EMERGENCY ACTION PLAN — EUNGELLA DAM (DAM ID 266)

ISSUE: 9.0 November 2024 Expiry Date: 1 March 2029

Prepared by Sunwater Limited

Controlled Copy No.

Gated: No	Staffed: Yes

Type: Earth and rock-fill, sloping core

Project: Eungella Dam EAP **File:** 08-000365/001

Address: 3086 Eungella Dam Road

Location: Lat. Lat. -21.146720° Lon. 148.378054°

21° 08’48.2”S 148° 22’41.0”E

Approved by the delegate of the Chief Executive, Department of Local Government, Water and Volunteers until 1 March 2029.

Emergency activation quick reference — Dam Hazards

The Emergency Action Plan (EAP) for Eungella Dam covers dam hazards evaluated within Sunwater's Dam Safety Management Program.
Use the following table to select the relevant section of the EAP that deals with the dam hazard.

Note: The Dam Safety Technical Decision Maker (DSTDM) or Flood Operations Decision Maker (FODM) is responsible for the decision to activate the EAP. The Incident Coordinator (IC) will coordinate the EAP under the direction of the DSTDM or FODM. Should the IC be uncontactable, the Local Event Coordinator (LEC) or Dam Duty Officer (DDO) is responsible for the coordination of the EAP.

Table 1: Emergency activation quick reference dam hazards				
Dam Hazards and section numbers	Activation levels			
	Alert	Lean Forward	Stand Up	Stand Down
	Activation triggers for dam hazards			
Flood operations **See section 5**	• Storage above FSL 562.71 m	• Storage above EL 566.04 m (flood of record—April 1989)	• Storage expected to rise above EL 569.21 m based on observed stream flow (allowing wave action), OR • As advised by the DSTDM	• Storage level EL 563.00 m and falling with no forecast increase in EL for the next 48 hours
Piping: embankment, foundation, or abutments **See section 6**	• Increasing leakage through an embankment, the foundations, or abutments	• Increasing leakage through an embankment, the foundations, or abutments with cloudy water	• Piping condition has been established	• Risk assessment has determined that failure risk has reduced
Earthquake **See section 7**	• Earthquake **confirmed** (by DSTDM), or felt in the area, AND • Intensity less than 5 MMI	• Earthquake **confirmed** (by DSTDM) or felt in the area, AND • Intensity greater than or equal to 5 MMI, OR • Intensity less than 5 MMI and change detected during surveillance inspection	• Earthquake **confirmed** (by DSTDM) or felt in the area, AND • A possible failure path has been identified	• Risk assessment has determined that failure risk has reduced
Terrorist threat/activity or high energy impact **See section 8**	• Not applicable	• Not applicable	• Possible terrorist activity noticed at dam or threat received • Large explosion heard/observed at dam (e.g. bomb explosion, aircraft hit) • Failure in progress or likely due to impact or explosion • Sufficient water in storage to create a dam hazard	• Risk assessment has determined that failure risk has reduced

CONTINUED NEXT PAGE: EMERGENCY ACTIVATION QUICK REFERENCE

Emergency activation quick reference — Other Emergency Situations

The EAP for Eungella Dam covers one other emergency situation evaluated within Sunwater's Dam Safety Management Program. Use the following table to select the relevant section of the EAP that deals with the other emergency situation.

Note: The Dam Safety Technical Decision Maker (DSTDM) or Flood Operations Decision Maker (FODM) is responsible for the decision to activate the EAP. The Incident Coordinator (IC) will coordinate the EAP under the direction of the DSTDM or FODM. Should the IC be uncontactable, the Local Event Coordinator (LEC) or Dam Duty Officer (DDO) is responsible for the coordination of the EAP.

Table 2: Emergency activation quick reference other emergency situations			
Dam Hazards and section numbers	Activation levels		
	Communications failure dam site (DDO)	Communications failure local area (LEC/ORR)	Communications failure Brisbane (IC/DSTDM)
	• Site managed (DDO – becomes LEC)	• Brisbane managed by Incident Coordinator (IC)	• Locally managed by Local Event Coordinator (LEC)
	Activation triggers for dam hazards		
Comms failure **See section 9**	• Unable to communicate to or from Dam site	• Unable to communicate to or from Local Area	• Unable to communicate to or from Sunwater Brisbane

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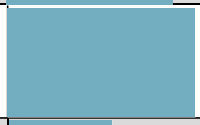
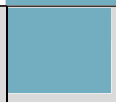
Document control

Table 3: Authorisation of document		
Name	**Signature**	**Date**
EAP Program Manager — Prepared for submission		26/11/2025
Principal Engineer – Dam Safety Compliance — Approved for submission		27/11/2025
Head of Dam Safety — Approved for submission		02/12/2025
EGM – Engineering and Asset Management (or delegate) — Dam Owner Authorising Officer		05/12/2025

Document revision history

Table 4: Document revision history				
Version	Date	Prepared by	Reason for change	Ref no.
2	May 2008		Significant changes of Eungella Dam Emergency Action Plan to reflect Sunwater Management structure and other minor changes. Refer HB # 601935 for amendments issued.	
3	October 2011		Significant changes to all sections of Eungella Dam Emergency Action Plan to reflect current Sunwater Management structure and other changes.	
3C	September 2013		Amendments due to new legislative requirements	1064546
4	October 2016		New Emergency Action Plan developed at expiry of 3E approval. Issued for consultation with Relevant Disaster Management Groups.	1870460
5	February 2017	[redacted]	Section 5, Emergency condition—flood operations, reviewed and amended by Sunwater after consultation with the Dam Safety Regulator.	1870460
6	October 2017	[redacted]	New Emergency Action Plan with minor amendments including contact list updates.	2092457
7	October 2018	[redacted]	Revised and reviewed Emergency Action Plan developed at expiry of approval. Also includes: updates that reflect the Water Legislation (Dam Safety) Amendment Act 2017, implementation of changes to Sunwater management structure, new event management roles and addition of new Emergency Activation section (Other Emergency Situations).	2274532
7.1	September 2019	[redacted]	Yearly contact update completed including relevant items such as Controlled Copy Holders and Organisational chart. Minor non-substantive error and formatting corrections.	2465147
7.2	September 2020	[redacted]	Amended contacts and associated sections, e.g. Organisation chart & Controlled Copy Holders list. Minor error corrections and other non-substantive changes.	2571774
7.3	September 2021	[redacted]	Amended contacts and associated sections, e.g. Organisation chart & Controlled Copy Holders list. Minor error corrections and other non-substantive changes such as removing Comprehensive Risk Assessments description (2.9) and simplifying FODM role in Activation triggers (5.2.1) including removing para 5.2.2.	2652782
7.4	September 2022	[redacted]	Amended contacts and associated sections. Minor error corrections and other non-substantive changes. The Chemical Hazard section has been removed as it is not a dam safety hazard and is dealt with in other more relevant documents.	2725694

Table 4: Document revision history				
Version	Date	Prepared by	Reason for change	Ref no.
8.0	February 2023	[redacted]	References updated in section 1. Fatigue management added in section 2.5. Amendments to emergency action tables in sections 5 to 9, inclusive of trigger change to Stand Up 2 in Flood Operations in section 5. Updates to dam details in section 3, contacts in Appendix A4, and inundation maps in Appendix B. Updated threat direction polygon in Appendix A7. Minor error corrections and other non-substantive changes. Incorporated AWS messaging changes.	2743863
8.1	September 2023	[redacted]	Non-substantive updates as part of Annual Safety Statement. Minor error corrections and readability improvements.	2809657
8.2	September 2024	[redacted]	Wet season preparedness – contact updates	2865415
9.0	November 2024	EAP Team	Full review pending expiry	2875659

Controlled document distribution list

Table 5: Controlled document distribution list		
Copy no.	Position	Location
1	Senior Storage Operator	Sunwater, Eungella Dam
2	General Manager, Pioneer Bowen Basin	Sunwater, Emerald
3	Operations Centre	Sunwater, Brisbane

Note: Communication information for each 'Controlled Copy Holder' is attached in Appendix A.

Electronic document distribution list

Printed electronic copies are considered uncontrolled copies

Table 6:Electronic distribution list	
Position	Location
Local Disaster Coordinator, Local Disaster Management Group (LDMG 1)	Mackay Regional Council, Mackay
Local Disaster Coordinator, Local Disaster Management Group (LDMG 2)	Whitsunday Regional Council, Proserpine
Executive Officer, Mackay DDMG	Police, Mackay
Senior Flood Forecaster	Bureau of Meteorology, Brisbane

Note: Communication information for each 'Electronic Copy Holder' is attached in Appendix A.

1. References, abbreviations and definitions

1.1. References/associated documents

Table 7: References/associated documents		
Ref	Document Title	Reference/location
A	Water Supply (Safety and Reliability) Act 2008 (the Act)	https://www.legislation.qld.gov.au/view/whole/pdf/inforce/current/act-2008-034
B	Queensland Disaster Management Act 2003	https://www.legislation.qld.gov.au/view/pdf/2024-07-01/act-2003-091
C	Queensland Disaster Management Guideline	https://www.disaster.qld.gov.au/__data/assets/pdf_file/0032/359465/QLD-Disaster-Management-Guideline
D	Emergency Action Plan for Referable Dam Guideline	https://www.resources.qld.gov.au/__data/assets/pdf_file/0018/84015/eap-guideline.pdf
E	Queensland State Disaster Management Plan 2018	https://www.disaster.qld.gov.au/plans
F	Queensland Government arrangements for coordinating public information in a crisis	https://www.disaster.qld.gov.au/__data/assets/pdf_file/0025/339406/L1159-DPC2739-Crisis-Communication-Document.pdf
G	Sunwater website	https://www.sunwater.com.au
H	Professional Engineers Act of Queensland 2002 (RPEQ)	https://www.legislation.qld.gov.au/view/pdf/inforce/2013-09-23/act-2002-054
I	Sunwater (internal) Eungella Dam Comprehensive Risk Assessment (April 2022)	Sunwater internal document
J	Fatigue Management Procedure	Sunwater internal document

1.2. Abbreviations and acronyms

AEP	Annual Exceedance Probability
AHD	Australian Height Datum
AMTD	Adopted Mean Thread Distance
ANCOLD	Australian National Committee on Large Dams
AWS	Australian Warning System
CEO	Chief Executive Officer
CRA	Comprehensive Risk Assessment
CTG	Counter Terrorism Group
D/S	Downstream
DCF	Dam Crest Flood
DCL	Dam Crest Level
DDC	District Disaster Coordinator
DDMG	District Disaster Management Group
DDMP	District Disaster Management Plan
DDO	Dam Duty Officer
DDS	Director Dam Safety
DLGWV	Department of Local Government, Water and Volunteers
DSR	Dam Safety Regulator
DSSC	Dam Safety Surveillance Coordinator
DSTDM	Dam Safety Technical Decision Maker
EAP	Emergency Action Plan
EA	Emergency Alert
EER	Emergency Event Report
EGMO	Executive General Manager Operations
EL	Elevation Level
EMC	Emergency Management Coordinator
FCL	Fixed Crest Level
FODM	Flood Operations Decision Maker
FSL	Full Supply Level
GM	General Manager
IC	Incident Coordinator
IFHC	Incremental Flood Hazard Category
IGEM	Inspector-General Emergency Management
KML	Keyhold Markup Language (file type)
LB	Left Bank
LDC	Local Disaster Coordinator
LDMG	Local Disaster Management Group
LDMP	Local Disaster Management Plan
LEC	Local Event Coordinator
MAP	Manager Asset Planning
Max. OL	Maximum Operating Level
MMI	Modified Mercalli Intensity
O&M	Operation & Maintenance
OB	Observation Bore
OC	Operations Centre
OCDO	Operations Centre Duty Officer
OM	Operator Maintainer
OMGR	Operations Manager
ORR	Owner's Regional Representative
OS	Operations Supervisor
PAR	Population at Risk
PFRM	Predictive Flood Routing Model
PLL	Probable Loss of Life
PMF	Probable Maximum Flood
PMP	Probable Maximum Precipitation
PMPF	Probable Maximum Precipitation Flood
QDMC	Queensland Disaster Management Committee
QPS	Queensland Police Service
RB	Right Bank
RC	Regional Council
RCC	Roller Compacted Concrete
ROC	Regional Operations Centre
RPEQ	Registered Professional Engineer of Queensland
RSL	Reduced Supply Level
SCADA	Supervisory Control and Data Acquisition
SCTN	Security and Counter Terrorism Network
SDCC	State Disaster Coordination Centre
SDF	Sunny Day Failure
SES	State Emergency Service
SMS	Short Message Service
SMT	Sunwater Media Team
SO	Standby Operator
SOM	Senior Operator Maintainer
SOP	Standing Operating Procedure
SRT	Strategic Response Team
SSO	Senior Storage Operator
SWL	Storage Water Level
U/S	Upstream

1.3. Business terms and definitions

Table 8: Business terms and definitions	
Term	**Definition**
Terms defined in accordance with the *Water Supply (Safety and Reliability) Act 2008* (the Act) (ref A)	
Australian Warning System	A national approach to information and warnings during emergencies like bushfire, flood, storm, extreme heat, and severe weather.
Dam hazard	Means a reasonably foreseeable situation or condition that may: • cause or contribute to the failure of the dam, if the failure may cause harm to persons or property, OR • require an automatic or controlled release of water from the dam if the release of the water may cause harm to persons or property. NOTE: Various dam failure modes have been referred to as *hazards* in this document e.g. piping.
Dam hazard event	Means an event arising from a *dam hazard* if: • persons or property may be harmed because of the event, AND • a coordinated response, involving two or more of the following relevant entities, is unlikely to be required; each local group and district group for the EAP, each local government whose area may be affected, the Chief Executive, another entity the owner of the dam considers appropriate, AND • the event is not an *emergency event*.
Disaster management plan (DMP)	Of a *district group* or local government, means the group's District Disaster Management Plan (DDMP) or local government's Local Disaster Management Plan (LDMP).
District group (DDMG)	For an EAP, means a district group established under the *Queensland Disaster Management Act 2003* (ref B), section 22 whose disaster district under that Act could, under the plan, be affected by a *dam hazard*.
Emergency Alert (EA)	Emergency Alert is a national telephone warning system enabling local and state agencies within Australia to issue warnings about a likely or actual disaster or emergency. This communication channel can send voice messages to landlines and text messages to mobiles within a defined spatial area (e.g. a threat direction polygon). It supplements other public information and warning methods.
Emergency event	Means an event arising from a *dam hazard* if: • persons or property may be harmed because of the event, AND • any of the following apply: o a coordinated response, involving two or more of the following relevant entities, is likely to be required; each local group and district group for the EAP, each local government whose area may be affected, the Chief Executive, another entity the owner of the dam considers appropriate, OR o the event may arise because of a disaster situation declared under the *Queensland Disaster Management Act 2003* (ref B), OR o an entity performing functions under the State Disaster Management Plan may, under that plan, require the owner of the dam to give the entity information about the event.
Local group (LDMG)	For an EAP, means a local group established under the *Queensland Disaster Management Act 2003* (ref B), section 29 whose local government area could, under the plan, be affected by a *dam hazard*.
Notice response	A dam owner's written response to a notice following an assessment of an EAP by a local government or *district group*.

Table 8: Business terms and definitions	
Term	**Definition**
Referable dam	A dam, or a proposed dam after its construction, will be a referable dam if: • a failure impact assessment of the dam, or the proposed dam, is carried out under the Act, AND • the assessment states the dam has, or the proposed dam after its construction will have, a category one or category two failure impact rating, AND • the Chief Executive has, under section 349 of the Act, accepted the assessment. Also, a dam is a referable dam if: • under section 342B of the Act, the owner of a dam is given a referable dam notice and, before the effective day for the notice, does not give the Chief Executive a failure impact assessment for the dam, AND • the Chief Executive has not, under section 349 of the Act, accepted a failure impact assessment of the dam.
Relevant entity	Means each of the following under the EAP for the dam: • the persons who may be affected, or whose property may be affected, if a *dam hazard event* or *emergency event* were to happen for the dam, e.g. the owners of parcels of farmland adjacent to the dam or residents of a township • each local group and district group for the EAP • each local government whose local government area may be affected if *a dam hazard event or emergency event* were to happen • the Chief Executive • another entity the owner of the dam considers appropriate, e.g. the Queensland Police Service (QPS).
Terms consistent with Queensland Disaster Management Guidelines (ref C)	
Activation levels	The four levels of EAP activation are: • **Alert:** A heightened level of vigilance due to the possibility of an event occurring. No further action may be required; however, the situation should be monitored by someone capable of assessing the potential of the threat. Moving to an Alert level indicates the dam owner is getting ready to activate the Lean Forward level of the EAP if the situation deteriorates. • **Lean Forward:** An operational state characterised by a heightened level of situational awareness of an impending disaster event and a state of operational readiness. Disaster coordination centres are on standby and prepared but not activated. • **Stand Up:** The operational state where resources are mobilised, personnel are activated, and operational activities commenced. Disaster coordination centres are activated. The dam owner needs to provide an Emergency Event Report (EER) in accordance with the provision of the Act. • **Stand Down:** Transition from responding to an event back to normal core business and/or continuance of recovery operations. There is no longer a requirement to respond to the event and the threat is no longer present. The movement through these levels of activation is not necessarily sequential. It should be applied with flexibility and adaptability and be tailored to the location and event. Triggering one of these levels of activation may not necessarily mean a similar activation of LDMGs or DDMGs.

Table 8: Business terms and definitions	
Term	**Definition**
AWS warning levels	The three AWS warning levels are: • **Advice:** The first warning level of the Australian Warning System meaning an incident has started but there is no immediate danger. Stay up to date in case the situation changes. • **Watch and Act:** The second warning level of the Australian Warning System meaning there is a heightened level of threat. Conditions are changing you need to start taking action now to protect you and your family. • **Emergency:** The third and highest warning level of the Australian Warning System meaning lives may be in danger and action should be taken immediately. Notes: These AWS warning levels do not change the Activation Levels of the EAP and are intended for external public facing information only. There is no Stand Down equivalent in AWS warning levels
Bureau of Meteorology flood level classifications	The three levels of flooding are: • **Minor flooding**: This causes inconvenience such as closing of minor roads and the submergence of low-level bridges and makes the removal of pumps located adjacent to the river necessary. • **Moderate flooding**: This causes the inundation of low-lying areas requiring the removal of stock and/or the evacuation of some houses. Main traffic bridges may be closed by flood waters. • **Major flooding**: This causes inundation of large areas, isolating towns and cities. Major disruptions occur to road and rail links. Evacuation of many houses and business premises may be required. In rural areas widespread flooding of farmland is likely.
Concurrent flooding	Flood flows downstream of a dam that are not a result of dam outflows; for instance, those from adjacent catchments or from the sea, and which occur in the same period as downstream releases or flooding from the dam.
Dam crest level (DCL)	The lowest elevation of the non-overflow crest section of the dam excluding handrails, parapets or wave walls that have not been designed to store water.
Dam crest flood (DCF)	The flood event that causes reservoir levels to reach the lowest point of non-overflow section of a dam.
Dam failure	Dam failure is the physical collapse of all or part of a dam or the uncontrolled release of any of its contents.
Downstream releases	Downstream releases are outflows from the dam made through appurtenant structures such as spillways or outlet works that are in accordance with the design of the dam.
Earthquake	A sudden release of energy in the earth's crust or upper mantle, usually caused by movement along a fault plane or by volcanic activity, resulting in the generation of seismic waves that can be destructive. The potential consequences of an earthquake include: • settlement, sliding, or overturning of monoliths in the dam wall • initiation of seepage lines in the foundations or abutments that could lead to piping damage and potential inoperability of appurtenant works.
Flood release	A flood release from a dam occurs when catchment inflows raise the storage level above the Full Supply Level (FSL) resulting in a discharge from the spillway of the dam.
Piping	Internal scour caused by the water flow and seepage that occurs through earth dams, dam foundations, or dam abutments. The internal scour can lead to the formation of a pipe, which can lead to a failure of the dam.
Plane strike or other impact	The impact of a plane, meteorite, or other high energy item on or in close vicinity of a dam that could damage the dam structure or create a wave that could overtop the dam.
Probable maximum flood (PMF)	The flood resulting from the probable maximum precipitation coupled with the worst flood-producing catchment conditions that can be realistically expected in the prevailing meteorological conditions.
Probable maximum precipitation (PMP)	The theoretical greatest depth of precipitation for a given duration that is physically possible over a particular drainage basin.

Table 8: Business terms and definitions	
Term	**Definition**
Probable maximum precipitation flood (PMPF)	The flood resulting from the probable maximum precipitation coupled with typical catchment conditions.
Stability, main embankment	High foundation pore pressure peaks may reduce the Factor of Safety against slip circle failure to an unacceptable level.
'Sunny Day' failure (SDF)	A failure that occurs at the FSL and there is no concurrent rain associated flooding.
Terrorist activity	A deliberate attempt to damage, fail or contaminate a dam.

Note: Sunwater has attempted to write the EAP to cope with all reasonably foreseeable emergency situations. However, there is considerable uncertainty about how any emergency situation might develop and progress. Factors such as the weather, the location, the mechanics, and the rate and size of any actual failure can considerably affect any resulting flood discharges. Therefore, a significant number of assumptions have had to be made in compiling sections of the EAP. Some variation in outcome should be expected where the event differs from the assumed behaviour.

2. Introduction

2.1. Context

Under the Water Supply (Safety and Reliability) Act 2008 (the Act) (ref A), the owner of a referable dam must have an approved EAP for the dam. Referable dams, by definition, would put lives at risk if they were to fail.

This EAP has been prepared in accordance with Chapter 4 of the Act. The content requirements for EAPs are contained in section 352H of the Act.

Summary of legal requirements – Section 352H

Section 352H (1) of the Act requires that the EAP must identify each dam hazard for the dam,

and for each of these dam hazard types (e.g. flood operations or piping risk):

1. identify the area likely to be affected by a dam hazard event or emergency event arising from the dam hazard
2. identify each circumstance that indicates a material increase in the likelihood of the dam hazard event or emergency event happening
3. state when and how the owner of the dam plans to warn persons who may be harmed, or whose property may be harmed by an event caused by the dam hazard, if one happens, and/or there is a material increase in the likelihood of an occurrence, including the order of priority in which the persons or categories of persons are to be warned
4. state when and how the owner plans to notify the relevant entities for the dam, if a dam hazard event or emergency event happens or, there is a material increase in the likelihood of such an occurrence, including the order of priority in which the relevant entities are to be notified
5. state the actions the owner of the dam plans to take in response to a dam hazard event or emergency event.

In accordance with section 352H (2) of the Act, the EAP may provide for the dam owner to make arrangements with a relevant entity for warnings to be given by the relevant entity on behalf of the dam owner in appropriate circumstances.

Section 352HA of the Act states that before giving the Chief Executive an EAP, the owner of the dam must give a copy of the plan to each local government whose area may be affected by a dam hazard identified in the plan, and each district group for the plan.

Section 352HB of the Act states that the local government must assess the EAP for consistency with its disaster management plan. In its assessment, the local government must consult with the local group for the plan.

Within 30 business days of receiving the EAP, the local government must give the owner of the dam a notice, which states whether it considers the plan is consistent with its disaster management plan; and if not, give reason why it considers the EAP is not consistent. The EAP must include any such notices, provided to the owner of the dam by a local government (or district group); and any responses which the owner gives to these notices. Section 352H (1) further stipulates that an EAP must include any other relevant matter prescribed by regulation.

The local government whose area may be affected by a dam hazard for Eungella Dam has been assessed as **Mackay Regional Council (MRC) and Whitsunday Regional Council (WRC)**. Sunwater has provided all **Disaster Management Groups (LDMGs)** with a copy of the draft EAP for assessment.

Section 352HC of the Act states that a district group may review the EAP for consistency with its disaster management plan. The district group for Eungella Dam is **Mackay District Disaster Management Group (DDMG)**. Sunwater has provided the DDMG with a copy of the draft EAP for review.

2.2. Purpose

The purpose of this EAP is to:

- enable the dam owner and the LDMG to respond to dam hazard events or dam emergency events in a timely and effective manner
- minimise the risk of harm to persons or property if a dam hazard event or dam emergency event for the dam happens
- identify dam hazards that could occur at Eungella Dam and the area likely to be affected for each hazard
- prescribe emergency actions taken by the dam owners and operating personnel in identifying and responding to dam hazards and notifying relevant entities.

It is possible for more than one dam hazard to exist at Eungella Dam at the one time. In such a circumstance, it may be necessary to act on the procedures within separate sections simultaneously.

The focus of this EAP is the management of dam hazards at Eungella Dam by the owner of the dam (Sunwater) and the communication and notification of dam hazards to the LDMGs, DDMGs and broader community. However, the EAP sits within the broader emergency response framework. This EAP has been developed to be consistent with and support the objectives of the Mackay and Whitsunday Councils' Local Disaster Management Plans (LDMP) and is a sub-plan of the LDMP.

2.3. Scope

The Eungella Dam EAP covers:

- dam hazards evaluated within Sunwater's Dam Safety Management Program
- details about the dam that are relevant to a dam hazard
- identification of circumstances that indicates a material increase in the likelihood of a dam hazard event and/or emergency event happening
- triggers for activation of a tiered response to dam hazard event or emergency event
- alignment of the EAP trigger levels for flood with the Australian Warning System (AWS) warning levels
- roles and responsibilities in responding to a dam hazard event or emergency event
- notification, warning, and communication protocols
- inspection, monitoring, and reporting protocols during emergencies
- other relevant information that may assist with identifying the area affected by an emergency event and/or the management of emergency events at Eungella Dam

2.4. Sunwater training

Training of the use and implementation of this EAP document is carried out at various times throughout the year, but specific pre-wet season training is undertaken in the months leading up to the wet season at each dam site.

During this period Sunwater staff complete work instructions for site preparations, and during July to September carry out checks on stores, supplies of fuel, on the current EAP such as contact details for individuals and dam information.

The EAP training that is carried out on site include walkthroughs of new changes, scenario (role play) and Q&A to check the knowledge and competency of all those who attended. The training is presented to relevant Sunwater staff (DDO's & LEC's) and disaster management stakeholders. DSTDM, FODM & IC information sessions are carried out once a year with the same walkthrough of new changes and Q & A, but this is not specific to any one Dam. New Sunwater employees in these various roles also have a walkthrough of the EAP.

Note: All enquiries regarding EAP training should be directed to [redacted]

Sunwater is also working towards carrying out a full test once annually involving each local authority and disaster management stakeholders. Where there is more than one referable dam in a local area, the exercise could involve more than one dam, or the location will be rotated. This full test would involve the SDCC and include the (non-live)

testing of Emergency Alerts. The test results relating to numbers of alerts generated will be shared with local authority and disaster management stakeholders.

2.5. Principles used in developing this EAP

The LDMGs have principal carriage of managing any disaster situation within the community, with the support of the district and state groups.

Sunwater will aim to inform and support the LDMGs in the local area.

The LDMG will be the principal voice on all communication to the community during a disaster situation in most circumstances except those where imminent dam failure is likely, and time is critical.

During a dam failure event that occurs with little or no warning, Sunwater will undertake the following actions to ensure the community is informed as soon as possible:

- maintain an up-to-date list of immediate D/S residents of Eungella Dam. The downstream limit is shown in the plan in Appendix B2 by the zone labelled Limit of downstream notification area.
- provide timely advice to the LDMGs.
- notify the immediately D/S residents via SMS.
- contact SDCC to request an Emergency Alert campaign throughout the Eungella Dam emergency polygon.

During a flood event, the LDMG in the local area will take the lead role in notifying all relevant persons. Sunwater will support the LDMG by undertaking the following actions to ensure the community is informed as soon as possible:

- maintain an up-to-date list of immediate D/S residents of Eungella Dam. The downstream limit is shown in the plan in Appendix B2 by the zone labelled Limit of downstream notification area.
- provide the LDMG with a copy of the list of residents (immediately D/S) annually for inclusion in the LDMG's SMS alert system.
- provide timely advice to the LDMGs.

Sunwater will independently inform and support the local DDMG.

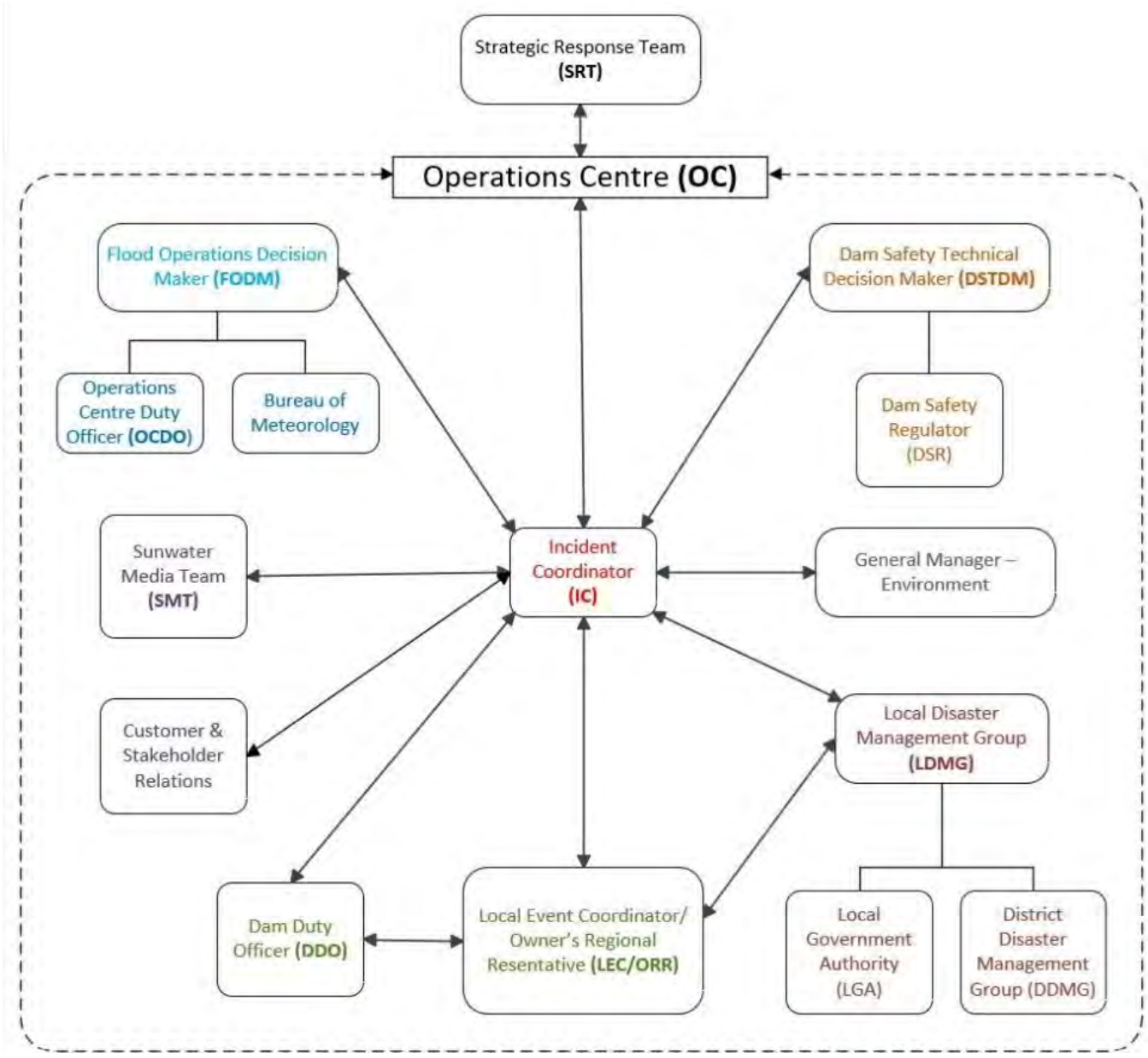
2.6. Fatigue Management Plan

Sunwater has a Fatigue Management Procedure (ref J). This document recognises fatigue as an important workplace hazard and has identified and outlined control processes to mitigate the risk of fatigue impaired HSE incidents. A copy of Sunwater's Fatigue Management Procedure can be provided upon request.

2.7. Dam hazard management within Sunwater

The Sunwater emergency management framework generally utilises the organisation's hierarchy and in-house experts as illustrated in Figure 1 below

Figure 1: Sunwater dam hazard management framework



Key aspects of the emergency management framework are:

- Central to the framework is the role of Incident Coordinator (IC) for any dam hazard at a dam. The IC will maintain overall responsibility for the coordination of the EAP. If the IC loses all communications during a dam hazard, then as a fail-safe position, the LEC followed by the DDO will assume the duties and responsibility of the IC. However, loss of communications could result in some communication processes defined in this EAP not being carried out.
- The DSTDM or FODM is responsible for the decision to activate the EAP. Should the DSTDM or FODM be uncontactable, the Local Event Coordinator (LEC) followed by the Dam Duty Officer (DDO) is responsible for the decision to activate. The FODM and DSTDM roles are filled by Registered Professional Engineers of Queensland (RPEQ) and are suitably qualified professionals who can make engineering decisions and provide engineering decisions as defined in the Professional Engineers Act of Queensland.
- The DSTDM is primarily responsible for analysing dam safety and providing expert technical advice in this regard. They will be expected to discuss dam hazards with peers and other technical experts and make sound decisions to mitigate risks and to determine a response to incidents and emerging issues. The DSTDM is the key communication contact with the Dam Safety Regulator.

- The FODM has responsibility for all matters involving flood modelling and forecasting and determining the associated impact to Sunwater storages/infrastructure. The FODM may pre-emptively activate the EAP in accordance with available hydrology forecast information in accordance with the OCP. For example, if an EAP trigger level is predicted to be exceeded based on forecast dam inflows derived from observed rainfall and streamflow conditions upstream of the dam, the EAP may be activated to the predicted level. Regarding the operation of the OC, the FODM must liaise with the IC as necessary to inform of decisions made.

2.8. Community information

Sunwater with the assistance of the local councils will ensure community education around messaging and impacts of the EAP and its related events is undertaken and continually improved.

Sunwater currently provides information externally to customers, downstream (D/S) residents, and the community in a range of methods or channels in relation to dam hazards and emergency situations. Individuals can access information through Facebook, the Sunwater website (sunwater.com.au), Sunwater Community App (Sunwater.com.au/community/sunwater-app/) and at several regional show/field days across regional Queensland where Sunwater may have stalls and information available. This engagement provides the community with tools to assist in self-management during emergencies.
In the event of an activation of this EAP, immediate D/S residents will be notified via short message service system (SMS).
In the event of an emergency event or when otherwise required, Sunwater and the affected local government also have the use of the National Emergency Alert System to send a voice message or SMS. This service is provided by TELSTRA and managed by the State Disaster Coordination Centre. The process Sunwater follows is documented in Appendix A7.
A copy of all Sunwater approved EAPs are available to the public on the Sunwater website:
https://www.sunwater.com.au/community/preparing-for-emergencies/emergency-management/
These copies are redacted to protect people's personal information.

2.9. Lessons learnt

Sunwater carries out Lessons Learnt workshops as part of its post event management. These Lessons Learnt can result in changes to the EAP. These are captured and if applicable to this document are implemented at the earliest opportunity and are made available in the next EAP update to the Dam Safety Regulator (DSR) as part of Sunwater's continual improvement of its EAPs. The Lessons Learnt actions if relevant are provided to stakeholders, such as the LDMGs, DDMGs, other dam owners and Department of Local Government, Water and Volunteers (DLGWV) as appropriate.

In addition, Sunwater requests any post event learnings be communicated regarding operational effectiveness and areas for improvement.

3. Dam details

3.1. General dam information

Location: Eungella Dam is an earth and rockfill dam situated on Broken River at AMTD 71.8 km within the Parish of Eungella, County of Hillalong, in the Shire of Mirani. The dam is located approximately 72 km west of the city of Mackay.

Purpose: Eungella Dam is used to supply water for mining and irrigation to the surrounding areas. Eungella Dam was constructed as part of the Collinsville Power Station Water Supply project, but now also supplies the coalfields at Glendon and Moranbah and the townships of Collinsville, Scottsville, Glendon and Moranbah via pipeline and regular river releases to fill the Bowen River Weir.

Catchment: Eungella Dam catchment is bounded by the Clarke Mountain range to the east and Mount Bruce to the west. Vegetation varies from rainforest at the catchment headwater to cleared grasslands at lower elevations.

Construction: Eungella Dam was constructed to full height in 1968.

Specification: The table below lists general specifications of Eungella Dam.

Table 9: Eungella Dam statistics

Description	Specification
Dam type	Earth and rockfill, sloping core
Catchment area	142 km^2
Full supply level (FSL)	EL 562.71 m
Dam crest level (DCL)	EL 569.21 m
Historical recorded max storage	EL 566.04 m (April 1989)
Storage capacity at FSL	112,400 ML
Dead storage	1256 ML
Storage area at FSL	848 ha
Max embankment height	44.5 m
Total length across dam crest	276 m
Spillway type	Concrete ogee crest with fully lined side channel spillway and flip bucket dissipator
Spillway crest level	EL 562.71 m
Spillway crest length	57.912 m at RL 1866’ to 1860’ (between vertical abutments) (refer drawing 27554) 54.86 m at spillway bridge (including bridge piers) (refer drawing 27598)
Spillway bridge piers	2 × 0.91 m wide
Outlet works	
Outlet control	2 x 840 mm diameter fixed cone dispersion values for river releases and BMA pump station connected to auxiliary outlet pipe work
River outlet capacity at FSL	11.3 m3/s (975 ML/d) – one regulating valve at 100% stroke
Outlet capacity at DCL	12.2 m3/s (1050 ML/d) – one regulating valve at 100% stroke

The discharge and storage curves can be found in Appendix C2 and Appendix C4.

3.2. Population at risk

The 2022 Comprehensive Risk Assessment (ref I) estimated the highest total failure PAR for Eungella Dam is 8 for the 1 in 1,200 AEP (DCF) scenario and 0 for the SDF scenario.

3.3. General arrangement

The general arrangement drawings are in Appendix B1.

3.4. Emergency inspections and monitoring

The Eungella Dam has been designed to conform to modern design standards, so that its failure is highly unlikely. To maintain the dam in a safe condition and detect any dam hazards, as soon as it begins to develop, or becomes apparent, the following is applicable to Eungella Dam.

3.4.1. Inspections

- Routine Visual Inspection: Conducted as per routine surveillance Work Order or as directed by the DSTDM
- Detailed Inspection: Conducted annually
- Comprehensive Inspection: Conducted 5-yearly

4. Roles and responsibilities

Table 10: Roles and responsibilities	
Roles and responsibilities	**Position Holder**
Owner • Liaise with the Board and Minister • Activate Sunwater Strategic Response and Business Continuity Plans, if required • Ensure necessary resources are available to manage any dam hazard and emergency events • Maintain an up-to-date list of immediate D/S residents of Eungella Dam. The downstream limit is indicated in the drawing in Appendix B2 by the zone labelled limit of downstream notification area. • At all times, aim to provide timely advice and support to the local disaster management groups (LDMGs) in the affected local government areas and the district disaster management groups (DDMGs) in the affected disaster districts • During a dam hazard event that occurs with little or no warning, undertake the following actions to ensure the community is informed as soon as possible: o Notify the downstream residents listed in the EAP via SMS o Contact SDCC to request an Emergency Alert campaign as detailed in the emergency alert request and threat direction polygon • Where a dam hazard event occurs with adequate time to warn downstream residents, notify the residents listed in the EAP via SMS (unless otherwise agreed with the LDMGs) • Record communications, notifications and observations as required	CEO EGMO EGM Engineering & Asset Management
Owner's Head Office Representative • Authorise the issuing of EAPs, SOPs and O&M Manuals and Amendments • Facilitate Dam Safety Training Courses for Service Managers, Operations Supervisor, Dam Operators, and other staff as appropriate and ensure that all staff required to undertake Dam Safety work are trained and accredited • Ensure that risks identified in CRAs or other technical reports undertaken in relation to Dam Safety are Included in the EAP • Ensure visual inspections and instrumentation monitoring frequencies conform to ANCOLD Guidelines • Ensure all Dam Safety work orders, work instructions and lesson learned outcomes are fully implemented. • Ensure requirements of the Dam Condition Schedule are met • Ensure the work instructions are correct and the Operating Logs, SOPs, Data Books, and EAPs are reviewed annually as per the Condition Schedule • Undertake and prepare the 5 yearly Comprehensive Inspection Reports with suitably qualified personnel within the time specified in the Condition Schedule and that work orders are created for recommendations and work is undertaken as required • Undertake Annual Inspections and prepare reports within the time frames specified in the Condition Schedule and that work orders are created for recommendations and work is undertaken as required • Review the Dam Safety Instrumentation Database and evaluate data to verify the structural integrity of the dams on a regular basis and maintain a spread sheet for verification for audit and quality control • Record communications, notifications and observations as required	Head of Dam Safety GM Asset Management

Table 10: Roles and responsibilities	
Roles and responsibilities	**Position Holder**
Owner's Regional Representative (ORR) • Liaise with the Storage Supervisor/Operator Maintainer • Arrange dam specific training and accreditation for relevant staff • Ensure competent, trained and accredited personnel operate the storages • Ensure necessary resources are available to manage any dam hazard and emergency event • Undertake the role of LEC as required • Ensure all work orders, work instructions and lesson learned outcomes are fully implemented • Record communications, notifications and observations as required	GM Pioneer Bowen Basin OS
Technical Advisor • Analyse the situation and provide expert technical advice • Discuss issue with peers and other technical experts and make sound decisions to mitigate the risk • Determine response to incidents and emerging issues • Record communications, notifications and observations as required	GM Environment
Strategic Response Team (SRT) • Facilitate the assessment, escalation and notification and management of strategic response and recovery for a high or extreme risk, or impact, event. • Initial and ongoing assessment of event status and requirements • Development, and revision of, strategic objectives based on requirements • Identifying, managing, and monitoring strategic risks • Monitor media and stakeholder/customer impacts • Managing/overseeing event communications including media, stakeholder, customer and internal communications • Record communications, notifications and observations as required	Various ELT members as per SRT roster
Dam Safety Technical Decision Maker (DSTDM) • Responsible for the decision to activate the EAP for dam safety hazards • Maintain current RPEQ accreditation • Analyse the situation and provide expert technical advice in relation to Dam Safety • Discuss Dam Hazard with peers and other technical experts and make sound decisions to mitigate the risk • Determine response to incidents and emerging issues • Issue warning on dam failure and advise on protective measures • Ensure the EAP is implemented appropriately and carry out the DSTDM role as required • Liaise with DSR as required • Record communications, notifications and observations as required	Various personnel as per OC roster
Flood Operations Decision Maker (FODM) • Responsible for the decision to activate the EAP for flood hazards • Maintain current RPEQ accreditation. • Provide hydrological advice in relation to predicted and actual dam outflows including assessment of weather and flood warnings and other related matters as identified in the OC Procedure (Sunwater internal). • Ensure the EAP is implemented appropriately and carry out the FODM role as required. • Record communications, notifications and observations as required.	Various personnel as per OC roster

Table 10: Roles and responsibilities	
Roles and responsibilities	**Position Holder**
Operations Centre Duty Officer (OCDO) • Assist the FODM in identifying if a flood is imminent and record modes of operation as directed by the FODM • Extract data relevant to the event from available sources • Assist the FODM by utilising this data in predictive flood models • Liaise with the FODM to update current flood risk information • Record communications, notifications and observations as required	Various personnel as per OC roster
Sunwater Media Team (SMT) • Analyse sensitive issues, discuss with the Owner and issue media releases • Handle public and customer comments (including social media) and advise the Owner if necessary • Liaise with the IC and update Queensland Disaster Management Group of flood events • Record communications, notifications and observations as required	Various personnel as per Media Team roster
Incident Coordinator (IC) • Notify LDMG/s, or council/s if LDMG not Stood Up, of intent to use the Emergency Alert (EA) • Ensure the EAP is coordinated appropriately and carry out the IC role as required • Record communications, notifications and observations as required	Various personnel as per OC roster
Local Event Coordinator (LEC) • Liaise with the Local Disaster Coordinator or proxy • Activate the EAP, when necessary, including when the IC is not available or unable to be contacted • Ensure the EAP is implemented appropriately and carry out the LEC role as required • Record communications, notifications and observations as required	Various personnel as per LEC roster
Dam Duty Officer (DDO) • Complete accreditation to operate and maintain relevant storage • Activate the EAP when necessary, such as when both the IC and LEC are not available or unable to be contacted. • Ensure the EAP is implemented appropriately and carry out the DDO role as required • Take direction from the DSTDM or FODM and IC as requested • Arrange immediate site inspection and make informed assessment of the situation • Escalate any issue not covered in the EAP or where actions are not clear • Record communications, notifications and observations as required	SSO OM SOM
Council Council has legislated local government functions, as per Section 80 of the Qld Disaster Management Act (2003). These include: • Ensure it has a disaster response capability • Approve its local disaster management plan • Ensure information about an event or a disaster in its area is promptly given to the district disaster coordinator for the disaster district in which area it is situated • Perform other functions given to the local government under the Act And as per Section 352HB of the *Water Supply (Safety and Reliability) Act 2008* (Qld): • Must assess (in consultation with its LDMGs) the EAP for consistency with the Local Disaster Management Plan	

Table 10: Roles and responsibilities	
Roles and responsibilities	**Position Holder**
Disaster Management Groups/Personnel – (In addition to requirements outlined in the Qld. Disaster Mgmt. Act (2003) **LDMG** • Assist Sunwater and the local Councils to ensure community education around messaging and impacts of EAP related events is undertaken and continually improved • Work with local Councils and Sunwater to ensure the EAP is regularly exercised • Identify and coordinate the use of manpower and resources that may be required for an EAP event • Identify and provide advice to DDMG about support services required by the LDMG to manage an EAP event **QPS** • Work with dam owner and LDMG to ensure Emergency Alerts polygons are prepared, stored and tested at the State Disaster Coordination Centre **DDMG** • DDMG may review plan with consistency with the District Disaster Management Plan **Security and Counter Terrorism (SCTN)** • Identifies areas of concern during the preparation of disaster plans and provides advice during counter terrorism emergency events	LDMG DDMG QPS SCTN Coordinator
Dam Safety Regulator (DSR) • Liaise with relevant Minister on necessary actions. • Approve this document as required under legislation • Liaise with Chief Executive as required in administering (regulating) the *Water Supply (Safety and Reliability) Act 2008*	DDS

5. Dam hazard — flood operations

5.1. Overview

The emergency action described in this section (dam hazard—flood operations) relates to:

A dam hazard where natural catchment inflows fill Eungella Dam to FSL 562.71 m and the rate of inflow exceeds the capacity of the outlet works. Inflows will cause the storage to temporarily rise to above the FSL of the storage at which time the spillway will discharge water into the Broken River. Note:

- The greater the rate of inflow, the higher the storage will rise.
- The higher the storage level rises, the greater the loads on the dam structure.
- Although unlikely, the greater the loading, the higher the likelihood of a dam failure.
- Typically, the level of surveillance is increased during flood operations (refer tables in this section).

- Spillway discharge from the dam. The spillway will then discharge water downstream into the Broken River.

The area likely to be affected by this dam hazard event is described as:

- As the rate of discharge increases, there will be an impact on low-level road crossings of the Broken River and other infrastructure in the river such as pump sites.

The following table shows historical floods experienced at Eungella Dam.

Table 11: Historical floods experienced at the dam			
Flood Rank	Date	Peak height EL	Peak height (m over crest)
1	Apr 1989	566.04 m	3.33 m
2	Mar 2017	565.26 m	2.55 m
3	Feb 1991	565.21 m	2.50 m
4	Apr 2000	564.64 m	1.93 m
5	Dec 2010	564.38 m	1.67 m

Detailed information on downstream flood impacts is presented in Appendix B.

The discharge curve is provided Appendix C4.

The following table shows Elevation Level versus percentage of Full Supply Level at Eungella Dam.

Table 12: EL versus FSL at Eungella Dam	
% of FSL	EL (m)
50	554.70
55	555.67
60	556.59
65	557.46
70	558.30
75	559.10

Table 12: EL versus FSL at Eungella Dam	
% of FSL	EL (m)
80	559.88
85	560.62
90	561.34
95	562.04
100 (FSL)	562.71
105	563.36
110	564.00
115	564.61
120	565.21

5.2. Emergency actions

Regarding the emergency action tables in this section; each level of activation includes both its own actions and the actions of any lower level, unless those lower-level actions are superseded.

5.2.1. Activation triggers

Table 13: Flood hazard activation trigger summary		
EAP flood activation trigger	Trigger summary	AWS
Alert	• Storage above FSL 562.71 m	Advice
Lean Forward	• Storage above EL 566.04 m (flood of record—April 1989)	Watch and Act
Stand Up	• Storage above EL 569.21 m (allowing wave action), OR • As advised by the DSTDM	Emergency
Stand Down	• Storage level EL 563.00 m and falling, with no forecast increase in EL in the next 48 hours	Advice

While this EAP is not triggered until Eungella Dam reaches EL 562.71 m, Sunwater, Mackay and Whitsunday Regional Councils and their respective LDMGs will work cooperatively and will endeavour to share intelligence of any rainfall event as and when either organisation becomes aware of a situation that could result in the activation of the EAP.

The Broken River is confined to a narrow valley downstream of the dam where it flows through rural areas with little development and no apparent floodplain. Potential properties at risk of inundation are not reached until the confluence with Urannah Creek, 35 km downstream. The Lean Forward trigger is set at the flood of record since properties on Urannah Creek upstream of this confluence may become inundated when flood levels exceed the flood of record. However, the flood level at this location will depend on the volume of rainfall falling in the Broken River catchment downstream of Eungella Dam and the Urannah Creek catchment.

The activation of Stand Up requires consideration of wave action. For example, if the gauge reading was forecast to reach 1 m below the dam crest level and the DDO reported 1 m high waves, Stand Up will be triggered.

Furthermore, the DSTDM may also trigger this activation if there are any dam safety concerns as the storage approaches dam crest level.

5.3. Emergency action roles

Table 14 to Table 19 specify emergency actions for the following roles:

- Dam Duty Officer (DDO)
- Local Event Coordinator (LEC)
- Incident Coordinator (IC)
- Dam Safety Technical Decision Maker (DSTDM)
- Flood Operations Decision Maker (FODM).

Table 14: Flood Operations DDO emergency action				
Activation Level	**Alert**	**Lean Forward**	**Stand Up**	**Stand Down**
Activation trigger	• Storage above FSL 562.71 m	• Storage above EL 566.04 m (flood of record—April 1989)	• Storage above EL 569.21 m (allowing wave action), OR • As advised by the DSTDM	• Storage level EL 563.00 m and falling, with no forecast increase in EL in the next 48 hours
Actions	• Record all communication • Inspect the dam daily (or as instructed by the DSTDM) and photograph/video and record using the approved forms in the HMT and send to DSTDM & IC • Undertake site preparations including but not limited to: o check communication systems (including backup and radio, satellite, phones, and internet) • Record the Storage Level twice daily (or as instructed by the DSTDM) using the gauge boards and confirm accuracy of gauging station • Record rainfall daily • Update Operating Log as per SOP12	• As per previous activation level, AND • Inspect the Dam 6-hourly (or as instructed by the DSTDM) and photograph/video and record using the approved forms in the HMT and send to DSTDM & IC. • Attention will be given to: o visual inspection of flow patterns over spillway and dissipator for evidence of scouring o inspect embankment for leaks, deformation, and erosion o obvious signs of seepage • Record lake height at the Headwater Gauge twice daily (or as requested) • Read instrumentation daily (or as instructed by the DSTDM) • Consider the need to isolate floating pontoon – HV switching (discuss with IC) • Close any affected roads as directed and move on any members of the public • Inspect the spillway for any blockages due to debris.	• As per previous activation level, AND • Evacuate any plant and/or vehicles to higher ground • View the embankment (with binoculars) • Remotely inspect the dam 6-hourly (or as instructed by the DSTDM) photograph/video and record using the approved forms in the HMT and send to IC & DSTDM • Check signs of erosion on D/S face, especially near spillway, if possible	• Return to routine surveillance activities and frequencies • Forward all EER material to IC email as required • Update Operating Log as per SOP 12
Notifications	• IC • SO • LEC/ORR	• As per previous activation level	• As per previous activation level	• Inform all previously notified contacts of Stand Down
AWS	ADVICE	WATCH AND ACT	EMERGENCY	ADVICE

ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO
e.g. taking photographs/video, dam inspections, instrument readings

Table 15: Flood Operations LEC emergency action				
Activation Level	**Alert**	**Lean Forward**	**Stand Up**	**Stand Down**
Activation trigger	• Storage above FSL 562.71 m	• Storage above EL 566.04 m (flood of record—April 1989)	• Storage above EL 569.21 m (allowing wave action), OR • As advised by the DSTDM	• Storage level EL 563.00 m and falling, with no forecast increase in EL for the next 48 hours
Actions	• Record all communication • Develop/implement staff roster • **NOTE: IC to do all LEC external notifications until LDMG 1 is stood up**	• As per previous activation level	• As per previous activation level	• Forward all EER material to IC email as required • Return to routine activities
Notifications	• IC • DDO • LDMG 1 • LDMG 2 • DDMG	• As per previous activation level	• As per previous activation level	• Inform all previously notified contacts of Stand Down
AWS	ADVICE	WATCH AND ACT	EMERGENCY	ADVICE

ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO
e.g. taking photographs/video, dam inspections, instrument readings

[redacted]
DSTDM [redacted]

Table 16: Flood Operations — IC emergency action

Activation Level	Alert	Lean Forward	Stand Up	Stand Down
Activation trigger	• Storage above FSL 562.71 m	• Storage above EL 566.04 m (flood of record—April 1989)	• Storage above EL 569.21 m (allowing wave action), OR • As advised by the DSTDM	• Storage level EL 563.00 m and falling, with no forecast increase in EL for the next 48 hours
Actions	• Record all communication • Liaise with Sunwater Media On-call, LDMGs, FODM and/or DSTDM to send SMS to D/S residents • Obtain catchment conditions from the DDO • Update Sunwater intranet with dam status • **NOTE: IC to do all LEC external notifications until LDMG 1 is stood up**	• As per previous activation level, AND • Ensure all abnormal observations or damage has been reported to DSTDM • Consider the need to appoint a Sunwater Recovery Coordinator. The Sunwater Recovery Coordinator is responsible for the follow through on actions to close out all matters and works outstanding after the initial emergency is over. • Confirm EAs and other messages are prepared in advance – if required.	• As per previous activation level, AND • Ensure staff are relocated to a safe location	• Compile EER and deliver to DSR if required • Update Sunwater intranet with dam status • Return to routine activities
Notifications	• D/S Residents • DDO • DSTDM • LEC/ORR • SMT • SRT • CEO	• As per previous activation level	• As per previous activation level, AND • SDCC	• Inform all previously notified contacts of Stand Down
AWS	ADVICE	WATCH AND ACT	EMERGENCY	ADVICE

ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO
e.g. taking photographs/video, dam inspections, instrument readings

IC [redacted]
DSTDM [redacted]

Table 17: Flood Operations LEC and IC communication plan					
Activation Level	**Trigger for communications**	**Group to contact**	**Method**	**Message text**	**AWS**
Alert	• Storage above FSL 562.71 m	• LDMG 1 • LDMG 2 • DDMG	• Phone	Describe current situation with dam—What is the event? What is the status? Advise of current storage level	**ADVICE**
		• D/S Residents	• SMS • (Phone for those without mobiles)	**Liaise with Sunwater Media on call, LDMG(s), FODM and/or DSTDM to send appropriate messaging** **Refer to Annexe for sample message**	
Lean Forward	• Storage above EL 566.04 m	• LDMG 1 • LDMG 2 • DDMG	• Phone	Describe current situation with dam—What is the event? What is the status? (Storage is greater than flood of record) Advise of current storage level Advise of any forecasts you are aware of	**WATCH AND ACT**
		• D/S Residents	• SMS • (Phone for those without mobiles)	**Liaise with Sunwater Media on call, LDMG(s), FODM and/or DSTDM to send appropriate messaging** **Refer to Annexe for sample message**	
Stand Up	• Storage above EL 569.21 m (allowing wave action), OR • As advised by the DSTDM • Dam failure possible but not in progress	• LDMG 1 • LDMG 2 • DDMG	• Phone	Describe current situation with dam—What is the event? *(Overtopping of crest)* What is the status? (Dam failure possible but not in progress) Advise of current storage level Advise of any forecasts you are aware of	**EMERGENCY**
		• SDCC	• Phone & Email	Complete Emergency Alert Request form if required and email to the SDCC	
		• D/S Residents	• SMS • (Phone for those without mobiles)	**Liaise with Sunwater Media on call, LDMG(s), FODM and/or DSTDM to send appropriate messaging** **Refer to Annexe for sample message**	
	• Dam failure in progress	• LDMG 1 • LDMG 2 • DDMG	• Phone	Describe current situation with dam—What is the event? (Overtopping of crest) What is the status? (Dam failure in progress) Advise of current storage level Advise of any forecasts you are aware of	
		• SDCC	• Phone & Email	Complete Emergency Alert Request form if required and email to the SDCC	
		• D/S Residents	• SMS (Phone for those without mobiles)	**Liaise with Sunwater Media on call, LDMG(s), FODM and/or DSTDM to send appropriate messaging** **Refer to Annexe for sample message**	

Table 17: Flood Operations LEC and IC communication plan					
Activation Level	Trigger for communications	Group to contact	Method	Message text	AWS
Stand Down	• Storage level EL 563.00 m and falling, no more rain observed in prior 12 hours	• D/S Residents	• SMS • (Phone for those without mobiles)	Liaise with Sunwater Media on call, LDMG(s), FODM and/or DSTDM to send appropriate messaging Refer to Annexe for sample message	ADVICE
		• LDMG 1 • LDMG 2 • DDMG • SDCC	• Phone	Describe current situation with dam—What is the event? What is the status? Advise of current storage level Advise EAP has been deactivated	

[redacted] Sunwater Customer Support 24-hour contact line

ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO
e.g. taking photographs/video, dam inspections, instrument readings

IC [redacted]
DSTDM [redacted]

Table 18: Flood Operations DSTDM emergency action				
Activation Level	**Alert**	**Lean Forward**	**Stand Up**	**Stand Down**
Activation trigger	• Storage above FSL 562.71 m	• Storage above EL 566.04 m • (flood of record—April 1989)	• Storage above EL 569.21 m (allowing wave action), OR • As advised by the DSTDM	• Storage level EL 563.00 m and falling, with no forecast increase in EL for the next 48 hours
Actions	• Record all communication • Provide technical advice to DDO and IC as needed • Review surveillance reports and determine if any additional responses are required • Advise DSR of EAP activation	• As per previous activation level	• As per previous activation level, AND • Liaise with the IC and advise on need to recommend evacuations • Monitor situation and assess risks	• Forward all EER material to IC email as required • Return to routine activities
Notifications	• DDO • IC • DSR	• As per previous activation level	• As per previous activation level	• Inform all previously notified contacts of Stand Down
AWS	ADVICE	WATCH AND ACT	EMERGENCY	ADVICE

ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO
e.g. taking photographs/video, dam inspections, instrument readings

IC [redacted]
DSTDM [redacted]

Activation trigger	• Storage above FSL 562.71 m	• Storage above EL 566.04 m (flood of record—April 1989)	• Storage above EL 569.21 m (allowing wave action), OR • As advised by the DSTDM	• Storage level EL 563.00 m and falling, with no forecast increase in EL for the next 48 hours
Actions	• Provide technical advice to DDO, DSTDM and IC as needed • Inform IC of any EAP decisions made • Review SDCC reports and determine if any additional responses are required • Undertake inflow assessment as per the OC Procedure and update as necessary • Update and issue Status Updates if required • Record all communication and decisions made	• As per previous activation level	• As per previous activation level,	• Forward all EER material to IC email as required • Return to routine activities
Notifications	• IC • DDO • DSTDM	• As per previous activation level	• As per previous activation level	• Inform all previously notified contacts of Stand Down
AWS				

ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO
e.g. taking photographs/video, dam inspections, instrument readings

IC [redacted]
DSTDM [redacted]

6. Dam hazard — piping: embankment, foundation, or abutments

6.1. Overview

The emergency action described in this section relates to a potential dam failure due to a piping condition through the embankment (Main Dam or Saddle Dams), foundations, or dam abutment. An early indicator of a piping condition can be an increase in seepage or a new area of seepage. If the seepage water is cloudy or has become cloudy, this may indicate that material is being transported and a pipe is being established.

If a pipe is established and progresses, then a dam failure may result. If a potential pipe is detected early, remedial repairs maybe possible in the form of constructing a filter and weighting zone over the pipe exit if safe to do so.

The flood outlines in Appendix B are there to provide indicative outlines of the maximum potentially affected area of a dam hazard caused by piping. The use of these flood outlines is prescribed below:

- Use the Sunny Day Failure (SDF) outline when a dam failure is in progress or likely due to piping and no concurrent flooding or downstream releases are occurring or expected to occur, or
- Use the Probable Maximum Flood (PMF) outline when a dam failure is in progress or likely due to piping and concurrent flooding or downstream releases are occurring or expected to occur.

NOTE: Definitions for Concurrent Flooding and Downstream Releases are provided in section 1.3.

6.1.1. Assessment of circumstances that indicate an increase in the likelihood of piping

An increase in seepage or a new area of seepage is a circumstance that could indicate an increased likelihood of piping. This circumstance is the trigger for the Alert status for piping.

Cloudy seepage water is a circumstance that could indicate an increased likelihood of piping. This circumstance is the trigger for the Lean Forward status for piping.

6.2. Emergency action roles

Table 20 to Table 24 specify emergency actions for the following roles:

- Dam Duty Officer (DDO)
- Local Event Coordinator (LEC)
- Incident Coordinator (IC)
- Dam Safety Technical Decision Maker (DSTDM).

Figure 2: Piping: embankment, foundation, or abutments flowchart

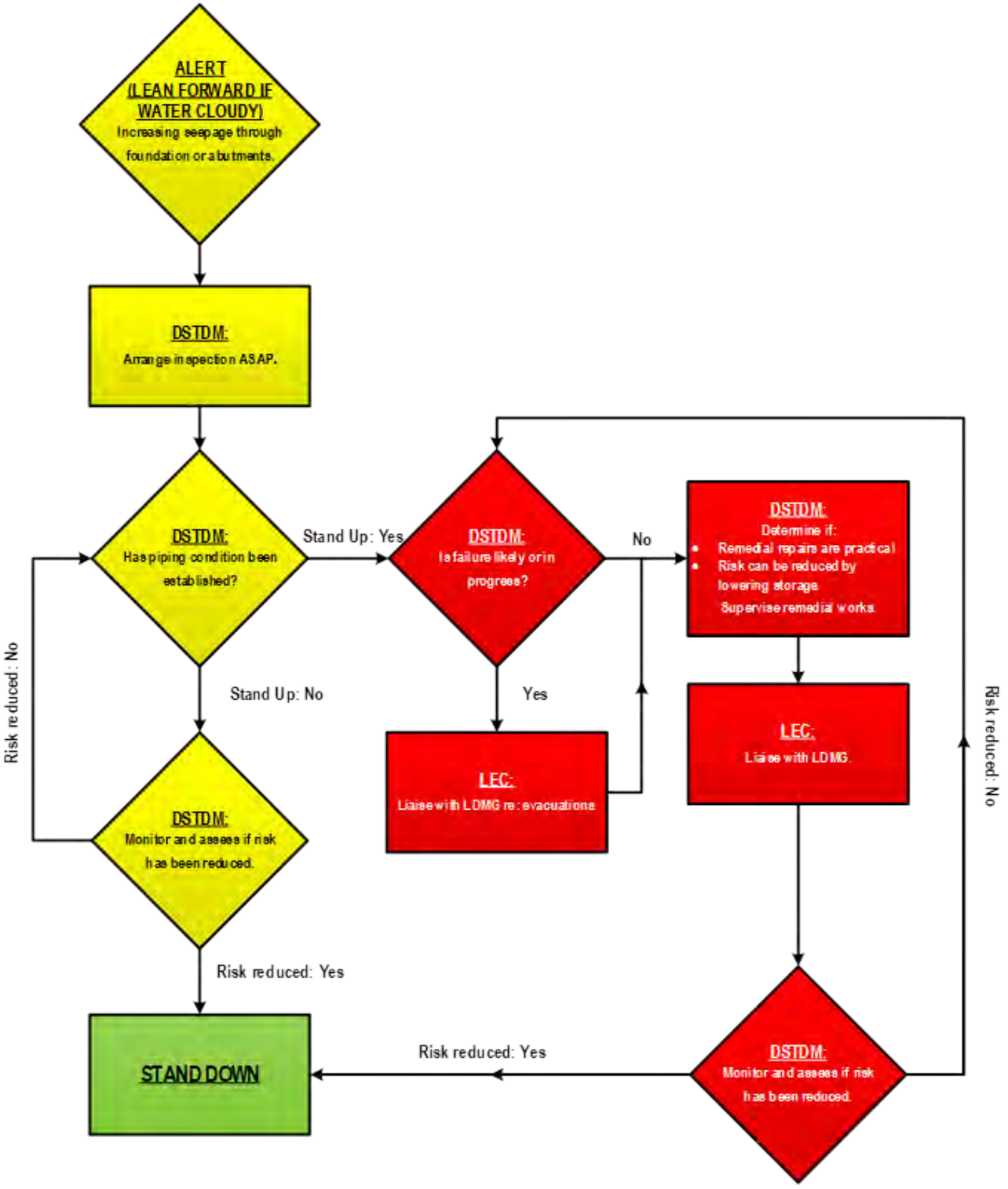


Table 20: Piping: embankment, foundation, or abutments DDO emergency action					
Activation Level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Down
Activation trigger	• Increasing leakage through the embankment, the foundations, or abutments	• Increasing leakage through the embankment, the foundations, or abutments with cloudy water	• Piping condition has been established	• Failure in progress or likely due to piping, AND • Sufficient water in storage to create a dam hazard	• Risk assessment has determined that piping risk has reduced
Actions	• Record all communication • Monitor flows every 6 hours (or as otherwise instructed by the DSTDM) until a decreasing trend is observable, or as directed by the IC • Photograph/video the piping from a safe point and record using the approved forms in the HMT and send to IC & DSTDM • Update Operating Log as per SOP 12	• As per previous activation level	• As per previous activation level, AND • Support/supervise remedial works as required • Lower the storage if directed • Close any affected roads as directed and move on any members of the public • Maintain surveillance of area immediately downstream of dam (if safe to do so) move on any members of the public	• As per previous activation level, AND • Ensure remedial works cease and plant and personnel have been moved to a safe location • Vacate the immediate vicinity of the piping condition • Record/photograph the piping damage and/or dam failure from a safe point	• Inspect the dam for any damage and photograph any damage identified during the event • Forward all EER material to IC email as required • Update Operating Log as per SOP 12 • Return to routine activities
Notifications	• DSTDM • IC • SO • LEC/ORR	• As per previous activation level	• As per previous activation level	• As per previous activation level	• Inform all previously notified contacts of Stand Down

ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO
e.g. taking photographs/video, dam inspections, instrument readings

IC [redacted]
DSTDM [redacted]

Table 21: Piping: embankment, foundation, or abutments LEC emergency action					
Activation Level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Down
Activation trigger	• Increasing leakage through the embankment, the foundations, or abutments	• Increasing leakage through the embankment, the foundations, or abutments with cloudy water	• Piping condition has been established	• Failure in progress or likely due to piping, AND • Sufficient water in storage to create a dam hazard	• Risk assessment has determined that piping risk has reduced
Actions	• Record all communication • **NOTE: IC to do all LEC external notifications until LDMG 1 is stood up**	• As per previous activation level	• As per previous activation level, AND • Liaise with relevant council(s) regarding potential road/bridge closures	• As per previous activation level	• Forward all EER material to IC email as required • Return to routine activities
Notifications	• IC • DDO • LDMG 1 • LDMG 2 • DDMG	• As per previous activation level	• As per previous activation level	• As per previous activation level	• Inform all previously notified contacts of Stand Down

ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO
e.g. taking photographs/video, dam inspections, instrument readings

IC [redacted]
DSTDM [redacted]

Table 22: Piping: embankment, foundation, or abutments — IC emergency action					
Activation Level	**Alert**	**Lean Forward**	**Stand Up 1**	**Stand Up 2**	**Stand Down**
Activation trigger	• Increasing leakage through the embankment, the foundations, or abutments	• Increasing leakage through the embankment, the foundations, or abutments with cloudy water	• Piping condition has been established	• Failure in progress or likely due to piping, AND • Sufficient water in storage to create a dam hazard	• Risk assessment has determined that piping risk has reduced
Actions	• Record all communication • Update Sunwater intranet with EAP status • **Note: IC to do all LEC external notifications until LDMG 1 is stood up**	• As per previous activation level, AND • Investigate availability of machinery and materials (if insufficient stockpiles available) • Place machinery operators on standby if directed by DSTDM • Consider the need to appoint a Sunwater Recovery Coordinator. The Sunwater Recovery Coordinator is responsible for the follow through on actions to close out all matters and works outstanding after the initial emergency is over. • Confirm EAs and other messages are prepared in advance – if required.	• As per previous activation level, AND • Liaise with Sunwater Media On-call to send SMS to D/S residents and phone those without mobiles • Mobilise resources to undertake remedial works if directed by DSTDM.	• As per previous activation level, AND • Liaise with the DSTDM to confirm that dam failure is in progress • Confirm that remedial works have ceased if directed by the DSTDM and plant and personnel have been moved to a safe location • Liaise with DDO and DSTDM re: potential for evacuations	• Compile EER and deliver to DSR if required • Update Sunwater intranet with dam status • Return to routine activities
Notifications	• DDO • LEC/ORR • SMT • SRT • CEO	• As per previous activation level	• As per previous activation level, AND • D/S Residents • SDCC	• As per previous activation level	• Inform all previously notified contacts of Stand Down

ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO
e.g. taking photographs/video, dam inspections, instrument readings

IC [redacted]
DSTDM [redacted]

Table 23: Piping: embankment, foundation, or abutments LEC and IC external communication plan				
Activation Level	**Trigger for communications**	**Group to contact**	**Method**	**Message text**
Alert	• Increase in leakage through an embankment, the foundations, or abutments	• LDMG 1 • LDMG 2 • DDMG	• Phone	Describe current situation with dam—What is the event? *(Unconfirmed piping risk)* What is the status? (Unconfirmed leakage—Investigation continues) Advise of current storage level Advise any issues you are aware of Standby for further advice
Lean Forward	• Increase in leakage through an embankment, the foundations, or abutments with cloudy water	• LDMG 1 • LDMG 2 • DDMG	• Phone	Describe current situation with dam—What is the event? *(Unconfirmed piping risk)* What is the status? (Unconfirmed leakage—Investigation continues) Advise of current storage level Advise any issues you are aware of Standby for further advice
Stand Up 1	• Piping condition has been established	• LDMG 1 • LDMG 2 • DDMG	• Phone	Describe current situation with dam—What is the event? *(Confirmed piping risk)* What is the status? (Confirmed piping/leakage) Advise of current storage level Advise any issues you are aware of. Discuss any potential road/bridge closures Prepare for possible evacuations
		• SDCC	• Phone & Email	Complete Emergency Alert Request form if required and email to the SDCC
		• D/S Residents	• SMS (Phone for those without mobiles)	**Liaise with Sunwater Media on call, LDMG(s) and DSTDM to send appropriate messaging. Refer to Annexe for sample message.**

[redacted] Sunwater Customer Support 24-hour contact line

Piping: embankment, foundation, or abutments	LEC and IC external communication plan (continued)			
Activation Level	**Trigger for communications**	**Group to contact**	**Method**	**Message text**
Stand Up 2	• Failure likely due to piping, AND • Sufficient water in storage to create a dam hazard	• LDMG 1 • LDMG 2 • DDMG	• Phone	Describe current situation with dam—What is the event? *(Confirmed piping risk)* What is the status? (Possible dam failure) Advise of current storage level Prepare coordinated evacuations
		• SDCC	• Phone & Email	Complete Emergency Alert Request form if required and email to the SDCC
		• D/S Residents	• SMS • (Phone for those without mobiles)	**Liaise with Sunwater Media on call, LDMG(s) and DSTDM to send appropriate messaging. Refer to Annexe for sample message.**
	• Dam failure in progress	• LDMG 1 • LDMG 2 • DDMG	• Phone	Describe current situation with dam—What is the event? *(Confirmed piping risk)* What is the status? (Dam failure in progress) Advise of current storage level
		• SDCC	• Phone & Email	Complete Emergency Alert Request form if required and email to the SDCC
		• D/S Residents	• SMS • (Phone for those without mobiles)	**Liaise with Sunwater Media on call, LDMG(s) and/or DSTM to send appropriate messaging. Refer to Annexe for sample message.**
Stand Down	• Risk assessment has determined that piping risk has reduced	• D/S Residents	• SMS • (Phone for those without mobiles)	**Liaise with Sunwater Media on call, LDMG(s) and DSTDM to send appropriate messaging. Refer to Annexe for sample message.**
		• LDMG 1 • LDMG 2 • DDMG • SDCC	• Phone	Describe current situation with Dam—What is the event? *(Dam Safety Risk—piping)* What is the status? (Dam Hazard Stood Down) Advise risk assessment has determined that piping risk has reduced, and EAP has been deactivated

[redacted] Sunwater Customer Support 24-hour contact line

Activation trigger	• Increasing leakage through the embankment, the foundations, or abutments	• Increasing leakage through the embankment, the foundations or abutments with cloudy water	• Piping condition has been established	• Failure in progress or likely due to piping, AND • Sufficient water in storage to create a dam hazard	• Risk assessment has determined that piping risk has reduced
Actions	• Record all communication • Arrange an inspection of the dam to assess its condition as soon as possible, when safe to do so • Determine if piping condition has been established • Monitor situation (including instrumentation data if available) and assess risks • Advise DSR of EAP activation	• As per previous activation level	• As per previous activation level, AND • Assess risk and determine if failure likely or in progress • Determine if remedial repairs are practical • Determine if risks can be reduced by lowering storage (if the storage is required to be drawn down, then the DSTDM needs to assess the maximum rate of drawdown based on latest available data and advise in writing to IC and DDO) • Supervise remedial repairs (if applicable). Supervise means provide technical oversight to the work. It does not necessarily mean on-site supervision. • Monitor situation and assess risks	• As per previous activation level, AND • Liaise with the IC and advise on need to recommend evacuations	• Forward all EER material to IC email as required • Return to routine activities
Notifications	• DDO • IC • DSR	• As per previous activation level	• As per previous activation level	• As per previous activation level	• Inform all previously notified contacts of Stand Down

ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO
e.g. taking photographs/video, dam inspections, instrument readings

IC [redacted]
DSTDM [redacted]

7. Dam hazard — earthquake

7.1. Overview

The emergency action described in this section relates to a potential dam failure due to an earthquake causing damage to the dam embankment (Main Dam or Saddle Dams), foundations, or dam abutment. Damage could take the form of cracking or slumping of the embankment, deformation or land slip, or increased seepage.

If damage does occur, then a dam failure may result. If damage is detected early, remedial repairs may be possible depending on the nature of the damage.

The flood outlines in Appendix B are there to provide indicative outlines of the maximum potentially affected area of a dam hazard caused by earthquake damage. The use of these flood outlines is prescribed below:

- Use the Sunny Day Failure (SDF) outline when a dam failure is in progress or likely due to earthquake damage and no concurrent flooding or downstream releases are occurring or expected to occur, or
- Use the Probable Maximum Flood (PMF) outline when a dam failure is in progress or likely due to earthquake damage and concurrent flooding or downstream releases are occurring or expected to occur.

NOTE: Definitions for Concurrent Flooding and Downstream Releases are provided in section 1.3.

7.2. Emergency action roles

Table 25 to Table 29 specify emergency actions for the following roles:

- Dam Duty Officer (DDO)
- Local Event Coordinator (LEC)
- Incident Coordinator (IC)
- Dam Safety Technical Decision Maker (DSTDM).

Figure 3: Earthquake flowchart

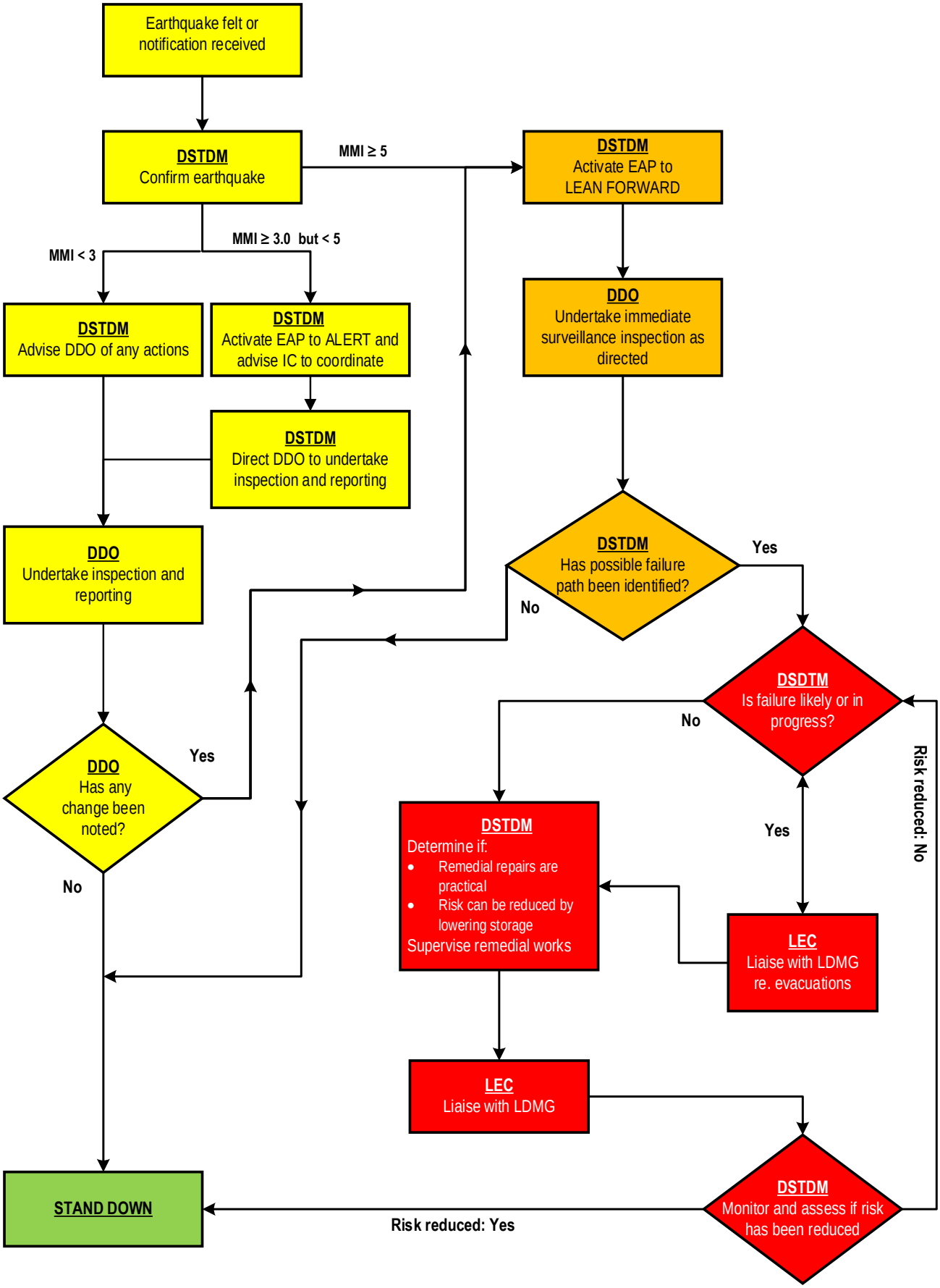


Table 25: Earthquake DDO emergency action					
Activation Level	**Alert**	**Lean Forward**	**Stand Up 1**	**Stand Up 2**	**Stand Down**
Activation trigger	• Earthquake **confirmed** (by DSTDM) or felt in the area, AND • Intensity less than 5 MMI	• Earthquake **confirmed** (by DSTDM) or felt in the area, AND • Intensity greater than or equal to 5 MMI, OR • Intensity less than 5 MMI and change detected during surveillance inspection	• Earthquake **confirmed** (by DSTDM) or felt in the area, AND • A possible failure path has been identified	• Failure in progress or likely due to earthquake, AND • Sufficient water in storage to create a dam hazard	• Risk assessment has been determined that failure risk has reduced
Actions	• **Confirmed** is defined as an earthquake alert received from Geoscience Australia that advises that an earthquake has occurred with an intensity ≥3.0 MMI at the dam • If an earthquake is felt in the area, the DDO is to contact the DSTDM as soon as reasonably practicable • If an earthquake is **confirmed** by the DSTDM, the DSTDM will direct the DDO to carry out inspection of the dam and associated structures • A record of all inspections, including photographs, videos, and condition reports (using the approved forms) is to be sent to DSTDM for review as soon as reasonably practical • The condition report must include, at a minimum, records of instrumentation readings, leaks, deformation, erosion, structural damage and any observed uncontrolled releases • The DDO is to update Operating Log as per SOP 12 • Record all Communication	• As per previous activation level, AND • Repeat the inspection as directed by the DSTDM	• As per previous activation level, AND • Support/supervise remedial work as directed by the DSTDM • Lower the storage if directed by the DSTDM • Liaise with IC regarding potential road closure • Maintain surveillance of area immediately downstream of dam (if safe to do so) and move on any members of the public • Vacate the immediate vicinity of the embankment	• As per previous activation level, AND • Ensure remedial works cease and plant and personnel have been moved to a safe location • Record/photograph the earthquake damage and/or dam failure from a safe point	• Inspect the dam for any damage and photograph any damage identified during the event as directed by the DSTDM • Forward all EER material to IC email as required • The DDO is to update Operating Log as per SOP12 • Return to routine activities
Notifications	• DSTDM • LEC/ORR • IC	• As per previous activation level	• As per previous activation level	• As per previous activation level	• Inform all previously notified contacts of Stand Down

ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO
e.g. taking photographs/video, dam inspections, instrument readings

IC [redacted]
DSTDM [redacted]

Table 26: Earthquake LEC emergency action					
Activation Level	**Alert**	**Lean Forward**	**Stand Up 1**	**Stand Up 2**	**Stand Down**
Activation trigger	• Earthquake **confirmed** (by DSTDM) or felt in the area, AND • Intensity less than 5 MMI	• Earthquake **confirmed** (by DSTDM) or felt in the area, AND • Intensity greater than or equal to 5 MMI, OR • Intensity less than 5 MMI and change detected during surveillance inspection	• Earthquake **confirmed** (by DSTDM) or felt in the area, AND • A possible failure path has been identified	• Failure in progress or likely due to earthquake, AND • Sufficient water in storage to create a dam hazard	• Risk assessment has been determined that failure risk has reduced
Actions	• The LEC is to record all communications • **Note: IC to do all LEC external notifications until LDMG 1 is stood up**	• As per previous activation level	• As per previous activation level, AND • The LEC is to liaise with relevant council(s) regarding potential road/bridge closures	• As per previous activation level	• Forward all EER material to the IC email as required • The LEC is to return to routine activities
Notifications	• IC • DDO • LDMG 1 • LDMG 2	• As per previous activation level, AND • DDMG	• As per previous activation level	• As per previous activation level	• Inform all previously notified contacts of Stand Down

ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO
e.g. taking photographs/video, dam inspections, instrument readings

IC [redacted]
DSTDM [redacted]

Table 27: Earthquake — IC emergency action

Activation trigger	• Earthquake **confirmed** (by DSTDM) or felt in the area, AND • Intensity less than 5 MMI	• Earthquake **confirmed** (by DSTDM) or felt in the area, AND • Intensity greater than or equal to 5 MMI, OR • Intensity less than 5 MMI and change detected during surveillance inspection	• Earthquake **confirmed** (by DSTDM) or felt in the area, AND • A possible failure path has been identified	• Failure in progress or likely due to earthquake, AND • Sufficient water in storage to create a dam hazard	• Risk assessment has been determined that failure risk has reduced
Actions	• When the IC is advised by the DSTDM that an earthquake has occurred with an intensity of ≥3.0 MMI at the dam, the IC is to coordinate the EAP to ALERT • The IC is to send notifications to nominated parties as listed in the notifications table below • The IC is to advise the DSTDM when all notifications have been sent • The IC is to record all communications • **Note: IC to do all LEC external notifications until LDMG 1 is stood up**	• As per previous activation level, AND • Investigate availability of machinery and materials (if insufficient stockpiles available) • The IC is to place machinery operators on standby if directed to do so by the DSTDM • The IC is to assess the need to appoint a Sunwater Recovery Coordinator. The Sunwater Recovery Coordinator is responsible for the follow through on actions to close out all matters and works outstanding after the initial emergency is over. • Confirm EA and other messages are prepared in advance – if required.	• As per previous activation level, AND • Liaise with Sunwater Media On-call to send SMS and email to D/S residents and phone those without mobiles • The IC is to coordinate resources to undertake remedial works if directed by DSTDM	• As per previous activation level • The IC is to liaise with the DSTDM who is to confirm that dam failure is in progress • The IC is to confirm that any remedial works have ceased if directed to do so by the DSTDM and the plant and personnel have been moved to a safe location • The IC is to liaise with DDO and DSTDM regarding the potential needfor evacuations	• Complete all internal and external notifications • Compile EER and deliver to DSR if required • Update Sunwater intranet with dam status
Notifications	• DDO • DSTDM • SRT • CEO	• As per previous activation level	• As per previous activation level, AND • D/S Residents • SDCC	• As per previous activation level	• Inform all previously notified contacts of Stand Down

ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO
e.g. taking photographs/video, dam inspections, instrument readings

IC [redacted]
DSTDM [redacted]

Table 28: Earthquake LEC and IC external communication plan				
Activation Level	**Trigger for communications**	**Group to contact**	**Method**	**Message text**
Alert	• Earthquake **confirmed** (by DSTDM) or felt in the area, AND • Intensity less than 5 MMI	• LDMG 1 • LDMG 2	• Phone	Describe current situation with dam—What is the event? *(Dam safety risk—Earthquake damage)* What is the status? (Under investigation) Advise of current storage level Stand by for further information
Lean Forward	• Earthquake **confirmed** (by DSTDM) or felt in the area, AND • Intensity greater than or equal to 5 MMI, OR • Intensity less than 5 MMI and change detected during surveillance inspection	• LDMG 1 • LDMG 2 • DDMG	• Phone	Describe current situation with dam—What is the event? *(Dam safety risk—Earthquake damage)* What is the status? (Under investigation) Advise of current storage level Stand by for further information
Stand Up 1	• Earthquake **confirmed** (by DSTDM) or felt in the area, AND • A possible failure path has been identified	• LDMG 1 • LDMG 2 • DDMG	• Phone	Describe current situation with dam—What is the event? *(Dam safety risk—Earthquake felt or reported in area)* What is the status? (Possible earthquake damage to dam) Advise of current storage level. Discuss any potential road/bridge closures LDMG to activate LDMP
		• SDCC	• Phone & Email	Complete Emergency Alert Request form if required and email to the SDCC
		• D/S Residents	• SMS (Phone for those without mobiles)	**Liaise with Sunwater Media on call, LDMG(s) and DSTM to send appropriate messaging.** **Refer to Annexe for sample message.**

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	• Failure likely due to earthquake, AND • Sufficient water in storage to create a dam hazard	• LDMG 1 • LDMG 2 • DDMG	• Phone	Describe current situation with dam—What is the event? *(Dam safety risk—Earthquake damage)* What is the status? (Dam failure likely) Advise of current storage level. Discuss any potential road/bridge closures (if not discussed at Stand Up 1) LDMG to activate LDMP
		• SDCC	• Phone & Email	Complete Emergency Alert Request form if required and email to the SDCC
		• D/S Residents	• SMS • (Phone for those without mobiles)	**Liaise with Sunwater Media on call, LDMG(s) and DSTM to send appropriate messaging.** **Refer to Annexe for sample message.**
	• Dam failure in progress	• LDMG 1 • LDMG 2 • DDMG	• Phone	Describe current situation with dam—What is the event? *(Dam safety risk—Earthquake damage)* What is the status? (Dam failure in progress) Advise of current storage level LDMG to activate LDMP
		• SDCC	• Phone & Email	Complete Emergency Alert Request form if required and email to the SDCC
		• D/S Residents	• SMS • (Phone for those without mobiles)	**Liaise with Sunwater Media on call, LDMG(s) and DSTM to send appropriate messaging.** **Refer to Annexe for sample message.**
	• Risk assessment has determined that failure risk has reduced	• D/S Residents	• SMS • (Phone for those without mobiles)	**Liaise with Sunwater Media on call, LDMG(s), and DSTM to send appropriate messaging.** **Refer to Annexe for sample message.**
		• LDMG 1 • LDMG 2 • DDMG • SDCC	• Phone	Describe current situation with dam—What is the event? *(Dam safety risk—Earthquake damage)* What is the status? (Dam hazard stood down) Advise risk assessment has been determined that failure risk has reduced, and that EAP has been deactivated

[redacted] Sunwater Media
On-call 24-hour contact line

Activation trigger	• Earthquake **confirmed** or felt in the area, AND • Intensity less than 5 MMI	• Earthquake **confirmed** or felt in the area, AND • Intensity greater than or equal to 5 MMI, OR • Intensity less than 5 MMI and change detected during surveillance inspection	• Earthquake **confirmed** or felt in the area, AND • A possible failure path has been identified	• Failure in progress or likely due to earthquake, AND • Sufficient water in storage to create a dam hazard	• Risk assessment has been determined that failure risk has reduced
Actions	• **Confirmed** is defined as an earthquake alert received from Geoscience Australia that advises an earthquake with an intensity ≥3.0 MMI has occurred at the dam • If an earthquake is **confirmed,** the DSTDM is to direct the IC to coordinate the EAP to ALERT • If an earthquake is **confirmed,** the DSTDM will direct the DDO to carry out inspections of the dam and associated structures • The DSTDM is to advise the DSR of the EAP activation to ALERT • The DSTDM is to monitor situation at the dam and associated structures and continue to assess the risks • The DSTDM is to record all communications	• As per previous activation level, AND • The DSTDM is to review all surveillance inspections undertaken at the dam and assess its condition as soon as possible • Determine if there are any possible failure paths from damage reported	• As per previous activation level, AND • The DSTDM is to arrange an inspection of the dam and the associated structures and assess the condition as soon as possible, when safe to do so • The DSTDM is to assess risk and determine if failure likely or in progress • The DSTDM is to determine if remedial repairs are practical • The DSTDM is to determine if risks can be reduced by lowering storage (if the storage is required to be drawdown, then the DSTDM needs to assess the maximum rate of drawdown based on latest available data and provide the necessary advice in writing to IC and DDO) • The DSTDM is to provide technical support and oversight of any remedial repairs (if applicable) • The DSTDM is to monitor situation at the dam and associated structures and continue to assess the risks	• As per previous activation level	• Forward all EER material to IC email as required • The DSTDM is to return to routine activities
Notifications	• DDO • IC • DSR	• As per previous activation level	• As per previous activation level	• As per previous activation level	• Inform all previously notified contacts of Stand Down

ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO
e.g. taking photographs/video, dam inspections, instrument readings

IC [redacted]
DSTDM [redacted]

8. Dam hazard — terrorist threat/activity or high energy impact

8.1. Overview

The emergency action described in this section relates to a potential dam failure due to a terrorist threat or activity or a high energy impact on the dam such as a plane crash or meteorite.

The vulnerability of Eungella Dam to a terrorist attack is low.

The flood outlines in Appendix B are there to provide indicative outlines of the maximum potentially affected area of a dam hazard caused by a terrorist attack or a high energy impact. The use of these flood outlines is prescribed below:

- Use the Sunny Day Failure (SDF) outline when a dam failure is in progress or likely due to a terrorist attack or a high energy impact and no concurrent flooding or downstream releases are occurring or expected to occur, or
- Use the Probable Maximum Flood (PMF) outline when a dam failure is in progress or likely due to a terrorist attack or a high energy impact and concurrent flooding or downstream releases are occurring or expected to occur.

NOTE: Definitions for Concurrent Flooding and Downstream Releases are provided in section 1.3.

8.1.1. Assessment of circumstances that indicates an increase in the likelihood of terrorist activity or high energy impact

Advice from authorities of a specific risk to water infrastructure is a circumstance that could indicate increased likelihood of a terrorist threat. If this were specific enough to name a dam, this circumstance would trigger Stand Up 1 activation level.

8.2. Emergency action roles

Table 30 to Table 34 specify emergency actions for the following roles:

- Dam Duty Officer (DDO)
- Local Event Coordinator (LEC)
- Incident Coordinator (IC)
- Dam Safety Technical Decision Maker (DSTDM).

Figure 4:Terrorist threat/activity or high energy impact flowchart

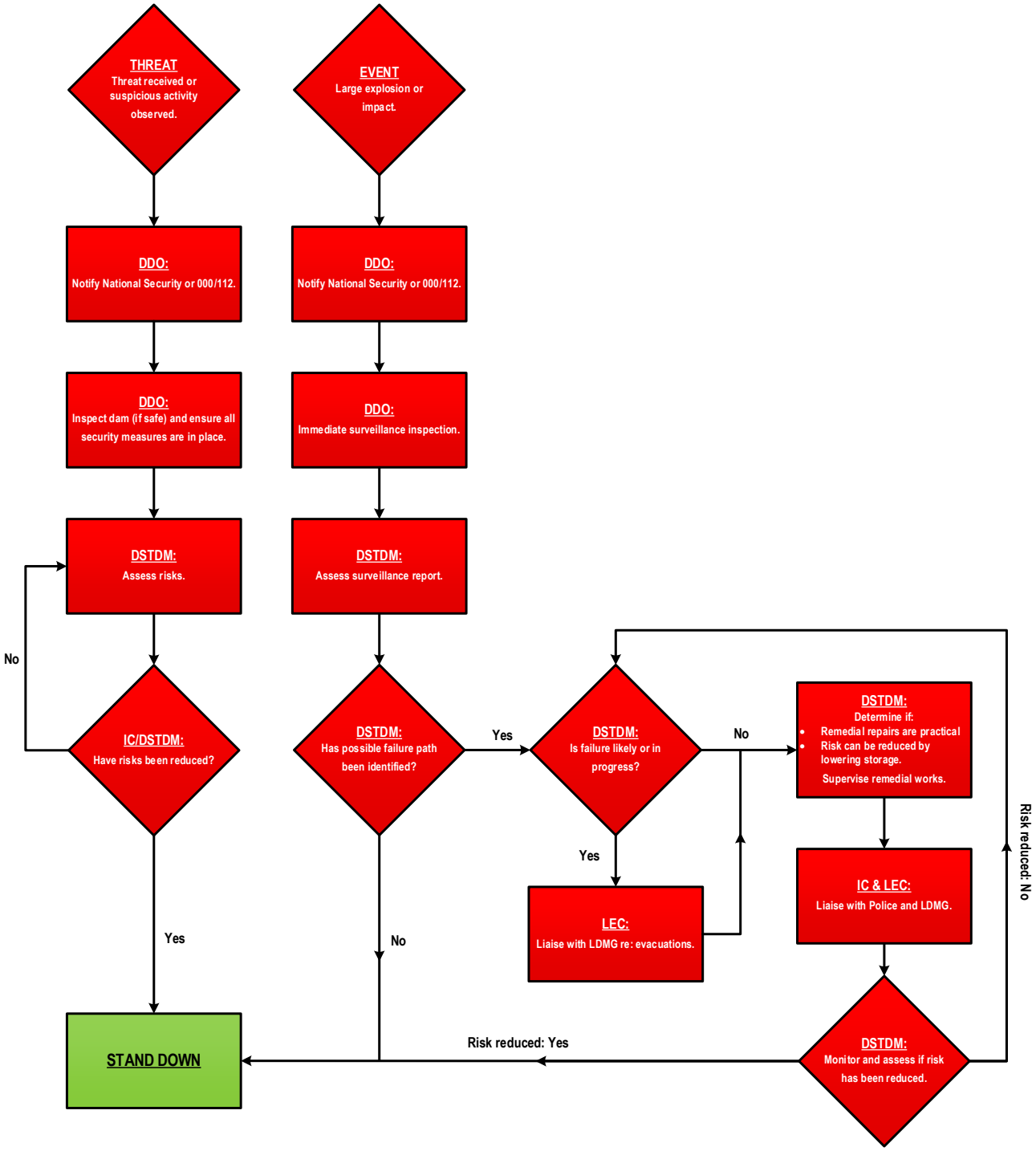


Table 30: Terrorist threat/activity or high energy impact DDO emergency action					
Activation Level	**Alert/Lean Forward**	**Stand Up 1**	**Stand Up 2**	**Stand Up 3**	**Stand Down**
Activation trigger	• Not applicable	THREAT • Possible terrorist activity/suspicious behaviour noticed at the dam • Threat received	EVENT • Large explosion heard/observed at dam (e.g. bomb explosion, aircraft hit)	RESPONSE • Failure in progress or likely due to impact or explosion, AND • Sufficient water in storage to create a dam hazard	• Risk assessment has determined that failure risk has reduced
Actions	• Not applicable	• **In an emergency call 000.** • Record all communication • If any suspicious behaviour noticed, contact DSTDM for advice. If instructed by DSTDM, or if threat received, complete the following: o Inspect dam (if safe) and ensure all o security measures in place (locked gates, etc.) o Photograph/video suspicious items from a safe point and record using the approved forms in the HMT and send to IC & DSTDM • If Police appoint Incident Manager, support and follow instructions • Close any affected roads as directed and move on any members of the public • Update Operating Log as per SOP 12	• As per previous activation level, AND • Undertake surveillance inspection of dam (if safe)	• As per previous activation level, AND • Lower reservoir level, if directed • Record/photograph the damage from a safe point • Vacate the immediate vicinity of the affected area	• Forward all EER material to IC email as required • Update Operating Log as per SOP 12 • Return to routine activities
Notifications	• Not applicable	• **#000 Emergency** • DSTDM • IC • SO • LEC/ORR	• As per previous activation level	• As per previous activation level	• Inform all previously notified contacts of Stand Down

ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO
e.g. taking photographs/video, dam inspections, instrument readings

IC [redacted]
DSTDM [redacted]

Activation trigger	• Not applicable	**THREAT** • Possible terrorist activity/suspicious behaviour noticed at the dam • Threat received	**EVENT** • Large explosion heard/observed at dam (e.g. bomb explosion, aircraft hit)	**RESPONSE** • Failure in progress or likely due to impact or explosion, AND • Sufficient water in storage to create a dam hazard	• Risk assessment has determined that failure risk has reduced
Actions	• Not applicable	• Record all communication • If police appoint Incident Manager, support and follow instructions • Liaise with relevant council(s) regarding possible road/bridge closures • **Note: IC to do all LEC external notifications until LDMG is stood up**	• As per previous activation level	• As per previous activation level, AND • Liaise with DDO, IC, and LDMG re: potential for evacuations	• Forward all EER material to IC email as required • Return to routine activities
Notifications	• Not applicable	• DDO • IC • LDMG 1 • LDMG 2 • DDMG	• As per previous activation level	• As per previous activation level	• Inform all previously notified contacts of Stand Down

ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO
e.g. taking photographs/video, dam inspections, instrument readings

IC [redacted]
DSTDM [redacted]

Table 32: Terrorist threat/activity or high energy impact — IC emergency action

Activation Level	Alert/Lean Forward	Stand Up 1	Stand Up 2	Stand Up 3	Stand Down
Activation trigger	• Not applicable	THREAT • Possible terrorist activity/suspicious behaviour noticed at the dam • Threat received	EVENT • Large explosion heard/observed at dam (e.g. bomb explosion, aircraft hit)	RESPONSE • Failure in progress or likely due to impact or explosion, AND • Sufficient water in storage to create a dam hazard	• Risk assessment has determined that failure risk has reduced
Actions	• Not applicable	• Record all communication • Contact National Security • If Police appoint Incident Manager, support and follow instructions • Update Sunwater intranet with dam status • Consider the need to appoint a Sunwater Recovery Coordinator. The Sunwater Recovery Coordinator is responsible for the follow through on actions to close out all matters and works outstanding after the initial emergency is over. • Confirm EAs and other messages are prepared in advance – if required. • **NOTE: IC to do all LEC external notifications until LDMG is stood up**	• As per previous activation level	• As per previous activation level, AND • Mobilise resources to undertake remedial works if directed by DSTDM	• Compile EER and deliver to DSR if required • Update Sunwater intranet with dam status • Return to routine activities
Notifications	• Not applicable	• CTG • DDO • DSTDM • LEC/ORR • SMT • SRT • CEO	• As per previous activation level, AND • D/S Residents • SDCC	• As per previous activation level	• Inform all previously notified contacts of Stand Down

ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO
e.g. taking photographs/video, dam inspections, instrument readings

IC [redacted]
DSTDM [redacted]

Table 33: Terrorist threat/activity or high energy impact LEC and IC external communication plan				
Activation Level	**Trigger for communications**	**Group to contact**	**Method**	**Message text**
Alert/Lean Forward	• Not applicable	• Not applicable	• Not applicable	• Not applicable
Stand Up 1	**THREAT** • Possible terrorist activity/suspicious behaviour notice at the dam • Threat received	• LDMG 1 • LDMG 2 • DDMG • CTG	• Phone	Describe current situation with dam — What is the event? (Dam safety risk – Security threat/ impact/explosion, etc.) What is the status? (Received/noted terrorist threat) Discuss any potential road/bridge closures LDMG to activate LDMP
Stand Up 2	**EVENT** • Large explosion heard/observed at dam (e.g. bomb explosion, aircraft hit)	• LDMG 1 • LDMG 2 • DDMG • CTG	• Phone	Describe current situation with dam — What is the event? (Dam safety risk – Security threat/ impact/explosion, etc.) What is the status? (Under investigation) Discuss any potential road/bridge closures (if not discussed at Stand Up 1) LDMG to activate LDMP
		• SDCC	• Phone & Email	Complete Emergency Alert Request form if required and email to the SDCC
		• D/S Residents	• SMS • (Phone for those without mobiles)	**Liaise with Sunwater Media on call, LDMG(s), and DSTDM to send appropriate messaging. Refer to Annexe for sample message.**
Stand Up 3	**RESPONSE** • Failure in progress or likely due to impact or explosion, AND • Sufficient water in storage to create a dam hazard	• LDMG 1 • LDMG 2 • DDMG • CTG	• Phone	Describe current situation with dam—What is the event? (Dam safety risk—Security threat/ impact/ explosion, etc.) What is the status? (Dam failure likely/In progress)
		• SDCC	• Phone & Email	Complete Emergency Alert Request form if required and email to the SDCC
		• D/S Residents	• SMS • (Phone for those without mobiles)	**Liaise with Sunwater Media On-call, LDMG(s), and DSTDM to send appropriate messaging Refer to Annexe for sample message.**
Stand Down	• Risk assessment has determined that failure risk has reduced	• D/S Residents	• SMS • (Phone for those without mobiles)	**Liaise with Sunwater Media on call, LDMG(s), and DSTDM to send appropriate messaging. Refer to Annexe for sample message.**
		• LDMG 1 • LDMG 2 • DDMG • SDCC • CTG	• Phone	Describe current situation with dam—What is the event? (Dam safety risk—Security threat/ impact/explosion, etc.) What is the status? (Dam hazard stood down) Advise that failure risk has been reduced and EAP has been deactivated

[redacted] Sunwater Customer Support 24-hour contact line

ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO
e.g. taking photographs/video, dam inspections, instrument readings

IC [redacted]
DSTDM [redacted]

Table 34: Terrorist threat/activity or high energy impact DSTDM emergency action					
Activation Level	**Alert/Lean Forward**	**Stand Up 1**	**Stand Up 2**	**Stand Up 3**	**Stand Down**
Activation trigger	• Not applicable	THREAT • Possible terrorist activity/suspicious behaviour noticed at the dam • Threat received	EVENT • Large explosion heard/observed at dam (e.g. bomb explosion, aircraft hit)	RESPONSE • Failure in progress or likely due to impact or explosion, AND • Sufficient water in storage to create a dam hazard	• Risk assessment has determined that failure risk has reduced
Actions	• Not applicable	• Record all communication • Assess risks	• As per previous activation level, AND • Arrange an inspection of the dam and assess its condition as soon as possible, when safe to do so • Assess risk and determine if failure likely or in progress • Determine if remedial repairs are practical • Determine if risks can be reduced by lowering storage (if the storage is required to be drawn down, then the DSTDM needs to assess the maximum rate of drawdown based on latest available data and advise in writing to IC and DDO) • Supervise remedial repairs (if applicable). Supervise means provide technical oversight to the work. It does not necessarily mean on-site supervision. • Monitor situation (including instrumentation data if available) and assess risks	• As per previous activation level, AND • Liaise with the IC and advise on need to recommend evacuations	• Forward all EER material to IC email as required • Return to routine activities
Notifications	• Not applicable	• DDO • IC • SRT • DSR	• As per previous activation level	• As per previous activation level	• Inform all previously notified contacts of Stand Down

ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO
e.g. taking photographs/video, dam inspections, instrument readings

IC [redacted]
DSTDM [redacted]

9. Other emergency situation — communications failure

9.1. Overview

The emergency action described in this section (other emergency situation — communications failure) relates to either:

- An emergency situation where all means of communication at the Dam site have been lost
- An emergency situation where all means of communication with the Local area have been lost
- An emergency situation where all means of communication with Brisbane site have been lost.

This section specifies actions and provides guidance for the three situations.

9.2. Emergency actions

Due to the large number of different possible scenarios, the table below only covers the most common or likely conditions.

9.3. Activation triggers

Table 35: Communications failure activation trigger summary	
Comms Failure Site	• Unable to communicate to or from dam site (usually affects DDO)
Comms Failure Local Area	• Unable to communicate to or from local area (likely to affect LEC/ORR)
Comms Failure Brisbane	• Unable to communicate to or from Sunwater Brisbane (could affect DSTDM or FODM & will affect IC)

9.3.1. Assessment of the circumstances that indicates the likelihood of communications failure escalating the activation level of a current Dam Hazard

The Operations Centre Duty Officer (OCDO) will assess the weather and flood warnings daily in accordance with the Operations Centre (OC) SOP. The OCDO will escalate to the Flood Operations Decision Maker (FODM) any warnings that have the potential to cause a significant communications failure.

The on-call IC will escalate to the FODM any local intelligence on conditions that could increase the probability of a significant communications failure.

The FODM will determine whether it is reasonably likely that there will be a significant communications failure within the subsequent 24 hours and assess the likely effect on current dam hazards. If required, the FODM will instruct the IC to escalate the activation level of any current dam hazards.

9.3.2. Emergency action roles

Table 36 to Table 38 specify emergency actions for the following roles:

- Dam Duty Officer (DDO)
- Local Event Coordinator (LEC)
- Incident Coordinator (IC)
- Dam Safety Technical Decision Maker (DSTDM)
- Flood Operations Decision Maker (FODM).

9.4. Emergency action roles

Activation trigger	• Unable to communicate to local area including LEC or ORR	• Unable to communicate to Sunwater Brisbane including IC or DSTDM or FODM
Actions	• As much as practicable, assume the role of LEC • Continue tasks in accordance with any other current emergency action • Every hour, attempt communications noting the following: o Mobile phone – try texting instead of voice, much higher probability of success o Satellite phone – needs to access open sky unless external antenna fitted o Social media – e.g. Facebook (Internet may be available via landline) • Record all communication and attempts via Operating Log entries as per SOP 12 and communication log if EAP event is current.	• Determine if LEC is in communication and if not, assume the LEC role as much as is practicable • Continue tasks in accordance with any other current emergency action • Every hour, attempt communications noting the following: o Mobile phone – try texting instead of voice, much higher probability of success o Satellite phone – needs to access open sky unless external antenna fitted o Social media – e.g. Facebook (Internet may be available via landline) • Record all communication and attempts via Operating Log entries as per SOP 12 and communications log if EAP event is current
Notifications	• IC • SO	• IC • SO

ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO
e.g. taking photographs/video, dam inspections, instrument readings

IC [redacted]
DSTDM [redacted]

Activation trigger	• Unable to communicate to dam site	• Unable to communicate to Sunwater Brisbane including IC or DSTDM or FODM
Actions	• Every hour, attempt communications by any and all means noting the following: o Mobile phone – try texting instead of voice, much higher probability of success o Satellite phone – needs to access open sky unless external antenna fitted o Social media – e.g. Facebook (Internet may be available via landline) • Record all communication and attempts • Assume that the DDO is carrying out LEC role at site as much as practicable • As much as is practicable, continue other tasks associated with the role in accordance with any other current emergency action	• Every hour, attempt communications by any and all means noting the following: o Mobile phone – try texting instead of voice, much higher probability of success o Satellite phone – needs to access open sky unless external antenna fitted o Social media – e.g. Facebook (Internet may be available via landline) • Record all communication and attempts • Liaise with the DDO and assume IC role • As much as is practicable, continue other tasks associated with the role in accordance with any other current emergency action
Notifications	• IC • DSTDM • SO • LDMG 1 • LDMG 2	• DDO • DSTDM • SO • LDMG 1 • LDMG 2 • DDMG

ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO
e.g. taking photographs/video, dam inspections, instrument readings

IC [redacted]
DSTDM [redacted]

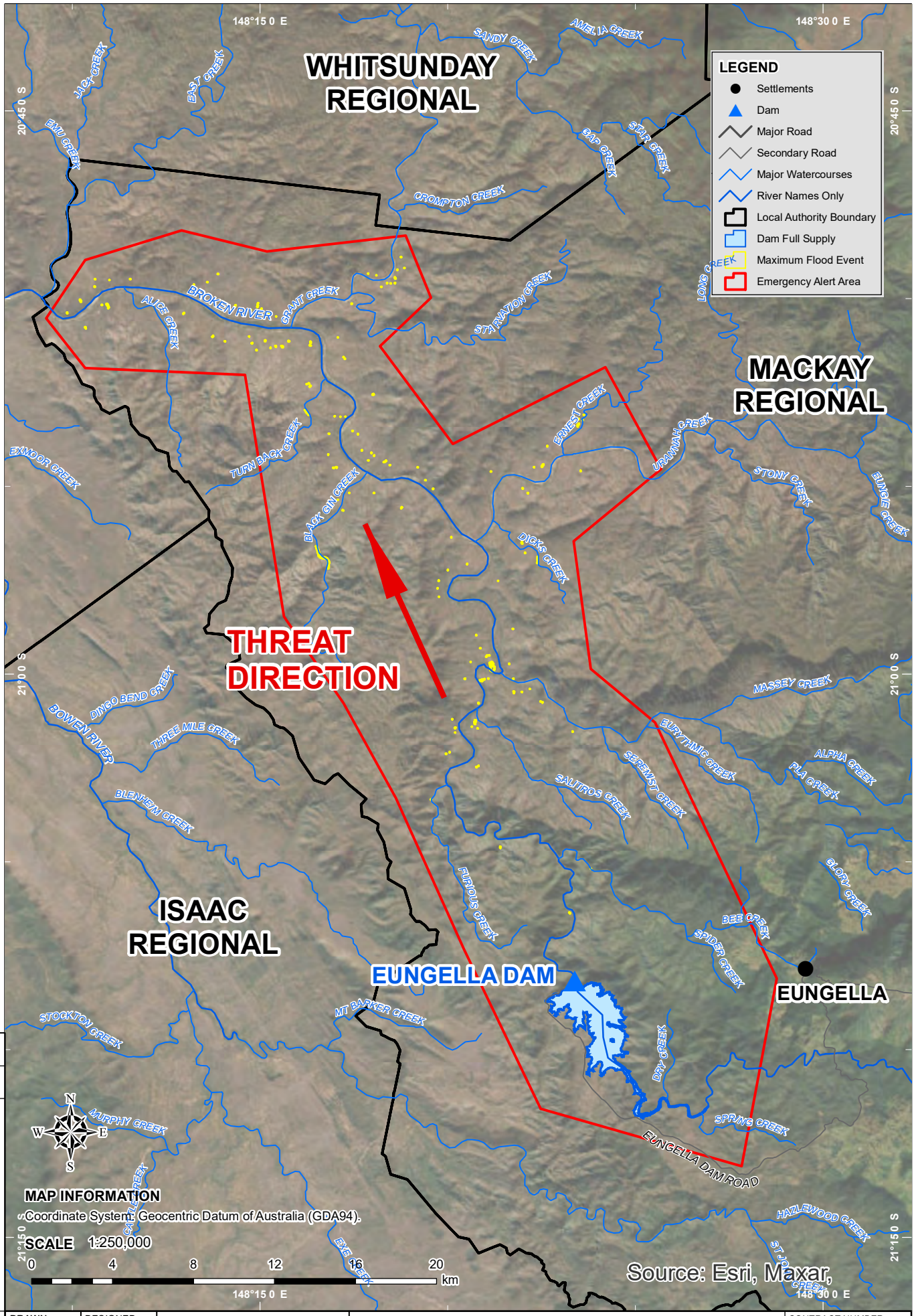
Table 38: Communications failure — IC emergency action		
Activation trigger	• Unable to communicate to dam site	• Unable to communicate to local area including LEC and ORR
Actions	• Every hour, attempt communications by any and all means noting the following: o Mobile phone – try texting instead of voice, much higher probability of success o Satellite phone – needs to access open sky unless external antenna fitted o Social media – e.g. Facebook (Internet may be available via landline) • Record all communication and attempts • As much as is practicable, continue other tasks associated with the role in accordance with any other current emergency action	• Every hour, attempt communications by any and all means noting the following: o Mobile phone – try texting instead of voice, much higher probability of success o Satellite phone – needs to access open sky unless external antenna fitted o Social media – e.g. Facebook (Internet may be available via landline) • Record all communication and attempts • Liaise with the DDO and carry out functions of the LEC as much as practicable • As much as is practicable, continue other tasks associated with the role in accordance with any other current emergency action
Notifications	• LEC/ORR • DSTDM • SO • DDMG	• DDO • DSTDM • SO • LDMG 1 • LDMG 2 • DDMG

ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO
e.g. taking photographs/video, dam inspections, instrument readings

IC [redacted]
DSTDM [redacted]

APPENDIX A NOTIFICATION AND COMMUNICATION LISTS

Appendix A has been redacted



Document: S:\BW Asset Delivery\SW-BW Service Delivery\R-WSRW-38-01-05-01 EAP Mapping\Drawings\ArcMap\Emergency Alerts\249574-C.mxd
Printed: 26/06/2023

MAP PRODUCED BY:
WATER RESOTCES & DAM SAFETY
TEL: (07)3120 0000

REVISION		
26/06/23	C	EA, PMF AREAS UPDATED — MGH
03/09/18	B	ALERT BOUNDARY AMENDED — MB — MH
23/01/18	A	ISSUED FOR USE — MB — MH

DRAWN ES | DESIGNED
CHECKED CP | CHECKED
APPROVED [redacted] 26/06/23

sunwater

EUNGELLA DAM
EMERGENCY ACTION PLAN
EMERGENCY ALERT AREA

CONTRACT NUMBER
DRAWING NUMBER 249574 | REV. C
SHEET 1 OF 1
DATE JUNE 2023

Appendix A7 Dam failure Emergency Alert request

Queensland Emergency Alert request guidelines

An Emergency Alert Request form should be completed, if required (see Section 5 to Section 8 for actions) and sent to the SDCC to activate the dam's emergency polygon.

Instructions

1. Emergency Alert request forms are not to be used UNLESS an Emergency Event has been declared
2. Print the Queensland Emergency Alert request form on the following page
3. Telephone the SDCC on [redacted] or [redacted] and tell them your intention to use the Emergency Alert for an emergency event for Eungella Dam
4. A Polygon for this dam is stored on the Disaster Management Portal. Ask the SDCC operative to locate the polygon. It will be a KML file with the file called Eungella_Dam_Emergency_Polygon
5. Give them your phone number, confirm their name, and end the call after advising the form/s will be sent shortly.
6. Send filled out Emergency Alert request form to SDCC email: SDCC@police.qld.gov.au. The form MUST be sent from a Sunwater email address and come from an authorised Sunwater employee.
7. Phone back SDCC to check that the message has been sent and ask for email confirmation.
8. Create a record to advise of completion of EA campaign

The following text is a copy of that contained in the prefilled Emergency Alert request:

File name	Voice message	SMS
[redacted]	FLOOD EMERGENCY WARNING from Sunwater. People downstream of Yuhn guh luh Dam must LEAVE IMMEDIATELY. Eungella Dam possible failure / is failing. Major flooding is happening now. Your life is at risk. Go now to a safe place away from the flood. Get full warnings and what you should do at Mackay Regional Council disaster dot mackay dot q l d dot gov dot a u and Whitsunday Regional Council disaster dot Whitsunday r c dot q l d dot gov dot a u.	FLOOD EMERGENCY WARNING from Sunwater. People downstream of Eungella Dam must LEAVE IMMEDIATELY. Eungella Dam possible failure / is failing. Major flooding is happening now. Your life is at risk. Go now to a safe place away from the flood. Get full warnings and what you should do at Mackay Regional Council http://disaster.mackay.qld.gov.au and Whitsunday Regional Council http://disaster.whitsundayrc.qld.gov.au

The following page contains a pre-filled copy of the Eungella Dam Emergency Alert request form.

Queensland Government

PHONE THE [redacted] – ADVISE EA IS BEING DEVELOPED

EMERGENCY ALERT REQUEST

Location of Alert: Eungella Dam (e.g. Suburb, Town)	**Date:**
LGA/Agency requesting:	**Time:**

Requesting Officer (e.g. Disaster Coordinator/Incident Controller)
Name:
Agency/Position:

Telephone:
(SDCC Watch Desk may telephone you)

Email:

Advised **LDC/LDMG**: ☐ YES **DDC/DDMG**: ☐ YES **Neighbouring LDMG/LGA**: ☐ YES ☐ N/A

Send Alert **Immediately**: ☐ YES **Scheduled**: ☐ YES Date & Time / / : hrs

Event Type

☐ Cyclone ☐ Storm Tide ☐ Flash Flood ☐ Flood
☐ Bushfire ☐ Fire Incident ☐ Smoke / Toxic Plume ☐ Chemical Spill
☐ Tsunami (Sent as Location Based Text Message ONLY)
☒ Other (please specify): Catastrophic Dam Failure

Distributed by: (Channel)

☒ Voice (Landline only) ☒ SMS – Location Based (Location of phone at time of distribution) ☐ SMS – Service Address Based (Registered billing address)

Message Severity

☒ Emergency Warning (Activates SEWS) ☐ Watch & Act ☐ Advice

Threat Direction Required? (e.g. Dam Spill) ☐ YES ☐ N/A

Threat location indicated on map? Only For Emergency Warning Voice & Service Address SMS ☐ YES ☐ N/A

EA Messaging Filename (Doc, Pdf):

Polygon Filename, (Kml, Kmz, Gml, GeoJSON):

Number of polygons ___ (if multiple, attach list in order of priority)

Supplied via: ☐ DM Portal ☐ Email ☐ Verbal ☐ Other
Other (please specify):

Supplied via: ☐ DM Portal ☐ Email ☐ Verbal ☐ Other
Other (please specify):

Voice: Type or handwrite, max 4000 characters incls spaces. (Ideally message should be < 450 characters)

FLOOD EMERGENCY WARNING from Sunwater. People downstream of Yuhn guh luh Dam must LEAVE IMMEDIATELY. Eungella Dam possible failure / is failing. Major flooding is happening now. Your life is at risk. Go now to a safe place away from the flood. Get full warnings and what you should do at Mackay Regional Council disaster dot mackay dot q l d dot gov dot a u and Whitsunday Regional Council disaster dot Whitsunday r c dot q l d dot gov dot a u.

SMS: Type or handwrite, use capitals for clarity, max 612 characters incls spaces. (Ideally should be < 160 characters incl. spaces)

FLOOD EMERGENCY WARNING from Sunwater. People downstream of Eungella Dam must LEAVE IMMEDIATELY. Eungella Dam possible failure / is failing. Major flooding is happening now. Your life is at risk. Go now to a safe place away from the flood. Get full warnings and what you should do at Mackay Regional Council http:// disaster.mackay.qld.gov.au and Whitsunday Regional Council http://disaster.whitsundayrc.qld.gov.au

Remove EA from websites:

☐ 12 hrs ☐ 24 hrs ☐ 48 hrs ☐ Specify Date & Time: ☐ Check back in 12 hrs:
☐ Replace previous EA message / / : hrs Contact #:_____

Requesting Officer: **Signature:** **Date:** / /

Send to [redacted] to confirm receipt

FOR USE BY SDCC

EA Request Form completed by: SDCC Watch Desk ☐ Requesting Officer ☐

Notification of any delays provided to Requestor: ☐ YES ☐ NO

EA User Name:
Signature: Date: / /

Emergency Alert No:

Authorising Officer Name:
Signature: Date: / /

EMS EA Campaign Report ID:

Report provided to Requestor on EA outcomes: ☐ YES ☐ NO

The EA Manual, EA Quick Reference Guide, EA Request Form Template are available at: www.disaster.qld.gov.au

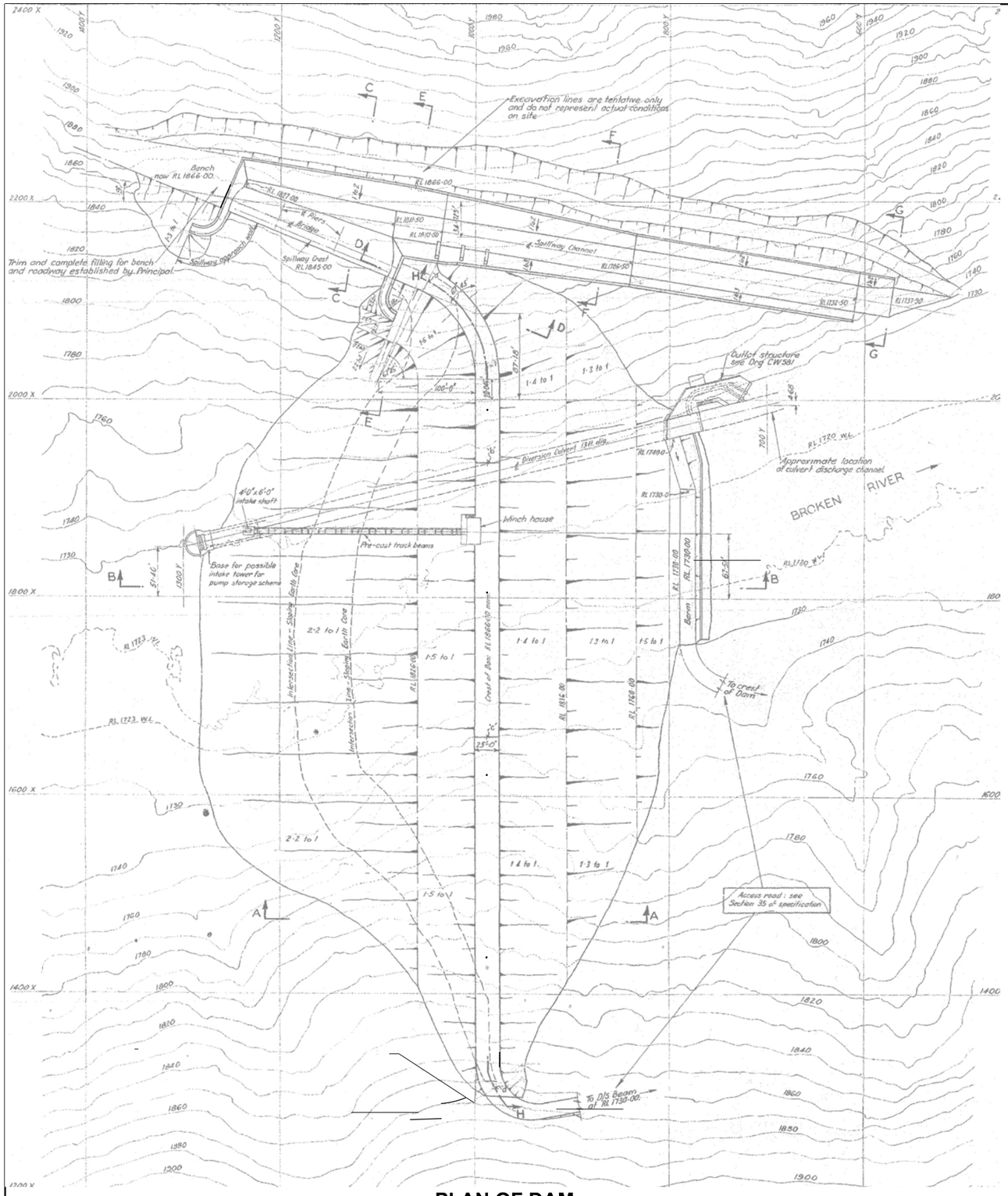
APPENDIX B DRAWINGS AND MAPS

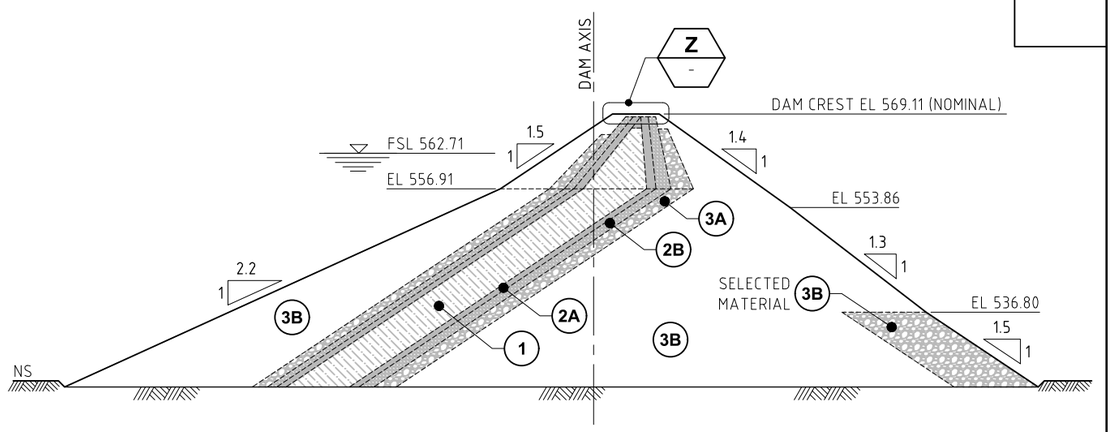
- Drawings
- Downstream Notification Area
- Inundation maps
- Locality Map
- Catchment Area

NOTE: Actual levels may differ from those shown in flood inundation maps due to variations in assumptions made in the models to actual flood events.

Appendix B1 Drawings

- General Arrangement

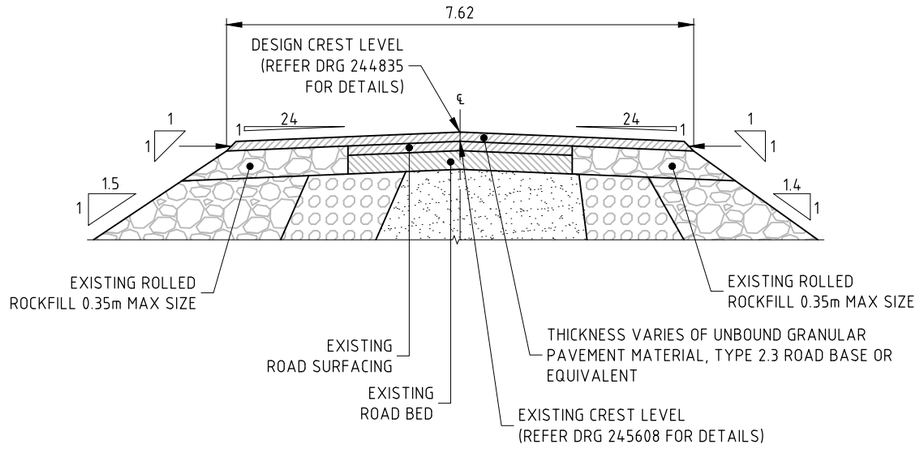




TYPICAL EMBANKMENT SECTION

SECTION A
SCALE 1:1000

Levels on this drawing are in metres
based on BM 961301 = EL 569.976m AHD (Derived)



DETAIL Z
SCALE 1:100

NOTES:

- DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
- LEVELS ARE IN METRES TO AUSTRALIAN HEIGHT DATUM.

EMBANKMENT ZONES

ZONE 1 - SANDY CLAYS AND CLAYS
ZONE 2A - SILTY SAND
ZONE 2B - FILTER ZONE
ZONE 3A - SELECTED SMALL SIZE ROCK FILL
ZONE 3B - ROCK FILL FROM SPILLWAY EXCAVATION

AS BUILT

REVISION						REFERENCE DRAWINGS		
11/02/16	1	AS BUILT	IDH	P. G. RICHARDSON				
11/05/15	0	ISSUED FOR CONSTRUCTION	IDH	P. G. RICHARDSON				
DATE		REMARKS	CKD	PASSED				

SCALES (A3 SIZE)
0 5 10 15 20 25 METRES 1:500
0 10 20 30 40 50 METRES 1:1000
0 25 50 75 METRES 1:1500

DRAWN	DESIGNED
CSS	PGR
CHECKED IDH	CHECKED
APPROVED [redacted]	
11/05/15	RPEQ [redacted]

sunwater
©SUNWATER LIMITED
ACN 131 034 985

EUNGELLA DAM
DAM SAFETY UPGRADE STAGE 1
EMBANKMENT CREST ROAD
GENERAL ARRANGEMENT

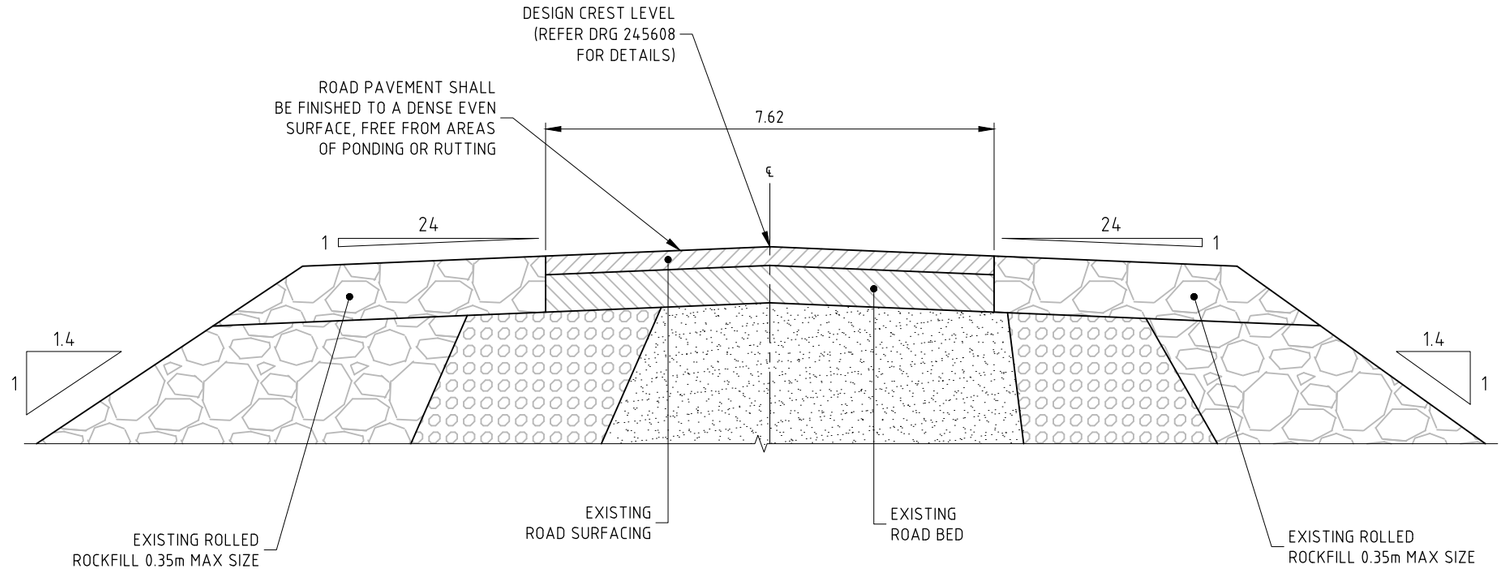
CONTRACT NUMBER

DRAWING NUMBER	REV.
245656	1

SHEET 1 OF 2
DATE MARCH 2015

Drawing Produced By:
Sunwater Ltd
Tel: (07) 3120 0000

CAD File: S:\BW Asset Delivery\SW-Bowen Broken WSS\N-WKBB-04-06-01-AA - Eungella Dam Safety Upgrade Stage 1\Drawings\AutoCAD\245656-1.dwg
DATE PLOTTED: 12 December 2024 12:52 PM BY: ROBERT BALSAXOUT: SHEET-1



SECTION B
SCALE 1:50

SH 1

NOTE:
- REFER SHEET 1 FOR DETAILED NOTES.

AS BUILT

CAD File: S:\BW Asset Delivery\SW-Bowen Broken WSS\N-WKBB-04-06-01-AA - Eungella Dam Safety Upgrade Stage 1\Drawings\AutoCAD\245656-1.dwg
DATE PLOTTED: 12 December 2024 12:53 PM BY : ROBERT BALSAM LAYOUT: SHEET-2

Drawing Produced By:
Sunwater Ltd
Tel: (07) 3120 0000

REVISION						REFERENCE DRAWINGS		
11/02/16	1	AS BUILT	IDH	P. G. RICHARDSON				
11/05/14	0	ISSUED CONSTRUCTION	IDH	P. G. RICHARDSON				
DATE		REMARKS	CKD	PASSED				

SCALES (A3 SIZE)

0 0.5 1.0 1.5 2.0 2.5 METRES
1:50

DRAWN	DESIGNED
CSS	PGR
CHECKED	CHECKED
APPROVED	
11/05/15	RPEQ

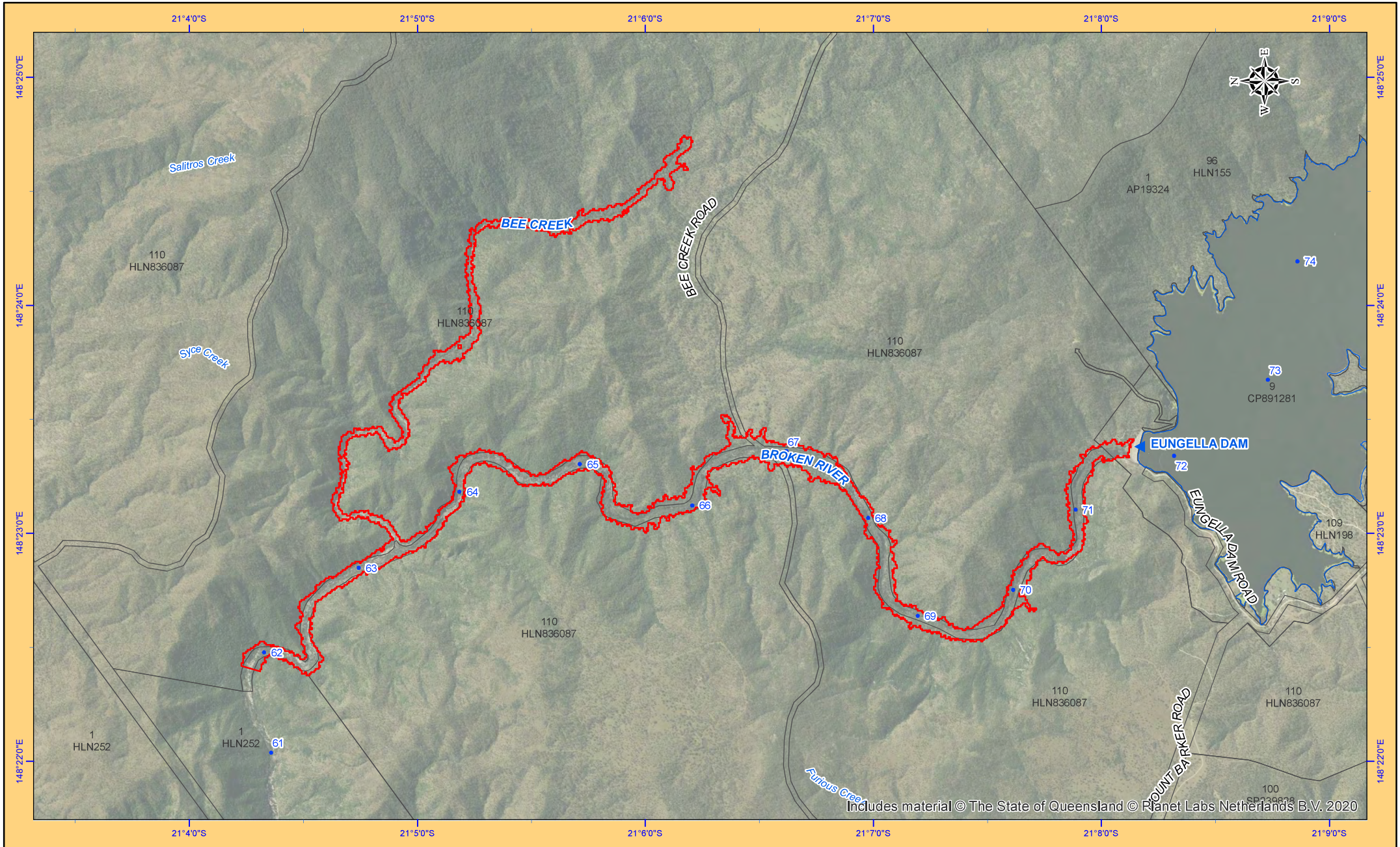
sunwater

EUNGELLA DAM
DAM SAFETY UPGRADE STAGE 1
EMBANKMENT CREST ROAD
GENERAL ARRANGEMENT

CONTRACT NUMBER

DRAWING NUMBER	REV.
245656	1

SHEET 2 OF 2
DATE MARCH 2015



The information and material contained on this map are for general information purposes only, and are not intended to constitute legal or professional advice and should not be relied on or treated as a substitute for specific advice relevant to particular circumstances.
While every care is taken to ensure the accuracy of this product, SunWater makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose.

MAP INFORMATION
Coordinate System: Geocentric Datum of Australia (GDA2020).

SCALE (A4 SIZE)
0 400 800 1,200 1,600 2,000 m 1:40,000

LEGEND
- AMTD (Markers)
- Eungella Dam FSL
- Limit of Downstream Notification Area

EUNGELLA DAM
DOWNSTREAM NOTIFICATION AREA

NOTES
Areas further downstream will become progressively more impacted by other rainfall and inflows that occur downstream of the dam (not shown here).

sunwater

DRAWING No. 250711 B

Document: S:\BW_WaterResources\GIS_Data\SW_Bowen Broken WSS\EungellaDam_CRA2022\Drawings\ArcMap\250711-B.mxd
Printed: Monday, 05/12/2022 07:35:19 AM

Appendix B3 Inundation maps

Drawings:

- Key Map
- Sunny Day Failure (SDF)
- Probable Maximum Flood (PMF)

Disclaimer: Every effort has been made to ensure the currency of the flood inundation maps reproduced in this EAP. However, as the maps have been extracted from external sources, their accuracy cannot be guaranteed. Please refer to the Local Disaster Management Plan for the most current information.

600000 620000 640000 660000 680000

7700000 7680000 7660000

BOWEN RIVER
Bowen River Weir
EMU CREEK
BROKEN RIVER
BOWEN DEV ROAD
KANGAROO CREEK
LITTLE BOWEN RIVER
BEE CREEK
EXE CREEK
CERITO CREEK
COLLINSVILLE - ELPHINSTONE ROAD
BLACKS CREEK
O'CONNELL RIVER
BRUCE HIGHWAY
MACKAY - EUNGELLA ROAD
MIRANI - MT OSSA ROAD
PIONEER RIVER
GARGETT - MIA MIA ROAD
MIRANI - ETON ROAD
EUNGELLA DAM ROAD

HAVILAH
EMU PLAINS
EXMOOR
WEETALABA
BYERWEN
REDCLIFFE VALE
BLENHEIM
EASTERN CREEK
NEWLANDS
TURRAWALLA
EXEVALE
WOLLOMBI
SUTTOR CREEK
GLENDEN
BLOOMSBURY
YALBOROO
CALEN
URANNAH
MOUNT OSSA
KUTTABUL
EUNGELLA
PINNACLE
MIRANI
EUNGELLA DAM
TEEMBURRA DAM
KINCHANT DAM
Mirani Weir

WHITSUNDAY REGIONAL COUNCIL
ISAAC REGIONAL COUNCIL
MACKAY REGIONAL COUNCIL

SHEET 4 OF 4
SHEET 3 OF 4
SHEET 2 OF 4
SHEET 1 OF 4

N W E S

LEGEND
- State Road (DTMR)
- Qld Rail Network
- Major Watercourse
- Minor Watercourse
- Built Up Area
- Qld Local Government Area
- Maximum Flood Event

Sunwater Storages
- Dam
- Weir
- Dam Reservoir

S:\BW_WaterResources\GIS_Data\SW_Bowen Broken WSS\EungellaDam_CRA2022\Drawings\ArcMap\256780-A.pagx
Exported: 20/02/2025 3:43 PM

MAP PRODUCED BY:
SUNWATER LTD
TEL: (07) 3120 0000

REVISION				
05/12/22	A	ISSUED FOR USE	LH	MGH
DATE		REMARKS	CKD	PSD

MAP INFORMATION
Projected Coordinate System: Mapping Grid of Australia (MGA2020), Zone 55.

DRAWING REFERENCE
256781 - Sunny Day Failure
256782 - Probable Maximum Flood

SCALES (A3 SIZE)
0 3 6 9 12 15 km
1:300,000

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	LH
APPROVED	
[redacted] 5/12/2022	RPEQ: [redacted]

sunwater

EUNGELLA DAM
DAM BREAK ANALYSIS 2022
INUNDATION PLANS
KEYMAP

CONTRACT NUMBER
DRAWING NUMBER 256780
REV. A
SHEET 1 OF 1
DATE DECEMBER 2022

Document: S:\BW_WaterResources\GIS_Data\SW_Bowen Broken WSS\EungellaDam_CRA2022\Drawings\ArcMap\256781-A.mxd
Printed: Monday, 05/12/2022 07:46:36 AM

Map Produced By:
Water Resources and Dam Safety
Tel: (07) 3120 0000

635,000 640,000 645,000 650,000

7,665,000

7,660,000

URANNAH ROAD
BARKER ROAD
ROAD
BEE CREEK ROAD
BEE CREEK
Bullock Creek
Furious Creek
MOUNT BARKER ROAD
Banham Creek
EUNGELLA DAM
Dry Creek
DIGGINGS ROAD
Mt Barker Creek
LIZZIE CREEK ROAD
BROKEN RIVER
EUNGELLA DAM ROAD
65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91

LEGEND
- AMTD (Marker)
- Major Road
- Secondary Road
- Cadastral Lot Boundary

Flood Modelling
- Model Limits
- Sunny Day Failure

Sunwater Storages
- Dam
- Saddle Dam
- Weir
- Eungella Dam FSL

REVISION					
05/12/22	A	ISSUED FOR USE	LH	MGH	
DATE		REMARKS	CKD	PSD	

MAP INFORMATION
Projected Coordinate System: Mapping Grid of Australia (MGA2020) Zone 55.

REFERENCE DRAWINGS
256780 - Keymap

SCALES (A3 SIZE)
0 500 1,000 1,500 2,000 2,500 m
1:50,000

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	LH
APPROVED	
[redacted]	
5/12/2022	RPEQ: [redacted]

sunwater

EUNGELLA DAM
DAM BREAK ANALYSIS 2022
SUNNY DAY FAILURE
(EMBANKMENT FAILURE)
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
256781	A

SHEET 1 OF 4

DATE DECEMBER 2022

Document: S:\BW_WaterResources\GIS_Data\SW_Bowen Broken WSS\EungellaDam_CRA2022\Drawings\ArcMap\256781-A.mxd
Printed: Monday, 05/12/2022 07:46:36 AM

Map Produced By:
Water Resources and Dam Safety
Tel: (07) 3120 0000

635,000 640,000 645,000 650,000

7,675,000

7,670,000

Black Gully Creek
Massey Creek
Eurythmic Creek
Salitros Creek
Serem si Creek
Syce Creek
URANNAH ROAD
Furious Creek
BROKEN RIVER
BEE CREEK
Banana

46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64

LEGEND
- AMTD (Marker)
- Major Road
- Secondary Road
- Cadastral Lot Boundary

Flood Modelling
- Model Limits
- Sunny Day Failure

Sunwater Storages
- Dam
- Saddle Dam
- Weir
- Eungella Dam FSL

REVISION					
DATE		REMARKS	CKD	PSD	
05/12/22	A	ISSUED FOR USE	LH	MGH	

MAP INFORMATION
Projected Coordinate System: Mapping Grid of Australia (MGA2020) Zone 55.

REFERENCE DRAWINGS
256780 - Keymap

SCALES (A3 SIZE)
0 500 1,000 1,500 2,000 2,500 m
1:50,000

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	LH
APPROVED	
[redacted]	
5/12/2022	RPEQ: [redacted]

sunwater

EUNGELLA DAM
DAM BREAK ANALYSIS 2022
SUNNY DAY FAILURE (EMBANKMENT FAILURE) INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
256781	A

SHEET 2 OF 4

DATE DECEMBER 2022

Document: S:\BW_WaterResources\GIS_Data\SW_Bowen Broken WSS\EungellaDam_CRA2022\DrawingsArcMap\256781-A.mxd
Printed: Monday, 05/12/2022 07:46:36 AM

MAP PRODUCED BY:
WATER RESOURCES AND DAM SAFETY
TEL: (07) 3120 0000

630,000 635,000 640,000 645,000

7,690,000 7,685,000 7,680,000

28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45

BROKEN RIVER

Urannah

Turn Back Creek

Back Gun Creek

Ernest Creek

Urannah Creek

Dicks Creek

LEGEND

- AMTD (Marker)
- Major Road
- Secondary Road
- Cadastral Lot Boundary

Flood Modelling

- Model Limits
- Sunny Day Failure

Sunwater Storages

- Dam
- Saddle Dam
- Weir
- Eungella Dam FSL

REVISION					
05/12/22	A	ISSUED FOR USE	LH	MGH	
DATE		REMARKS	CKD	PSD	

MAP INFORMATION
Projected Coordinate System: Mapping Grid of Australia (MGA2020) Zone 55.

REFERENCE DRAWINGS
256780 - Keymap

SCALES (A3 SIZE)
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1:50,000

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	LH
APPROVED	
[redacted]	
5/12/2022	RPEQ: [redacted]

sunwater

EUNGELLA DAM
DAM BREAK ANALYSIS 2022
SUNNY DAY FAILURE
(EMBANKMENT FAILURE)
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
256781	A

SHEET 3 OF 4

DATE DECEMBER 2022

Document: S:\BW_WaterResources\GIS_Data\SW_Bowen Broken WSS\EungellaDam_CRA2022\DrawingsArcMap\256781-A.mxd
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Map Produced By:
Water Resources and Dam Safety
Tel: (07) 3120 0000

620,000 625,000 630,000 635,000

7,700,000 7,695,000 7,690,000

EMU CREEK
BROKEN R VER
Alice Creek
Grant Creek
Starvation Creek
Turn Back Creek
Trapp

9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

LEGEND
- AMTD (Marker)
- Major Road
- Secondary Road
- Cadastral Lot Boundary

Flood Modelling
- Model Limits
- Sunny Day Failure

Sunwater Storages
- Dam
- Saddle Dam
- Weir
- Eungella Dam FSL

REVISION					
05/12/22	A	ISSUED FOR USE	LH	MGH	
DATE		REMARKS	CKD	PSD	

MAP INFORMATION
Projected Coordinate System: Mapping Grid of Australia (MGA2020) Zone 55.

REFERENCE DRAWINGS
256780 - Keymap

SCALES (A3 SIZE)
0 500 1,000 1,500 2,000 2,500 m
1:50,000

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	LH
APPROVED	
[redacted]	
5/12/2022	RPEQ: [redacted]

sunwater

EUNGELLA DAM
DAM BREAK ANALYSIS 2022
SUNNY DAY FAILURE (EMBANKMENT FAILURE) INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
256781	A

SHEET 4 OF 4

DATE DECEMBER 2022

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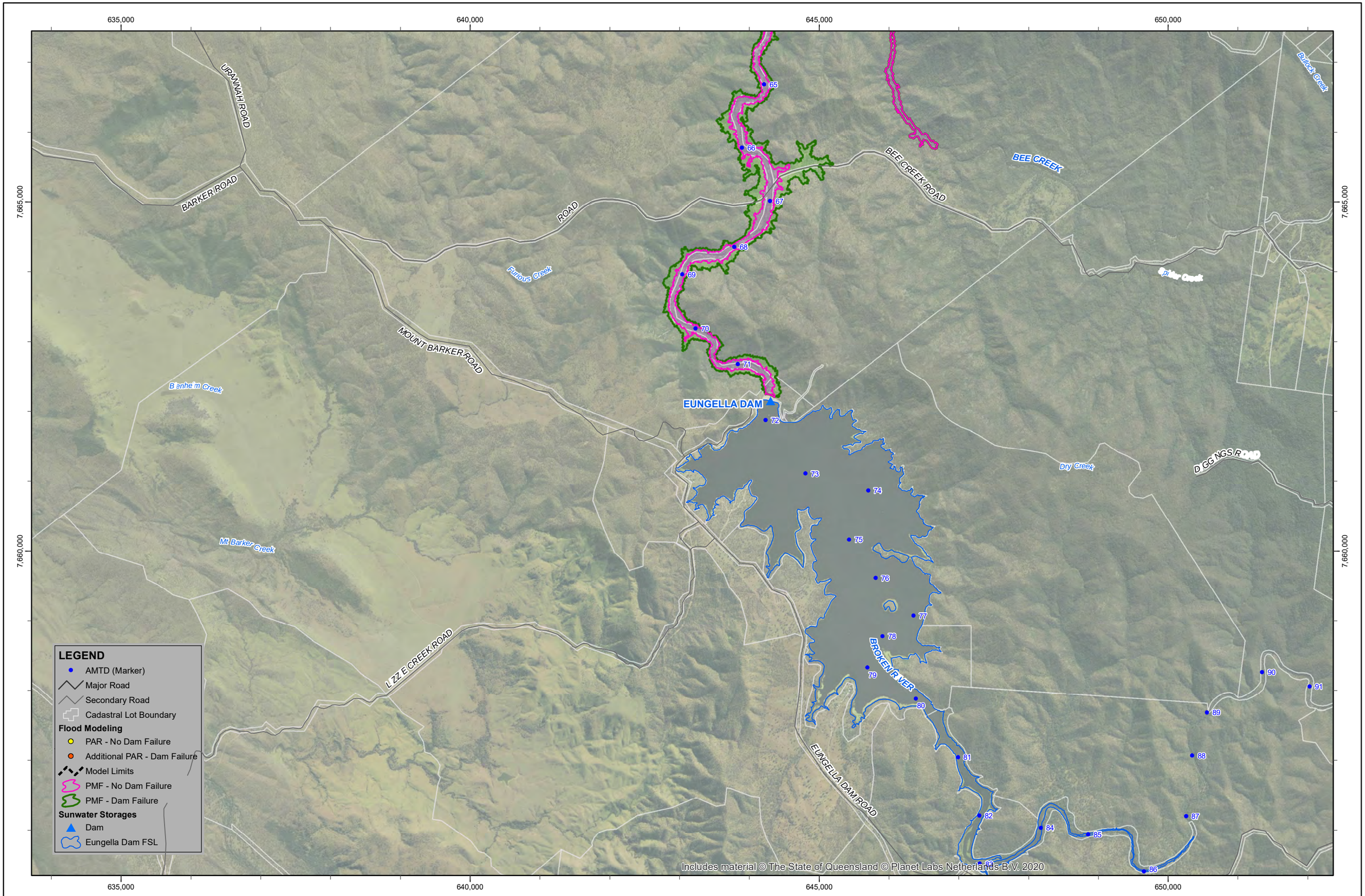

REVISION					
05/12/22	A	ISSUED FOR USE	LH	MGH
DATE		REMARKS	CKD	PSD

MAP INFORMATION
Projected Coordinate System: Mapping Grid of Australia (MGA2020) Zone 55.

REFERENCE DRAWINGS
256780 - Keymap

SCALES (A3 SIZE)
0 500 1,000 1,500 2,000 2,500 m
1:50,000

DRAWN: IDH | DESIGNED:
CHECKED: | CHECKED: LH
APPROVED: [redacted] 5/12/2022 RPEQ: [redacted]

sunwater

EUNGELLA DAM
DAM BREAK ANALYSIS 2022
PROBALE MAXIMUM FLOOD (EMBANKMENT FAILURE) INUNDATION PLAN

CONTRACT NUMBER
DRAWING NUMBER 256782 | REV. A
SHEET 1 OF 4
DATE DECEMBER 2022

MAP PRODUCED BY:
WATER RESOURCES AND DAM SAFETY
TEL: (07) 3120 0000

Document: S:\BW_WaterResources\GIS_Data\SW_Bowen Broken WSS\EungellaDam_CRA2022\Drawings\ArcMap\256782-A.mxd
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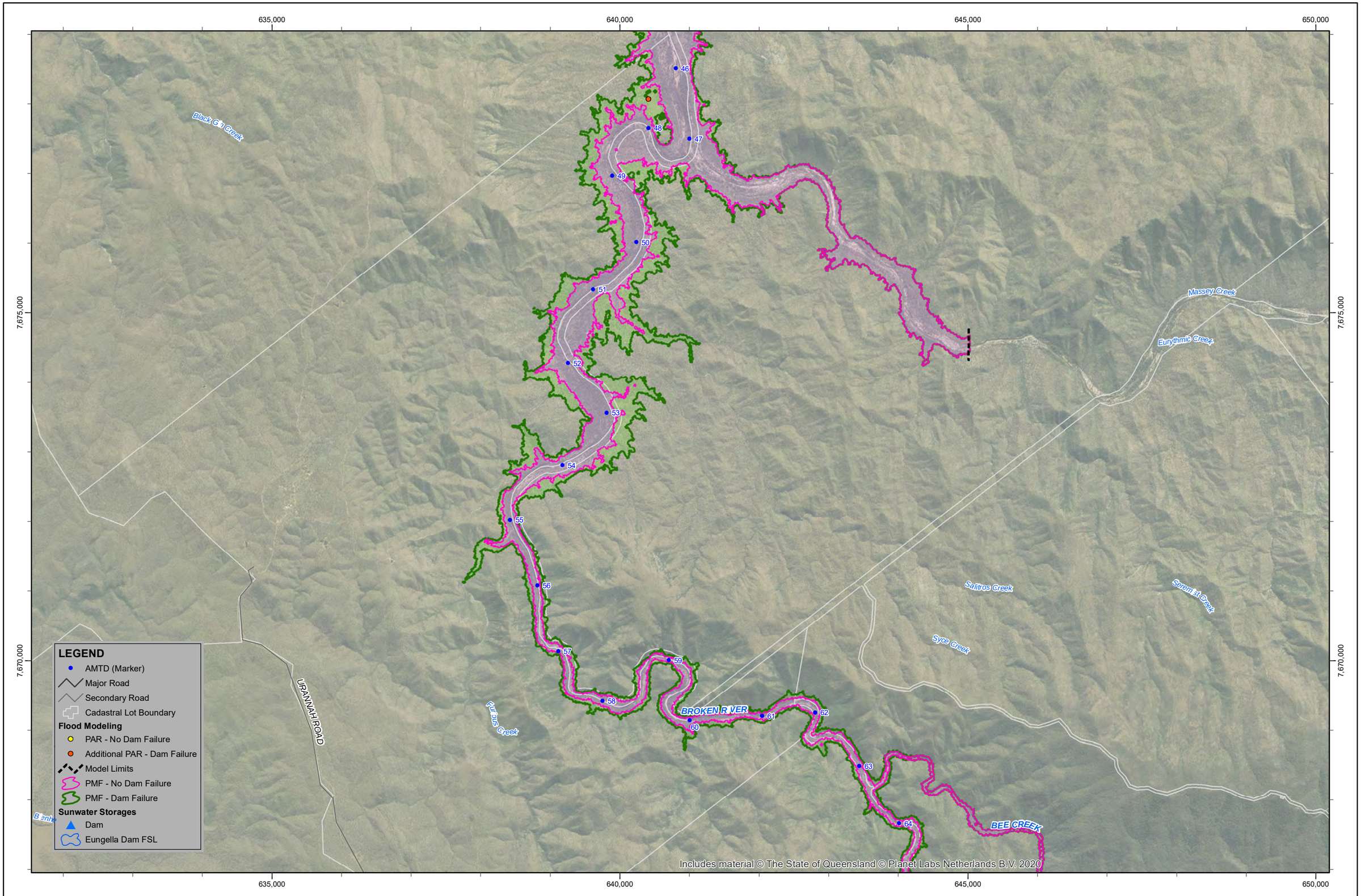

REVISION					
05/12/22	A	ISSUED FOR USE	LH	MGH	
DATE		REMARKS	CKD	PSD	

MAP INFORMATION
Projected Coordinate System: Mapping Grid of Australia (MGA2020) Zone 55.

REFERENCE DRAWINGS
256780 - Keymap

SCALES (A3 SIZE)
0 500 1,000 1,500 2,000 2,500 m
1:50,000

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	LH
APPROVED	
[redacted]	
5/12/2022	RPEQ: [redacted]

sunwater
©SUNWATER LIMITED
ACN 131 034 985

EUNGELLA DAM
DAM BREAK ANALYSIS 2022
PROBALE MAXIMUM FLOOD (EMBANKMENT FAILURE) INUNDATION PLAN

CONTRACT NUMBER
DRAWING NUMBER 256782
REV. A
SHEET 2 OF 4
DATE DECEMBER 2022

MAP PRODUCED BY:
WATER RESOURCES AND DAM SAFETY
TEL: (07) 3120 0000

Document: S:\BW_WaterResources\GIS_Data\SW_Bowen Broken WSS\EungellaDam_CRA2022\Drawings\ArcMap\256782-A.mxd
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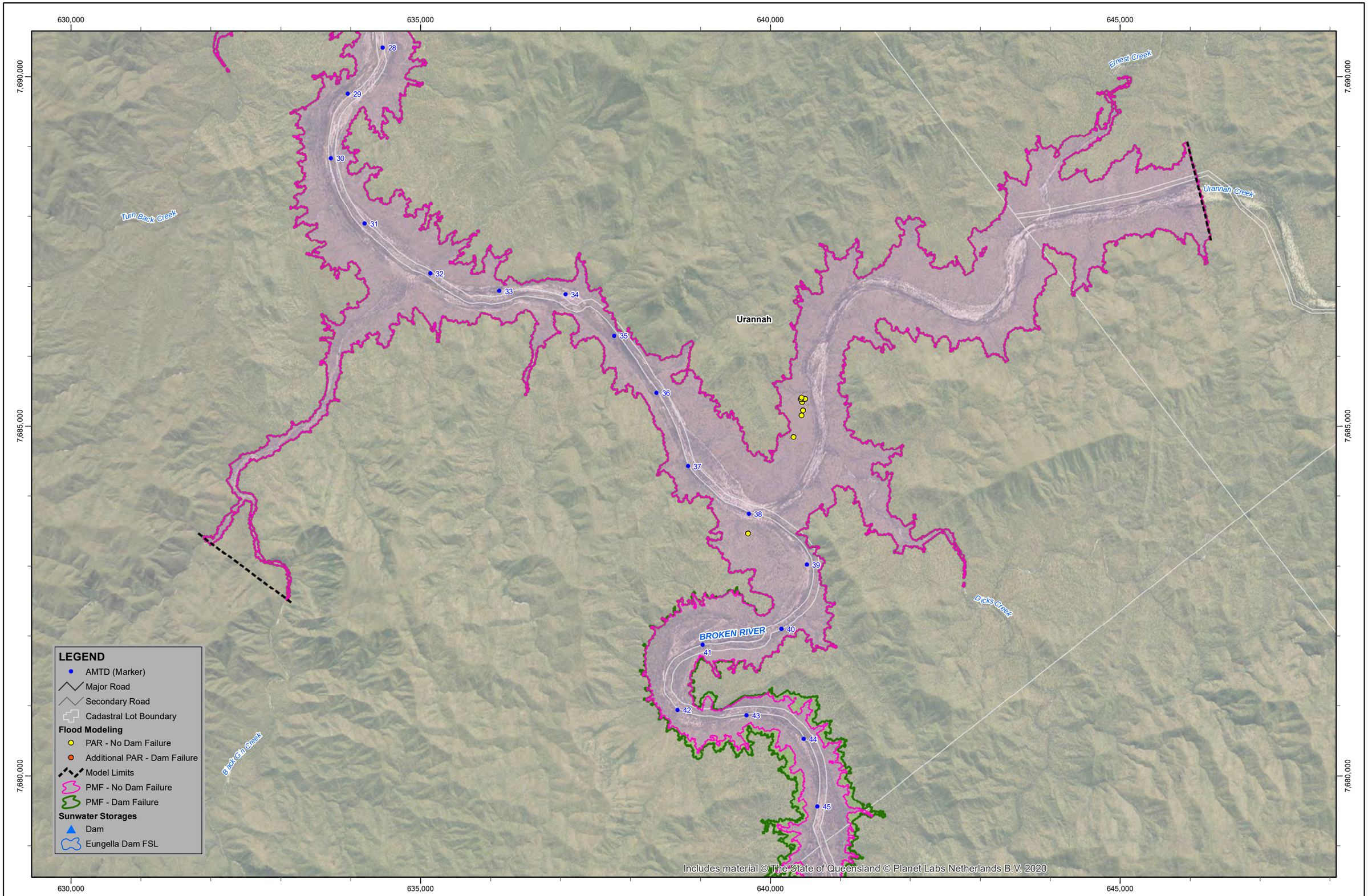


REVISION					
05/12/22	A	ISSUED FOR USE	LH	MGH	
DATE		REMARKS	CKD	PSD	

MAP INFORMATION
Projected Coordinate System: Mapping Grid of Australia (MGA2020) Zone 55.

REFERENCE DRAWINGS
256780 - Keymap

SCALES (A3 SIZE)
0 500 1,000 1,500 2,000 2,500 m
1:50,000

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	LH
APPROVED	
[redacted]	
5/12/2022	RPEQ: [redacted]

sunwater

EUNGELLA DAM
DAM BREAK ANALYSIS 2022
PROBALE MAXIMUM FLOOD (EMBANKMENT FAILURE) INUNDATION PLAN

CONTRACT NUMBER	
DRAWING NUMBER	REV.
256782	A
SHEET 3 OF 4	
DATE DECEMBER 2022	

MAP PRODUCED BY:
WATER RESOURCES AND DAM SAFETY
TEL: (07) 3120 0000

Document: S:\BW_WaterResources\GIS_Data\SW_Bowen Broken WSS\EungellaDam_CRA2022\Drawings\ArcMap\256782-A.mxd
Printed: Monday, 05/12/2022 07:56:00 AM

Map Produced By:
Water Resources and Dam Safety
Tel: (07) 3120 0000

620,000 625,000 630,000 635,000

7,700,000 7,695,000 7,690,000

EMU CREEK
BROKEN RIVER
Alice Creek
Grant Creek
Starvation Creek
Turn Back Creek
Trapp

9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

LEGEND

- AMTD (Marker)
- Major Road
- Secondary Road
- Cadastral Lot Boundary

Flood Modeling

- PAR - No Dam Failure
- Additional PAR - Dam Failure
- Model Limits
- PMF - No Dam Failure
- PMF - Dam Failure

Sunwater Storages

- Dam
- Eungella Dam FSL

REVISION					
05/12/22	A	ISSUED FOR USE	LH	MGH	
DATE		REMARKS	CKD	PSD	

MAP INFORMATION
Projected Coordinate System: Mapping Grid of Australia (MGA2020) Zone 55.

REFERENCE DRAWINGS
256780 - Keymap

SCALES (A3 SIZE)
0 500 1,000 1,500 2,000 2,500 m
1:50,000

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	LH

APPROVED [redacted]
5/12/2022 RPEQ: [redacted]

sunwater

EUNGELLA DAM
DAM BREAK ANALYSIS 2022
PROBALE MAXIMUM FLOOD (EMBANKMENT FAILURE) INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
256782	A

SHEET 4 OF 4
DATE DECEMBER 2022

Appendix B4 Locality plan

Figure B5:Eungella Dam locality plan

Document: S:\BW Asset Delivery\GIS_Data\Enterprise_GIS\Water_Supply_Schemes\Bowen Broken\DrawingsArcMap\253508-A.mxd
Printed: Thursday, 22/10/2020 07:07:17 AM

MAP PRODUCED BY:
SUNWATER LTD
TEL: (07) 3120 0000

148°22'0"E 148°24'0"E 148°26'0"E 148°28'0"E 148°30'0"E 148°32'0"E 148°34'0"E

21°8'0"S
21°10'0"S
21°12'0"S
21°14'0"S

120215A - BROKEN R AT EUNGELLA DAM TW
EUNGELLA DAM
120211A - BROKEN R AT EUNGELLA DAM HW
EUNGELLA DAM AL
EUNGELLA
EUNGELLA AL
NETHERDALE AL
MACKAY - EUNGELLA ROAD
DRY CREEK
BROKEN RIVER
100009A - CREDITON TBR
OLD RACECOURSE TM
SPRING CREEK
EUNGELLA DAM ROAD
RIDGELANDS AL

N
W E
S

LOCALITY PLAN
CAIRNS
TOWNSVILLE
MOUNT ISA
MACKAY
Map Extent
ROCKHAMPTON
BUNDABERG
BRISBANE

LEGEND
- Rainfall Station
- Rainfall & River Station
- River Station
- Town
- State Road (DTMR)

Sunwater Storage Infrastructure
- Sunwater Dam

sunwater

EUNGELLA DAM BROKEN RIVER CATCHMENT MAP

MAP INFORMATION
Coordinate System: Geocentric Datum of Australia (GDA94).

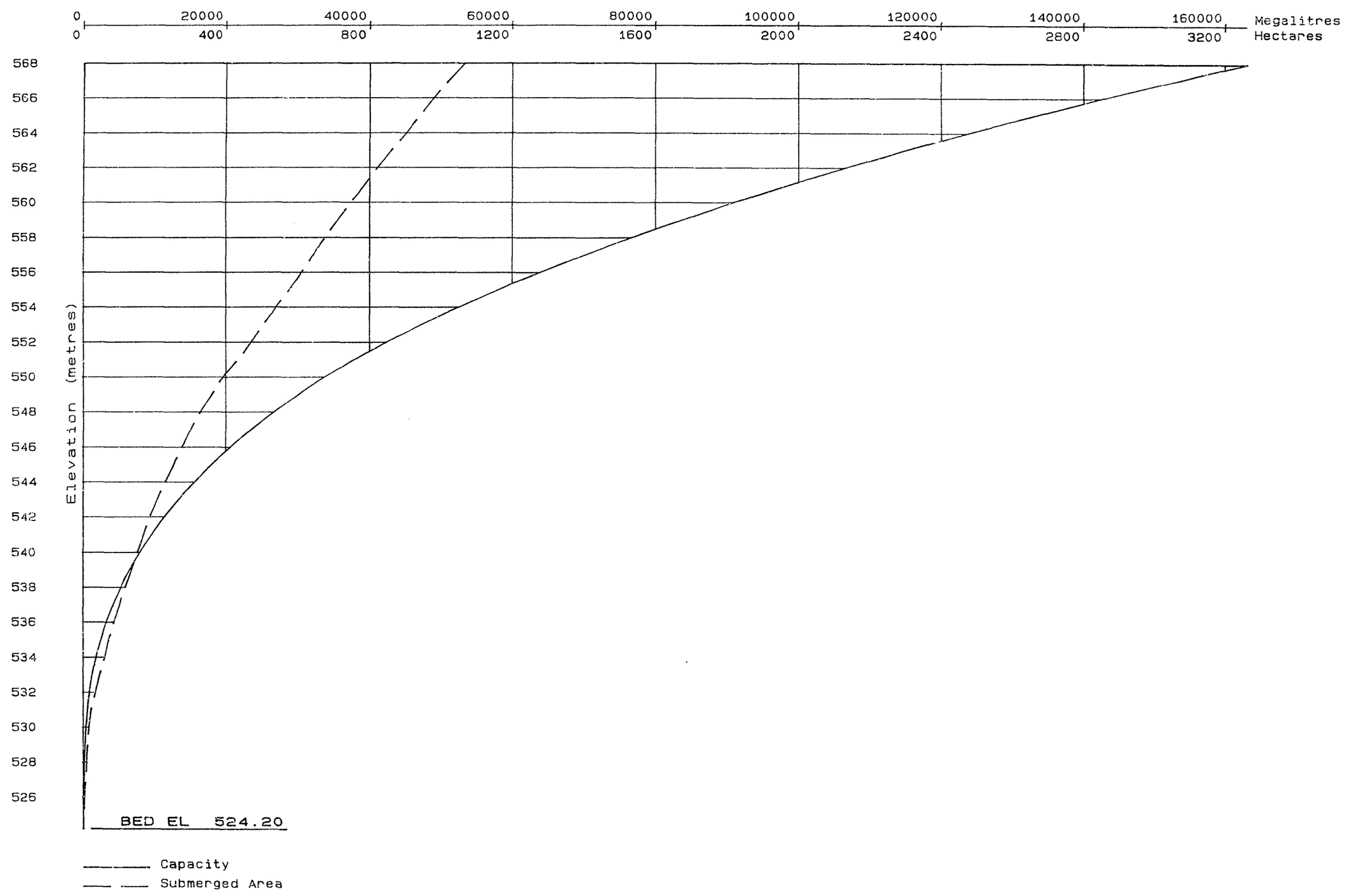
SCALES (A3 SIZE)
0 1 2 3 km 1:60,000

Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

DRAWING No. 253508 A

APPENDIX C EQUIPMENT AND TECHNICAL INFORMATION

Appendix C1 has been redacted



Level Datum: Australian Height Datum (AHD = State Datum +0.355 m)
BM961301 on Crest EL 569.976 m AHD
Computed from DTM produced from Oct 1957 photography & 1969 photography
Digital data & volumes computed to EL 580m AHD
Spillway Crest Level: EL 562.71 m AHD [112,476 ML ; 848 ha]
Catchment Area: 142 sq km
Latitude: 21 08 10 Longitude: 148 23 25

NATURAL RESOURCES

BROKEN RIVER - BASIN 120
EUNGELLA DAM - AMTD 71.8 km
TOTAL STORAGE

STORAGE CURVE

A3-205005

23/01/97

205005 (TIF)

EL (M)	AREA (HA)	VOLUME (ML)	
		TOTAL	COMM
580.00	1647	324782	
579.50	1621	316611	
579.00	1596	308570	
578.50	1570	300657	
578.00	1542	292876	
577.50	1516	285232	
577.00	1490	277718	
576.50	1465	270330	
576.00	1441	263065	
575.50	1417	255922	
575.00	1393	248900	
574.50	1369	241997	
574.00	1345	235211	
573.50	1322	228544	
573.00	1298	221996	
572.50	1274	215567	
572.00	1251	209254	
571.50	1227	203058	
571.00	1204	196981	
570.50	1181	191019	
570.00	1158	185173	
569.50	1134	179445	
569.00	1110	173835	
568.50	1087	168342	
568.00	1065	162962	
567.50	1043	157693	
567.00	1021	152536	
566.50	1000	147485	
566.00	979	142539	
565.50	958	137697	
565.00	939	132952	
564.50	920	128305	
564.00	900	123756	
563.50	880	119304	
563.00	860	114953	
562.50	841	110701	
562.00	821	106548	
561.50	802	102493	
561.00	784	98530	
560.50	765	94658	
560.00	747	90878	
559.50	728	87190	
559.00	711	83593	
558.50	693	80085	
558.00	676	75663	
557.50	658	73328	
557.00	641	70080	
556.50	625	66915	
556.00	608	63833	
555.50	591	60834	

EL (M)	AREA (HA)	VOLUME (ML)	
		TOTAL	COMM
555.00	574	57920	
554.50	555	55100	
554.00	537	52370	
553.50	520	49728	
553.00	502	47173	
552.50	485	44704	
552.00	468	42320	
551.50	451	40023	
551.00	432	37814	
550.50	410	35707	
550.00	391	33707	
549.50	374	31795	
549.00	358	29963	
548.50	342	28212	
548.00	326	26542	
547.50	312	24948	
547.00	300	23420	
546.50	288	21951	
546.00	275	20541	
545.50	265	19188	
545.00	253	17894	
544.50	241	16658	
544.00	230	15482	
543.50	218	14361	
543.00	207	13297	
542.50	197	12286	
542.00	186	11330	
541.50	177	10422	
541.00	169	9555	
540.50	161	8730	
540.00	152	7948	
539.50	144	7206	
539.00	136	6504	
538.50	127	5845	
538.00	118	5233	
537.50	109	4667	
537.00	100	4146	
536.50	93	3663	
536.00	85	3218	
535.50	78	2810	
535.00	71	2437	
534.50	65	2096	
534.00	59	1784	
533.50	53	1504	
533.00	46	1256	
532.50	40	1041	
532.00	34	857	
531.50	28	703	
531.00	22	580	
530.50	18	480	

EL (M)	AREA (HA)	VOLUME (ML)	
		TOTAL	COMM
530.00	16	395	
529.50	14	320	
529.00	12	256	
528.50	11	199	
528.00	9	150	
527.50	8	109	
527.00	6	74	
526.50	5	46	
526.00	4	25	
525.50	2	12	
525.00	1	3	
524.50	0	0	

Level Datum: Australian Height Datum (AHD = State Datum +0.355 m)
BM961301 on Crest EL 569.976 m AHD
Computed from DTM produced from, Oct 1957 photography & 1969 photography
Digital data & volumes computed to EL 580m AHD
Spillway Crest Level: EL 562.71 m AHD [112,476 ML ; 848 ha]
Catchment Area: 142 sq km
Latitude: 21 08 10 Longitude: 148 23 25

NATURAL RESOURCES

BROKEN RIVER - BASIN 120
EUNGELLA DAM - AMTD 71.8 km
TOTAL STORAGE

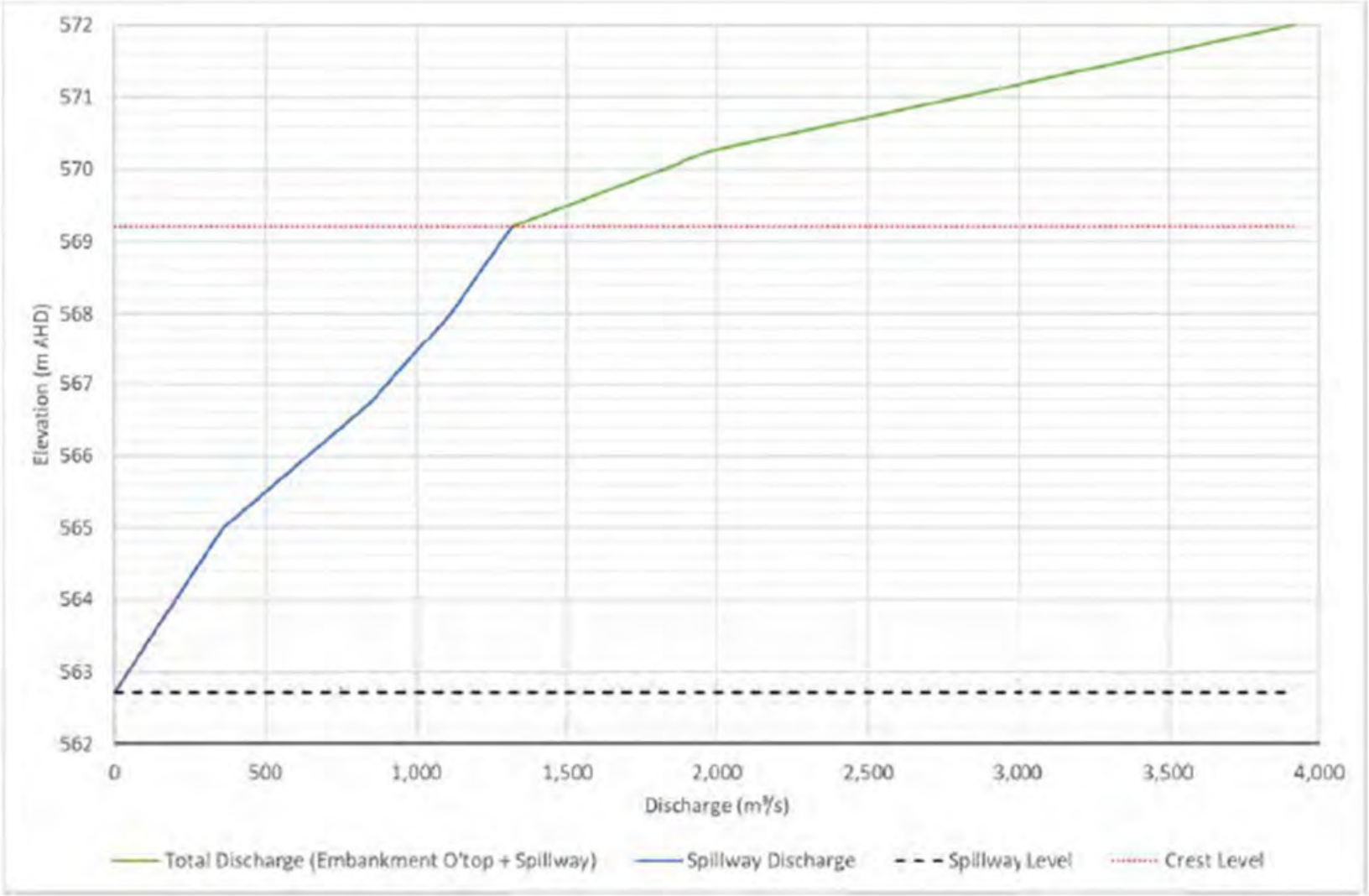
STORAGE DATA

A3-205006

23/01/97

205006 (TIF)

Appendix C4 Discharge Curve



APPENDIX D INTERACTION WITH LOCAL GOVERNMENT AND DISTRICT GROUPS

To be populated as interactions occur

Appendix D has been redacted

Annexe — Eungella Dam SMS Messages

	Advice Stay informed 	**Watch and Act** Prepare to leave 	**Emergency** Leave immediately To be issued in consultation with 	Stand Down 
SMS	ADVICE from Sunwater. Eungella Dam is likely to spill/spilling excess water into Broken River. People downstream of Eungella Dam should STAY INFORMED and MONITOR CONDITIONS. Water flows from Eungella Dam expected to remain within beds and banks of river/may contribute to widespread/localised/ overland flooding. Expect increased river flows in 6-12 hours/later today/ overnight/tomorrow.	FLOOD WATCH AND ACT from Sunwater. Excess water spilling from Eungella Dam into Broken River has increased significantly. Water flows from Eungella Dam may contribute to dangerous/widespread flooding downstream. Expect increased river flows in 6-12 hours/later today/ overnight/tomorrow. People downstream of Eungella Dam must PREPARE TO LEAVE in case the flood gets worse. Call Triple Zero (000) if your life is in danger. Call the SES on 132500 for flood help. More information here: bit.ly/RecandSafety	FLOOD EMERGENCY WARNING from Sunwater: People downstream of Eungella Dam must LEAVE IMMEDIATELY. Eungella Dam possible failure/is failing. Major flooding is happening now. Your life is at risk. Go now to a safe place away from the flood. Get full warnings and what you should do at Mackay Regional Council http:// disaster.mackay.qld.gov.au/ and Whitsunday Regional Council http://disaster.whitsundayrc.qld.gov.au/	ADVICE from Sunwater. Eungella Dam is continuing to spill/has stopped spilling excess water into Broken River. Eungella Dam has returned to regular operating conditions. Expect decreased river flows in timeframe. Stay informed.