



APPLIED TECHNOLOGY & MANAGEMENT, INC.

Pipelines

An ATM Newsletter for Municipalities and Counties

Summer 2010

Professional Milestones

The following ATM staff have recently accomplished new professional accreditations:

- Angela Bryan, P.E., **LEED AP**
- Kayle Moore, **P.E.**
- Justin Davis, **P.E.**
- Michael Klink, **P.E.**

Office Locations

South Carolina

Charleston
Hilton Head

Florida

Tallahassee
Gainesville
Jacksonville Beach
St. Augustine
Melbourne Beach
West Palm Beach

About Us

ATM provides civil, coastal, environmental, marina, and water resources engineering services.

Our staff takes pride in developing sustainable solutions that meet the functional, regulatory, and economic needs of our clients.

Our Mission

At ATM we are stewards of the environmental, and advocates for our clients.

We do this by providing scientifically based, practical solutions, and an entrepreneurial approach to natural resource management.

We believe this results in success for our clients and ATM.

In This Issue

Neptune Beach - A Case Study for Meeting a Nutrient TMDL



Water Quality Storm in Florida



The Ever Increasing Popularity of Mooring Fields



What topics or concerns would you like to see explored in upcoming issues of Pipelines?

If you have suggestions, would like to be interviewed for Pipelines, or added to our mailing list, please call Grant Mysterly at (904) 249-8009 or email gmysterly@appliedtm.com.

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Neptune Beach – A Case Study for Meeting a Nutrient TMDL

The City of Neptune Beach was an eager participant in the Basin Management Action Plan (BMAP) developed for the implementation of the Lower St. Johns River Basin Total Maximum Daily Load (TMDL) for total nitrogen (TN). The City was committed to doing their part to help improve the health of the river by minimizing their TN load to the river as much as possible. Testing results in 1998, the baseline year for the TMDL, indicated that the wastewater treatment plant (WWTP) TN loading was 25,186 pounds per year, which was equivalent to a concentration of 8.27 mg/L at a flow of 1.0 million gallons per day (mgd). As a result of the BMAP process, an allocation of the TN reductions required to meet the TMDL was developed and finalized in October 2008. The City's share of the reductions from their WWTP was 15,431 pounds per year; a 38.7% reduction.

Working with ATM, the City developed a plan and design of a system to remove TN to a level well below the BMAP requirements. Early estimates projected that costs would run between \$150 and \$350 per pound of TN removed to design and construct a treatment system to meet the BMAP mandated reduction. The City initially budgeted \$3 million to fund the project. They then discovered that, due to the effluent TN concentration increasing nearly threefold

from 8.3 mg/L to 23.5 mg/L, the total pounds of TN to be removed had escalated significantly. As a first step in evaluating all options available, the City considered the potential of decommissioning the WWTP and pumping raw wastewater to the City of Atlantic Beach for treatment. The price of peak flow reduction to meet the City of Atlantic Beach's flow limitations ultimately resulted in this option being impractical.



ATM then evaluated the nutrient removal treatment processes from a cost-effective standpoint, and settled on the Integrated Fixed Film Activated Sludge (IFAS) process. This process met the City's needs by eliminating the need for additional process tankage and by readily accommodating high peak flows experienced by the City during extended periods of wet weather. The HDPE media used in the IFAS process provides for a large surface area for growth of microbes that treat the wastewater, allowing for additional treatment in a given tank volume.

To implement this TN reduction project, ATM assisted the City of Neptune Beach in obtaining \$700,000 in grant funding for the IFAS project, and another \$250,000 for a reclaimed water project from the St. Johns River Water Management District. The TMDL project bids were received on the low end of the budgetary spectrum; less than 65% of the amount initially budgeted. The final cost for reducing the effluent TN concentration from 23.5 mg/L to less than 3 mg/L, a reduction of 39,314 pounds per year, was only \$43 per pound with the IFAS system. The project is currently under construction and will be operational over 15 months prior to the deadline called for in the BMAP.

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Water Quality Storm in Florida

At times lately, it feels like Florida is in the middle of the “perfect storm” when it comes to water quality issues. The State is being hit with a regulatory hurricane with the establishment of Numeric Nutrient Criteria by the U. S. Environmental Protection Agency (EPA), the ongoing implementation of the consent decree that has mandated that Total Maximum Daily Loads (TMDLs) be established for hundreds of waterbodies throughout the state, and recent proposed changes in Municipal Separate Storm Sewer System (MS4) requirements and other initiatives coming from EPA. Unfortunately,



Florida’s municipalities and counties have to weather this storm during a time when budgets and staffs are shrinking. Keeping up with what is coming can be a daunting task.

In January 2010, EPA published its draft Water Quality Standards for the State of Florida’s Lakes and Flowing Waters. The criteria set strict numeric limits for allowable nutrient concentrations in freshwater streams, lakes, springs and spring runs, and canals within South Florida. Additionally, EPA proposed what it termed Downstream Protective Values (DPVs) that would apply to freshwater streams. DPVs would be nutrient concentrations allowable in the upstream freshwater areas that would not cause harm to lakes, bays or estuaries when the water flowed downstream.

Following the publication of the draft criteria, EPA received an unprecedented amount of feedback from municipalities, counties, private and public groups, and even the Florida Department of Environmental Protection. EPA is scheduled to publish its final DPVs in October 2010 for lakes and flowing waters (freshwater), but it has already announced some significant changes to schedules based upon a court ruling in June of this year. The finalization of the DPVs that EPA defined to protect Florida’s bays and estuaries has been postponed until August 2012 (the original date was October 2011). The draft criteria would be then proposed for public comment in November 2011. This is critically important because the proposed values were based upon flawed analyses and were highly controversial. The DPVs to protect lakes are still scheduled to be published in October 2010, but recent requests for information from EPA may delay those also. The finalization of the canal criteria has also been postponed until the August 2012 date. The criteria for estuarine waters, which was scheduled to be published for public comment in January 2011, has now been postponed to November 2011, with finalization of those criteria by the August 2012 date. FDEP is currently hosting numerous public meetings throughout the State to solicit input on development of waterbody-specific criteria for each of Florida’s estuaries. FDEP hopes to either establish estuarine criteria itself before the deadline, or get EPA to publish the analyses and values it has produced. EPA is continuing its efforts to finalize the remaining criteria (freshwater stream, springs, and lakes criteria) for the October 2010 deadline. FDEP and other groups are working to influence EPA’s

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efforts to make the final criteria as reasonable as possible, knowing that the forthcoming decisions will have significant impacts upon water quality treatment requirements in Florida. On the TMDL front, FDEP and EPA continue to propose TMDLs throughout the State and are on a fast track to complete hundreds of TMDLs before the court-ordered consent decree period ends in 2012. As with the numeric nutrient criteria, these TMDLs can pose significant fiscal burden on permitted discharges and have focused on MS4 reductions. One new development is that various Phase I MS4 permits throughout the State of Florida are due for renewal and are past their 5-year deadline. Various issues have delayed the permit renewals, but one key issue relates to the language in the permits that links TMDLs with the MS4-permitted actions. In past permits, language has provided a tie to load reductions in TMDLs that would impact the MS4 discharges. The tie, however, has relied upon the completion of Basin Management Action Plans (BMAPs) that outline detailed allocations with significant input from all stakeholders. In a recently available draft of the first Phase I MS4 permit under this cycle (Palm Beach County), new language has been added that puts the burden of the development of the TMDL allocations (where no BMAP exists) directly on the MS4 permittees. The allocations would be developed through a 48-month period following permit issuance, with the MS4 permittees required to produce reports that outline how load reductions would be achieved. These load reductions would be included in revised requirements for the next permit cycle. This change has the potential to significantly increase the workload and costs for individual MS4 permittees and comes at a time of significant budget constraints for municipalities and counties.

Applied Technology & Management is currently working with agencies and local governments throughout the state on issues related to TMDL development and establishment of numeric nutrient criteria. For additional information on how ATM can assist you or your community, please contact Steve Peene (850-591-1888) or Janet Hearn (386-418-6400).

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The Ever Increasing Popularity of Mooring Fields

As available waterfront property diminishes and marina expansion options become increasingly difficult, many municipalities are looking at managed mooring fields as a way of providing affordable, environmentally-friendly options of attracting long-term and transient boaters to their downtown areas. As an example, the City of St. Augustine will complete construction of a 165 slip mooring field in the Summer of 2010, and the City of Titusville has received their permit and should begin construction on their 119 slip mooring field by the Summer of 2011. Other municipalities that currently have or are contemplating managed mooring fields include the Cities of Vero Beach, Miami, Cocoa, Key West, Fernandina Beach, and Marathon. For marinas wanting to expand their number of slips, mooring fields offer lower construction and maintenance costs, efficient use of space not available for conventional marinas, and fewer impacts to the surrounding waters than dock expansion. While the construction cost for a new wet slip in a conventional marina can run as high as \$20,000 each, not including dredging, mooring stations can be usually installed for under \$2,000 each.

In addition, moorings organize a harbor in a manner that is safe, secure and environmentally responsible. When restricted to designated moorings, boats are anchored in a safe location away from other vessels and owners must dispose of trash and sewage properly.

Whether a boat owner or not, the entire community benefits from the development of an organized anchorage within the City's waterways. Without designated mooring areas, a live-aboard boater may drop anchor for an unlimited amount of time anywhere in a bay, often resulting in the bay being used for "boat storage" which can be dangerous for other boaters and perhaps harmful to the environment. Managed mooring fields allow the municipality to control the presence of the vessels within the lease or owned area. According to Mr. Jim Piggott, Director of General Services for the City of St. Augustine, the City spent \$110,000 last year alone removing derelict vessels that had been abandoned.

The process of developing a mooring field is similar to that for a new marina. Careful planning and layout is critical for the mooring field to work efficiently. Important considerations include appropriate water depth, bottom characteristics and soil properties, riparian rights, and anticipated swing radii. For the City of Titusville, a large expanse of seagrass must be protected from the moorings. Working with Florida Department of Environmental Protection and Florida Fish and Wildlife Conservation Commission, the City and ATM helped maximize the number of moorings while completely avoiding the seagrass areas.



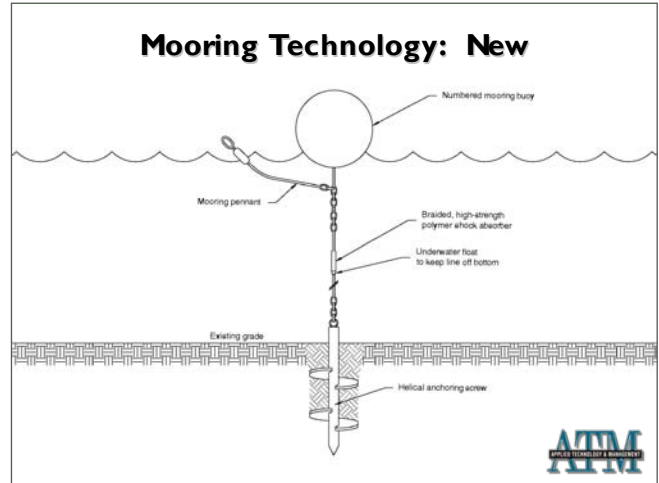
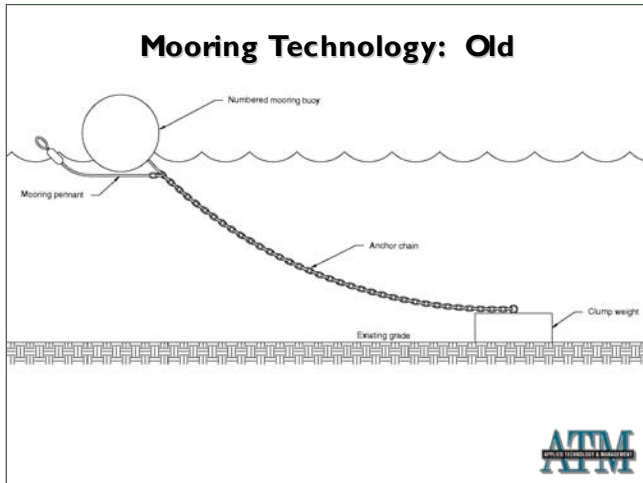
City of Titusville Mooring Field Plan

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In the past, mooring stations usually consisted of a clump weight and a length of anchor and chain connected to a mooring ball. The downside to this arrangement was that the chain had a tendency to scour the bottom and cause damage to surrounding areas.



New technology now involves the use of helical anchors and shock absorbing lines. This allows the line to stay off of the bottom, and allows the swing radius to be shortened, providing a more efficient use of the mooring area.

The creation of managed mooring fields is expected to become increasingly popular for waterfront communities. Increased tourism by transient boaters, improved water quality, and maximum use of available water areas all point toward a rising trend that is both affordable and beneficial to the community.