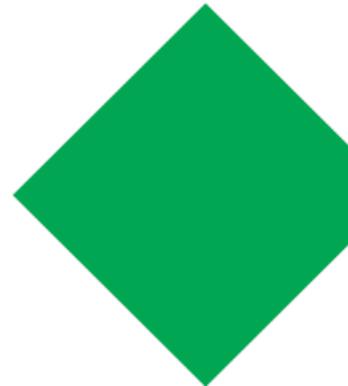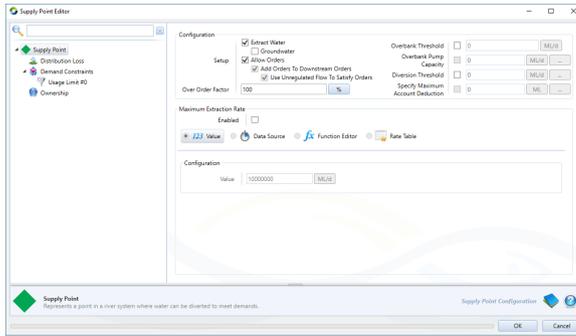# Supply point node

A Supply Point node (Figure 1) represents a location in the river where water can be extracted to meet demands. You can specify whether water is to be taken from regulated water, unregulated water or groundwater sources.

Figure 1. Supply Point node

> **Note**: Only one of the effluents from a supply point node must connect to a water user node.

Supply point configuration

Extract Water

Enabling the *Extract water* checkbox will ensure that the supply point extracts water. If disabled, water will not be given to the water user, and it will be passed downstream. This is the only difference between enabling and disabling the checkbox. Disable the *Extract Water* c heckbox for demand models which require a flow at the supply point, but require the flow to remain in-stream, ie., the order will not actually be extracted. This could be used for shepherding environmental releases, for example.

> **Note:** The supply point will only have an affect on the minimum constraint if extract water is enabled.

Groundwater

The *Groundwater* checkbox signifies the supply point as a groundwater pump. It will be used only when there is demand and there is no available regulated, supplementary water, or water from on farm storage to satisfy demand. You must set the *maximum extraction rate* (ML /day) for groundwater sources. When *Groundwater* is enabled, the supply point node icon changes to indicate groundwater extraction (Figure 2).

Figure 2. Supply point node, groundwater extraction

Allow Orders

Enabling the *Allow Orders* checkbox essentially means that the supply of water to the water user is regulated. This will affect water distribution if account sharing has been set up in the Water user node. Refer to Account sharing (full Source version only);

Add Orders to Downstream Orders

This option only applies to non-extractive supply points and is available when *Extract Water* is unchecked and *Allow Orders* is checked. (The supply point behaviour becomes similar to a minimum flow node). When the supply point extracts water, this checkbox is forced on, as the water ordered does not make it downstream. In some circumstances, such as when tracking water entitlements, you may wish to only have the order required to make up the total on top of downstream orders to be attributed to the supply point, not the entire amount flowing past, as the downstream water users will already have those orders attributed to them. If the water user requires water, the water user requirement is added to the downstream orders.e.g Downstream of the supply point there is currently a 20ML order, the water user requires 30ML, the supply point will order 30ML and the total ordered volume upstream will be 50ML. When this option is unchecked it will only order the difference between the downstream order and water user requirement.

Use Unregulated Flow to Satisfy Orders

This option is only available when **Extract Water** is unchecked, **Allow Orders** is checked and **Add Order to Downstream Orders** is checked.

When this option is checked the forecast unregulated water (minimum expected flow - minimum constraint) is considered to be available and the supply point will only order the difference.

e.g Downstream of the supply point there is currently a 20ML order, the water user requires 30ML. The current minimum flow constraint at the supply point is 10ML. The supply point will order 20ML, the total ordered volume will be 40ML. When this option is unchecked the forecast unregulated water is considered to be unavailable and will order the full amount.e.g Downstream of the supply point there is currently a 20ML order downstream, the water user requires 30ML, 10ML forecast unregulated water, the supply point will still order 30ML, the total ordered volume will be 50ML.

> **Note:** Order recorders show the date the water is expected to arrive, while the Min Constraint recorder shows what the Constraint is at Min Travel Time. Thus the two values are offset by Min Travel time.

Over Order Factor

Specifying an **Over Order Factor** will allow you to choose a percentage factor representing additional water released to meet a particular order, eg a factor of 1.2 or 120% means that the demand is scaled up by 20% in the ordering phase. The additional water is sourced from the upstream storage

Units: Percentage or proportion

Allowable range: Positive integer (%) greater than or equal to 100. Values of less than 100 (%) or 1 (proportion) are changed back to 100% or 1.

Default value: 100%

> **Full version only**
>
> **Note:** Accounts are not debited for the additional water ordered as a result of the over order factor.

During the flow phase, the extraction actually available to the water user is the minimum of i) the original order (not including the over order factor), or ii) the physical extraction capacity, or iii) any river flow constraints.

The over order factor does not necessarily need to incorporate all estimated delivery losses in the system. If there are upstream nodes or links which simulate losses in the system between the storage and the supply point, Source automatically increases the order to account for estimates of those losses. Refer to the individual node descriptions in the Source Scientific Reference Guide for methods used to estimate losses.

The over order factor is used to add further contingency to a storage release. It should therefore only be calibrated after the physical characteristics of the system have been completely configured. It is up to you to select (or calibrate) an over order factor which is realistic for the system (to ensure that unnecessary water is not released from the storage).

Maximum Extraction Rate

The maximum extraction rate is the highest possible pumping rate for in bank flows. It can be specified using a value, data source, function or rate table. Optionally you can add an additional pump capacity for overbank flows by specifying an **Overbank Threshold** and **Over bank Pump Capacity**.

If you are extracting surface water, specifying a maximum extraction rate is optional, as the extraction will be limited by other factors such as orders and flow in the river. If groundwater extraction is selected, a maximum extraction rate must be provided otherwise unlimited amounts of water will be available.

The absence of a limit on supply point pumping capacity can lead to a situation where the ***Maximum Extraction Rate*** result cannot be displayed because it will contain infinite values resulting in an empty graph

Note that for regulated supply points (***Allow Orders*** enabled) the value is applied in the order phase. For unregulated supply points ((***Allow Orders*** disabled) it is applied in the flow phase.

Overbank Threshold

The overbank threshold should be configured if you want to simulate floodplain harvesting by the water user. Overbank flow occurs if the flow rate in the river rises above the specified overbank threshold. Any overbank water can be used to meet the demand model or water user storage requirements without incurring a debit on the water user's accounts.

Overbank Pump Capacity

The ***overbank pump capacity*** is the additional pump capacity that can be used to pump flows in excess of the overbank threshold. It can be specified using a value or function.

> **Overbank in combination with off-allocation**
>
> **Note:** The overbank threshold is defined according to the flow upstream of the supply point and the volume available for extraction of overbank is only constrained by the overbank pump capacity and the calculated overbank volume. Overbank may be taken in addition to off-allocation, in which case the downstream flows may drop below the overbank threshold. Overbank water is not included in off-allocation water, and although the off-allocation volume available is calculated according to off-allocation thresholds etc. (see Off-Allocation), during some events additional water may be accessed via overbank. Functions for the off-allocation threshold or in a minimum flow requirement node may be configured to control the amount of water of each type is available.

Diversion Threshold

The supply point will not be able to pump any water below the diversion threshold. It tries to mimic the fact that the pump may not be at the very bottom of the river. Therefore, you need a certain volume of water in the river before you can pump any at all. It affects the system during the flow phase of the supply point only. It can be specified using a value or function.

Specify maximum account deduction (full Source version only)

If ***Extract water*** is not enabled, you can specify maximum account deduction which will limit water debited to an accounting system; if this deduction cap is more than total order water, the total order water is debited. This parameter can be specified as a value or a function. When using a function you need to consider travel time, see: Ordering.

Distribution Loss

You can specify a loss at the supply point as a percentage or proportion of water supplied to water user (Not water extracted at supply point, so not including loss) as a value, function or data source (Figure 3). This water is lost from the system, and constrains the amount of water available to water users. For example, if the maximum extraction rate is 125 ML/d, and there is also a 25% distribution loss, the water users have access to 100 ML/d. Orders by the supply point are increased to accommodate the distribution loss, and will then be increased again by the over order factor (if configured). By selecting the Order additional volume option the user can select whether the additional volume is always ordered or only ordered when there is a demand from the Water User node.

Figure 3. Supply point node, Distribution Loss
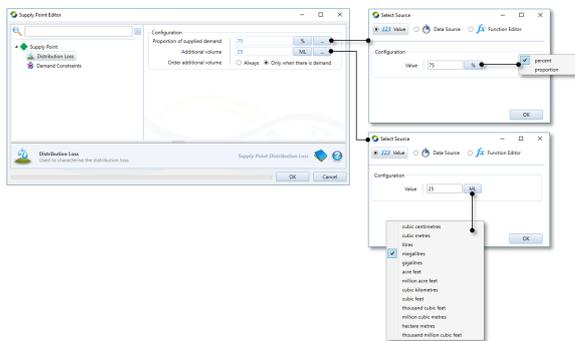
Resource Assessment (full Source version only)

In a resource assessment system, distribution loss is not deducted from any account unless *Fr om Account Host & Distribution Losses* is selected as the *Usage to Date* calculation method on the *Configuration*tab for the annual accounting system (see Annual Accounting - Configuration).

Supply Point Demand Constraints

Demand Constraints can be placed on the supply point to restrict the volume of water that a Water User node can use during either a Water Year, Moving Water Year or Moving Time Window (Figure 4). The Usage Limit Volume and Initial Debit can be set with either a fixed volume, Data Source or by a Function.

Figure 4. Supply point node, Demand Constraint

Supply Point Recorders

Planned Extraction: requirement of the supply point. This is the extraction required by the water user plus any over order factor, or requirement of non-extractive water user plus any over order factor. For non-extractive situations unreg contributions are also included in planned extraction.