

RESOURCE OPERATIONS LICENCE

Water Act 2000



Name of Licence

Bundaberg Water Supply Scheme Resource Operations Licence

HOLDER

Name of Holder: SunWater

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RESOURCE OPERATIONS PLAN

The licence relates to the Burnett Basin Resource Operations Plan.

AUTHORITY TO INTERFERE

The licence authorises the licence holder to interfere with the flow of water, in the Bundaberg Water Supply Scheme, detailed in the Burnett Basin Resource Operations Plan Chapter 4, to the extent necessary to operate the water infrastructure to which the licence applies.

WATER INFRASTRUCTURE

The water infrastructure to which the licence applies is detailed in the Burnett Basin Resource Operations Plan in Attachment 4.1D Bundaberg Water Supply Scheme: Infrastructure Details.

OPERATING ARRANGEMENTS AND SUPPLY REQUIREMENTS

The operating arrangements and supply requirements that relate to the licence holder are detailed in the Burnett Basin Resource Operations Plan Chapter 4 and apply in accordance with the Attachment 9.1 Implementation Schedule.

In accordance with section 110 of the *Water Act 2000*, the licence holder must comply with the operating arrangements and supply requirements in the Burnett Basin Resource Operations Plan, for the Bundaberg Water Supply Scheme.

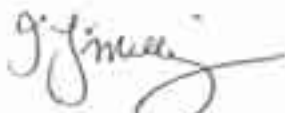
OTHER LICENCE CONDITIONS

1. The licence permits the destruction of vegetation by inundation up to the full supply level of Paradise Dam.
2. From 13 July 2006 until 30 June 2008 or until Paradise Dam fills (EL 67.6m AHD) for the first time before 30 June 2008, the licence holder must comply with the operating arrangements and supply requirements in Schedule 1.
3. The licence holder must carry out and report on the stated monitoring program set out in the Burnett Basin Resource Operations Plan Chapter 4 and in accordance with the Burnett Basin Resource Operations Plan Chapter 3.

COMMENCEMENT OF LICENCE

The licence takes effect on 13 July 2006

GRANTED ON 13 JULY 2006



Graeme Milligan
General Manager, Water Management and Use
(Delegate for chief executive)

Schedule 1

Abbreviations

| | |
|-------------------|--|
| AA _E | Announced Allocation Percentage for Existing Allocations |
| AA _N | Announced Allocation Percentage for New Allocations |
| AA _{ALL} | Announced Allocation Percentage for All New and Existing Allocations |
| AA _{HPA} | Announced Allocation Percentage for High Priority |
| AA _{MPA} | Announced Allocation Percentage for Medium Priority |
| AHD | Australian Height Datum |
| AMTD | Adopted Middle Thread Distance |
| BAB | Ben Anderson Barrage |
| BP | Business Products |
| BuW | Bucca Weir |
| CO | Carryover |
| Cumecs | cubic meters per second |
| CV | Current Volume |
| NR&M | Department of Natural Resources & Mines |
| DPI | Department of Primary Industries |
| EFO | Environmental Flow Objectives |
| EFV | Environmental Flow Volume |
| EFR | Environmental Flow Release |
| EL | Elevation |
| FCT | Flow Control Table |
| FD | Forward Draw |
| FHD | Fred Haigh Dam |
| FSL | Full Supply Level |
| GS | Gauging Station |
| HPA | High Priority Water Allocations |
| HPD | High Priority Diversions |
| IN | Inflow |
| IQQM | Integrated Quality Quantity Model |
| IROL | Interim Resource Operation Licence |
| KB | Kolan Barrage |
| km | kilometres |
| m | metres |
| MOV | Minimum operating Volume |
| MOL | Minimum operating Level |
| ML | Megalitres |
| ML/a | Megalitres per annum |
| ML/d | Megalitres per day |
| MPA | Medium Priority Water Allocations |
| MPD | Medium Priority Diversions |
| NCW | Ned Churchward Weir |
| OL | Operating Level |
| °C | Degrees Celsius |
| PO | Proposed Operation |
| PD | Paradise Dam (formerly referred to as Burnett River Dam) |
| RE | Reserve |
| ROL | Resource Operation Licence |
| ROP | Burnett Basin Resource Operation Plan |
| s97 | Section 97 of the Water Act 2000 |
| SL | Storage Loss |
| t/w | tail water |
| Temp | temperature |
| TOL | Transmission and Operating Loss Allowance |
| u/s | up stream |
| UV | Useable Volume |
| VIWY | Net total volume of water allocation moved into current water year |
| WRP | Water Resource Plan |
| WASO | Water Allocation Security Objectives |
| WSI | Water Sharing Index |

PART A

BACKGROUND

1 Purpose of Schedule 1

The purpose of this schedule is to provide temporary arrangements for the management of water associated with the Staged Development of the Bundaberg WSS during the Transitional Periods (See general Flowchart in Appendix A).

2 Structure of Schedule 1

Schedule 1 is structured in two parts.

Part A: Background

Part B: Temporary Arrangements, structured as detailed below.

Part B contains details of the transitional arrangements for the management of water for the Staged Development of the Bundaberg WSS.

Part B contains the following subsections:

Section 1 Introduction

Section 2 The Bundaberg WSS and Operating Rules during Period 1 (Commence Storage Impoundment Sequence of Paradise Dam)

Section 3 The Bundaberg WSS and Operating Rules during Period 2 (Commence Operation and Storage Filling of Paradise Dam)

Section 4 The Bundaberg WSS and Operating Rules Post Transitional Period (Additional Allocations from PD are fully integrated with Existing Allocations)

3 Interim Operating Arrangements During the Filling Period of Paradise Dam (PD)

This schedule covers the temporary arrangements for the management of flows during the following periods of storage impoundment and storage filling of Paradise Dam (See general Flowchart in Appendix A).

Period 1: Commencing the Storage Impoundment Sequence of PD

Commences when the construction of the environmental conduit “plug” is completed (Mid-October 2005) to the time when:

- The new Water Allocations are granted to Burnett Water (anticipated by December 2005), and
- The storage Level of Paradise Dam has exceeded EL 43m AHD (*approx 16,500 ML, a condition required for moving the existing MPAs of zone GZ from the Upper Burnett WSS into the Bundaberg WSS*).

Operation of the Burnett River Subscheme during Period 1: Paradise Dam will be utilised as a balancing storage during this impoundment stage, with the application of an impoundment strategy as described in Part B, **Section 2.7**.

Operation of the Kolan River Subscheme during Period 1: The operation of the Kolan River Subscheme is to be consistent with the operational rules described in the April 2005 ROP.

Period 2: Initial Operation of Bundaberg WSS (Storage Filling Period of Paradise Dam)

Commences at the time when the new Water Allocations are granted, and the storage level of Paradise Dam has exceeded EL 43m AHD (16,500 ML). Period 2 is to be commenced as soon as possible so that people who have bought New Allocations from PD can access the available water.

This period ends after the Sunset Clause has lapsed (30 June 2008), or when Paradise Dam storage is full (EL 67.6m AHD or 300,000 ML).

Operation of Burnett River Subscheme during Period 2: Paradise Dam shall be operated in accordance with procedures and rules as described in Part B, **Section 3**. The water sharing rules as described in **Section 3.14** will be applied to gradually bring online the New Allocations of 103,345 ML/a (MPAs), and 19,550 ML/a (HPAs).

Operation of the Kolan Subscheme during Period 2: Operation of the Kolan Subscheme is to be consistent with the operational rules described in the current ROP. The proposed transitional water sharing rules and calculation procedures as described in **Section 3.14** will be applied to gradually bring online the '**Returned New Allocations**' of 20,655 ML/a (MPAs) and 450 ML/a (HPAs) in the Kolan River Subscheme.

Post-Transitional Period

Commences on 1 July 2008, or when PD storage is full (EL 67.6m AHD or 300,000 ML) and all new Allocations of 124,000 ML/a (MPAs) and 20,000 ML/a (HPAs) are fully merged in the Bundaberg WSS. The approved ROP at that time should then be applied for scheme operations, including water sharing rules and water trading limits.

Note: explanatory notes and words in italics are provided as supporting information and therefore should not be considered as part of the rules.

PART B

BUNDABERG WATER SUPPLY SCHEME TEMPORARY ARRANGEMENTS

1 Introduction

Part B of this schedule details the temporary arrangements.

2 The Bundaberg WSS Operating Rules During Period 1 (Commencing Storage Impoundment Sequence for Paradise Dam)

2.1 Period 1 (Storage Impoundment Stage of Paradise Dam)

Period 1 Commences:

- Commences when the construction of the environmental conduit “plug” of Paradise Dam is completed (Mid-October 2005).

Period 1 Ends, when:

- The new Water Allocations are granted to Burnett Water Pty Ltd (anticipated by December 2005), and
- The storage Level of Paradise Dam has exceeded EL 43m AHD (*approx 16,500 ML, a condition required for supplying the existing MPAs of zone GZ*).

2.2 Infrastructure Associated with The Bundaberg WSS for Period 1

The April 2005 ROP identifies infrastructure in the following Subschemes:

- Kolan River for the ponded area of Fred Haigh Dam and downstream to AMTD 14.7 km including the ponded area of Bucca Weir and the Kolan Barrage.
- Burnett River from AMTD 162.8 km to 25.7 km including the ponded area of Paradise Dam, Ned Churchward Weir, and Ben Anderson Barrage.
- Sections of tributaries of these rivers that contain water ponded behind the infrastructure in this scheme, or ponded from natural waterholes.

The new SunWater/Burnett Water Paradise Dam will be utilised as a **balancing storage** during this impoundment stage.

2.3 Water Allocations and Zones in the Bundaberg WSS During Period 1

Regulated water allocations in this scheme belong to two priority categories.

- High Priority (HP)
- Medium Priority (MP)

Table 2.3-1 shows a list of the zones in the Bundaberg WSS.

Table 2.3-1 Zones of the Bundaberg WSS

| ZONE | AMTD (km) | | |
|--------------------------|-------------|--|--|
| Kolan River Zones | | | |
| AA | 14.7 – 31.5 | | |

| | | | |
|----------------------------|--------------|--|--|
| AB | 31.5 – 38.1 | | |
| AC | 38.1 – 55.7 | | |
| AD | 55.7 – 116 | | |
| Burnett River Zones | | | |
| CA | 25.7 – 65.6 | | |
| CB | 65.6 – 97.9 | | |
| GZ | 97.9 – 162.8 | | |

Explanatory notes:

Zone GZ moved into the Bundaberg WSS when Paradise Dam came online. The existing water allocation holders in zone GZ (AMTD 162.8 - 97.9 km) of the Upper Burnett WSS merged into the Bundaberg WSS, when the water volume in Paradise Dam exceeded EL 43m AHD, approximately 3,500 ML above the minimum operating volume. This is a reserve volume for zone GZ, required to ensure no impacts on the existing water allocation holders in the Burnett River Subscheme.

2.4 Proposed ROP area zones

Refer to Attachment 2.1 of the current ROP.

2.5 Infrastructure Operating Rules During Period 1

The rules outlined in Section 4.1.5, Chapter 4 of the Burnett River Basin April 2005 ROP are to be followed with the Paradise Dam being utilized as a balancing storage during the impoundment stage, through the application of an impoundment strategy as described in the following sections.

The purpose of the following sections is to define the agreed operating rules for Paradise Dam during the stages of impoundment and filling, until new water allocations are granted. These rules attempt to minimize impacts to existing water allocation holders downstream of Paradise Dam.

2.6 Operating Principles for Paradise Dam During Period 1

- SunWater makes announced allocations defining available water for its customers. In undertaking this assessment inflows into the system are considered.
- Under the Burnett Basin Water Resource Plan (WRP) irrigators in the Bundaberg Water Supply Scheme have a defined water allocation security objective (WASO).
- Through its Resource Operations Licence (ROL) and subsequently the Burnett Basin Resource Operations Plan (ROP), SunWater has a legal obligation to provide its customers with their allocation and meet its customers WASO's.
- Through its Resource Operations Licence, Burnett Water Pty Ltd is required to pass all supplemented flows released by SunWater in the Upper Burnett WSS unhindered through the construction site of Paradise Dam, to supply water allocations users in zone GZ until it is supplied from the Bundaberg WSS.
- SunWater proposes the minimum wetted commissioning level for Paradise Dam is at 43m AHD (16,500 ML).
- Inflows into the Paradise Dam impoundment equivalent to that of existing air space in SunWater's downstream storages, at the time of the inflow event, is deemed to be SunWater's water and will be stored in and released from Paradise Dam by Burnett Water as determined and requested by SunWater operators.

2.7 Operating Rules for Paradise Dam Storage During Period 1

- All *supplemented inflows* released from SunWater storages upstream (Claude Wharton Weir, etc.) to supply allocations in **zone GZ** must be released or diverted through the outlet works.
- All *unsupplemented inflows* received into the storage **less than** or equal to the combined volume of air space in SunWater downstream storages (Ned Churchward Weir and Ben Anderson Barrage) at the time of the inflow event, is considered to be SunWater's water and shall be stored in Paradise Dam, and released as directed by SunWater Operators. These directed releases can be used for the purpose of storage commissioning.
- All *unsupplemented inflows* received into the storage **greater than** the combined volume of air space in SunWater's downstream storages (Ned Churchward Weir and Ben Anderson Barrage) at the time of the inflow event, shall be stored in Paradise Dam.

2.8 Water Sharing Rules During Period 1

- Calculation of AAs for existing water allocations in zone GZ will be done according to the procedure applied for the Upper Burnett River Scheme (Refer to Section 4.2.6, Chapter 4 and Attachment 4.2F of the Burnett River Basin, April 2005 ROP).
- Calculation of AAs for existing water allocations in the Bundaberg WSS will be done according to the procedure applied for this scheme (Refer to Section 4.1.6, Chapter 4 and Attachment 4.1F of the Burnett River Basin, April 2005 ROP).

3 The Bundaberg Water Supply Scheme and Operating Rules during Period 2

3.1 Period 2 Initial Operation of Bundaberg WSS (Storage Filling Period of Paradise Dam)

Period 2 Commences:

- Commences at the time when the new Water Allocations are granted, and the storage level of Paradise Dam exceeds EL 43m AHD.

Period 2 Ends:

- This period ends after the Sunset Clause is lapsed (30 June 2008), or when Paradise Dam storage volume is full (EL 67.6m AHD or 300,000 ML).

Operating Principles for the Bundaberg WSS with Paradise Dam during Period 2: The Bundaberg WSS with Paradise Dam shall be operated in accordance with procedures and rules as described in **Section 3.5**.

Operation of the Burnett River Subscheme and the Kolan River Subscheme during Period 2: Operation of the Burnett River Subscheme and the Kolan River Subscheme is to be consistent with the water sharing rule described in **Section 3.16**.

The transitional AAs calculation procedures as described in **Section 3.14** be applied to bring online the New Allocations of 124,000 ML/a (MPAs), and 20,000 ML/a (HPAs) without adverse impact on the existing users in the Kolan River Subscheme and the Burnett River Subscheme.

3.2 Infrastructure Associated with The Bundaberg WSS during Period 2

The current ROP identifies infrastructure in the following Subschemes:

- Kolan River for the ponded area of Fred Haigh Dam and downstream to AMTD 14.7 km including the ponded area of Bucca Weir and the Kolan Barrage.
- Burnett River from AMTD 162.8 km to 25.7 km including the ponded area of Paradise Dam, Ned Churchward Weir, and Ben Anderson Barrage.
- Sections of tributaries of these rivers that contain water ponded behind the infrastructure in this scheme, or ponded from natural waterholes.

The new SunWater/ Burnett Water Paradise Dam storage will be operated according to the transitional rules:

- During this period, Part B, **Section 3.5**.

3.3 Water Allocations Associated with The Bundaberg WSS during Period 2

Regulated water allocations in this scheme belong to two priority categories.

- High Priority Allocations (HPAs)
- Medium Priority Allocations (MPAs)

The following additional water, when the water allocations are granted, will be available for allocation from Paradise Dam:

- Paradise Dam AMTD 131.4 km
 - 20,000 ML/a** High Priority Allocations (WSI 95 - 100)
 - 124,000 ML/a** Medium Priority Allocations (WSI 90 - 95)

3.4 Infrastructure Operating Rules During Period 2

The rules outlined in next sections for the storage filling stage, together with the application of an impoundment strategy should be followed.

The purpose of the following sections is to define the agreed operating rules for Paradise Dam during the stage of storage filling until the storage is full (EL 67.6m AHD or 300,000ML). These rules attempt to eliminate impacts to existing water allocation holders in the Bundaberg WSS.

3.5 Operating Principles for the Bundaberg WSS with Paradise Dam during Period 2

- SunWater makes announced allocations defining available water for its customers. In undertaking this assessment inflows into the system are considered.
- Under the Burnett Basin Water Resource Plan (WRP) irrigators in the Bundaberg Water Supply Scheme have a defined water allocation security objective (WASO).
- Through its Resource Operations Licence (ROL) and subsequently the Burnett Basin Resource Operations Plan (ROP), SunWater has a legal obligation to provide its customers with their allocation and meet its customers WASO's.
- All **unsupplemented inflows** received into the storage **less than** or equal to the combined volume of air space in SunWater's downstream storages (Ned Churchward Weir and Ben Anderson Barrage) at the time of the inflow event, is considered to be SunWater's water and shall be stored in Paradise Dam, and released as directed by SunWater Operators. These directed releases can be used for the purpose of commissioning of the Dam.
- All **unsupplemented inflows** received into the storage **greater than** the combined volume of air space in SunWater's downstream storages (Ned Churchward Weir and Ben Anderson

Barrage) at the time of the inflow event, shall be stored in Paradise Dam as part of the storage filling process.

- Water may be released from Paradise Dam up to the maximum discharge capacity of the outlet works to meet downstream demands of **zone GZ**, new Burnett River Subscheme Allocations and/ or to pass environmental flows as required.
- Storage release rules for Paradise Dam are to be carried out in conjunction with Fred Haigh Dam release rules as described in the April 2005 ROP (Section 2.2.2 of Attachment 4.1E) and the current ROP (Sections 2.2.1 and 2.2.3 of Attachment 4.1E).
- Storage release rules for EFOs **Low Flow requirements** are to be carried out according to rules described in the current ROP (Section 2.6.1 of Attachment 4.1E).
- Storage release rules for EFOs **Medium to High Flow requirements** are to be carried out according to rules described in the current ROP (Section 2.6.2 of Attachment 4.1E).
- Maximum change in storage outlet release rates must be carried according to the limits as described in the current ROP (Section 2.2 of Attachment 4.1E).
- Should the Paradise Dam storage level drop below EL 43m AHD (16,500 ML) at anytime during **Period 2**, the whole Bundaberg WSS will be operated in the same principles as applied for **Period 1**, with an exception that zone GZ will continue to be supplied by the Bundaberg WSS.

3.6 Rules for Operation of Storages During Period 2

3.6.1 Nominal Operating Levels of Storages

Refer to current ROP (Table 1, Section 1.1 of Attachment 4.1E)

3.6.2 Minimum Operating Level of Storages

Refer to current ROP (Table 2, Section 1.2 of Attachment 4.1E)

3.6.3 Critical Water Supply Arrangements

Refer to current ROP (Section 1.4 of Attachment 4.1E)

3.6.4 Rules for Releases of Water from Storages

3.6.4.1 General Rules

Refer to current ROP (Section 2.1 of Attachment 4.1E)

3.6.4.2 Inlet / Outlet Works

Refer to current ROP (Section 2.2 of Attachment 4.1E)

3.6.4.3 Release Rules

Refer to April 2005 ROP (Section 2.2.2 of Attachment 4.1E) and current ROP (Sections 2.2.1 and 2.2.3 of Attachment 4.1E)

3.6.4.4 Ben Anderson Barrage: Sluice Gate and Shutter Operations

Refer to current ROP (Section 2.5 of Attachment 4.1E)

3.6.4.5 Rate of Rise and Fall Downstream of Storages

Refer to current ROP - (Section 2.3 of Attachment 4.1E)

3.6.4.6 Rate of Rise and Fall in Storages

Refer to current ROP (Section 2.4 of Attachment 4.1E)

3.6.4.7 Ned Churchward Weir

Refer to current ROP (Section 2.4.1 of Attachment 4.1E)

3.7 Environmental Management Rules

3.7.1 Quality of Water Released from Storages

Where the outlet infrastructure incorporates multi-level intakes, the Operator will endeavour to draw water from the inlets in the way that maximise the quality of the water released.

3.7.2 Low Flow Releases

Refer to current ROP (Section 2.6.1 of Attachment 4.1E)

3.7.3 Medium to High Flow Releases

Refer to current ROP (Section 2.6.2 of Attachment 4.1E)

3.7.4 Storage Inflow Derivation Methodology

Refer to current ROP (Section 2.7 of Attachment 4.1E)

3.7.5 Minimum Levels for Aquatic Refuge and Recreation

Refer to current ROP (Section 2.6.3 of Attachment 4.1E)

3.7.6 Releases Associated with Fish Transfer Devices

3.7.6.1 Paradise Dam Fishway

Refer to current ROP - (Section 2.8.4 of Attachment 4.1E)

3.7.6.2 Ned Churchward Weir Fishway

Refer to current ROP - (Section 2.8.1 of Attachment 4.1E)

3.7.6.3 Ben Anderson Barrage Fishway

Refer to current ROP - (Section 2.8.2 of Attachment 4.1E)

3.7.6.4 Kolan Barrage Fishway

Refer to current ROP - (Section 2.8.3 of Attachment 4.1E)

3.8 Maintenance of Stable Water Levels in Ned Churchward Weir

Refer to current ROP - (Section 2.4.1 of Attachment 4.1E)

3.9 Releases to Maintain Water Levels in Downstream Waterholes

Refer to current ROP - (Section 1.3 of Attachment 4.1E)

3.10 Minimum Levels in Storages for Aquatic Refuge and Recreational Purposes

Refer to current ROP - (Table 2, Section 1.2 of Attachment 4.1E)

3.11 Other Operational Arrangements for Environmental, Social, Cultural Purposes

Refer to current ROP - (Section 2.9 of Attachment 4.1E)

3.12 Quality of Water Downstream of Storages

Refer to current ROP - (Section 3 of Attachment 4.1E)

3.13 Use of Watercourses for Distribution of Water

Refer to current ROP - (Section 3.1 of Attachment 4.1E)

3.14 Water Sharing Rules (Announced Allocations) During Period 2

There are two main types of priority groups and two classes of water allocations (New and Existing Allocations) proposed in the Bundaberg Water Supply Scheme during Period 2, namely;

- **High Priority:** Existing Allocations (**HPA_E**), and New Allocations (**HPA_N**)
- **Medium Priority:** Existing Allocations (**MPA_E**), and New Allocations (**MPA_N**).

The Burnett Basin Water Resource Plan specifies the performance indicators (WASOs) for two priority groups in Schedule 6. The following water sharing rules define the way the water resources of the Bundaberg Water Supply Scheme will be shared between the Existing Water Allocation Priority Groups, and how the New Allocations will be gradually brought online as water becomes available in the storage of Paradise Dam.

***Note:** Special AA calculation procedure (Section 3.15.1) are required to ensure existing allocation holders will not be impacted when new allocations from Paradise Dam are granted and gradually come online.*

General rules to be applied for water sharing during this period are:

- Announced allocations must be made for each water allocation priority group, and each class (New and Existing) of allocations at the start of Period 2.
- When the Bundaberg WSS is operated as a One-allocation scheme, announced allocation rules as described in Section 3.15 must be followed.
- When the Bundaberg WSS is operated as Two-allocation Subschemes, announced allocation rules as described in Section 3.16 must be followed.
- The announced allocation is the water allocation volume that may be taken during the period of the water year from 1 July to 30 June. It is expressed as a percentage from 0% to 100%. The announced allocation may not be greater than 100% for both Medium and High Priority, and is to be rounded up to the nearest 1%.
- Announced allocation may be reviewed during the year within ten business days of when a major inflow occurs, or when New Allocations are sold. If the revised announced allocation

increases by more than 5%, then the revised percentage of announced allocation must be announced.

- If the revised AA percentage of the Existing Allocations is below what was previously announced in the same water year, then the previously announced allocation percentage is to be maintained.
- If the revised AA percentage of the New Allocations is below what was previously announced in the same water year, then the revised percentage of announced allocation must be announced.
- All New Allocations will be fully merged with Existing Allocations when Paradise Dam storage is full at 300,000ML (EL 67.6m AHD), or the Sunset Clause ends. These conditions are required to fully integrate Paradise Dam with the Bundaberg WSS.

3.15 One- Allocation Scheme

The Bundaberg WSS will be operated as One-allocation scheme when;

- **Paradise Dam \geq EL 43m AHD (16,500 ML), and Fred Haigh Dam \geq EL 63.81m AHD (150,000 ML)** at the start of the water year,

if

- **Paradise Dam \leq 16,500 ML, and Fred Haigh Dam \geq 80,000 ML** at the start of the water year, then the Bundaberg WSS will be operated as a One-allocation Scheme with **Period 1** operating rules.

The Bundaberg WSS will be operated as a joined scheme for the purpose of resource assessment as described below.

The following rules are to be applied under One-allocation Scheme conditions:

- (1) A resource assessment is to be carried out for entire Bundaberg WSS.
- (2) Separate announced allocations are to be made for each priority group, New and Existing allocations in the Bundaberg WSS as described in Section 3.15.1
- (3) The Kolan River Subscheme New Returned Water Allocations (20,655 ML/a of MPAs and 450 ML/a of HPAs) will be merged with the Existing Allocations when they are sold. This is applied when the Bundaberg WSS is operating as either “One-allocation scheme” or “Two-allocations Subschemes”.
- (4) Announced allocations of New Water Allocations (103,345ML/a of MPAs and 19,550ML/a of HPAs) the Burnett River Subscheme shall be made based on the volume of water available in Paradise Dam that exceeds 16,500 ML (EL 43m AHD), or based on all New Allocations sold in the Burnett River Subscheme at the time if it is greater.
- (5) The AA New Allocations in the Burnett River Subscheme shall be re-set to Zero at any time during the water year when Paradise Dam drops below this level.
- (6) Releases are to be made from Fred Haigh Dam to supply users on the Kolan River and the Burnett River as described in Section 3.6.4.3.
- (7) Releases from Paradise Dam to supply Ned Churchward Weir to continue when Paradise Dam is above its minimum operating level, and must comply with the release rules as described in Section 3.6.4.3.

3.15.1 One-Scheme: Calculation Procedures for Announced Allocations during Period 2

If the Bundaberg WSS operates as One-allocation scheme at the commencement of Period 2, the following steps should be applied in the AA calculation procedure to bring online New Allocations.

Note:

The intention of this procedure is to ensure Existing Water Allocation Holders in the Bundaberg WSS are not disadvantaged when New Water Allocations from Paradise Dam are granted and gradually come online from December 2005.

When Period 2 commences, the AA for Burnett New Allocations is calculated based on water available in Paradise Dam that exceeds EL 43m AHD (16,500ML). Note that Paradise Dam minimum operating volume is at 13,000ML, hence allowing 16,500ML would ensure at least 3,500ML of water reserve available to provide deliveries to Zone GZ (2,854ML/a) without adverse impacts on the Existing Allocations. Any water in the Paradise Dam storage above this volume (16,500ML) shall be made available for New Allocations.

The AA shall be calculated for a portion of New Water Allocations in proportion to the usable volume available in Paradise Dam at the time. It is required to ensure that the announced allocation percentages of Existing Water Allocations in the Bundaberg WSS are not reduced. When inflow occurs, the portion of announced allocation will be increased accordingly. All New and Existing Water Allocations will be fully merged, and receive the same announced allocation when the merging conditions are met, at which time, and thereafter, all Water Allocations, within their respective priority groups, are treated equally.

STEP 1: Provide Water for Existing Allocations of Zone GZ, and Calculation of AAs for Existing Allocations in the Bundaberg WSS including zone GZ AA_{MPAE}

If Paradise Dam Current Storage Volume (PDCV) \geq 16,500 ML then;

- Merge 2,854 ML/a of MPAs from **Zone GZ** into the Bundaberg WSS, and
- Calculate the Announced Allocation percentage for Existing Water Allocations for High Priority (AA_{HPAE}) and, Medium Priority (AA_{MPAE}) including (2,854 ML/a) of **Zone GZ**.

Note:

The reserve volume (3,500 ML) in the PD storage will be included as part of the usable volume in the existing AAs calculation formula listed in Section 3.15.2.2.

STEP 2: Determine the volume of water available in Paradise Dam for New Allocations:

$$UV_{PD} \text{ (PD Usable Volume Available for New Allocations)} = \text{Current Volume} - 16,500\text{ML} \quad (1)$$

Work example:

- PD current storage level as measured at 52m AHD (CV = 64,000 ML). Hence, water volume available for New Allocations (UV_{PD}) = 64,000 – 16,500 = 47,500 ML

STEP 3: Determine the Percentage of total New Allocations that can be allocated with AAs from the water available in PD.

$$\text{ALPER (Allocable Percentage of New Allocations)} = UV_{PD} / \text{FSV} \quad (2)$$
$$\text{FSV} = (300,000 - 16,500)$$

Work example:

- Water volume available in PD for New Allocations as calculated in Step 2 where UV_{PD} = 47,500 ML; Hence: $\text{ALPER} = 47,500 / (300,000 - 16,500) = 0.17$ or 17%

STEP 4: Determine the Volumes of New Allocations (portion of 124,000 ML/a of MPAs, and 20,000 ML/a of HPAs) available with AAs, based on the volume

of water available in PD, or based on New Allocations sold (whichever the larger).

The larger of;

$$MPA_N \text{ (Volume of New Medium Priority Allocations with AAs)} = ALPER \times 124,000 \quad (3a)$$

Or

- New MPAs Sold at the time (3b)

The larger of;

$$HPA_N \text{ (Volume of New High Priority Allocations with AAs)} = ALPER \times 20,000 \quad (4a)$$

Or

- New HPAs Sold at the time (4b)

Work example:

- Medium Priority New Allocations with AAs (MPA_N) = $124,000 \times 0.17 = 21,000 \text{ ML/a}$. This volume can be allocated all in the Burnett River Subscheme, or in proportion to $103,345 \times 0.17 = 17,570 \text{ ML/a}$ for the Burnett River, and $(21,000 - 17,570) = 3,430 \text{ ML/a}$ for the Kolan River Subscheme.
- High Priority New Allocations with AAs (HPA_N) = $20,000 \times 0.17 = 3,400 \text{ ML/a}$. Similarly, this volume can be allocated all in the Burnett River Subscheme, or in portion to the New High Priority Allocations for each subscheme as calculated above.

STEP 5: Determine Announced Allocation percentages for Existing Water Allocations for Medium Priority (AA_{MPAE}) and High Priority (AA_{HPAE}) respectively based on procedure outlined in Section 3.15.2

STEP 6: Determine the Announced Allocation percentages for All New and Existing Water Allocations for Medium Priority (AA_{MPAALL}) and High Priority (AA_{HPAALL}) respectively based on the procedure outlined in Section 3.15.3

STEP 7: Compare AA_{MPAE} & AA_{HPAE} in STEP 5 with AA_{MPAALL} & AA_{HPAALL} in STEP 6

- If $AA_{MPAALL} \geq AA_{MPAE}$, and $AA_{HPAALL} \geq AA_{HPAE}$

▶ Proceed to **STEP 9** to check for conditions of merging.

- If $AA_{MPAALL} \leq AA_{MPAE}$, and $AA_{MPAALL} \leq AA_{MPAE}$

▶ Then, issue the Announced Allocation percentages for the **Existing Allocations**. Proceed to **STEP 8**

STEP 8: Determine the Announced Allocation percentages for New Water Allocations for Medium Priority (AA_{MPAN}) and High Priority (AA_{HPAN}) respectively based on the procedure outlined in Section 3.15.4

▶ Then, issue the calculated Announced Allocation percentages of all **New Allocations**

STEP 9: Checking for conditions to completely Merge the New Allocations with the Existing Allocations:

- (1) Paradise Dam Storage is full at **300,000 ML (EL 67.6m AHD)**, or
- (2) End of Sunset Clause.

- ▶ Issue the Announced Allocation percentages for **All New & Existing High Priority Allocations** (HPA_{ALL}) and **All New & Existing Medium Allocations** (MPA_{ALL}). (*AAs for all Allocations must be \leq AAs of total Existing Allocations*)

Repeat **Steps 1 to 9** when the announced allocation is revised until conditions of merging are met, or the end of the Sunset Clause.

3.15.2 One-Scheme: Announced Allocation for Existing Water Allocations only

3.15.2.1 One-Scheme: Announced Allocation for Existing High Priority Allocations

Announced allocation percentage for **Existing High Priority Water Allocations** will be 100% unless the announced allocation percentage for Existing Medium Priority Water Allocations is zero, in which case the announced allocation percentage for Existing High Priority Allocations must be determined using the following formula.

$$AA_{HPAE} = \left\{ \frac{UV + IN - TOL - VIWY + HPDE}{HPAE} \right\} \times 100$$

Where:

- $HPAE$ is the total of all Existing High Priority Allocations, 17,049 ML/a of the Burnett River Subscheme, and 7,323ML/a of the Kolan River Subscheme.
- $HPDE$ is the total volume of water already taken by Existing High Priority Water Allocation Holders in the current water year up to the time of the resource assessment for the Bundaberg WSS.

3.15.2.2 One-Scheme: Announced Allocation for Existing Medium Priority Allocations

The announced allocation percentage for **Existing Medium Priority Water Allocations** is determined using the following formula.

$$AA_{MPAE} = \left\{ \frac{UV + 3,500 + IN - HPAE - RE - TOL - VIWY + DIVE}{MPAE \text{ (include GZ)}} \right\} \times 100$$

Where:

- **3,500 ML** is a PD reserve volume above the Minimum Operating Volume (MOV = 13,000 ML), which is required to supply for zone GZ in the Bundaberg WSS.
- **GZ** is an existing zone with 2,854 ML/a of MPAs (that moved from the Upper Burnett WSS).
- $MPAE$ is the total of Existing Medium Priority Allocations, **122,804 ML/a** (119,950+2,854) of the Burnett River Subscheme, and **89,149 ML/a** of the Kolan River Subscheme.

The parameters used in the above relationship are defined in the following sections.

3.15.3 One-Scheme: Announced Allocation for All New and Existing Water Allocations

3.15.3.1 One-Scheme: Announced Allocation for All High Priority Allocations

Announced allocation percentage for **All New and Existing High Priority Water Allocations** will be 100% unless the announced allocation percentage for All New and Existing Medium Priority Water Allocations is zero, in which case the announced allocation percentage for High Priority allocations must be determined using the following formula.

$$AA_{HPAALL} = \left\{ \frac{UV_{PD} + UV + IN - TOL - VIWY + HPD_{ALL}}{HPA_{ALL}} \right\} \times 100$$

Where:

- UV_{PD} is the usable volume (above EL 43m AHD or 16,500ML) available in Paradise Dam for New Allocations.
- HPA_{ALL} is the total of All New and Existing High Priority Allocations, **36,599ML/a** (17,049 + 19,550) of the Burnett River Subscheme, and **7,773ML/a** (7,323+450) of the Kolan River Subscheme.
- HPD_{ALL} is the total volume of water already taken in the Bundaberg WSS by **New and Existing High Priority Water Allocation Holders** in the current water year up to the time of the resource assessment for the Bundaberg WSS.

3.15.3.2 One-Scheme: Announced Allocation for All Medium Priority Allocations

The announced allocation percentage for **All New and Existing Medium Priority Water Allocations** is determined using the following formula.

$$AA_{MPA_{ALL}} = \left\{ \frac{UV_{PD} + UV + IN - HPA_{ALL} - RE - TOL - VIWY + DIV_{ALL}}{MPA_{ALL}} \right\} \times 100$$

Where:

- UV_{PD} is a usable water volume (above EL 43m AHD or 16,500ML) available in Paradise Dam for New Allocations.
- MPA_{ALL} is the total of All New and Existing Medium Priority Allocations, **226,149ML/a** (122,804 + 103,345) of the Burnett River Subscheme, and **109,804ML/a** (89,149 + 20,655) of the Kolan River Subscheme.
- HPA_{ALL} is the total of All New and Existing High Priority Allocations as defined in previous section (36,599 + 7,773) = **44,372ML/a**

The announced allocation percentage determined according to the above formula should be applied equally to **All New and Existing Medium Priority Water Allocations** when the following merging conditions occur:

- Paradise Dam Storage is full at **300,000 ML(EL 67.6m AHD)**, or
- End of Sunset Clause.

The parameters used in the above relationship are defined in the following sections.

3.15.4 One-scheme: Announced Allocation for New Water Allocations only

3.15.4.1 One-Scheme: Announced Allocation for New High Priority Allocations

Announced allocation percentage for **New High Priority Water Allocations** will be 100% unless the announced allocation percentage for New Medium Priority Water Allocations is zero, in which case the announced allocation percentage for New High Priority allocations must be determined based on the water available in PD using the following formula.

$$AA_{HPAN} = \left\{ \frac{(UV_{PD} + UV + IN - TOL - VIWY + HPD_{ALL}) - (AA_{HPAE} \times HPAE) / 100}{HPAN} \right\} \times 100$$

Where:

- UV_{PD} is the usable water volume (above EL 43m AHD or 16,500 ML) available in Paradise Dam for New Allocations.
- $HPAN$ is a proportion of New High Priority Allocations that shall be determined based on, **the greater of** the water available in PD (see **Step 3**), or the New Allocations volume already sold at the time in the Bundaberg WSS.

- **HPD_N** is the total volume of water already taken (diverted) by New High Priority Water Allocation Holders in the current water year up to the time of the resource assessment for the Bundaberg WSS.

3.15.4.2 One-Scheme: Announced Allocation for New Medium Priority Allocations

The announced allocation percentage for all New Medium Priority Water Allocations is determined using the following formula.

$$AA_{MPAN} = \left\{ \frac{(UV_{PD} + UV + IN - HPAN - RE - TOL - VIWY + DIV_{ALL}) - HPAE - (AA_{MPAE} \times MPAE)/100}{MPAN} \right\} \times 100$$

Where:

- **UV_{PD}** is a usable water volume (above EL 43m AHD or 16,500ML) available in Paradise Dam for New Allocations.
- **MPAN** is a proportion of New Medium Priority Allocations that shall be determined based on, **the greater of** the water available in PD (see **Step 3**), or the New Medium Priority Allocations volume that are already sold at the time.

The parameters used in the above relationship are defined in the following sections.

3.15.5 One-Scheme: Resource Assessment Parameters

The sections following describe the parameters to be used in the resource assessment calculation for One-Allocation Scheme for the Bundaberg WSS.

3.15.5.1 Useable Volume of Paradise Dam (UV_{PD})

UV_{PD} is determined by the following equation;

$$UV_{PD} = (CV - MOV - 3,500 - SL)$$

$$UV_{PD} = 0 \text{ if } (CV - MOV - 3,500 - SL) \text{ is less than } 0$$

Where:

- **UV_{PD}** is the useable volume of Paradise Dam.
- **CV** is the current measured volume of Paradise Dam.
- **MOV** is the minimum operating volume of Paradise Dam (*approx 13,000 ML*).
- **SL** is the storage losses of Paradise Dam.

3.15.5.2 One-Scheme: Useable Volume (UV)

UV is determined by summing the useable volume of each of the storages (excluding Paradise Dam) in the Bundaberg WSS included in the resource assessment as per the following equation;

$$UV = \text{sum}(UV_{\text{storage}})$$

$$UV_{\text{storage}} = (CV - MOV - SL)$$

$$UV_{\text{storage}} = 0 \text{ if } (CV - MOV - SL) \text{ is less than } 0$$

Where:

- **UV_{storage}** is the useable volume of each storage.
- **CV** is the current volume of the storage.
- **MOV** is the minimum operating volume of the storage.
- **SL** is the storage losses in the Bundaberg WSS (see Section 3.15.5.3).

The useable volumes of **Fred Haigh Dam, Bucca Weir, Kolan Barrage, Ned Churchward Weir** and **Ben Anderson Barrage** are included in the resource assessment in the Bundaberg WSS.

3.15.5.3 One-Scheme: Storage Losses (SL)

The sum of storage losses for all storages in the Bundaberg WSS as One-Allocations scheme. Refer to current ROP - (Tables 1 & 2, Section 3 of Attachment 4.1F).

3.15.5.4 One-Scheme: Inflow (IN)

Storage inflow allowances for the Bundaberg WSS. Refer to current ROP - (Table 3, Section 3 of Attachment 4.1F).

3.15.5.5 One-Scheme: High Priority Diversions (HPD)

HPD is the volume of water already taken by high priority water allocation holders in the current water year up to the time of the resource assessment for the Bundaberg WSS.

- **HPD_E** is the volume of water already taken by **Existing High Priority** Water Allocation Holders,
- **HPD_{ALL}** is the volume of water already taken by **All New and Existing High Priority** Water Allocation Holders,
- **HPD_N** is the volume of water already taken by **New High Priority** Water Allocation Holders.

3.15.5.6 One-Scheme: High Priority Water Allocations (HPAs)

HPAs is the High Priority water allocations in the Bundaberg Water Supply Scheme.

- **HPA_E** is the Existing High Priority Water Allocations only,
- **HPA_{ALL}** is the total of all New and Existing High Priority Water Allocations,
- **HPA_N** is the New High Priority Water Allocations only.

3.15.5.7 One-Scheme: Medium Priority Water Allocations (MPAs)

MPA is the Medium Priority water allocation in the Bundaberg Water Supply Scheme.

- **MPA_E** is the Existing Medium Priority Water Allocations only,
- **MPA_{ALL}** is the total of all New and Existing Medium Priority Water Allocations,
- **MPA_N** is the New Medium Priority Water Allocations only.

3.15.5.8 One-Scheme: Diversions (DIV)

DIV is the volume of water taken by Water Allocation Holders in the current water year up to the time of the resource assessment for the Bundaberg WSS. It is commonly referred to as HPD (High Priority Diversion) plus MPD (Medium Priority Diversion).

- **DIV_E** is the volume of water taken by Existing Water Allocation Holders in the current water year up to the time of the resource assessment,
- **DIV_{ALL}** is the volume of water taken by All New and Existing Water Allocation Holders in the current water year up to the time of the resource assessment,
- **DIV_N** is the volume of water taken by New Water Allocation Holders in the current water year up to the time of the resource assessment.

3.15.5.9 One-Scheme: Reserve (RE)

Reserve volumes for the whole Bundaberg WSS. Refer to April 2005 ROP - (Table 4, Section 3 of Attachment 4.1F).

3.15.5.10 One-Scheme: Transmission and Operational Loss Allowance (TOL)

Transmission and operational losses for the whole Bundaberg WSS. Refer to current ROP - (Table 5, Section 3 of Attachment 4.1F).

3.15.5.11 One-Scheme: Carryover and Forward Draw (VIWY)

VIWY is an allowance in the resource assessment for carry over and forward draw.

- Carryover:– carryover of unused allocation from the previous year to the current year, discounted for losses.
- Forward Draw:– use of projected allocation from the following year.

For these two products in resource assessment:

$$VIWY = CO - FD - CO_{DIV}$$

Where:

- CO is the volume of carryover water current at the time of the resource assessment.
- FD is the amount of forward drawn water used in the previous year.
- CO_{DIV} is the volume of carryover water that had been supplied.

The restrictions in the current ROP regarding FD and CO apply (s2.1, Attachment 4.1F).

3.16 Two- Allocation Subschemes

The Bundaberg WSS will be operated as Two Separate Subschemes when;

- **Paradise Dam \geq EL 43m AHD (16,500 ML), and Fred Haigh Dam \leq EL 63.81m AHD (150,000 ML)** at the start of the water year,

if

- **Paradise Dam \leq 16,500 ML, and Fred Haigh Dam \leq 80,000 ML** at the start of the water year, then the Bundaberg WSS will be operated as Two Separate Subschemes, according to **Period 1** operating rules.

The Bundaberg WSS will split up into Two Subschemes, the Kolan River Subscheme and the Burnett River Subscheme for the purpose of resource allocations and assessment as described below.

The Kolan River Subscheme:

The Kolan River Subscheme is from the upper end of Fred Haigh Dam ponded area (AMTD 116km) to the Kolan Barrage (AMTD 14.7km). It includes the following infrastructures:

- Fred Haigh Dam, Bucca Weir and Kolan Barrage.

The Burnett River Subscheme:

The Burnett River Subscheme is from the upper end of Paradise Dam (AMTD 162.8km) to the Ben Anderson Barrage (AMTD 25.7km). It includes the following infrastructure:

- Paradise Dam, Ned Churchward Weir and Ben Anderson Barrage.

The following rules are to be applied under the split condition:

- (1) A separate resource assessment is to be carried out for each Subscheme. Separate announced allocations are to be made for each Subscheme for each priority group, class of New & Existing allocations as described in Section 3.16.6.
- (2) Announced allocation (AA) for the Kolan River Subscheme shall be calculated based on the Existing Allocations, and the returned New Allocations that are sold in this Subscheme.

- (3) No releases are to be made from FHD to the Burnett River Subscheme to supply demands of users or to maintain storage operating levels (release rules stated in Section 3.6.4.3).
- (4) Releases from Paradise Dam to supply users downstream and Ned Churchward Weir to continue when Paradise Dam is above its minimum operating level, and must comply with the release rules as described in Section 3.6.4.3.
- (5) Releases are to be made from Fred Haigh Dam to supply users on the Kolan River only when FHD is above its minimum operating level, and must comply with the release rules as described in Section 3.6.4.3.
- (6) The Subschemes will rejoin to One-allocation system when FHD level exceeds EL 64.31m AHD (160,000 ML) at any time during the water year,
- (7) Announced allocation that applied immediately prior to rejoin continues unchanged until sufficient water is available to increase both Subschemes to a single announced allocation percentage.

3.16.1 Two-Allocations Subschemes: Calculation Procedures for Announced Allocation during Period 2

On the commencement of Period 2, the following steps should be applied in the AA calculation procedures when the Bundaberg WSS is operating as Two Separated Subschemes, namely the Kolan River Subscheme and the Burnett River Subscheme.

Note:

The intention of this procedure is to ensure the entitlements of Existing Water Allocation Holders in both Subschemes are fully protected under the split scheme operations when New Water Allocations from Paradise Dam are granted and gradually come online from December 2005.

The Burnett River Subscheme AAs for New Allocations is calculated based on water available in Paradise Dam that exceeds EL 43m AHD (16,500ML). This is to ensure at least 3,500 ML of water reserve available to provide deliveries to Zone GZ (2,854ML/a) without adverse impacts on the Existing Allocations in the Burnett River Subscheme. Any water available in the PD storage above this volume (16,500 ML) shall be provided for New Allocations in the Burnett River Subscheme only.

The Kolan River Subscheme AAs for New Allocations will be calculated together with Existing Allocations as they are sold at the time. In simple term, the “Returned New Allocations (20,655ML/a of MPAs and 450ML/a of HPAs)” in the Kolan River Subscheme will be progressively merged to the Existing Allocations when they are sold.

All Water Allocations will be fully merged, and received the same announced allocation when the merging conditions are met, at which time, and thereafter, all Water Allocations are treated equally.

STEP 1: Provide Water for Existing Allocations of Zone GZ and Calculate the AA for Existing Allocations including GZ (AA_{MPAE_B}) in the Burnett River Subscheme only:

If Paradise Dam Current Storage Volume (PDCV) ≥ 16,500 ML then;

- Merge 2,854 ML/a of MPAs from **Zone GZ** into the Bundaberg WSS, and
- Calculate the Current Announced Allocation percentage of Existing Water Allocations for Medium Priority (AA_{MPAE_B}) including (2,854ML/a) Allocations of **Zone GZ**.

Note:

The reserve volume of 3,500 ML in PDs required as a condition to merge 2,854 ML/a of MPAs from zone GZ into the Burnett River Subscheme to ensure no impact on the existing Allocations in this Subscheme. This reserve volume (3,500 ML) in the PD will be included as part of the subscheme usable volume for the existing AAs calculation formula for the Burnett River Subscheme in Section 3.16.2.

STEP 2: Determine the volume of water available in Paradise Dam for New Allocations in the Burnett River Subscheme only:

UV_{PD} (PD Usable Volume Available for New Allocations) = Current Volume – 16,500ML (1)

Work example:

- PD current storage level as measured at 52m AHD (CV = 64,000 ML). Hence, water volume available for New Allocations (UV_{PD}) = 64,000 – 16,500 = 47,500 ML

STEP 3: Determine the Percentage of total New Allocations in the Burnett River Subscheme that can be allocated with AAs from water available in PD storage.

$ALPER$ (Allocable Percentage of New Allocations) = UV_{PD} / FSV (2)
 $FSV = (300,000 - 16,500)$

Work example:

- Water volume available in PD for New Allocations in this subscheme as calculated in Step 2 where $UV_{PD} = 47,500$ ML; Hence: $ALPER = 47,500 / (300,000 - 16,500) = 0.17$ or 17%

STEP 4: Determine the Volumes of New Allocations in the Burnett River Subscheme (17% portions of 103,345ML/a MPAs, and 19,550ML/a HPAs) available with AAs, based on the volume of water available in PD, or based on the Allocations Sold in this Subscheme at the time (whichever the larger).

The larger of;

MPA_N (Volume of New Medium Priority Allocations with AAs) = $ALPER \times 103,345$ (3a)

Or

- New MPAs Sold at the time (3b)

The larger of;

HPA_N (Volume of New High Priority Allocations with AAs) = $ALPER \times 19,550$ (4a)

Or

- New HPAs Sold at the time (4a)

Work example:

- Medium Priority New Allocations with AAs (MPA_N) = $103,345 \times 0.17 = 17,570$ ML/a. This volume with AA can only be allocated in the Burnett River Subscheme.
- High Priority New Allocations with AAs (HPA_N) = $19,550 \times 0.17 = 3,320$ ML/a. This volume with AA can only be allocated all in the Burnett River Subscheme.

STEP 5: Determine Announced Allocation percentages of the Burnett River Subscheme Existing Medium Priority (AA_{MPAE_B}) and High Priority Allocations (AA_{HPAE_B}) respectively, based on procedure outlined in Section 3.16.2

Note:

In the Two-allocations Subschemes situation, AAs for the Burnett River Subscheme allocations must be calculated and maintained separately for the New Allocations and Existing Allocations.

STEP 6: Determine the Announced Allocation percentages of the Burnett River Subscheme All New & Existing Water Allocations for Medium Priority (AA_{MPAALL_B}) and High Priority (AA_{HPAALL_B}) respectively, based on the procedure outlined in Section 3.16.3

STEP 7: Compare AA_{MPAE_B} & AA_{HPAE_B} in STEP 5 with AA_{MPAALL_B} & AA_{HPAALL_B} in STEP 6

- If $AA_{MPAALL_B} \geq AA_{MPAE_B}$ and $AA_{HPAALL_B} \geq AA_{HPAE_B}$
 - ▶ Then, issue the Announced Allocation percentages for **All High Priority** (HPA_{ALL_B}) and **All Medium Allocations** (MPA_{ALL_B}) for the Burnett River Subscheme. Then proceed to **STEP 10**.
- If $AA_{MPAALL_B} \leq AA_{MPAE_B}$ and $AA_{MPAALL_B} \leq AA_{MPAE_B}$
 - ▶ Issue the Announced Allocation percentages for the **Existing Allocations only** for the Burnett River Subscheme. Then proceed to **STEP 8**

STEP 8: Determine the Announced Allocation percentages of the Burnett River Subscheme New Water Allocations for Medium Priority (AA_{MPAN_B}) and High Priority (AA_{HPAN_B}) based on the procedure outlined in Section 3.16.4

- ▶ Then, issue the calculated Announced Allocation percentages of **New High** (AA_{HPAN_B}) and **Medium** (AA_{MPAN_B}) Allocations for the Burnett River Subscheme.

STEP 9: Determine Announced Allocation percentages of the All Kolan River Subscheme Medium Priority (AA_{MPAE_K}) and High Priority Allocations (AA_{HPAE_K}) respectively based on procedure outlined in Section 3.16.5

- ▶ Then, issue the calculated Announced Allocation percentages of **All High and Medium Allocations** for the Kolan River Subscheme.

Note:

*In the Two-allocations Subscheme situation, AAs for the Kolan River Subscheme allocations will be calculated based on the Existing Allocations and the Returned New Allocations that **have been sold** in the Kolan River Subscheme at the time.*

STEP 10 : Checking for conditions to completely Merge the New Allocations with the Existing Allocations in the Bundaberg WSS:

- (1) Paradise Dam Storage must be Full at **300,000 ML (EL 67.6m AHD)** and Fred Haigh Dam Storage Level must be \geq **64.31m AHD (160,000 ML)**, or
- (2) End of Sunset Clause.

Repeat **Steps 1 to 10** when the announced allocation is revised until conditions of merging are met, or to the end of the Sunset Clause.

3.16.2 Two-Subschemes: Announced Allocation for Existing Water Allocations Only

3.16.2.1 Burnett River Subscheme: Announced Allocation for Existing High Priority Allocations (AA_{HPAE_B})

Announced allocation percentage for **Existing High Priority Water Allocations** in the Burnett River Subscheme will be 100% unless the announced allocation percentage for Existing Medium Priority Water Allocations is zero. In that case the announced allocation percentage for Existing High Priority Allocations can be determined using the following formulae.

$$AA_{HPAE_B} = \left\{ \frac{UV_B + IN_B - TOL_B - VIWY_B + HPD_{E_B}}{HPA_{E_B}} \right\} \times 100$$

Where:

- **HPA_{E_B}** is Existing High Priority Allocations of **17,049 ML/a for the Burnett Subscheme.**
- **HPD_{E_B}** is the volume of water already taken by Existing High Priority Water Allocation Holders in the current water year up to the time of the resource assessment for the Burnett River Subscheme.
- All other variables in the formula are for the Burnett River Subscheme only.

3.16.2.2 Burnett River Subscheme: Announced Allocation for Existing Medium Priority Allocations (AA_{MPAE_B})

The announced allocation percentage for **Existing Medium Priority Water Allocations** in the Burnett River Subscheme is determined using the following formulae;

$$AA_{MPAE_B} = \left\{ \frac{UV_B + 3,500 + IN_B - HPA_{E_B} - RE_B - TOL_B - VIWY_B + DIV_{E_B}}{MPA_{E_B} \text{ (include GZ)}} \right\} \times 100$$

Where:

- **3,500ML** is a PD reserve volume above the Minimum Operating Volume (MOV = 13,000 ML), which is required to supply zone GZ in the Burnett River Subscheme.
- **GZ** is an existing zone with 2,854 ML/a of MPAs (moved from the Upper Burnett WSS).
- **HPA_{E_B}** is Existing High Priority Allocations of 17,049 ML/a for the Burnett River Subscheme.
- **MPA_{E_B}** is Existing Medium Priority Allocations, 122,804 ML/a (119,950+2,854) for the Burnett River Subscheme.
- All other variables in the formula are for the Burnett River Subscheme only.

The parameters used for the Burnett River Subscheme in the above relationships are defined below.

3.16.3 Two-Subschemes: Announced Allocation for All New and Existing Allocations

3.16.3.1 Burnett River Subscheme: Announced Allocation for All High Priority Allocations (AA_{HPAALL_B})

Announced allocation percentage for **All New and Existing High Priority Water Allocations** in the Burnett River Subscheme will be 100% unless the announced allocation percentage for All New and Existing Medium Priority Water Allocations in this subscheme is zero. In that case the announced allocation percentage for All High Priority Allocations in the subscheme must be determined using the following formula.

$$AA_{HPAALL_B} = \left\{ \frac{UV_{PD} + UV_B + IN_B - TOL_B - VIWY_B + HPD_{ALL_B}}{HPA_{ALL_B}} \right\} \times 100$$

Where:

- **UV_{PD}** is the usable volume (above EL 43m AHD or 16,500ML) available in Paradise Dam for New Allocations.
- **HPA_{ALL_B}** is the total of All New and Existing High Priority Allocations, 36,599ML/a (17,049 + 19,550) in the Burnett River Subscheme.

- **HPD_{ALL_B}** is the volume of water already taken in the Burnett River Subscheme by **New and Existing High Priority Water Allocation Holders** in the current water year up to the time of the resource assessment for this subscheme.
- All other variables in the formula are for the Burnett River Subscheme only.

3.16.3.2 Burnett River Subscheme: Announced Allocation for All Medium Priority Allocations (**AA_{MPAALL_B}**)

The announced allocation percentage for **All New and Existing Medium Priority Water Allocations** is determined using the following formula.

$$AA_{MPAALL_B} = \left\{ \frac{UV_{PD} + UV_B + IN_B - HPA_{ALL_B} - RE_B - TOL_B - VIWY_B + DIV_{ALL_B}}{MPA_{ALL_B}} \right\} \times 100$$

Where:

- **UV_{PD}** is a usable water volume (above EL 43m AHD or 16,500ML) available in Paradise Dam for New Allocations.
- **MPA_{ALL_B}** is the total of All New and Existing Medium Priority Allocations, 226,149ML/a (122,804+103,345) for the Burnett River Subscheme.
- All other variables in the formula are for the Burnett River Subscheme only.

The parameters used for the Burnett River Subscheme in the above relationships are defined below.

3.16.4 Two-Subschemes: Announced Allocation for New Allocations only

3.16.4.1 Burnett River Subscheme: Announced Allocation for New High Priority Allocations (**AA_{HPAN_B}**)

Announced allocation percentage for **New High Priority Water Allocations** in the Burnett River Subscheme will be 100% unless the announced allocation percentage for New Medium Priority Water Allocations is zero, in which case the announced allocation percentage for New High Priority allocations must be determined based on the water available in PD using the following formula.

$$AA_{HPAN_B} = \left\{ \frac{(UV_{PD} + UV_B + IN_B - TOL_B - VIWY_B + HPD_{ALL_B}) - (AA_{HPAE_B} \times HPA_{E_B}) / 100}{HPAN_B} \right\} \times 100$$

Where:

- **UV_{PD}** is the usable water volume (above EL 43m AHD or 16,500 ML) available in Paradise Dam for New Allocations.
- **HPA_{N_B}** is a proportion of New High Priority Allocations that shall be determined based on, the Greater of the water available in PD (see **Step 3**), or the New Allocations volume already sold at the time in the Burnett River Subscheme.
- **HPD_{N_B}** is the volume of water already taken (diverted) in the Burnett River Subscheme by New High Priority Water Allocation Holders in the current water year up to the time of the resource assessment for this subscheme.
- All other variables in the formula are for the Burnett River Subscheme only.

3.16.4.2 Burnett River Subscheme: Announced Allocation for New Medium Priority Allocations (AA_{MPAN_B})

The announced allocation percentage for all New Medium Priority Water Allocations in the Burnett River Subscheme is determined using the following formula.

$$AA_{MPAN_B} = \left\{ \frac{(UV_{PD} + UV_B + IN_B - HPA_{N_B} - RE_B - TOL_B - VIWY_B + DIV_{ALL_B}) - HPA_{E_B} - (AA_{MPAE_B} \times MPA_{E_B}) / 100}{MPA_{N_B}} \right\} \times 100$$

Where:

- UV_{PD} is a usable water volume (above EL 43m AHD or 16,500ML) available in Paradise Dam for New Allocations.
- MPA_{N_B} is a proportion of New Medium Priority Allocations that shall be determined based on, the Greater of the water available in PD (see **Step 3**), or the New Medium Priority Allocations volume that are already sold at the time for the Burnett River Subscheme.
- All other variables in the formula are for the Burnett River Subscheme only.

The parameters used for the Burnett River Subscheme in the above relationships are defined below.

3.16.5 Two-Subschemes: Announced Allocation for Water Allocations in the Kolan River Subscheme

3.16.5.1 Kolan River Subscheme: Announced Allocation for Existing and New High Priority Allocations (AA_{HPA_K}):

The Returned New HPAs of 450 ML/a in the Kolan River Subscheme will be merged with the Existing High Priority Allocations immediately when sold with an announced allocation percentage of 100%. When the announced allocation percentage for All Medium Priority Water Allocations in this subscheme is Zero, then the announced allocation percentage for All New and Existing High Priority Allocations must be determined based on the water available in the Kolan River Subscheme using the following formula.

$$AA_{HPA_K} = \left\{ \frac{UV_K + IN_K + TOL_K - VIWY_K + HPD_{ALL_K}}{HPA_{ALL_K}} \right\} \times 100$$

Where:

- HPA_{ALL_K} is All Existing and New High Priority Allocations of $(7,323 + 450) = 7,773$ ML/a for the Kolan River Subscheme.
- HPD_{ALL_K} is the volume of water already taken by All New and Existing High Priority Water Allocation Holders in the Kolan River Subscheme .
- All other variables in the formula are for the Kolan River Subscheme only.

3.16.5.2 Kolan River Subscheme: Announced Allocation for Existing and New Medium Priority Allocations (AA_{MPA_K}):

The Returned New Medium Priority Water Allocations (20,655 ML/a) in the Kolan River Subscheme will be merged with the Existing Medium Priority Water Allocations as they are sold. The announced allocation percentage for All New and Existing Medium Priority Allocations must be determined based on the water available in the Kolan River Subscheme using the following formula.

$$AA_{MPA_K} = \left\{ \frac{UV_K + IN_K - HPA_{ALL_K} - RE_K - TOL_K - VIWY_K + DIV_K}{MPA_{ALL_K}} \right\} \times 100$$

Where:

- MPA_{ALL_K} is Existing and New Medium Priority Allocations = 89,149 + New MPAs Sold at the time, up to 20,655 ML/a in the Kolan River Subscheme.
- All other variables in the formula are for the Kolan River Subscheme only.

Note:

When water is available in Paradise Dam, less pressure will be placed on Fred Haigh Dam to supply for Existing Allocations in the Burnett River Subscheme. This is reflecting in the new separation condition of the Kolan River Subscheme when Fred Haigh Dam volume is at or below 150,000ML (old separation rule is at 80,000ML). This separation condition would ensure adequate water reserve in FHD to allocate for the returned New Allocations (20,655ML/a of MPAs and 450ML/a of HPAs) in this subscheme with no impact on the Existing Allocations. Hence the returned New Allocations can be progressively merged with the Existing Allocation as they are sold at the time in this subscheme.

The parameters used for the Kolan River Subscheme in the above relationships are defined below.

3.16.6 Two-Subschemes: Resource Assessment Parameters

The sections following describe the parameters to be used in the resource assessment calculation when the Bundaberg WSS is split up into Two Allocation Subschemes.

3.16.6.1 Useable Volume of Paradise Dam (UV_{PD})

UV_{PD} is determined by the following equation;

$$UV_{PD} = (CV - MOV - 3,500 - SL)$$

$$UV_{PD} = 0 \text{ if } (CV - MOV - 3,500 - SL) \text{ is less than } 0$$

Where:

- UV_{PD} is the useable volume of Paradise Dam.
- CV is the current measured volume of Paradise Dam.
- MOV is the minimum operating volume of Paradise Dam (*approx 13,000 ML*)
- SL is the storage losses of Paradise Dam.

3.16.6.2 Two-Subschemes: Useable Volume (UV)

UV is determined by summing the useable volume of each of the storages included in the resource assessment for each subscheme as per the following equation;

$$UV = \text{sum}(UV_{\text{storage}})$$

$$UV_{\text{storage}} = (CV - MOV - SL)$$

$$UV_{\text{storage}} = 0 \text{ if } (CV - MOV - SL) \text{ is less than } 0$$

Where:

- UV_{storage} is the useable volume of each storage for a subscheme.
- CV is the current volume of the storage.
- MOV is the minimum operating volume of the storage.
- SL is the storage losses of the subscheme (calculated using data in Section 3.16.6.3).

The Burnett River Subscheme Usable Volume (UV_B):

- UV_B is the total useable volumes of Ned Churchward Weir and Ben Anderson Barrage.

The Kolan River Subscheme Usable Volume (UV_K):

- UV_K is the total useable volumes of Fred Haigh Dam, Bucca Weir and Kolan Barrage.

3.16.6.3 Two-Subschemes: Storage Losses (SL)

SL is the storages losses for each subscheme included in the resource assessment;

- SL_K is the total storage losses for the Kolan River Subscheme which included Fred Haigh Dam, Bucca Weir and Kolan Barrage.
- SL_B is the total storage losses for the Burnett River Subscheme which included Paradise Dam, Ned Churchward Weir and Ben Anderson Barrage.

Refer to current ROP - (Tables 1 & 2, Section 3 of Attachment 4.1F)

3.16.6.4 Two-Subschemes: Inflow (IN)

IN is inflow allowances for each subscheme that included in the resource assessment;

- IN_K is inflow allowances for the Kolan River Subscheme which included Fred Haigh Dam, Bucca Weir and Kolan Barrage.
- IN_B is inflow allowances for the Burnett River Subscheme which included Paradise Dam, Ned Churchward Weir and Ben Anderson Barrage.

Refer to current ROP - (Table 3, Section 3 of Attachment 4.1F)

3.16.6.5 Two-Subschemes: High Priority Diversions (HPDs)

HPD is the volume of water already taken by High Priority Water Allocation Holders in the current water year up to the time of the resource assessment for each subscheme.

- HPD_{E_B} is the volume of water already taken by Existing High Priority Water Allocation Holders in the Burnett River Subscheme,
- HPD_{ALL_B} is the volume of water already taken by All New and Existing High Priority Water Allocation Holders in the Burnett River Subscheme,
- HPD_{N_B} is the volume of water already taken by New High Priority Water Allocation Holders in the Burnett River Subscheme,
- HPD_{ALL_K} is the volume of water already taken by All New and Existing High Priority Water Allocation Holders in the Kolan River Subscheme.

3.16.6.6 Two-Subschemes: High Priority Water Allocations (HPAs)

HPAs is High Priority Water Allocations in each subscheme.

- HPA_{E_B} is the Existing High Priority Allocations in the Burnett River Subscheme,
- HPA_{ALL_B} is the All New and Existing High Priority Allocations in the Burnett River Subscheme,
- HPA_{N_B} is the New High Priority Water Allocations in the Burnett River Subscheme,
- HPA_{ALL_K} is the New and Existing High Priority Water Allocations in the Kolan River Subscheme.

3.16.6.7 Two-Subschemes: Medium Priority Water Allocations (MPAs)

MPA is Medium Priority Water Allocations in each subscheme.

- MPA_{E_B} is the Existing Medium Priority Water Allocations in the Burnett River Subscheme,
- MPA_{ALL_B} is the New and Existing Medium Priority Water Allocations in the Burnett River Subscheme,
- MPA_{N_B} is the New Medium Priority Water Allocations in the Burnett River Subscheme.
- MPA_{ALL_K} is the Existing and New Medium Priority Water Allocations sold in the Kolan River Subscheme.

3.16.6.8 Two-Subschemes: Diversions (DIV)

DIV is the volume of water taken by All New and Existing Water Allocation Holders during the current water year up to the time of the resource assessment. It is commonly referred to as HPD (High Priority Diversion) plus MPD (Medium Priority Diversion) in each subscheme.

- DIV_{E_B} is the volume of water taken by Existing Water Allocation Holders in the Burnett River Subscheme during the current water year up to the time of the resource assessment,
- DIV_{ALL_B} is the volume of water taken by All New and Existing Water Allocation Holders in the Burnett River Subscheme during the current water year up to the time of the resource assessment,
- DIV_{N_B} is the volume of water taken by New Water Allocation Holders in the Burnett River Subscheme during the current water year up to the time of the resource assessment,
- DIV_K is the volume of water taken by All New and Existing Water Allocation Holders in the Kolan River Subscheme in the current water year up to the time of the resource assessment.

3.16.6.9 Two-Subschemes: Reserve (RE)

- RE_B is the reserve storage volume of water set aside for water supplies and associated losses in future water years for the Burnett River Subscheme,
- RE_K is the reserve storage volume of water set aside for water supplies and associated losses in future water years for the Kolan River Subscheme.

Refer to April 2005 ROP - (Table 4, Section 3 of Attachment 4.1F)

3.16.6.10 Two-Subschemes: Transmission and Operational Loss (TOL)

- TOL_B is the transmission and operational losses for the Burnett River Subscheme,
- TOL_K is the transmission and operational losses for the Kolan River Subscheme.

Refer to current ROP - (Tables 7 & 8, Section 3.1 of Attachment 4.1F)

3.16.6.11 Two-Subschemes: Carryover and Forward Draw (VIWY)

- $VIWY_B$ is an allowance in the resource assessment for carry over and forward draw in the Burnett River Subscheme.
- $VIWY_K$ is an allowance in the resource assessment for carry over and forward draw in the Kolan River Subscheme.

Detailed formula is described in **Section 3.15.5.11**. The restrictions in the current ROP regarding FD and CO apply (s2.1, Attachment 4.1F).

3.17 Water Allocation Holders between AMTD 176 km and 162.8.0 km (Zone GY)

- These water allocation holders are permitted to extract water from Paradise Dam when Paradise Dam storage level is at or above EL 62.92m AHD (190,000 ML) if the announced allocation for the Claude Wharton Subscheme in the Upper Burnett WSS is greater than zero.
- These allocation holders are Not permitted to extract water from Paradise Dam when Paradise Dam elevation is below 62.92m AHD.

3.18 Seasonal Water Assignment

Refer to current ROP - (Section 2.2, Attachment 4.1F)

3.19 Water and Aquatic Ecosystem Monitoring

Refer to current ROP - (Attachment 4.1G)

3.20 Water Allocation Change Rules

Refer to current ROP - (Attachment 4.1H)

4 The Bundaberg WSS Operating Rules Post Transition Period

4.1 Additional Paradise Dam Allocations Fully Integrated with Existing Allocations

Post Transition Period commences:

- Commences when Paradise Dam storage volume is full (EL 67.6m AHD or 300,000 ML), or the end of the Sunset Clause.

Operation of the Burnett River Subscheme Post Transition periods: Operation of the Burnett Subscheme and Paradise Dam shall be consistent with the approved ROP at that time.

Operation of the Kolan Subscheme Post Transition periods: Operation of the Kolan Subscheme is to be consistent with operational rules described in the approved ROP at that time.

APPENDIX (A)

Flowchart of Steps and Procedures applied in Issuing AAs for New Water Allocations from Paradise Dam

