

1.0 INTRODUCTION

This report provides a description of the Impervious Cover (IC) method and tests its feasibility as a TMDL development tool using watersheds nominated by five New England States. In the report, we describe the IC method and apply it to complete a set of seven total maximum daily load (TMDL) allocations for impaired watersheds throughout New England. EPA Region I has identified the IC method as a potentially useful, innovative TMDL approach for water bodies impaired by stormwater. This work has been conducted by EPA Region I as part of an initiative to select and apply scientifically appropriate and resource efficient methods to complete TMDL allocation projects.

The IC method uses percent impervious cover in a watershed as a surrogate TMDL target. The IC method may be applicable for completing TMDLs in smaller stormwater-impaired streams with biological impairments (e.g., aquatic life, macroinvertebrate, or habitat impairments). The IC method appears to be well-suited to support phased implementation of TMDLs using adaptive management techniques to achieve environmental improvements. The IC Method TMDL applications described herein are pilot projects designed to test the feasibility of using the IC Method within the TMDL framework.

The IC metric in the TMDL analysis (EPA generally recommends 9%, unless a state has more site-specific information that indicates a different target is appropriate) is a target to guide implementation of best management practices (BMPs). Based on extensive data and the best information available, it appears that if the IC target is met (by reducing actual IC, reducing directly connected IC, or other measures – see Chapter 5) stormwater-impaired waters will be brought back into compliance with water quality standards (WQS). The IC target, however, is not intended to assess ultimate compliance with State WQSs. Compliance will be determined by monitoring of appropriate state-specific parameters in the affected water body and comparison to water quality criteria. The IC Method is most applicable to smaller watersheds or sub-watersheds with greater than 9% IC, where the IC model indicates a strong correlation between %IC and aquatic life standards attainment.

EPA notes that all sources contributing to an impairment need to be acknowledged in a TMDL analysis. If stormwater runoff volume represented by the surrogate impervious cover is not the only likely contributor, other causes will have to be identified, assessed, and possibly provided TMDL targets.

EPA Region 1 and representatives of the New England states reviewed and evaluated numerous candidate TMDL methods for feasibility in completing TMDLs in New England. The Impervious Cover Method was selected primarily because it provides a strong and straightforward link

between water quality impairments and causal factors. The IC Method is based on the scientific relationship between the portion of impervious cover in a watershed and its stream quality. Stream quality is defined in this context to include a broad set of parameters characterizing hydrologic, physical, water quality, and biological conditions. The method is largely based on the work of The Center for Watershed Protections which has compiled and evaluated extensive data relating watershed impervious cover to hydrologic, physical, water quality, and biological conditions (Schueler, 2003).

Application of the Impervious Cover Method requires use of watershed land use information to estimate watershed impervious cover. Watershed impervious cover is then correlated to extensive datasets to support prediction of stream quality. Through this method, stream quality may be predicted in each watershed (and sub-basin) based on percent impervious cover. Where impairment is predicted (i.e., where stream quality is unacceptable), the IC method may be applied to specify modifications (e.g., BMPs) designed to remove impairments. The process of applying the IC method to complete TMDL allocations is described herein and applied to complete seven pilot TMDL allocations.

The IC Method is very useful for developing TMDLs for aquatic life impairments caused by stormwater runoff. It is particularly helpful for developing stormwater TMDLs where no specific pollutant can be identified as the cause of the impairment. If a water body is 303(d)-listed for both an aquatic life impairment caused by stormwater and specific pollutants, the IC Method may be used to address the aquatic life impairment. Specific TMDL targets for the listed pollutants should also be developed. Where any specific 303(d)-listed pollutants are primarily related to stormwater runoff, the techniques outlined in this report may be appropriate. If the specific listed pollutants causing the impairment are related to sources other than stormwater volume, then other more appropriate techniques should be used to develop these TMDL targets.

This report contains the following components:

- Section 2 – an overview of the impervious cover method;
- Section 3 - a description of how the IC method is applied to complete the TMDL development;
- Section 4 – a description of the application of the IC method to complete TMDL development for seven watersheds throughout New England; and
- Section 5 – a brief description of the TMDL implementation process.

The watersheds assessed in Chapter 4 do not all match our selection criteria for using the IC method, nor do they all have impervious cover greater than 9%, which is generally our suggested

initial TMDL target (unless a state has more site-specific information that indicates a different target is appropriate). For each example watershed, we note what worked and what didn't work in the analysis, and discuss whether the watershed is an appropriate selection for this approach. The ICM was identified as an appropriate method for TMDL development for four of the seven pilot TMDL applications. For the remaining three pilot watershed TMDL applications, the ICM method was deemed inappropriate based on the presence of additional known and specific impairments and/or %IC below the TMDL metric in the subject watershed. The seven pilot applications successfully tested the feasibility of using the ICM for TMDL development by identifying both appropriate and inappropriate TMDL application scenarios.