

Chapter 12

Regulatory Tools

A. Introduction

Regulatory tools can be pivotal in ensuring that a community's development protects its water resources. Many current planning regulations do not address watershed protection, and can even encourage water resource degradation. For instance, many zoning laws that are currently in place actually encourage urban sprawl, and often ignore the impacts of development on a community's natural resources. Furthermore, developers may consciously or subconsciously perceive that they have financial incentives to ignore water resource protection when developing projects, so they do not take environmental concerns into consideration. Because of the increasing importance of protecting water resources, local planning efforts are increasingly considering a wide variety of environmental issues. This new focus on the environment can have a tremendous impact on the health of local water resources.

The first step communities can take to guarantee water resource protection is to evaluate their current land use planning programs to see if changes should be made. Once this evaluation is made, it is highly probable that communities will find that their regulations can be improved. Communities can use land use regulatory tools to help prevent development in sensitive areas and control patterns of development. Zoning ordinances, subdivision regulations, and building codes all can be designed to address nonpoint source pollution on privately owned lands, and can serve to protect surface and groundwater sources.

This chapter addresses four aspects of wet growth regulatory tools.¹ First, the chapter discusses how Kentucky communities might assess their codes and ordinances for water resource protection gaps and opportunities and how they might modify these codes and ordinances, and why they might consider changes that can allow, encourage, and require sustainable development and discourage or prevent unsustainable development. Second, the chapter describes 22 different categories of ordinances or regulations that are often used to protect watersheds and water resources from the adverse impacts of land use and development. The chapter describes or refers to examples of many of these types of ordinances, some of which are reproduced in the Appendix of this handbook. Third, the chapter refers readers to some general sources of further information and examples. Finally, the chapter addresses the degree to which private property rights constrain local government regulation of land use or actually present opportunities for making development more responsible and sustainable.

¹ This chapter is drawn from a synthesis of many different sources listed in the "Sources" section at the end of the chapter. Unless a specific citation appears, the information appearing in this chapter can be found at any of a variety of sources.

B. Assessing and Modifying Codes and Ordinances

1. Overview: Identifying Regulatory Gaps and Opportunities

Local land use regulations shape whether local development, growth, and uses of land are harmful to our waters and watersheds. Local land use regulations: 1) allow or authorize certain land use and development practices; 2) encourage or facilitate certain land use and development practices; 3) restrict or prohibit certain land use or development practices; and 4) require certain land use or development practices, either as a legal obligation of land ownership or use or as a condition of a development approval that is otherwise restricted. Regulation of the aspects of land use that affect our surface waters, groundwater, water supplies, water quality, or watershed functioning is appropriate because land use and development imposes harms on others, even if inadvertent. Most advocates of limited government regulation and strong private property rights readily agree that a landowner's or developer's actions that impose harms and costs on neighbors and the public – known to economists as “negative externalities” – are properly the subject of government regulation, because private markets do not work perfectly to force the landowner or developer to bear the full costs of his/her/its land uses. Private property owners have never had the right to use their land in ways that harm others. Regulation can often be a more cost-effective way of preventing these harms, instead of relying on after-the-fact lawsuits or fines. In addition, many landowners and developers would like guidance and assistance to engage in responsible development that protects the water resources on which all of us depend, and they may find local codes and ordinance actually imposing obstacles to wet growth design and development methods.

Therefore an important aspect of achieving “wet growth” is for local communities to assess their codes and ordinances to identify regulatory gaps and weaknesses that discourage sustainable development and uses of land and allow or even encourage unsustainable development and uses of land. This chapter explores three different types of assessments and regulatory principles that Kentucky communities can use. In addition, the chapter addresses the extent to which regulatory assessment methods, regulatory principles, and specific types of ordinances apply to communities without zoning. Many of the methods and tools presented in this chapter can be adapted to Kentucky communities that have not adopted zoning.

2. Water-Resource Protection Assessments and Regulatory Goals²

This handbook has introduced many various ways that land use and development can be modified or adapted to protect water resources. Kentucky communities can assess their codes and ordinances for the ways that they allow, facilitate, or require land uses and development to protect water quality, conserve water resources, and sustain healthy watersheds, and prevent land uses and development from degrading water quality, wasting water, and altering watershed functioning.

In making these assessments and setting regulatory reform goals, Kentucky communities may want to ask the following 42 questions:

1. Does your comprehensive plan identify water-resource protection goals and policies?
2. Does your comprehensive plan contain a natural resources protection element, a water quality protection element, an open space element, and a water supply and conservation element?
3. Does your comprehensive plan incorporate any relevant watershed plans?
4. Does your comprehensive plan identify lands, areas, and sensitive (or critical) watershed features for conservation?
5. Do your codes and ordinances contain standards for rezoning, development approvals, and permits that the proposed project not adversely affect water quality, water supplies and resources, or watershed functioning (or similar water-protecting standards)?
6. Do your decision makers impose conditions or binding elements for development approvals that specify particular water-resource protection requirements for the particular project that are appropriate to the project, its location, and the likely impacts it will have unless it is conditioned or restricted?
7. Do your codes and ordinances identify riparian buffer zones – ideally greater than 100 feet but no less than 50 feet, as measured

² This section integrates many materials, including material from throughout this handbook. One additional source that was considered in developing this set of assessment questions was a draft of a “Municipal Water Quality Policy Audit Tool” that is under development with involvement by the U.S. EPA. At the time this handbook was written, the tool was still being drafted and revised. However, Kentucky communities may want to seek out this tool in the future. It provides a scoring system for a variety of water-quality policies and regulatory standards, which can aid communities in assessing their current status and set goals for future improvement.

from the top of the streambank – and restrict development in these riparian buffer zones?

8. Do your codes and ordinances prohibit development on stream banks and alteration of stream structures?
9. Do your codes and ordinances prohibit development of wetlands?
10. Do your codes and ordinances protect hillsides, steep slopes, and ridges by adopting sets of development restrictions for identified categories of land classified by slope grade and/or soils?
11. Have you zoned prime farmland for agricultural land uses and included restrictions on development and subdivision of agricultural lands in your zoning code (e.g., minimum lot sizes, restricted uses)?
12. Do your codes and ordinances prohibit any development in floodplains unless the developer can demonstrate with clear evidence that the development will have no adverse impacts upstream, downstream, or on floodplain functioning?
13. Do your codes and ordinances create aquifer recharge zones and limit development in them, including prohibition on uses and activities that pose substantial risk of contaminating groundwater, limits on ratios of impervious cover, and prohibitions on development that alters sinkholes, karst features, or key recharge elements?
14. Do your codes and ordinances include a wellhead protection program?
15. Do your codes and ordinances establish stormwater quality, quantity, and velocity standards for all development sites (performance standards), such as restrictions on water flow from the site, requirements that post-development flows do not exceed pre-development flows, restrictions on sedimentation levels, requirements that runoff be retained or detained on-site, limits on nitrogen, phosphorus, or other content of water runoff entering the stormwater sewer system?
16. Do your codes and ordinances allow or require landowners and developers to use low impact development (LID) methods and green infrastructure (described at length in Chapters 5 and 7 of this handbook)?

17. Do your land development review and approval processes provide for or encourage a pre-filing meeting between developers and local officials (planners, public works officials, water resource managers, environmental specialists, etc.) to develop a site plan that protects water resources?
18. Do your codes and ordinances allow or require narrower streets, sidewalks on only one side of the street, vegetated islands in cul-de-sacs, pervious pavement, short or shared driveways, and other street layout alternatives that minimize impervious cover (in consultation with emergency officials regarding emergency-vehicle access)?
19. Do your codes and ordinances require more points of connection between new projects and surrounding developments/neighborhoods than are necessary?
20. Do your codes and ordinances include maximum parking ratios (in addition to minimum parking ratios), allow or require various green infrastructure and pervious pavement/materials in parking lot and garage design, and allow for various parking alternatives (including shared parking agreements, credit for on-street parking) aiming to minimize overdevelopment of parking lots and parking garages?
21. Do your codes and ordinances allow reductions in the amount of required parking (credit or alternative ratios) for transit-oriented or transit-accessible projects, projects with significant bicycle parking spaces or car-pool plans, shared or on-street parking capacity, or predictably low numbers of vehicles (e.g., senior housing, affordable housing, commercial activities with few employees or customers for the space, staggered vehicle usage)?
22. Do your codes and ordinances encourage or require the use of parking garages for substantial commercial, industrial, institutional, or multi-family residential developments, instead of surface parking lots, thus reducing the overall impervious cover footprint of the parking demands of these projects?
23. Do your codes and ordinances allow or require that streets, parking lots, medians, and other transportation facilities be curbless so as to allow water to run into grassy or landscaped areas, and do they allow or require that street-side swales be used instead of conventional curb and gutter design?

24. Do your public-works/transportation policies require that major street projects retrofit existing streets and related facilities with green infrastructure or low-impact methods?
25. Do your codes and ordinances provide incentives for open space protection, and clearly establish terms for shared ownership and management of open space (e.g., for common open space)?
26. Do your codes and ordinances require developers to either set aside open space or pay open-space impact fees that are proportionate to the demand for open space created by the development (e.g., 10 acres of neighborhood and community parks for every 1,000 persons in a development)?
27. Do you have a tree preservation ordinance that requires landowners and developers to retain existing mature trees or to replace them at a ratio of equal or greater amount of tree caliper?
28. Do your codes and ordinances have landscaping requirements for most forms of development, and do they allow or favor native landscaping, large trees, substantial tree canopy ratios, rain gardens, and vegetated swales?
29. Do your codes and ordinances, or other site approval standards, require parking lots to have certain numbers, types, and sizes of trees according to parking lot size or location, a certain minimum percentage of the parking lot interior to be landscaped (e.g., 10%), or a certain minimum size for landscaped areas (e.g., minimum of 25 square feet for island planting areas), and do they require that runoff in parking lots drain to landscaped/vegetated areas?
30. Do your land development procedures and approval standards require developers and landowners to submit landscaping, tree preservation, and tree canopy plans as part of development-approval applications and site plans?
31. Do your codes and ordinances allow landowners or developers to use green roofs on buildings and parking structures, and do your site design approval processes require green roofs for certain high-runoff structures if other BMPs are not available or effective?
32. Do your codes and ordinances allow and require water conservation design and development?
33. Do your codes and ordinances preempt private covenants and deed restrictions from mandating wasteful water uses?

34. Do your codes and ordinances allow for water harvesting devices like rain barrels and cisterns, and do they prohibit private covenants and deed restrictions from restricting their use?
35. Do your codes and ordinances give landowners and developers extra credit towards conservation or set-aside requirements for conservation of especially sensitive lands and resources or restoration of degraded lands and resources (unless the degradation was caused by the landowner or developer seeking the credit)?
36. Do your codes and ordinances exempt critical water resource areas from acreage calculations for purposes of maximum density per acre?
37. Do your codes and ordinances include incentives, bonuses, and stream-lined processes for landowners and developers to use low-impact development, green infrastructure, land conservation, water conservation, smart-growth, and watershed protection methods that exceed those required by your codes and ordinances (and other relevant laws and regulations)?
38. Do your codes and ordinances include incentives and bonuses for redevelopment or re-use of already-developed sites?
39. Do your codes and ordinances contain landscaping, buffering, parking, open space, and density requirements in “infill” areas (already developed areas) that are appropriate to these areas, instead of imposing suburban or rural standards on urban or town-center locations?
40. Do your codes and ordinances allow for mixed-use developments, particularly the combination of residential and commercial/retail, thus allowing for compact, multi-use, infill development such as lofts condominiums above storefronts, among other types?
41. Do your officials require landowners or developers to post BMP/green infrastructure bonds or escrows for major BMPs or green infrastructure that are required, to ensure that these stormwater management facilities are constructed as required?
42. Do your codes and ordinances contain strong and effective enforcement provisions and require periodic inspections to ensure that development projects comply with applicable laws, regulations, and permit conditions?

*3. Better Site Design (Low-Impact Development)
Assessments and Regulatory Goals
(Using the Codes and Ordinances Worksheet)*

Better Site Design principles of low-impact development (LID), developed by the Center for Watershed Protection and the Site Planning Council, can assist Kentucky communities in evaluating and improving local ordinances to facilitate the use of LID methods. This process involves communities working through the Center for Watershed Protection's Codes and Ordinances Worksheet (COW), which is reproduced in Appendix A of this handbook. The COW awards points for certain LID or "better site design" provisions in local codes and ordinances, and localities can then add up the points to determine how their codes and ordinances fare. The worksheets and scores also indicate the kinds of changes that localities could adopt that would produce higher scores and more sustainable development. Multi-stakeholder participation in completing the COW – or at least evaluating its results – can help to build community understanding of and commitment to the specific LID standards that could shape development and land use.

The COW elements correspond to a set of Better Site Design principles, many of which can be incorporated into local codes and ordinances, whether or not the COW is actually completed and scored. These principles are listed below:

Streets and Parking Lots (Principles 1-10):

- **Model Principle 1. Street Width**
"Design residential streets for the minimum required pavement width needed to support travel lanes; on-street parking; and emergency, maintenance, and service vehicle access. These widths should be based on traffic volume."
- **Model Principle 2. Street Length**
"Reduce the total length of residential streets by examining alternative street layouts to determine the best option for increasing the number of homes per unit length."
- **Model Principle 3. Right-of-Way Width**
"Wherever possible, residential street right-of-way widths should reflect the minimum required to accommodate the travel-way, the sidewalk, and vegetated open channels. Utilities and storm drains should be located within the pavement section of the right-of-way wherever feasible."
- **Model Principle 4. Cul-de-sacs**
"Minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover."

The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.”

- Model Principle 5. Vegetated Open Channels
“Where density, topography, soils, and slope permit, vegetated open channels should be used in the street right-of-way to convey and treat stormwater runoff.”
- Model Principle 6. Parking Ratios
“The required parking ratio governing a particular land use or activity should be enforced as both a maximum and a minimum in order to curb excess parking space construction. Existing parking ratios should be reviewed for conformance taking into account local and national experience to see if lower ratios are warranted and feasible.”
- Model Principle 7. Parking Codes
“Parking codes should be revised to lower parking requirements where mass transit is available or enforceable shared parking arrangements are made.”
- Model Principle 8. Parking Lot Design
“Reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in the spillover parking areas.”
- Model Principle 9. Structured Parking
“Provide meaningful incentives to encourage structured and shared parking to make it more economically viable.”
- Model Principle 10. Parking Lot Runoff
“Wherever possible, provide stormwater treatment for parking lot runoff using bioretention areas, filter strips, and/or other practices that can be integrated into required landscaping areas and traffic islands.”

Lot Development (Principles 11-16):

- Model Principle 11. Open Space Developments
“Advocate open space design development incorporating smaller lot sizes to minimize total impervious area, reduce total construction costs, conserve natural areas, provide community recreational space, and promote watershed protection.”

- Model Principle 12. Setbacks and Frontages
“Relax side yard setbacks and allow narrower frontages to reduce total road length in the community and overall site imperviousness. Relax front setback requirements to minimize driveway lengths and reduce overall lot imperviousness.”
- Model Principle 13. Sidewalks
“Promote more flexible design standards for residential subdivision sidewalks. Where practical, consider locating sidewalks on only one side of the street and providing common walkways linking pedestrian areas.”
- Model Principle 14. Driveways
“Reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.”
- Model Principle 15. Open Space Management
“Clearly specify how community open space will be managed and designate a sustainable legal entity responsible for managing both natural and recreational open space.”
- Model Principle 16. Rooftop Runoff
“Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas and avoid routing rooftop runoff to the roadway and the storm water conveyance system.”

Conservation of Natural Areas (Principles 17-22):

- Model Principle 17. Aquatic Buffers
“Create a variable width, naturally vegetated buffer system along all perennial streams that also encompasses critical environmental features such as the 100-year floodplain, steep slopes and freshwater wetlands.”
- Model Principle 18. Buffer Maintenance
“The riparian stream buffer should be preserved or restored with native vegetation that can be maintained throughout the plan review, delineation, construction, and occupancy stages of development.”
- Model Principle 19. Clearing and Grading
“Clearing and grading of forests and native vegetation at a site should be limited to the minimum amount needed to build lots,

allow access, and provide fire protection. Manage fixed portion of any community open space as protected green space in a consolidated manner.”

- Model Principle 20. Tree Conservation
“Conserve trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native plants. Wherever practical, manage community open space, street rights-of-way, parking lot islands, and other landscaped areas to promote natural vegetation.”
- Model Principle 21. Conservation Incentives
“Incentives and flexibility in the form of density compensation, buffer averaging, property tax reduction, storm water credits, and by-right open space development should be encouraged to promote conservation of stream buffers, forests, meadows, and other areas of environmental value. In addition, off-site mitigation consistent with locally adopted watershed plans should be encouraged.”
- Model Principle 22. Stormwater Outfalls
“New stormwater outfalls should not discharge unmanaged stormwater into jurisdictional wetlands, sole-source aquifers, or other water bodies.” (Site Planning Roundtable 1999, pp. 3-6)

4. Watershed-Based Zoning

Watershed-based zoning utilizes watershed and subwatershed boundaries as a directive to make land use decisions (U.S. EPA 2005, p. 3-13). This approach to zoning reduces harmful development in sensitive watershed areas, and instead directs such development to areas that can better handle these impacts. Communities adopting watershed-based zoning modify their zoning ordinances to incorporate specific, identified watershed protection measures into all aspects of the zoning code. The steps involved in the watershed-based zoning process are as follows:

1. Conduct a comprehensive stream inventory.
2. Refine/verify impervious cover/stream quality relationships.
3. Map existing and future impervious cover at the subwatershed level.
4. Designate subwatersheds into stream quality categories based on growth patterns and attainable stream quality.
5. Modify existing comprehensive plan to meet subwatershed targets.
6. Incorporate any management priorities derived from larger watershed planning efforts.

7. Adopt specific stream protection strategies for each subwatershed. Strategies can include limits on impervious cover, stream buffers, and other protective measures.
8. Implement long-term monitoring and enforcement program to provide management feedback (Center for Watershed Protection 1995, p. 44).

5. Regulation in Communities Without Zoning

Some Kentucky counties and cities have not adopted zoning as authorized by K.R.S. ch. 100. State law does not require counties or cities to engage in comprehensive planning or to adopt zoning. Nonetheless, some of the regulatory tools described in this chapter can be used by counties or cities that have not adopted zoning.

First, Kentucky counties or cities that have not adopted zoning or a comprehensive plan may nonetheless regulate the subdivision of land under K.R.S. § 100.273(2). The authority to regulate subdivisions includes “requirements for the design of streets, blocks, lots, utilities, recreation areas, other facilities, hazardous areas, and areas subject to flooding. Such requirements may deal with all forms of land use including residential commercial, industrial, and other uses.” K.R.S. § 100.281(3). Thus, communities could adopt or modify land subdivision regulations to require specific stormwater management methods, low-impact development standards for streets and sidewalks (as well as for parking lots and driveways), green infrastructure, control of sediment and erosion, water conservation standards, or the protection of certain sensitive areas like wetlands or steep slopes as part of reviewing and approving subdivision plat applications.

Second, Kentucky communities that have not adopted zoning nevertheless have authority to regulate to protect the public health and safety, natural resources, or public infrastructure. These regulations can cover actions that would threaten the public health and safety, cause a public nuisance, degrade natural resources, or harm public infrastructure, but they cannot regulate the categories of land use (e.g., residential v. commercial) or apply to particular geographic areas of the local jurisdiction (i.e., create zones), both of which characterize zoning regulations.

Thus, if a county or city were to adopt a regulation applying to all types of land uses and all areas within its jurisdiction, it could restrict particular actions that create harms to public health, safety, natural resources, or public infrastructure, such as regulating stormwater runoff flowing off of any parcel of land, the erosion of soils and creation of sediment in waterways, the use of certain harmful chemicals that are shown to enter waterways, and physical alteration of stream banks or wetlands, among other actions. Some of the ordinances discussed below, even if adopted as zoning ordinances by communities that have planning and zoning, could be altered to be adopted as non-zoning health-and-safety ordinances by communities that do not have zoning.

C. Specific Regulatory Tools: Types of Ordinances

Communities across the United States, including in Kentucky, have been adopting ordinances to protect water resources and sustain watersheds from adverse land use and development activity. The wide range of types of ordinances already exists for communities to consider adapting to their particular needs and goals. This section briefly describes 22 different types of ordinances with references to examples of some of them.

1. Stormwater Management Ordinances

Cities or counties may want to add or improve broad stormwater management ordinances in their land development codes. A stormwater management ordinance that applies to private land development and use can be a critical aspect of a local government meeting its federal Clean Water Act requirements for management of its municipal separate storm sewer system (MS4) to prevent degradation of surface waters from stormwater runoff.

Stormwater management ordinances should focus on minimizing stormwater runoff rates and volumes and reducing the amount of pollutants in stormwater runoff. This is typically done by reducing the amount of impervious surfaces on a site and preserving the natural features of the site. However, stormwater management ordinances can also authorize and set standards for off-site stormwater control facilities, including shared off-site facilities. These facilities could include detention or retention ponds, vegetated swales or other bioretention sites, rain gardens, and the like. Stormwater management ordinances often require developers to create plans for minimizing or preventing stormwater runoff, pollution in runoff, and/or sedimentation and erosion. The ordinances sometimes require that landowners or developers obtain stormwater management permits for certain development activities or land uses, or they may require that landowners and developers create plans as part of other land development approvals like subdivision plats, conditional use permits, zoning changes, or site plan approvals. Effective stormwater management ordinances should include the following:

- guidance on best management practices (BMPs) for stormwater management;
- requirements that development projects include a construction and post-construction stormwater management plan;
- maintenance plans for stormwater management techniques; and
- enforcement measures (Northwestern Indiana Regional Planning Commission).

Attention should be given to ordinance language regarding maintenance responsibilities, because failure to maintain BMPs properly undermines their effectiveness at controlling stormwater.

Four examples demonstrate the variety of stormwater ordinances that can be adopted. The City of Oak Grove, Kentucky adopted a Storm Water Management and Control Ordinance in 2000. It requires “all significant developments” to absorb or detain on-site stormwater so that the peak discharge of water leaving the site post-development does not exceed the pre-development peak discharge. It also prohibits alterations of land’s natural drainage, water damage to neighboring properties, and erosion. Its provisions address on-site drainage systems, stormwater storage areas, detention facility design, sinkholes and subterranean water channels, the submission and content of stormwater management plans by owners or developers of significant developments, and processes for variances and enforcement. The Oak Grove ordinance is reproduced in Appendix B of this handbook.

The City of Fort Worth, Texas has a “Stormwater Protection” article in its Environment Code that: 1) prohibits any discharges to its MS4 system that are not composed entirely of stormwater (i.e., contain pollutants) subject to a variety of exceptions (e.g., discharge from firefighting by the Fire Department, discharge in full compliance with an NPDES permit, discharge from lawn watering or landscape irrigation); 2) prohibits sewage lines from being or remaining connected to the MS4 system; 3) requires a permit and registration for mobile commercial cosmetic cleaning businesses; and 4) requires a federal or state permit for any stormwater discharges from any industrial activity, including construction. Fort Worth has been known as a model for its illicit discharge prevention, detection, and removal program. The Fort Worth code provision is reproduced in Appendix C of this handbook.

In contrast, Grand Traverse County, Michigan has a Soil Erosion and Stormwater Runoff Control Ordinance that requires that anyone (except for specified government agencies) obtain a soil erosion and stormwater runoff control permit from the Drain Commissioner for any of 14 categories of proposed “earth changes” (including all industrial, commercial use, or subdivision developments regardless of size, location, or environmental sensitivity), which requires submission of a soil erosion and stormwater runoff control plan. This Grand Traverse County Soil Erosion and Stormwater Runoff Control Ordinance is reproduced in Appendix D of this handbook.

Finally, Albemarle County, Virginia requires any landowner seeking a site plan or subdivision plan approval to execute a Stormwater Management/BMP Facilities Agreement as a condition of approval and stating the landowner’s legal duties to construct and maintain certain on-site stormwater management/BMP facilities, subject to County inspection and enforcement. The Albemarle County Stormwater Management/BMP Facilities Agreement is reproduced in Appendix E of this handbook.

2. Sediment and Erosion Control Ordinances

Local ordinances addressing sediment and erosion aim to prevent one of the most pollution-generating aspects of land development. “These local laws may require the consideration of topography and soil type, the retention of as much natural vegetation as possible, and other measures for soil stabilization. Cuts and fills may be required to follow the land’s natural contours. Communities may require development proposals to include basic sediment barriers, vegetative or structural cover for soil exposed during construction, and ponds or basins to retain water and sediment. Vegetated buffers along waterways and sediment basins can also be required to protect sites adjacent to a proposed development. Development may be allowed only by special permit, and may require mitigation of damages. The phasing of construction projects can also significantly reduce erosion.” (Nolon 2003, p. 236) Examples of soil and erosion control ordinances include the City of Minneapolis, Minnesota’s “Erosion and Sediment Control for Land Disturbance Activities Ordinance,” reproduced in Appendix F of this handbook, and Grand Traverse County, Michigan’s Soil Erosion and Stormwater Runoff Control Ordinance, discussed previously in connection with stormwater management ordinances and reproduced in Appendix D of this handbook.

3. Subdivision Regulations

Subdivision regulations can be created or amended to protect water resources, and are typically essential. Through subdivision regulations, cities and counties provide for the orderly and rational subdivision of land into multiple parcels or units of ownership or possession. In general, they apply whenever a property owner wishes to divide land into more than one parcel or lot, although practically they contemplate that this subdivision is for future development, such as farmland being converted into a residential neighborhood (commonly called a residential subdivision because its development starts with subdividing the land into many different single-family residential lots). These regulations establish general site design standards and ensure that new development has the basic infrastructure to support it, such as streets of adequate capacity that connect to existing streets, water supplies and other utility services, stormwater management systems, flood control, hazards management, parks and recreation areas, and often schools that have to be developed to support new residential development. In Kentucky, the authority to regulate subdivisions includes “requirements for the design of streets, blocks, lots, utilities, recreation areas, other facilities, hazardous areas, and areas subject to flooding. Such requirements may deal with all forms of land use including residential commercial, industrial, and other uses.” K.R.S. § 100.281(3).

Subdivision regulations typically create certain requirements for the landowner or developer, which could be utilized to ensure that projects are developed using practices that protect water resources and avoid adverse impacts on sensitive lands, water quality, water supplies, and watersheds. First, site design

standards could be revised to minimize the amount of impervious surfaces used, as well as to promote the use of best practices for streets, curbs, gutters, and other drainage structures. Additionally, subdivision regulations can be used to implement dedicated area requirements to protect sensitive water resource areas. Erosion control requirements and on-site wastewater facilities can also be regulated using these tools. An example of a stormwater management facilities/best-management practices agreement that subdivision plan applicants may be required to execute as a condition of subdivision plan approvals can be seen in Appendix E (Albermarle County (VA) Stormwater Management/BMP Facilities Agreement).

Moreover, subdivision regulations can be tailored to allow for innovative developments that protect natural features and water resources, such as conservation subdivisions. Conservation subdivisions are discussed separately later.

Under the breadth of subdivision regulatory authority granted by Commonwealth statute (K.R.S. § 100.281(3)), Kentucky cities and counties arguably could adopt or modify land subdivision regulations to require specific stormwater management methods, low-impact development standards for streets and sidewalks (as well as for parking lots and driveways), green infrastructure, control of sediment and erosion, water conservation standards, or the protection of certain sensitive areas like wetlands or steep slopes as part of reviewing and approving subdivision plat applications.

4. *Building Codes*

Building codes can be utilized to help protect water resources. Although many building codes are required by state law to meet certain standards, communities can also adopt additional codes to help address local needs. Examples of building code alterations that can have this effect include:

- *Building Permit Limitations*: Building permit limitations restrict the number of permits that are to be issued within a specific area or during a certain time period, thus limiting the amount of new construction.
- *Impervious Surface Building Codes*: Building codes that apply to impervious surfaces control the amount of area on a site that can be covered in impervious surfaces, such as roads, roofs, parking areas, and sidewalks. By reducing impervious surface area on a site, stormwater runoff is managed more effectively.
- *Porous Pavement Codes*: Porous pavement codes require the incorporation of permeable pavements and materials into a development, thus increasing the capture, infiltration, and treatment of stormwater runoff.

5. Development Approval Standards (Rezoning, Use Permits, Variances, Subdivisions, Site Plans)

Wet growth policies will be more effective if they are integrated into all aspects of land use development regulation and approval. In particular, local governments can amend their codes and ordinances to include water-quality, conservation, watershed-protection, runoff-prevention, and similar criteria in their standards for approving or denying applications for rezoning, use permits, variances, subdivision plats, and site plans. For example, the Fauquier County (VA) Board of Supervisors adopted an ordinance in 2008 that establishes water-resource protecting general standards for special permits and special exception uses, among other standards. These include approval standards that: 1) the use not degrade or deplete surface or groundwater quality and quantity to the extent that it would adversely affect the surrounding properties or area; 2) the development provide for adequate drainage, stormwater retention and treatment, and low-impact development techniques when deemed appropriate; 3) landscaping or buffering may be required as necessary or appropriate; 4) low-impact development techniques will be encouraged and incorporated as deemed appropriate; and 5) the future impact of the proposed use is to be considered in determining a time limit on the permit. The Fauquier County Zoning Ordinance Related to Utilization of Low Impact Development Techniques with Site Development is reproduced in Appendix G of this handbook. Another example is the Town of Skaneateles, New York, which “revised its zoning laws to incorporate review of building permits, subdivision activities, and other zoning actions by the Syracuse Water Department to help ensure compliance with the Department’s Watershed Rules and Regulations. The Action was initiated by town residents concerned with maintaining the high water quality of Skaneateles Lake, which is the primary drinking water supply for municipalities in the Syracuse, NY area.” (NALGEP et al. 2003, pp. 38-39) See Appendix J of this handbook for the Skaneateles “Lake Watershed Overlay District Ordinance.”

6. Riparian Buffer Zones

Riparian³ buffer or setback zones are used along the edges of water bodies, where the effects of pollution, runoff, and land use are especially strong and harmful. They create an area of “buffer” between development and surface waters – an area where development is prohibited or severely restricted. They create a transition between development and protected waters.

Buffers and setbacks protect water resources by protecting lands that filter over-ground flows carrying pollutants from land to surface waters. They also can

³ This handbook uses the term “riparian” in this context to refer not only to lands adjacent to rivers, streams, and creeks, but also to lands that are adjacent to lakes, which are more properly called “littoral” or “shoreland” buffers. To avoid cumbersome use of multiple words, we use “riparian buffers” to refer to lands along any surface water.

minimize flooding, preserve wildlife habitat, and provide recreation areas. Buffers and setbacks that prove to be most effective are undisturbed, naturally vegetated strips of land that are 50 to 400 feet wide (NACO 2000, p. 28). Riparian forest buffers are especially important to protect given their many hydrologic and ecological functions. Buffer and setback zoning can be an important method for protecting these areas by reducing the adverse impacts of surface water runoff on water resources.

Local communities can create riparian buffer zones by ordinances. These ordinances should include the following provisions:

- clearly-marked buffer boundaries on local planning maps;
- maintenance language governing permissible, required, and impermissible vegetation and prohibiting soil disturbance in the buffer;
- tables that illustrate buffer width adjustment by percent slope and type of stream; and
- clear provisions regarding allowable uses and restricted uses (U.S. EPA).

Some riparian buffer ordinances may prohibit any development or land disturbance other than nonhabitable structures related to use of the waterway (e.g., docks, gazebos), but others might allow differing types and amounts of development in a series of zones from no (or nearly no) development in the zone adjoining the waterway but increasing amounts of development allowed for the other zones as their distance from the waterway increases. In other communities, development in a riparian buffer may be allowed only with a permit for which impacts on the waterway must be avoided or mitigated on-site. Moreover, all of these ordinances should be supplemented by extensive public education about appropriate land uses adjacent to or near surface waters.

The factors for delineating riparian buffer zones will vary depending on the zone's location. However, some factors to consider include:

- steepness of adjacent topography;
- quantity and velocity of runoff entering the buffer;
- type of riparian vegetation;
- seasonal water levels;
- nature and extent of wetlands and floodplains;
- soil types and infiltration capacity;
- density of development adjacent to the riparian corridor; and
- wildlife values.

Buffer areas can be designated by overlay zoning (see the next section) or by generally applicable definitions of distances from the stream bank.

Ordinances in Apex and Cary, North Carolina, for example, require development buffers between development and streams. These ordinances required that buffers be at least 50 feet wide along intermittent streams and an

average of 100 feet wide along perennial streams (U.S. EPA 2005, p . 3-17). Appendix H of this handbook contains Baltimore County, Maryland's Buffer Protection and Management Ordinance, establishing forest buffers for stream systems. Appendix I reproduces Buffalo, Minnesota's Shoreland Management Overlay District Ordinance, which requires permits for any development activities on shorelands – defined by certain distances from lakes, ponds, flowages, rivers, streams, or floodplains – and creates standards and processes for the consideration of permit applications, including limitations on development.

7. Watershed or Water Resource Overlay Zones

A common means of protecting water resources is through overlay zoning that creates additional development requirements and restrictions to specified geographic areas that are particularly sensitive or critical to watersheds or water supplies and that are designated as overlay zones.

Overlay zoning establishes additional zoning restrictions for an area in addition to the underlying zoning type. Communities can identify environmentally sensitive watershed areas and then limit, either by ordinance or regulation, certain harmful activities in the zone. The area is mapped as a district that is designated on the zoning map and contains district-specific regulatory requirements and restrictions in the zoning code or regulations. However, the underlying zoning district also remains in effect. For instance, residential density could be limited, or land uses that are not compatible with source protection could be prohibited. A system of overlay zones to protect water resources allows development to continue while still maintaining or even improving water quality. Often buffer zones (see above) are incorporated into watershed or water resource overlay zones. In addition, a particular type of overlay zone may be created to protect groundwater and aquifers, which are discussed more specifically in the next section.

There are several steps in the process of developing an overlay zone:

1. Establish boundaries for the overlay zone. Topographic maps are useful in determining effective boundaries. Hydrologic processes need to be analyzed to ensure that the scale is large enough to cover all significant land-development effects on the protected streams, lakes, aquifers, reservoirs, or other water bodies that are the object of the overlay zoning.
2. Establish standards to be used in the zone to reduce or mitigate the impacts of development. Common standards include: limitations on areas covered by impervious surfaces, required minimum setbacks between buildings and water resources, required buffer areas, restrictions on hazardous material usage, regulations on septic systems, and standards for erosion control,

restrictions on densities allowed, and requirements for cluster development.

3. Establish review procedures to administer standards to proposed developments and land uses. Certain projects will be easily reviewable under the adopted standards, while other may require site-specific review. The applicant may be required to submit geotechnical and hydrological analyses to determine the project's likely impacts on water quality, and to create water protection plans for the proposed project. However, the application of overlay zoning standards to development or land-use project proposals often can be included in existing land development review processes.
4. Create specific enforcement mechanisms in the ordinance adopting the overlay zone to ensure that landowners and developers comply with its terms (Russell 2004).

Four different watershed overlay ordinances are provided in the Appendix of this handbook to illustrate the variety of ordinance provisions that can be used. They are: Appendix I, Buffalo, Minnesota's Shoreland Management Overlay District Ordinance, protecting shorelands bordering lakes, ponds, flowages, rivers, streams, and floodplains; Appendix J, Skaneateles, New York's Lake Watershed Overlay District Ordinance, protecting lands draining to Skaneateles Lake on which local water supplies depend; Appendix K, Greensboro, North Carolina's Water Supply Watershed District Overlay, protecting lands adjacent to and draining to a water supply intake and reservoir at heightened risk of pollution; and Appendix L, York County, Virginia's Watershed Management and Protection Area Overlay District, protecting watersheds surrounding current or potential public water supply reservoirs.

8. Groundwater, Aquifer, Wellhead, and Sinkhole Protections

Groundwater resources need special protections because they are at risk of pollution and degradation from many different sources. The four main ways that groundwater can become contaminated are infiltration, direct migration, interaquifer exchange, and recharge from surface waters (Nolon 2003, p. 195). Groundwater is the source of drinking water for many people and communities, as well as being integrally connected to surface waters, sustaining a variety of biological life, and supporting geologic structures in our landscapes.

The ways that land use codes and ordinances can protect groundwater cover a range from the general to the particular:

- 1) generally applicable prohibitions on certain kinds of activities or uses of land, such as the use or storage of hazardous or toxic substances like perchloroethylene;

- 2) various measures designed to control stormwater runoff that transports pollutants into groundwater (discussed several places in this chapter);
- 3) creation of overlay zones to protect areas of groundwater recharge from particular kinds of land uses like those using hazardous substances or from high ratios of impervious cover (see the discussion of overlay zoning in the previous section); and
- 4) protection of specific locations or features affecting groundwater, such as wellheads or sinkholes.

Examples of groundwater protection ordinances include: Appendix M, Lexington, Kentucky's Sinkhole Ordinance; Appendix N, Hernando County, Florida's Groundwater Protection and Siting Ordinance; Appendix O, San Antonio, Texas' Edwards (Aquifer) Recharge Zone District; Appendix P, Stratham, New Hampshire's Aquifer District Ordinance; and Appendix Q, Weston, Wisconsin's Wellhead Protection District Ordinance.

9. Wetlands Regulations

Local ordinances may protect wetlands from development and the impacts of development-related degradation. While wetlands that significantly affect the chemical, physical, and biological integrity of navigable waters are subject to federal regulatory protections under Section 404 of the Clean Water Act⁴, local governments may have strong interests in protecting what have sometimes been indiscriminately labeled "isolated" wetlands, because these wetlands can affect local and Commonwealth water resources such as non-navigable waters, intermittent streams, groundwater, or overall watershed health and functioning. Some types of ordinances, such as stormwater management regulations, low-impact development standards, riparian buffer zones, and watershed overlay zones, protect wetlands while also protecting other aspects of the watershed, localities may wish to adopt particular overlay and/or buffer zone ordinances that protect wetlands in particular.

"Local wetlands protection ordinances protect wetlands by regulating development activities in wetland areas and their surrounding buffer zones. They can require, for example, design review, review of grading and building permits, limitations on certain activities, e.g., operation of motorized vehicles, filling, dumping, grazing, limitations on pesticide use, and prohibition of soil disturbances (including grading, plowing, and cultivating). In addition, wetland protection ordinances can require the implementation of stormwater management plans or floodplain management plans to protect wetland form excessive runoff and nonpoint source pollution." (McElfish 2004, p. 118)

⁴ See Justice Kennedy's "swing vote" concurrence in *Rapanos v. United States*, 547 U.S. 715 (2006).

For example, the City of Oakdale, Minnesota created a “wetland district” in its zoning code to preserve wetlands and their functions, and this zoning code section is reproduced in Appendix R. The Town of Cape Elizabeth, Maine has adopted a set of various land development restrictions for various resource protection districts, including the “critical wetland district,” the “critical wetland buffer overlay district,” the “wetland protection district”, and the “floodplain district.” This ordinance uses both overlay zoning and buffer zoning, as well as a table of various permitted uses, uses permitted with a resource protection permit (granted or denied according to “Resource Protection Performance Standards”), and prohibited uses in each of the four types of districts. The ordinance appears in Appendix S.

10. Floodplain Protection Ordinances

Like watershed lands, riparian buffer zones, aquifer recharge areas, and wetlands, floodplains can be designated for special protections, either through overlay zones for designated floodplain areas or through generally applicable standards used in the review of all development proposals. Communities often restrict development in floodplains in order to protect human life and property from flooding, to be eligible for federal flood insurance under the National Flood Insurance Program, and to protect the ecological and hydrologic functions of floodplains in their watersheds. Land development restrictions should address not only runoff, drainage, and pollution, but also the functions of particular floodplain landscapes like wet meadows, bottomland hardwood forests, and riparian shrub wetlands. Howard County, Maryland’s land development code provisions concerning floodplain development, provided in Appendix T, illustrate the kind of regulatory protections for floodplains that can be adopted by ordinance. Likewise, the Town of Cape Elizabeth, Maine’s resource protection districts discussed above and in Appendix S include floodplain districts as well as various wetland districts.

11. Steep Slope Protections

“Steep slope protection provisions limit building on steep slopes, mandate setbacks from wetlands and watercourses, and contain vegetative or other requirements to protect steep slopes from development impacts. They are often included in wetland and watercourse ordinances, as slopes affect the drainage of runoff into waterways. But they are also found as free-standing ordinances or associated with overlays intended to protect ridge lines or hilly habitat areas.” (McElfish 2004, pp. 123-24) While some localities adopt steep slope and hillside protections as overlay zones, this can become cumbersome if the area is generally hilly, thus creating a patchwork of many overlay zones that must be identified on a map. Alternatively, local communities can adopt certain performance standards that apply to any development on land that exceeds a certain percent slope (e.g., a natural gradient in excess of 25%). Whether as hillside, ridgeline, or steep slope overlay zones, as performance standards and requirements applicable to any land with a certain slope or greater, or as part of other watershed protection ordinances, provisions related to slopes, ridges, and hills should be oriented to preventing

erosion and landslides, decreasing overall impervious cover, maintaining or restoring vegetation that anchors soils, and prohibiting intensive structures and construction practices that alter the natural terrain.

12. Open Space Zoning, Cluster Development, and Conservation Subdivisions

Local zoning ordinances shape the allocation of structures on development sites and across the landscape. Wet growth regulatory approaches produce more land set aside for open space than conventional development regulations. They did so by: 1) allowing or encouraging land to be dedicated to open space and non-development conservation, particularly by reducing minimum lot size, lot setback requirements, lot frontage distances, and the like; 2) requiring that a certain percentage of land of large development projects to be set aside for open space (or setting a maximum percentage of the development site that can be covered with impervious surfaces); 3) allowing cluster development in which structures are placed in close proximity in a compact area, leaving common areas in open space and natural areas in an undeveloped state; and 4) requiring cluster development for certain lands with sensitive natural features that should be preserved from development (e.g., streams, wetlands, forests, hillsides and steep slopes, and so forth).

Open space areas can be used for recreation areas, natural conservation lands, wildlife habitat, aesthetic enjoyment, or stormwater management facilities. Often conservation easements or dedications are used to protect the land permanently as open space. One way of requiring open space is to condition development approvals on open space dedications based on the project's demand created for open space (e.g., a certain amount per person or per household based on national standards) or likely impact on natural resources and stormwater runoff. Open space dedications require that a certain amount of land is dedicated by developers to be permanently protected open space. If the developer does not dedicate the land, a fee could be required, with the money used to purchase another piece of property in the community to dedicate for open space purposes, often called "in lieu" fees.

Conservation subdivisions are a particular type of cluster development with significant conservation of open space and environmentally sensitive lands and features set aside as conservation areas, allowed by ordinances that permit developers to circumvent conventional lot-size, lot-spacing, and lot-configuration requirements. Appendix U contains Louisville, Kentucky's Conservation Subdivision Regulations, adopted as part of its Land Development Code in 2008. Appendix V contains the Hamburg Township, Michigan's Open Space Community Zoning Ordinance.

13. Agricultural Lands Conservation Zoning

Protecting agricultural lands from development can have some water protection benefits. Prime farmland should be zoned for agricultural uses, and the regulations applicable to the zone selected should prohibit development of these lands. Even though agricultural land uses can erode soils and cause nonpoint source pollution runoff with fertilizers, pesticides, and herbicides, much prime farmland has relatively stable soils and needs less application of chemicals than other lands to which agricultural activities may be diverted (U.S. EPA). Moreover, converting farmland to development permanently alters its capacity to absorb runoff and support watershed functions.

14. Tree Preservation Ordinances

Communities can use their codes and ordinances to protect existing trees and require tree planning and maintenance on development sites. Codes and ordinances can prohibit landowners and developers from removing mature trees from development sites without replacing them with trees equaling the same or greater total caliper as those removed. The code might allow for developers or landowners to take advantage of certain tree “credits” that are banked and sold/transferred by others (or by the same developer or landowner) for certain tree conservation activities of unusual and substantial ecological benefit above and beyond that which is required by law or regulation. Codes and ordinances can require that permit applications, subdivision plats, or site plans be accompanied by a landscaping and tree conservation plan for the development, as well as post-development maintenance. Certain trees of special significance can be placed on a registry and protected by ordinance from removal or significant alteration. Examples of three different tree preservation ordinances are: Appendix W, Fairfax County, Virginia’s Tree Conservation Ordinance; Appendix X, Southlake, Texas’ Tree Preservation Ordinance; and Appendix Y, Northbrook, Illinois’ Tree Protection and Preservation Ordinance.

15. Forest Conservation Ordinances

As discussed throughout this handbook, forests play especially critical roles in watershed health and functioning. They are increasingly at risk of conversion to land development, particularly throughout the Southeast. While tree preservation ordinances typically aim to protect trees in cities, towns, and places that already have undergone some development, often with a focus on site development and community tree canopy, forest conservation ordinances aim to protect forest lands from conversion to developed lands. They may severely restrict development on forest lands or particular forest lands like riparian forest buffers (see riparian buffers, discussed previously), may require developers to create plans to conserve all or parts of the forest intact, or create incentives for reforestation. Frederick County, Maryland’s Forest Resource Ordinance is reproduced in Appendix Z as an example of a forest conservation ordinance.

16. Native Landscaping Ordinances

Local ordinances can protect native landscaping in two ways: 1) restricting the removal of existing natural vegetation or providing incentives to preserve existing vegetation in its natural state (e.g., meadows); or 2) requiring or providing incentives for the use of native plants and trees in landscaping (and possibly require eradication of non-native invasive species). Native vegetation is typically more drought-tolerant than non-native species of plants, supports wildlife and biodiversity, keeps forests healthy and functioning (which invasive plant species threaten), maintains overall ecological richness and diversity, and requires fewer or no chemicals (e.g., fertilizers, pesticides) to maintain. At a minimum, local governments can review weed and nuisance ordinances to ensure that they are not unwisely prohibiting landowners from using or preserving native wildflowers, prairie plants, or warm season grasses.

17. Water Conservation Ordinances

Local codes and ordinances can require that landowners and developers use water-efficient techniques in the design, development, and use of particular projects, either through generally applicable standards or on project-by-project review of subdivision plat, permit, or site-plan applications. In addition, review of codes and ordinances can identify and remove particular regulatory constraints that prevent the use of water-efficient design and development features, such as rain barrels and cisterns or native landscaping. Furthermore, land development codes and ordinances might prohibit certain water usages. Appendix AA contains Dallas, Texas' Conservation Measures Relating to Lawn and Landscape Irrigation. Appendix BB contains the Landscape Water Conservation Ordinance Guidelines of the St. Johns River Water Management District in Florida, which are recommended provisions for local water conservation ordinances.

18. Concurrency Requirements

Concurrency requirements mandate that development cannot proceed unless there is the public infrastructure – including water supplies, sewer system capacity, and stormwater management systems – to support the development. These are discussed with respect to water supply planning at length in Chapter 6 of this handbook.

19. Real Estate Transfer Regulations

Local codes and ordinances may prohibit the transfer of real estate unless certain water-quality or environmental conditions are inspected and approved. For example, Washtenaw County, Michigan requires that residential onsite water and sewage disposal systems be inspected and meet minimum standards for good working conditions at the time that property is transferred. See Appendix CC for this regulation.

20. Low-Impact Development Zoning

Some communities expressly incorporate low-impact development as a specific set of standards into their land development codes and ordinances. These standards are discussed at length in Chapter 5 of this handbook. One community that has incorporated LID techniques in its site development review and approval standards for special permits and special exception uses is Fauquier County, Virginia. See the ordinance at Appendix G. Another community taking a different approach is the City of Sammamish, Washington. It amended its municipal code to provide that LID is the preferred design approach to development projects and establishes a comprehensive and detailed point system to be used in awarding incentives to landowners and developers to use LID methods. This ordinance appears at Appendix DD.

21. Development Agreements and Planned Unit Developments

Development agreements are contracts between a developer and a local government. They stipulate the details of how the parties believe that a project should be developed. In a development agreement, permit conditions are negotiated in exchange for the developer providing conditions that benefit the community, including water resource protection. Development agreements allow for predictable conditions during development, which is especially useful for larger developments that may be implemented over a long period of time.

Provisions in local codes and ordinances for planned unit developments (PUDs) “permit large tracts to be developed, or groups of tracts to be assembled and developed, in a more flexible manner than would have been permitted by the underlying zoning. Because the development is planned and reviewed as an entity, the developer may be able to achieve better site planning by altering the use, density, and design requirements in the zoning law. There is no standard definition of a PUD, as local governments’ use of the technique has resulted in a range of options for more flexible development. These include relaxation of minimum lot size requirements, permitting mixed residential and commercial land use, or allowing greater design flexibility. In exchange, developers are often required to compensate for the impacts of their projects by leaving more open space, meeting the infrastructure needs of the development, or offering other community facilities and services.” (McElfish 2004, p. 71) These arrangements could allow for greater use of green infrastructure, land conservation, and low-impact development methods to protect water resources.

22. Impact Fees

Impact fees are fees collected from new development applicants to compensate for the environmental impact their development will have. The fees are calculated using a formula that incorporates the impacts on natural resources and local infrastructure that will be caused by the development. Impact fees can help to cover some of the cost of new water and sewer lines, roads, and public services that are required by new developments. Communities can use the fees to mitigate the impacts the development will have on water quality. Impact fees can encourage infill development while discouraging sprawl.

23. Transferable Development Rights

Transferable development rights (TDRs) allow communities to establish areas that are designated for no development and areas that are designated for additional development. To build in the area designated for development, a developer purchases development rights from someone who owns land in the area where no development is allowed, thus keeping this land undeveloped so that water resources can be protected. Once a landowner sells development rights, permanent restrictions are placed on that landowner's property. This method helps to conserve land in sensitive areas where communities believe no development should be allowed, while also giving developers the opportunity to proceed with their developments, often with increased densities and other benefits provided as incentives. TDRs are most effective in urban areas where there is considerable pressure to develop suburban land. An example of a TDR ordinance is Sarasota County, Florida's Transfer of Development Rights Ordinance, reproduced in Appendix EE.

24. Incentive Zoning

Incentive zoning, also called bonus zoning, provides developers with extra desired elements, such as density bonuses, in exchange for dedicating additional open space or protecting water resources. For instance, developers can be offered incentives to cluster new houses in the least environmentally sensitive areas of the development. The more vulnerable areas, such as wetlands and buffers, are then permanently preserved. The first step in incentive zoning is to determine what incentives will encourage developers to alter their development projects. Builders, developers, and real estate professionals can be helpful in making this determination. Communities will then want to establish the details of the incentive zoning, such as where this type of zoning would be beneficial, the exact incentives to be offered, and the benefits to the community that will be requested. The next step is to amend any planning regulations, such as zoning ordinances and comprehensive plans, to include incentive zoning. This can be done by creating an overlay zoning district to establish the boundaries of the incentive zoning area. The incentives offered, as well as the community benefits to be provided by the developer, should

be spelled out in the zoning ordinance. Incentive zoning can be most beneficial in areas where demand for density increases is the highest.

D. Other Resources on Ordinances

Communities can find regulatory tools, model ordinances, and examples of other communities' ordinances from a variety of resources, including the following:

- U.S. EPA Model Ordinances to Protect Local Resources, www.epa.gov/owow/nps/ordinance.
- Stormwater Managers' Resource Center, www.stormwatercenter.net.
- Gaining Ground Information Database, <http://www.landuse.law.pace.edu/>.
- National Association of Counties, *Source Water Protection: A Guidebook for Local Governments* (2000), available at [http://www.naco.org/Content/ContentGroups/Programs and Projects/Environmental1/Water1/SourceWaterProtectionGuida.pdf](http://www.naco.org/Content/ContentGroups/Programs_and_Projects/Environmental1/Water1/SourceWaterProtectionGuida.pdf).
- Minnesota Department of Natural Resources, *Natural Resources Guidance Checklist*, <http://files.dnr.state.mn.us/assistance/nrplanning/community/nrchecklists/compplan.pdf>.
- American Rivers, *Local Water Policy Innovation: A Road Map for Community Based Stormwater Solutions* (2008), [http://www.americanrivers.org/site/DocServer/Local Water Policy Innovation Stormwater Oct 2008.pdf?docID=8401](http://www.americanrivers.org/site/DocServer/Local_Water_Policy_Innovation_Stormwater_Oct_2008.pdf?docID=8401).

E. Private Property Rights and Land Use Regulation: Opportunities for Responsible Development

Our protections of private property in the U.S. allow local governments considerable latitude in regulating land use in order to ensure that landowners and developers engage in responsible and sustainable development that does not harm others or our environment. One of the common objections to the use of regulatory tools to protect water resources from land use and development is that they infringe on private property rights. However, it is important to understand the legal and constitutional scope of private property rights protections and the range and limits of government regulatory authority.

Private property is defined by both American law and our culture – our norms, expectations, and values (including our acceptance or rejection of moral theories about private property rights and responsibilities). The law of private property rights and the culture of private property rights are not the same, even though they can sometimes be confused or even though people may want one to shape the other.

In the U.S., we cherish private property. There is a strong commitment to private property rights protections in American culture. Protections of private property rights promote liberty and freedom, facilitate economic investment and productivity, protect the connections that we form with our “things” that help to shape our identity (e.g., a wedding ring, the family homestead), strengthen community, and ensure stability and order in society. The culture and politics of private property rights protections are the reality in which government regulators must act and make choices.

However, our culture, values, and practical realities also recognize limits to private property rights. The hard reality that we have to face is that private property rights only have value if they come with responsibilities and limits. It is not possible to have a society in which each person has limitless freedom to do whatever he or she wants. The exercise of my rights can diminish the value of your rights. This is particularly true with private property rights in land, because each parcel of land exists in the context of neighboring lands, communities, and environments. Private property rights cannot be absolute, because they affect other private property owners and the community, economy, and society in which these rights exist.

There are several types of limits to private rights in land that we typically recognize in the U.S. A landowner cannot use his or her land to harm the public health and safety. A landowner cannot unreasonably harm another’s use and enjoyment of his/her property (i.e., create a nuisance). A landowner cannot obtain benefits of a particular use while imposing or pushing the costs of that use onto neighbors or the public. A landowner has to contribute to the public infrastructure and services that he or she enjoys and that serve his or her property (increasing the value of his/her property). A landowner cannot use his or her land beyond its physical or ecological carrying capacity. Landowners are expected to be good neighbors and part of a community.

The scope and limits of private property rights in American values roughly correspond to some legal concepts about private property. According to U.S. courts, private property is a “bundle of rights” that is represented metaphorically by a “bundle of sticks.” (Arnold 2002) Landowners may have a variety of different rights or sticks in the bundle, including the right to exclude, the right to possess, the right to use, and the right to transfer land, but the scope and limits of each stick are determined by social values and needs. Alternatively, private property might be seen as a “web of interests” in which the landowner has property interests in a particular parcel of land, with its unique characteristics, defined by the nature of the relationships and expectations that the owner forms with the land and by the relationships of other interest-holders in the land (e.g., co-owners, tenants, easement holders, neighbors, and so forth) (Arnold 2002). In either concept, private property rights are not absolute because they exist among neighboring lands, communities and society, and physical and ecological realities.

All of these principles have shaped the law regarding government regulation of land use and the extent to which land use regulation is considered interfering with private property rights. Kentucky communities considering wet growth regulations should consider three different categories of legal issues related to land use regulation and private property rights.

First, the government has the authority to enforce the limits inherent in private property rights as defined by state property law. For example, landowners have never had the legal right to use land in a way that harms others. This principle has been in our legal tradition since ancient Rome and our English common law heritage. This principle forms the basis of the law of nuisance (both private nuisances affecting nearby landowners and public nuisances affecting the public in general), and the government can regulate to prevent nuisances. Another set of limits inherent in property law has to do with rights in water, lands submerged under navigable or tidal waters, and wetlands. These private property rights are often limited by the state ownership doctrine (state ownership of waters), the federal navigation servitude, the public trust doctrine, and, in eastern states like Kentucky, the rights of other riparian landowners in the system of riparian water rights to shared interests in navigable waters like flowing streams and rivers. Again, government regulation can enforce these limits and protect the rights of others.

Second, the government has the authority to regulate land use, including enactment of zoning ordinances, under its “police power,” which is the power inherent in state governments to protect the public health, safety, morals and welfare. (This power of state governments is extended to local governments through home-rule principles in some states or through state enabling legislation, like K.R.S. chapter 100 in Kentucky.) In 1926, the U.S. Supreme Court, composed of the most conservative or libertarian majority in our nation’s history, upheld an Ohio village’s zoning ordinance as a valid exercise of the police power (*Euclid v. Ambler Realty*, 272 U.S. 265 (1926)). The *Euclid* decision is important, because the zoning ordinance reduced the value of the plaintiff’s private property by 75%, zoning was a new phenomenon substantially affecting the freedom to use private property as the owner wanted, and the U.S. Supreme Court was using private property rights arguments to regularly strike down government regulations at this time in U.S. legal history. However, these strongly libertarian Justices viewed zoning ordinances as reasonably protecting neighbors’ private property rights by preventing nuisances, being based on good planning and studies, protecting quality of life in communities, protecting public health and safety, and as being location-specific (as much property law is) – regulating to keep the “pig in the barnyard” and to keep the “pig” out of “the parlor” (*Euclid*).

Government land use regulations cannot be arbitrary and capricious. This means that they cannot be based on justifications that make no sense to any rational person. And they cannot single out one property owner for treatment different than all similar property owners just because government officials have a personal vendetta against the owner. However, different classes of property or property

owners can be treated differently (e.g., new uses versus existing uses; industrial and commercial uses versus residential uses; land near waterways versus land in already developed urban areas). The courts will not second-guess the local government's reasons just because there is a reasonable argument that the ordinance is not effective, fair, or entirely consistent. As long as a reasonable person could accept the regulators' justification, the courts will defer to their judgment despite good arguments to the contrary. This is what is known as the "rational basis" test applied with the "fairly debatable" standard of review. There are some circumstances when courts give regulations a "harder look," especially where state legislation authorizing planning and zoning imposes limits on local governments or withholds some regulatory authority. Nonetheless, the principle of giving local and state governments wide latitude to formulate land-use regulations to protect the public health, safety, morals, and welfare (including environmental conditions and water-resource protections) remains firmly embedded in U.S. law.

However, even though local and state governments have broad authority to enact land use regulations that affect private property interests, they may be liable to compensate landowners for the loss of those interests if those regulations intrude too much on private property rights. This is the third area – the law of takings. If the government has "taken" one's property for a public use or purpose⁵, the landowner is not entitled to have the action invalidated, but instead is entitled to "just compensation," which is defined as the fair market value of the property interest that has been taken.

The Takings Clause of the U.S. Constitution states that "nor shall private property be taken for public use, without just compensation." (U.S. Constitution Amendment V) Over time, the U.S. Supreme Court has determined that three different categories of actions constitute takings, in addition to the government's affirmative exercise of eminent domain to take title to property (e.g., when the state seeks to acquire land from a hold-out property owner in order to complete a highway).

The first are "physical or possessory takings," when the government "invades" or occupies private property or requires a private property owner to allow others onto his or her property without his or her permission. These actions are always takings when the physical occupation is continuous (unless the landowner had already relinquished the right to exclude, such as when the government prevents an owner from unjustly evicting a tenant) and almost always a taking when the physical occupation or presence is intermittent (*Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419 (1982); *Kaiser Aetna v. United*

⁵ This handbook does not address the issue of government taking of private property for private redevelopment that improves the local economy, which was the subject of the controversial U.S. Supreme Court case *Kelo v. City of New London*, and has been largely precluded in Kentucky by both state court decisions and by state statute. This issue is not particularly relevant to wet-growth regulations that are directly aimed at protecting public health, safety, and resources.

States, 444 U.S. 164 (1979)). Few, if any, of the wet growth regulations discussed in this handbook involve physical occupations by the government.

The second are “regulatory takings,” when the landowners complains that his or her private property rights to use or develop land have been so constrained that the regulation is tantamount to a taking of title to his or her land. This is the category that is particularly relevant to the wet growth regulations discussed in this chapter. Regulatory takings will be addressed in greater detail immediately after the third category (exactions) is described.

The third are “exactions,” which when the government conditions land development approvals on the private property owner providing property, facilities, or possibly impact fees to the government or public. Examples are when the government requires landowners to provide parks, roads, schools, public drainage easements, and the like as conditions of development. Exactions are takings only if they do not have a substantial relationship to a legitimate government interest (they almost always do have this relationship) or if they are not roughly proportional to the development’s impact (i.e., no taking if the landowner has to provide land, facilities, or fees that correspond to the likely impact of his project) (*Nollan v. California Coastal Commission*, 483 U.S. 825 (1987); *Dolan v. City of Tigard*, 512 U.S. 374 (1994)). Exactions do not include conditions on development that restrict the property owner from certain uses or that require the property owner to do certain things as he or she uses the land (unless property has to be conveyed to the government or public as part of these conditions). A few of the aspects of wet-growth codes and ordinances discussed in this chapter might constitute exactions, but the government’s requirements of conservation easements or land dedications will not be deemed takings if the government officials make some sort of individualized determination that the type and amount of requirements imposed on a particular development project are roughly proportionate to the project’s likely impacts on water quality, water supplies, runoff, watersheds, and the like. Most exactions easily pass the required tests and do not require compensation to the landowner.

The common issue when the government enacts environment-protecting land use regulations is whether the regulations create a regulatory taking. The basic premise of “regulatory takings” is that when a government regulation “goes too far” it will be considered a taking and just compensation will be due to the property owner (*Pennsylvania Coal v. Mahon*, 260 U.S. 393 (1922)). How far is too far? The U.S. Supreme Court has developed two tests: 1) the *Lucas* per se test; and 2) the *Penn Central* ad hoc balancing test.

According to *Lucas v. South Carolina Coastal Council*, 505 U.S. 1003 (1992), the government owes the private property owner just compensation when:

- it enacts a regulation

- that deprives the landowner of all (100%) of the economically beneficial or viable *use* (that is use, not value) of his or her land,
- unless the regulated uses were not inherently part of the landowner's private property rights under background principles of state property law (e.g., would constitute a nuisance, would violate the public trust doctrine).

This is a difficult test for the landowner to meet in order to establish a taking. Many regulations, even if they severely restrict land use or development, leave the landowner some economic uses. The test does not require that the use be profitable in order for it to be economically beneficial or viable. Moreover, some very restrictive land use regulations aim to prevent uses and development that exceed the landowner's inherent rights under state property law, such as creating a public or private nuisance, polluting navigable waters, or flooding neighbors' land with excess runoff.

If a regulation leaves the landowner some economic use of the land (less than a 100% taking), the landowner may still be able to establish a taking under the *Penn Central* test (438 U.S. 104 (1978)), which weighs and balances the following factors in an ad-hoc, fact-specific manner:

- the economic impact on the owner;
- the regulation's interference with the owner's distinct and reasonable investment-backed expectations about the property;
- and
- the character of the government action.

Even though this test has been the basis of landowners obtaining just compensation for regulations in a handful of cases, nearly all *Penn Central* takings claims fail, because courts hold that landowners reasonably should expect some costly government regulations in order to prevent harms to the public and protect the environment.

An indication of the very limited protections afforded to landowners under the Takings Clause can be seen in the U.S. Supreme Court decision in *Palazzolo v. Rhode Island*, 533 U.S. 606 (2001). The Court held that a landowner is not precluded from establishing that a regulation is a taking just because the regulation was in place at the time that he or she purchased the land. In other words, the regulation itself is not a "background principle of state property law" that inherently limits a private property owner's compensable property interest. However, all nine Justices – including those who are characterized as very conservative and strongly protective of private property rights – agreed that one home worth \$180,000 on 18 acres of coastal wetlands arguably worth millions of dollars is an economically viable use of land. Therefore there was no *Lucas* taking when the Rhode Island regulation created such a severe diminution of value. If even the most conservative judges believe that a regulation that limits an 18-acre multi-million-dollar parcel of land to one home worth \$180,000 is not a denial of all economically viable use of land, then the *Lucas* test is indeed very narrow. However, the Court sent the case

back to the Rhode Island courts to evaluate the landowner's *Penn Central* claim. The landowner lost the *Penn Central* claim, because the state courts held that the landowner did not have a reasonable expectation to develop homes on fragile coastal wetlands that have been subject to the public trust since early in the state's history.

While there have been some notable cases that landowners have won on regulatory takings claims, most have resulted in the government not owing compensation for its regulation of land use and development. For example, in *Gardner v. New Jersey Pinelands Commission* (593 A.2d 251 (1991)), there was no taking for land use regulations that limited the property owner's land to farmland in order to protect the ecology of the Pinelands, especially including water quality, from unlimited development.

In *Daddario v. Cape Code Commission* (681 N.E. 2d 833 (1997)), the denial of an earth removal permit for a 7-phase, 32-acre sand and gravel extraction plan was not a taking; the commission denied the permit to preserve open space and protect natural resources, and the landowner had rejected a proposal by government staff members to allow 25 acres of extraction out of a total of 70 acres.

In *Smith v. Town of Mendon* (822 N.E.2d 1214 (2004)), there was no taking when the government required an applicant for a site plan to develop a home on part of a parcel to grant a conservation restriction that would prevent development on parts of the parcel within an environmental protection overlay district. The conservation restriction was required in order to protect a creek, a wooded area, an agricultural district, and a floodplain, and to prevent stormwater runoff from steep slopes.

In *Strom v. City of Oakland* (583 N.W.2d 311 (1998)), the Nebraska Supreme Court allowed a property owner's takings claim to proceed to trial, when the landowner sought compensation for being required to install erosion and sediment control measures on his farmland. However, the Court expressed skepticism about whether the owner could prove a substantial enough interference with his property rights to succeed on his takings claim, given the government's strong interest in preventing erosion and sediment runoff.

In *Woodbury County Soil Conservation District v. Ortner* (279 N.W.2d 276 (1979)), the Iowa Supreme Court held that a soil conservation district's requirements that a landowner either seed his land or terrace it were not takings of the landowner's property.

Both the Wisconsin Supreme Court and the New Hampshire Supreme Court have held that filling and developing natural wetlands can be prohibited without constituting a taking, because landowners do not have private property rights to alter the fundamental natural characteristics of their land (*Just v. Marinette County*,

201 N.W.2d 761 (Wis. 1972); *Rowe v. Town of North Hampton*, 553 A.2d 1331 (N.H. 1989)).

Finally, Professor Michael Wolf, the Nelson Chair in Local Government Law at the University of Florida and one of the nation's leading experts on the constitutional issues related to land use and environmental planning and regulation, has analyzed the wet-growth regulatory approach in light of U.S. Supreme Court cases decided since 1984 concerning private property rights, land use and environmental regulation, and local government power (Wolf 2006). Professor Wolf has identified 14 lessons from the U.S. Supreme Court's decisions that local governments should consider in considering and crafting wet growth regulations:

- “Lesson #1: The Court Looks at Actual Intent and Does Not Accept Sham Purposes.
- Lesson #2: The Court Is Skeptical About Claims to Property That Are Unsubstantiated by State Law.
- Lesson #3: Comprehensive Planning Earns Deference and Trumps Private Rights-Based Arguments.
- Lesson #4: Ripeness Requirements Continue to Be Significant Hurdles for Those Bringing Regulatory Takings Challenges.
- Lesson #5: The Text Trumps Legislative History.
- Lesson #6: Judges Appreciate the Administrative Burdens Faced by Local Officials.
- Lesson #7: Congress May Subject Municipalities to Suit in State Court Without Violating "State Sovereignty".
- Lesson #8: It Takes Egregious or Arbitrary Government Conduct for Property Owners to Prove Substantive Due Process Violations.
- Lesson #9: The Court Endorses Careful Planning for Environmentally Sensitive Lands.
- Lesson #10: Regulators Must Ensure That Landowners Retain Something More Than Token Value.
- Lesson #11: Judges Will Not Tolerate Backdoor Strategies.
- Lesson #12: The Equal Protection Clause Remains Potentially Effective as an Avenue of Relief Against Municipalities That Abuse Regulatory Power.
- Lesson #13: Multiple Refusals of a Landowner's Reasonable Development Requests Could Lead to a Substantial Jury Award.
- Lesson #14: Immunity for Local Legislators Is the Same as That of Their Federal and State Counterparts.” (Wolf 2006, pp. 243-60)

Professor Wolf then applies these 14 lessons to four wet-growth regulatory scenarios in a hypothetical municipality, “Hydro City”:

“Consider the following four scenarios involving the implementation of wet-growth tools:

Scenario A

Hydro City officials have decided to be more rigorous in their inspections during pre-construction and construction phases and to assess additional fines in the event of violations. Some of the developers with poor compliance track records have filed suit against the city and the individual officials, claiming that they (developers) have a property right to fair enforcement of land regulations.

City officials would be wise to consider the following four lessons in planning their defense for possible lawsuits by these developers: First, the Court is skeptical about claims to property that are unsubstantiated by state law (Lesson #2). A naked assertion of a "property right to fair enforcement" should not be deemed sufficient to trigger judicial concern. Second, the Commentators have emphasized that comprehensive planning earns deference and trumps private rights-based arguments (Lesson #3). If city officials are acting in accordance with standard procedures in support of published plans, they reduce the likelihood of judicial interference. Third, it takes egregious or arbitrary government conduct for property owners to prove substantive due process violations (Lesson #8). The enforcement of otherwise valid regulations against landowners is not the kind of government activity that triggers heightened judicial scrutiny. The private party challenging the regulation carries a heavy burden in the face of significant judicial deference. Fourth, immunity for local legislators is the same as that of their federal and state counterparts (Lesson #14). While 42 U.S.C. § 1983 provides strong incentives to sue local governments and their officials for constitutional torts, local lawmakers are protected from disgruntled landowners who claim that their constitutional rights have been violated by the enactment of faulty ordinances or by other legislative acts.

Scenario B

SuperMegaMart has acquired land for a new discount retail facility on the city's north side. The city has responded by imposing a six-month moratorium on permits for big-box stores, ostensibly pending the drafting and adoption of a new set of regulations for 100,000+ square-foot stores. When the first moratorium was about to expire, a second six-month moratorium followed. While no real work has been performed on the ordinance, the city is considering a third moratorium.

Four of the lessons from the Court Commentators indicate that Hydro City officials are on shaky ground. First, the court looks at actual intent and does not accept sham purposes (Lesson #1). As each month passes without the introduction of an actual ordinance, the chances grow that a reviewing court will see through this charade.

Second, the Justices will not tolerate back-door strategies (Lesson #11). Store counsel can effectively use the legislative history of the series of moratoria in a court challenge brought against the city. Third, the Equal Protection Clause remains potentially effective as an avenue of relief against municipalities that abuse regulatory power (Lesson #12). It is possible that a court will find that local officials have crossed the line between careful deliberation and unreasonable, retributive behavior. Fourth, multiple refusals of a landowner's reasonable development requests could lead to a substantial jury award (Lesson #13). Members of a jury in a § 1983 case, introduced to a landowner complying with existing land-use regulations who has met with a non-responsive or even belligerent response, could inflict costly damage on the taxpayers of Hydro City.

Scenario C

No new permanent buildings are permitted in buffer zones bordering the river, and owners of existing structures may not make additions or improvements. Owners who can show a seventy-five percent reduction in value can apply for a variance. Owners who can show a ninety percent reduction will be given rights to develop non-sensitive properties elsewhere.

There are three lessons from the Court that indicate the difficulties local governments face when implementing environmental regulations that have a significant impact on land values and uses. First, ripeness requirements continue to be significant hurdles for those bringing regulatory takings challenges (Lesson #4). Landowners and developers bringing regulatory takings challenges often find themselves forced to make difficult and time-consuming strategic choices concerning the choice of forum and the need to request permission or a variance after being denied relief initially (or even repeatedly). Second, the Court endorses careful planning for environmentally sensitive lands (Lesson #9). Courts have signaled their support for the development of comprehensive programs directed to reap defined and concrete environmental benefits for the entire community. Third, regulators must ensure that landowners retain something more than token value (Lesson #10). There is a point at which the financial burdens carried by one or a group of landowners are deemed too onerous, and local regulators must be aware of the general and specific effects of their actions.

Scenario D

City officials, concerned about water consumption, pass an ordinance that imposes a sliding scale--tying costs to usage (the more usage, the higher the per-unit cost). In order to secure enough votes to pass the ordinance, sponsors of the ordinance exempted existing users

and other in-state companies from the new scheme. Lawsuits are threatened.

The Commentators have provided three lessons that address the fairness questions raised by these hypothetical facts. First, the text trumps legislative history (Lesson #5). If a piece of legislation creates unfair or illegal categories, even the best of intentions preceding its enactment will be deemed irrelevant. Second, judges appreciate the administrative burdens faced by local officials (Lesson #6). Though a separate branch, the judiciary is not unmindful of the significant challenges facing local legislatures today, when raising taxes is extremely difficult (and potentially fatal to a political career) and when financial support from Washington, D.C. is often insubstantial. Third, Congress may subject municipalities to suit in state court without violating "state sovereignty" (Lesson #7). Unlike the states who created them (and have the power to alter their powers and boundaries), municipalities are vulnerable to costly and otherwise injurious litigation. This fact alone should lead to caution by local officials when they create distinctions that leave some landowners outside the benefited class." (Wolf 2006, pp. 261-64)

Thus, local government officials enjoy considerable constitutional freedom and authority to consider and craft wet growth regulations to protect water resources and watersheds from land use, development, and growth that threatened our waters.

Sources:

Arnold, Craig Anthony (Tony). 2002. "The Reconstitution of Property: Property as a Web of Interests." *Harvard Environmental Law Review* 26:281. Available from SSRN at <http://ssrn.com/abstract=1024244>.

Arnold, Craig Anthony (Tony), ed. 2005a. *Wet Growth: Should Water Law Control Land Use?*

Arnold, Craig Anthony (Tony). 2005b. "Is Wet Growth Smarter Than Smart Growth?: The Fragmentation and Integration of Land Use and Water." *Environmental Law Reporter* 35: 10152. Available from SSRN at <http://ssrn.com/abstract=1040821>.

Arnold, Craig Anthony (Tony). 2007. "The Structure of the Land Use Regulatory System in the United States." *Journal of Land Use and Environmental Law* 22: 441. Available from SSRN at <http://ssrn.com/abstract=1020305>.

Center for Watershed Protection. 1995. Site Planning for Urban Stream Protection. Available at http://www.cwp.org/Resource_Library/Center_Docs/BSD/ELC_BSDpart1.pdf and http://www.cwp.org/Resource_Library/Center_Docs/BSD/ELC_BSDpart2.pdf.

Center for Watershed Protection. 1998. Better Site Design: A Handbook for Changing Development Rules in Your Community. Available at http://www.cwp.org/Resource_Library/Better_Site_Design/.

Center for Watershed Protection. 2008. Codes and Ordinances Worksheet. Available at http://www.cwp.org/Resource_Library/Center_Docs/SW/pcguidance/Tool4.pdf.

Georgia Department of Community Affairs and Georgia Quality Growth Partnership. Toolkit of Best Practices, Incentive Zoning Tool. Available at http://www.dca.state.ga.us/intra_nonpub/Toolkit/Guides/IncntvZng.pdf.

Juergensmeyer, Julian Conrad and Thomas E. Roberts. 2007. Land Use Planning and Development Regulation Law, 2nd ed.

McElfish, James M, Jr. 2004. Nature-Friendly Ordinances: Local Measures to Conserve Biodiversity.

National Association of Counties (NACO). 2000. Source Water Protection: A Guidebook for Local Governments. Available at http://www.naco.org/Content/ContentGroups/Programs_and_Projects/Environmental1/Water1/SourceWaterProtectionGuida.pdf.

National Association of Local Government Environmental Professionals et al. (NALGEP et al.). 2003. Smart Growth for Clean Water: Helping Communities Address the Water Quality Impacts of Sprawl. Available at <http://www.resourcesaver.com/file/toolmanager/Custom093C337F42157.pdf>.

Nolon, John R. 2003. Open Ground: Effective Local Strategies for Protecting Natural Resources.

Northwestern Indiana Regional Planning Commission. Stormwater Fact Sheet. Available at <http://www.nirpc.org/environment/pdf/Stormwater.pdf>.

Russell, Joel. 2004. "Overlay Zoning to Protect Surface Waters." Planning Commissioners Journal 54: 1 (Spring).

Site Planning Roundtable. 1998. Consensus Agreement on Model Development Principles to Protect Our Streams, Lakes, and Wetlands. Available at http://www.cwp.org/Resource_Library/Better_Site_Design/.

United States Environmental Protection Agency (U.S. EPA), Model Ordinances to Protect Local Resources, <http://www.epa.gov/owow/nps/ordinance>.

United States Environmental Protection Agency (U.S. EPA). 1999. Watershed Protection Management Measure.

United States Environmental Protection Agency (U.S. EPA). 2005. National Management Measures to Control Nonpoint Source Pollution from Urban Areas, EPA 841-B-05-004. Available at http://www.epa.gov/owow/nps/urbanmm/pdf/urban_guidance.pdf.

Wolf, Michael Allan. 2006. "Supreme Guidance for Wet Growth: Lessons from the High Court on the Powers and Responsibilities of Local Governments." *Chapman Law Review* 9: 233.