Definitions—to be added to Chapter 85 of the Story County Land Development Regulations

"Buffer" means an area of land and vegetative area, including desirable trees, shrubs and herbaceous plants that exists or is established to separate different land uses or mitigate a risk associated with land use or structure.

"**Channel Protection Storage Volume"** means providing for practices that will allow for extended detention of the runoff generated by a 1-year, 24-hour duration storm event. This means capturing the runoff volume from a storm of this nature, and slowly releasing it over a period of no less than 24-hours to reduce the rapid "bounce" effect common in many urban streams that leads to down cutting and streambank erosion.

"Erosion and Sediment Control" means the use of BMPs that are designed to intercept precipitation and prevent movement of soil particles, including practices that both prevent erosion and those that capture soil particles after they have been dislodged.

"**Infiltration**" means the gradual downward flow of water from the surface through soil to groundwater and water table reservoirs.

"Non-structural BMPs" means pollution prevention, education, or institutional management and development practices designed to limit the conversion of rainfall to runoff and to prevent pollutants from entering runoff at the source of runoff generation.

"**Overbank Flood Protection**" means providing on-site stormwater detention to limit runoff peak flow rates from the 5-year recurrence interval storm event to prevent downstream surcharge of conveyance systems and reduce overbank flooding.

"Post-development condition" means the extent and distribution of land cover types anticipated to occur after development activities are completed that will influence rainfall, runoff, and infiltration.

"**Pre-development condition**" means the extent and distribution of land cover types present before the initiation of the proposed land development activity.

"**Runoff**" means that portion of the precipitation on a drainage area that is discharged from the area, including surface runoff and groundwater runoff.

"**Stormwater**" means storm runoff, snowmelt runoff, and surface runoff and drainage.

"Stormwater Management" means the use of BMPs that are designed to reduce stormwater runoff, pollutant loads, discharge volumes, peak flow discharge rates and detrimental changes in stream temperature that affect water quality and habitat.

"Structural BMPs" means engineered and constructed systems that are used to treat, store, or infiltrate stormwater at the point of generation or the point of discharge.

"Time of Concentration" means the time needed for water to flow from the most remote point in a watershed to the watershed outlet. It is a function of topography, geology and land use within the watershed.

"**Water Quality Volume**" means the runoff resulting from a rainfall depth of 1.25" (90% of the rainfall events in Iowa are of this depth or less) that is required to be captured and treated. By managing these storms, the majority of water volume will be treated and many of the "first flush" pollutants of concern will be effectively managed on-site.

Amendments to Chapter 88.05 of the Story County Land Development Regulations

4. Any development that will disturb an area of one or more acres is required to obtain a National Pollutant Discharge Elimination System (NPDES) Permit.

5. ~~4.~~ Erosion and Sediment Control. ~~Any development that will "disturb" an area of one or more acres is required to obtain a National Pollutant Discharge Elimination System (NPDES) permit for its stormwater discharge.~~

A. Applicability. Any development that meets the any one of following thresholds shall be required to submit a grading permit application in addition to other applicable development permit applications prior to commencing development activities:

(1) Development that will disturb an area of 10,000 square feet or more;

(2) Development that will disturb more than 15 percent of Natural Resources Area, as identified in the Story County Cornerstone to Capstone (C2C) Comprehensive Plan, Natural Areas, as identified in the Ames Urban Fringe Plan, or naturally occurring resources on a development site;

(3) Discretion is reserved to the Planning and Development Director to require a grading permit application and corresponding erosion and sediment control plan for any development that has the potential to create negative impacts due to erosion and sedimentation.

B. Exemptions. The following exemptions to the grading permit application requirement may apply; however, such uses shall not be exempt from adopted Floodplain Management Ordinance (codified in Chapter 80 of this Code of Ordinances).

(1) Agricultural. Except to the extent required to implement Section 335.2, Code of Iowa, the grading permit application requirement shall not apply to development that is primarily adapted, by reason of nature or area, for use for agricultural purposes, while so used.

(2) County Engineer. The grading permit application requirement shall not apply to development that is for the maintenance and/or construction of public roads and public road right-of-way, completed by the Story County Engineer

C. Criteria for Erosion and Sediment Control. Sedimentation and erosion pollute waterways, degrades land, causes the loss of native vegetation and habitats, and impairs drainage. Development activities cause land to become susceptible to erosion and sedimentation by wind and water. To mitigate the impacts of erosion and sedimentation and to protect natural resources, the following criteria shall be met:

(1) Erosion and sediment control measures shall meet the *Iowa Statewide Urban Design and Specifications (SUDAS)* guidelines and shall minimize stormwater velocity and volume and the area disturbed by development activities to mitigate erosion and sedimentation.

(2) Perimeter control measures shall be installed prior to any disturbance activities, other than those necessary to install the controls, and shall be actively maintained until final stabilization of the development site.

(3) The limits of grading and clearing shall be marked on-site to protect areas that will not be disturbed.

(4) The amount of area disturbed shall be limited through staging of development activities.

(5) An undisturbed buffer zone of not less than 100 feet on both sides of surface water should be maintained at all times.

(6) Sediment basins shall be used for common drainage locations that serve an area with five (5) or more acres disturbed at one time. If properly planned, the basins may also serve as permanent stormwater management facilities to meet stormwater management criteria in Section 88.05(6) of this Chapter.

(7) Stabilization measures shall be immediately initiated for all disturbed areas after an area is no longer actively being worked or if an area will not be worked for 14 calendar days. Stabilization Natural Resources Area, as identified in the Story County Cornerstone to Capstone (C2C) Comprehensive Plan, Natural Areas, as identified in the Ames Urban Fringe Plan, naturally occurring resources, or highly erosive areas shall be prioritized.

(8) Practices to minimize soil compaction, including reducing passes made over an area with heavy equipment, not using heavy equipment when soil is wet, and discing and tilling prior to sodding and seeding shall be implemented.

(9) Topsoil shall not be removed unless required for the function of an area.

(10) Topsoil that is removed but may be used for restoration after development activities cease shall be preserved on-site and respread to the depth that originally existed.

(11) An erosion and sediment control plan shall be submitted with the grading permit application and shall include a narrative, site plan, and other attachments necessary to illustrate that the development is designed and constructed incorporating erosion and sediment control measures that meet the *Iowa SUDAS* guidelines and the requirements of this chapter. It shall also:

a. Estimate the size of the area to be disturbed, identify the limits of clearing and grading, and identify the soil-disturbing activities.

b. Identify Natural Resources Area, as identified in the Story County Cornerstone to Capstone (C2C) Comprehensive Plan, Natural Areas, as identified in the Ames Urban Fringe Plan, or naturally occurring resources, including critical areas such as steep slopes, exposed soil and rock outcrops, and watercourses

or water bodies that will be impacted by erosion or sedimentation and receive discharges from the site.

c. Identify existing and proposed topography/slopes. Contours shall be shown at intervals of not more than five feet, provided, however, that a minimum of two contours shall be shown. LIDAR contour maps may be used and can be requested from the Story County Planning and Development Department.

d. Identify soil types. The description shall include texture and erodibility. Soil types based on the U.S. Department of Agriculture Natural Resources Conservation Service Soil Survey may be used.

e. Identify drainage patterns, outlets, concentrated or sheet flow areas, and features that may impact drainage, including drainage ways, swales, buildings, streams, roads, land use, etc.

f. Identify the type, location, timing of each erosion and sediment control measure and their relationship to soil-disturbing activities and the site's character (soils, drainage patterns, slopes, etc.). Structural measures, temporary stabilization measures, and permanent stabilization measures for erosion and sediment shall be identified.

g. Describe the maintenance procedures required for each erosion and sediment control measure. Such maintenance procedures shall keep the erosion and sediment control measures functioning in an effective manner and include removal of sediment from streets, ditches, or other offsite areas.

D. Inspections and Responsibility.

(1) Story County shall have no obligation to review, check, or otherwise verify erosion and sediment control measure designs, plans, or construction. In no instance shall acceptance of such documents and approval of the grading permit by Story County be construed as approval of the design, construction, or concurrence by Story County that all criteria have been satisfied. The property owner, designer, developer, and contractors shall be fully responsible for the design, construction, and any damages resulting from erosion and sedimentation.

(2) An inspection for compliance with submitted erosion and sediment control plans and requirements of this chapter shall be conducted by Planning and Development Staff as part of the required foundation location inspection for a zoning permit or, if no zoning permit is required, after perimeter and other initial controls, as specified in the plan, have been installed but prior to the commencement of development activities.

~~A. Development that is not required to obtain a NPDES storm water discharge permit shall provide temporary sediment barriers to filter runoff so sediment stays on the site. As soon as vegetation is removed by construction activity, sediment barriers shall be used extensively in drainage ditches, waterways, and on the contour. The sediment barrier must~~

be maintained until the project is completed and placed back into a vegetative state. If the sediment barrier deteriorates to the point at which it loses its effectiveness, it shall be replaced. Sediment barriers shall be spaced in accordance with Table 88-3. The following are acceptable materials for sediment barriers:

(1) Silt Fence. A silt fence shall be designed to allow water to pass through while retaining the sediment on the site. The maximum drainage area flow to a silt fence should not exceed 1/4 acre per 100 feet of fence. Silt fences should be placed as close as possible to the undisturbed soil and shall use steel posts.

(2) Compost Filter Tubes. The particle size shall be selected in light of the soil gradations that are to be retained by the device. These devices should be installed along the contour, as with silt fences. Compost tubes shall not be placed on slopes in excess of a 10% grade. Spacing shall be determined to allow the bottom of the next higher tube to be seen from the one being installed below, and shall be placed at least five feet from the toe of a slope to provide for the formation of a sediment basin. The tubes shall be staked and additional compost placed in front of each tube to enhance the ability to collect sediment.

(3) Wattles. Wattle locations shall be established in the same manner as compost tubes, but installed in shallow trenches (two to four inches deep). Excavated materials shall be placed on the upstream side of the wattle to initiate sediment collection. The wattles shall be staked with wooden stakes and left in place during the establishment of vegetation on the slope.

Table 88-3 Maximum Sediment Barrier Spacing

SILT FENCE SPACING ON SLOPES	
Slope	**Placement Interval (feet)**
3:1 (33%)	40
4:1 (25%)	50
5:1 (20%)	60
10:1 (10%)	100
< 50:1 (2%)	150
3:1 (33%)	40
4:1 (25%)	50
5:1 (20%)	60
SILT FENCE SPACING IN DITCHES	
Ditch Grade (%)	**Approximate Spacing (feet)**
1-2	150
2-4	75
4-6	40

~~>6~~	~~25~~
~~COMPOST TUBE SPACING~~	
~~Slope~~	**~~Approximate Spacing (feet)~~**
~~10:1 (10%) - 20:1 (5%)~~	~~30~~
~~20:1 (5%) - 50:1 (2%)~~	~~50~~
~~< 50:1 (2%)~~	~~75~~
~~WATTLE SPACING~~	
~~Slope~~	**~~Approximate Spacing (feet)~~**
~~> 2:1 (50%)~~	~~10~~
~~2:1 (50%) - 4:1 (25%)~~	~~15~~
~~< 4:1 (25%)~~	~~20~~

6. Stormwater Management ~~and Water Quality~~. ~~to better replicate natural watershed hydrology and water quality, controlling runoff discharge, volume, frequency and quality to the same as predevelopment runoff conditions. Such development shall incorporate best management practices as outlined in the Iowa Storm Water Management Manual – 2D-1 General Information for BMPs, as amended, and erosion and sediment control practices that meet or exceed the Iowa Statewide Urban Design and Specifications (SUDAS) guidelines. (Ordinance No. 184) (Ordinance No. 192) (Ordinance No. 208)~~

A. Applicability. Development that meets the any one of the following thresholds shall be required to submit a stormwater management plan, in addition to other applicable development permit applications, prior to commencing development activities:

(1) Development that will result in the creation of 10,000 square feet or more of impervious surfaces;

(2) Development that will result in the division of land for three or more development lots;

(3) Development that will disturb more than 15 percent of Natural Resources Area, as identified in the Story County Cornerstone to Capstone (C2C) Comprehensive Plan, Natural Areas, as identified in the Ames Urban Fringe Plan, or naturally occurring resources on a development site;

(4) Discretion is reserved to the Planning and Development Director to require a stormwater management for any development that has the potential to create negative impacts due to stormwater runoff.

B. Exemptions. The following exemptions to the stormwater management plan requirement may apply; however, such uses shall not be exempt from adopted Floodplain Management Ordinance (codified in Chapter 80 of this Code of Ordinances).

(1) Agricultural. Except to the extent required to implement Section 335.2, Code of Iowa, the stormwater management plan requirement shall not apply to development that is primarily adapted, by reason of nature or area, for use for agricultural purposes, while so used.

(2) County Engineer. The stormwater management plan requirement shall not apply to development that is for maintenance and/or construction of public roads and public road right-of-way, completed by the Story County Engineer

C. Criteria for Stormwater Management. Stormwater runoff increases nonpoint source pollution, flooding, siltation, stream temperatures, and streambank erosion. To reduce impacts on waterbodies, groundwater, and in-stream habitat the following criteria shall be met to maintain existing flow patterns and reduce stormwater runoff rates and volumes to predevelopment rates:

(1) The stormwater management plan shall be prepared by a licensed professional engineer (PE) or landscape architect, and include a signed and dated certification under penalty of perjury by the preparer of the stormwater management plan that it complies with all requirements of this ordinance and the Iowa Stormwater Management Manual and that the County is entitled to rely upon the certification as due diligence.

(2) Soil Quality Management and Restoration Methods in the Iowa Stormwater Management Manual shall be used on all green spaces that will contain turf and other landscaping to maintain and improve infiltration.

(3) The site shall be designed to manage the water quality volume of a rainfall depth of 1.25 inches by infiltration practices that meet the guidelines in the Iowa Stormwater Management Manual.

(4) To protect stream channels, the site shall be designed to infiltrate or provide 24-hour extended detention of the channel protection volume defined as the 1 year, 24-hour storm through practices that meet the guidelines in the Iowa Stormwater Management Manual.

(5) Stormwater management shall be provided to limit the post-development rate of runoff from the site area during the 5-year through the 100-year, 24-hour storm events to runoff rates equivalent to the predevelopment rates from the same storm event.

(6) The stormwater management control plan shall include a site plan and narrative detailing how runoff and associated water quality impacts resulting from the development is proposed to be controlled or managed to meet the standards and guidelines in the Iowa Stormwater Management Manual and the requirements of this chapter. It shall also:

a. Identify the proposed structural stormwater management BMPs selected for the site, their purpose, and their location, with clear citations to the Iowa Stormwater Management Manual and County stormwater criteria.

b. Identify the subwatershed area (Hydrologic Unit Code 12) and relationship between other watersheds.

c. Identify Natural Resources Area, as identified in the Story County Cornerstone to Capstone (C2C) Comprehensive Plan, Natural Areas, as identified in the Ames Urban Fringe Plan, or naturally occurring resources, including critical areas such as steep slopes, exposed soil and rock outcrops, and watercourses or water bodies that will be impacted by stormwater runoff from the site.

d. Identify drainage patterns and stormwater conveyance patterns (including overland conveyance of the 100-year storm event), including outlets, concentrated or sheet flow areas, and features that may impact drainage, including drainage ways, swales, buildings, streams, roads, land use, etc.

e. A soil management plan as defined by the Iowa Stormwater Management Manual shall be provided and include a technical assessment of soils that identifies the soil series and the site limitations based on soils data provided in the Story County Soil Survey hosted by Natural Resources Conservation Service (NRCS). If a stormwater BMP depends on the hydraulic properties of soils, then the assessment may include soil borings and measurements of percolation/infiltration rates, as necessary.

f. Identify existing and proposed topography/slopes. Contours shall be shown at intervals of not more than five feet, provided, however, that a minimum of two contours shall be shown. LIDAR contour maps may be used and can be requested from the Story County Planning and Development Department.

g. Identify pre-development and post-development land use and proposed changes in grading, impervious area, and drainage patterns, including volume and quality. Justification of proposed changes in natural conditions may also be required.

h. Describe the maintenance procedures required for each stormwater management BMP. Such maintenance procedures shall keep the stormwater management BMPs functioning in an effective manner.

D. Inspections and Responsibility.

(1) Story County shall have no obligation to review, check, or otherwise verify the certified engineering calculations, designs, or stormwater detention facility plans and construction required to be submitted. In no instance shall the acceptance of such documents by Story County be construed as approval of the engineer or designer's design, design methods, design calculations, detention facilities plan, construction, or concurrence by Story County that all design criteria have been

satisfied. The property owner, engineer or designer, developer, and contractors shall be fully responsible for the design, construction, planning, and any damages resulting from concentrated discharge of stormwater detention facilities.

(2) An inspection for compliance with submitted stormwater management plans and requirements of this chapter shall be conducted by Planning and Development Staff as part of the required inspection for a zoning permit.