

Attachment B

City of Bellevue February 3, 2012 Comment Letter for the
Draft NPDES (2013-2018) Western Washington Phase II Municipal Stormwater Permit

Challenges to the Use of LID and Measures to Address the Challenges (Originally submitted to Ecology in 2010 to meet current permit requirements)

PERMIT REQUIREMENT

The Phase II Western Washington NPDES Municipal Stormwater Permit requires municipalities, including Bellevue, to provide a summary of identified barriers to the use of low impact development (LID) and measures to address the barriers (Permit condition S9.E.4.a.). This document summarizes the barriers identified by Bellevue staff and measures to be taken to address the barriers. This report categorizes the barriers according to the Ecology guidelines. The types of barriers as defined by Ecology include:

- Regulatory
- Environmental
- Community acceptance and understanding
- Staff and developer training and experience
- Operations and maintenance

INTRODUCTION

Bellevue supports the appropriate use of LID in stormwater management programs. There are many barriers that need to be addressed in order to increase the use of LID (where feasible) in the future. These are described below.

The Washington State Department of Ecology has been developing proposals to better define LID and increase the use of LID by municipalities in the next NPDES municipal stormwater permits. In August 2010, Ecology issued a white paper on some proposals¹. The level of detail provided on the proposals was insufficient to assess their engineering and practical application, perform a cost-benefit analysis or identify potential legal issues.

Bellevue assumes Ecology will develop revised LID requirements and standards (based on their selected approach) and update the 2005 Ecology Stormwater Management Manual *prior to including new LID requirements in the next NPDES permit*. Updating the Manual requires a public review process which will allow municipalities and other stakeholders to assess and comment on the proposed new LID standards and requirements.

There is limited experience nationally and locally with implementation of LID facilities on a large scale over an extended time period. Steps to increase the use of structural LID facilities should proceed in conjunction with additional understanding and knowledge of the long-term implications.

¹ LID Stormwater Standards, August 2010

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Regulatory

LID definitions – LID and associated requirements have not been clearly defined. This makes implementation difficult and time-consuming. The Department of Ecology (Ecology) is working on further defining LID and associated requirements.

‘Where feasible’ definition – Ecology is working on defining where LID is feasible per a ruling of the Pollution Control Hearings Board. Ecology completion of the “where feasible” definition is needed.

“Where feasible” process – Because of the lack of formal definition, Ecology has not clearly outlined a process or checklist for determining feasibility of LID practices on a site. In the interim, Bellevue has developed a site suitability assessment process for LID practices and engineering feasibility checklists for several LID practices used in the right-of-way. The City would need to revise these once Ecology guidance is developed.

Saturated Hydraulic Conductivity – Conductivity, also known as infiltration rate, is critical to determine the feasibility of LID. The current methods (PIT, infiltrometer, permeameter and grain size) in the state stormwater manual are highly subjective and give different answers. There are four different sections in the 2005 Ecology Manual and the LID Technical Guidance Manual that explain how to determine the infiltration rate, and they are all different. Ecology needs to provide better guidelines regarding the process for determining the appropriate technique and their use so that more accurate rates can be determined. Alternatively, Bellevue could clarify the process in the storm and surface water engineering standards if funding were available to hire a consulting engineer.

Modeling approach – Ecology’s modeling approach has a fundamental flaw. For individual practices, the Western Washington Hydrologic Model (WWHM) assumes that water that is infiltrated does not return as surface flow or interflow. In the City’s experience, interflow (and surface runoff) is a natural occurrence and can result in drainage problems and flooding. To ignore interflow (and surface runoff) in an area with a high percentage of glacial till is a prescription for disaster. Ecology should use the results of the LID research on interflow currently being conducted by Washington State University extension before it considers developing a LID hydrologic performance standard based on this modeling approach.

Model availability – The free version of Ecology’s model, WWHM, does not include modules for LID; users must buy the Pro version to obtain these modules. Ecology should make the LID modules available in the free version of WWHM in order to support LID implementation.

Allowable credit calculation – Ecology is working to refine LID credits to be used in reducing detention storage volume and for other potential LID incentives. Modeling results show LID practices can be more effective at reducing runoff volumes and durations than the credits that Ecology currently allows. This discourages the use of LID. Ecology should continue its work to refine its model and increase the credits allowed for LID based on research conducted since 2005.

Regulatory complexity – The implementation of on-site stormwater management per Minimum Requirement #5 is too complex for the small residential builder. Ecology should develop more prescriptive standards for single family residential projects that solely trigger on-site stormwater management best management practices (BMPs) to infiltrate, disperse and retain stormwater runoff to maximum extent practicable.

Required modification to existing policies and codes - City policies and codes must be amended in order to implement new LID definitions and requirements. The process required to amend policies and codes is significant. The City will need to do this after Ecology implements new LID definitions and requirements.

Required clarifications to design and construction standards – Ecology and the Puget Sound Partnership are working to refine LID design and construction standards for inclusion in the 2005 Ecology Stormwater Management Manual. After Ecology has updated the Manual, including a public review and comment process on the proposed changes, Bellevue expects Ecology will include adoption of the revised Manual as a requirement in the NPDES municipal stormwater permits. The City will then need to revise its storm and surface water engineering standards, clearing and grading development standards and storm and surface water maintenance standards. The process to revise standards is significant.

New development procedures – Many LID practices require protection of large areas during construction. This requires contractors to plan and construct in new ways. In a plat, a developer subdivides a property and installs only the roads and utility infrastructure, then sells lots to individual home builders. It is unclear how such a developer would meet MR5 and how the minimum requirements then apply to the new owners. The City should clarify procedures for these situations and educate staff and developers.

Basin scale LID requirement – Ecology outlined a new, untested basin scale LID proposal in their August 2010 LID white paper. There are many details that would need to be worked out and “a longer public and political process could be expected to accompany such an effort” [Pollution Control Hearings Board (PCHB) ruling on the Phase I LID appeal regarding applying LID at a basin-scale versus a parcel or subdivision scale].

If Ecology moves forward on a basin-scale LID requirement, then Ecology should consider requiring this proposal as a pilot project condition for Phase I permits only. Phase II municipalities, including Bellevue, could be subject to this requirement in a future permit depending on the outcome of the Phase I basin-scale pilot projects. This approach would recognize the differences between Phase I and II permits, untested nature of the proposal, need to develop implementation details before application on a wide-scale basis, and the PCHB *Phase I* LID ruling that:

“Little evidence was presented as to the elements and cost of basin or watershed planning that would be necessary to implement LID at this level...Given these several factors, the Board concludes that a permit condition requiring municipalities to implement LID at a

basin or watershed level is not, at this time, reasonable or practicable. This is not to say that no steps can or should be taken at this time. Ecology has identified the particular importance of basin planning in areas which are relatively undeveloped where new development is occurring. The Board concludes that city and county permittees should identify such areas where potential basin planning would assist in reducing harmful impacts of stormwater water discharges upon aquatic resources.”

Land use controls – Ecology’s proposal in its August 2010 LID white paper suggests that the next NPDES permit will require municipalities to adopt LID measures as local land use controls despite a conflict in its authority to do so under the Clean Water Act. Identified barriers include potential conflicts between existing statutory requirements (like the Growth Management Act) and Ecology’s proposed LID mandates. Additional barriers to this approach include lack of clearly defined guidelines and available resources for municipal adoption and implementation of said controls.

Enforcement dilemma on private property – The City does not have a process or adequate resources to assure LID stormwater facilities constructed on individual single family residential lots (versus as part of a subdivision development), will not be modified and/or eliminated over time. Ecology should provide guidelines so that the region has consistent enforcement, likely on a complaint basis, for LID facilities on individual single family lots. The City should update applicable codes and enforcement protocols to prevent LID stormwater facilities on individual single family residential lots from being modified and/or eliminated over time.

Environmental

Poorly draining soils – Based on geotechnical investigations, data and maps, many areas of the City have soils inappropriate to implementation of LID infiltration options, limiting their widespread application. Geotechnical engineering is expensive for small residential lots. Ecology should allow use of a map of such areas to simplify the feasibility analysis process for individual single-family residential lots.

Moderate, steep, or unstable slopes – The City has areas having steep slopes that may be inappropriate to certain infiltration and flow attenuation LID options, limiting their widespread application. Ecology should allow use of a map of such areas to simplify the feasibility analysis process for individual single family residential lots.

High groundwater and ground/surface interflow – Areas of the City have high groundwater or ground/surface interflow that may be inappropriate for certain infiltration, flow attenuation, and flow reduction LID options. This is an area of high uncertainty and lacks significant data or resources to perform an analysis. The cost of this is borne by each applicant. Continue to evaluate on a site-by-site basis by each applicant.

Impacts to adjacent and down slope sites – Some infiltration and flow attenuation options have the potential to negatively impact adjacent or down slope areas. The case law on

groundwater interflow is unknown. Ecology should research this issue and provide technical guidance to the permittees.

Reliability – Certain LID techniques have proven to have failure and other performance issues over time. The state should monitor LID performance over time. The City should identify and prepare to address potential reliability issues in implementing LID, particularly for public projects.

Groundwater Contamination – Potential for LID techniques, especially infiltration, to contribute to groundwater contamination is being studied. These studies are identifying factors in LID planning, design and maintenance that influence the risk of groundwater contamination. Ecology (and others) should monitor LID uses for potential groundwater contamination impacts and to identify LID planning, design and maintenance factors that minimize this risk.

Community Acceptance and Understanding

Performance, reliability, life cycle cost, and unintended impacts – Early stormwater management efforts and some more recent efforts using LID techniques (such as infiltration) achieved limited success. Perceptions exist that it may be difficult to predict LID technique performance, that ground water quality may be negatively affected, and that LID facilities may be susceptible to failure and have relatively high replacement costs over time. The state should monitor LID performance over time and take a cautious approach to implementing LID until there is more experience and a better understanding of factors that support or prevent the successful use of LID. Ecology should communicate the results of this research to the permittees and adapt LID standards as necessary.

Perceptions of compromised public safety and property damage – Certain LID techniques are perceived by some as potentially compromising public safety (such as by transportation and fire agencies). Concerns include, but are not limited to, reduced emergency vehicle access/response (by using “skinny” streets), exacerbating landslide potential and causing water damage on adjacent properties (by using infiltration and dispersion), and standing water in rain gardens creating mosquito breeding areas. For example, see the article and blog about rain gardens constructed in a Seattle neighborhood in 2010 by Seattle Public Utilities: [http://www.myballard.com/2011/02/03/city-to-work-with-residents-on-roadside-raingardens/?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed:+myballard+\(MyBallard\)](http://www.myballard.com/2011/02/03/city-to-work-with-residents-on-roadside-raingardens/?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed:+myballard+(MyBallard)) To educate internally, Bellevue has sent many staff to the Puget Sound Partnership LID training workshops. Ecology and the Puget Sound Partnership should mount a public awareness campaign to inform the public about appropriate use of LID techniques.

Expectation management – Some members of the building industry are under the misimpression that LID can be used everywhere and in all cases to eliminate or drastically reduce other on-site stormwater management facility costs. Ecology and the Puget Sound Partnership should mount a public awareness campaign to inform the public about appropriate use of and reasonable expectations for results from LID techniques.

Staff and/or Developer Training and Experience

Experienced designer and contractor availability – While greater numbers of experienced LID system designers and contractors will become available over time, there are currently few fully trained, knowledgeable and experienced individuals available for system design, construction and maintenance. Ecology should continue to provide training to more quickly develop the pool of available LID designers and contractors. The City could also rely on Seattle’s growing pool of trained, certified designers and contractors.

Staff expertise – Many LID practices are new and complex, and require knowledge or expertise that review, planning and engineering staff do not have (e.g., plant biology and hydrogeology). Ecology should continue offering trainings in LID, and the City should continue to send staff to appropriate trainings.

Operations & Maintenance

Emergency response requirements – Local emergency response measures (e.g. firefighting activities) may potentially impact LID systems. Failure of LID systems that result in flooding or erosion may also require emergency response. The City must develop a strategy for addressing emergency response needs and limiting liability as a result of LID implementation.

Operation and maintenance standards – There is limited, general information available on LID operation and maintenance. Bellevue worked with a consultant to create some LID maintenance standards to use as a starting point for inspecting LID facility performance and identifying maintenance requirements. The maintenance standards are available at http://www.bellevuewa.gov/pdf/Utilities/Utilities_Storm_Maintenance_Standards_Feb_2010.pdf. The state should be funding and monitoring long term operation, maintenance and performance studies of LID techniques.

Maintenance costs – Long-term maintenance costs of most LID techniques are unknown, since many have been used for less than 10 years. The state, as noted in O&M Standards comment above, should be funding and monitoring long term operation, maintenance and performance studies of LID techniques. Particularly where LID techniques are used in City projects, the City should track and prepare for addressing the maintenance costs.

Life cycle costs –LID life cycle costs are unknown as compared to more traditional stormwater management techniques. Ecology should provide conservative estimates of life cycle costs to the permittees. The City could then use these estimates to plan for potential increased life cycle costs when implementing LID measures on City projects.