



North Carolina Department of Environment and Natural Resources

MEMORANDUM

TO: ENVIRONMENTAL REVIEW COMMISSION
Attn: Jeff Hudson, Commission Counsel
Jennifer McGinnis, Commission Counsel

FROM: J. Neal Robbins
Director of Legislative and Intergovernmental Affairs

SUBJECT: Review of Engineering Work Study

DATE: January 1, 2014

Overview

Attached for your information is the Department of Environment and Natural Resources report on Review of Engineering Work. This report is provided to you pursuant to S.L 2013-413, Section 58 which states: "The Department of Environment and Natural Resources, in conjunction with the Departments of Transportation and Health and Human Services, and local governments operating delegated permitting programs on behalf of the departments, shall study their internal processes for review of applications and plans submitted for approval. In particular, the departments, and local governments as applicable, shall examine: (i) standard processes for each environmental permit program with respect to evaluation of applications and plans submitted for approval, including the role professional engineers play in each permit program in terms of direct review of applications or plans, or supervisory responsibilities for review of applications and plans by other staff; (ii) mechanisms in place to ensure that staff who are not professional engineers are not engaged in the unauthorized practice of engineering; (iii) the standard scope of review within each permit program, including whether staff are reviewing applications or plans solely on the basis of the application or plan's ability to satisfy the requirements of the statute, rule, standard, or criterion against which the application or plan is being evaluated, or whether staff are requiring revisions that exceed statutory or rulemaking requirements when evaluating such permits or plans; (iv) opportunities to eliminate unnecessary or superfluous revisions that may have resulted in the past from review processes that exceeded requirements under law, and opportunities to otherwise streamline and improve the review process for applications and plans submitted for approval." The attached study report is submitted to fulfill this requirement.

2013 Study Report on Review of Engineering Work

Session Law 2013-413, Section 58

January 1, 2014

Submitted by:

North Carolina Department of Environment and Natural Resources

Other Participating Agencies and Organizations:

North Carolina Department of Health and Human Services

North Carolina Department of Transportation

North Carolina League of Municipalities

North Carolina Association of County Commissioners

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EXECUTIVE SUMMARY

Session Law 2013-413, Section 58 mandates that the Department of Environment and Natural Resources (DENR) study review of engineering work in conjunction with the Department of Health and Human Services (DHHS), the Department of Transportation (NCDOT), and local governments operating delegated permit programs. The study calls for the review of internal processes for review of applications and plans submitted for approval. In particular, the departments and local governments were to examine:

- (i) Standard processes for each environmental permit program with respect to evaluation of applications and plans submitted for approval, including the role professional engineers play in each permit program in terms of direct review of applications or plans, or supervisory responsibilities for review of applications and plans by other staff;
- (ii) Mechanisms in place to ensure that staff who are not professional engineers are not engaged in the unauthorized practice of engineering;
- (iii) The standard scope of review within each permit program, including whether staff are reviewing applications or plans solely on the basis of the application or plan's ability to satisfy the requirements of the statute, rule, standard, or criterion against which the application or plan is being evaluated, or whether staff are requiring revisions that exceed statutory or rulemaking requirements when evaluating such permits or plans; and
- (iv) Opportunities to eliminate unnecessary or superfluous revisions that may have resulted in the past from review processes that exceeded requirements under law, and opportunities to otherwise streamline and improve the review process for applications and plans submitted for approval.

To complete this study, DENR organized a stakeholder group that included representatives from DENR's regulatory divisions, the Department of Transportation, and the Department of Health and Human Services. Local government representatives were also present and coordinated with the assistance of the North Carolina League of Municipalities and the North Carolina Association of County Commissioners.

After reviewing internal processes for plans and approvals, the stakeholder group agreed that there was a diverse range of environmental programs with varying degrees of review of engineering work required. The group felt that there were sufficient engineers on staff where needed to review engineering work and that there are many mechanisms in place to prevent the unauthorized practice of engineering.

All government agencies are open to opportunities to streamline and improve the review process and to work in conjunction with all members of the regulated community. The stakeholder group formulated recommendations that can help guide both design engineers and regulators without requirements that may result in delays in the technical review response loop and approval times. The recommendations also call for better communication between state and local agencies and the regulated communities.

The following is a list of recommendations going forward based on input from various agencies:

DENR

1. **Review of checklists-** the Department will review existing checklists based on feedback from the regulated community.
2. **Enhanced review of innovative designs and new technology-** the Department recommends implementing new requirements that provide a pre-application meeting and a higher level of engineer review for innovative designs.
3. **Improved communication and customer service-** the Department has the following suggestions to improve the permit process: (a) each permitting unit will offer voluntary application submittal meetings when workload allows or after two letters have been sent by the Department to the applicant. The applicant may request a meeting with the reviewer and a professional engineer supervisor if applicable; and (b) representatives from each permitting unit will make themselves available on a predetermined monthly schedule in order to discuss issues with applicants and consultants.

DHHS (On-Site Water Protection Branch)

1. **Outreach education and training-** financial support for outreach education and training for design consultants would increase the knowledge base, improve communication and streamline review processes.
2. **Rule revisions-** changes in the complexity of the rule-making process have made it difficult to implement positive Rules revisions. Given the opportunity, the agency would restructure the current Rules to clarify information and incorporate state of the art knowledge and practices. Staff and stakeholders previously cooperated to draft rules revisions and these documents are available to facilitate any revision process.

Local Governments

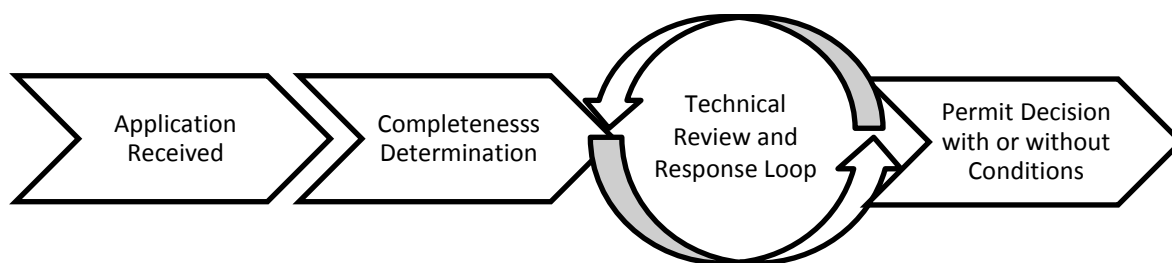
1. **Implement an electronic review process-** an electronic review process increases transparency and awareness throughout the entire review. When coupled with the ability to appeal plan review decisions to a professional engineer employed or retained by the local government, this transparency can be just as effective as requiring a professional engineer seal on all plan reviews.
2. **Establish a performance goal for reviews-** some local governments, such as the cities of Greensboro and Wilmington, mandate that all plan reviews take place within a specified window of time once a complete plan is submitted. This type of performance goal ensures the plan review process occurs within a reasonable amount of time.
3. **Define what comments “constitute the practice of engineering”-** if the legislature pursues a requirement that non-professional engineers may not make comments that “constitute the practice of engineering” as part of their plan reviews, there is a need to define what that phrase means. Otherwise, non-professional engineers would not know when to avoid making these types of requirements.

FINDINGS

I. REVIEW OF PROGRAMS: STANDARD PROCESSES AND MECHANISMS IN PLACE

NC Department of Environment and Natural Resources

The Department of Environment and Natural Resources has numerous environmental permitting, plans, and approval programs. The standard review process for environmental permits, plans and approvals generally follows the path below:



The “technical review and response loop” is where regulators review and approve engineering reports, plans and specifications. The many regulatory divisions within the Department have various amounts of engineering work that has to be reviewed. All divisions, however, have mechanisms in place that ensure that staff who are not professional engineers are not engaged in the unauthorized practice of engineering including the presence of engineers in review and supervisory roles, staff training, guidance manuals and best practices and policies within each program.

Division of Water Resources, Public Water Supply Section: The Public Water Supply Section is responsible for reviewing and approving engineering reports, plans and specifications that must be submitted in accordance with state statutes and regulations by persons intending to construct, alter or expand community and non-transient non-community public water systems. All staff that review and approve engineering reports, plans and specifications are in engineering positions that require an accredited engineering degree. The section does not have reviewers that are not classified as engineers reviewing or approving engineering plans.

All engineering review is performed by staff in engineering positions that report to an Engineering Manager who is a professional engineer. In addition, as stated above, all Engineer positions are filled by persons with an accredited engineering degree. Four of the five current reviewers are professional engineers while the fifth is an engineering intern as designated by the N.C. Board of Examiners for Engineers and Surveyors.

Division of Water Resources, Water Quality Permitting Section: The Water Quality Permitting Section includes the Complex Permitting Unit, the Compliance & Expedited Permitting Unit, the Non-Discharge Unit, the Transportation Permitting Unit, and the 401 & Buffer Permitting Unit. The Division of Water Resources also has two other branches

associated with environmental permitting; the Animal Feeding Operations Branch, and the Groundwater Protection Branch, both under the Water Quality Regional Operations Unit.

There are over sixty permitting programs within these groups. The programs are very different in scope and mandate. The majority of these permitting programs do not have professional engineers on staff and do not have any in supervisory positions. Across the programs included above, there are only four professional engineers on staff.

Approximately half of the permitting programs from these groups require submission of application materials that must be certified by a professional engineer. This would include the fast-track permitting program for sewer extensions where regional offices receive, review, and approve permit applications. Most regional office reviewers are not classified as engineers (most are environmental specialists) and anything that does not meet minimum design criteria comes to the Central Office for review by a professional engineer. Other units, like the Non-Discharge Unit receive, review and approve permit applications at the Central Office level.

Division of Coastal Management: The Division of Coastal Management is responsible for administering the Coastal Area Management Act. This Act requires permits for development in Areas of Environmental Concern (AEC). Neither CAMA nor the rules of the Coastal Resources Commission require that application materials be certified by a professional engineer. To the contrary, the CAMA permit process is of a simplified design, with the intention that much of the information required in many CAMA permit applications can be filled out by someone with little or no technical knowledge.

The Division does not have any professional engineers on staff, nor does it have any positions designated as engineering positions. Because there are no requirements in the rules that mandate that plans be prepared by a professional engineer, the Division does not have any application reviewers that are certifying engineering plans.

In the few cases where a professional engineer may submit information in support of a permit application (i.e. structural stability of a cantilevered structure, statement of imminent threat of collapse of a structure due to a failing bulkhead, transportation engineering questions), the information provided by the professional engineer is accepted at face value and not questioned. Furthermore, none of the tools that staff utilize to aid applicants in preparing permit applications (permit checklists, state rules dealing with permit application process, permit process flowcharts) contain any reference to engineering requirements.

Division of Energy, Mineral, and Land Resources: The Division of Energy, Mineral, and Land Resources includes the Erosion and Sedimentation Control Program, the Mining Program, the Dam Safety Program and the Stormwater Permitting Program. The Dam Safety and Stormwater Programs require materials to be sealed by professional engineers. The staff engineers who perform the application reviews are engineering interns, professional engineers or engineering degree graduates with experience. Depending on the work load, the supervisory staff engineers, nine are professional engineers and two have engineering degrees (one with a Master's Degree), may also perform application reviews.

At any point during the review, if additional information is required to process or approve the application, staff will ask for it in e-mail and letter form. If the information is provided, the applications are approved and/or permitted. If the information is not provided, the review is then escalated to the Regional Engineers or Program Specialists for disapproval or denial. Regional Engineers and Program Specialists are all classified as engineers, the majority of which are professional engineers. Staff not classified as engineers perform preliminary application reviews to login the applications, determine if a complete application has been submitted and identify possible missing details in the application prior to a full review by classified engineers. Checklists are used in this preliminary review.

Furthermore, staff is specifically trained not to perform any design work and there are checklists, guidance manuals, pre-application meetings and staff host design workshops in all the programs that provide guidance to designers and create a level playing field for design engineers and the reviewing engineers.

Division of Air Quality: The Division of Air Quality issues permits that generally require review of both the engineering and regulatory aspects of a project. Division rules do contain a requirement for a professional engineer seal under certain circumstances and the rules are not related to the practice of engineering. Since many applications do contain engineering work, the Division permitting staff are all engineers, many of whom are professional engineers. Engineers within the Division are not engaged in the unauthorized practice of engineering as there are enough professional engineers at all levels to provide guidance when needed.

Division of Waste Management, Solid Waste Section: The solid waste section issues permits ranging in complexity from a municipal solid waste landfill (MSW) to a stump grinding operation. Section training and practice is employed to ensure that engineering is not practiced when it is not appropriate. In instances where there is significant question about an engineering proposal, generally something that varies significantly from the norm, the engineer consults with the supervisor. The supervisor and the engineer collaborate and if necessary another professional engineer on staff can be consulted. The review letter that is produced does not dictate change, it cites specific rules or engineering practices that are in question and will ask questions designed to lead the preparer to an end, or allow them to further clarify and defend the design. If it is sealed, then it is accepted, after agency review.

Division of Waste Management, Hazardous Waste Section: The Hazardous Waste Section reviews and issues permits for the storage, treatment and disposal of hazardous waste. In addition, the Section reviews plans and reports to assess and remediate hazardous waste and hazardous constituents that are present in soil, sediment, surface water or groundwater.

The Hazardous Waste Statute does not require that the applications be reviewed by a professional engineer nor does it require that the application be submitted by a professional engineer. The state and federal rules, however, do require that some submittals and programs be signed by or under the direction of a professional engineer.

Reviews of the permit applications and work plans are based on the rules, 15A NCAC 13A .0101 through .0119 and the Federal Code of Regulation Chapter 40 various sections, guidance

documents issued by Environmental Protection Agency (EPA) and the section, and checklists that have been created by EPA and revised by the section. Deviation or omission from the rules is questioned in a Notice of Deficiencies or Letters of Clarification. These deviations do not question the underlying engineering, but rather the adherence to the rules and guidance.

Currently, the Hazardous Waste Section has one professional engineer on staff. All of the Notice of Deficiencies or Letters of Clarification are reviewed by the Facility Management Branch Head to ensure consistency and to ensure that items identified are based on rule or guidance.

Division of Waste Management, Superfund Section: The Superfund Section investigates, prioritizes, monitors and remediates uncontrolled and unregulated hazardous substance and waste disposal sites in North Carolina. Three Branches of the Superfund Section clean sites up, seek compliance by responsible parties, and respond to emergency threats using both state and federal authorities. The Superfund Section staff of 60 includes 15 engineers, of which 3 are professional engineers licensed to practice in North Carolina. Each work group or regional unit includes at least one engineer.

Most Superfund Section employees are project managers who oversee the work of responsible parties and their consultants, or oversee cleanups by state contractors using state funds. In general, the work being reviewed by Superfund Section staff is a cross-disciplinary mix of geology, chemistry, biology, toxicology, and engineering. Review is conducted as an iterative series of comment and reply. In the rare case when questions arise that might constitute a judgment on the practice of engineering by staff, and the project manager is not an engineer, the work is then reviewed as well by one of the staff engineers, and when necessary, by one of the licensed professional engineers on staff.

Division of Waste Management, Underground Storage Tank (UST) Section: The two activities performed by the Section involving review of engineering work include:

- (1) Review and approval of pre-and post-installation applications for installing new UST systems. If an application is incomplete or indicates that a system was not installed in accordance to the requirements, then an operating permit is not issued. The UST Section's Permit and Inspection Branch has two environmental engineers performing these reviews and one is a professional engineer.
- (2) Review and approval of corrective action plans involving active soil or groundwater remediation systems (e.g., soil vapor extraction, air sparge, pump and treat systems). The UST Section Corrective Action Branch has 38 staff in the regional offices that can perform reviews of corrective action plans involving active remediation. Four staff members are environmental engineers, but none are professional engineers. The State Trust Fund Branch, State Lead Program may request an active remediation corrective action plan from its contractors for some sites it oversees. There are two environmental engineers in the Branch and one is a professional engineer.

In total, the UST Section has two professional engineers on staff. None of the environmental engineer positions require a professional engineer license at this time, according to statute. The

section does ensure that staff performing and overseeing plan reviews have the education, training, knowledge and experience to adequately perform these reviews.

NC Department of Transportation

The North Carolina Department of Transportation (NCDOT) is delegated authority by the Sedimentation Control Commission to review and approve erosion control plans and to self-monitor implementation of the erosion and sedimentation control plan on active NCDOT construction projects only. All plans are either designed by NCDOT or consultant engineering firms. Plans are reviewed and approved by NCDOT registered engineers or staff supervised by registered engineers.

The Department performs design and construction with staff or consultants who are either registered professional engineers or who are supervised by registered professional engineers.

The Department evaluates erosion and sedimentation control plans in order to remain compliant with the guidelines and directives set forth by NC Sedimentation Control Commission. When design standards are exceeded it is primarily due to permit conditions in either 401 or 404 permits that are issued by the US Army Corps of Engineers and NC Department of Environment and Natural Resources, Division of Water Resources.

The Department evaluates erosion and sediment control plans for compliance with environmental laws and regulations. It has been necessary at times to exceed requirements under law to provide suitable protection to jurisdictional resources and private property based on the soil conditions and/or constructability issues

NC Department of Health and Human Services

Environmental permitting programs within the NC Department of Health and Human Services, Division of Public Health, Environmental Health Section include the on-site water protection branch, the food establishment plan review program and the swimming pool plan review program.

On-Site Water Protection Branch (OSWP): Permitting authority for all system design whether engineered or not is governed under Article 11 of Chapter 130A of NC General Statutes and 15A NCAC 18A .1900 (Rules Governing Sewage Treatment and Disposal Systems). Ultimate permitting authority lies with Local Health Department (LHD) personnel who are authorized agents of the state.

A professional engineer shall design certain systems including: systems with design flow >3,000 gallons per day (gpd), a system required to use more than one pump or siphon or systems treating Industrial Process Wastewater (IPWW) [Rule .1938(d)]; system-specific approvals issued pursuant to G.S. 130A-343 and Rule .1969 (Experimental and Innovative systems) frequently require engineered designs; and the LHD may require an engineer to design any other system serving a business or multi-family dwelling [Rule .1938(d) (8)].

Review processes and Engineering requirements by LHDs include the statutory and rule requirements for engineered designs as listed above. Some LHDs require professional engineers to design other types of systems such as low pressure pipe (LPP) distribution, multiple supply line networks to off-site drainfields, effluent pump components, systems with a design flow over 1,000 gallons per day, etc. LHD personnel consult the state for assistance if they are uncomfortable with reviewing a set of engineered plans. State-level assistance ranges from merely answering questions to reviewing part or all of the plans and specifications.

State review process for engineered designs includes:

- The .1900 rules require review of systems with design flow >3000 gpd or systems treating IPWW [Rule .1938(d)] by the On-site Water Protection Branch of the Division of Public Health in the Department of Health and Human Services (OSWP, DPH, DHHS).
- The state reviews engineered plans at the LHD's request as provided for in Rule .1964(b).
- The position descriptions for the environmental engineering review positions in the OSWP Branch as currently written by the Office of State Personnel are not required to be held by professional engineers. However, there has been at least one professional engineer on staff since 1983 and currently all four positions are staffed by professional engineers.

No formal mechanisms are in place to ensure review staff who are not professional engineers are not improperly engaging in the practice of engineering. However, all reviews of engineering submittals are conducted within the framework of job descriptions approved by the Office of State Personnel and annual work plans. These job descriptions and work plans include plan review and approval prior to permitting in compliance with applicable laws and rules.

Local Health Department staff review engineered plans to: ensure compliance with the .1900 rules; verify consistency of details and specifications; substantiate plan applicability to specific soil and site limitations; confirm inclusion of sufficient detail and instruction for system installation; and conduct an overall assessment of rule-required items for permitting, design, construction, operation and maintenance. Many LHDs utilize review checklists to facilitate consistent review of submittals. When LHD staff has questions or concerns about a proposed design, they request state assistance.

Any professional engineer who designs or reviews plans is obligated by the Engineering Rules of Professional Conduct to inform the NC Board of Examiners for Engineers and Land Surveyors when made aware of any person violating statutory and rule requirements governing the practice of engineering.

The On-Site Water Protection Branch reviews are based on requirements in Article 11 Chapter 130A of Carolina General Statutes, Title 15A NCAC 18A .1900 Rules applicable North Carolina General Assembly Session Laws. In accordance with Rule .1964(a) interpretation and technical assistance is provided "in accordance with the recognized principles and practices of soil science, geology, engineering, and public health." Additionally, when project reviewers are licensed North Carolina professional engineers, they must comply with the governing laws and rules pertaining to the practice of engineering in the State of North Carolina (Chapter 89C of the North Carolina General Statutes and Title 21 Chapter 56 of the North Carolina Administrative Code).

Staff differentiates preferences from requirements. Provisions related to groundwater monitoring are subject to Federal requirements (Clean Water Act) to protect source water.

Local Health Departments review a significant subset of on-site projects that are required (either by rule or by local health department direction) to be designed by professional engineers. Local reviews verify that the proposed design meets all the requirements of the .1900 Rules and includes all information necessary for permitting, construction, and system operation and maintenance. In accordance with Rule .1964(b), LHDs may request technical information and assistance from state personnel as needed.

Food Establishment Plans: Plans for chain food establishments are reviewed by an Environmental Engineer at the DPH Environmental Health Section. Plans for independent food establishments are reviewed by local Environmental Health Specialists acting as agents of the Department of Health and Human Services. The reviews are made to assure compliance with 15A NCAC 18A .2600 “Rules Governing the Food Protection and Sanitation of Food Establishments.” The reviews include evaluation of the menu, the food handling procedures, the applicability of the proposed food service equipment and its layout, the water and hot water supply, plumbing system, chemical and refuse storage, and floor, wall, and ceiling finishes.

The buildings and finishes are generally designed by architects; whereas the plumbing, mechanical, and electrical systems are designed by engineers. Food equipment is determined by the owner/operator and the equipment supplier. Any changes that are needed to the engineer-designed systems, such as the addition of hand sink(s) or a water heater change to meet demand, are noted to the design engineer who then makes the changes. The Environmental Engineer acts as a liaison between local health departments and submitters if a concern involving an engineered system is raised by the health department during one of their reviews.

Reviews are made based on a checklist of requirements of the above rules and the North Carolina Food Code. No engineering changes are made without consulting the design engineer, who will then make the changes to the plan.

The submittal package includes an application that is the main tool used to determine whether a plan will be approved as submitted. The application includes information on food handling, the plumbing system and components, and material finishes. It is as important as the plan in the review process. Any comments to a submitter that indicate plan disapproval must clearly indicate how the submittal does not meet the requirements of the above rules and Code.

Public Swimming Pool Plans: Plans for public swimming pools are reviewed by local environmental health specialists acting as agents of the Department of Health and Human Services. The reviews are to assure completeness and compliance with statutes, rules and standards for the design and construction of public swimming pools. The reviews are made using a checklist and include water supply, sewage disposal, sanitary facilities, piping and circulation components for water quality, and safety requirements for pool shell, deck, fencing, lighting, signs and markers, safety equipment, chemical storage and equipment rooms. There are no engineers working in this program and required changes are based on the deficiency noted with the design engineer responsible for any design changes to correct the deficiencies

Reviews are made based on a checklist of rule requirements and no specific engineering changes are specified. For example, if a pipe is too small to carry the required flow at the specified velocity, the design engineer will be notified and will be responsible for providing a revision to meet the required flow velocity.

Program staff is responsible for following a checklist to assure all required features are included in the plans and that the requirements in the Statutes, rules and standards referenced in the rules are met. No engineering decisions are made by staff and the deficiencies noted are reported to the design engineer, who is responsible for all engineering decisions.

Local Governments

Local governments have received delegated authority from the federal and state governments to review engineering plans for a variety of programs, including design of water distribution systems, wastewater collection systems, reclaimed water systems, water treatment plants, wastewater treatment plants, sedimentation and erosion control designs, and post-construction stormwater best management practice (BMP) designs. Because the largest numbers of local government plan reviews involve designs for sedimentation and erosion control devices or post-construction stormwater BMPs, this report focuses on review of those designs. Approval of those designs results in a locally-issued permit for the activity being reviewed.

It is standard practice for local governments to offer applicants pre-application meetings with local government plan reviewers. These meetings take place before design work begins to ensure applicants understand the relevant requirements for a particular project. In addition, it is standard for local governments to maintain open channels of communication with designers throughout the permit application process.

Local governments that have a sufficient volume of plan reviews dedicate funding to hire one or more professional engineers to handle plan reviews. These professional engineers are typically involved in the plan review process from start to finish, including pre-design fact-finding meetings, pre-application meetings, plan review at the time of submittal, and plan review at the time of permit issuance. However, in some cases, once the local government receives a plan submittal of low to medium technical complexity, a non-professional engineer with sufficient training may perform the plan review under the supervision of a professional engineer. In these instances, if a design professional takes issue with any review comments by the non-professional engineer, the design professional may request that a professional engineer review the comments.

Regardless of these standard practices, in almost all projects involving an alternative design that may not be part of the conventional design guidelines laid out in the State BMP Manual or other state-approved technical reference documents, a professional engineer is involved in the plan review.

It should be noted that there are local governments across the state which do not employ a professional engineer to conduct plan reviews. Typically, these jurisdictions do not have a large

enough volume of plan submittals to justify the expense of funding a professional engineer position on staff.

Regardless of whether a local government has a professional engineer on staff or not, local governments put mechanisms in place to prevent the unauthorized practice of engineering by non-engineers. These mechanisms include: stormwater permit application forms, minimum plan review submittal requirement checklists, BMP checklists, and BMP design supplement forms. Most local governments utilize the State BMP Manual as the standard design guidance document, while jurisdictions with large volumes of plan submittals may create ancillary/secondary design guidance documents such as technical standards manuals or standard details handbooks. This additional guidance assists plan reviewers and designers in ascertaining compliance with local ordinances, thereby facilitating compliance.

In general, the checklists and forms consist of a list of minimum submittal requirements and require the design engineer to fill in certain portions of the form in order to capture the required technical information. This technical information includes information on the design itself as well as construction details and specifications. These mechanisms allow the plan reviewer to simply compare the information provided on the checklist or form with what is on the plan to confirm its accuracy.

In addition, many jurisdictions hold internal meetings to assist plan review and reduce inconsistencies in the review process. At these internal meetings, professional engineers and their staff members discuss projects and reach consensus on any site-specific ordinance interpretations or design issues for which a clear standard has not already been established.

Local governments base their review of plan submittals on the plan's ability to satisfy local, state, and federal regulations as well as accepted industry standards. Checklists assist in the review and are compiled from regulatory requirements, design-related requirements, and guidance from sources such as:

- North Carolina Administrative Code
- Local Government ordinances
- Reference guide for development or other manuals
- Standard drawings & specifications
- Published letters to industry and written policies
- NC DENR's Stormwater BMP Manual

When reviewing construction drawings, local governments must ensure the plans provide adequate details and specifications – such as dimensions, materials, and methods of construction – to clearly define how the contractor can achieve acceptable results for what is proposed to be built.

However, there are occasionally circumstances in which the plan reviewer must apply judgment in determining a plan's compliance with statutes, rules, standards, and other published criteria. This situation is particularly true with stormwater management. Certain common judgments, such as selection of runoff coefficients, assumptions for time of concentration, degree of

adherence to natural drainage patterns, etc., have a wide range of potential answers. To accommodate this variation, most plan reviewers allow the design professional a range within which to exercise such judgments and encourage common-sense design judgment in accordance with law, while maintaining the integrity of the stormwater management criteria and facilitating consistent application of these criteria.

Some cases that fall outside the normal scope of published standards and checklists that take additional review time and revisions can include:

- *The design engineer proposed a design that local experience has shown to be problematic in that jurisdiction.* In such cases, the plan reviewer would typically meet or talk with the designer to convey the concern. However, if the designer did not address the concern, and the design did not pose a safety issue, was not contrary to any written requirement or standard, and would be privately maintained, the plan reviewer must approve the design. Typically, if a local government saw recurring problematic design submittals, it would modify its guidance documents.
- *The details of a design are not referenced specifically in guidance documents; however, the local government's guidance documents contain a general statement that a design must comply with some industry standard.* For example, a local design guidance document could contain language that reinforced concrete designs shall comply with the American Concrete Institute's latest building code requirements.
- *The design engineer proposes a new technology.* In this case, a plan reviewer would likely review supporting documentation submitted by the designer, as well as information gathered independently by the plan reviewer, to determine whether the design would perform as intended. If new technology becomes more prevalent in designs, typically, local governments would incorporate suggested design standards into guidance documents.

II. OPPORTUNITIES TO ELIMINATE UNNECESSARY OR SUPERFLUOUS REVISIONS AND STREAMLINE AND IMPROVE THE REVIEW PROCESS

NC Department of Environment and Natural Resources

In compliance with various legislative mandates, the Department is finding opportunities to eliminate unnecessary or superfluous revisions to applications for permits and plans and to streamline and improve the review process. The most prominent initiative is the regulatory rules review under House Bill 74, Session Law 2013-413. Under the regulatory reform process every rule will be reexamined, amended if appropriate, and readopted or repealed.

Additionally, the Stormwater Permitting Program is undergoing a stakeholder process to establish minimum design criteria and develop a fast-track permitting process in accordance with House Bill 480, Session Law 2013-82.

The following are other initiatives to streamline and improve the review process:

- The Underground Storage Tank Section just implemented a major initiative to streamline the installation application review process and to issue permits to operate systems earlier.
- The Division of Energy, Mineral, and Land Resources is developing a pilot electronic plan review process for erosion and sedimentation control plans and stormwater permits that is scheduled to be online by March 2014.
- As part of a corrective action plan that began in September 2012 and is expected to be complete by the end of 2013, programs in the water quality permitting section began a series of actions to address customer service, quality assurance, and public transparency. The following items have been instituted as a result of the corrective action plan to improve the review process:
 - Permitting units will update each of their applications and associated instructions to mirror all applicable administrative codes, general statutes, and policies. Clearly stating in the application and instructions what materials are required will help ensure that applications are more accurate and complete upon submittal. When applicable, these instructions will be formatted as checklists which both the applicant and reviewer can use to verify completeness.
 - Each permitting unit will offer voluntary application submittal meetings when workload allows.
 - Representatives from each permitting unit will make themselves available on a predetermined monthly schedule in order to discuss issues with applicants, consultants, and the general public.

Furthermore, the Department is considering ways to improve the review of innovative designs provided that the engineering justification behind such measures are fully considered and sufficiently detailed in the permit application. For example, as a matter of internal policy within the Division of Energy, Mineral, and Land Resources, innovative designs are always reviewed by professional engineers on staff before acceptance or denial of the permit.

NC Department of Transportation

The Department's review process is currently averaging a 10 day review time. Engineers review then submit recommendations to the design engineer. The process has been improved through the use of electronic plan submittals for those engineers who are separated by office location.

The Department continues to look for improvements to its design and review process to ensure the Department remains compliant but limits time delays due to the review process.

NC Department of Health and Human Services

On-Site Water Protection Branch (OSWP): OSWP provides checklists and guidance documents to design engineers and Local Health Department (LHD) reviewers. These mechanisms provide extensive information on the level of detail to be included in plans and specifications submitted as part of the project application package. Recommendations inform the designer of discrepancies between the proposal and previous experience as it affects system performance as well as operation and maintenance requirements. The OSWP uses the checklists

and guidance documents to identify discrepancies between the information contained in the submittal package and the minimum information required for review.

OSWP encourages applicants and their consultants to submit proposed projects in constituent parts (design flow confirmation, site plan and layout approval, and system engineering design) rather than as a total package. Submittal of projects in constituent parts allows partial review while other constituent parts are completed. This may even allow some construction activities to begin or proceed while project review continues.

Design engineers have the option to meet with OSWP plan review staff at a “pre-design conference” at the OSWP Central office, the local health department or at the project site, as appropriate. Attendees include the applicant’s consultants, OSWP and LHD staff to facilitate communication and expedite completion of review and subsequent permit issuance.

Local Health Departments commonly establish significant lines of communication with design engineers active in their counties. They convey expectations and submittal requirements as early in the process as possible to minimize subsequent revisions. They also conduct meetings with applicants and design engineers to inform them about rules and address comments on the proposed design relative to those rules. Local cooperation with design engineers minimizes the need for state-level review that may delay project inception. Local pre-screening of applications optimizes the time line of any required or requested state-level review.

There has long been consensus on the need to update, streamline and refine the Rules Governing (Subsurface) Wastewater Treatment and Disposal Systems to eliminate conflicting references, clarify intent, reflect current practices and incorporate technological and practical advancements.

Food Establishment Plans: The review process is inherently streamlined since every comment must be based on an aspect of the plan that does not comply with the rule. The rules were developed with stakeholder input and are widely accepted standards for food establishment design.

Public Swimming Pool Plans: The process for reviewing public swimming pool plans is streamlined by the use of a checklist and must be completed in less than 30 days. There is no opportunity for unnecessary or superfluous revisions to the plans because every comment must be based on a required element missing from the plan or a specification that violates a statute or rule. The rules were developed with stakeholder input and are widely accepted standards for public swimming pool design.

Local Governments

To streamline plan review and provide more transparency in the review process, local governments such as the City of Charlotte require electronic submittal of certain plans. Unlike with the usual paper submittal process – where redlined plan sets are typically in the hands of a designer only – the City’s electronic submittal system allows plan reviewers to mark their comments electronically. Therefore, all parties involved in the project, from designers to developers, may monitor the permitting process. The system eliminates uncertainty about when plans were submitted for review, when review comments were issued, or who made the comments. This

transparency helps hold all parties accountable for their actions. Other benefits of electronic plan review include:

- The ability to quickly exchange plan sheets with a design professional to address “minor” comments at the end of a review cycle, avoiding the need to approve plans “as noted”
- The ability to work interactively with the plan reviewer during or after a review cycle to make sure there is a clear understanding of how the review comments should be addressed, thus greatly improving the potential for plan approval with the next plan submittal.

RECOMMENDATIONS

NC Department of Environment and Natural Resources

The Department supports any effort to increase efficiency and provide customer service to permit and plan applicants. However, it must be noted that any additional requirements for review of applications may lead to increased delays in permit actions for a number of programs. For instance, the average review time for the fast-track sewer extension permits is 14 days. If the process were changed to require review by a professional engineer, the review time would undoubtedly increase. Delays in review and approvals would be similar across the other permitting programs within the Water Quality Permitting Section given the few professional engineers on staff.

An additional concern is that when a permit is contested by a third party, the action is brought against the state challenging the decision and the state defends the decision and potentially the design, not the certifying or designing engineer. Thus, the state must be allowed to question the validity of the information presented in support of a permit request.

Any modification of regulatory requirements also has the potential to impact agreements with the EPA. For example, in the Public Water Supply Section of the Division of Water Resources, the rules, statutes and conditions for EPA primacy delegation to run a program to implement the federal Safe Drinking Water Act on behalf of EPA all require that applicants submit engineering documentation certified by a professional engineer licensed to practice in North Carolina. The rules, statutes, and EPA Primacy conditions also require Public Water Supply Section approval of engineering documentation prior to construction.

After review of programs and consideration of improvements that can be made to both help the regulated engineering community and their clients, the Department makes the following recommendations:

1. **Review of Checklists-** the Department will review existing checklists based on feedback from the regulated community.
2. **Enhanced Review of Innovative Designs and New Technology-** feedback related to the unauthorized practice of engineering seems to occur when a non-traditional design is submitted for review. The Department recommends implementing new requirements that provide a pre-application meeting and a higher level of engineer review for innovative designs.
3. **Improved Communication and Customer Service-** generally comments about design or deficiencies to applications are made via letters which request modifications or additional information. The Department has the following suggestions to improve this process:
 - a. Each permitting unit will offer voluntary application submittal meetings when workload allows or after two letters have been sent by the Department to the applicant. The applicant may request a meeting with the reviewer and a professional engineer supervisor if applicable.

- b. Representatives from each permitting unit will make themselves available on a predetermined monthly schedule in order to discuss issues with applicants and consultants.

NC Department of Transportation

The Department relies on a work force of engineers and technicians to remain compliant with state and federal environmental regulations. The Department would continue to rely on its work force that is comprised of employees or consultants that are either registered engineers or supervised by registered engineers.

If the legislation strictly prohibited non registered engineers from reviewing erosion and sedimentation control plans or making revisions to the plans during construction, the Department would see a reduction in its ability to respond to corrective actions during construction. The result would increase the risk of a violation to State and Federal environmental regulations.

NC Department of Health and Human Services

On-Site Water Protection Branch (OSWP): New legislation would significantly affect the length of time needed for local issuance of permits for onsite wastewater systems. Requirements for review of engineering designs by a professional engineer. will force many LHDs to send project submittals to the state to ensure compliance with the .1900 Rules. Sending more plans to the state for review will increase turnaround time and significantly delay the overall permitting process. Local review should be appropriately encouraged and facilitated to avoid delays. Providing additional guidelines as to what constitutes the practice of engineering and the actions that fall under that “umbrella” may be necessary.

Local Health Departments are also concerned that legislation reducing their ability to review engineering submittals would lower standards of project quality and adversely affect public health and the environment.

An internal review of all OSWP checklists and guidance documents is underway to ensure a specific rule reference to any “requirement” and clearly describe any “recommendation” or “preference” as such. Recommendations going forward include:

1. Effective performance of technologies scaled for on-site use is an evolving discipline. Practical experience is often used to evaluate the appropriateness of a design when standard practices are nonexistent, inadequate or ambiguous. Financial support for outreach education and training for design consultants would increase the knowledge base, improve communication and streamline review processes.
2. Changes in the complexity of the rule-making process have made it difficult to implement positive Rules revisions. Given the opportunity, OSWP would restructure the current Rules to clarify information and incorporate state of the art knowledge and practices. Staff and stakeholders previously cooperated to draft rules revisions and these documents are available to facilitate any revision process.

Food Establishment Plans: The process for reviewing plans for food establishments is highly efficient. Its components involve requirements such as proper food handling procedures that can

be evaluated with no engineering knowledge. Any change to require engineers to review plans for food establishments would be wasteful, unnecessary, and would place a burden on county health departments.

Public Swimming Pool Plans: The process for reviewing plans for public swimming pools is highly efficient and is based on a checklist of key requirements that can be evaluated with minimal training or engineering knowledge. The current process relies on the design engineer to make all engineering decisions and does not require any engineering decisions to be made by the reviewer. Any change to require engineers to review pool plans would be wasteful and unnecessary and would place undue burden on county health departments which have no need for engineers as evidenced by the fact that only one county health department currently has one.

Local Governments

The North Carolina Association of County Commissioners and the North Carolina League of Municipalities make the following recommendations:

1. **Implement an electronic review process.** As described in the previous section, an electronic review process increases transparency and awareness throughout the entire review. When coupled with the ability to appeal plan review decisions to a professional engineer employed or retained by the local government, this transparency can be just as effective as requiring a professional engineer seal on all plan reviews.
2. **Establish a performance goal for reviews.** Some local governments, such as the cities of Greensboro and Wilmington, mandate in their ordinances that all plan reviews take place within a specified window of time once a complete plan is submitted. This type of performance goal ensures the plan review process occurs within a reasonable amount of time.
3. **Define what comments “constitute the practice of engineering.”** If the legislature pursues a requirement that non-professional engineers may not make comments that “constitute the practice of engineering” as part of their plan reviews, there is a need to define what that phrase means. Otherwise, non-professional engineers would not know when to avoid making these types of requirements.

CONCLUSION

The Department of Environment and Natural Resources, in conjunction with the Department of Transportation, the Department of Health and Human Services, and local governments operating delegated environmental permitting programs as represented in the stakeholder group appreciate the opportunity to submit feedback to the Environmental Review Commission on the subject of review of engineering work in accordance with Session Law 2013-413.

The stakeholder group discussed the many mechanisms in place to prevent the unauthorized practice of engineering and to ensure programs operate within the purview of existing statutes, rules, and regulations. Stakeholders identified methods to improve and streamline the process and many of those recommendations indicate a need for improved communication between applicants, design engineers, and regulators.

In summary, the Department of Environment and Natural Resources recommends improving the permit process by reviewing checklists for clarity, providing a higher level of review for innovative designs, and making an explicit offer of assistance at all points in the process especially after multiple rounds of comments or revisions have been made. The Department of Health and Human Services recommends expanding outreach efforts and simplifying the rule revision process. Local governments, as represented by the N.C. League of Municipalities and the N.C. Association of County Commissioners, recommends implementing an electronic review process, establishing performance goals for review, and explicitly defining what comments would constitute the unauthorized practice of engineering.