Have your say
Consultation draft

Environmental Protection Act 1994
Point-Source Water Quality Offsets Policy
Foreword

The draft Point Source Water Quality Offsets Policy (the Policy) aims to facilitate an alternative investment option for regulated point source operators to manage their water emission requirements under the Environmental Protection Act 1994, while improving water quality.

This draft Policy is being made available to facilitate public submissions.

The Policy is intended to replace the document called Flexible options for managing point source emissions: A voluntary market-based mechanism for nutrient management which was published in 2014.

Have your say and provide your feedback on the Draft Point Source Water Quality Offsets Policy.

All feedback will be considered in the finalisation process.

To provide feedback please email, phone, fax or post your feedback.

Email: evinfo@ehp.qld.gov.au
Phone: Jim Fewings on (07) 3330 5655
Fax: (07) 3330 5996
Post: Healthy Waters, Department of the Environment and Heritage Protection
       GPO Box 2454
       Brisbane QLD 4001

Note: Your responses may be subject to a Right to Information application.

Consultation closes 30 September 2017
Contents

Foreword..................................................................................................................................................3
1 Introduction ..................................................................................................................................................1
2 Purpose .....................................................................................................................................................2
3 Objectives ..................................................................................................................................................2
4 Who can use this policy ..........................................................................................................................2
    We invite comments on the scope of this policy..................................................................................2
5 Definitions ..................................................................................................................................................3
6 Types of water quality offsets ..............................................................................................................4
    a) Two or more point sources ...............................................................................................................4
    b) A point source and diffuse source provider ..................................................................................4
7 Requirements ............................................................................................................................................4
    7.1 Location ............................................................................................................................................4
    7.2 Offset equivalency ..............................................................................................................................5
    7.3 Offsets ratio (bubble licence) ..........................................................................................................6
    7.4 Offsets ratio (diffuse source) ..........................................................................................................6
        Table 2: Examples of diffuse source management actions..............................................................7
        Case study: Determining nutrient reductions delivered by bank stabilisation activities—Beaudesert Pilot Project .........................................................................................................................7
    7.5 Wet versus dry weather ....................................................................................................................7
    7.6 Timing .................................................................................................................................................8
    7.7 Duration ..............................................................................................................................................8
    7.8 Monitoring and reporting ..................................................................................................................8
    7.9 Liability ..............................................................................................................................................8
    7.10 Catchment and Total Water Cycle Management .........................................................................9
8 Policy review .............................................................................................................................................9
1 Introduction

This document outlines the requirements for adopting water quality offsets¹ as an option for managing point source discharges to Queensland waters.

This Draft Point Source Water Quality Offsets Policy (the policy) provides the basis for environmental authority (EA) holders, regulated under the Environmental Protection Act 1994 (EP Act), to meet their point source water emission discharge requirements through an alternative investment option, while achieving improved water quality in the receiving environment.

The policy gives flexibility to operators to implement offset solutions and to meet their environmental obligations for incremental upgrades or production. The outcome-based approach in licencing environmentally regulated activities in this policy will be tested through pilot projects led by industry and local government. The outcome-based approach should benefit the receiving environment and line up with whole-of-catchment investment priorities. The policy intends to guide the implementation of projects under various water quality offset scenarios. The policy delivers on the Department of Environment and Heritage Protection's (EHP) priority strategy for avoiding, minimising or offsetting negative impacts on the environment through:

- regulating environmentally significant activities based on best practice outcomes
- maintaining programs to address impacts on coasts and catchments from urban and rural development
- administering the environmental offsets framework to minimise impacts on the environment.

Water quality offsets for discharge management will allow cost-effective solutions for environmental authority holders to achieve catchment-based, waterway health outcomes in Queensland.

¹ Throughout the document terms that appear in bold at first mention have been included in the definitions table at the start of the document.
2 Purpose

The purpose of the policy is to provide an alternative investment option for approved point source operators (e.g. Sewage treatment plants) to meet their water emission discharge requirements under the EP Act while delivering an improvement in water quality in the receiving environment.

3 Objectives

The policy has five key objectives:

1. Deliver an overall improvement in the health of Queensland waterways by reducing total discharge loads.
2. Provide cost effective and flexible options for regulated point sources to meet environmental authority conditions for discharge loads.
3. Allow for further growth and development while improving waterway health in accordance with local and national water quality standards.
4. Minimise transaction costs and regulatory burden.
5. Maximise an investment’s benefits for waterway and catchment improvement priorities.

4 Who can use this policy

The policy applies to approved point source operators that hold an environmental authority under the EP Act.

The policy applies to the management of total nitrogen and total phosphorus discharging in waters. In addition, the department is considering applying the policy to management of total suspended solids. For all proposed offsets, a point source operator must demonstrate a valid scientific approach for evaluating and monitoring the offset. Advice should be sought from the department.

We invite comments on the scope of this policy

Other water quality parameters such as salinity, pathogens and biological oxygen demand are outside the scope of the policy. Treatment of these water emission pollutants must be managed to a level that protects environmental values.

Water quality impacts at the point source discharge site must be avoided or minimised using contemporary best management approaches when considering the use of water quality offsets as part of a proponent's overall total discharge management plan.

To use this policy a proponent must demonstrate that any proposed discharge increases at the point source, which will be counterbalanced by water quality offsets, will create an additional benefit to receiving waters.

---

2 National standards include those set by the Australian and New Zealand Environment and Conservation Council (ANZECC) and the National Health and Medical Research Council, or locally derived water objectives developed under the Queensland Water Quality Guideline and other relevant regional plans and strategies.

3 To be determined by the department based on water quality objectives and environmental values under the Environmental Protection (Water) Policy 2009.
## 5 Definitions

The following definitions are adopted for the purposes of this policy.

<table>
<thead>
<tr>
<th>Term</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attenuation factor</td>
<td>A multiplicative factor that takes into account the distance between the offset location and the point of concern, as well as risk to immediate environment at point source. This is to account for uncertainty in delivering an improvement in the receiving waters.</td>
</tr>
<tr>
<td>Bubble licence</td>
<td>An environmental authority for multiple activities for which a single load limit is required.</td>
</tr>
<tr>
<td>Catchment</td>
<td>An area of land bounded by natural features such as hills, from which drainage flows to a common point, usually ending in a river or creek and eventually the sea or termination point.</td>
</tr>
<tr>
<td>Diffuse source pollution</td>
<td>Non-point pollutant sources (i.e. without a single point of origin or not introduced into a receiving stream from a specific outlet). The pollutants are generally carried off the land by stormwater or overland flow. Common non-point sources are agriculture, forestry, urban areas, and historical mining sites.</td>
</tr>
<tr>
<td>NRM region</td>
<td>There are 14 natural resource management (NRM) regions in Queensland that correspond to 14 NRM organizations acting as delivery agents under the regional stream of the National Landcare Programme. Refer to <a href="http://www.nrm.gov.au/regional/regional-nrm-organisations">http://www.nrm.gov.au/regional/regional-nrm-organisations</a> for list of NRM regions. An adjacent NRM region is defined as when two NRM regions share a boundary.</td>
</tr>
<tr>
<td>Offsets ratio</td>
<td>An amount in excess of the volume of pollutants that provides a buffer to account for the uncertainty in discharge removal efficiencies of the offset.</td>
</tr>
<tr>
<td>Point of concern</td>
<td>Generally this is the point source discharge site that requires an offset. The point of concern will be determined on a case-by-case basis depending on the sensitivity of the receiving environment.</td>
</tr>
<tr>
<td>Point source pollution</td>
<td>Any discernible confined and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, discrete fissure, or other discrete source where pollutants are or may be discharged. For example a sewage treatment plant is a point source pollutant.</td>
</tr>
<tr>
<td>Proponent</td>
<td>A holder, or a prospective holder, of an environmental authority wishing to undertake a voluntary nutrient reduction action/s to meet water emission discharge requirements under the Environmental Protection Act 1994.</td>
</tr>
<tr>
<td>River Basin</td>
<td>Under the Queensland Water Quality Guidelines 2009, river basins are defined according to where water flows and drains across the landscape. Refer to Figure 2.3.2 for a map of defined river basin divisions across all of Queensland. An adjacent river basin is defined as when two river basins share a boundary.</td>
</tr>
<tr>
<td>Toxicity</td>
<td>The health effects which living organisms suffer as a result of contaminants in aquatic ecosystems.</td>
</tr>
<tr>
<td>Water quality offset</td>
<td>An action taken to counter-balance a pollutant discharged from a point source.</td>
</tr>
<tr>
<td>Water type</td>
<td>A water body type under the Queensland Water Quality Guidelines 2009, within which water quality (or biological condition) is sufficiently consistent that a single guideline value can be applied to all waters within each type. Examples of water types include: upland freshwater, lowland freshwater, lakes, wetlands (palustarine), estuaries and marine – inshore and offshore.</td>
</tr>
<tr>
<td>Whole of catchment management</td>
<td>Planning and implementation of management practices or actions within a catchment, sub-catchment or river basin, that takes into account land uses and threats to water quality and environmental values, to improve water quality and ecosystem functioning.</td>
</tr>
</tbody>
</table>
6 Types of water quality offsets

The policy provides for corresponding water quality offsets between:

a) Two or more point sources

Water quality offsets can occur within and between regulated entities.

If two or more point sources are managed by the same regulated entity through an amalgamated authority under section 243 of the EP Act, they may combine discharge limits to meet an overall reduced discharge limit—commonly referred to as a ‘bubble licence’.

Two or more point sources that are not managed by the same regulated entity can also enter into a water quality offset arrangement—where one point source reduces its limit below that specified on the environmental authority, so that the other/s may increase their discharge load accordingly. The adjusted load limits would be reflected as a condition of the environmental authorities for each entity.

b) A point source and diffuse source provider

A point source may also use corresponding diffuse source water quality offsets from rural, urban or other diffuse sources. The type of management actions that may achieve water quality offsets include:

- riparian area restoration
- constructed wetlands
- improved fertiliser application management
- improved grazing land management practices
- water sensitive urban design (beyond meeting the design objectives under the State Planning Policy State Interest Water Quality).

The water quality offset would be reflected as a condition of the environmental authority for the point source. The policy does not allow for water quality offsets in the form of a direct financial contribution to an entity.

7 Requirements

To ensure that the water quality offset generates a water quality improvement, the proponent will need to meet the following requirements:

- Increased point source discharge must not occur within areas that have been identified as ecosystems of High Ecological Value (HEV) or Slightly Disturbed (SD) under the Environmental Protection (Water) Policy 2009 (EPP).
- The proponent must evaluate the management hierarchy, in accordance with section 13 for surface water and ground water under the EPP, before considering water quality offsets. The proponent must meet the standard criteria as defined under the EP Act including best practice environmental management, financial implications and benefits to public interest.
- The water quality offset must not be designed to meet other legislative or policy requirements (e.g. putting a water quality offset in place to meet stormwater management design objectives under the State Planning Policy State Interest Water Quality). However, EHP encourages water quality offsets that do more than simply meet minimum legislative requirements.
- For water quality offsets, proponents need to show that the selected actions will generate water quality improvements that would have otherwise not taken place. Water quality offsets must be additional to what is already required – determined by compliance with the general environmental duty, law or planning regulations, or agreed to under other schemes or programs. Best practice guidelines should be used where available. Of course it is expected that water quality offset providers are already meeting current recommended practice before undertaking the water quality offset.

For actions that do not have well established best practice guidelines, the proponent should seek advice from the department. To build knowledge, EHP encourages evidence-based pilot projects, with preliminary proposals submitted to the department. The proponent must demonstrate the impact and benefit of a water quality offset in a proposed location.

7.1 Location

The proponent must show evaluation of the EPP management hierarchy, in accordance with section 13 for surface waters and ground waters, for the proposed location of the water quality offset. This includes a feasibility evaluation
of water quality offset locations available in relation to the point source discharge – upstream, downstream, same river basin, adjacent river basin, non-adjacent river basin, same NRM region, adjacent NRM region and non-adjacent NRM region (see Table 1). The proponent must clearly articulate reasons for proposing a water quality offset location that is not upstream, not within the same river basin or not within the same NRM region as the point source discharge. For all proposed water quality offset locations, to the proponent must show an equivalency in discharge reduction in receiving waters (refer to section 7.2). A downstream water quality offset for wet weather may be considered favourable if it occurs within the same water type as the point source discharge.

For a water quality offset not located within the same river basin as the point source (including locations within adjacent or non-adjacent river basins or NRM regions), the proponent must evaluate the local impact caused by the point source discharge. Such evaluations must be undertaken against the objectives of meeting water quality objectives, having no toxicity risk to the aquatic ecosystem, and no negative impact on the environment. The proponent will need to identify the environmental values being protected as well as the discharge equivalency in receiving waters (e.g. Moreton Bay) of the point source discharge.

An attenuation factor represents a factor that takes into account the uncertainty about delivering an improvement in the receiving environment thus influences the applicable offset ratio (refer to Table 1). The attenuation factor will take into account pollutant losses/attenuation during transport in the catchment and will be applied to both point and non-point source pollution reductions, as the distance between the point source and offset increases. It also takes into account the potential impact of the point source discharge increase on the receiving environment. Generally, the further the distance between two point sources or the point of concern and the water quality offset site, the higher the factor to be applied.

### Table 1 Management hierarchy for assessing offset locations available and ratio to be applied

<table>
<thead>
<tr>
<th>Location</th>
<th>Offsets ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Same river basin – upstream</td>
<td>1.5:1</td>
</tr>
<tr>
<td>Same river basin - downstream</td>
<td>To be determined as part of the proposal, an attenuation factor may increase the 1.5:1 offsets ratio. This may depend on distance from point source and impact on the receiving environment.</td>
</tr>
<tr>
<td>Same river basin – different water type</td>
<td></td>
</tr>
<tr>
<td>Adjacent river basin</td>
<td></td>
</tr>
<tr>
<td>Non-adjacent river basin</td>
<td></td>
</tr>
<tr>
<td>Same NRM region</td>
<td></td>
</tr>
<tr>
<td>Adjacent NRM region</td>
<td></td>
</tr>
<tr>
<td>Non-adjacent NRM region</td>
<td></td>
</tr>
</tbody>
</table>

### 7.2 Offset equivalency

The water quality offset must address the same pollutant as the water quality parameter being licensed. The policy currently applies to total nitrogen and total phosphorous. Therefore, total phosphorous emissions must be counterbalanced by total phosphorous reductions, and total nitrogen emissions with total nitrogen reductions.

The department is considering including proposals for a water quality offset of total suspended solids, which means total suspended solids will need to be counterbalanced by total suspended solids. Evaluation of water quality offsets for total suspended solids may include a determination of bioavailability of particulate nutrients in sediments. Consideration may be given for geological versus biological sources of suspended solids. In some cases, geological sources may pose a single risk to the environment compared to the potential multiple risk from biological sources. The argument is that biological suspended solids will have a portion of bioavailable nutrients and therefore may add to the nutrient load. Geological suspended solids, on the other hand, are more likely to be inert, posing risks related only to sediment load (e.g. turbidity and sedimentation). A proposal for a water quality offset for total geological suspended solids may require less evidence for demonstrating water quality offset equivalency, as compared to proposals for offsetting organic suspended solids. As stated above, EHP encourages evidence-based pilot project submissions to build further knowledge.
The proposed offset must ensure that no local toxicity will occur from the point source discharge, water quality offset or bubble licence. For example, this includes toxicity caused by metals and other contaminants, which may be assessed against national guidelines. As part of the bubble licence conditions, no toxicity will be permitted into the receiving waterway as a result of increased point source discharge locally.

It may be possible to reduce nutrients by undertaking actions that reduce sediment, such as through riparian restoration, as long as equivalent nutrient reductions are achieved. The proponent will need to use modelling to demonstrate nutrient reduction equivalency.

7.3 Offsets ratio (bubble licence)

The application of an offsets ratio is necessary to account for uncertainties and to ensure that there will be a net benefit to the receiving environment in terms of water quality improvements.

An offsets ratio of 1.5:1 will be applied to ensure that a water quality offset at one point, corresponding with discharges at another point source, generates a water quality improvement in the receiving environment. For example, if a sewage treatment plant was exceeding its nutrient discharge limit, it could pay another sewage treatment plant with lower treatment costs to reduce their discharge by 1.5 times the load required to prevent future exceedances. This would result in a net reduction in the discharge of nutrients to the receiving environment.

The ratio of 1.5:1 will apply for water bubble licences that are located upstream in the same river basin and within the same water type. For proposed bubble licences located downstream or outside of the same water type within the same river basin, or located in adjacent river basin, non-adjacent river basin, adjacent NRM region and non-adjacent NRM region - an attenuation factor may increase the 1.5:1 ratio to ensure an improved water quality outcome in the receiving environment. The application of the attenuation factor will depend on equivalency demonstration by the proponent (Table 1).

For bubble licences, proponents are required to demonstrate that the selected actions will generate additional water quality improvements that would have otherwise not taken place.

7.4 Offsets ratio (diffuse source)

Point source load reductions and increases can be easily quantified at the point source, whereas it is more difficult to quantify the load reduction from diffuse sources. There are a range of management actions that have the potential to reduce nutrients and sediments, such as those described in Table 2. However, the efficacy of these actions is not always known for individual sites.

In order to assess the proposed load reduction the proponent will be required to demonstrate the efficacy of the water quality offset. This may include using appropriate catchment and receiving water quality models. The methodology is likely to differ depending on the management action that is selected. For instance, the scientific approach used for demonstrating nutrient reduction through bank stabilisation (sediment removal) will differ from the approach for demonstrating nutrient reduction through improved fertiliser application. An example approach used for calculating a water quality offset delivered by bank stabilisation is outlined in the case study below.

An offsets ratio or buffer of 1.5:1 will then be applied for diffuse water quality offsets to deliver water quality improvement accounting for uncertainties. For example, to counterbalance the impact of an additional six tonnes of total nitrogen from the point source, the diffuse water quality offset must remove nine tonnes of total nitrogen. The offsets ratio of 1.5:1 will apply for water quality offsets that are located upstream in the same river basin and within the same water type as the point source discharge. For offsets located downstream or outside of the same water type within the same river basin, or located in adjacent river basin, non-adjacent river basin, adjacent NRM region and non-adjacent NRM region, an attenuation factor may increase the ratio to ensure an improved water quality outcome in the receiving environment. The application of the attenuation factor will depend on equivalency demonstration by the proponent (Table 1).

As stated above, evidence-based pilot project submissions to build further knowledge are encouraged. With future additional water quality offset projects resulting in more science becoming available to determine efficacy, it may be possible to apply a generic efficacy measure for certain actions.
Table 2: Examples of diffuse source management actions

<table>
<thead>
<tr>
<th>Example</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bank stabilisation</td>
<td>Bank stabilisation, by structural or vegetative means, presents an opportunity for reducing the amount of nutrients (contained in sediment) being transferred into a waterway.</td>
</tr>
<tr>
<td>2. Improved nutrient management</td>
<td>Improved nutrient management practices above any required minimum standard for agricultural land help to ensure that there are minimal nutrient run-off effects to surrounding lands and waters, while maintaining agricultural yields.</td>
</tr>
<tr>
<td>(fertiliser application)</td>
<td></td>
</tr>
<tr>
<td>3. Constructed wetlands</td>
<td>Constructed wetlands act as nutrient assimilation and filtering devices to clean polluted water before it enters the local waterway.</td>
</tr>
</tbody>
</table>

Case study: Determining nutrient reductions delivered by bank stabilisation activities—Beaudesert Pilot Project

A pilot project is currently underway in the Logan River to manage additional nitrogen and phosphorus discharges from the Beaudesert Sewage Treatment Plant (STP) as a result of local population growth. The pilot commenced in January 2014.

Almost $1 million has been invested by Queensland Urban Utilities to repair around 500 metres of eroded riparian bank located close to the sewage treatment plant. The works include structural bank stabilisation, pile fields and riparian planting.

A modelling approach was used to determine the scale of works required to offset 5 tonnes/year of total nitrogen (TN) from entering the river each year. Put simply, historical erosion rates and bank erosion models were used to calculate the average sediment erosion during high flow events, and soil samples were taken to determine the percentage of TN in the sediment. This allowed the production of an estimate of the sediment erosion avoided over a period of time which is then turned into an annualized rate of erosion (11 200 tonnes/year) and the associated annualised total nitrogen load avoided (5 tonnes/year) by bank stabilisation activities.

The nitrogen and phosphorus savings made through the riparian works will be used to counterbalance any potential increases in nitrogen discharge from the sewage treatment plant that may occur during and after wet weather events, when recycled water demand reduces and streambank erosion risks are highest. The Beaudesert STP supplies recycled water to five local customers to minimise treated effluent releases to the Logan River during dry weather periods.

These nitrogen savings allowed the Beaudesert STP to continue safely at its current capacity in the short-term without undertaking expensive upgrades. This means that about $7 million in savings can be invested elsewhere in the sewage network.

The pilot study has been running for three of its five years test period including detailed monitoring and assessment.

7.5 Wet versus dry weather

Best management practice should be addressed in all proposals. Proponents are encouraged to adopt total recycled/beneficial re-use of point source discharge under dry weather conditions and release only in wet weather. Should dry weather discharge offset be proposed, the water quality offset must counterbalance point source dry weather discharge and an attenuation factor may apply (Figure 1). For proposed wet weather discharges, the water quality offset must counterbalance total point source wet weather discharge. For example, the policy does not allow offsetting a dry weather discharge with a wet weather discharge such as erosion control.
Point source water quality offsets policy

Figure 1. Diagram illustrating hypothetical options for offsetting wet and dry weather point source discharge. Options A, B and C illustrate projects that would adopt 100%, 50% and 0% recycled/beneficial re-use of dry weather point source discharge respectively. TN represents Total Nitrogen and values in blue are hypothetical. Although not illustrated in the diagram, an attenuation factor may apply for dry weather offsets.

7.6 Timing

Water quality offsets must be provided in advance or concurrently with impacts that are occurring so that the water quality offset provides the benefit at the time of additional discharge release. Timing will be considered on a case-by-case basis and will be applicable as stated in the environmental authority. Examples of variations in timing will depend on the water quality offset adopted, for instance:

- Bubble license – immediate
- Riparian and riverine restoration – time allowed for vegetation to establish.

For new point source operations, offset on-ground works (e.g. riparian restoration) should commence as soon as possible, rather than wait for point source to be operational before commencing works.

7.7 Duration

The duration of the water quality offset will be negotiated on a case-by-case basis to align with the performance specifications and lifespan of the point source infrastructure (maximum of 20 years). The proponent must monitor and maintain the water quality offset throughout its lifespan. The water quality offset arrangements only remain in place for the period of time stated.

7.8 Monitoring and reporting

The proponent is responsible for monitoring and reporting water quality effects at the point source location and other relevant locations specified in the proponent’s environmental authority in order to demonstrate the efficacy of the water quality offset. The type of monitoring that is required will depend on the water quality offset selected.

The costs of all monitoring and reporting activities are to be met by the proponent and are not the responsibility of the department.

The department is responsible for reviewing performance and monitoring reports. Monitoring must take place according to best available practice, the environmental authority conditions and in accordance with the Monitoring and Sampling Manual under the EPP.

7.9 Liability

The proponent is responsible for ensuring that the water quality offset is implemented diligently, is maintained, and meets the design criteria. The proponent may contract management actions to a third party (e.g. land owner, NRM body, manager, broker), but the legal responsibility for the water quality offset will remain with the proponent as a requirement of the proponent’s environmental authority.
The environmental authority conditions may also include requirements for when and how the water quality offset will be replaced in the event it is destroyed or damaged in circumstances such as an extreme weather event.

If the water quality offset fails to achieve the agreed outcome, and the proponent is unable to demonstrate that the water quality offset has been appropriately implemented and maintained, then this will be a breach of the environmental authority and the department will consider its enforcement options.

7.10 Catchment and Total Water Cycle Management

Water quality offsets under this policy should align with any whole-of-catchment and total water cycle management planning. Examples of these include: catchment management action plans, water quality improvement plans, local government total water cycle management and urban stormwater water quality management plans. For example, where key priority areas have been identified for on ground restoration works, offset locations should coincide with these priority locations.

8 Policy review

This policy will be reviewed to keep up to date with continuous improvement in technology, management practices and experience. The review process will incorporate, but is not limited to, review of requirements in light of scientific information and third party submissions.