music BY eWater

eWater

MUSIC v6: offering more capable and tailored stormwater planning for urban areas

MUSIC (Model for Urban Stormwater Improvement Conceptualisation) is software that helps developers and planners devise water sensitive urban designs (WSUD) and integrated water-cycle management capability (IWCM) to manage urban stormwater. Thousands of professionals working on stormwater management across Australia use MUSIC. In some states MUSIC is mandatory for designing new urban developments.

Innovative functional and visual changes in MUSIC version 6 give you improved modelling performance and a more robust user interface, as well as substantial timesaving possibilities.

MUSIC lets you conceptually choose appropriate sizes for stormwater infrastructure options — swales, tanks, rain gardens, wetlands, etc. — until the design meets or exceeds appropriate standards for stormwater volume and pollutants.

MUSIC can model a wide range of treatment devices to identify the best way to capture and reuse stormwater runoff and remove its contaminants — and reduce runoff frequency. With MUSIC you can evaluate these treatment devices to achieve WSUD and IWCM goals.

You can apply MUSIC at a range of catchment scales. By using it to compare alternative designs you can confidently decide on those that give the best outcomes — in cost as well as hydrology and receiving-water quality.

And with the new feature MUSIC-*link* your MUSIC v6 design will be tailored to (participating) Local Government Authorities' requirements.

With MUSIC you can:

- simulate stormwater flows and detention from lot-scale to suburb-scale;
- estimate the potential for stormwater harvesting and reuse, and the effects on downstream flows and water quality;
- model pollutants including suspended solids, total phosphorus and total nitrogen, and estimate the impacts of various treatment options;

- model water balance;
- compare the water-quantity, quality and cost vs benefit objectives achieved by alternative treatment-train scenarios; and
- plan entire stormwater systems.

New features in MUSIC v6

MUSIC-*link* is the major new feature in MUSIC v6. In areas where councils' requirements are built into MUSIC v6, MUSIC-*link* offers significant time-saving and convenience in designing and assessing plans of stormwater treatment systems.

New capabilities in MUSIC v6 let you:

- import external time-series flow data on source nodes, and then use MUSIC to predict water quality;
- run at 5 minute time-steps;
- specify an initial volume for all storage nodes; in earlier versions of MUSIC you had to assume the storage was full at the beginning of a run — now MUSIC v6 provides greater flexibility;
- include a maximum drawdown limit for all storage nodes with stormwater harvesting options — to preserve wetland plants, for instance;
- estimate the surface area for a sedimentation basin and the inlet volume for wetland nodes, allowing you to design these stormwater features using WSUD guidelines within MUSIC;
- add multiple rainwater tanks (with the same properties) in a model, improving usability;
- include flow-based capture efficiency for the gross pollutant trap and generic nodes, allowing for improved handling of pollutants; and
- apply additional properties in the vegetated swale node, including swale capacity; this means it is easier to see the results of changing parameters, so modellers can better understand the characteristics of swales without reference to external software or calculations.

music BY eWater

Bioretention systems

These are vegetated stormwater filtration systems that use a soil or sand-based filtration medium to remove particulates and soluble contaminants. The system may be lined or unlined and may or may not have an underdrain. Based on significant extra data and research, bioretention nodes take better account of the characteristics of the filter media and vegetation. MUSIC users can now more accurately design or represent a variety of different bioretention systems.

Infiltration systems

Unvegetated infiltration systems, for removing contaminants, which have no underdrain. MUSIC offers a greatly enhanced infiltration modelling capacity to account for horizontal flows from storage and allow for changes in flow with depth. There is greater flexibility to model systems with lined sides or base.

Media filtration systems

Unvegetated stormwater filtration systems for removing contaminants, using media such as gravel, sand or other fine granular material. They are assumed always to have an outlet pipe (underdrain).

Gross pollutant traps

These mesh-like devices are designed to remove floating and suspended rubbish and debris above 5mm in size. Many are proprietary off-the-shelf items.

Buffer strips

Strips of vegetated land beside a road are effective in the removal of coarse and medium-size suspended particles; they provide good pre-treatment prior to a bioretention system or other vegetated treatment measures.

Vegetated swales

Open channels that use vegetation to primarily remove suspended solids. Subject to high flows, they rely on shallow slopes and the density and height of vegetation, to work well.

Ponds and sedimentation basins

Open water bodies act as temporary stores to allow the settling of suspended solids. They can include ornamental ponds, but usually lack vegetation. Reuse of the water is an option.

Rainwater tanks

These domestic water stores enable roof runoff to be captured and used. Contaminants can either settle in the tank or are removed when the water is used on a garden. Tanks can reduce stormwater flows and help to counteract the increase in impervious area that urbanisation brings. They also provide an alternative water supply.

Wetlands

These are heavily vegetated water bodies; the physical, chemical and biological processes that they facilitate remove fine suspended sediment and soluble and insoluble contaminants. Wetlands are commonly used as 'end of pipe' measures, but recent research shows they also work well earlier on. MUSIC can also model reuse of the water in a wetland's permanent pool.

Detention basin

Assists in stormwater peak flow management.

Generic treatment nodes

MUSIC allows the user to model a treatment device that is not a specific node within the program if the user has sufficient data to model it effectively; for example, flow diversions, flow dilutions or contamination by sewer overflow. In these cases, MUSIC allows the user to define 'transfer functions' for flows and water quality.

music●link

Streamlined planning and assessment of water sensitive urban designs

MUSIC-*link* is a new timesaving feature in MUSIC v6, the latest version of the stormwater planning software MUSIC by eWater.

Several councils have collaborated with eWater to devise the MUSIC-*link* feature, aiming for more efficient planning and assessment of water sensitive urban designs (WSUD).

MUSIC-*link* benefits both the staff of developers designing stormwater systems and the staff of councils who assess the designs. Using MUSIC-*link*, developers can quickly meet council requirements, and council staff can easily check the compliance of the submitted stormwater designs.

The whole development and stormwater design process becomes more timely and cost-effective from start to finish — from initial concept to actual construction.

Council staff using MUSIC-*link* will access a report showing how well the design meets the council's specifications and assumptions, saving them resources previously used in detailed cross-checking.

For developers and consultants designing stormwater systems for participating councils, MUSIC-*link* removes the tedious setup stage spent gathering and entering council requirements into the MUSIC model. Further, once the stormwater treatment train has been designed, the developer can quickly check it in MUSIC-*link*, showing immediately if the planned design is satisfactory or if the designer needs to return to the drawing board.

Since its launch in 2013, 18 councils have their requirements programmed into MUSIC-*link*, and others are poised to join.

Any council can have its requirements included in MUSIC-*link* by contacting eWater.

How councils can get involved

It is easy to find out how to help developers in your council area, and your council officers, to be confident about compliance of new stormwater management designs – please contact us below. MUSIC-*link* is part of MUSIC v6.

How does MUSIC-*link* work?

MUSIC-*link* creates a customised version of MUSIC for use in a local government area.

It incorporates council requirements for water quality and treatment performance into MUSIC, so it can be used to build models of stormwater systems that are appropriate to the local area. It also provides a report comparing the elements and performance of the MUSIC models against the council's requirements.

Previously, council staff, on receiving a submitted stormwater model from designers, needed to check piece by piece all the assumptions in the model and the expected performance of the whole plan for all stormwater conditions.

Now, council staff use MUSIC-*link* to generate a detailed report showing how well the submitted model meets each of the council's stormwater treatment requirements. If the stormwater system has been designed using the local data in MUSIC-*link* it should pass on all counts, or be accompanied by sound explanations about any variations. Instead of repeatedly checking, rejecting and rechecking developers' models, council can now quickly move to the next stage of its evaluation process.

The MUSIC-*link* database of council requirements makes it easy for developers to use approved local assumptions and objectives when planning stormwater treatment options. When ready to submit their work to council, the convenient 'quick check' facility in MUSIC-*link* shows a 'green light' if the design fits council specifications. Submitted designs should meet the council approval at the first attempt.

Key features:

MUSIC-*link* creates a customised version of MUSIC for use in a local government area.

- It incorporates council requirements for water quality and treatment performance.
- It provides a report that compares the elements and performance of the MUSIC model against council requirements.
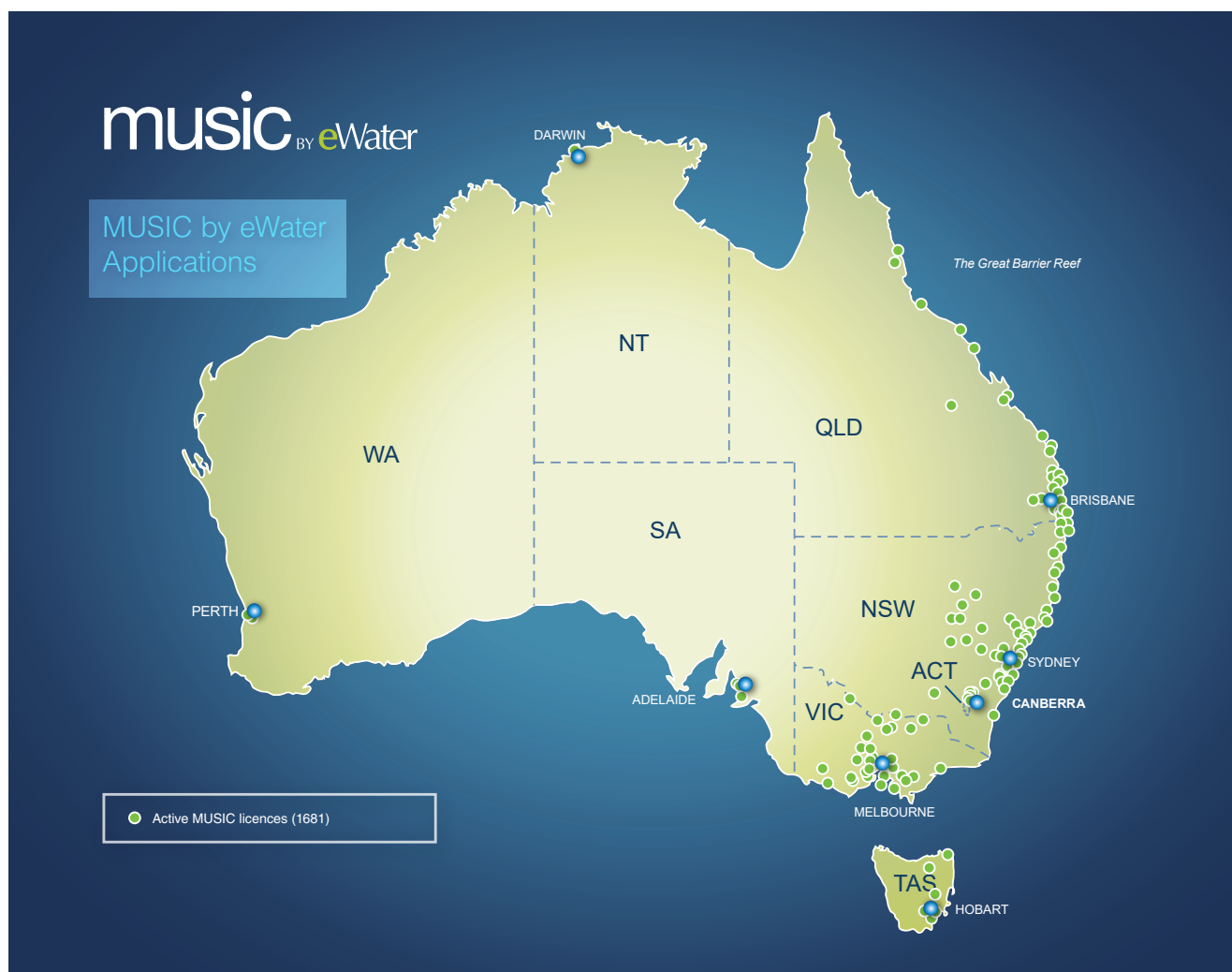
music link

eWater

Councils joined

ACT Government	City of Gold Coast	Coffs Harbour City Council	Parramatta City Council
Blacktown City Council	City of Newcastle	Hornsby Council	Penrith City Council
Brisbane City Council	City of Onkaparinga	Ku-ring-gai Council	Port Stephens Council
Central Coast Council	City of Sydney	Lake Macquarie Council	Warrnambool City Council
City of Camden	Clarence Valley Council	Liverpool City Council	

music BY eWater

MUSIC by eWater Applications

DARWIN

NT

QLD

WA

SA

NSW

The Great Barrier Reef

BRISBANE

PERTH

ACT

ADELAIDE

SYDNEY

VIC

CANBERRA

● Active MUSIC licences (1681)

MELBOURNE

TAS

HOBART

Want to know more?

Visit www.ewater.org.au/music

Sep 2018 © eWater Ltd (Photo: Noraluca013, Shutterstock)

Sales, support & training

T: 1300 5 WATER (toll free in Aus) or +61 2 6201 5057
E: support@ewater.org.au