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## **16.0 GLOSSARY**

### ***Acid Sulfate Soil***

- a soil or soil horizon that contains sulfides; or
- an acidic soil or acidic soil horizon affected by the oxidation of sulfides.

### ***Catchment Management Plans (CMPs)***

These Council planning documents include information on the 'State of the Catchment' being studied as well as action plans to manage a wide range of waterway issues within the catchment, including water quality, water quantity and other associated environmental and social issues (eg weeds, creek signage, development assessment/issues). Note that the term 'Waterway Management Plans' (WMPs) is now being used in Council to describe plans that at least fulfil, and in some cases exceed, the requirements of a CMP (refer to the definition of a WMP).

CMPs may be used by:

- Council to identify and prioritise actions that need to be undertaken in the catchments;
- community groups to guide community based activities in their catchment and increase their understanding of the waterway-related issues facing their catchment and their creeks;
- staff in Council who are developing Local Plans (as defined in the *Brisbane City Plan*) or plans for open space that include waterways corridors;
- developers or their consultants who need specific information (eg on existing water quality, waterway health and key local issues) to support their development applications; and
- water quality specialists who are developing and updating measurable 'Water Quality Objectives' for the City's waterways based upon those 'Environmental Values' the community and Council wish to protect.

### ***Creek Catchment***

An area of land bounded by natural features such as hills, from which all runoff flows to a common low point (eg a creek).

### ***Desired Environmental Outcomes (DEOs)***

DEOs provide the foundation of a planning scheme from which all other elements derive. As their name suggests they:

- represent what is wanted or sought to be achieved through the scheme;
- relate to the 'environment' which is defined broadly in the Integrated Planning Act 1997 to cover matters and conditions relating to the natural, built and human environments (see Schedule 10 of the Act); and
- are expressions of end states rather than a means to an end.



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***Ecologically Sustainable Development (ESD)***

Development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends.

***Environmentally Relevant Activity (ERA)***

An activity prescribed by regulation under the *Environmental Protection Act 1994* as being an ERA (generally activities that pose a significant risk to the environment due to the nature of on-site activities).

***Environmental Values (EVs)***

The actual or potential function carried out by the water body (eg suitability for recreational use or use as a modified aquatic ecosystem to support biological integrity). These values are typically determined through a process of consultation with key stakeholders. This can be done on a site-specific basis or via a regional planning exercise. Note that Environmental Values may allow for differences between seasons (eg an environmental value of a waterway may be swimming, but in the dry season only). Refer to Schedule 2 of the *Environmental Protection (Water) Policy 1997 and Guideline on Identifying and Applying Water Quality Objectives in Brisbane City* (BCC, 2000) for more information.

***Faecal Coliforms***

Bacteria that can be used as an indicator for faecal pollution (eg sewage, animal droppings, etc).

***'High Risk' Development***

A development (or development proposal) may be classified as 'high risk' if it falls within one of the following categories:

- any development (or development proposal) located in a waterway corridor, the Brisbane River corridor, or a wetland area as indicated on Council planning scheme maps; and/or
- multi-unit dwellings or commercial uses with an impermeable surface area (not including roof area) in excess of 2500 m<sup>2</sup>; and/or
- subdivisions where greater than 6 lots are involved; and/or
- industrial activities that are not impact assessable (under Council's *City Plan*) and have at least 1000 m<sup>2</sup> in uncovered storage / working space; and/or
- industrial activities that are impact assessable (under Council's *City Plan*); and/or
- uncovered car parks with at least 100 spaces.

Note that for these types of development, the design will demonstrate that relevant WQOs for receiving waters within or outside of the development are protected or enhanced during the construction, operation and maintenance phases.

***Land-Disturbing Development***

Any carrying out of building work, plumbing or drainage work, operational work (eg road building) or reconfiguring a lot (ie subdivision) where there is potential for accelerated erosion from wind or water and/or the discharge of sediment to drains or waterways.



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### ***Local Stormwater Management Plans (LSMPs)***

Plans that are prepared by Council on an 'as needed' basis to address very specific and localised stormwater issues. These plans currently detail how specific and localised stormwater issues are to be managed, such as local flooding of a street or pollution in a lake. These plans replace the functions of, and build upon, the old Council 'Relief Drainage Plans', which were primarily concerned with water quantity management. These plans are usually prepared in fully developed sub-catchments.

### ***'Low Risk' Development***

For development subject to Council approval but not specified as 'high risk development' (see above). Note that for these types of development, water quality impacts need to be minimised by simply identifying and adopting best practice techniques.

### ***Mixing Zone***

An area where wastewater mixes rapidly with receiving surface waters because of the momentum or buoyancy of the wastewater and the turbulence of the receiving surface waters. An 'initial mixing zone' may be defined for wastewater discharges to receiving waters using the items for consideration nominated in S. 18 of the *Environmental Protection (Water) Policy 1997*. This section allows for discharges to occur where WQOs are met outside of the mixing zone, but sets certain minimum requirements for water quality within the zone (eg to avoid acute toxicity to biota).

### ***Natural Channel Design (NCD)***

The basic principles of Natural Channel Design (NCD) are to maintain the hydraulic conveyance requirements of engineered or affected stormwater drainage channels, while improving Environmental Values. This holistic approach combines the disciplines of hydraulic engineering, fluvial geomorphology and in-stream and riparian ecology. NCD also encompasses non-specific engineering principles such as community requirements. Brisbane City Council has produced a guideline for the development industry and practicing consultants to outline the requirements and steps involved in designing natural channels.

### ***Primary Contact Recreation***

Recreation in which the users come into frequent and direct contact with the water either as part of the activity or accidentally (eg swimming or surfing).

### ***Receiving Water***

A water body that may receive runoff from the catchment under consideration, and has some environmental value or beneficial use. For ease of use, the receiving water is usually defined as a water body within the nearest waterway corridor (as defined in the *City Plan*). Natural wetlands are included in the definition of receiving waters, but constructed wetlands that have been built primarily for the purpose of stormwater (or wastewater) treatment, are not.

### ***Riparian***

The banks and associated areas that fringe waterways and are linked by physical and ecological processes to the waterway.



### **Secondary Contact Recreation**

Recreation that generally has infrequent body contact with the water (eg boating or fishing).

### **Site Based Stormwater Management Plan (SBSMP)**

A SBSMP shall identify potential on and off site (upstream, downstream and adjacent properties) impacts associated with stormwater for a proposed development. The SBSMP shall also identify a range of stormwater management strategies and actions for water quality, water quantity, and environmental issues (eg riparian vegetation within the waterways affected by the development). A SBSMP needs to be developed in accordance with Council's *Subdivision and Development Guidelines* and the *Environmental Protection (Water) Policy 1997*. A SBSMP may form part of the development's overall Environmental Management Plan.

### **Stormwater Management Plan (SMP)**

A plan that evaluates options for the management of stormwater quantity, quality and ecological values within the waterway corridor on a benefit-cost basis. The plan draws upon environmental assessments, as well as hydrologic, hydraulic and water quality modelling. The plan replaces the functions of, and builds upon, the old 'Master Drainage Plan'. The plan is usually developed for developing areas, for example, fringes or pockets of the City that are being urbanised.

### **Stormwater Quality Best Management Practices (SQBMPs)**

A range of stormwater management measures which aim to reduce the amount of stormwater runoff and export of pollutants. These practices include:

- *Source controls* that aim to prevent the entry of pollutants into stormwater at the pollutant source. These are often non-structural controls that involve public education to modify community behaviour (eg drain and kerb labelling, public awareness campaigns).
- *Runoff reduction controls* which lower the volume and peak discharge of stormwater flows. This effect reduces the potential for pollutant washoff and downstream erosion (eg on-site detention systems, stormwater recycling systems, dry detention basins).
- *Infiltration controls* that include stormwater treatment and/or disposal methods that allow filtration through a porous media (eg porous pavements, percolation trenches).
- *Pollution interception controls* (eg Stormwater Quality Improvement Devices - SQIDS) that physically intercept or retain stormwater pollutants for removal or further treatment (eg filter strips, gross pollutant traps, constructed wetlands, vegetated filter strips, grassed swales).

### **Stormwater Runoff**

Surface water draining to a watercourse as a result of rainfall.



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### **Stormwater Quality Improvement Devices (SQIDs)**

Can be one of a number of devices used to improve the health of our waterways. SQIDs work by reducing the amounts of pollutants that enter stormwater and waterways.

Types of SQIDs located around Brisbane include:

- *Trash racks*: remove large objects and rubbish including bottles, cans, leaves and branches.
- *Gross pollutant traps (GPTs)*: remove litter and sediment as well as helping to remove minor amounts of pollutants such as nutrients (ie nitrogen and phosphorus), heavy metals and organic compounds that are carried by finer sediment particles. Some GPTs are located above ground, whilst others (eg CDS units) are built below ground (out of sight) and have fine screens to trap small particles of sediment.
- *Constructed (artificial) wetlands*: remove large to very small particles of sediment, nutrients and harmful materials like heavy metals. In Brisbane, wetlands need to cover a large area to remove pollutants effectively, but can produce excellent treatment results. It is essential that wetlands be preceded by sediment basins, GPTs and/or trash racks as 'pre-treatment units'.
- *Gully Pit Baskets*: collect litter, leaves and other pollutants in baskets within gully pits at the side of roads.

### **Wastewater**

For the purposes of this guideline, wastewater is any material that flows through the City's sewerage system, leaves the City's sewerage network at overflow points, flows through on-site sewage treatment systems, and/or is discarded following car or bin washing activities.

### **Wastewater Recycling**

The use of water that has already been used which would otherwise have to be wasted (eg the use of partially treated sewage effluent to irrigate and fertilise golf courses).

### **Water Quality Guidelines**

These are documents that specify numerical concentration levels for water quality indicators associated with a particular environmental value which, if achieved, will lead to the protection of that value. The following documents are used to decide the water quality guidelines for Environmental Values:

- site specific documents;
- the *Australian Water Quality Guidelines for Fresh and Marine Waters* (ANZECC, 1992); and
- documents published by a recognised entity.



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### **Water Quality Indicators**

A water quality indicator is an indicator for an environmental value, and is a property that can be measured in a quantitative way (eg pH, temperature). To determine if an environmental value is being protected, it is necessary to monitor conditions associated with that value. For example to determine if the environmental value of swimming (primary recreation) is being achieved, the water quality indicators such as faecal coliforms and secchi depth will need to be measured. The results of those measurements are then compared to the water quality guidelines to determine if the environmental value is being achieved.

### **Water Quality Modelling**

An important technique used to make predictions about the quality of waterways in the City. There are essentially two main types of water quality modelling that are being undertaken in the Brisbane area at present. These are:

- *Pollutant export modelling* via models such as AQUALM, which predicts the pollutant loads being discharged from a given area (eg a creek catchment discharging into the Brisbane River). To undertake basic pollutant export modelling, the pollutant export relationships for a variety of land use types need to be determined (eg number of kilograms of suspended sediment per year that can be expected in runoff from fully urbanised residential land in South East Queensland). Council's Stormwater Quality Monitoring Program aims to collect the data necessary to derive such pollutant export relationships.
- *Dynamic, receiving water quality modelling*, which aims to predict the ambient water quality (eg the water quality in Moreton Bay given a variety of point and non-point source discharges). These models are complex, but are very important tools for waterway managers to allow them to run 'what if' scenarios for a variety of management options (eg the cessation of a major point source discharge).

### **Water Quality Monitoring**

In Brisbane, water quality monitoring is a generic term, used to define the following types of monitoring:

- *Ambient Water Quality Monitoring* – This is the monitoring of background levels of various parameters such as pH, salinity, heavy metals, etc. Terminology usually implies monitoring during periods of dry weather/low flow.
- *Stormwater Quality Monitoring* – In Brisbane, the monitoring of stormwater runoff using automatic sampling units to collect samples during rainfall events is conducted at several locations throughout the City. The results of the analysis of these samples are then used to develop pollutant export relationships for particular types of catchments or land uses.
- *Biological Monitoring* – By monitoring various biological parameters in or adjacent to a waterway, an indication of land use impacts can be obtained. These parameters include riparian vegetation (the trees, grasses, shrubs and other plants which live on the banks of waterways) and benthic macroinvertebrates (insects, insect larvae, crustaceans, snails, worms etc, which inhabit the 'benthos' or bottom sediments of a waterway). Both of these parameters can give a better long term indication of the health of a waterway than can be provided by traditional physiochemical water quality measurements, as the numbers and types of inhabitants will fluctuate over



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time depending on the impacts affecting them. This monitoring can be directly linked to ecological health monitoring.

- *Ecological Health Monitoring* – Traditionally, ambient water quality monitoring, using physical and chemical parameters has been used to gain an understanding of the impacts of human activities upon waterways. These parameters can be used over a long term to observe trends in water quality, however they do not allow us to gauge the effects of this water quality on ecosystems. Ecological health monitoring is the study of various ecological parameters (eg extent of seagrass beds, growth of phytoplankton, etc) upon which changes in water quality can have a direct effect. For example, the extent of seagrass beds in Moreton Bay has been directly linked to the amount of suspended sediments that are in the water.

### **Water Quality Objectives (WQOs)**

Measurable goals for the quality of receiving waters to ensure the Environmental Values are upheld (eg to sustain seagrasses in Moreton Bay, the concentration of suspended sediment in the water needs to be <10 mg/L on a sustained basis). These objectives are usually long term goals but may be supplemented with 'Best Practice Discharge Guidelines' when WQOs cannot be reached over a short period of time, or given site constraints. Best practice discharge guidelines are associated with mitigating impacts of various activities, and include objectives for construction and operation of particular activities.

Development proponents must ensure that stormwater being discharged from a site does not threaten the set of WQOs that are relevant to the site, and where possible, the development proposal should seek to exceed these objectives (ie improve receiving water quality to levels above the minimum acceptable standard). Only where development proponents can prove that WQOs cannot be met will 'Best Practice Discharge Guidelines' be considered by Council's assessment staff.

### **Water Sensitive Urban Design (WSUD)**

Provides a strategy for the conservation and management of water resources through better management of stormwater. For example:

- storage rather than conveyance of stormwater;
- maintenance and enhancement of water quality;
- water conserving landscaping;
- conservation of water related environments;
- use of vegetation for stormwater treatment; and
- localised water supply for irrigation.

Factors considered in WSUD are hydrology, soil conditions, topography, community expectations, and Environmental Values. It can include the reuse of stormwater, water conserving landscaping, increased infiltration, porous paving and natural channel design.

### **Waterway**

Any element of a river, creek, stream, gully or drainage channel, including the bed and banks. This term includes waterways indicated on the Planning Scheme Maps.



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### **Waterway Category**

A classification system used by Brisbane City Council to indicate the broad nature of the waterway's condition/value. The categories are:

- *High* = Includes a nearly intact natural corridor and/or areas of significant environmental value.
- *Modified* = Ranges from natural creek with significant remnants of fringing vegetation to degraded, unlined creeks with potential for ecological enhancement.
- *Utility* = Includes concrete lined waterways and/or drains and degraded unlined creeks with minimal potential for ecological enhancement.

### **Waterway Corridors**

The corridors along a waterway indicated on the Planning Scheme Maps. These corridors are defined by:

- a flood regulation line (FRL);
- a Local Plan, Environmental Corridor or Waterway Corridor;
- a Waterway Corridor as defined in a Stormwater Management Plan (SMP);
- a Waterway Corridor as defined in a Waterway Management Plan (WMP);
- if one or more of these measurements is available for a particular waterway, the largest applies;
- if there is no FRL, Local Plan, SMP or WMP, a 30 m distance measured on each side from the centre line of a waterway.

### **Waterway Health Monitoring**

Waterway health monitoring is usually the collection and analysis of samples of various types to determine whether a waterway is healthy. In this context, a healthy waterway is stable and sustainable, maintaining its organisation and autonomy over time and its resilience to stress.

### **Waterway Management Plan (WMP)**

An integrated plan addressing the management of waterways in a catchment including stormwater drainage, water quality, ecological health, flooding and waterway usage.

### **Waterway Type**

For the purposes of this guideline, waterway type indicates whether the waterway is essentially freshwater, tidal or marine in nature.