



**National Association of Flood & Stormwater Management
Agencies**

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NAFSMA Comments on the National Research Council's
2009 Report on Urban Stormwater Management
in the United States

DRAFT

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The National Association of Flood and Stormwater Management Agencies (NAFSMA) is very pleased to submit this paper commenting on the report titled “Urban Stormwater Management in the United States” (the report), written by the National Research Council (NRC) of the National Academies. We understand the report was commissioned by the U.S. Environmental Protection Agency (EPA) to review its current permitting program for stormwater discharge under the Clean Water Act (CWA) and provide suggestions for improvement.

Background on NAFSMA

NAFSMA is a 30-year old national organization based in the nation’s capital that represents close to 100 local and state flood and stormwater management agencies, most of which are in large urban areas. Its members serve a total of more than 76 million citizens by providing flood and or stormwater management and as a result, the association has a strong interest in the proposed discussion on urban stormwater runoff.

The mission of the Association is to advocate public policy and encourage technologies in watershed management that focus on issues relating to flood protection, stormwater and floodplain management in order to enhance the ability of its members to protect lives, property, the environment and economic activity from the adverse impacts of storm and flood waters.

It is important to note that many of NAFSMA’s member agencies are currently Phase I or II jurisdictions falling under the Clean Water Act’s National Pollutant Discharge Elimination System (NPDES) Permit Program.

Formed in 1978, NAFSMA works closely with the EPA, the U.S. Army Corps of Engineers (Corps) and the Federal Emergency Management Agency (FEMA) to carry out its mission. NAFSMA members are on the front line protecting their communities from loss of life and property, while protecting and if possible, improving the quality of the nation’s surface waters. Therefore, the organization is keenly aware that all options for mitigating damages that can be caused by urban stormwater runoff should be considered as tools to meet clean water goals.

We applaud EPA’s determination to review their policies and implementation practices to determine the effectiveness of stormwater management in the United States. We believe some of the best minds in the country have been convened to study this issue and have produced a truly expansive report on their understanding of the current landscape and whether we have been successful in urban stormwater management.

Given that, and with all due respect, we believe the report missed an opportunity to include appropriate representation, in either its authoring committee or review committee, of local

jurisdictions who are at the heart of carrying out EPA's permitting program. NAFSMA is pleased to present these views and suggestions, understanding the intent of the report is to both review the EPA's current permitting program for stormwater discharge under the Clean Water Act and provide suggestions for improvement. Likewise, we offer this information as a means of reflecting the broad and diverse needs of our member agencies.

Our paper begins with a summary reflecting our key concerns and recommendations, followed by a detailed review of each chapter in the report.

Executive Summary

The report is focused on the activities and impacts at the state-level with not enough mention of the impacts to the local jurisdictions. Those cities and counties, who are required to implement stormwater policies and goal-driven programs as a result of federally mandated programs and permits, are the ground truth of how we actually address stormwater management. The report paints a picture of reluctance to embrace doing what it takes to address water quality issues. We believe the story is a much more faceted issue, recognizing the many core functions of local government. Our members are far from disinterested, as suggested in the report, to strive for water quality improvements. In order to fund and manage programs required for us to be effective, we must compete with many other local drivers, not the least of which are public safety, transportation and solid waste services. The report should recognize that local government is especially able to make the best decisions for their community given all competing interests.

The report suggests that stormwater discharges are well characterized; however, in-stream water quality data appears sparse and variable, making it difficult to make a correlation between water quality impairments and their causes. Therefore, requirements imposed on stormwater dischargers simply based on biological and chemical in-stream conditions without clear causative relations would be premature and unjustifiable. We believe that more monitoring and research is needed to better understand the relationship between stormwater inputs and receiving stream water quality. We suggest that EPA consider more funding for monitoring and research.

The report doesn't do a good job of recognizing and addressing the effects of land uses other than urbanization on water quality. Activities such as agriculture, forest harvesting, mining, utility corridor development, etc. all have impacts on water quality degradation. The report tends to compare impacts of urbanization to pristine or totally clean water bodies, when in fact, many water bodies are already impaired due to natural occurrences or impacts from activities not associated with urbanization.

The report also suggests that current water quality models may not be sufficient for linking specific pollutant source discharges to in-stream impairment. As a result, it may be difficult to determine the relationship between a specific source (or amount of that source) and an observed water quality impairment. Uncertainty in modeling, limited data and the scale of multiple stressors and problems that cause or contribute to the impairment can distort stormwater's role and the needed solution. We believe that more funding and effort should be put forth toward the development of more sophisticated models to better predict how various pollutant source inputs affect in-stream water quality. Such an investment would greatly improve the ability of all levels of government to manage and improve water quality.

We should recognize that in not only needing better modeling and research in the relationship between treatment practices and receiving water quality, we should not force the development of this research on local jurisdictions through their NPDES permits. Mandating more extensive and costly monitoring of many sites will reduce the amount of local funding for implementing best management practices (BMPs) or stormwater control measures (SCMs). This is truly a national issue with regional implications and will require not only local effort, but federal and state funding as well.

We suggest that more research is needed to determine the performance of both structural and non-structural BMPs and how they affect in-stream water quality. This is especially needed for non-structural BMPs, many of which are essential components of Municipal Separate Storm Sewer Systems (MS4) stormwater permits. Performance data collected from this type of research would be very valuable to stormwater management programs particularly in determining cost-benefit of alternative BMP programs.

The report recommends that numeric standards should be developed for stormwater discharges rather than the use of the Maximum Extent Practicable (MEP) standard for MS4 compliance. We believe that stormwater discharges must be characterized and administered as a non-point source program as the management and control of stormwater discharges is far more complex, costly, and difficult than it is for traditional point source discharges. The MEP standard has been in use for the management of MS4 stormwater discharges for several years and provides MS4 permittees with the flexibility for options to provide effective stormwater management while balancing those activities with other municipal functions.

The report suggests that more prescriptive permits and stormwater pollution prevention plans should be developed by regulatory agencies, resulting in better in-stream water quality. However, prescriptive requirements whose effectiveness for direct in-stream water quality improvement has not been verified would only result in failure and major financial burden on MS4 permittees. We believe that through the adaptive management process enabled by the MEP

standard, the MS4 permittee is in the best position to understand what activities and SCMs are most beneficial on a local level to address MS4 permit requirements and water quality needs.

We believe that EPA should consider an “urban stream” classification or designated use, which would be less stringent but more achievable in urban areas than the current minimum secondary recreation/occasional contact use designations implemented by States. Due to the complex nature of controlling stormwater runoff and pollutants and the land development characteristics of highly urbanized areas, it may be physically impossible and fiscally irresponsible to achieve these current minimum standards and designations in an urban setting. Further, we believe that EPA should consider development and application of a streamlined Use Attainability Analysis (UAA) for flood control and engineered channels to properly identify the realistic beneficial use. In addition, beneficial use designation for such channels should be flexible to allow for the existing use to be suspended during high flows for which such channels are originally designed.

We are troubled by the report’s suggested use of flows or impervious cover as surrogate measures for pollutant loading. While some evidence exists that flow or impervious cover can be linked to pollutant loading, pollutant and event specific cause and effect relationships have not been fully identified or developed at present time. Moreover, flows or impervious cover are directly connected with urban development management which is strictly under the land use authority of local governments. Federal intrusion into local land use management would be a major policy shift that is outside of the purview of federal agencies. Therefore, regulating such parameters by federal water quality programs is unjustifiable.

While the report is not clear on its recommended level of watershed planning, we would caution EPA that a “watershed” can be defined very differently depending on its point of interest. When considering jurisdictional roles as a point of interest, we need to recognize the difficulty in reconciling watershed planning and implementation. We know of several very effective regional planning organizations based on watersheds. However, the vast majority of local governments, which are making decisions on land use planning, economic development, public safety, social welfare concerns and funding for capital improvements and regulations affecting stormwater management are not predicated on watershed boundaries.

NAFSMA continues to be resolved that Low Impact Development (LID) should not be mandated for all local governments. We see a clear bias towards LID in the report and acknowledge its uses and benefits in stormwater management. We know that some jurisdictions, both local and state, have adopted LID as their SCM of choice, but we are way too early in the assessment of the effectiveness of LID nationally and it would be a mistake to require it of all NPDES permits. We should continue to encourage its use and testing, using a process of adaptive management to

bring out the best in green infrastructure along with other flexible options that may fit some communities better than strictly a LID approach.

The report was a good first step toward understanding some of these critical issues. A strong follow through would involve bringing together a national assembly of academic, regulatory, environmental and stormwater management experts to undertake step 2. NAFSMA strongly supports a national stormwater summit of scientists, engineers, regulators and MS4 permittees. Such a summit would address the status of the stormwater sciences (what we now know, and what we yet need to know); and, how we can use the information we now have to define an effective sustainable stormwater quality strategy for the foreseeable future.

Chapter 2: The Challenge of Regulating Stormwater

Chapter 2 Summary

Chapter 2 presents a substantial and important review of the current stormwater regulatory program. Such a review is essential to understanding the complexities of the current program which have led most informed observers, including stormwater management practitioners, to conclude that the current NPDES based effort cannot succeed in meeting the expectations now imposed on it.

Chapter 2 of the report identifies and discusses many of the factors which lead to this conclusion, reaching the same conclusion itself. (See p. 98. “Yet in its current configuration EPA’s approach seems inadequate to overcome the unique challenges of stormwater and therefore runs the risk of being only partly effective in meeting its goals.”)

In many ways Chapter 2 is foundational to the balance of the report. It is used to begin building the case for a new regulatory approach that would purportedly “overcome” the obstacles inherent with stormwater. Unfortunately, disproportional weight is given to “regulatory, institutional and societal obstacles” and too little consideration is given to the inherent variability in climatological, hydrologic, legal and economic factors which ultimately drive stormwater management decisions at the state, regional and local level.

Chapter 2 also focuses discussion on the challenging workload placed on EPA and the states by the stormwater regulatory program. However, it appears the absence of experienced municipal stormwater practitioners on the Committee on Reducing Stormwater Discharge Contributions to Water Pollution resulted in a Chapter that did not fully understand or address the many challenges local municipalities must face in implementing their stormwater permit compliance programs. To the permitting authority, each municipality constitutes a regulated discharger, but

for the municipality every parcel of land within its jurisdiction represents a discharger and every person, business, animal and bad air day constitutes a unique pollution source. Unfortunately, Chapter 2 simply doesn't demonstrate an understanding of the full array of challenges which impact the implementation of stormwater regulatory compliance programs.

Chapter 2 Supported Elements

NAFSMA supports and agrees with many of the elements presented in Chapter 2. These are discussed below.

- 1. Traditional Water Quality Based Numeric Effluent Limit Driven Permits Inapplicable to Stormwater:** The Chapter explains rather clearly why the traditional end-of-pipe water quality based, numeric effluent driven NPDES permit does not work for stormwater's episodic flows, hugely variable volumes, durations, intensities and antecedent conditions, and the ubiquitous and highly diverse pollutant sources which characterize every runoff event.

Among the obstacles to the application of water quality based effluent limits for stormwater; Chapter 2 recognizes the tremendous variability that can occur in water quality standards. The Chapter notes that a water quality standard can vary 1,000 fold for a given constituent and still be considered scientifically justified (e.g., dioxin).

The Chapter further recognizes that, not only is it not possible for stormwater discharges to achieve water quality based numeric effluent limits, it is not practically possible to establish such limits for stormwater. The Chapter cites the conclusions of the California State Water Board's 'Blue Ribbon Panel' finding that it is "not yet feasible to establish strictly enforceable end-of-pipe numeric effluent limits for MS4 [municipal stormwater] discharges".

The Chapter acknowledges that a key component of the inapplicability of numeric limits is the inability to accurately monitor the sources, discharges and impacts of stormwater borne pollutants.

- 2. Stormwater is a Non-Point Source Regulated in a Point Source Program:** Chapter 2 implicitly acknowledges that stormwater is in fact a non-point event, impacted by ubiquitous pollution sources, but discharged and regulated through a traditional point source regulatory construct which assumes full source, flow and discharge responsibility can be tied to the "owner" of the discharge.

Because the origin of stormwater and the pollutants it carries are essentially a non-point source phenomenon, the assignment of physical and legal responsibility for the control of the pollutant to the owner of the discharge creates a variety of institutional, legal, economic and

equity issues that require a different regulatory approach. Our concurrence on this point ends at the Chapter's suggestion of utilizing in-stream bio-criteria and flow control as surrogates for numeric effluent limit based permitting of municipal stormwater discharges.

- 3. "Maximum Extent Practical" (MEP) is the Congressionally Mandated Performance Criteria for MS4 Permits:** The Chapter acknowledges that Section 402 (p) and the MEP performance standard was created out of the difficulty experienced by EPA in finding a feasible way to apply the CWA to stormwater. The specific language of Section 402 (p) (3) (B) (iii), which creates the MEP standard, was the result of protracted negotiations involving prominent environmental, regulatory, stormwater and congressional participants who indeed recognized it as a new and different standard, as is evidenced in the Congressional record.

NAFSMA acknowledges and supports the inclusion in Chapter 2 of the legal opinion of the California Water Resources Control Board Chief Counsel (1993) which defined MEP, based on existing regulatory history and authorities, as technically feasible SCM's, considering costs, public acceptance, effectiveness and regulatory compliance. We also acknowledge and support the Chapter's recognition of EPA's description of MEP in its Phase II Rule (1999) as a flexible site specific standard.

The Chapter presents substantial evidence that the variabilities inherent in the non-point character of stormwater gave rise to MEP as a new compliance standard specifically applicable to stormwater management programs. Our concurrence with the Chapter's discussion of MEP ends at its inference that MEP was intended as a pathway to the imposition of numeric water quality standards.

There has been substantial debate since early in the MS4 program as to the usefulness of a measurable definition of MEP. A measurable definition would improve the ability to separate the 'Good' permit compliance programs from the 'Bad' ones. The overriding negative has been the likelihood of the creation of non-achievable permit limits which would cause even the best programs to be treated as violators. The Chapter 2 discussion of MEP should have more thoroughly addressed this dilemma.

- 4. The Total Maximum Daily Load (TMDL) Program Is a Bad Fit for Managing Stormwater:** The discussion of the TMDL program cites the technical, economic and political/legal challenges associated with attempting to regulate stormwater related pollutant sources through TMDL's. Among these challenges is the disconnect between the sources of pollutants and the owners of the discharge facility, the exclusion of economic feasibility considerations, and the limitations of monitoring accuracy. The Chapter correctly acknowledges, along with EPA, that with respect to TMDL's, effluent limitations expressed as SCM's appear to be the best current approach.

- 5. Tiered Beneficial Uses and Flexible Anti-degradation Rules Are Helpful in Stormwater Regulation:** The discussion of tiered beneficial uses recognizes the inherent reality that “urbanized” streams exist and may continue to support certain beneficial uses; albeit, different uses from those associated with non-urbanized streams. NAFSMA agrees with the Chapter’s conclusion that tiered uses, linked to flexible anti-degradation rules can maximize stormwater program cost effectiveness. We also believe this principle of targeting effort toward the most substantial objective was also a fundamental purpose of the MEP flexibility provided under Section 402 (p).
- 6. Shifting Stormwater Monitoring to In-Stream Biotic Health:** Chapter 2 lists many reasons why the pollutant focused monitoring mandated in current stormwater permits is duplicative, produces little truly new information, is of little value in permit performance evaluation and is significantly expensive relative to the value received. While there are significant caveats to bio-criteria based permit performance mandates, reducing pollutant based monitoring in favor of more useful biotic information may be desirable under certain circumstances.
- 7. The Stormwater Permit Program is Complex and Difficult to Administer:** We concur with the Chapter’s recognition that stormwater program compliance issues span a broad spectrum, from stormwater and pollutant source issues, to paperwork, to legal authorities, to resource availability, and more. The Chapter recognizes that requisite legal authorities are complex and are frequently in conflict, and that stormwater quality obligations can conflict with other local obligations, such as public safety.

NAFSMA also appreciates the Chapter’s discussion of the complexities of interfacing stormwater quality objectives with urban land use issues, such as in-fill, redevelopment, smart growth objectives, and more; and, the related need for regulatory program flexibility.

The Chapter also provides a good understanding of the impact of the stormwater regulatory program on the states; and, the difficulty created by the absence of federal funding to support the CWA stormwater mandate.

Although the Chapter acknowledges that the weight of implementing the stormwater regulatory program has overwhelmed the states, it fails to give similar consideration as to the arguably greater impact upon municipal permittees. The Chapter seems to allude to shifting state responsibilities to the municipalities as a means to alleviate state performance deficiencies. On this point we are deeply disappointed with the Chapter’s limited focus.

- 8. Additional Pollution Control Capability:** NAFSMA concurs with the Chapter’s recognition that EPA must be much more proactive in its efforts toward implementing true

source control programs for constituents (e.g., pesticides) which cause or contribute to stormwater quality problems.

Further, we concur with the recognition of the need for large regional stormwater management facilities as components of a total stormwater management system.

Chapter 2 Items of Concern

NAFSMA is concerned that some of the elements discussed in this Chapter do not correspond with the experience of local stormwater practitioners. These elements are discussed below:

1. **Mischaracterization of the Municipal Performance, Capability, and Impacts Relative to the Stormwater Regulatory Program:**

While Chapter 2 discusses at length the stormwater program impact on states, sympathizing with their limited resources and capabilities, the Chapter virtually ignores the program's impact on municipal permittees. The Chapter suggests municipalities haven't made the hard political decisions to raise the necessary program funding, have not taken initiative in program implementation and that public participation and scrutiny are prohibitively limited. It suggests municipal personnel are professionally inadequate concerning water quality issues, and that local concerns over constitutional legal authorities are not creditable as to future stormwater management.

While local communities are diverse and have varying levels of understanding and resources to comply with the stormwater quality program, NAFSMA believes the NRC report characterization of municipalities is incorrect. Most Phase I communities are very capable and have performed well considering the circumstances. We believe those permittees have done their best at complying with a challenging program and science that is still evolving.

From the broad perspective, the Report's conclusion that the stormwater program can be substantially repaired by increasing the municipal obligation through watershed permitting, adding new monitoring protocols and by surrendering land use authority to federal regulatory entities is seriously flawed. Further, it demonstrates a very limited understanding of the local municipal permittees' role, effort and capability relative to the stormwater program.

2. **Overstates the Public Participation Issue:**

The Chapter suggests that there is limited public oversight and opportunity for citizen enforcement of Stormwater Pollution Prevention Plan (SWPPP's), particularly associated with general permits. This is simply not an accurate picture. The Chapter took the very limited exception for security protection for a business' product and process and applied it to the entire stormwater program. In fact, the expansive opportunity for public oversight and litigation has actually impeded program progress and diverted resources away from program implementation. As recently as 2008, the renewal of

50% of California's major MS4 permits was overdue, in most cases, by two or more years, and nearly all active permits, including the state's general permits, had been the object of an appeal, litigation, or extended debate and delay.

- 3. Mischaracterizes the Original Concept of "Maximum Extent Practical":** The Chapter's discussion of MEP suggests it was intended as another pathway to water quality standards. We could not disagree more strongly. In fact, the Congressional record clearly shows that MEP was intended as a new performance objective for a new type of NPDES permit, created specifically to accommodate the physical uniqueness of stormwater. MEP was to be neither a floor nor a ceiling, but rather a journey, applying continually improving best efforts toward better and better receiving water quality. (see EPA's Interim Policy, 1996.)

The Chapter also tends to characterize the variability and flexibility found in MS4 permits as a weakness of MEP. To the contrary, it is the variability in stormwater that caused Congress to create the MEP standard and EPA to establish a programmatic basis for municipal stormwater compliance. The freedom to select from a variety of SCM's in the pursuit of MEP is essential to achieving the best site specific results.

- 4. A Numeric End-of-Pipe Value for MEP:** Chapter 2 advocates the benefit of creating a numeric definition for MEP to support end-of-pipe enforcement. This discussion, however, ignores the reality that stormwater's variability, the lack of feasible technology-based controls and the inability to demonstrate direct end-of-pipe results produced by specific SCM's, make numeric end-of-pipe evaluation of a stormwater permit compliance program problematic. If the results of the SCM's aren't provable, it is inappropriate to penalize the permittee as a violator.

In its discussion of regional pollutant concentration differences, the Chapter leaves the impression that arid regions produce more pollution. However, when total rainfall is considered the loads of arid and wet regions are similar.

- 5. Cost-Benefit as an Evaluation Tool:** We disagree with the view that generally disregards cost-benefit as a valid program evaluation methodology. As more SCM cost and effectiveness data is compiled, stormwater permittees can use cost-benefit measures to maximize the results achieved for the dollars available. Furthermore, permitting authorities could use such data to insure that permittees are achieving the best possible results through their permit programs.
- 6. Use of Flow as Surrogate Limitation for Stormwater Permits:** The Chapter's discussion of flow as a surrogate stormwater permit limit describes only the obvious advantages (ease of administration, measurement, enforcement). However, the Chapter gives little weight to the counter-veiling issues. For example, reducing flow does not address pollutant sources (a pre-

development flow regime also carries pollutants), it does not reduce urban pollution (it just deposits the pollutants in new places), and it potentially creates separation of powers conflicts over local land use control and economic development. The Chapter also appears to support setting aside constitutional rights and protections to achieve stormwater quality goals. We question the merit, equity and practicality of such a position.

- 7. TMDL Load Reductions; Enforced Only Against Permittees:** In discussing the watershed wide focus of TMDL's in pursuing the reduction of pollutant loading, the Chapter discussion did not make clear that load reduction requirements are imposed only against NPDES permit holders. Thus the responsibility for achieving a prescribed Waste Load Allocation under a TMDL is imposed solely on permit holders who may discharge only a small fraction of the total load. Additionally, the source of the pollutant may be beyond the permittee's direct control [e.g. brake dust (copper), pyrethroids and other EPA approved pesticides, atmospheric deposition (mercury, acid rain, and nutrients)]. Aside from being highly inequitable, such a requirement can easily create an unattainable mandate on a local municipality.
- 8. Prescriptive Stormwater Permits:** The Chapter cites evidence that more extensive, prescriptive permits are associated with better stormwater program results. This sets up an inaccurate and misleading cause and effect conclusion (thick permits produce good results). In reality it is well selected, designed and operated SCM's which produce good results. Rather than good results, massive prescriptive, stormwater permits have most often produced delay, conflict, appeals, litigation and misdirected energy and expenditures.
- 9. Failure of CWA Section 402 (p):** The Chapter implies that CWA Section 402 (p) has failed (permits are unenforceable), because there was no numeric end-of-pipe measure established. In reality, the potential for Section 402 (p) to succeed was almost immediately undermined by efforts to set-aside the MEP in favor of numeric end-of-pipe limits. The tiered definition of success inherent in the MEP performance standard has been constantly under attack by well intentioned water quality advocates desiring to establish numeric effluent permit limits, limits which nonetheless remain effectively non-achievable due to the lack of feasible technology-based controls for stormwater discharges. Despite the perceived shortcomings of CWA Section 402(p), it nevertheless remains the statutory foundation for the regulation of stormwater discharges in the United States. Further, States and local communities retain the discretion to impose more stringent standards as *they* deem appropriate.

Chapter 2 Missed Concepts

There are several instances where NAFSMA believes the presentations in Chapter 2 failed to address, or accurately address, issues of significant importance to the implementation of the stormwater quality program. These are outlined below:

- 1. Water Quality Standards:** In its acknowledgement of the huge variability that can be found in water quality standards for individual constituents, the Chapter did not adequately address the degree to which the standard setting process can be subjective, particularly in the establishment of beneficial uses.

The Chapter also failed to acknowledge that even the most aggressive SCM program cannot demonstrate routine attainment of most water quality standards at the end-of-pipe.

- 2. UAA and Beneficial Use Application for Flood Control Structures:** While the report acknowledges and supports the concept of tiered beneficial use designations, such as the process used in Ohio, we believe there is missed opportunity to recognize the huge change in beneficial use when flood control structures are at high flow. While it is possible to have a particular use during normal flow situations, the use is clearly flood control and safe carrying of floodwaters during high flow events. There should be some recognition of this in a streamlined UAA process so that the typical use is suspended during these high flow periods.
- 3. Definition of Stormwater Program Success:** Chapter 2 rightfully acknowledges the lack of a uniform definition of program success, but proposes to address this need by recommending the creation of a new end-of-pipe numeric standard. The Chapter discussion misses the fact that end-of-pipe results can rarely be attributed, over the short or middle term, to specific SCM's. The definition of success must be tiered: short term success must include the degree of program implementation (effort); mid-term success must recognize lessons learned, efficiency and effectiveness of the effort; and long-term success must be keyed to improved and improving receiving water quality. Permit performance evaluation could then be justly focused on the 'successful' initiatives of each permittee rather than initiating enforcement actions simply because of variations in uncontrollable parameters.

The Chapter's suggestion that more rigorous monitoring and SCM implementation, tied to a new numeric end-of-pipe standard, will increase success simply replicates the stormwater program experience of the past 18 years (more monitoring, more SCM's, more numeric performance standards, higher costs, more violated permit limits, more litigation and penalties).

- 4. MS4 Stormwater Program Costs:** The Chapter presents substantial information concerning state program costs and the impact of these costs in delaying effective implementation. The Chapter is virtually silent, however, on the program cost and implementation impact on municipalities. While quantifying municipalities' program implementation costs may be difficult, simply stating that municipalities incur 'some' costs is completely inadequate.

- 5. Ubiquitous Nature of Stormwater Borne Pollutants:** The Chapter was notably deficient in its description of the pollutant sources for which the stormwater system owner is held responsible. Every parcel of land in the watershed and every activity of man and nature is a potential pollutant source, including activities that occur outside the watershed and pollutant sources which are outside the permittees' control, any one of which could cause or contribute to a receiving water quality problem. An in depth discussion of the diverse stormwater related pollutant sources would be much more valuable than the discussion of zoning ordinances, and would help demonstrate that the NRC truly understands the scope of the problem.
- 6. Municipal Engineering Standards, Public Service /Safety Priority:** In its discussion of building and engineering standards as potential stormwater program obstacles, the Chapter did not recognize these standards often result from statutory or court action, promulgated for the purpose of protecting public health and safety.

Relatedly, the Chapter did not acknowledge that there may well be public service/safety objectives which are of higher priority than a stormwater quality objective.
- 7. LID Versus ‘Smart Growth’:** In its discussion of LID as an SCM program component, the Chapter did not fully address the conflict which can exist between a LID strategy, which in general requires less urban density, and ‘Smart Growth’ strategies which, in general, require greater urban densities.
- 8. Site Runoff Limitations/Flow Reduction:** In supporting the use of flow as a stormwater regulatory measure, the Chapter cited Section 348 of the Energy Independence and Security Act of 2007, noting it as an example of site runoff limitation (i.e., flow reduction). What was omitted in the discussion is that the federal government reserved to itself in the Act a “technically feasible” exemption. By doing so, the federal government, in fact, recognized and applied to itself the core tenet of MEP (see California Water Resource Control Board legal opinion of Chief Counsel 1993).
- 9. NPDES Program Complexity for Municipalities:** The Chapter does not demonstrate an awareness of the scope or weight of the stormwater regulatory program (along with expectations that accompany it) that is borne by municipal stormwater permittees. Without such understanding, the current stormwater regulatory program cannot be effectively repaired.

Chapter 2 Conclusions and Recommendations

Despite the shortcomings noted above, Chapter 2 provides a somewhat useful overview of the stormwater regulatory problem. However, the Chapter's lack of appreciation of the critical obstacles and complexities that must be addressed by urban stormwater programs undermines the value of the Chapter's conclusions. Simply exchanging pollutant specific permit objectives for bio-criteria, and exchanging local land use control for the ease of flow based regulation still misses the real issue – ubiquitous urban pollution sources and the inability of municipal permittees to assure water quality standards attainment through implementation of SCM's.

The CWA's original point source control program was successful because of the following critical factors (1) a predictable, manageable flow, (2) direct control of pollutant sources, concentrations and volume, (3) the availability and application of feasible technologies and (4) a nationwide investment in capital improvement projects. Each of these critical success factors is absent from the current stormwater regulatory program. It should therefore come as no surprise that all efforts to date to create surrogates for these factors in order to facilitate program 'success' have been found lacking.

The report was a good first step toward understanding some of the critical issues. EPA must now convene a national assembly of academic, regulatory, environmental and stormwater management experts to undertake step 2.

Chapter 3: Effects of Urbanization on Watersheds

Chapter 3 Summary

Chapter 3 is a thorough academic review by the NRC of the effects of urbanization on watersheds.

One of its notable conclusions, and one that NAFSMA agrees with, is that the efforts to create quantitative relationships (“mechanistic links”) between land use changes, including population growth, and their effects on various aspects of receiving waters (i.e., geomorphic, hydrologic, biologic, ecologic, etc.) are still in development. However, a current and very significant problem for MS4 permittees is that many MS4 permits are being written as though that critical knowledge and the requisite technical capability to successfully apply it and sustain the effort, already exist. As a result, the requirements in many MS4 discharge permits exceed what is achievable and miss what are the driving forces behind observed effects in the nation's receiving waters.

Another general conclusion in Chapter Three is that there are “...a number of overarching truths that remain poorly integrated into stormwater management decision making...” despite their

“strong” scientific basis. One has to question how much functional and applicable ‘truth’ there is in these “truths” in light of the preceding conclusion addressed above. Clearly, there is a degree of tension between these two conclusions as they impact MS4 permit requirements.

Chapter 3 Supported Elements

NAFSMA in part or wholly supports and agrees with some elements discussed in this Chapter. The following comments provide NAFSMA’s interpretations of these discussions.

- 1. Epidemiological Studies are Needed on Human Health Risks to Swimmers Due to Stormwater Discharges:** We fully agree with this recommendation. These studies and related research have been advocated for years and need to be done before forcing municipalities to take extraordinary, economically unsustainable means to reduce bacterial counts in stormwater runoff to current bacterial standard levels for swimmable waters. Even with a direct linkage to effects on human health, the solutions may not be sustainable in the end and much work is needed on what is achievable and what are simply regulatory mandates that will expend scarce resources without reaching the desired goals.

There is a recent informal study by International BMP Database team members and their colleagues that implies there may be some SCMs that are more effective than others in reducing bacterial counts in runoff. Identifying cost effective technologies would help MS4 permit holders in their efforts to comply with their permits and reduce bacterial counts in runoff reaching receiving waters.

- 2. Non-traditional Sources of Pollutants Must be Taken into Account:** This issue addresses sources of pollutants that are not under the control of MS4 permit holders. Some of the sources, such as atmospheric fallout, are in part due to emissions by industry, automobile emissions and wear and tear, power generation, home heating, volcanoes and other eruptions of gasses from the earth, agriculture, and the list goes on. Some of these activities occur under other forms of permits issued by the states and/or federal government in which MS4s have no authority or voice.

In addition, many of the pollutants in stormwater and dry weather flows are the result of products that are regulated by the federal government, including pesticides, herbicides, industrial discharges, household chemical products, and more. All of them wind up falling onto the urban landscape with the mandate imposed on MS4 permit holders to remove them from urban runoff. This transfer of responsibility is much more costly to the nation, and especially to the MS4 permit holders, than instituting controls on the sources of these pollutants such as product manufacturers and users.

- 3. The Use of a Single Design Storm is Not suitable for Addressing the Multiple Objectives of Stormwater Management:** We are in full agreement with this comment. In fact, the state-of-the-art in the engineering community no longer suggests the use of a single design storm for stormwater management, although the state-of-practice among many municipalities still clings to its use because of ease of use and simplicity. Nevertheless, there are examples of municipalities that have done their own research and studies and have come up with relatively simple guidance for the selection, sizing and design of appropriate SCMs. In those municipalities, the designer does not need to investigate the effects of multiple storm events to select, size and design effective SCMs.

Chapter 3 Items of Concern

NAFSMA is concerned with and discusses below a number of the observations and issues in this Chapter.

- 1. There is a Direct Relationship Between Land Cover [urbanization] and Biological Condition of the Downstream Receiving Waters:** These effects, namely degradation of biological states, have been reported to occur with even minor developments, further noting that degradation increases as urban densities increase. The report fails to address the effects of other land use changes such as agriculture, forest harvesting, mining, utility corridor development, water diversions and others. NAFSMA has concerns about the non-stated assumption of this report that urbanization is the only cause, or the primary cause, for the observed degradations. We do not disagree that urbanization is a significant contributor, but urbanization is not the only cause and may not always be the primary contributor. Of further concern, the point of comparison when it comes to such assessments of impacts is often “pristine” water bodies and not the ones that may already have seen degradation due to other anthropogenic activities. The clear implication of the report is that if urbanization is somehow controlled, these effects would not show up.

Three points of concern arise from this conclusion. First, it may not always be true. Even wholly natural ecologies can be the source of certain in-stream conditions labeled as impairments for the purpose of the Clean Water Act regulatory program. Secondly, the control of urbanization is neither a legal nor practical component of an MS4 permit, and is not a mechanism readily available to the local stormwater manager. Lastly, without the knowledge to clearly define the stressors and their relationship to observed in-stream conditions, it is very difficult to select, design and operate SCMs which will predictably achieve the desired results.

- 2. Protection of Aquatic Life in Urban Streams Will Require Addressing All Types of Stressors, Including Water Quality, Modification of Hydrology, Habitat Changes and Others:** We agree with the premise that water chemistry is not the only factor affecting

aquatic life and causing the observed changes seen in receiving waters. How to implement the recommendation that these other “stressors” be addressed is something about which we have serious concerns. “Cures” that work in one region or municipality or under one set of site conditions may not be the answer for another region, municipality or site. The economic impacts of mandating such “cures” can be very significant to the overall economy of the nation and especially to the economies of many municipalities. Thorough nationwide research on the sources of impacts, the technologies to best address them and the economical sustainability of various technologies is therefore vitally needed. This research should also include the legal and regulatory frameworks that may encourage or discourage the use of certain technologies, as is the case today.

3. The Full Distribution and Sequence of Flows Should Be Taken Into Consideration

When Assessing Impacts of Stormwater on Streams: NAFSMA agrees that the hydrologic modifications that take place when areas urbanize is one of the causes of receiving water geomorphic and aquatic habitat modifications and degradation. We also agree with the basic thought that mitigating hydrologic modification effects requires more than addressing control of peak flows alone. However, we are concerned that this broad concept of flow causation and regulation will be taken to such extremes, as already seems to be happening in some areas of United States, that requirements and objectives will be put in place that cannot be achieved within the bounds of fiscal or physical laws.

In addition, there are enormous legacy effects on the receiving waters from past human activities, including urbanization, over the last 200 years that have left their footprint on the receiving waters of this nation. Unfortunately current regulations for reversing them are not well crafted and will need more recognition of what is achievable in each receiving water, over what time and at what costs. Implementing regulations that do not take these considerations into account will result in wasteful use of resources.

This area, and the necessary control technologies, is in desperate need of additional, well controlled research that looks at effects over a number of years. There are currently published computer modeling results for some parts of United States which indicate that controlling a wide range of small to moderate storm runoff event peaks can achieve most of the mitigation of impacts being desired without imposing an undue economic burden. These types of studies need to be pursued nationwide and include reality checks against what is observed in nature. Only the federal government has sufficient resources to conduct such studies and research.

4. The Report Also States That “...total recoverable heavy metals are exceeded for almost every rain in urban areas.”:

We are not clear what is being exceeded since water quality standards are based on the dissolved form of the metals and not the total recoverable form. Most of the runoff data in the United States reveals that it is not that common for the heavy

metals to exceed EPA approved standards in urban receiving streams based on the dissolved phase of the metals.

5. Biological Monitoring of Water Bodies is Critical to Better Understand Cumulative

Impacts: While this statement is true, such monitoring is “too good” of an integrator of the collective impact of multiple of stressors, but does not provide the means to target the individual stressors that contribute most to the observed degraded conditions. A significant negative of such monitoring is the resultant inability to identify and eliminate pollutants through source reduction which is arguably the most effective SCM of all.

If biological monitoring is added to the MS4 mandate, it would add another required activity and cost to the permit holders and would accumulate much data that nobody has yet learned how to use.

Chapter 3 Conclusions and Recommendations

We strongly support the advancement of the stormwater sciences and the development of effective sustainable stormwater management technologies. We do not believe, however, that the solution to the myriad receiving water problems is to be found in simply expanding the reach of MS4 stormwater permits. We believe that significantly increased understanding of the sources of, and mechanistic links among, the observed in-stream problems is essential to the implementations of a strategy which can be successful on both a local and national scale.

Such a strategic approach will require (1) much more research on cause and effect relationships, (2) creating an MS4 voice in programs addressing non-traditional pollutant sources that impact urban runoff quality, (3) identification of SCM technologies that are effective and sustainable; and (4) a funding source to accomplish the research and development needs which transcend the local MS4 permittee’s capability.

NAFSMA strongly supports, as a next rational step, the conduct of a national stormwater summit of scientists, engineers, regulators and MS4 permittees. Such a summit would address the status of the stormwater sciences (what we now know, and what we yet need to know); and, how we can use the information we now have to define an effective sustainable stormwater quality strategy for the foreseeable future.

Chapter 4: Monitoring and Modeling

Chapter 4 Summary

Like Chapter 3, Chapter 4 is a thorough academic review, addressing stormwater monitoring and modeling by the Committee. One of the general conclusions articulated in this chapter is that monitoring and modeling are the two weakest areas in stormwater management. We do not fully agree with this assessment and believes that there are other areas of stormwater technology, science, knowledge and practice that are further behind than monitoring and modeling. We also believe that monitoring and modeling have much supportive technology and science, but that their proper use and implementation suffer from a lack of training, education, and resourcing of the practitioners working in these areas of stormwater management.

Another conclusion in the report points to the “paucity of data” as one of the problems. That conclusion, however, conflicts with another statement in the report that stormwater runoff quality is well characterized. We believe that, although there is much runoff characterization data, there is need for much more data on the function of various SCMs operating under field conditions, their long-term maintenance needs required to keep them functioning, and the realistic lifetime expectations for installed SCMs before they will need complete rehabilitation.

The general conclusions in the report suggests many “fixes” to the monitoring issue, but many of these, in our opinion, are aimed at research-level monitoring protocols which are not applicable to permit compliance. Research-level protocols are very intensive and expensive and not appropriate for compliance monitoring, unless the number of monitoring sites required by the permits is significantly reduced to balance out the increases in effort and costs.

Another general conclusion stated in the report is that *EPA needs to provide continuous support and development of water quality models and spatial data infrastructure*. At the same time, the report concludes that computer models need volumes of data for calibration and ground-truthing before they provide reliable information for decision making. It appears the report writers believe, and we agree, that much work remains before many of the tools needed for making decisions to achieve reliable and cost effective stormwater management are perfected and useful in field applications.

Chapter 4 Supported Elements

NAFSMA in part or wholly supports and agrees with some elements discussed in this Chapter. The following comments provide NAFSMA’s interpretations of these discussions.

- 1. The Quality of Stormwater from Urbanized Areas is Well Characterized:** We fully agree with this statement. In fact, this conclusion in the report primarily refers to the data collected by Phase 1 MS4s and does not mention that there is much data collected under EPA’s National Urban Runoff Program (NURP) project. With some exceptions, data for lead being an example, much of the more recent stormwater runoff characterization data collected by MS4s confirmed the findings of NURP.

- 2. Industry Needs to Obtain Reliable Stormwater Runoff Data for Certain of its Critical Industrial Sectors to Help Permit Writers Establish Benchmarks for Technology-based Effluent Guidelines:** We fully agree.
- 3. Industry Monitoring Should be Targeted at Sites Posing Greatest Risk to Receiving Waters From Their Stormwater Discharges:** We fully agree.
- 4. EPA Needs to Take Steps and Allocate Resources to Insure that the Modeling and Monitoring Technology Continues to Advance in Order to Provide Better Tools for Pragmatic and Cost Effective Stormwater Management:** We agree. Much work needs to be done to learn what the drivers in stormwater runoff are and how they translate to the observed effects in receiving waters. In addition, we need to understand which of the drivers are controllable and to what degree. Too much effort, some of it endorsed by EPA, is focused on what is believed to work best in protecting receiving water systems. This is often done without the commensurate scientific or technical knowledge as to whether the mandated practices will yield the desired results, and whether they are economically and physically sustainable.
- 5. Watershed Models are Useful Tools - - -, but They are Incomplete in Scope and Typically Do Not Offer Definitive Causal Links Between Polluted Discharges and Downstream Degradation:** NAFSMA concurs in the value of models as a holistically focused watershed management tool. We also are aware of the limitations of models as drivers for SCM selection and design, or as a permit compliance and SCM program effectiveness measure for MS4 permittees. Care must be taken to insure that models are not misused in the rush to advance stormwater quality management.

Chapter 4 Items of Concern

NAFSMA is concerned with a number of the observations and issues in this Chapter, which are discussed below.

- 1. Flow and Rainfall Monitoring Should be Included in the Continuous Flow-Weighted Water Quality Monitoring:** Although NAFSMA agrees with this conclusion in principle, it is concerned with the increased cost if this becomes a requirement of the MS4 discharge permit holders. This concern can be addressed by reducing the number of sites required by the permits to be monitored in inverse proportion to the increased costs of continuous sample gathering and analysis, when compared to the costs of grab sampling. If this was done, it would likely result in better monitoring programs than those that simply insist on sampling all, or most, of the outfalls within the MS4.
- 2. First Flush Concentrations Associated with Runoff Samples that Occur Early in the Hydrograph are Dependent on Rainfall Intensity, Land Use and Specific Solute:** We do not fully agree with this conclusion. In fact, there are municipalities where NURP found

the first-flush phenomenon to be virtually nonexistent. NURP data showed that in a number of communities throughout United States there were no statistically significant trends in pollutant concentration increases (over the event mean concentration) when samples were taken early in a stormwater runoff season or when samples were taken during an individual storm. USGS documented these findings for Denver and other cities in the United States.

The implication of the report is that obtaining and analyzing discrete samples during runoff events will somehow improve stormwater management decisions. This is debatable, but it does have the potential of increasing monitoring costs exponentially without demonstrable commensurate benefits. While such research may be a desirable goal for a nationwide program that EPA may want or need to undertake, it is not one that should be a permit mandate for MS4s.

3. Continuous Flow-Weighted Sampling by MS4s Should Replace Grab Sample

Monitoring Practices: We agree with this conclusion in the Report, except as noted above, the number of sites that are required to be monitored by the MS4 permit holders need to be reduced in inverse proportion to the increased costs of continuous sample gathering and analysis when compared to the costs of grab sampling. If this is done, it probably will result in monitoring programs that are better designed as compared to ones that insist on sampling all, or most, of the outfalls within an MS4. In addition this could result in more valuable information for adaptive management by stormwater discharges.

Chapter 4 Conclusions and Recommendations

Chapter 4 provides a thorough academic review of stormwater monitoring and modeling. However, some of the extrapolations of findings and possible effects on MS4 permit holders concern NAFSMA and its members. In particular, we are concerned about the recommendations to (1) replace grab sample monitoring in all cases with continuous flow-weighted sampling, (2) include flow and rainfall monitoring in the continuous flow-weighted water quality monitoring required of MS4s, and (3) that MS4s should implement discreet sampling analysis during runoff events to show that first flush concentrations occur early in the hydrograph and are dependent on rainfall intensity. Although NAFMA does not disagree with the Report's observations and conclusions, it is concerned about the fiscal implications if EPA moves to implement these recommendations nationwide through MS4 permit mandates. If required, much of this impact can be mitigated through reductions in the number, and better selection of the sites and events to be monitored.

Other recommendations in the Chapter are more appropriately suited to a nationwide research effort that would best be led and funded by EPA. We believe there is indeed a clear and present need for such a nationwide research effort. As was true with NURP, the results of such a

research program would be far better designed and much more cost effective for MS4 stormwater management programs.

In that regard, we believe there would be great value in the conduct of a “NURP” II program. NURP II would not necessarily be a new reach initiative as was “NURP I”. Rather it would be charged with the task of (1) determining the state of knowledge as to the stormwater management related science, and practices, (2) identifying the known effective and sustainable technologies which can improve MS4 permit program performance; and (3) identifying a research and development agenda for the future.

Chapter 5: Stormwater Management Approaches

Chapter 5 Summary

Chapter 5 of the report includes a comprehensive discussion of SCMs, which form the basis of stormwater pollution prevention plans that municipal permittees are required to implement. The Chapter’s stated goal for stormwater management or pollution prevention plans is to reduce pollutant loads to water bodies and maintain, as much as possible, the natural hydrology of a watershed.

There are nearly 20 different broad categories of SCMs that are discussed in Chapter 5, including information on their characteristics, applicability, goals, effectiveness, and cost. In addition, case studies are used to illustrate the use of SCMs in specific settings and demonstrate the effect a particular SCM can have on water quality or a biological metric.

Chapter 5 addressed SCM performance monitoring and modeling. Monitoring of SCMs is discussed within two broad purposes: functionality and more intensive performance monitoring. Functionality monitoring is used to determine if a SCM is functioning as designed and performance monitoring is focused on determining what level of performance is achieved by the SCM. The strengths, weaknesses, and difficulties of modeling are addressed.

Chapter 5 advocates designing systems of SCMs on a watershed scale. The report’s definition of watershed scale refers to a small local watershed to which the individual development site drains (i.e., a few square miles within a single municipality).

A discussion of cost, finance options, and incentives is included in Chapter 5. Also discussed are challenges to implementation of watershed based management and stormwater control measures. Challenges recognized include costs, long term maintenance of SCMs, lack of design guidance on important SCMs and lack of training, different standards in different jurisdictions that are within the same watershed, water rights that conflict with stormwater management, urban development and sprawl, and safety and aesthetic concerns.

Chapter 5 concludes that SCMs have demonstrated the ability to reduce runoff volume and peak flows and to remove pollutants. However, in very few cases has the performance of SCMs been mechanistically linked to the guaranteed sustainment at the watershed level of receiving water quality, in-stream habitat, or stream geomorphology. The report concludes that individual controls on stormwater discharges are inadequate as the sole solution to stormwater in urban watersheds and that SCM implementation needs to be designed as a system integrating structural and non-structural SCMs. The Chapter also notes that past practices of designing detention basins on a site-by-site basis have been ineffective at protecting water quality in receiving waters and only partially effective in meeting flood control requirements.

Chapter 5 Supported Elements

We generally agree with certain of the elements outlined in this chapter. These elements are discussed below.

- 1. Lack of Knowledge:** We support the recognition that the state of science has yet to reveal the mechanistic links that would allow for a full assessment of the relationship between stormwater pollution prevention plan implementation and in-stream water quality. It is also recognized that there is a substantial knowledge gap about the effect of particular stormwater discharges on specific receiving waters.
- 2. Potentially Substantial Costs:** The report notes that the potentially substantial costs of implementing SCMs raise a number of fundamental social choices concerning land-use decisions, designated uses, and priority setting for urban waters. It is noted that there is a resistance of states and local governments to the unknown cost burden and uncertain benefits of implementing costly stormwater compliance programs. Further, MS4 permittees contend that the permit requirements are unreasonable, expensive, and unrealistic to achieve. It also notes that local government officials view some permit provisions such as LID or better site design as intrusion into the land-use authority of local governments.
- 3. Potential Consequence of Too Costly Goals:** Setting of overly ambitious or excessively costly goals for urban streams may result in the perverse consequence of causing more waters to fail to meet designated use. Policies designed to achieve exceedingly costly or infeasible designated uses in urban or urbanizing areas could have the net consequence of shifting development (and associated impervious surface) out into neighboring areas and watersheds. The end result might be minimal improvements in “within-watershed” ambient conditions but a decrease in designated uses (more impairments) elsewhere. The report also acknowledges that setting unrealistic or unachievable water quality objectives in urban areas can pose political risks for stormwater management programs. Promising what cannot be realistically achieved may act

to undermine public support for urban stormwater programs. Increasing costs without significant observable improvements in ambient water conditions or achievement of water quality standards could ultimately reduce public support to the program.

4. Wide Variation in State Program Goals: There is a wide variation in state program goals which reflects the difficulties that states face in keeping up with rapidly changing information about SCM design and performance. Chapter 5 notes that some states have no specific criteria because they do not produce SCM manuals, while others have manuals that address every category of criteria from flooding events to groundwater recharge. Some states rely upon EPA or other states' or transportation agencies' manuals. Soil and erosion control criteria are the most common and often exist in the absence of any other state criteria.

5. Stormwater Management Needs to be Included in the Early Stages of Community Planning: SCMs are most effective from the perspective of both efficiency and cost when stormwater management is incorporated in the early planning stages of a community.

6. Performance of SCMs Not Linked to Sustainment of Water Quality: The characteristics, applicability, goals, effectiveness, and cost of nearly 20 different broad categories of SCMs to treat the quality and quantity of stormwater runoff are discussed in the report including a multitude of case studies illustrating the use of SCMs in specific settings. However, it is concluded in Chapter 5 that only in a very few cases has the performance of SCMs been mechanistically linked to the guaranteed sustainment of receiving water quality, in-stream habitat, or stream geomorphology on a watershed scale.

7. Limited Understanding of SCMs: There are many SCMs for which there is only a limited understanding of their performance and effectiveness, particularly those that are nonstructural in nature.

8. Long Term Maintenance Concerns of LID Features Located on Private Property: It is recognized in Chapter 5 that for those SCMs that are implemented at the individual site scale on private property, such as rain gardens, local stormwater managers may be reluctant to adopt such practices due to concerns about their ability to compel private landowners to conduct necessary maintenance over time. The long term effectiveness of such SCMs is highly dependent on consistent and adequate maintenance.

9. Performance Monitoring a Complex and Intensive Task: Stormwater is characterized by widely fluctuating flows. In addition, inflow pollutant concentrations vary over the course of a storm and can be a function of time since the last storm, watershed, size and intensity of rainfall, season, amount of imperviousness, pollutant of interest, and so forth. This variability of the inflow to SCMs along with the very nature of SCMs makes performance monitoring a complex task. Also measurement of multiple inflows, outflows, evapotranspiration and infiltration is

simply not feasible for most sites. Performance monitoring is an extremely intensive effort in order to determine the performance of an SCM over either an individual storm event or over a series of storms.

10. Performance of Nonstructural SCMs Unknown: It is recognized that much needs to be done to determine the performance of nonstructural SCMs, for which little to no monitoring data are available.

11. Modeling of SCMs Extremely Challenging: Chapter 5 recognizes that the dispersed nature of the implementation of SCMs, the wide variety of possible SCM types and goals, and the wide range of rainfall events they are designed for makes modeling of SCMs extremely challenging. Modeling these effects over large watersheds by simulating each SCM is not only impractical, but the noise in the modeling may make the simulation results suspect.

12. Research Needed for Nonstructural SCMs: Research is needed to gather performance data for nonstructural SCMs. Until such information is available, it will be virtually impossible to predict whether a particular non-structural SCM is sufficiently effective to prevent nearby receiving waters from violation of its water quality standard.

Chapter 5 Items of Concern

NAFSMA is concerned with some of the elements included in this chapter. These elements along with NAFSMA's conclusions and recommendations are discussed below.

1. Scope of Watershed Planning and Implementation: It is not clear to us what level of watershed planning the report is espousing. Initially the "watershed" is defined as a small local watershed to which the individual site drains (i.e., a few square miles within a single municipality). However, the report later states that "Governmental and watershed boundaries rarely coincide, with the result that most watersheds are made up of many municipal bodies regulating stormwater management. Unfortunately in most cases there is no overarching stormwater regulatory structure that is based upon a watershed analysis". We note that the reality is that watersheds come in all varieties, sizes, and shapes. While it may be possible to develop a watershed plan and implement that plan when one municipality has jurisdiction over the entire watershed the same is not true when the watershed of concern includes multiple jurisdictions. The latter situation is considerably more difficult to manage. The report mentions that "Many metropolitan areas around the country have institutions, such as the Southeast Wisconsin Regional Planning Commission and the Milwaukee Metropolitan Sewage District, that are doing stormwater master planning to reduce flooding, bank erosion, and water quality problems on a watershed scale." We believe the distinction needs to be made between planning and implementation. While regional planning is important, it is not a substitute for program

implementation. Implementation usually takes place at the municipal government level where local officials must balance environmental concerns with public safety, economic development and social welfare concerns. It is unrealistic to assume or believe that locally elected officials are going to cede local control of land use and economic development decisions because of stormwater quality issues, except perhaps in a very few isolated cases.

2. Maintaining the Natural Hydrology of a Watershed: The report states that the goal of stormwater management is “to reduce pollutant loads to water bodies and maintain, as much as possible, the natural hydrology of a watershed”. Later on it is stated that the emerging goal of stormwater management is to “mimic, as much as possible, the hydrological and water quality processes of natural systems”. NAFSMA reiterates that the CWA specifically and intentionally uses the term “maximum extent practicable” with regard to the control of pollutants. Although a laudable goal, maintaining the natural hydrology of a watershed or mimicking natural systems is not mentioned in Section 402 (p) of the Clean Water Act. Further, there is a considerable difference between what is possible and what is practicable. We are concerned with the cost and practicality of being required to do whatever is “possible” to maintain the natural hydrology of a watershed. As previously mentioned many large urban areas are already developed in the United States, and in these highly urbanized watersheds, restoring natural hydrology may not even be possible, much less affordable or socially acceptable.

3. Limited Linkage Between Performance of SCMs and Watershed Improvement: It is stated in Chapter 5 that when designed, constructed, and maintained correctly SCMs have demonstrated the ability to reduce runoff volume and peak flows and to remove pollutants. However, the report goes on to say that only in a very few cases has the performance of SCMs been mechanistically linked to the guaranteed sustainment at the watershed level of receiving water quality, in-stream habitat, or stream geomorphology. We are concerned that local governments will be required to spend ever larger amounts of money on “new” or “advanced” systems of SCMs whose effectiveness is unproven. Further, the installation and long term maintenance cost of new SCMs must be part of the effectiveness calculus. We also believe that more aggressively mandated NPDES stormwater requirements certainly should not take place without knowing the proposed measures will be effective.

4. The Stormwater Program vs. a Planning Philosophy: The report states that “sprawl” and the impacts on in-stream water quality that result from urbanization have been an inevitable consequence of improved economic conditions. It further notes that in the United States, sprawl constitutes the vast majority of development occurring today because a majority of the population is attracted to the benefits of a suburban lifestyle, government has subsidized roads and highways at the expense of public transit, and local zoning often limits development density. While this may be the case, we believe the report is expressing a planning or political philosophy. As the report notes there are obviously many people that like living in suburbs. Roads and highways are supported by many people as is mass transportation. It doesn't seem

that the report's stated planning or political philosophy should be taken to be the "correct" philosophy when we are dealing with how the public should live and spend their tax money. Another point of view is that these decisions should be made at the local and state levels and not dictated to local governments by the federal government through a stormwater management plan.

5. More Information Needed before Stormwater Program Is Escalated: Three of the seven conclusions of Chapter 5 underscore the need for additional knowledge. One conclusion states that performance characteristics are starting to be established for most structural and some nonstructural SCMs, but that additional research is needed on the relevant hydrologic and water quality processes within SCMs across different climates and soil conditions. Another conclusion states that research is needed to determine the effectiveness of suites of SCMs at the watershed scale. It is also concluded in the report that improved guidance for the design and selection of SCMs is needed to improve their implementation. These conclusions in the report lead NAFSMA to conclude that we are not ready to jump into an aggressive new stormwater mandate while fundamental information still needs to be developed. Local governments should not be required to perform on a "hope it works" basis.

6. Local Governments Can Only Control What Is in Their Jurisdiction: Regarding inspection and maintenance of SCMs, the report states that larger communities need to develop a workable model that can be used to operate, inspect, and maintain the stormwater infrastructure consisting of a myriad of SCMs across their "local watershed". We are concerned with the casual reference for a responsibility across their local watershed. The local watershed may extend beyond the communities' boundaries where the community would not have jurisdiction. Additionally, there are specific situations where local communities may not have authority over stormwater dischargers located within their jurisdiction including military installations, federal and state institutions, state highway systems and maintenance yards, and tribal lands. We must be clear on both of these points.

7. Stormwater Programs Impose a Real Cost on Local Governments: It is stated in the report that conceptually, the costs of providing SCMs are all opportunity costs. Opportunity costs are defined as the value of alternatives (next best) given up by society to achieve a particular outcome. The report goes on to say that in the case of stormwater control, opportunity costs include direct costs necessary to control and treat runoff such as capital and construction cost, the present value of annual operation and maintenance costs, administrative costs, monitoring costs, etc. NAFSMA notes that the NPDES program results in a mandate that local governments implement stormwater programs. The mandate results in real money that local government must budget, raise and spend. The term opportunity cost tends to obscure the fact that this is a mandate that costs local governments and local land owners a huge amount of real dollars. Also, local governments must consider stormwater program compliance costs with costs for other responsibilities such as fire, police, public health, parks and recreation facilities, libraries, roads and streets, O & M of public facilities, et. al.

8. Reducing Impervious Surfaces: A strong recommendation in Chapter 5 is that impervious surfaces need to be reduced. The report states [p365] that impervious surface per capita could be substantially reduced by “increasing the population per dwelling unit”. We are curious how a local government could increase the population per dwelling unit.

9. Resistance of States and Local Governments to the NPDES Mandate: It is noted in the report that there is a resistance of states and local governments to the unknown cost burden and that cities contend that the permit requirements are unreasonable, expensive, and unrealistic to achieve. It also notes that local government officials view some permit provisions such as LID or better site design as intrusion into the land-use authority of local governments. Further, some states, such as California, are bound by voter approved constitutional statutes that require local governments to obtain voter approval of new taxes, fees, or assessments. Our position is that these are legitimate local governance issues. The NPDES program does infringe on local land-use authority and permit requirements can be expensive while the nexus to tangible local benefits is often unclear. When voters or their elected representatives do not approve new fee programs to underwrite the costs of the stormwater program it should not be inferred as a failure of local government. Municipal permittees implement reasonable stormwater quality programs in light of the local conditions and demands on their resources.

Chapter 5 Missed Concepts, Conclusions and Recommendations

NAFSMA believes that some concepts or issues were missed or understated in the committee’s work on this chapter. These issues along with our conclusions and recommendations are discussed below.

1. Stormwater Not the Only Responsibility of Local Governments: NAFSMA recommends that more recognition be given to the fact that stormwater is just one responsibility of local government, and that it is difficult for local governments to reduce the level of other local government functions to commit additional resources on stormwater programs. Additionally, a community’s ability and/or disposition to provide additional funding for expanded stormwater compliance programs through new taxes, fees or assessments may vary widely. Costs of stormwater programs are discussed in Chapter 5, but not in the context of the wide range of responsibilities of local governments and their limited financial capabilities. The cost focus in Chapter 5 is more on “helping” local governments find additional sources of funding.

2. The Impact of Existing Urban Land Uses: There are greater opportunities to mitigate the impacts of urbanization in the application of SCMs to new development or redevelopment situations than to existing urban infrastructure situations. In urban areas the existing urban land use is the dominant impact on the natural environment. We believe there should be more recognition that the application of SCMs to new development and redevelopment will have

limited effect on the natural systems already impacted by development. In areas that are already developed the focus will need to continue on SCMs such as pollution prevention, illicit discharge detection and elimination, erosion control, and product substitution even though, as recognized in Chapter 5, the state of science has yet to reveal the mechanistic links that would allow for a full assessment of the relationship between stormwater pollution prevention plan implementation and in-stream water quality.

3. Intense Urban Development Results in Unavoidable Changes to the Natural

Environment: We believe that highly urbanized communities cannot be developed without changing the natural environment. Impacts can be mitigated to some extent, but not completely eliminated. The NPDES stormwater program needs to acknowledge and incorporate this reality. We agree with the conclusion in Chapter 5 that the accumulation of SCMs in a watershed may not protect the most sensitive beneficial aquatic life uses. It is not realistic to require stormwater programs to completely mimic natural stream environments in dense (high population and buildings per acre) urban settings.

4. The Requirements of Section 402(p) of the Clean Water Act: The CWA, section 402(p), requires “controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.” The focus of the law is on the control of pollutants. It is our position that while it may be good to incorporate other benefits such as mimicking a natural stream environment into a stormwater management program where it makes sense to the local community, the legal obligation per the CWA is to reduce pollutants to the maximum extent practicable.

5. LID Should Not Be Mandated for All Local Governments: It is NAFSMA’s position that no one SCM should be mandated for all MS4s. Clearly, LID is a favorite concept of the report and perhaps it should be encouraged. It is acknowledged in Chapter 5 that the long term impact of LID on a watershed basis is not known at this time. It would be a mistake to mandate such a specific SCM which would essentially be a national demonstration project to see how effective the LID approach would be over time. There will perhaps be many MS4s that will embrace LID and require its use in their communities. If they are successful the concept will become commonplace in time. Investment in public works facilities of any kind are for the long term and municipalities cannot afford to be forced to go in a direction only to later find out it doesn’t work as well as the proponents promised.

6. Implementation on Watershed Basis Not Always Possible: Planning on a watershed basis is a good goal. Mandating implementation on a watershed basis is an unrealistic goal. When there are multiple municipalities in a watershed, local governments are unlikely to cede their local decision-making authority to a “watershed entity” (except perhaps in rare situations).

Neither EPA nor the states will be able to mandate local governments to rearrange themselves along watershed boundaries.

Chapter 6: Innovative Stormwater Management and Regulatory Permitting

Chapter 6 Summary

Chapter 6 of the report advocates using watershed boundaries, instead of political boundaries, for all stormwater and wastewater discharge permitting. A transitional period is described to assist with implementation of the changes. The chapter recommends significantly increasing the stormwater management responsibilities and authorities of municipal governments, including requiring them to develop biological water quality objectives, design criteria for SCMs, and to take other actions. It recommends enhancements to the industrial and construction stormwater programs including the definition of design storms, preparation of SCM selection guidance, implementation of enhanced monitoring of industrial sites, the development of guidance on identifying high risk sites, and integration of construction and post-construction permit provisions. The chapter further advocates the establishment of a quantitative basis for *maximum extent practicable* in MS4 permits, use of runoff volume and pollutant load limits in MS4 permits, use of turbidity limits for construction sites, and regulation of land development (impervious cover) changes.

Chapter 6 Supported Elements

NASFMA supports and agrees with some of the elements outlined in this chapter. These elements are discussed below.

- 1. Additional Resources:** We strongly support the committee's recognition that to implement more effective stormwater management additional resources will be needed. The report states that "EPA should seek significant congressional funding to support the states and municipalities..." It is clear that federal funding comparable to the levels seen during the grants program in the 1980's -- which funded the construction of our nation's publically owned wastewater treatment systems -- is required to make any significant headway in our national efforts to address the impacts of urban runoff. Historically, stormwater programs have largely been excluded from these federal funding programs. We urge law makers, EPA, and states to adjust resource allocations among all of our important public sector priorities and to tailor the requirements of our nation's stormwater management programs and their funding levels appropriately.
- 2. Customized Stormwater Management Strategies on Subwatershed Basis:** NASFMA supports the concept of customizing stormwater management strategies on a subwatershed

basis. The concepts illustrated in Table 6-3 of the report (p. 548) provide excellent ideas for consideration by MS4 operators as they refine their stormwater management programs. Although we do not believe the table should be viewed as imposing strict requirements on any particular MS4, the ideas noted have merit. NASFMA encourages EPA and the states to provide MS4 permit language that allows for this type of flexibility.

- 3. Identifying High Risk Industrial Facilities:** The report calls for enhanced guidance to MS4 operators on identifying high risk industrial facilities within their jurisdictions. NASFMA supports the development and issuance of such additional guidance, however, NASFMA encourages EPA and the states to include large and medium MS4 operators in the process of developing such guidance, because many large and medium MS4 operators have mature programs with excellent internal procedures and processes. We feel this process might be more akin to assembling a synthesis of currently effective practices.
- 4. Industrial Stormwater and Industrial Control Measure Monitoring:** NASFMA supports an incremental enhancement of industrial stormwater monitoring and industrial stormwater control measure monitoring. Because our members rely on industrial activities for citizen employment and economic development in our communities we believe that equitable and incremental enhancements are appropriate and will help identify and reduce industrial contributions to stormwater pollutant loads, however, we don't support a radical increase in these requirements nor do we support uneven increases in these requirements that might lead to inequities from city to city. In addition, we believe that industrial monitoring should be the responsibility of the industrial facilities themselves and not the MS4 operator, unless appropriate fees can be levied by the MS4 on industrial sites.
- 5. Establish Realistic Water Quality Goals:** The report acknowledges that streams in highly urbanized areas are sometimes so degraded that restoration in accordance with currently adopted water quality standards may not be feasible so more realistic and achievable water quality objectives should be developed to guide stormwater management actions. We strongly support this concept and we urge EPA and state decision-makers to provide additional support and guidance to help stakeholders achieve the necessary refinements to water quality standards where warranted via UAA or alternative regulatory processes.

Chapter 6 Items of Concern

NASFMA is concerned with some of the elements outlined in this chapter. These elements are discussed below.

- 1. Watershed Based Permitting Implementation:** If watershed based permitting proceeds, the practical realities of addressing local political issues, governance structures, annual budgeting, legal frameworks, and jurisdictional issues need to be considered when developing implementation details. We feel the report does not sufficiently address these implementation realities and we urge law makers, EPA, and state regulatory agencies that are

considering changes to our NPDES program to proceed cautiously. As stated in our comments on Chapter 5, local governments are unlikely to cede their local decision-making authority to a “watershed entity.” Additionally, watershed based permitting can also contribute to the cost and complexity of implementing the stormwater program. For example, in Riverside County, California, stormwater is regulated under three separate NPDES MS4 permits – each issued by an independent Regional Water Quality Control Board and each with its own unique requirements, schedules, reporting and monitoring programs. By virtue of geography, three cities now fall under the jurisdiction of two of these permits.

- 2. Definition of Watershed Based Permitting:** The description of watershed based permitting in the report does not appear to match our understanding of what EPA is promoting. We believe that EPA advocates synchronizing the issuance of the various discharge permits required to address multiple stressors (discharges) in a watershed, rather than combining all discharges into one integrated permit. We believe that coordinated and synchronized permitting makes good sense; however, the report appears to suggest that one bloated and unwieldy permit addressing all discharges would yield a better outcome. We could not disagree more. We believe that regulatory agency staff, municipal staff, and other stakeholders involved in wastewater issues are best suited to address wastewater permitting issues and that stormwater stakeholders are best suited to address stormwater issues. Permit issuance can be synchronized, but they should be separate permits.
- 3. Regulation of Flow:** The committee calls for the direct regulation of stormwater runoff flows and provides a short technical and legal justification for this recommendation. NASFMA is very concerned about federalizing the regulation of runoff flows for a variety of reasons. Due to extreme variability of precipitation patterns, rainfall intensities, depths, soil conditions, topography and other conditions affecting runoff flow across our nation, a top down approach to management of this part of the hydrologic cycle is not workable from a political or technical perspective. We believe that local conditions require local approaches. From a legal perspective, we do not see how an increase in water flow in a conveyance could possibly be viewed as the “discharge of a pollutant.”
- 4. Biological Water Quality Objectives:** NASFMA generally agrees with encouraging the development and implementation of biological water quality objectives within state water quality standards and their use in stormwater management; however, while this is a beneficial trend, the report does not acknowledge the investment required to develop such a set of national standards. Significant field study will be required to collect the observational information needed to develop defensible standards. While Ohio and some other states have made great headway on this issue, many other states are far from having the necessary data. We are further concerned by the report’s call for a stronger role for MS4 operators in the development of these biological criteria. This effort will further burden local municipal

governments with monitoring and scientific research that should be conducted by USGS, EPA, or state regulatory agencies.

- 5. Integrated Permits Under Municipal Control:** The committee calls on EPA and states to develop and issue integrated permits for construction stormwater, municipal stormwater, industrial stormwater, municipal and industrial wastewater, combined sewer overflows, biosolids, pretreatment, and other Clean Water Act discharges. While this may, in theory, seem to foster watershed based management of water resources, in practice it would likely result in an unmanageable permitting process for both the permittee and the state regulatory body. Separately issued wastewater and stormwater permits can sometimes be subject to protracted negotiations and discussions over legal and technical issues. Sometimes contested case hearings or other legal or administrative processes are required. These technical, political, and policy discussions often take considerable time to resolve before permits are issued. By combining all the issues into one large permitting action, we believe the process can only become more cumbersome and unwieldy and that stakeholders on all sides of the issue would not have sufficient time or resources to address all of the technical, legal, and policy issues that would invariably arise.

The use of integrated permits would preclude the use of general permits, which seem to be quite necessary, given the sheer number of small MS4 permits, construction, and industrial permits required. Few states could afford to issue integrated and individual permits to their regulated communities.

We are also concerned about how integrated permits would be issued. We would generally support the use of integrated permits, if requested by a group of dischargers. This would be indicative of collective support and of consensus by local stakeholders. This seems to have been the case in the Clean Water Services (Washington County, Oregon) example featured in Box 6-2 of the report. We would, however, have grave concerns if integrated permits were initiated by a state or EPA. A top down approach would not be productive and might serve to delay water quality improvements because of the practical realities of achieving consensus among all stakeholders. Furthermore, there are many MS4 operators that do not own or operate municipal wastewater treatment facilities.

- 6. Municipal Responsibility for Industrial and Construction Discharges:** The report suggests that in the interim, giving “MS4’s controlling jurisdiction and responsibility over discharges from construction and industry to the MS4 in addition to their responsibility to implement the programmatic minimum measures defined in regulation” will help improve our nation’s stormwater program as it moves to a watershed approach. The report suggests that this is a new approach and that it will create more responsible MS4 operators that will help foster progress. This suggestion illustrates a fundamental misunderstanding of current MS4 permit programs. MS4 permits *already* require MS4 operators to implement controls over construction activities and industrial sites. As soon as pollutants from these activities enter the MS4 they become the legal responsibility of the MS4 operator. This suggestion

does not add anything new to our stormwater management approaches. This suggestion also appears to imply that states and the EPA, who have significantly greater legal authority, would abdicate their regulatory responsibility and authority to the MS4 operator. We doubt that states and EPA would be willing to delegate Clean Water Act authority to MS4 operators and we believe this would reduce our nation's ability to address water quality concerns arising from stormwater.

7. **Geographic Expansion of Permitted Areas:** The report calls for extending the regulated area for MS4 permitting from the US Census defined urbanized area to “any area in a the watershed... zoned or otherwise projected for development at an urban scale (*e.g.*, more than one dwelling per acre)” (p. 485). NAFSMA believes that this would be unworkable for a number of reasons. First, the delineation of this new boundary would be an enormous task at the national scale. Second, many areas of the country do not have zoning rules adopted and may not conduct regional land use planning to the level of detail required by this idea. Thirdly, it is unclear how this new regulatory zone would change over time. Under current regulations the US Census will update the urbanized area on a ten year cycle and there is certainty regarding that process, which is constitutionally required. Under the proposed approach the delineation frequency is not discussed and a responsible party for the delineation is not identified.
8. **Numeric Expressions for Maximum Extent Practicable:** We have serious concerns about the establishment of numeric expressions for the MEP standard. The report proposes the establishment of end of pipe municipal action levels (MAL) based on a statistical analysis of the data in the National Stormwater Quality Database (NSQD). The report suggests that MAL's would increase MS4 accountability and it would foster more actions to achieve pollutant load reductions and to restore impaired waters. This is contrary to what the California State Water Resources Control Board Blue Ribbon Panel that originally proposed the concept, intended.

The Blue Ribbon Panel report concluded that the best approach to manage stormwater was through the use of a series of well designed functional control measures with strict design criteria, maintenance requirements, and inspection requirements. The panel proposed to use MAL to determine the need for additional well specified and defined control measures and help in the iterative and adaptive process of implementing them. It was never intended to replace MEP with numeric expressions. Use of numeric expressions to represent MEP will change the intent of the MAL and would, in effect, result in the imposition of numeric effluent limitations on municipal stormwater discharges at the end of pipe. This would divert attention away from the more important work of enhancing methods of flow management, stormwater control measure design criteria, control measure maintenance, and stream rehabilitation work.

Fundamentally, the development and implementation of MALs as described in the report seems contrary to other key elements in the report. The MAL concept seems to focus

attention on the pollutant levels at the end-of-pipe, however, many of the other elements in the report seem to focus attention on land use management, stream restoration, and flow management, which are not well assessed using end-of-pipe measures.

- 9. Improved Runoff Monitoring:** The report points out some of the deficiencies in current monitoring approaches. It notes that some stakeholders addressing the committee believed monitoring was expensive, “nearly useless, burdensome, and producing data that are not being utilized.” The report suggests that research quality monitoring (using the paired watershed approach and other methods) should be employed by the MS4 operator, rather than EPA and the states. It is mentioned that EPA and states should “provide material support and guidance;” however, no mention is made regarding the substantial costs that would be incurred to conduct the type of monitoring as outlined in the report.

Chapter 6 Missed Concepts

NAFSMA believes that some concepts or issues were missed in the committee’s work on this chapter. These issues include the following:

- 1. Regulatory Realities of Establishing Realistic Water Quality Goals:** The report acknowledges that streams in highly urbanized areas are often so degraded that restoration in accordance with currently adopted water quality standards is not usually feasible such that more realistic and achievable water quality objectives should be developed to guide stormwater management actions. Table 6-2 of the report (p. 547) illustrates a graduated set of water quality objectives for urban subwatersheds. The table shows a range of conditions ranging from a *lightly impacted watershed* with 1 to 5% impervious cover to *urban drainage* (61 to 100% impervious). The table implies that full attainment of designated uses is not required and that something less than full attainment of the national fishable and swimmable goal is possible to establish. The discussion omits the regulatory and legal reality that requires a use attainability analysis (UAA) – a lengthy and potentially very expensive process – to be conducted for receiving waters before the applicable water quality standards can be refined in this manner. Current regulations only prescribe six technical reasons for adjusting an adopted water quality standard to reflect attainable uses. The report does not acknowledge this requirement and ignores the practical challenges of conducting UAA, especially in waters impacted by stormwater runoff and in particular for recreational uses. As currently applied, the UAA process is almost unworkable.
- 2. Construction Stormwater Program:** The publication of the report pre-dates EPA’s publication of its proposed *effluent limitation guidelines* for the construction and development point source category, which outlines more rigorous construction stormwater management requirements. EPA’s proposal includes a requirement to use *active treatment*

systems to reduce effluent turbidity. Under the proposal, sites larger than 30 acres, with high rainfall, and high erosivity would have to achieve less than 13 Nephelometric Turbidity Units (NTU's) in their effluent. The report provides some suggestions to improve construction runoff programs, including a call for turbidity limits. NAFSMA has been on record as being concerned with the 13 NTU limit, compliance costs and the science behind determining methods available for treatment (reference February 26, 2009 – NAFSMA Comments on the Effluent Limitations Guidelines and Standards for the Construction and Development Point Source Category November 28, 2008 Proposed Rule – Docket ID No. EPA-HQ-OW-2008-0465). These recommendations should be considered as EPA and stakeholders finalize the effluent limitation guidelines.

- 3. Total Maximum Daily Loads:** The report suggests that urban stream impairments could be addressed by conducting TMDL studies using impervious cover as a surrogate variable. It does not appear that the report provides sufficient explanation of how an impervious cover TMDL might work in an impaired watershed that is already significantly developed. It appears that the committee was suggesting that significant redevelopment would be required to remove impervious cover and that would allow restoration of designated uses. This is not a realistic approach given the likely costs associated with such a large effort. The concept also runs counter to certain smart-growth principles, such as in-fill and clustered development. If something less than attainment of the fishable and swimmable goals was allowable following a refinement of the designated use through a UAA, then, perhaps, some watershed retrofitting would be sufficient.
- 4. Affordability Should be Considered in Permitting:** The report doesn't address the strain stormwater permitting provisions place on local resources. We strongly suggest that permit writing agencies consider affordability when crafting permit provisions. This is consistent with a legal opinion issued by the California Water Board's Office of Chief Counsel in 1993, which indicated that costs should be considered when assessing MEP.

Chapter 6 Conclusions and Recommendations

NAFSMA appreciates the work of the committee and welcomes the new ideas presented in the report and the national discussion it has prompted. We strongly support the committee's call for increased federal funding and guidance and support for municipal stormwater programs, however, we have some concerns about the significant changes proposed to the statutory and regulatory framework of the program.

We support calls for additional resources, a careful transition to watershed based approaches to water quality improvement, the use of subwatershed management strategies, the development of high risk industrial facility guidance, increased industrial monitoring, and the establishment of realistic water quality goals.

We are concerned about how watershed based permitting would be defined and implemented, the regulation of flow, the development and use of biological water quality objectives, increased municipal responsibilities under MS4 permits, the geographic expansion of permitting areas, numeric expressions for maximum extent practicable, and calls for improved monitoring without sufficient funding.

We believe the report should have included more in-depth discussion concerning the very real impediments that must be overcome to refine water quality standards and restoration goals through use attainability analyses, the impact of the pending construction and development point source category effluent limitation guidelines, and a more thorough discussion of total maximum daily loads.

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