municipal, and agricultural waste discharged into water.
- W. **"Property Owner"** shall mean the named property owner as indicated by the records of the Johnson County Kansas Records and Tax Administration;
- X. **"Release"** means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the MS4 and/or surface waters.
- Y. **"Sanitary sewer"** means the system of pipes, conduits, and other conveyances which carry industrial waste and domestic sewage from residential dwellings, commercial buildings, industrial and manufacturing facilities, and institutions, whether treated or

untreated, to a sewage treatment plant and to which stormwater, surface water, and groundwater are not intentionally admitted.

- Z. **"Septic tank waste"** means any domestic sewage from holding tanks such as vessels, chemical toilets, campers, trailers, and septic tanks.

- AA. **"Sewage"** means the domestic sewage and/or industrial waste that is discharged into the sanitary sewer system and passes through the sanitary sewer system to a sewage treatment plant for treatment.

- BB. **"State"** means the state of Kansas.

- CC. **"Stormwater"** means stormwater runoff, snow melt runoff, and surface runoff and drainage.

- DD. **"Surface waters"** means any body of water classified as "surface waters" by the state of Kansas, including streams, rivers, creeks, brooks, sloughs, draws, arroyos, canals, springs, seeps, cavern streams, alluvial aquifers associated with these surface waters, lakes, man-made reservoirs, oxbow lakes, ponds, and wetlands, as well as any other body of water classified by the federal government as a "water of the United States".

- EE. **"Waste"** means any garbage, refuse, sludge or other discarded material which is abandoned or committed to treatment, storage or disposal, including solid, liquid, semisolid or contained gaseous materials resulting from industrial, commercial mining, community and agricultural activities. Waste does not include solid or dissolved materials in domestic sewage or irrigation return flows or solid or dissolved materials or industrial discharges which are point sources subject to permits under the State of Kansas. The Federal definition of solid waste is found at 40 CFR 257.2.

- FF. **"Water quality standard"** means the law or regulation that consists of the beneficial designated use or uses of a water body, the numeric and narrative water quality criteria that are necessary to protect the use or uses of that particular water body, and an antidegradation statement.

7-95. General Prohibition.

- A. No person shall release or cause to be released into the MS4, or into any surface water within the City, any discharge that is not composed entirely of stormwater that is free of pollutants, except as allowed in subsection B.

- B. Unless identified by the City or KDHE as a significant source of pollutants to surface water the following non-stormwater discharges are deemed acceptable and not a violation of this section:
 - 1. water line flushing;
 - 2. diverted stream flow;

3. rising groundwater;
4. uncontaminated groundwater infiltration as defined under 40 CFR 35.2005(20) to separate storm sewers;
5. uncontaminated pumped groundwater;
6. contaminated groundwater if authorized by KDHE and approved by the municipality;
7. discharges from potable water sources;
8. foundation drains;
9. air conditioning condensate;
10. irrigation waters;
11. springs;
12. water from crawl space pumps;
13. footing drains;
14. individual residential car washing;
15. flows from riparian habitats and wetlands;
16. dechlorinated swimming pool discharges excluding filter backwash;
17. street wash waters (excluding street sweepings which have been removed from the street);
18. discharges or flows from emergency fire fighting activities;
19. heat pump discharge waters (residential only);
20. treated wastewater or other discharges meeting requirements of a NPDES permit;
and
21. other discharges determined not to be a significant source of pollutants to waters of
the state, a public health hazard or a nuisance.
22. Discharges specified in writing by the Director as being necessary to protect public health and safety.

- C. Notwithstanding the provisions of subsection B of this section, any discharge shall be prohibited by this section if the discharge in question has been determined by the Director to be a source of a pollutants to the MS4 or to surface waters, written notice of such determination has been provided to the property owner or person responsible for such discharges, and the discharge has occurred more than ten days beyond such notice.

7-96. Specific Prohibitions and Duties.

The specific prohibitions and requirements in this section are not inclusive of all the discharges prohibited by the general prohibition in Section 7-95, but are provided to address specific discharges that are frequently found or are known to occur:

- A. No person shall release or allow to be released any of the following substances into the MS4:
1. Any new or used petroleum product or waste, antifreeze or oil;
 2. Any industrial waste;
 3. Any hazardous substance or hazardous waste, including household hazardous waste;
 4. Any domestic sewage or septic tank waste, grease trap or grease interceptor waste, holding tank waste, or grit trap waste;
 5. Any garbage, rubbish or other waste;
 6. Any new or used paints, including latex-based paints, oil-based paints, stains, varnish, and primers, as well as cleaning solvents and other associated products;
 7. Any yard wastes which have been moved or gathered by a person;
 8. Any wastewater that contains soap, detergent, degreaser, solvent, or surfactant based cleaner from a commercial motor vehicle wash facility; from any vehicle washing, cleaning, or maintenance at any new or used motor vehicle dealership, rental agency, body shop, repair shop, or maintenance facility; or from any washing, cleaning, or maintenance of any business or commercial or public service vehicle, including a truck, bus or heavy equipment, provided that those businesses operating in the city on October 1, 2006 whose practices and uses would otherwise fall within the provisions of this subsection shall have until October 1, 2008 to comply with this subsection;
 9. Any wastewater from a commercial mobile power washer or from the washing or other cleaning of a building exterior that contains soap, detergent, degreaser, solvent, or any surfactant based cleaner;

10. Any wastewater from commercial floor, rug, or carpet cleaning;
 11. Any wastewater from the washdown or other cleaning of pavement that contains any soap, detergent solvent, degreaser, emulsifier, dispersant, or other cleaning substance; or any wastewater from the wash-down or other cleaning of any pavement where any spill, leak, or other release of oil, motor fuel, or other petroleum or hazardous substance has occurred, unless all such materials have been previously removed;
 12. Any effluent from a cooling tower, condenser, compressor, emissions scrubber, emission filter, or the blowdown from a boiler;
 13. Any ready-mixed concrete, mortar, ceramic, or asphalt base material or discharge resulting from the cleaning of vehicles or equipment containing or used in transporting or applying such material;
 14. Any runoff, washdown water or waste from any animal pen, kennel, fowl or livestock containment area or any pet wastes generally;
 15. Any filter backwash from a swimming pool or fountain, except that nothing in this ordinance shall be construed as to require the alteration of the filter discharge plumbing of an existing swimming pool, fountain or spa if such plumbing was compliant with applicable state, federal, and local regulations at the time of construction;
 16. Any swimming pool, fountain or spa water containing a harmful level of chlorine (> 0 parts per million), muriatic acid or other chemical used in the treatment or disinfection of the water or during cleaning of the facility;
 17. Any discharge from water line disinfection by super chlorination if it contains a harmful level of chlorine (>0 parts per million) at the point of entry into the MS4 or surface waters;
 18. Any contaminated runoff from a vehicle wrecking or storage yard;
 19. Any substance or material that will damage, block, or clog the MS4;
 20. Any release from a petroleum storage tank (PST), or any leachate or runoff from soil contaminated by leaking PST; or any discharge of pumped, confined, or treated wastewater from the remediation of any such PST release, unless the discharge has received an NPDES permit from the state;
 21. Any other discharge that causes or contributes to causing the City to violate a state water quality standard, the City's NPDES stormwater permit, or any state-issued discharge permit for discharges from its MS4.
- B. No person shall introduce or cause to be introduced into the MS4 any harmful quantity of sediment, silt, earth, soil, or other material associated with clearing,

grading, excavation or other construction activities in excess of what could be retained on site or captured by employing sediment and erosion control measures, except as allowed for in conformance with the Merriam Code.

- C. No person shall connect a line conveying sanitary sewage, domestic or industrial, to the MS4. No property owner shall allow such a connection to continue in use on their property.
- D. No person shall use pesticides, herbicides and/or fertilizers except in accordance with manufacturer recommendations. Pesticides, herbicides and fertilizers shall be stored, transported and disposed of in a manner to prevent release to the MS4.
- E. No person shall tamper with, destroy, vandalize, or render inoperable any BMPs which have been installed for the purpose of eliminating or minimizing pollutant discharges, nor shall any person fail to install or fail to properly maintain any BMPs which have been required by the City or by other local, state, or federal jurisdictions.

7-97. Inspection and Detection Program

The Director is authorized to develop and implement a plan to actively detect and eliminate prohibited discharges and connections to the MS4 or surface waters within the City. Such plan may include, but is not limited to, periodic and random inspections of facilities and businesses, particularly those most associated with potentially prohibited discharges; visual surveys of exterior practices; inspection, sampling and analyses of discharges from outfalls of the MS4, particularly during dry weather periods; manhole and pipe inspections to trace discharges through the system to point of origin; education on pollution prevention; and receipt of complaints and information from the public regarding known or suspected discharges.

7-98. Release Reporting and Cleanup.

- A. Any person responsible for the release of any prohibited material that may flow, leach, enter, or otherwise be introduced into the MS4 or surface waters shall take all necessary steps to ensure the containment and cleanup of such release.
- B. In the event of such a release of hazardous materials said person shall immediately notify emergency response agencies of the occurrence via emergency dispatch services.
- C. In the event of a release of non-hazardous materials, said person shall notify the Director in person or by phone or facsimile no later than the next business day. Notifications in person or by phone shall be confirmed by written notice addressed and mailed to the Director within three business days of the phone notice.

7-99. Enforcement; Designation of Officer; Abatement; Right of Entry; Penalty.

The Director or his or her appointed representative shall be designated as the public officer charged with the administration and enforcement of this Act. The public officer shall authorize the investigation of violations of the Act. If it is determined that a violation of this Act exists, then the officer shall declare such condition a nuisance and is authorized to pursue abatement and enforcement procedures as specified in Chapter 18 of the Code or may sign a written complaint for prosecution in the municipal court of the City. Penalties shall be as set forth in Section 1-7 of the Merriam Code.

(Ord. No. 1550, Art. 9, 09-25-06).