BUREAU OF WATERSHED MANAGEMANT PROGRAM GUIDANCE

Storm Water Management Program

Meeting Infiltration Performance Standard of ch. NR 151, Wis. Adm. Code

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APPROVED:

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A. Statement of Problem Being Addressed

Under ss. NR 151.124 and 151.244, Wis. Adm. Code, a construction site landowner must meet the performance standard for infiltration of runoff taking into account site constrictions. A technical standard has been developed to assist site designers in the assessment of the site and its adequacy in providing infiltration that is both protective of groundwater and practical to implement. Department staff who work with developers and consultants need guidance on how much to encourage infiltration when assisting an applicant with potential barriers to infiltration.

B. Background

The intent of the infiltration standard in ch. NR 151, Wis. Adm. Code, is to encourage infiltration of runoff. This requirement is tempered by a series of prohibitions and exemptions for the purpose of minimizing the risk of groundwater contamination and to address the practicality of implementation. These prohibitions and exemptions are not intended to be tools for developers and designers to avoid infiltration altogether.

Developers and designers need to seek practical and sometimes innovative methods to meet infiltration requirements. Where infiltration standards are unable to be fully realized, then developers and designers need to meet the standards to the Maximum Extent Practicable (MEP). MEP is a term that provides flexibility in meeting a standard (or goal). However, there needs to be site-specific reasons why a project is unable to fully meet a standard. If full attainment of a standard is impractical due to site conditions, then the standard is to be achieved to the furthest degree practical. For example,

- If a portion of a site is not acceptable for infiltration due to poor soils or high groundwater, directing runoff via gravity flow to other areas of the site that are suitable must be considered.
- If a layer of clay soil is underlain by sandy soils suitable for infiltration then excavation of the clay layer may be warranted.
- If the only area on a site suitable for an infiltration basin is located up-slope of proposed impervious areas and the impervious areas have no other reasonable location, the designers are not required to pump water to meet the infiltration requirements in ch. NR 151, Wis. Adm. Code. However, decentralizing infiltration practices and installing rain gardens or other smaller practices around the site must be considered as an alternative.

Proper implementation of ch. NR 151, Wis. Adm. Code, will require that some land or parcels will be needed for storm water management. The economic considerations regarding the loss of developable land are not a reasonable justification to avoid full attainment of a standard. The developer and designer should not assume a predetermined outcome or rely on the prohibitions and exemptions identified in ch. NR 151, Wis. Adm. Code, to avoid infiltration, but rather they should seek ways to employ infiltration to the MEP.

C. Guidance

In order to address some of the situations that are commonly encountered in implementing the infiltration performance standard the following guidance may be used by regional staff and other

reviewers of projects. Following are a number of scenarios that require further explanation if the intent to encourage infiltration is to be met.

Best Infiltration Area

Must the best infiltrating area be used for infiltration? No, it is acceptable to meet the infiltration volume standard without using the best infiltration area. There may be valid reasons why certain areas of the site need to be used for purposes other than infiltration. However, if the full infiltration volume standard will not be met then the reviewer should ask themselves the following two questions:

1. Was the Site Evaluation for Stormwater Infiltration technical standard #1002 followed and an evaluation of the infiltration areas conducted early enough in the process to influence the site layout and has that documentation been provided?
2. Has the site been designed to accommodate infiltration to the maximum extent practicable (MEP)??

If the answer to both of these questions is yes, then the plan is adequate. However, the developer or designer can not claim exemption from infiltration by placing impervious areas over all suitable soils. If this occurs for sites under DNR jurisdiction, site redesign may be required.

Uphill Pumping

At some sites the only area on the site that is not prohibited or exempted is up-hill of the proposed impervious areas. In these cases pumping storm water up-gradient for infiltration will not be required. However, some infiltration practices can still be accommodated even where there is limited separation to seasonal high groundwater and bedrock or where there is limited percent fines. Those practices are bioretention systems or rain gardens.

Measured Infiltration Rate

Chapter NR 151 allows an exemption from the infiltration performance standard for areas where the infiltration rate of the soil is less than 0.6 inches/hour when measured in the field at the bottom of the infiltration system. However, this exemption can be claimed after a soils analysis if the least permeable soil horizon five feet below the bottom of the infiltration system is one of the following: sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, or clay. This is consistent with the criteria in the Site Evaluation for Stormwater Infiltration Technical Standard # 1002 Step C. 5.

Excavation to Suitable Soil

During the soils analysis a soil layer suitable for infiltration may be identified in the soils profile below an unsuitable soil layer at or near ground level. Should the developer consider additional excavation to reach those soils? Absolutely. DNR believes that excavation of unsuitable soils is appropriate to access suitable soils within 5 feet below ground level. Local administrators have the authority to select a maximum depth that they consider reasonable, which may be in excess of 5 feet below ground level.

Fill for Suitable Soil

Many sites are filled as part of construction or during grading after the plat phase. If the native soil was not exempt, but the fill material is placed and compacted and the soils now meet an exemption (such as 0.6 inches/hour infiltration rate), would the original condition or the construction condition dictate? Filling and compaction activities performed after implementation of ch. NR 151, Wis. Adm. Code (October 1, 2004) will not justify an exemption from the infiltration requirements. The infiltration requirements will be based on the native soil conditions. Accordingly, these sites may be required to remove fill or mitigate compaction to

meet the infiltration requirement. Where fill placement and compaction occurred prior to implementation of the infiltration standards within ch. NR 151, Wis. Adm. Code, the infiltration requirements will be based on both fill and native soil conditions. However, every effort must still be made to use infiltration practices, such as rain gardens for roof runoff.

Conveyance of Runoff to the Infiltration Device

Sections NR 151.124 (1)(a) through (c), Wis. Adm. Code, indicate that regardless of the goal, no more area than the equivalent of 1% of the disturbed area of a site with up to 40% connected imperviousness and no more area than the equivalent of 2% of the disturbed area of the site will be required as an effective infiltration area for a site with more than 40% connected imperviousness. This has been referred to as a "cap". If a developer has built to the cap it is important to verify that sufficient runoff is directed to this device to achieve the maximum infiltration volume possible. If the infiltration goals have been met, then it is not necessary to route all runoff to the devices. However, routing as much runoff as possible through the devices may provide additional infiltration benefits. If the infiltration goal (60%/75%/90%) is not met and the infiltration devices will be built to the cap, the infiltration devices must be located and have runoff routed to them to maximize the infiltration potential of the devices.

Depth of Infiltration Devices

Occasionally a developer may claim an exemption because they are proposing to construct the basin at an elevation where the separation distance to groundwater or bedrock can no longer be met. The developer needs to have a good reason why the device has to be so deep. Even then, he/she can still be required to look at other infiltration options and practices. Not all the practices have the same design depth requirements.

Source Area Infiltration Prohibitions

Section NR 151.124 (3)(a), Wis. Adm. Code, suggests that runoff from certain source areas is *prohibited* from being infiltrated. However as identified under s. NR 151.124(6), runoff from such source areas may be infiltrated provided the infiltration system maintains compliance with the preventative action limit at a point of standards application in accordance with ch. NR 140, Wis. Adm. Code.

Infiltration of Off-Site Runoff

The infiltration performance standard should generally be met with infiltrating only runoff generated from on-site areas. A developer generally has no control over the quality or quantity of runoff draining from off-site areas into their site. On a case-by-case basis, it may be acceptable to take credit for infiltration of off-site runoff but the following 2 issues need to be taken into consideration:

1. Will appropriate runoff pretreatment be installed and maintained to protect both the groundwater and the infiltration system?
2. Will off-site runoff continue to enter the on-site infiltration system in the future?

This guidance may not cover all possible scenarios. For situations not addressed in this guidance document, the question to ask is has the developer tried to employ infiltration to the MEP.

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