

## Borehole & Seepage Water TC:

### New Buildings & Major Refurbs – Net Zero & Green Star

Date: 24 July 2018, GBCSA, for African projects.

The GBCSA confirm:

- **Borehole water supply** - Based on the fact that there is limited science and studies done on the effect of extensive borehole water supply usage in South Africa and its consequences for the environment (including groundwater & all the natural systems affected by ground water) the GBCSA does not define borehole water use as 'environmentally sustainable', and therefore the borehole option will not contribute to GBCSA rating tools scores/results. GBCSA acknowledge that borehole water can act as an alternative water source in water stressed periods in water stressed regions.  
(Borehole water supply is defined by the GBCSA as a constructed hole in the ground from which groundwater can be abstracted. It includes a well, excavation, or any other artificially constructed or improved underground cavity which can be used for the purpose of intercepting, collecting or storing water in or removing water from an aquifer; observing and collecting data and information on water in an aquifer; or recharging an aquifer. [Source: *National Water Act (Act No. 36 of 1998)*].)
- **Groundwater seepage** can contribute to GBCSA rating tools (Green Star and Net Zero) scores/results - with certain conditional requirements **in new buildings (and major refurbishments)** – see below for details on how projects can include this.

## Basement Seepage Water/ Subsoil Drainage

**Definition for Basement Seepage Water** (GBCSA definition): The slow movement of water into a structure that penetrates the groundwater table (also known as subsoil drainage).

(Taken from The Groundwater Foundation glossary, definition 1 of seepage: The slow movement of water into or out of a body of surface or subsurface water. [www.groundwater.org](http://www.groundwater.org) )

For projects that wish to be rewarded for the use of basement seepage water in a Green Star New Build/Major Refurb project and Net Zero New Build/Major Refurb project, and Net Zero projects in Existing Buildings targeting a modelled rating:

### Criteria

1. The project must undertake 75% (for Net Zero & Green Star) of the viable aspects of water efficiency AND on-site water solutions *before* they are able to use basement seepage water as an option. Projects are to answer *Yes* to 75% of Checklist A: Questions 1 – 13 below; or give a detailed explanation of why an element is not viable for their project.
2. Provide a water meter to the basement seepage water connected to BMS or other management system.
3. Develop and commit to a Seepage Water Management Plan (for As Built projects only)

## Documentation Requirements

1. Short Report including (Design & As Built):
  - The completed Checklist A, detailing which items were achieved, and
  - Brief description of system design, including number of pumps, flow rate, tank capacities, any water quality treatment, metering strategy, and how the water is incorporated for reuse within the building;
  - Rationale and estimation of (Design) or documentation of (As Built) volume of water to be extracted,
2. Tender drawings (or specifications) or As Built drawings detailing:
  - Location of pumps
  - Location of the water meter for the basement seepage water;
  - Management system - BMS or other management system to which the pumps and meters are linked.
3. [Design & As Built] Client letter committing to implementation of a Seepage Water Management Plan to be tabled at regularly occurring management meetings, as set out in Additional Guidance
4. [As Built only] Seepage Water Management Plan as set out in Additional Guidance below

## Additional Guidance:

### Seepage Water Management Plan

The Seepage Water Management Plan should clearly and simply set out the management plan to:

- Document monthly the volume of water collected from basement seepage
- Purpose for which this volume of water is used
- Describe any water quality issues/risks, and what mitigations plans are in place
- Give details of any environmental and health and safety risks associated with the abstraction and use of this water, and what risk mitigations plans are in place
- Highlight any particular maintenance issues that the facilities manager should be aware of related to the seepage water abstraction or use
- Highlight any particular usage issues that the building occupants should be aware of related to the seepage water abstraction or use
- Review seepage water performance and issues at monthly (or regularly occurring, at least once a quarter) management meetings

### Checklist A

1. Does your project have all tap fittings with 6/min flow rates or less? (either the fitting itself or flow restrictor)	Y/N na
2. Does your project have all shower fittings with 8l/min flow rates or less? (either the fitting itself or flow restrictor)	Y/N na
3. Does your project have all WCs with 3/6 litre flush systems?	Y/N
4. Does your project have all urinals with flush capacities of less than 1l per urinal?	Y/N na
5. Does your project have PIR or timer controls on all tap fittings?	Y/N
6. Does your project have drip irrigation (only applicable to projects with landscaping or gardens)?	Y/N na

7. Does your project have water efficient appliances, where applicable?	Y/N Na
8. Does your project have an Air cooled AC System? (or cooling tower with using non-potable water)	Y/N Na
9. Does your project have educational/awareness material targeting the User?	Y/N
10. Does your project have water sub-meters?	Y/N
11. Does your project have BMS or other smart monitoring and control system or leak detection system for the projects water usage?	Y/N
12. Does your site have onsite rainwater harvesting? How many litres?	Y/N
13. Does your site have onsite greywater system? How many litres?	Y/N

### Water Quality at Source

It is the responsibility of the project team to ensure that all standards and legislation is complied with as well as any applicable Water Use Licence Application (WULA) is acquired in the correct time frames.

### Innovation Point Opportunities for Green Star projects:

#### Replenishment / Recharge

The GBCSA believe that replenishment/recharge should be a key consideration for projects that construct into the water table. However at this point there is not enough science and research to detail specifically how this should occur at a building level, besides creating more vegetated and penetrable surfaces that allow water to percolate back underground. Thus, at this point in time there is no requirement for projects to demonstrate replenishment/recharge to the water table, but there is an opportunity for projects to target this in Green Star project as Innovation 3 credits.

The GBCSA encourage innovative ways to recharge the water table, and encourage projects to submit these as **Innovation 3 Credits**.

#### Hydrocensus & Water balance

The GBCSA believe that a hydrocensus would be of value when abstracting ground water, to understand the existing ground water abstraction in the neighbourhood and understand the impact of additional abstraction. The GBCSA do not have adequate information to set clear guidance on requirements for this, and can therefore not require projects to undertake this. It is therefore proposed to be rewarded through Green Star Innovation 3 credits.

A suggestion for a credit is set out below, to be reviewed and fine-tuned in detail by projects targeting this as an Innovation 3 credit in their submissions:

A suitable qualified professional\* can provide:

- Hydrocensus information on how much groundwater will be abstracted from the resource. During a hydrocensus, information on other borehole positions, depth of boreholes, volumes abstracted should be gathered from a suitable neighbourhood surrounding the project site (defined by the suitably qualified professional).
- An initial water balance to calculate whether the specific neighbourhood is suitable groundwater abstraction.

- Hydrocensus surveys and water balance to be undertaken by suitably qualified professional every 3 years.

***\*Suitably Qualified Professional***

*An example of a suitably qualified could be an environmental geologist or geo-hydrologist that has 3 years' work experience in undertaking EIAs (including water samples and water testing's), that is a member of the Ground Water Division of GSSA (Geological Society of SA) – projects submitting an innovation credit can motivate why/how a professional is suitably qualified to undertake the work related to this credit.*

The GBCSA encourage innovative ways for project to understand the impact on their own and the neighbourhood's ground water abstraction on the water table, and encourage projects to submit these as **Innovation 3 Credits**.