

Planning Board Workshop on Stormwater & Vegetative Buffers –

Recommendations for Revised Ordinances and Programs; presented by Bob Zeid on behalf of the Stormwater Advisory Board

The primary objective of this workshop is for the Planning Board to identify goals that could be achieved by a revised vegetation ordinance. Since the relationship of vegetation to stormwater and water quality improvement are so integral to this discussion I thought it would be useful to provide the workshop attendees with an overview of key stormwater issues and how vegetative buffers fit into an overall regulatory scheme. An outline of the presentation is:

1. Overview of stormwater regulations and timing of compliance
2. Oak Island stormwater regulations and timing of compliance
3. Recommended changes in ordinances and potential projects
4. Incentives for voluntary compliance
5. Implications of no action

1. Overview of Stormwater Regulations & Timing of Compliance

In 1972, Congress passed the Clean Water Act, which required a National Pollutant Discharge Elimination System (NPDES) program to be put in place to control stormwater pollution. Although Congress authorized the Environmental Protection Agency (EPA) to enforce compliance of the Clean Water Act, the agency delegated authority to the states to allow specific legislation, programs, and enforcement. In North Carolina, the regulatory oversight for the Clean Water Act is handled by the Department of Environment and Natural Resources (NCDENR) but specifically through the Division of Water Quality (DWQ). For detailed information, see the Division of Water Quality [website on stormwater and runoff pollution](#).

Phase I of the stormwater regulations (enacted in 1990) required a stormwater permitting program for large or medium-sized municipalities with populations of 100,000 or more. Phase II of the NPDES stormwater program became law in December 1999, which required smaller communities to comply as well by creating small municipal separate storm sewer systems (MS4s). Compliance with the Phase II stormwater regulations is measured against six major goals:

- public education and outreach on stormwater impact
- public involvement and participation
- illicit discharge detection and elimination
- construction site runoff control
- post-construction stormwater management in new development and redevelopment
- pollution prevention and good housekeeping for municipal operations

In 2000, North Carolina began the rulemaking proceedings and temporary rules were put into effect in 2001 as adopted by the Environmental Management Commission (EMC), a citizen commission charged with adopting environmental regulations. In 2003, the EMC proposed stormwater regulations, which impacted 123 municipalities and portions of 33 counties, were rejected by the Rules Review Committee setting off a lawsuit. In 2004, the General Assembly stepped in and created its own set of temporary rules; S1210 was ratified on July 14, 2004. Later, the EMC created a revised set of stormwater regulations and those were reconciled with the General Assembly's S1210 as part of the final bill (SB1566) approved in 2006. This legislation added approximately 100 municipalities to Phase II requirements. Key provisions included:

- clarifies that cities have the authority to adopt and enforce ordinances implementing stormwater programs, but that DENR may not require municipalities to implement illicit discharge detection and elimination programs in their extraterritorial jurisdictions;
- establish a lower threshold for triggering stormwater control requirements in areas near shell fishing waters; and
- require development in coastal areas to have controls capable of managing greater amounts of rainfall
- sets forth the circumstances under which development activities will have a vested right to continue without complying with the post-construction stormwater management practices

2. Oak Island Stormwater Regulations & Timing of Compliance

Oak Island Phase II stormwater permit became effective March 1, 2007. Effective July 1st, key provisions of the new state regulations for projects that disturb at least one acre within a half-mile of “shellfish resource waters” require:

- development of more than 12% of the land must be done in conjunction with a stormwater mitigation system such as retention ponds, vegetative buffers, etc.;
- high-density developments must hold and purify rainfall from the biggest yearly storm (3.8”); was previously required to absorb the first 1.5”

The recommended changes and potential projects listed below are a mix from the Stormwater Advisory Board¹ and discussions outside the committee.

3. Recommended Changes in Ordinances and Potential Projects

Some recommendations to consider include:

- Ban clear cutting lots from property line to property line for both residential and commercial
 - A vegetative buffer in the setback areas should be preserved except for areas needed to access the property (e.g., driveways).
- Review commercial parking requirements to allow a reduced number of parking spaces in lieu of more vegetative buffering and/or incorporating vegetation in the parking areas. This would not only serve the aesthetic demands of the community but, more importantly, help meet the requirements of the stormwater plan for the site. However, the vegetative areas must be large enough to be effective in aiding stormwater. The size of the vegetative areas needed should be determined by the capacity required for that design component of the stormwater site plan.
- Residential: cap the size footprint of the house and driveway based on their combined total of impervious surface as (1) a percentage of the entire lot or (2) a percentage of the buildable area
- Commercial: establish vegetative buffers around the property line within the setback that cannot be covered by driveways or other impervious surfaces; establish a cap on the total percentage of impervious surface allowed
- Review of materials and designs typically used for driveways and parking areas. Alternative construction methods may allow grass strips or pervious materials inserted between concrete or paved runners. May also consider reducing the width of driveways and parking areas.
- Apply a standard to development of lots less than one acre by requiring a stormwater plan be implemented for properties that exceed a trigger (e.g., 50% impervious surface)
- Use of pervious surfaces for parking lots, pedestrian-friendly areas, and sidewalks in commercial district
- Establish a heritage tree protection program that ensures old growth is not removed without a permit or prior review

Some stormwater-related projects under consideration include:

- **Stormwater information on the town website:** a draft website is available for your review (<http://www.oakislandnc.com/stormwater/index.htm>). This website will be published after the new stormwater manager has been hired and had a chance to review it. When published it will offer the Planning Board and USA Tree Advisory added impact on the vegetation-related issues since there is so much already written about its impact on stormwater control, improved riparian buffers, etc.
- **Improvements to the town’s existing NPDES (National Pollutant Discharge Elimination System):** sites already approved as part of the OI Stormwater Management Plan and Phase II of the NC State program may be improved via increased vegetative buffers and/or engineering. The improvements to street ends and other sites (e.g., boat ramps) could have enormous impact on reducing sediment and fecal coliform discharges into Davis Canal and the Intracoastal Waterway.

¹ The Oak Island Stormwater Advisory Board is comprised of Bob Zeid (Chair); Susan Pierce (Secretary); Elaine Painter, and Dan Weaver working in conjunction with Gene Kudgus, Director of Public Works, and Dara Royal, member of Oak Island Town Council.

- **Installation of retention ponds, rain gardens, or artificial wetlands on small parcels of town-owned property:** some town-owned parcels that are too small to build on may be candidates for rain gardens and serve as useful demonstrations to local homeowners and builders. The hope is that these sites will be a catalyst for homeowners to try it on their own property. Other projects may include conversion of a septic tank into a SW component.
- **Increased public awareness of stormwater control measures:** A critical component of the Phase II stormwater plan's first-year goals is to increase public awareness and input on the stormwater compliance and controls. A key part of improving both water quantity and quality from individual yards and businesses is promoting the value of vegetative buffers and tree preservation.
- **Increased public awareness of water quality measurements (metrics for stormwater):** One area being discussed is trying to make the water quality data more readily available to the public so they can see whether it's improving or not. Since the Division of Water Quality and other DENR-related agencies have data from long-term monitoring already, it would be essential to partner with these agencies for access to the data and weave them into the town stormwater website or annual updates. We feel that if the public were made more aware of the water quality data there could be increase compliance to improve or maintain it.
- **Public forum on low-impact development:** There is great value in having a public forum for OI residents to hear about what smart growth initiatives should be done and the priorities they would like to assign them. Once the Land Use Plan is updated, a local workshop may serve as a foundation for getting public buy-in on what new ordinances the town should adopt. This OI workshop should not only include overviews from all the relevant boards and committees but local agencies as well. Other topics like harmonization with the county UDO (unified development ordinance) on stormwater may also be useful to discuss, especially since there are several major projects spanning both county and OI Township.

4. Incentives for Voluntary Compliance

Since the Phase II stormwater compliance does not apply to sites less than one acre the majority of development on Oak Island will be exempt. To prevent further degradation of water quality there should be a system to apply uniform standards – where possible – to development of single family homes, multi-family, and commercial property less than one acre. Some incentives for voluntary compliance could include:

- promote Low Impact Development (LID) techniques by having significantly lower impact fees for projects that include stormwater management mitigation in their plans;
- Oak Island may qualify for grants and other state/federal funding to underwrite significant stormwater; conversely the town may not receive certain monies if it does not take minimal initiatives
- establish a group of citizens that can work in conjunction with town employees to help consult and establish bowl gardens, bioretention ponds, artificial wetlands, etc. for other neighbors and projects planned by the town. This will be an excellent way to disseminate information to citizens and build on a grassroots foundation of knowledge for applications. The town may want to subsidize costs of plants or materials or labor in order to affect a wider acceptance of the program; can help underwrite this with grant funding.
- establish an advisory group for citizens living directly on the water so that they can receive additional materials regarding keeping their riparian buffer healthy, not using pesticides/herbicides, or other practices that could have a dramatic impact on water quality. For example, could compile a list of commonly used pesticides and herbicides that should not be used around water. May also wish to publish on town website if appropriate.

5. Implications of No Action

The consequences of not improving stormwater measures could include:

- further deterioration of watershed resulting in decreased shellfish beds, algal blooms, fish kills, and beach closings
- increased regulatory scrutiny by CAMA, DENR, DWQ for any development subject to Phase II requirements
- state-mandated monitoring of Section 303(d) waters for certain pollutants (e.g., total maximum daily load [TMDL])². The watershed surrounding Oak Island is already designated as Section 303(d).
 - TMDL allocations have not been issued for any of the Town’s receiving water bodies. None of these water bodies are considered “water quality-limited”. Monitoring conducted in Davis Canal in the fall of 2002 indicated low levels of fecal coliform, phosphorus, nitrate/nitrite, and oil and grease. Table 3.1 is from the SW Management Program Report (Jan 2004). However, this may change and we should discuss the implications in terms of what TMDL levels might be trended and set. In a related area, this may provide an opportunity for the Town to expand the long-term monitoring of surrounding waters and trend pollutants for potential TDML levels. This will also be a good chance to get some baseline data before expanded sewer, which will give us a chance to assess the overall impact on water quality.

Table 3.1

| RECEIVING WATER NAME | WATER QUALITY CLASSIFICATION | USE SUPPORT RATING | WATER QUALITY ISSUES |
|-------------------------------|------------------------------|--------------------|----------------------|
| Davis Canal | SA/HQW | NR | NONE |
| Davis Creek | SA/HQW | NR | NONE |
| Intracoastal Waterway | SA/HQW | NR | NONE |
| Montgomery Slough | SA/HQW | NR | NONE |
| Eastern Channel | SA/HQW | NR | NONE |
| Denis Creek | SA/HQW | NR | NONE |
| Elizabeth River | SA/HQW | NR | NONE |
| Atlantic Ocean | N/A | NR | NONE |
| Dutchman Creek Outlet Channel | SA/HQW | NR | NONE |

The Tidal Salt Water Quality Classifications used by the NCDENR are as follows:

- (1) Class SC: salt waters protected for secondary recreation, fishing, aquatic life including propagation and survival, and wildlife. All salt waters shall be classified to protect these uses at a minimum.
- (2) Class SB: salt waters protected for primary recreation, which includes swimming on a frequent or organized basis, and all Class SC uses.
- (3) Class SA: suitable for commercial shell fishing and all other tidal saltwater uses.
- (4) Class SWL: waters that meet the definition of coastal wetlands as defined by 15A NCAC 2H .0205, and which are landward of the mean high water line, and wetlands contiguous to estuarine waters as defined by 15A NCAC 2H .0206.

All the receiving water bodies adjacent to Oak Island have an SA usage classification.

Surface waters are classified according to their best intended uses. Determining how well a water body supports its uses (use support status) is an important method of interpreting water quality data and assessing water quality. Surface waters are rated *fully supporting* (FS), *partially supporting* (PS), or *not supporting* (NS). The ratings refer to whether the classified uses of the water (i.e., aquatic life protection, primary recreation, and water supply) are being met. For example, waters classified for fishing, aquatic life protection, and secondary recreation (Class C for freshwater or SC for saltwater) are rated PS if data used to determine use support meet certain criteria. However, if these criteria were not met, then the waters would be rated as PS or NS, depending on the degree of degradation. Waters rated PS or NS are considered to be impaired. Waters lacking data, or having inconclusive data, are listed as not rated (NR). The Town of Oak Island receiving waters have not been rated to date and, therefore, are given an NR designation.

² TMDL or **Total Maximum Daily Load** is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and non-point sources. The calculation must include a margin of safety to ensure that the water body can be used for the purposes the State has designated. The calculation must also account for seasonal variation in water quality. A TMDL provides a detailed water quality assessment that provides the scientific foundation for an implementation plan. An implementation plan outlines the steps necessary to reduce pollutant loads in a certain body of water to restore and maintain human uses or aquatic life. The development of TMDLs and implementation plans are often the best method to improve water quality.





















Section 303(d)(1)(C) of the Clean Water Act and the U.S. Environmental Protection Agency's (EPA) implementing regulations (40 CFR Part 130) require the establishment of a Total Maximum Daily Load (TMDL) for the achievement of state water quality standards when a water body is water quality-limited. A TMDL identifies the degree of pollution control needed to maintain compliance with standards and includes an appropriate margin of safety. The TMDL focuses on reducing the pollutant inputs to a level (or "load") that fully supports the designated uses of a given water body. The mechanisms used to address water quality problems after the TMDL is developed can include a combination of best management practices and/or effluent limits and monitoring required through NPDES permits.

- costs associated with cleanup, mitigation, or other engineered measures to correct water quality issues such as piping.
 - If the current development practices continue unchanged the water quality could degrade to the point that the state will require Oak Island to treat the stormwater prior to discharge. This would require the construction of a facility on the mainland and conveyance (piping) of the stormwater to a treatment plant. The costs to purchase land, design and construct the facility, as well as operate it in combination with extensive monitoring could be comparable to (or exceed) the sewer infrastructure costs.

6. References & Additional Resources

Some additional links for stormwater include:

- NC Division of Water Quality: Stormwater Runoff and Non-point Source Pollution (<http://h2o.enr.state.nc.us/Stormwater.html>)
- NPDES Phase II Stormwater Program (http://h2o.enr.state.nc.us/su/NPDES_Phase_II_Stormwater_Program.htm)
- International Stormwater Best Management Practices (BMP) Database (<http://www.bmpdatabase.org/index.htm>)
- NCDENR: List of Laws, Rules, & Regulations (<http://www.ncstormwater.org/pages/laws.html>)
- NCDENR Recreational Water Quality Program (http://www.deh.enr.state.nc.us/shellfish/Water_Monitoring/RWQweb/aboutus.htm)
- NPDES Phase II Stormwater Program (http://h2o.enr.state.nc.us/su/NPDES_Phase_II_Stormwater_Program.htm)
- Best Management Practices (BMP) Manual – 2007 draft (see links to chapters below)

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