EMERGENCY ACTION PLAN — CALLIDE DAM (ID 239)

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Prepared by **Sunwater Limited**

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Emergency activation quick reference — Dam Hazards

The Emergency Action Plan (EAP) for Callide 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 and section numbers	Activation levels for dam hazards			
	Alert	**Lean Forward**	**Stand Up**	**Stand Down**
Flood operations See section 5	• Outflows are forecast to exceed 200 m^3/s based on 12 hour forecast rainfall, AND • Storage above EL 212.50 m (70% volume), AND • Rainfall/streamflow is observed in the catchment, OR • Outflows up to 130 m3/s	• Storage above EL 215.50 m with observed rainfall, OR • Outflows up to 370 m3/s	• Storage is above EL 216.37 m, OR • Outflows up to 750 m3/s	• Storage at EL 215.50 m and falling, and no forecast increase in EL in the next four days
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
Gate malfunction See section 9	• Loss of control* of one or more gates with insufficient forecast inflows to exceed storage level EL 215.5 m in the next 4-day forecast period.	• Loss of control* of one or more gates with sufficient forecast inflows to exceed storage level EL 215.5 m in the next 4-day forecast period.	• Loss of control* of one or more gates; AND • Storage level above EL 215.5 m.	• Confirmation that all gates are functioning correctly

*Includes uncontrolled gate vibration

NEXT PAGE: Emergency activation quick reference – Other Emergency Situations

Emergency activation quick reference — Other Emergency Situations

The EAP for Callide 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 1: Emergency activation quick reference (continued)

Other Emergency Situations 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 other emergency situations		
Comms Failure See section 10	• 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

Authorisation of document

Position/role	Signature	Date
EAP Program Lead Prepared for submission		
Principal Engineer – Dam Safety Compliance — Approved for submission		03/11/2025
Head of Dam Safety — Approved for submission		
EGM – Engineering and Asset Management (or delegate) — Dam Owner Authorising Officer		05/11/2025

Document revision history

Version	Date	Prepared by	Reason for change	Ref. no.
2	May 2008		Significant changes of Callide Dam Emergency Action Plan to reflect Sunwater Management structure and other minor changes. **Note:** Refer to HB # 710727 for amendments issued.	
3	October 2011		Significant changes to all sections of Callide Dam Emergency Action Plan to reflect current Sunwater Management structure and other changes.	
4			New Emergency Action Plan developed at expiry of 3G approval. Issued for consultation with Relevant Disaster Management Groups.	HB # 1824667
5	October 2016		Addition of Flood Impact Mapping to Section five. Updates to notification & communication lists and Emergency Alert sections.	HB # 2026932
6			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).	HB # 2086721
7	September 2018		Amended contacts and associated sections, e.g. Organisation chart & Controlled Copy Holders list. Minor error corrections and other non-substantive changes.	HB # 2367029
8			Amended contacts and associated sections, added new hazard for Gate failures, added emergency siren instructions and removed DSTDM involvement from Chemical hazard section. Incorporated global changes. Reviewed by Flood operations and Dam Safety personnel.	HB # 2438172
8.1	February 2020		Amended Dam hazard, flood operations; Lean Forward trigger – reduction of gate opening from 1.0 m to 0.75 m. Minor error corrections and other non-substantive changes.	HB # 2505374
8.2	2020		Amended contacts and associated sections, e.g., Organisation chart & Controlled Copy Holders list. Minor error corrections and other non-substantive changes.	HB # 2572569
8.3	September 2021		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. Added clarification regarding Operations Actions associated with gate vibration issue.	HB # 2617575
8.4			Required for inclusion with a new Addendum A.2.1. Minor error corrections and contact updates. Non-substantive update.	HB # 2675311
8.5	November 2022		Removal of Addendum A.2.1. Error corrections and other non-substantive changes to improve readability and useability. Incorporated global non-substantive EAP changes resulting from feedback from previous internal and external reviews.	#2756936
8.6	September 2023		Added Fatigue Management Plan. Deleted Chemical Spill. Non-substantive updates as part of Annual Safety Statement. Minor error corrections and readability improvements.	2813192
9.0	April 2025	EAP Team	Full substantive review pending expiry	#2814593

Controlled document distribution list

Copy no.	Position	Location
1.	Senior Operator Maintainer	Sunwater, Callide
2.	Operations Manager	Sunwater, Biloela
3.	Operations Centre	Sunwater, Brisbane
4.	Deputy Local Disaster Coordinator — Banana Local Disaster Management Group	Banana Shire Council, Biloela
5.	District Disaster Coordinator — Gladstone District Disaster Management Group	Police, Gladstone
6.	Officer in Charge – Biloela Police	Police, Biloela
Note: Communication information for each 'Controlled Copy Holder' is attached in Appendix A.		

Electronic document distribution list

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Position	Location
Senior Flood Forecaster	Bureau of Meteorology, Brisbane
Note: Communication information for each 'Electronic Copy Holder' is in Appendix A.	

1. References, abbreviations, and definitions

1.1 References/associated documents

Ref.	Document title	Reference/location
A	Water Supply (Safety and Reliability) Act 2008	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/inforce/current/act-2003-091
C	Interim Queensland Prevention, Preparedness, Response and Recover Disaster Management Guideline 2024-25	Disaster Management Guidelines
D	Queensland Dam Safety Management Guidelines	https://www.resources.qld.gov.au/__data/assets/pdf_file/0007/78838/dam-safety-management.pdf
E	Australian Rainfall and Runoff (ARR) 2016	http://book.arr.org.au.s3-website-ap-southeast-2.amazonaws.com/ ISBN 978-1-925848-36-6
F	Emergency action plan for referable dam guideline	https://www.resources.qld.gov.au/__data/assets/pdf_file/0018/84015/eap-guideline.pdf
G	Queensland Interim State Disaster Management Plan 2024-25	Interim-Queensland-State-Disaster-Management-Plan-2024-25.pdf
H	Professional Engineers Act 2002 (RPEQ)	https://www.legislation.qld.gov.au/view/pdf/inforce/2013-09-23/act-2002-054
I	Queensland Warnings Manual	https://www.disaster.qld.gov.au/__data/assets/pdf_file/0027/339417/M1174-Queensland-Emergency-Alert-Manual.pdf
J	Sunwater website — list of referable dams	https://www.sunwater.com.au/community/preparing-for-emergencies/emergency-management/
K	Sunwater (internal) Strategic Event Procedure	Sunwater Internal Document
L	Callide Dam Safety Condition Schedule	Sunwater Internal Document
M	Guidelines on Consequence Categories for Dams	ANCOLD ISBN: 978-0-9808192-5-0 (ANCOLD, 2012)
N	Guideline for Failure Impact Assessment of Water Dams	https://www.resources.qld.gov.au/__data/assets/pdf_file/0005/78836/guidelines-failure-impact-assessment.pdf
O	Callide Dam Failure Impact Assessment	Sunwater Internal Document
P	Callide Dam Safety Review	Sunwater Internal Document
Q	2015 Callide Creek Flood Review — IGEM, 2015	https://www.igem.qld.gov.au/callide-creek-flood-review
R	Callide Valley Flood Mitigation Study — DEWS and Sunwater, 2017	https://cabinet.qld.gov.au/documents/2018/Apr/CallideSt/Attachments/Report.PDF
S	Queensland Rainfall and River Conditions	http://www.bom.gov.au/qld/flood/index.shtml?ref=hdr
T	Sunwater (internal) Blue Green Algae (BGA) Monitoring Program Manual (EM29)	Blue-green Algae Monitoring Procedure (EM29)
U	Callide Dam Operation and Maintenance (O&M) Manual (includes Spill Operations Manual (SOM))	Callide Dam O&M Manual
V	Callide Dam Comprehensive Risk Assessment — Sunwater, July 2018	Sunwater Internal Document
W	Water Act 2000	https://www.legislation.qld.gov.au/view/pdf/inforce/current/act-2000-034
X	Sunwater Emergency Alert Protocol	Sunwater Internal Document

Ref.	Document title	Reference/location
Y	Guidelines on Dam Safety Management (ANCOLD, 2003)	ANCOLD ISBN: 0-731027620
Z	Sunwater (internal) Referable Structures Standing Operating Procedure (SOP) 12 – Dam Log Books	Sunwater Internal Document
AA	Callide Dam Hazard Management Toolkit	Only available with Sunwater internal versions of EAPs
BB	Fatigue Management Procedure	Sunwater Internal Document
CC	Callide Dam Comprehensive Risk Assessment 2018	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 & 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
EGM	Executive General Manager
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
HMT	Hazard Management Toolkit
IC	Incident Coordinator
IFHC	Incremental Flood Hazard Category
IGEM	Inspector-General Emergency Management
KML	Keyhole 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
Max. OL	Maximum Operating Level
MMI	Modified Mercalli Intensity
O&M	Operation & Maintenance
OB	Observation Bore
OC	Operations Centre
OCDO	Operations Centre Duty Operator
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
QFD	Queensland Fire Department
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

The meaning of terms used in this section are set out in accordance with relevant legislation or as defined by operator requirements.

Term	Definition
Terms defined in accordance with *Water Supply (Safety and Reliability) Act 2008* (the Act) (ref A)	
Australian Warning System (AWS)	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.
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 or local government's disaster management plan as per Queensland Disaster Management Act 2003 (ref B).
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 2 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 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*.

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 1 or category 2 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.
Terms consistent with *Queensland Disaster Management Guidelines*	
Activation levels	The four levels of EAP activation are: • **Alert:** A heightened level of vigilance and potential requirement for actions where specific conditions are met (particularly Dam Hazard, Flood Operations section) 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 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. **Notes:** 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.

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 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. **Concurrent flooding is only accounted for during the two extreme events which are the DCF and PMF events.** The modelled concurrent flooding downstream of the dam for the DCF scenario is 1 in 10 AEP and PMF is 1 in 100 AEP.
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.

Term	
Piping	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.
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 or fail or contaminate a dam.

2. Introduction

2.1 Context

Under the *Water Supply (Safety and Reliability) Act (2008)* (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 and the *Emergency action plan for referable dam guideline* (ref F) and the *Queensland State Disaster Management Plan* (ref G). The content requirements for EAPs are contained in section 352H of the Act. This EAP also reflects the outcomes and principles outlined in the 2015 Callide Review issued by the Inspector General Emergency Management.

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):

1. identify the area likely to be affected by a dam hazard event or emergency event arising from the dam hazard; and
2. identify each circumstance that indicates a material increase in the likelihood of the dam hazard event or emergency event happening; and
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; and
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; and
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 Callide Dam has been determined as **Banana Shire Council (BSC)**. Sunwater has provided the BSC 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 Callide Dam is **Gladstone DDMG**. Sunwater has provided the DDMG with a copy of the draft EAP for review.

Note: Sunwater has attempted to write the EAP to cope with all reasonably foreseeable emergencies. However, there is considerable uncertainty about how any emergency 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.

2.2 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
- to minimise the risk of harm to persons or property if a dam hazard event or emergency event for the dam happens
- to identify dam hazards that could occur at Callide Dam and the area likely to be affected for each hazard
- to 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 Callide 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 Callide 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 Banana Shire Council Local Disaster Management Plan (LDMP).

2.3 Scope

The Callide 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 or emergency event
- triggers for activation of a tiered response to a 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 a dam hazard event and/or emergency event, and the management of such hazards.

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 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 and the current EAP, such as contact details for individuals and dam information.

The EAP training that is carried out on-site includes 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 & LECs) 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 State Disaster Coordination Centre (SDCC) and include the (non- live) testing of Emergency Alerts (EAs). 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 LDMG has 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 LDMG 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 Callide 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 LDMG.
- notify the immediately D/S residents via SMS.
- contact SDCC to request an Emergency Alert campaign throughout the Callide 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 Callide 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 LDMG.

Sunwater will independently inform and support the Gladstone DDMG.

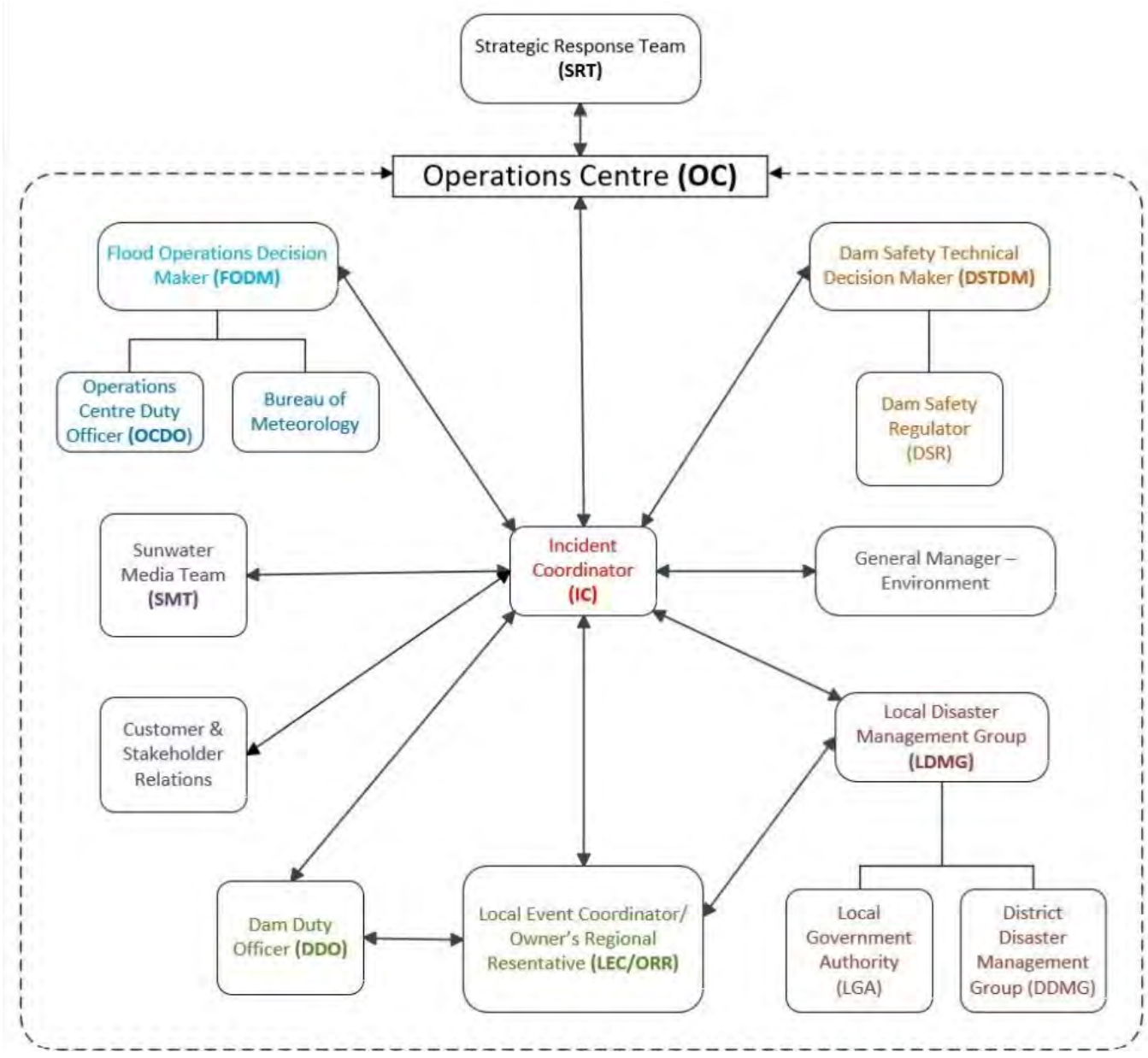
2.6 Fatigue Management Plan

Sunwater has a Fatigue Management Procedure. 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 emergency 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 emergency response organisation



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 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 A8.

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 the 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: Callide Dam is situated approximately 10km east of Biloela, in Central Queensland, at AMTD 80.1km on Callide Creek.

Purpose: Callide Dam is filled by natural inflows from Callide Creek and water pumped from Awoonga Dam through the Awoonga-Callide pipeline to Stag Creek. Its main purpose is to supply water for the cooling towers at the Callide B and Callide C Power Stations. The dam's other purpose is to supply the Biloela area's water supply and to recharge the aquifer.

Catchment: The soil types in the catchment consist of shallow loams and grey-brown, medium, shallow, cracking clays. Predominant vegetation is grassed, open forest that is home to species of blood wood, gum-topped box, and silver-leaf ironbark. Some sections of the streambed upstream of the dam can be observed carrying baseflow many months after the last rainfall event.

Construction: Callide Dam is an earth and rockfill dam that was constructed to full height in 1988. The dam was constructed in two stages — stage 1 was completed in 1965 and stage 2 was completed in 1988 — when the automatically operated radial gates were added.

Specification: The table below lists key statistics of Callide Dam.

Table 2: Callide Dam key statistics

Description	Specification
Dam type	Earth and Rockfill
Full Supply Level (FSL)	EL 216.10 m AHD
Reduced Full Supply Level (RSL)	EL 215.5 m AHD
Minimum Operating Level	185.371 m AHD
Dam Crest Level (DCL)	Left Bank (minimum dam crest elevation) – EL 219.13 m Right Bank (minimum dam crest elevation) – EL 219.15 m* *Note: This is the minimum elevation stated on drawing number 244529, near the right-side spillway training wall.
Historical recorded storage—Feb 2015	EL 217.203 m
Storage capacity at FSL (216.10 m)	136,370 ML
Storage area at FSL (216.10 m)	1240 ha
Catchment area	518 km^2
Max height of dam above foundation	37 m (approximately)
Length across crest	2008 m
Spillway type	Automatically operated radial gate and controlled, reinforced, concrete ogee crest
Spillway crest level (Fixed Crest Level)	EL 207.57 m
Spillway crest length	79.25 m
Max discharge capacity (at DCL)	6577 m^3/s or 568,300 ML/d as per DWG28229

Description	Specification
Radial gates	
Top of gates elevation (when closed)	EL 216.81 m
Outlet works	2 x 1220 mm DIA MSCL pipes within a reinforced, concrete outlet conduit 660 mm cone regulating valve and 300 mm low-flow cone regulating valve

3.2 Population at risk

Callide Dam is deemed to have a Category 2 failure impact rating, which means that its failure has the potential to result in more than 100 Population at Risk (PAR).

Callide Dam is classified as an 'High A' hazard category dam based on a Population at Risk (PAR) of 685 for the Sunny Day Failure (SDF) event, with the severity of damage and loss assessed as 'Major'. The estimated maximum PAR for a flood failure of Callide Dam is 1599, which corresponds to flood failure of the Main Dam during a Probable Maximum Flood Failure event.

The dam was assessed for flood events as having a 'High A' Incremental Flood Hazard Category (IFHC) rating. This rating was based on an incremental potential loss of life of 310 and 'Major' damage and loss for the incremental flood impact zone between the PMF Dam Failure and PMF No Dam Failure, in accordance with ref M and ref CC. Accordingly, the Acceptable Flood Capacity (AFC) for this rating is the Probable Maximum Precipitation Flood (PMPF).

3.3 Spillway adequacy

Callide Dam can overtop in flood events rarer than the Dam Crest Flood (DCF), which has been estimated as ~1 in 8,900-year event (ref V). However, the societal risk profile of Callide dam is below the ANCOLD (2003) recommended limit of tolerability for existing dams.

Stability issues have been identified with the left embankment since the 2010 CRA. As an interim risk reduction measure, the storage is operated at a Reduced Supply Level (RSL), which is currently 0.6 m below the design FSL.

The 2015 flood event generated by Cyclone Marcia provided valuable data on the embankment's response to higher storage levels. Investigations are currently underway and will provide guidance on:

- resuming operation at the design FSL, or
- reducing the maximum operating level permanently, or
- undertaking a dam safety upgrade

3.4 Dam drawings

The General Arrangement drawings are in Appendix B1.

3.5 Emergency inspections and monitoring

Callide 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 Callide Dam.

3.5.1 Inspections

The following inspections are to be carried out:

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

4. Roles and responsibilities

Roles and responsibilities	Position holder
Owner (Sunwater) • 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 event • Maintain an up-to-date list of immediate D/S residents (Appendix A4) of Callide Dam: o As part of the response to the 2015 IGEM Callide review, Sunwater extended the downstream notification area for Appendix A4 to include areas as far downstream as the Jambin Dakenba Road. It is at this point that concurrent flows limit Sunwater's ability to provide valid messaging to areas further downstream. The notification area extent is indicated in the drawing in Appendix B2. • At all times, aim to provide timely advice and support to the LDMGs in the affected local government areas and the 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 residents listed in Appendix A4 EAP via SMS o contact the SDCC to request an Emergency Alert as detailed in the Emergency Alert request and threat detection 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 Dam Condition Schedule • Undertake and prepare the five yearly Comprehensive Inspection Reports with suitably qualified personnel within the time specified 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 ref L 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 spreadsheet for verification for audit and quality control • Record communications, notifications and observations as required	Head of Dam Safety GM Asset Management

Roles and responsibilities	Position holder
Owner's Regional Representative (ORR) • Liaise with the Senior Storage Operator/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 Central OS
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
Technical Advisor • Analyse the situation and provide expert technical advice • Discuss issues 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
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 hazards 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

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 and IC 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 QDMC of flood events • Record communications, notifications and observations as required	Various personnel as per Media Team roster
Incident Coordinator (IC) • Notify LDMGs, or councils if LDMGs 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 are 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 required • 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	SOM SSO OM
Council **Banana Shire Council** Council has legislated local government functions, as per Section 80 of the Queensland 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 DDMG for the disaster district in which area it is situated • Perform other functions given to the local government And as per Section 352HB of the Water Supply (Safety and Reliability) Act 2008 (Qld) • Must assess (in consultation with its LDMG) the EAP for consistency with the LDMP	

Roles and responsibilities	Position holder
Disaster Management Groups/Personnel - (In addition to requirements outlined in **the Queensland Disaster Management Act 2003**) LDMG • As per Inspector-General Emergency Management (IGEM) review recommendation, work together with Sunwater and the councils to ensure community education around messaging and impacts of EAP related events is undertaken and continually improves • Work with councils and Sunwater to ensure the EAP is regularly exercised • Identify and coordinate the use of resources and support services that may be required for an EAP event, noting that for safety events unique to the dam Sunwater will approach councils to initiate • During a dam hazard/emergency event, **providing they are Stood Up**, the LDMGs in the affected local government areas will take the lead role in notifying the broader community • Identify and provide advice to the relevant DDMGs about support services required by the LDMG to manage an EAP event • Provide reports and make recommendations to the relevant DDMGs about matters relating to EAP events QPS • Work with dam owner and LDMGs to ensure Emergency Alert polygons are prepared, stored and tested at the State Disaster Coordination Centre (SDCC) DDMG • May review the EAP for consistency with the DDMP Security and Counter Terrorism Network (SCTN) • Identifies areas of concern during the preparation of disaster plans and provides advice during counter terrorism emergency events	LDMG QPS DDMG 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 Act	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 that occurs where natural catchment inflows fill Callide Dam to EL 215.50 m (RSL) and the rate of inflow exceeds the capacity of the outlet works. The spillway will then discharge water downstream into the Callide Creek. These flood flows can create a dam hazard. Inflows will also cause the storage to temporarily rise to above the RSL of the storage. 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.
- Spillway discharge from the dam where there have been no indications that a dam failure may be initiating or in progress.

Refer to Spill Operations Manual (ref U) for spillway gate operation during flood events.

Note: for spillway gate operations, 'above' means at or above.

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

As the rate of discharge increases there will be an impact on low-level road crossings of Callide Creek (ref Q) and other infrastructure in the creek such as pump sites. The following table shows historical floods experienced at Callide Dam.

Table 3: Historical floods experienced at Callide Dam

Flood rank	Date	Peak height EL (m)	Peak height (m over RSL)
1	Feb 2015	217.203	1.703
2	Jan 2013	216.682	1.182
3	Mar 2017	216.32	0.82
4	Mar 2011	216.25	0.75
5	Jan 2011	216.23	0.73

Following flooding in the reach of Callide Creek downstream of the dam associated with Cyclone Marcia in February 2015, a key outcome of the IGEM review was to investigate the use of Callide Dam as a flood mitigation dam. The study to resolve this question concluded that this was not feasible but that early releases could assist in visual clues to the community that significant dam outflows may be imminent. Sunwater agreed to implement such early releases once gate controls were in place and these have now been installed.

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

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 4: Flood emergency activation trigger summary

EAP Flood Activation Trigger	Trigger Summary	AWS
Alert	• Outflows are forecast to exceed 200 m^3/s based on 12 hour forecast rainfall, AND • Storage above EL 212.50 m (70% volume), AND • Rainfall/streamflow is observed in the catchment, OR • Outflows up to 130 m^3/s	**ADVICE**
Lean Forward	• Storage is above EL 215.50 m, OR • Outflows up to 370 m^3/s	**ADVICE**
Stand Up 1	• Storage is above EL 216.37 m, OR • Outflows up to 750 m^3/s	
Stand Up 2	• Storage is above EL 216.49 m, OR • Outflows up to 1500 m^3/s	
Stand Up 3	• Storage is above EL 216.66 m, OR • Outflows up to 3500 m^3/s	**WATCH AND ACT**
Stand Up 4 greater than flood of record	• Storage is above EL 217.20 m (flood of record), OR • Outflows greater than 3500 m^3/s	
Stand Up 5	• Storage is above EL 219.13 m (Allowing for wave action), OR • As advised by the DSTDM	**EMERGENCY**
Stand Down	• Storage at EL 215.50 m and falling, and no forecast increase in EL in the next four days	**ADVICE**

While this EAP is not activated until Callide Dam reaches the Alert trigger, Sunwater and the Banana LDMG will work cooperatively and will endeavour to share intelligence when whichever organisation becomes aware of a condition that could result in the activation of the EAP.

The activation of Stand Up 5 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 5 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.

In respect of forecast rainfall, as is identified in the roles and responsibilities of the FODM, regard must be had to the OC Procedure (Sunwater internal).

With regard to determining the outflow estimates, the Callide Dam Operation and Maintenance (O&M) Manual (ref U) should be used to derive the cumulative flow through all gates based on observed water level and gate opening heights.

5.2.2 Emergency action roles

Table 5 to Table 10 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 5: Flood operations — DDO emergency action

Activation level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Up 3	Stand Up 4 greater than flood of record	Stand Up 5	Stand Down
Activation trigger	• Outflows are forecast to exceed 200 m^3/s based on 12 hour forecast rainfall, AND • Storage above EL 212.50 m (70% volume), AND • Rainfall/streamflow is observed in the catchment, OR • Outflows up to 130 m^3/s	• Storage is above EL 215.50 m, OR • Outflows up to 370 m^3/s	• Storage is above EL 216.37 m, OR • Outflows up to 750 m^3/s	• Storage is above EL 216.49 m, OR • Outflows up to 1500 m^3/s (trigger level for outer gates)	• Storage is above EL 216.66 m, OR • Outflows up to 3500 m^3/s	• Storage is above EL 217.20 m (flood of record), OR • Outflows greater than 3500 m^3/s	• Storage is above EL 219.13 m (Allowing for wave action),OR • As advised by the DSTDM	• Storage at EL 215.50 m and falling, and no forecast increase in EL in the next four days
Actions	• Record all communication • Undertake site preparations, including: o fuel and operation of backup generator o operations of sump pump o seal of outlet building o communication systems (including backup radio, satellite, phones, and internet) • Confirm with FODM and IC that trigger conditions have been met, and refer to the Spill Operations Manual • Continuously monitor gate operation for indications of vibration and if observed go to Section 9 – Gate Malfunction Hazard and notify DSTDM • Inspect the dam daily (or as instructed by the DSTDM) and photograph/video and record using the approved forms and send to IC & DSTDM • Record the Storage Level daily (or as instructed by the DSTDM) using gauge boards and confirm accuracy of gauging station	• As per previous activation level, AND • Attention will be given to: o visual inspection of flow patterns over spillway and dissipater for evidence of scouring o inspect embankment for leaks, deformation, and scour o obvious signs of seepage • Continue to monitor the dam in accordance with the Spill Operations Manual	• As per previous activation level, AND • Inspect the dam twice daily (or as instructed by the DSTDM) and photograph/video and record using the approved forms and send to IC & DSTDM • Photograph the gates and discharge area	• As per previous activation level, AND • View the embankment with binoculars • Photograph spillway discharge area daily and email to Owner's Representative	• As per previous activation level	• As per previous activation level, AND • Monitor and report gate openings to IC • Fully check all elements of gate operating mechanisms are in their guides • Remotely inspect the dam 6-hourly (or as instructed by the DSTDM) and photograph/video and record using the approved forms in and send to IC & DSTDM • Consider staff evacuation options.	• As per previous activation level, AND • Evacuate any plant and/or vehicles to higher ground • Monitor and record the Storage Level at four-hourly intervals (or as instructed by the DSTDM)	• Return to routine surveillance activities and frequencies • Inspect the dam and photograph any damage identified during the event • Update Operating Log as per SOP 12 • Forward all EER material to IC email as required

NOTE: DDO Emergency Actions continued next page

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

Table 5 (Continued): Flood Operations — DDO emergency action

Activation level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Up 3	Stand Up 4 greater than flood of record	Stand Up 5	Stand Down
Activation trigger	• Outflows are forecast to exceed 200 m^3/s based on 12 hour forecast rainfall, AND • Storage above EL 212.50 m (70% volume), AND • Rainfall/streamflow is observed in the catchment, OR • Outflows up to 130 m^3/s	• Storage is above EL 215.50 m, OR • Outflows up to 370 m^3/s	• Storage is above EL 216.37 m, OR • Outflows up to 750 m^3/s	• Storage is above EL 216.49 m, OR • Outflows up to 1500 m^3/s (trigger level for outer gates)	• Storage is above EL 216.66 m, OR • Outflows up to 3500 m^3/s	• Storage is above EL 217.20 m (flood of record), OR • Outflows greater than 3500 m^3/s	• Storage is above EL 219.13 m (Allowing for wave action),OR • As advised by the DSTDM	• Storage at EL 215.50 m and falling, and no forecast increase in EL in the next four days
Actions	(continued) • Measure and record vibrating wire piezometers and seepage weirs daily, unless otherwise directed by DSTDM • Record rainfall daily • Update Operating Log as per SOP 12	(continued) • Ensure left embankment drainage pipes are clear of blockages and no embankment material is being lost					(continued) • NOTE: All gates are expected to be fully open at this level. However, if referred from Gate Malfunction Hazard, all gates may not necessarily be fully open	
Notifications	• IC • SO • LEC/ORR • DSTDM	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level	• Inform all previously notified contacts of Stand Down
AWS	**ADVICE**	**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 6: Flood operations — LEC emergency action

Activation level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Up 3	Stand Up 4 greater than flood of record	Stand Up 5	Stand Down
Activation trigger	• Outflows are forecast to exceed 200 m^3/s based on 12 hour forecast rainfall, AND • Storage above EL 212.50 m (70% volume), AND • Rainfall/streamflow is observed in the catchment, OR • Outflows up to 130 m^3/s	• Storage is above EL 215.50 m, OR • Outflows up to 370 m^3/s	• Storage is above EL 216.37 m, OR • Outflows up to 750 m^3/s	• Storage is above EL 216.49 m, OR • Outflows up to 1500 m^3/s s (trigger level for outer gates)	• Storage is above EL 216.66 m, OR • Outflows up to 3500 m^3/s	• Storage is above EL 217.20 m (flood of record), OR • Outflows greater than 3500 m^3/s	• Storage is above EL 219.13 m (Allowing for wave action),OR • As advised by the DSTDM	• Storage at EL 215.50 m and falling, and no forecast increase in EL in the next four days
Actions	• Record all communication • Develop/ implement staff roster • **Note: IC to do all LEC external notifications until LDMG is stood up**	• As per previous activation level, AND • Ensure all abnormal observations or damage has been reported to DSTDM and IC	• As per previous activation level	• As per previous activation level • In the event of gates failing to open, liaise with DDO and DSTDM • When Gates 1/2 & 5/6 are opened, advise DSTDM	• As per previous activation level	• As per previous activation level, AND • When approaching EL 218.66 m (0.5m below crest), discuss evacuations with staff onsite	• As per previous activation level, AND • Ensure staff have evacuated the office • NOTE: All gates are expected to be fully open at this level. However, if referred from Gate Malfunction Hazard, all gates may not necessarily be fully open	• Return to routine activities • Forward all EER material to IC emails as required
Notifications	• DDO • IC • LDMG • DDMG	• As per previous activation level	• As per previous activation level	• As per previous activation level, AND • DSTDM	• As per previous activation level	• As per previous activation level	• As per previous activation level	• Inform all previously notified contacts of Stand Down
AWS	**ADVICE**	**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 7: Flood operations — IC emergency action

Activation level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Up 3	Stand Up 4 greater than flood of record	Stand Up 5	Stand Down
Activation trigger	• Outflows are forecast to exceed 200 m^3/s based on 12 hour forecast rainfall, AND • Storage above EL 212.50 m (70% volume), AND • Rainfall/streamflow is observed in the catchment, OR • Outflows up to 130 m^3/s	• Storage is above EL 215.50 m, OR • Outflows up to 370 m^3/s	• Storage is above EL 216.37 m, OR • Outflows up to 750 m^3/s	• Storage is above EL 216.49 m, OR • Outflows up to 1500 m^3/s (trigger level for outer gates)	• Storage is above EL 216.66 m, OR • Outflows up to 3500 m^3/s	• Storage is above EL 217.20 m (flood of record), OR • Outflows greater than 3500 m^3/s	• Storage is above EL 219.13 m (Allowing for wave action),OR • As advised by the DSTDM	• Storage at EL 215.50 m and falling, and no forecast increase in EL in the next four days
Actions	• Record all communication • Confirm with FODM that trigger conditions have been met and direct DDO to initiate manual gate operations • Liaise with Sunwater Media on-call to send SMS and email to D/S residents and phone those without mobiles • Update Sunwater intranet with dam status • **Note: IC to do all LEC external notifications until LDMG 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	• As per previous activation level, AND • In the event of gates failing to open, liaise with DDO, LEC and DSTDM • When Gates 1/2 & 5/6 are opened, advise DSTDM	• As per previous activation level	• As per previous activation level, AND • When approaching EL 218.66 m (0.5 m below crest), discuss evacuations with staff onsite	• As per previous activation level, AND • Liaise with the DSTDM to confirm that dam failure is in progress	• Complete all notifications • Update Sunwater intranet with dam status • Return to routine activities • Compile EER and deliver to DSR if required
Notifications	• FODM • DDO • LEC/ORR • DSTDM • SMT • D/S Residents • Callide Mine • Callide Power Station • SRT • CEO	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level, AND • SDCC • Emergency siren	• Inform all previously notified contacts of Stand Down
AWS	**ADVICE**	**ADVICE**			**WATCH AND ACT**		**EMERGENCY**	**ADVICE**

Table 8: Flood operations — LEC and IC external communication plan

Activation level	Trigger for communications	Group to contact	Method	Message text	AWS
Alert	• Outflows are forecast to exceed 200 m^3/s based on 12 hour forecast rainfall, AND • Storage above EL 212.50 m (70% volume), AND • Rainfall/streamflow is observed in the catchment, OR • Outflows up to 130 m^3/s	• D/S Residents	• SMS • Email • Phone for those <u>without</u> mobiles	**Liaise with Sunwater Media on-call, LDMG, FODM and/or DSTDM to send appropriate message** **Refer to Annexe for sample message**	**ADVICE**
		• LDMG • DDMG • Callide Mine • Power Station	• Phone	Describe current situation with dam: What is the event? What is the status? Advise of current storage level and whether any flood releases are due to commence	
Lean Forward	• Storage is above EL 215.50 m, OR • Outflows up to 370 m^3/s	• D/S Residents	• SMS • Email • Phone for those <u>without</u> mobiles	**Liaise with Sunwater Media on-call, LDMG, FODM and/or DSTDM to send appropriate message** **Refer to Annexe for sample message**	**ADVICE**
		• LDMG • DDMG • Callide Mine • Power Station	• Phone	Describe current situation with dam: What is the event? What is the status? Advise of current storage level and describe gates opening if appropriate Discuss any potential road/bridge closures	
Stand Up 1	• Storage is above EL 216.37 m, OR • Outflows up to 750 m^3/s	• D/S Residents	• SMS • Email • Phone for those <u>without</u> mobiles	**Liaise with Sunwater Media on-call, LDMG, FODM and/or DSTDM to send appropriate message** **Refer to Annexe for sample message**	
		• LDMG • DDMG • Callide Mine • Power Station	• Phone & email	Describe current situation with dam: What is the event? What is the status? Advise of current storage level and describe gates opening if appropriate Advise of any forecasts you are aware of	

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

Table 8 (Continued): Flood operations — LEC and IC external communication plan

Activation level	Trigger for communications	Group to contact	Method	Message text	AWS
Stand Up 2	• Storage is above EL 216.49 m, OR • Outflows up to 1500 m^3/s (trigger level for outer gates)	• D/S Residents	• SMS • Email • Phone for those without mobiles	**Liaise with Sunwater Media on-call, LDMG, FODM and/or DSTDM to send appropriate message** **Refer to Annexe for sample message**	
		• LDMG • DDMG • Callide Mine • Power Station	• Phone	Describe current situation with dam: What is the event? What is the status? Advise of current storage level and describe gates opening if appropriate Advise of any forecasts you are aware of	
Stand Up 3	• Storage is above EL 216.66 m, OR • Outflows up to 3500 m^3/s	• D/S Residents	• SMS • Email • Phone for those without mobiles	**Liaise with Sunwater Media on-call, LDMG, FODM and/or DSTDM to send appropriate message** **Refer to Annexe for sample message**	**WATCH AND ACT**
		• LDMG • DDMG • Callide Mine • Power Station	• Phone	Describe current situation with dam: What is the event? What is the status? Advise of current storage level and describe gates opening if appropriate Advise of any forecasts you are aware of	

Table 8 (Continued): Flood operations — LEC and IC external communication plan

Activation level	Trigger for communications	Group to contact	Method	Message text	
Stand Up 4 greater than flood of record	• Storage is above EL 217.20 m (flood of record), OR • Outflows greater than 3500 m^3/s	• D/S Residents	• SMS • Email • Phone for those without mobiles	**Liaise with Sunwater Media on-call, LDMG, FODM and/or DSTDM to send appropriate message** **Refer to Annexe for sample message**	
		• LDMG • DDMG • Callide Mine • Power Station	• 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 and describe gates opening if appropriate Advise of any forecasts you are aware of	
Stand Up 5	• Storage is above EL 219.13 m • NOTE: All gates are expected to be fully open at this level. However, if referred from Gate Malfunction Hazard, all gates may not necessarily be fully open	• LDMG • DDMG • Callide Mine • Power Station	• Phone	Describe current situation with dam: What is the event? What is the status? Advise of current storage level and describe gates opening if appropriate Advise of any forecasts you are aware of	**EMERGENCY**
		• D/S Residents	• SMS • Email • Phone for those without mobiles	**Liaise with Sunwater Media on-call, LDMG, FODM and/or DSTDM to send appropriate message** **Refer to Annexe for sample message**	
		• SDCC	• Phone & Email	Complete Emergency Alert Request Form as per instructions and email to the SDCC	
		• Emergency siren	• Phone & Email	**Complete emergency siren instructions in Appendix A8 and notify SRT.** Not to be used UNLESS confirmed dam failure is in progress and the Emergency Alert is being sent out.	
Stand Down	• Storage at EL 215.50 m and falling, and no forecast increase in EL in the next four days	• D/S Residents	• SMS • Email • Phone for those without mobiles	**Liaise with Sunwater Media on-call, LDMG, FODM and/or DSTDM to send appropriate message** **Refer to Annexe for sample message**	**ADVICE**
		• LDMG • DDMG • Callide Mine • Power Station • 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	

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

IC	07 3120 0320
DSTDM	07 3120 0100
FODM	07 3120 0264

Table 9: Flood operations — DSTDM emergency action

Activation level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Up 3	Stand Up 4 greater than flood of record	Stand Up 5	Stand Down
Activation trigger	• Outflows are forecast to exceed 200 m^3/s based on 12 hour forecast rainfall, AND • Storage above EL 212.50 m (70% volume), AND • Rainfall/streamflow is observed in the catchment, OR • Outflows up to 130 m^3/s	• Storage is above EL 215.50 m, OR • Outflows up to 370 m^3/s	• Storage is above EL 216.37 m, OR • Outflows up to 750 m^3/s	• Storage is above EL 216.49 m, OR • Outflows up to 1500 m^3/s (trigger level for outer gates)	• Storage is above EL 216.66 m, OR • Outflows up to 3500 m^3/s	• Storage is above EL 217.20 m (flood of record), OR • Outflows greater than 3500 m^3/s	• Storage is above EL 219.13 m (Allowing for wave action),OR • As advised by the DSTDM	• Storage at EL 215.60 m and falling, and no forecast increase in EL in the next 4 days
Action	• Record all communication • Provide technical advice to DDO and IC as needed • Review surveillance reports and determine if any additional responses are required • Note: Confirm that gate operation is being monitored for indications of vibration	• As per previous activation level	• As per previous activation level	• As per previous activation level, AND • In the event of gates failing to operate, provide advice to DDO, IC and LEC on rectification	• As per previous activation level	• As per previous activation level	• As per previous activation level, AND • Liaise with the IC and confirm need to sound emergency siren due to dam failure • NOTE: All gates are expected to be fully open at this level. However, if referred from Gate Malfunction Hazard, all gates may not necessarily be fully open	• Return to routine activities • Forward all EER material to IC email as required
Notifications	• DDO • IC • DSR	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level	• Inform all previously notified contacts of Stand Down
AWS	**ADVICE**	**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 10: Flood operations — FODM emergency action

Activation level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Up 3	Stand Up 4 greater than flood of record	Stand Up 5	Stand Down
Activation trigger	• Outflows are forecast to exceed 200 m^3/s based on 12 hour forecast rainfall, AND • Storage above EL 212.50 m (70% volume), AND • Rainfall/streamflow is observed in the catchment, OR • Outflows up to 130 m^3/s	• Storage is above EL 215.50 m, OR • Outflows up to 370 m^3/s	• Storage is above EL 216.37 m, OR • Outflows up to 750 m^3/s	• Storage is above EL 216.49 m, OR • Outflows up to 1500 m^3/s (trigger level for outer gates)	• Storage is above EL 216.66 m, OR • Outflows up to 3500 m^3/s	• Storage is above EL 217.20 m (flood of record), OR • Outflows greater than 3500 m^3/s	• Storage is above EL 219.13 m (Allowing for wave action),OR • As advised by the DSTDM	• Storage at EL 215.50 m and falling, and no forecast increase in EL in the next four days
Action	• Record all communication • Confirm with IC that trigger conditions have been met and to activate EAP • Continue to monitor catchment conditions • Update Flood models as per OC Procedure • Update and issue flood operations report • Update IC and DSTDM re: current flood situation and PFRM results	• As per previous activation level, AND • Issue a Flood Situation Report daily	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level • NOTE: All gates are expected to be fully open at this level. However, if referred from Gate Malfunction Hazard, all gates may not necessarily be fully open	• Forward all EER material to IC email as required • Return to routine activities
Notifications	• IC • DSTDM • DDO	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level	• Inform all previously notified contacts of Stand Down
AWS	**ADVICE**	**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

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

6.1 Overview

The emergency action described in this section relates to a potential dam hazard 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 may be 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 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 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.

  Notes: Definitions for *Concurrent Flooding* and *Downstream Releases* are provided in Section 1.3.

6.1.1 Assessment of circumstances that indicates 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 11 to Table 15 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

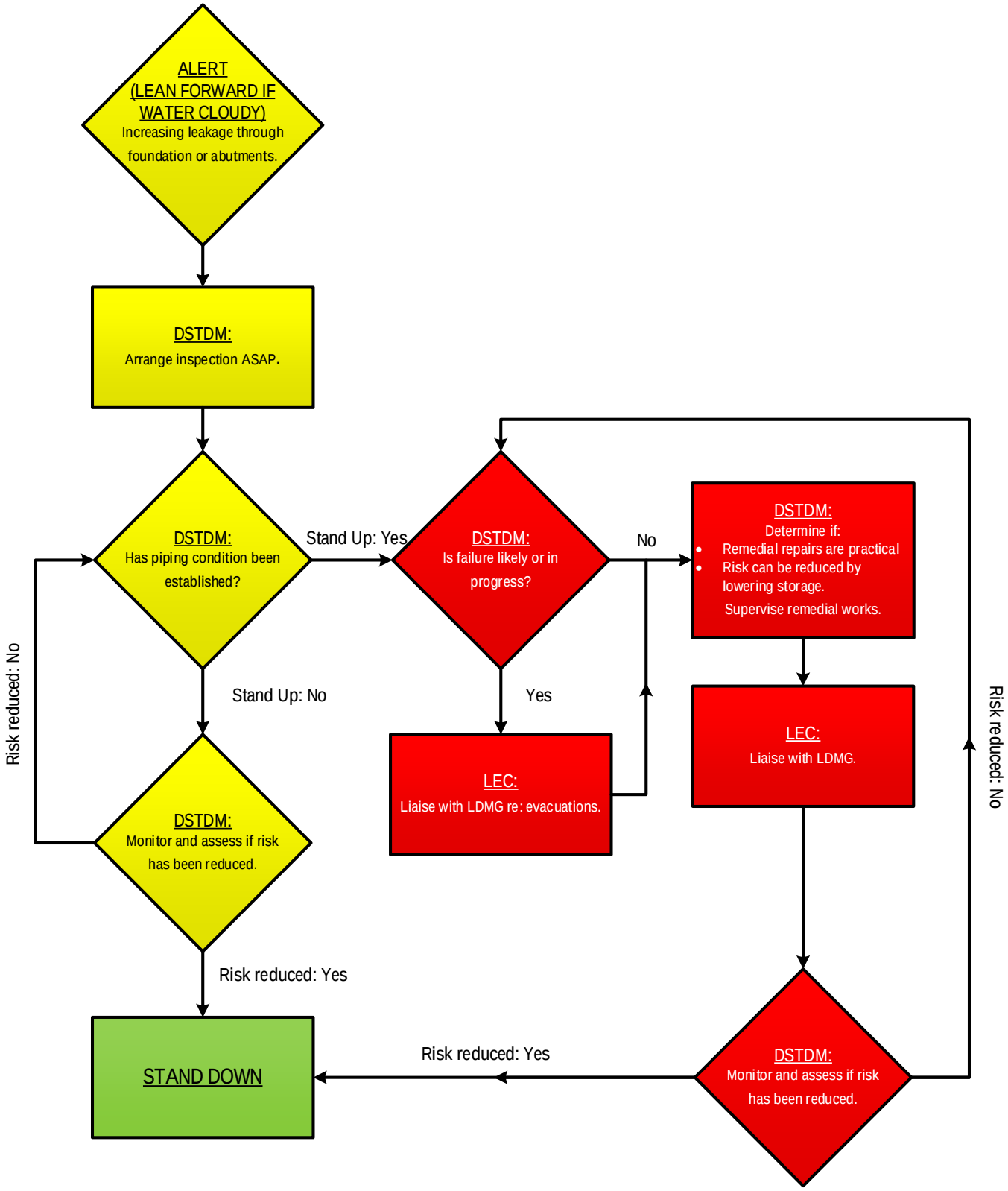


Table 11: Piping: embankment, foundation, or abutments — DDO emergency action

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 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 • Sound gate operations siren if required • Close any affected roads if not already closed by others • Maintain surveillance of area immediately downstream of dam (if safe to do so) and move on any members of the public	• As per previous activation level, AND • Vacate the immediate vicinity of the piping condition • Ensure remedial works cease and plant and personnel have been moved to a safe location	• 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

Table 12: 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 is stood up**	• As per previous activation level	• As per previous activation level, AND • Liaise with DDO and 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	• DDO • IC • LDMG	• 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

king photographs/video, dam inspections, instrument readings

Table 13: 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 dam status • **Note: IC to do all LEC external notifications until LDMG 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 Recovery Coordinator. The Recovery Coordinator is then 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 • Mobilise resources to undertake remedial works if directed by DSTDM	• As per previous activation level, AND • Direct remedial works to cease if directed by the DSTDM and plant and personnel to be moved to a safe location • Liaise with the DSTDM to confirm that dam failure is in progress	• Complete all notifications • Compile EER and deliver to DSR if required • Update Sunwater intranet with dam status • Return to routine activities
Notifications	• DSTDM • DDO • LEC/ORR • SMT • SRT • CEO	• As per previous activation level	• As per previous activation level, • AND • D/S Residents • SDCC • Callide Mine • Power Station	• As per previous activation level, AND • Emergency Siren	• 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

Table 14: Piping: embankment, foundation, or abutments — LEC and IC external communication plan

Activation level	Trigger for communications	Group to contact	Method	Message text
Alert	• Increasing leakage through an embankment, the foundations, or abutments	• LDMG	• 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	• Increasing leakage through an embankment, the foundations, or abutments with cloudy water	• LDMG • 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	• D/S Residents	• SMS (Phone for those without mobiles)	**Liaise with Sunwater Media on-call, LDMG and DSTDM to send appropriate message** **Refer to Annexe for sample message**
		• SDCC	• Email & Phone	Complete Emergency Alert Request Form as per instructions and email to SDCC
		• LDMG • DDMG • Callide Mine • Power Station	• 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

Table 14 (Continued) Piping: embankment, foundation, or abutments — LEC and IC external communication plan

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	• D/S Residents	• SMS • Email • Phone for those without mobiles	**Liaise with Sunwater Media on-call, LDMG, and DSTDM to send appropriate message** **Refer to Annexe for sample message**
		• SDCC	• Email & Phone	Complete Emergency Alert Request Form as per instructions and email to SDCC
		• LDMG • DDMG • Callide Mine • Power Station	• 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
	• Dam failure in progress	• D/S Residents	• SMS • (Phone for those without mobiles)	**Liaise with Sunwater Media on-call, LDMG, and DSTDM to send appropriate message** **Refer to Annexe for sample message**
		• SDCC	• Email & Phone	Complete Emergency Alert Request Form as per instructions and email to SDCC
		• LDMG • DDMG • Callide Mine • Power Station	• 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
		• Emergency siren	• Phone & Email	**Complete emergency siren instructions in Appendix A8 and notify SRT.** **Not to be used UNLESS confirmed dam failure is in progress and the Emergency Alert is being sent out.**
Stand Down	• Risk assessment has determined that piping risk has reduced	• D/S Residents	• SMS • Email • Phone for those without mobiles	**Liaise with Sunwater Media on-call, LDMG, and DSTDM to send appropriate message** **Refer to Annexe for sample message**
		• LDMG • DDMG • Callide Mine • Power Station • 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

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

Table 15: Piping: embankment, foundation, or abutments — DSTDM 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
Action	• 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 and assess risks	• 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 drawn down based on latest available data and advise in writing to IC and DDO) • Supervise remedial repairs (if applicable). Supervise means to provide technical oversight to the work. It does not necessarily mean on-site supervision.	• As per previous activation level, AND • Liaise with the IC and confirm need to sound emergency siren due to dam failure • 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

7. Dam hazard — earthquake

7.1 Overview

The emergency action described in this section relates to a potential dam hazard 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. The use of these flood outlines is prescribed below:

- Use the SDF outline when a dam failure is in progress or likely due to earthquake and no concurrent flooding or downstream releases are occurring or expected to occur, or
- Use the PMF outline when a dam failure is in progress or likely due to earthquake and concurrent flooding or downstream releases are occurring or expected to occur.

  Notes: Definitions for *Concurrent Flooding* and *Downstream Releases* are provided in Section 1.3

7.2 Emergency action roles

Table 16 to Table 20 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

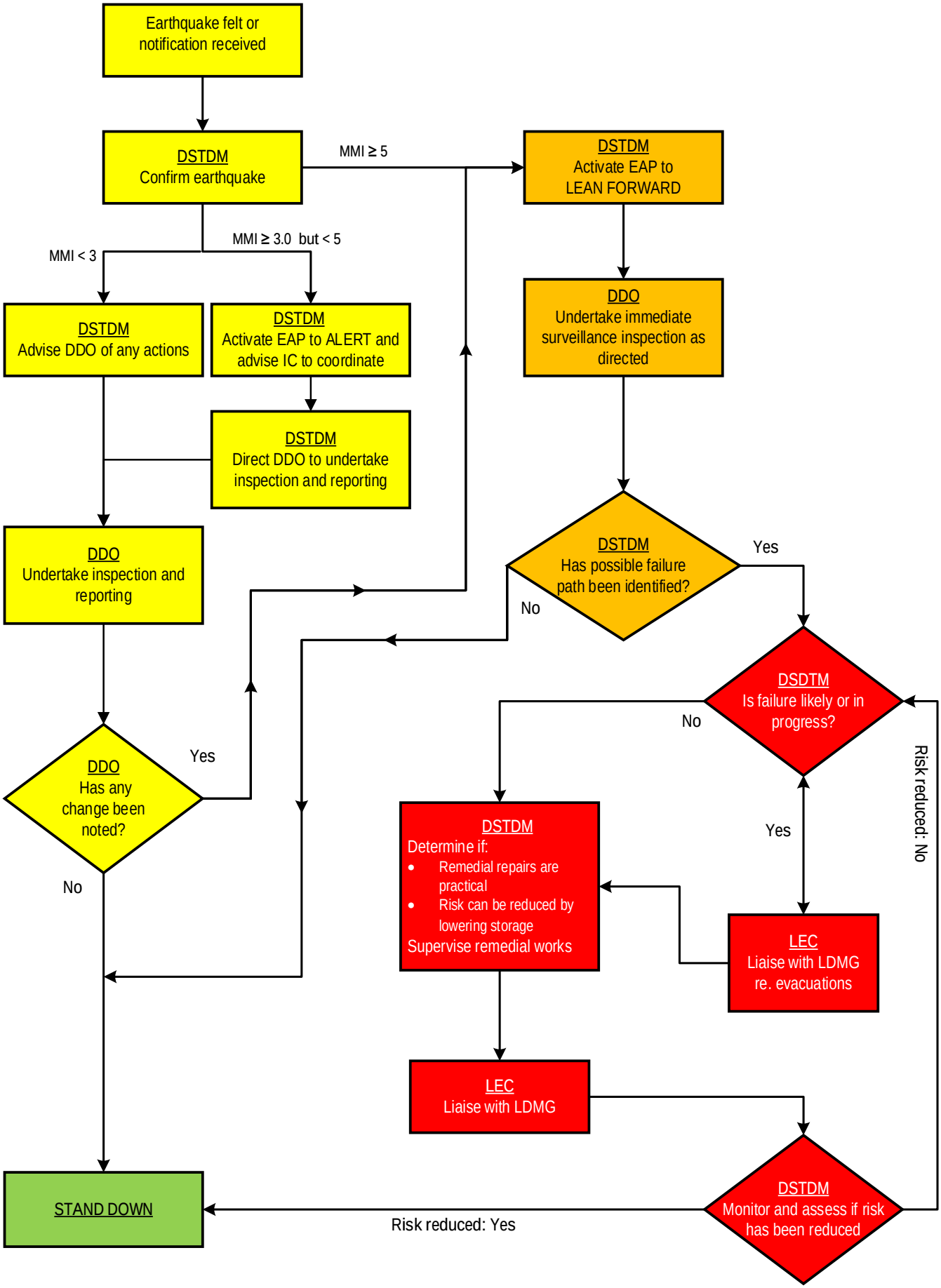


Table 16: Earthquake — DDO emergency action

Activation level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Down
Activation trigger	• Earthquake **confirmed** (by the DSTDM) or felt in the area, AND • Intensity less than 5 MMI	• Earthquake **confirmed** (by the 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 the 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 (Modified Mercalli Intensity) 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 inspections 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 • Sound gate operations siren if required • 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 SOP 12 • 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

Table 17: Earthquake — LEC emergency action

Activation level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Down
Activation trigger	• Earthquake **confirmed** (by the DSTDM) or felt in the area, AND • Intensity less than 5 MMI	• Earthquake **confirmed** (by the 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 the 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 communication • **Note: IC to do all LEC external notifications until LDMG 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	• 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

Table 18: Earthquake — IC emergency action

Activation level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Down
Activation trigger	• Earthquake **confirmed** (by the DSTDM) or felt in the area, AND • Intensity less than 5 MMI	• Earthquake **confirmed** (by the 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 the 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 than 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 is stood up**	• As per previous activation level, AND • Investigate the availability of machinery and materials (if insufficient stockpiles are available) • The IC is to place the 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 all EAs and other messages are prepared in advance of use – if required	• As per previous activation level. AND • Liaise with Sunwater Media on-call, LDMG, and DSTDM to send appropriate messaging • The IC is to coordinate resources to undertake remedial works if directed by the DSTDM	• As per previous activation level, AND • The IC is to liaise with the DSTDM who is to confirm that a failure of the dam 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 the DDO and the DSTDM regarding the potential need for evacuation	• Complete all internal and external notifications • Compile EER and deliver to the 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 • Callide Mine • Power Station	• As per previous activation level, AND • Emergency Siren	• 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

Table 19: Earthquake — LEC and IC external communication plan

Activation level	Trigger for communications	Group to contact	Method	Message text
Alert	• Earthquake **confirmed** (by the DSTDM) or felt in the area, AND • Intensity less than 5 MMI	• LDMG	• 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 the 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 • 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 the DSTDM) or felt in the area, AND • A possible failure path has been identified	• D/S Residents	• SMS • Email • Phone for those without mobiles	**Liaise with Sunwater Media on-call, LDMG, and DSTDM to send appropriate message** **Refer to Annexe for sample message**
		• SDCC	• Email & Phone	Complete Emergency Alert Request Form as per instructions and email to SDCC
		• LDMG • DDMG • Callide Mine • Power Station	• 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 Activate emergency response

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

Table 19 (Continued): Earthquake — LEC and IC external Communication Plan

Activation level	Trigger for communications	Group to contact	Method	Message text
Stand Up 2	• Failure likely due to earthquake, AND • Sufficient water in storage to create a dam hazard	• D/S Residents	• SMS • Email • Phone for those without mobiles	**Liaise with Sunwater Media on-call, LDMG, and DSTDM to send appropriate message** **Refer to Annexe for sample message**
		• SDCC	• Email & Phone	Complete Emergency Alert Request Form as per instructions and email to SDCC
		• LDMG • DDMG • Callide Mine • Power Station	• 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
	• Dam failure in progress	• D/S Residents	• SMS • Email • Phone for those without mobiles	**Liaise with Sunwater Media on-call, LDMG, and DSTDM to send appropriate message** **Refer to Annexe for sample message**
		• SDCC	• Email & Phone	Complete Emergency Alert Request Form as per instructions and email to SDCC
		• LDMG • DDMG • Callide Mine • Power Station	• 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
		• Emergency siren	• Phone & Email	**Complete emergency siren instructions in Appendix A8 and notify SRT.** **Not to be used UNLESS confirmed dam failure is in progress and the Emergency Alert is being sent out.**
Stand Down	• Risk assessment has been determined that failure risk has reduced	• D/S Residents	• SMS • Email • Phone for those without mobiles	**Liaise with Sunwater Media on-call, LDMG, and DSTDM to send appropriate message** **Refer to Annexe for sample message**
		• LDMG • DDMG • Callide Mine • Power Station • 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

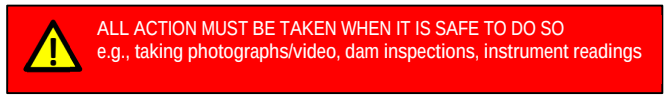


Table 20: Earthquake — DSTDM emergency action

Activation level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Down
Activation trigger	• Earthquake **confirmed** (by the DSTDM) or felt in the area, AND • Intensity less than 5 MMI	• Earthquake **confirmed** (by the 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 the 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
Action	• **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 **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 reported damage	• 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 drawn down, then the DSTDM needs to assess the maximum rate of drawdown based on the 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, AND • Liaise with the IC and confirm need to sound emergency siren due to dam failure	• Forward all EER material to the 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

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 hazard 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 Callide Dam to a terrorist attack is low.

Note: Risk is higher due to gated nature of spillway.

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 threat/activity or a high energy impact. The use of these flood outlines is prescribed below:

- Use the SDF outline when a dam failure is in progress or likely due to a terrorist threat/activity or a high energy impact and no concurrent flooding or downstream releases are occurring or expected to occur, or
- Use the PMF outline when a dam failure is in progress or likely due to a terrorist threat/activity or a high energy impact and concurrent flooding or downstream releases are occurring or expected to occur.

  Notes: 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 21 to Table 25 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

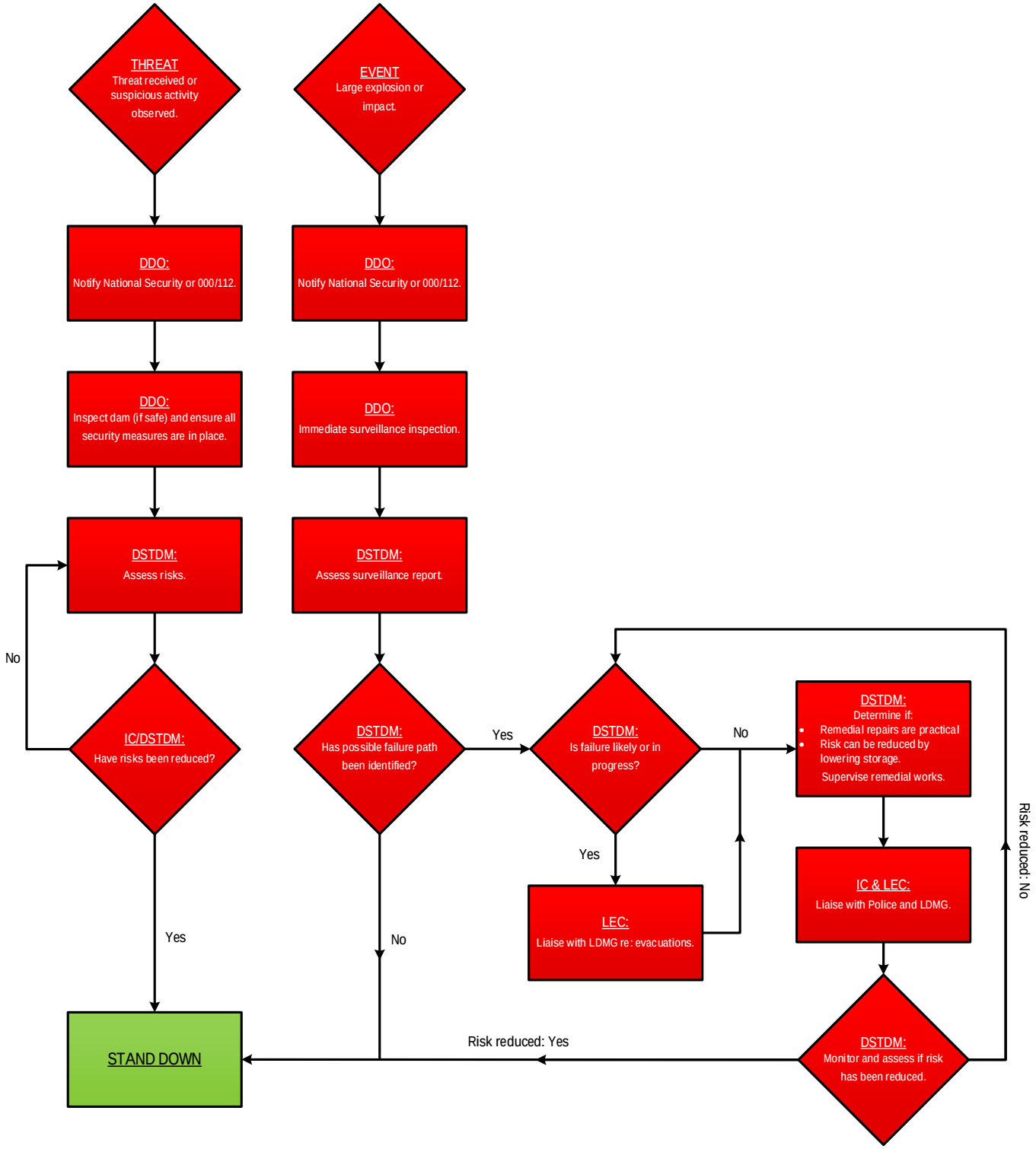


Table 21: Terrorist threat/activity or high energy impact — DDO emergency action

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, of if threat received, complete the following: • Inspect dam (if safe) and ensure all security measures in place (locked gates, etc.) • Photograph/video suspicious items from a safe point and record using the approved forms and send to IC & DSTDM • If Police appoint Incident Manager support and follow instructions • Close any affected roads as directed • Update Operating Log as per SOP 12	• As per previous activation level, AND • Vacate the immediate vicinity of the affected area	• As per previous activation level, AND • Lower storage level if directed by DSTDM • Sound gate operations siren if required	• 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

Table 22: Terrorist threat/activity or high energy impact — LEC 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 • If Police appoint Incident Manager support and follow instructions • Monitor situation and assess risks • Liaise with DDO and 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 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 • 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

Table 23: 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 (CTG) • If Police appoint Incident Manager support and follow instructions • Update Sunwater intranet with dam status • **Note: IC to do all LEC external notifications until LDMG is stood up**	• As per previous activation level • 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 the DSTDM to confirm that dam failure is in progress • Liaise with DDO, DSTDM, and LEC re: potential for evacuations • Mobilise resources to undertake remedial works if directed by DSTDM	• Complete all notifications • 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 • Callide Mine • Power Station	• As per previous activation level, AND • Emergency siren	• 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

Table 24: 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	**ALERT NOT APPLICABLE**			
Lean Forward	**LEAN FORWARD NOT APPLICABLE**			
Stand Up 1	**THREAT** • Possible terrorist activity/ suspicious behaviour noticed at the dam • Threat received	• LDMG • 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 Activate emergency response
Stand Up 2	**EVENT** • Large explosion heard/observed at dam (e.g., bomb explosion, aircraft hit)	• D/S Residents	• SMS • Email • Phone for those without mobiles	**Liaise with Sunwater Media on-call, LDMG, and DSTDM to send appropriate message** **Refer to Annexe for sample message**
		• SDCC	• Email & Phone	Complete Emergency Alert Request Form as per instructions and email to SDCC
		• LDMG • DDMG • CTG • Callide Mine • Power Station	• 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)
Stand Up 3	**RESPONSE** • Failure in progress or likely due to impact or explosion, AND • Sufficient water in storage to create a dam hazard	• D/S Residents	• SMS • Email • Phone for those without mobiles	**Liaise with Sunwater Media on-call, LDMG, and DSTDM to send appropriate message** **Refer to Annexe for sample message**
		• SDCC	• Phone & Email	Complete Emergency Alert Request Form as per instructions and email to SDCC
		• LDMG • DDMG • CTG • Callide Mine • Power Station	• 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)
		• Emergency siren	• Phone & Email	Complete emergency siren instructions in Appendix A8 and notify SRT. Not to be used UNLESS confirmed dam failure is in progress and the Emergency Alert is being sent out.
Stand Down	• Risk assessment has determined that failure risk has reduced	• D/S Resident	• SMS • Email • Phone for those without mobiles	**Liaise with Sunwater Media on-call, LDMG, and DSTDM to send appropriate message** **Refer to Annexe for sample message**
		• LDMG • DDMG • Callide Mine • Power Station • 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

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

Table 25: 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
Action	• 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 drawn down 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 confirm need to sound emergency siren due to dam failure • Liaise with the IC and LEC and advise on need to recommend evacuations	• Forward all EER material to IC email as required • Return to routine activities
Notifications	• Not applicable	• IC • DDO • 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

9. Dam hazard — gate malfunction

9.1 Overview

The emergency action described in this section relates to the malfunction of one or more gates, including uncontrolled vibration.

9.1.1 Assessment of circumstances that indicates an increase in the likelihood of gate malfunction occurring

The following EAP dam hazards could indicate an increased likelihood of gate malfunction:

- flood operations/blockage
- earthquake
- terrorist threat.

Mechanical or electrical failure during an operational test could also result in gate malfunction.

9.2 Emergency action roles

In respect of forecast rainfall, as is identified in the roles and responsibilities of the FODM, regard must be had to the OC Procedure (Sunwater internal).

Table 26 to Table 31 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 26: Gate malfunction — DDO emergency action

Activation level	Alert	Lean Forward	Stand Up	Stand Down
Activation trigger	• Loss of control* of one or more gates with insufficient forecast inflows to exceed storage level EL 215.5 m in the next 4-day forecast period.	• Loss of control* of one or more gates with sufficient forecast inflows to exceed storage level EL 215.5 m in the next 4-day forecast period.	• Loss of control* of one or more gates; AND • Storage level above EL 215.5 m.	• Confirmation that all gates are functioning correctly
Actions	• Record all communication • Refer to the Spill Operations Manual • Support/supervise remedial works as required • Update Operating Log as per SOP 12 • Note: Continuously monitor for indications of vibration and if observed, notify DSTDM	• As per previous activation level, AND • Lower the storage if directed • Maintain surveillance of area immediately downstream of dam (if safe to do so) and move on any members of the public	• As per previous activation level, AND • Close any affected roads if not already closed by others	• 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	• Inform all previously notified contacts of Stand Down

*Includes uncontrolled gate vibration

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

Table 27: Gate malfunction — LEC emergency action

Activation level	Alert	Lean Forward	Stand Up	Stand Down
Activation trigger	• Loss of control* of one or more gates with insufficient forecast inflows to exceed storage level EL 215.5 m in the next 4-day forecast period.	• Loss of control* of one or more gates with sufficient forecast inflows to exceed storage level EL 215.5 m in the next 4-day forecast period.	• Loss of control* of one or more gates; AND • Storage level above EL 215.5 m.	• Confirmation that all gates are functioning correctly
Actions	• Record all communication • **Note: IC to do all LEC external notifications until LDMG is stood up**	• 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	• DDO • IC • LDMG	• As per previous activation level, AND • DDMG	• As per previous activation level	• Inform all previously notified contacts of Stand Down

*Includes uncontrolled gate vibration

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

Table 28: Gate malfunction — IC emergency action

Activation level	Alert	Lean Forward	Stand Up	Stand Down
Activation trigger	• Loss of control* of one or more gates with insufficient forecast inflows to exceed storage level EL 215.5 m in the next 4-day forecast period.	• Loss of control* of one or more gates with sufficient forecast inflows to exceed storage level EL 215.5 m in the next 4-day forecast period.	• Loss of control* of one or more gates; AND • Storage level above EL 215.5 m.	• Confirmation that all gates are functioning correctly
Actions	• Record all communication • Update Sunwater intranet with dam status • **Note: IC to do all LEC external notifications until LDMG is stood up**	• As per previous activation level • 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 • Note: review Flood Operation (Section 5) triggers (including whether there is a requirement to notify D/S Residents)	• Complete all notifications • Compile EER and deliver to DSR if required • Update Sunwater intranet with dam status • Return to routine activities
Notifications	• DSTDM • DDO • LEC/ORR • SMT • SRT • CEO	• As per previous activation level	• As per previous activation level, AND • SDCC– if required • D/S Residents – if required	• Inform all previously notified contacts of Stand Down

*Includes uncontrolled gate vibration

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

Table 29: Gate malfunction — LEC and IC external communication plan

Activation level	Trigger for communications	Group to contact	Method	Message text
Alert	• Loss of control* of one or more gates with insufficient forecast inflows to exceed storage level EL 215.5 m in the next 4-day forecast period.	• LDMG	• Phone	Describe current situation with gates What is the status? (e.g. time to repair?) Advise of current storage level Advise any issues you are aware of — Investigation continues Standby for further advice
Lean Forward	• Loss of control* of one or more gates with sufficient forecast inflows to exceed storage level EL 215.5 m in the next 4-day forecast period.	• LDMG • DDMG	• Phone	Describe current situation with gates What is the status? (e.g. time to repair?) Advise of current storage level Advise any issues you are aware of — Investigation continues Discuss any potential road/bridge closures Standby for further advice
Stand Up	• Loss of control* of one or more gates; AND • Storage level above EL 215.5 m.	• LDMG • DDMG	• Phone	Describe current situation with gates What is the status? (unknown time to repair?) Advise of current storage level Advise of flooding risk if loss of control of gates continue Advise any issues you are aware of — investigation continues
		• SDCC – if required	• Phone & Email	Complete Emergency Alert Request Form as per instructions and email to SDCC.
		• D/S Residents – if required	• SMS (Phone for those without mobiles)	**Liaise with Sunwater Media on-call, LDMG, DSTDM to send appropriate message**
Stand Down	• Confirmation that all gates are functioning correctly	• D/S Residents – if required	• SMS (Phone for those without mobiles)	**Liaise with Sunwater Media on-call, LDMG, DSTDM to send appropriate message**
		• LDMG • DDMG • SDCC – if required	• Phone	Describe current situation with gates What is the status? (Dam hazard stood down) Confirmation that all gates are functioning correctly, and EAP has been deactivated

*Includes uncontrolled gate vibration

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

Table 30: Gate malfunction — DSTDM emergency action

Activation level	Alert	Lean Forward	Stand Up	Stand Down
Activation trigger	• Loss of control* of one or more gates with insufficient forecast inflows to exceed storage level EL 215.5 m in the next 4-day forecast period.	• Loss of control* of one or more gates with sufficient forecast inflows to exceed storage level EL 215.5 m in the next 4-day forecast period.	• Loss of control* of one or more gates; AND • Storage level above EL 215.5 m.	• Confirmation that all gates are functioning correctly
Action	• Record all communication. • Arrange an inspection of the dam to assess its condition as soon as possible, when safe to do so • Monitor situation and assess risks • Liaise with FODM and obtain PFRM results • Confirm that gates are being monitored for indications of vibration	• As per previous activation level, AND • Determine if risks can be reduced by lowering storage • Supervise remedial repairs (if applicable). Supervise means provide technical oversight to the work. It does not necessarily mean on-site supervision	• Assess risk and determine if failure likely or in progress	• Forward all EER material to IC email as required • Return to routine activities
Notifications	• FODM • DDO • IC • LEC/ORR • DSR	• As per previous activation level	• As per previous activation level	• Inform all previously notified contacts of Stand Down

*Includes uncontrolled gate vibration

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

Table 31: Gate malfunction — FODM emergency action

Activation level	Alert	Lean Forward	Stand Up	Stand Down
Activation trigger	• Loss of control* of one or more gates with insufficient forecast inflows to exceed storage level EL 215.5 m in the next 4-day forecast period.	• Loss of control* of one or more gates with sufficient forecast inflows to exceed storage level EL 215.5 m in the next 4-day forecast period.	• Loss of control* of one or more gates; AND • Storage level above EL 215.5 m.	• Confirmation that all gates are functioning correctly
Actions	• Record all communication • Undertake hydrological inflow assessment based on the 4-day forecast period	• As per previous activation level	• As per previous activation level, • Liaise with DSTDM regarding outflow estimates due to gate malfunction	• Complete all notifications • Forward all EER material to IC email as required
Notifications	• IC • DSTDM	• As per previous activation level,	• As per previous activation level	• Inform all previously notified contacts of Stand Down

*Includes uncontrolled gate vibration

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

10. Other emergency situation — communications failure

10.1 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.

10.2 Emergency actions

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

10.2.1 Activation triggers

Table 32: Communications failure emergency 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 or ORR)
Comms Failure Brisbane	• Unable to communicate to or from Sunwater Brisbane (could affect DSTDM or FODM & will affect IC)

10.2.2 Assessment of circumstances that indicates the likelihood of communications failure escalating the activation level of a current dam hazard

The FODM will assess the weather and flood warnings daily in accordance with the OC Procedure (Sunwater internal) and ref S. They will escalate to the IC any warnings that have the potential to generate an inflow event.

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 so assessed, the FODM may instruct the IC to escalate the activation level of any current dam hazards.

10.2.3 Emergency action roles

Table 32 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).

Table 33: Communications failure — DDO emergency action

Activation level	Comms Failure – Local Area	Comms Failure – Brisbane
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	• LEC/ORR • SO

Table 34: Communications failure — LEC emergency action

Activation level	Comms Failure Dam Site	Comms Failure – Brisbane
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 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	• Issue Sunwater Incident Alert • 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 • 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	• DDO • DSTDM • SO • LDMG • DDMG

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

Table 35: Communications failure — IC emergency action

Activation level	Comms Failure – Dam Site	Comms Failure – Local Area
Activation trigger	• Unable to communicate to dam site	• Unable to communicate to local area including LEC and ORR
Actions	• 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 • As much as is practicable, continue other tasks associated with the role 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 • 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 • DDMG

Table 36: Communications failure — LEC and IC communication plan

Activation level	Trigger for communications	Group to contact	Method	Message text
Comms Failure Site	• Unable to communicate to or from dam site, AND • DDO is at dam site	• IC/LEC • DSTDM • SO • LDMG • DDMG	• Phone	Describe current situation with dam communications. What is the status – estimated time to restore communications?
Comms Failure Local Area	• Unable to communicate to or from local area including LEC and ORR	• DDO • DSTDM • SO • LDMG • DDMG	• Phone	Describe current situation with dam communications. What is the status – estimated time to restore communications?
Comms Failure Brisbane	• Unable to communicate to or from Sunwater Brisbane	• DSTDM • LDMG • DDMG	• Phone	Describe current situation with dam communications. What is the status – estimated time to restore communications?

o

Table 37: Communications failure — DSTDM emergency action

Activation level	Comms Failure – Site	Comms Failure – Local Area
Activation trigger	• Unable to communicate to dam site	• Unable to communicate to local area including LEC and ORR
Actions	• Provide technical advice to IC/LEC as needed • Record all communication • As much as is practicable, continue other tasks associated with the role in accordance with any other current emergency action	• Provide technical advice to IC as needed • Record all communication • Assume that the DDO is assisting IC with LEC role • As much as is practicable, continue other tasks associated with the role in accordance with any other current emergency action
Notifications	IC LEC/ORR SRT DSR	IC DDO SRT DSR

Table 38: Communications failure — FODM emergency action

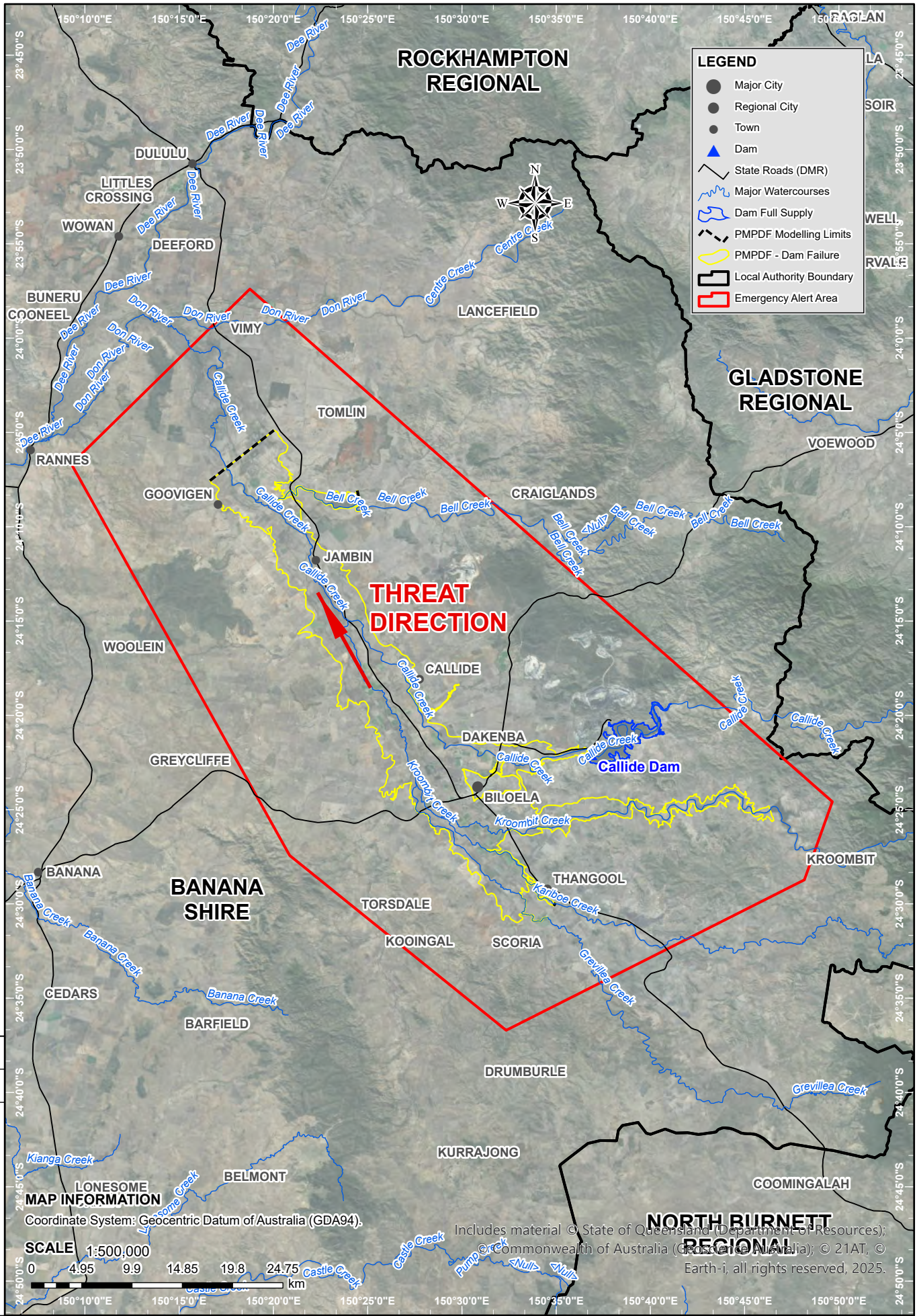
Activation level	Comms Failure Site	Comms Failure – Local Area
Actions		• Record all communication

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

APPENDIX A Notification and communication lists

A1 Sunwater regional notification list
A2 Sunwater Brisbane notification list
A3 External notification list
A4 D/S residents' notification list
A5 Other reference contacts
A6 Emergency alert polygon
A7 Dam failure emergency alert request
A8 Dam failure emergency siren activation

Appendix A1 to Appendix A5 have been redacted



Document: S:\BW Asset Delivery\SW-BW Service Delivery\R-WSRW-38-01-05-01 EAP Mapping\Drawings\ArcMap\Emergency Alerts\249571-B.mxd
Date Exported: 13/06/2025

Map Produced By:
Sunwater GIS
GISAdmin@sunwater.com.au

REVISION	DATE	REMARKS	CKD	PSD
B	03/09/18	ALERT AREA AMENDED	MB	MH
A	23/01/18	ISSUED FOR USE	MB	MH

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
MB	
APPROVED	
M. HUGHES	
23/1/2018	

sunwater

CALLIDE DAM
EMERGENCY ACTION PLAN
EMERGENCY ALERT AREA

CONTRACT NUMBER	
DRAWING NUMBER	REV.
249571	B
SHEET 1 OF 1	
DATE JANUARY 2018	

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 9 for actions) and sent to the SDCC to activate the Callide Dam emergency polygon.

Instructions

1. Emergency Alert request forms are not to be used UNLESS an Emergency Event has been declared.
2. Print off the Queensland Emergency Alert request form on the following page.
3. Telephone the [redacted] and tell them your intention to use the Emergency Alert for an Emergency Event for Callide 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 called [redacted]
5. Give them your phone number, confirm their name, and end the call after advising the form will be sent shortly.
6. Send filled out Emergency Alert request form to [redacted] The form MUST be sent from a Sunwater email address and come from an authorised Sunwater employee.
7. Phone back SDCC to check 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:

Filename:	Voice Message:	SMS:
[redacted]	FLOOD EMERGENCY WARNING from Sunwater. People downstream of Callide Creek and those in the Callide Valley must LEAVE IMMEDIATELY. Callide 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 Banana Shire Council e m d dot banana dot q l d dot gov dot a u	FLOOD EMERGENCY WARNING from Sunwater. People downstream of Callide Creek and those in the Callide Valley must LEAVE IMMEDIATELY. Callide 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 Banana Shire Council https://emd.banana.qld.gov.au

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

Queensland Government

PHONE THE [redacted] – ADVISE EA IS BEING DEVELOPED

EMERGENCY ALERT REQUEST

Location of Alert: Callide 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 Callide Creek and those in the Callide Valley must LEAVE IMMEDIATELY. Callide 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 Banana Shire Council e m d dot banana 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 Callide Creek and those in the Callide Valley must LEAVE IMMEDIATELY. Callide 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 Banana Shire Council http://emd.banana.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 A8: Dam failure emergency siren activation

Emergency Siren Log On

The siren alarm sequence is activated remotely via the SiSA software. The SiSA software is accessed via the SiSA web portal which can be accessed via the SunWater "Jump Box" infrastructure. Jump Box can be accessed by following this procedure:

1. [redacted]
2. Log in using your **Sunwater user credentials** via Authenticator.
   [redacted] using your **Sunwater user credentials**.
4. Click [redacted] which will download a Remote desktop link [redacted]
5. Click the **Remote Desktop Connection** link and log in.
6. From the Scada Jump Host, Open '**Remote Desktop Connection'** and connect to [redacted] using your **Sunwater user credentials.** This will log you into the Siren Server.

Using the SiSA Siren Software

Open the **Microsoft Edge** browser and enter URL [redacted]

- Log on as **Tech** to test system – this **WILL NOT** sound the sirens
  [redacted]

- Log on as **Operator** to sound the siren – this **WILL** sound the siren/s
  [redacted]

- Click 'Select Units' and select the siren/s that you wish to activate or test.

- Click the appropriate RED BUTTON:
  - "Silent Test Selected Sirens"
  - "Get Selected Siren Status"
  - "Test Alarm"
  - "DAM EMERGENCY"

APPENDIX B Drawings and maps

B1 Drawings

B2 Flood impact — downstream

B3 Inundation maps

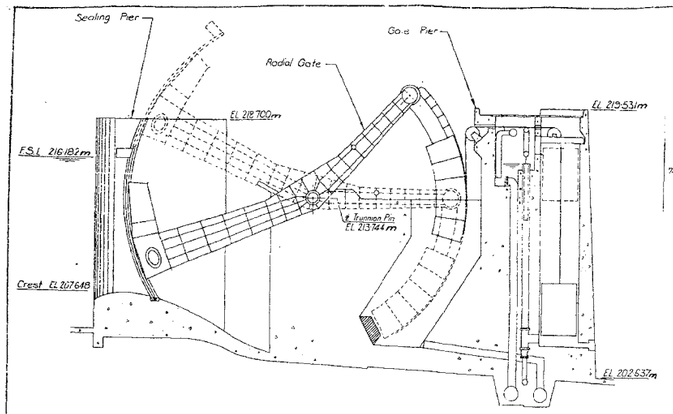
B4 Catchment maps

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.

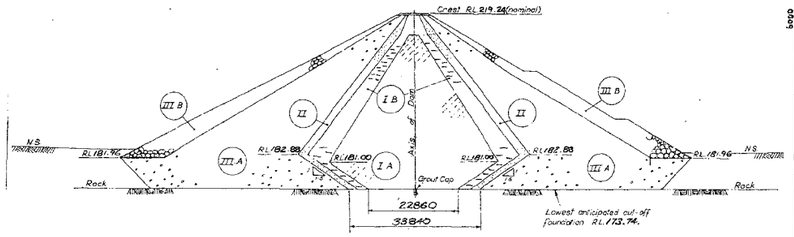
Appendix B1: Drawings

The following drawings are applicable to the General Arrangement:

- General Arrangement
- Spillway General Arrangement
- Outlet works General Arrangement
- Stage II General Arrangement



SECTION THROUGH GATE PIER



TYPICAL EMBANKMENT SECTION

n.t.s.

RLs in metres.

Note. This drg. to be read in conjunction with drg. L19325, and supersedes 'SECTION TYPE 1' on that drg.

The Zone (IA), (IB) and (II) boundaries shown hereon also apply to Section Type 2 (Maximum).

POSSIBLE WEIGHTING ZONE

HYDRAULICS BUILDING

RADIAL GATES

Inlet tower. See Drg. L19303 & L19304.

Mass concrete plug. See Drg. L19297.

For details of roadway top of dam see Drg. L19325.

For embankment curve see Drg. L19860.

Weighting zone See Drg. L20100

4" outlet conduit. See Drg. L19293 & L19296.

Vehicle turning area. See Drg. L19859.

Stone-pitched outfall drain. See Drg. L19860.

Stone-pitched toe drain. See Drg. L19860.

Limit of embankment construction to be determined on site.

Connecting road to top of dam.

Road construction

Axis of dam.

CALLIDE 'A' PUMP STATION

CALLIDE 'B' PUMP STATION

TOWN SUPPLY RAW WATER PUMP STATION.

POSSIBLE DISPOSAL AREA.

Outlet structure earthworks & access. See Drg. L20101A

Outlet structure & Valve House See Drg. L19322 & L19323.

RESTRICTED AREA within which the pumping station for powerhouse water supply will be constructed (See drg. L20101A)

RESTRICTED AREA within which the powerhouse water supply pipeline will be laid. Final location and extent will be determined by the Engineer - Constructor for the powerhouse construction.

ELECTRICAL CONTROL BUILDING

Spillway

Dissipator

ACCESS BRIDGE

Concrete stairway

KROOMBIT CREEK DIVERSION CHANNEL

For details of spillway see Drg. L19325 to L19330 inclusive and L19333.

1900 MSCL DIVERSION PIPELINE

CALLIDE CREEK

CAM (RAGLAND)

Note:-
1. All levels are to State Datum. To convert to AHD multiply by 0·3048 and add 0·305.
2. Point X 5000/ Y 5000 on Damsite Grid = Point X 50006/ Y 50006 on General Area Grid.

Levels on this drawing are incorrect.
Subtract 0.079m to correct to AHD.
Based on PM 95173 = EL 219.162

Revision					Drawing Schedule		
16-5-74	D	Amended contours added			L19333	L19322
26-6-68	C	Amended vehicle turn. area, wt zone & restricted area. Added drg references	[illegible]	[illegible]	L19304	L 20101
					L19296	L19326 to
					L19293	L19330 incl.
					L19303	L19359
13-4-66	B	GENERAL MODS.	[illegible]	[illegible]	L19297	L19860
Date		Remarks	Checked	Passed	L19325	L20100

Feet 100 0 100 200 300 400 500 600 700 800 900 1000 Feet.

FOR LONGITUDINAL AND CROSS SECTIONS SEE DRG. L19325.

Design	Drafting
Prep.	Dr. [illegible]
Ckd.	Ckd. [illegible]
Supv. [illegible]	Supv. [illegible]

Submitted [illegible] Senior Engineer.

Recommended [illegible] Chief Designing Engineer.

Approved [illegible] 12.10.62 Commissioner.

IRRIGATION AND WATER SUPPLY COMMISSION

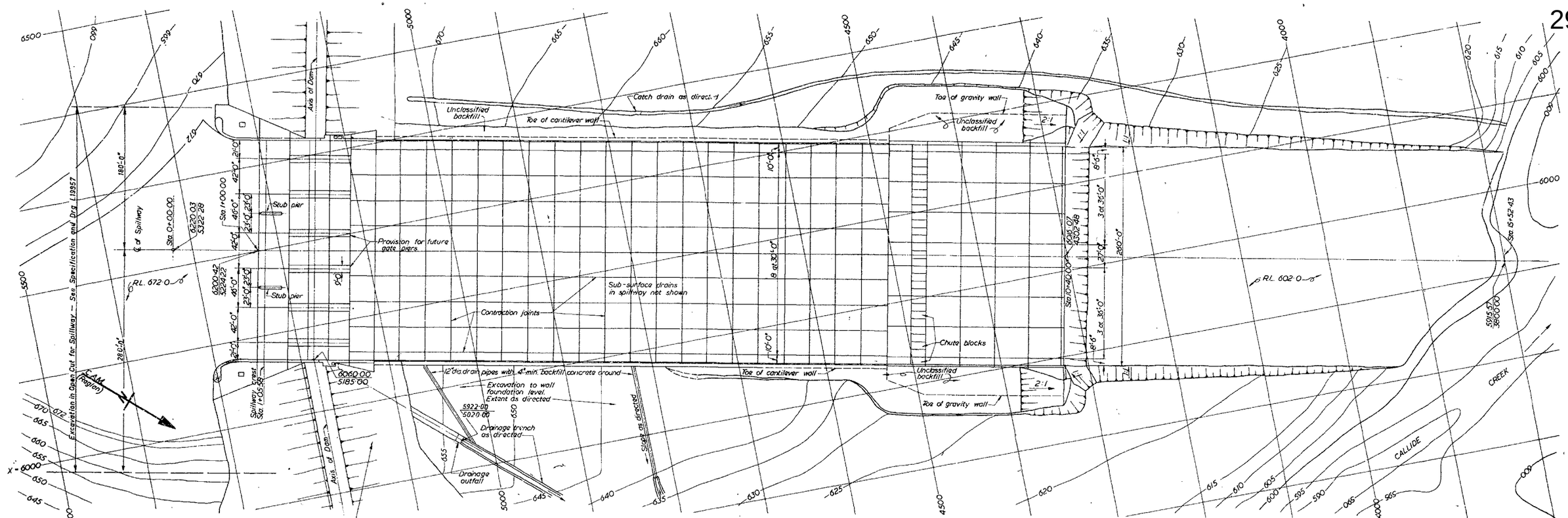
CALLIDE CREEK — A.M.T.M. 49·8M

CALLIDE DAM

GENERAL ARRANGEMENT

Sheet 1 of 2. L 19324

DWG 19324E.tif



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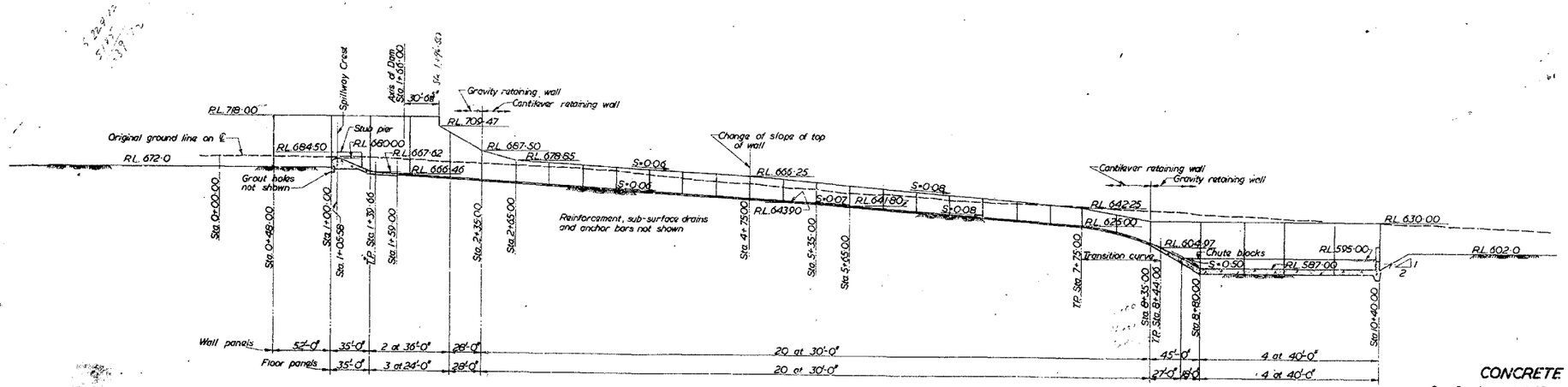

SECTION ALONG ℄ OF SPILLWAY
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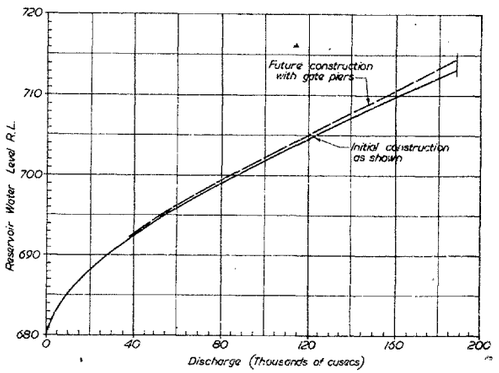


SPILLWAY DISCHARGE CURVE

CONCRETE REQUIREMENTS

See Drawing L19327

REINFORCEMENT

See Drawing L19327

NOTES

For general notes see Drawing L19327

REFERENCE DRAWINGS

Spillway – Crest Details – Sheet 1 of 3	L19327
Spillway – Crest Details – Sheet 2 of 3	L19328
Spillway – Crest Details – Sheet 3 of 3	L19329
Spillway – Chute – Sections and Details	L19330
Spillway – Dissipator – Plan and Sections	L19333
Spillway – Panel and Block Designation System	L19815
Spillway – Reinforcement in Spillway Walls	L19816 to L19829 inclusive
Spillway – Reinforcement in Spillway Floor Slabs	L19830 to L19837 inclusive.
Spillway – Proposed Excavation	L19857

19326 A

Levels on this drawing are in feet to State Datum (SD).
Conversion to AHD: AHD = SD x 0.3048 + 0.305m
Based on PM 95173 = EL 219.162m

AS BUILT

SCALE :
'0' 20 0 20 40 60 80 100 120 140 160 180 200
Scale of Feet

Revision	Date	Remarks	Checked	Passed
3-463 A		Holdfare Turn Area, Sway Excav. Dry Stone Outfall Levels. Reference Drawings		

Drawing Schedule: L19333, L19330, L19329, L19328, L19327

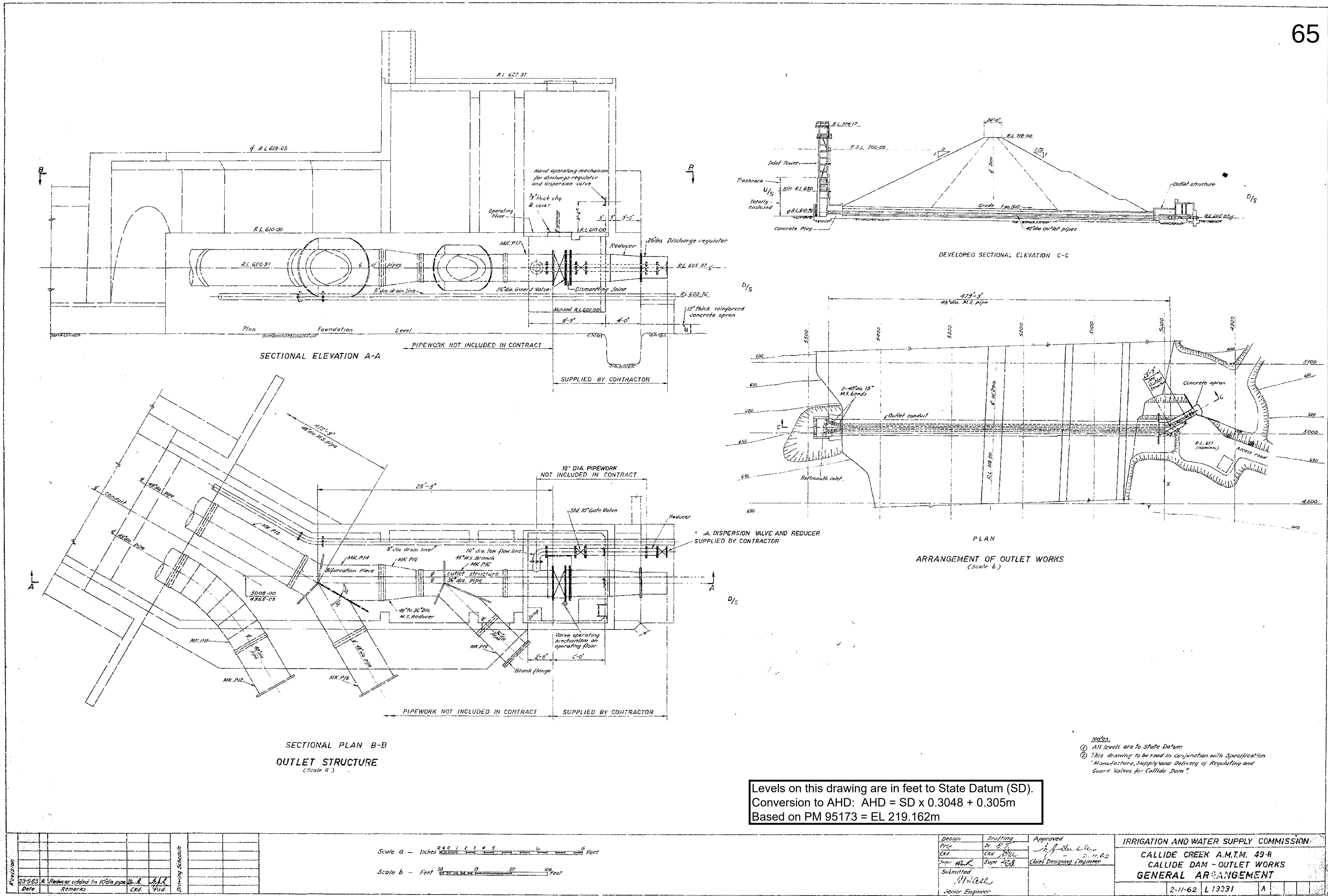
Survey Books — Field — Level

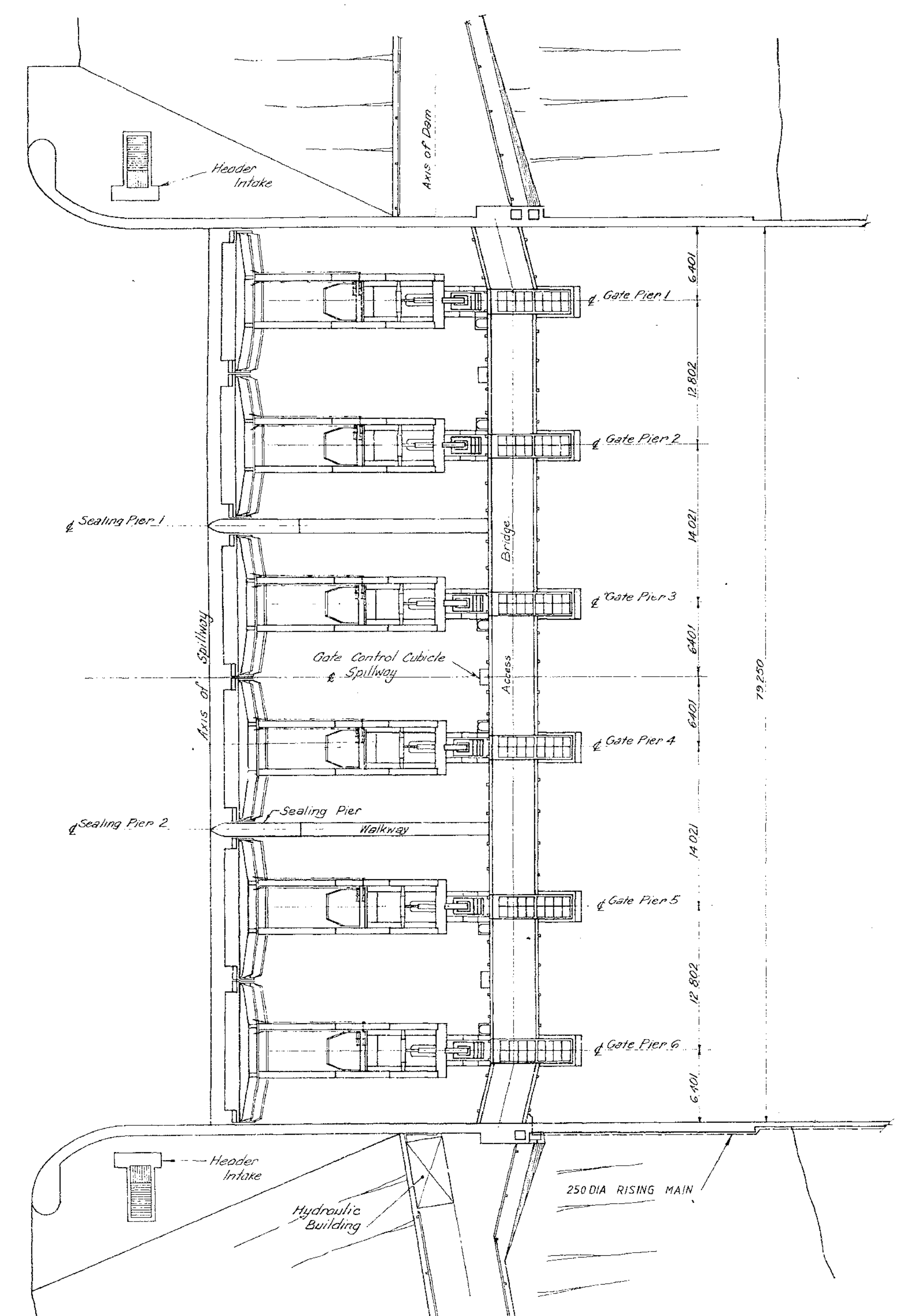
QUEENSLAND IRRIGATION AND WATER SUPPLY COMMISSION — Chief Engineer

SNOWY MOUNTAINS HYDRO-ELECTRIC AUTHORITY — Chief Engineer

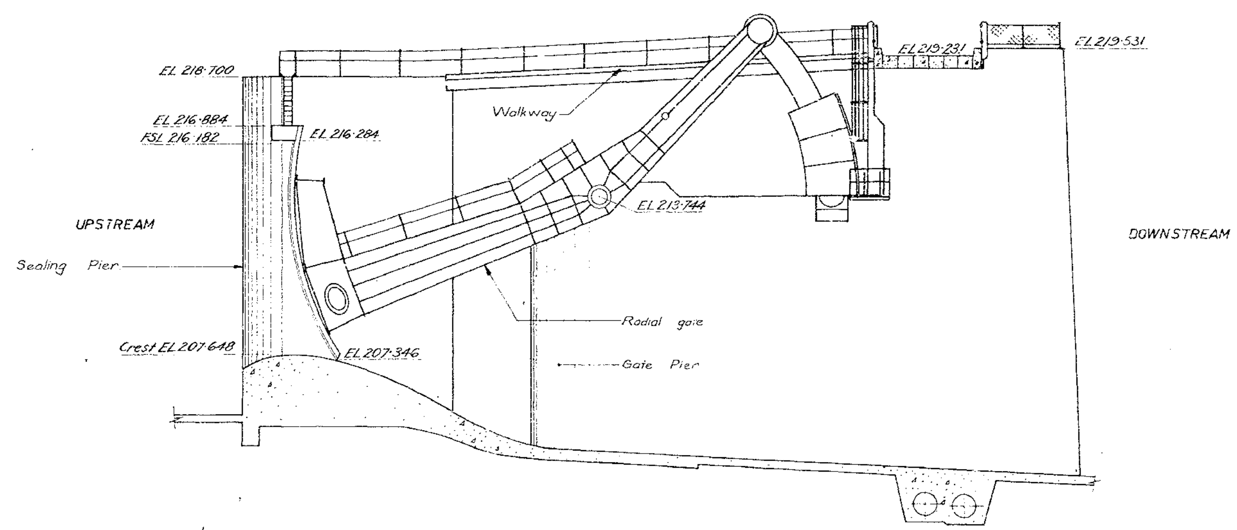
QUEENSLAND IRRIGATION AND WATER SUPPLY COMMISSION
CALLIDE CREEK – A.M.T.M. 49·8
CALLIDE DAM
SPILLWAY
GENERAL ARRANGEMENT
L 19326 A

DWG 19326A.tif


SECTIONAL ELEVATION A-A
R.L. 627.37
℄ R.L. 619.03
R.L. 610.00
R.L. 605.97
Hand operating mechanism for discharge regulator and dispersion valve
Operating Floor
MK.P17
Reducer
26"dia. Discharge regulator
26"dia. Guard Valve
Dismantling Joint
8"dia. drain line
R.L. 602.76
12" thick reinforced concrete apron
Plan Foundation Level
PIPEWORK NOT INCLUDED IN CONTRACT
SUPPLIED BY CONTRACTOR
SECTIONAL PLAN B-B
OUTLET STRUCTURE
(Scale a)
473'-9" 48"dia. M.S. pipe
25'-9"
10" DIA. PIPEWORK NOT INCLUDED IN CONTRACT
Std. 10" Gate Valve
Reducer
DIA. DISPERSION VALVE AND REDUCER SUPPLIED BY CONTRACTOR
8"dia. drain line
10" dia. low flow line
45° M.S. Branch
MK.P14
MK.P15
MK.P16
Bifurcation Piece
Outlet structure
36"dia. pipe
48" to 36" dia. M.S. Reducer
5008.00
4365.05
MK.P11
MK.P12
MK.P18
Valve operating mechanism on operating floor
Blank flange
DEVELOPED SECTIONAL ELEVATION C-C
Inlet Tower
Trashrack
F.S.L. 700.00
Sill R.L. 630
Totally enclosed
Concrete Plug
Grade 1 on 100
48"dia. outlet pipes
Outlet structure
U/S
D/S
PLAN
ARRANGEMENT OF OUTLET WORKS
(Scale b)
473'-9" 48"dia. M.S. pipe
2-48"dia. 15° M.S. bends
Outlet conduit
Bellmouth inlet
Concrete apron
Access road
Notes.
① All levels are to State Datum
② This drawing to be read in conjunction with Specification "Manufacture, Supply and Delivery of Regulating and Guard Valves for Callide Dam".
Levels on this drawing are in feet to State Datum (SD).
Conversion to AHD: AHD = SD x 0.3048 + 0.305m
Based on PM 95173 = EL 219.162m
Scale a – Inches – Feet
Scale b – Feet
Revision
23-5-63 A Reducer added to 10"dia pipe
Date Remarks Ckd. Apsd
Drawing Schedule
Design
Drafting
Approved
Chief Designing Engineer
Submitted
Senior Engineer
IRRIGATION AND WATER SUPPLY COMMISSION
CALLIDE CREEK A.M.T.M. 49-6
CALLIDE DAM ~ OUTLET WORKS
GENERAL ARRANGEMENT
2-11-62 L 13331 A



PLAN
Scale 'a'



ELEVATION
Scale 'b'

Note:-
1. All dimensions are in millimetres and Elevations are in metres
2. All materials and workmanship are to be in accordance with the specification
3. Levels Datum : All levels are to AHD (BM # IW 49·8 = EL 191·094)

Levels on this drawing are incorrect.
Subtract 0.079m to correct to AHD.
Based on PM 95173 = EL 219.162

AS BUILT
By
Class'n
Date

Date	Rev.	Remarks	Ckd	Psd
4·2·85	B	General Amend		
1·5·84	A	Tender to Working Drg		

Drawing Schedule

AI-75685	Rising Main - General Layout & Sections
L44243	Header Trash Racks - General Arrangement
L34599	Access Bridge Arrangement
L34620	Access Ladders - General Arrangement Sh.1
L34635	Walkway - General Arrangement
L34608	Gate Pier - Arrangement & Details. Sh 1 of 2
M44216	Sealing Pier - General Arrangement

Scale 'a' 0 5 10 15 20m (1:200 Scale Before Reduction)

Scale 'b' 0 5 10m (1:100 Scale Before Reduction)

Design	Drafting	Recommended
Prep	Dr G.H.	
Ckd	Ckd	Chief Designing Engineer
Supr	Supr	Approved
Submitted R. Russo Senior Engineer Designs		Commissioner

QUEENSLAND WATER RESOURCES COMMISSION
CALLIDE CREEK AMTD 80·1 km
CALLIDE DAM — STAGE II
GENERAL ARRANGEMENT

20·5·83 | L 34610 | A | B

INS. 0 2 4 6 8 10
CM. 0 2 4 6 8 10 20 30

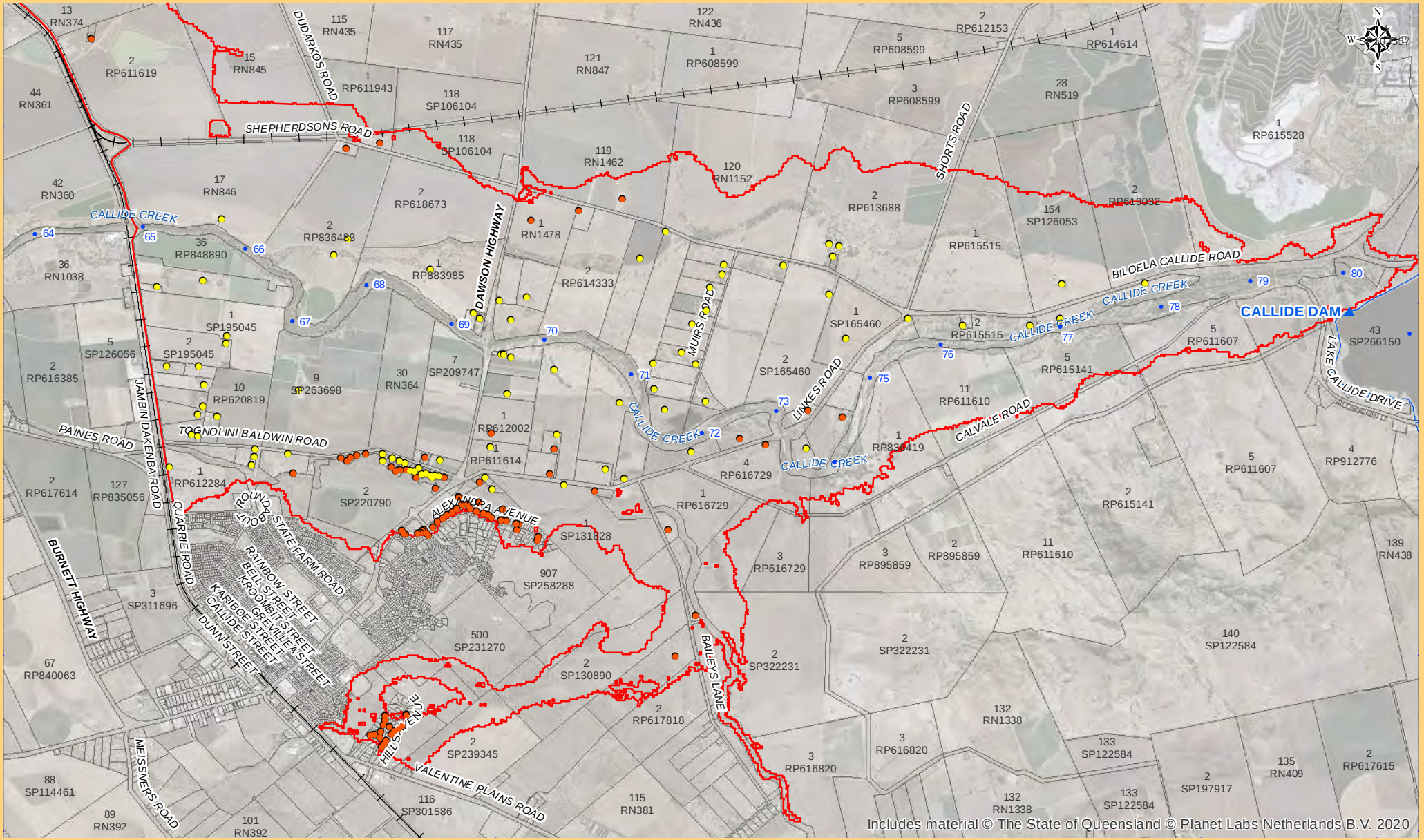
DWG 34610G.tif

Appendix B2: Flood impact downstream

The following information relates to or describes downstream flood impact:

- Most crossings over Callide Creek are flooded under most considered scenarios.
- The road bridge on Dawson Highway, AMTD 69.4km on Callide Creek (north of Biloela) would not be overtopped for the case of the 'Sunny Day' failure of spillway gates. However, this bridge would be overtopped by 2.25m and 3.8m for the Sunny Day Failure (SDF) and Probable Maximum Flood (PMF) embankment failure cases.
- Other major bridges would be overtopped by a minimum of 0.5m for the 'Sunny Day' gate failure scenario and up to 5m for the 'Sunny Day' embankment failure case.
- The PMF events would cause the overtopping of all crossings over Callide, and its tributaries downstream of Callide Dam. Most bridges would be overtopped in this case by more than 3m.
- For the SDF, it would take approximately 2 hours after a dam failure until the water levels would begin to rise at Biloela. It takes approximately 12 hours for the water level to rise for locations further downstream.
- For the PMF failure, the time until the level of Callide Creek begins to rise significantly is one hour or less. The calculated time does not vary significantly along the main stream due to the flow contribution from tributaries.
- The time to peak flood levels along the main stream varies between approximately four hours to 29 hours for the SDF of the embankment and between 6.5 hours to 19.5 hours for the PMF cases.
- The time available for evacuation at Biloela is just under four hours. This does not provide sufficient warning time to evacuate the Population at Risk (PAR) in Biloela.
- The time to peak flood levels is more than 12 hours at both Jambin and Goovigen. This is considered to provide sufficient time to evacuate.
- According to the ANCOLD guidelines, the Acceptable Flood Capacity (AFC) fallback alternative for a 'High A' Incremental Flood Hazard Category (IFHC) dam is the PMF.

The next page is a map of the downstream notification area which outlines the extent of the notification area in an EAP event.



MAP INFORMATION
Coordinate System: Geocentric Datum of Australia (GDA20).

SCALE (A4 SIZE)
0 550 1,100 1,650 2,200 2,750 m 1:55,000

LEGEND
- AMTD (Markers)
- Dam Full Supply Level
- Limit of Downstream Notification Area Main Dam
- PAR - No Dam Failure
- PAR - Dam Failure

CALLIDE 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. 260342 A

Document: S:\BW Asset Delivery\SW-BW Service Delivery\R-WSRW-38-01-05-01 EAP Mapping\Drawings\ArcMap\DS Notification Area\260342-A.pagx
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Appendix B3: Inundation maps

The following maps have been produced from the Callide dam Failure Impact Assessment 2018 (reference O)

Drawings:

1. Keymap
2. Sunny Day Failure
3. Dam Crest Flood
4. Probable Maximum Flood

Disclaimer: Every effort has been made to ensure the currency of the flood inundation maps reproduced in this EAP.

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

200,000 220,000 240,000 260,000 280,000

7,320,000 7,300,000 7,280,000

RANNES
GOOVIGEN
JAMBIN
CALLIDE
BILOELA
THANGOOL
BANANA
CALLIDE DAM
KROOMBIT DAM

SHEET 6 OF 6 (PMF)
SHEET 4 OF 4 (SDF)
SHEET 5 OF 6 (PMF)
SHEET 3 OF 4 (SDF)
SHEET 4 OF 6 (PMF)
SHEET 2 OF 4 (SDF)
SHEET 1 OF 6 (PMF)
SHEET 1 OF 4 (SDF)
SHEET 3 OF 6 (PMF)
SHEET 2 OF 6 (PMF)

Callide Creek Weir
Stag Creek Weir
STAG CREEK PIPELINE

BANANA SHIRE COUNCIL
GLADSTONE REGIONAL COUNCIL
NORTH BURNETT REGIONAL COUNCIL

BURNETT HIGHWAY
DAWSON HIGHWAY
LEICHHARDT HIGHWAY

Spring Creek, Garden Creek, Dee River, Eight Mile Creek, Harris Creek, Don River, Cooper Downs Creek, Camp Creek, Woolein Creek, Six Mile Creek, Wandoo Creek, Police Camp Creek, Banana Creek, Four Mile Creek, Station Creek, Sandy Creek, Gerard Creek, Smoky Creek, Back Creek, Redshirt Creek, Alma Creek, Zig Zag Creek, Calliope River, Running Creek, Doubtful Creek, Lost Spring Creek, Toms Creek, Bell Creek, Maxwelton Creek, Rocky Creek, Rainbow Creek, Fanes Creek, Fannys Creek, Malakoff Creek, Stag Creek, Oaky Creek, Callide Creek (Old Channel), Callide Creek, Collins Creek, Neville Creek, Selheim Creek, Orange Creek, Crimean Creek, Kroombit Gully, Dry Creek, Kroombit Creek, Grevillea Creek, Karboe Creek, Prospect Creek, Prairie Creek, Clinker Creek, Scoria Creek, North Karboe Creek, South Karboe Creek

LEGEND
- Settlements
- Major Road
- Secondary Road
- Qld Rail Network
- Modelling Limits
- Major Watercourse
- Minor Watercourse
- Built Up Areas
- Qld Local Government Area
- Limit of Downstream Notification Area Main Dam
- Maximum Flood Event
- Sunwater Pipeline

Sunwater Storage Infrastructure
- Dam
- Weir
- Dam Ponded Area

DATE		REMARKS	CKD	PSD
26/10/23	E	DOWNSTREAM NOTIFICATION ADDED	LH	MGH
28/10/22	D	LOCAL GOVERNMENT AREA BOUNDARY	LH	MGH
25/10/22	C	UPDATED TO 2022 FORMAT	LH	MGH
06/03/19	B	MAJOR ROADS, SCALE	IDH	MGH
03/12/18	A	ISSUED FOR USE	IDH	MGH

REVISION

MAP INFORMATION
Projected Coordinate System: Mapping Grid of Australia (MGA2020) Zone 56.

REFERENCE DRAWINGS
250795 - Sunny Day Failure
250797 - Probable Maximum Flood

SCALES (A3 SIZE)
0 2.5 5 7.5 10 12.5 km
1:250,000

DRAWN IDH | DESIGNED
CHECKED | CHECKED MGH
APPROVED M.G. HUGHES 3/12/2018
RPEQ: 18351

sunwater

CALLIDE DAM
DAM BREAK ANALYSIS 2017
INUNDATION PLANS
KEYMAP

CONTRACT NUMBER
DRAWING NUMBER 250794 | REV. E
SHEET 1 OF 1
DATE SEPTEMBER 2018

Document: S:\BW_WaterResources\GIS_Data\SW_Callide Valley WSS\CallideDam_EAP2022\Drawings\ArcMap\250795-B.mxd
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Map Produced By:
Water Resources and Dam Safety
Tel: (07) 3120 0000

246,000 248,000 250,000 252,000 254,000 256,000 258,000 260,000 262,000

7,308,000 7,306,000 7,304,000 7,302,000 7,300,000 7,298,000

Oaky Creek
GREVELLS ROAD
DUDARKOS ROAD
DAWSON HIGHWAY
JAMBIN DAKENBA ROAD
SHEPHERDSONS ROAD
SHORTS ROAD
IAN MCCAULEY WAY
COAL ROAD
BILOELA CALLIDE ROAD
COCUPS ROAD
CALLIDE CREEK
Callide Creek
LAKE CALLIDE DRIVE
CALVALE ROAD
MUIRS ROAD
LINKES ROAD
TOGNOLINI BALDWIN ROAD
PAINES ROAD
TAN DRIVE
ROAD
BURNETT HIGHWAY
QUARRIE ROAD
DUNN STREET
TIAMBY STREET
RAINBOW STREET
STATE FARM ROAD
BELL STREET
KARIBOE STREET
CALLIDE STREET
GLADSTONE ROAD
BAILEYS LANE
PEAKES HUNGERFORD ROAD
VALENTINE PLAINS ROAD
KROOMBIT CREEK
MEISSNERS ROAD

Dakenba
Lake Callide
CALLIDE DAM

62 63 64 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 46 47 48 49 50 51

LEGEND
- AMTD (Markers)
- Major Road
- Secondary Road
- Qld Rail Network
- Cadastral Lot Boundary

Flood Modelling
- PAR - Dam Failure
- Modelling Limits
- Sunny Day Failure

Sunwater Storages
- Dam
- Weir
- Callide Dam FSL

REVISION					
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH	
03/12/18	A	ISSUED FOR USE	IDH	MGH	
DATE		REMARKS	CKD	PSD	

MAP INFORMATION
Projected Coordinate System: Mapping Grid of Australia (MGA2020) Zone 56.

REFERENCE DRAWINGS
250794 - Keymap

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

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	MGH

APPROVED
M.G. HUGHES
3/12/2018
RPEQ: 18351

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CALLIDE DAM
DAM BREAK ANALYSIS 2017
SUNNY DAY FAILURE
SPILLWAY EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
250795	B

SHEET 1 OF 4
DATE SEPTEMBER 2018

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MAP PRODUCED BY:
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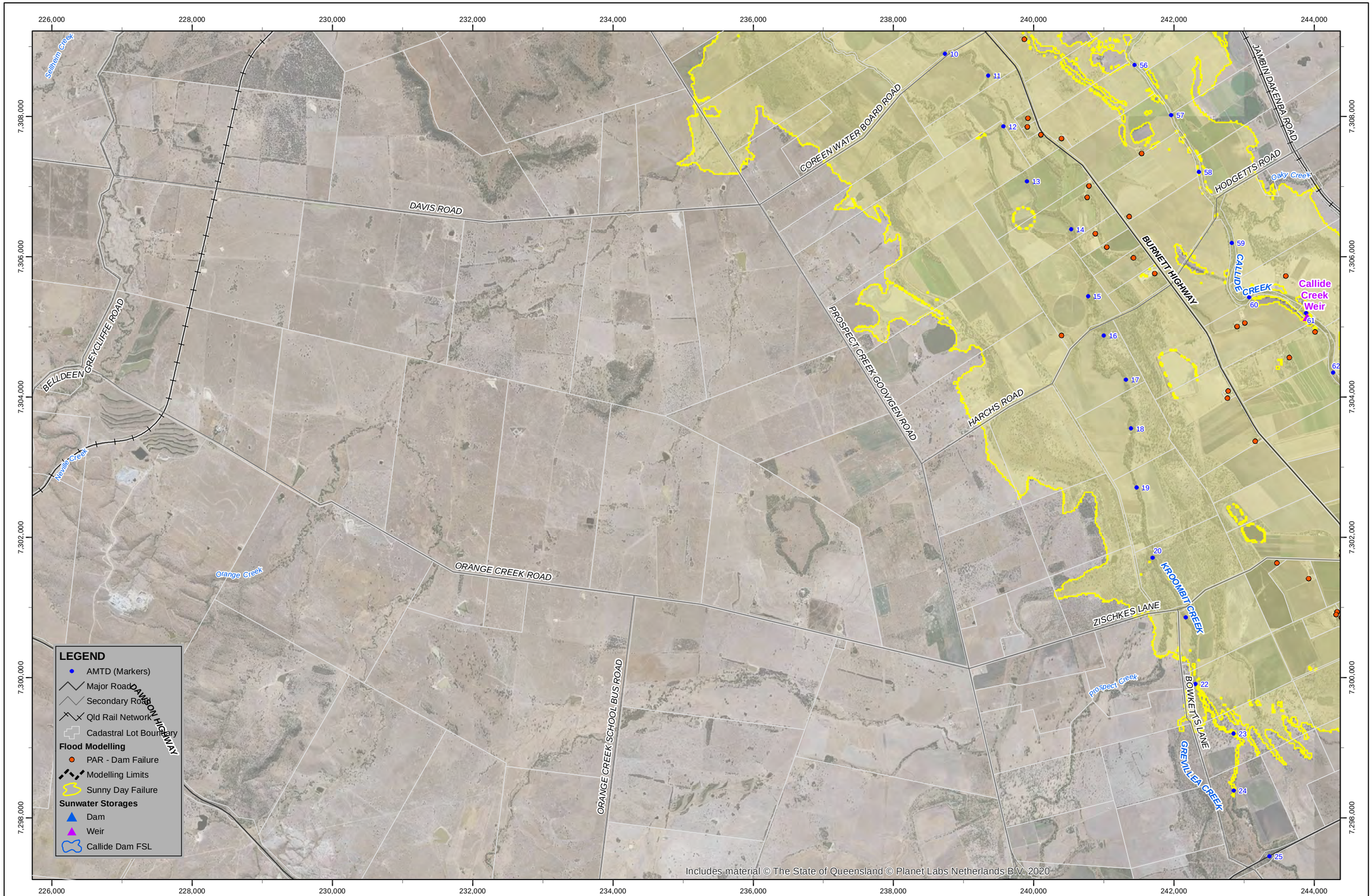

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03/12/18	A	ISSUED FOR USE	IDH	MGH
DATE		REMARKS	CKD	PSD

MAP INFORMATION
Projected Coordinate System: Mapping Grid of Australia (MGA2020) Zone 56.

REFERENCE DRAWINGS
250794 - Keymap

SCALES (A3 SIZE)
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1:50,000

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	MGH

APPROVED
M.G. HUGHES
3/12/2018
RPEQ: 18351

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CALLIDE DAM
DAM BREAK ANALYSIS 2017
SUNNY DAY FAILURE
SPILLWAY EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
250795	B

SHEET 2 OF 4

DATE SEPTEMBER 2018

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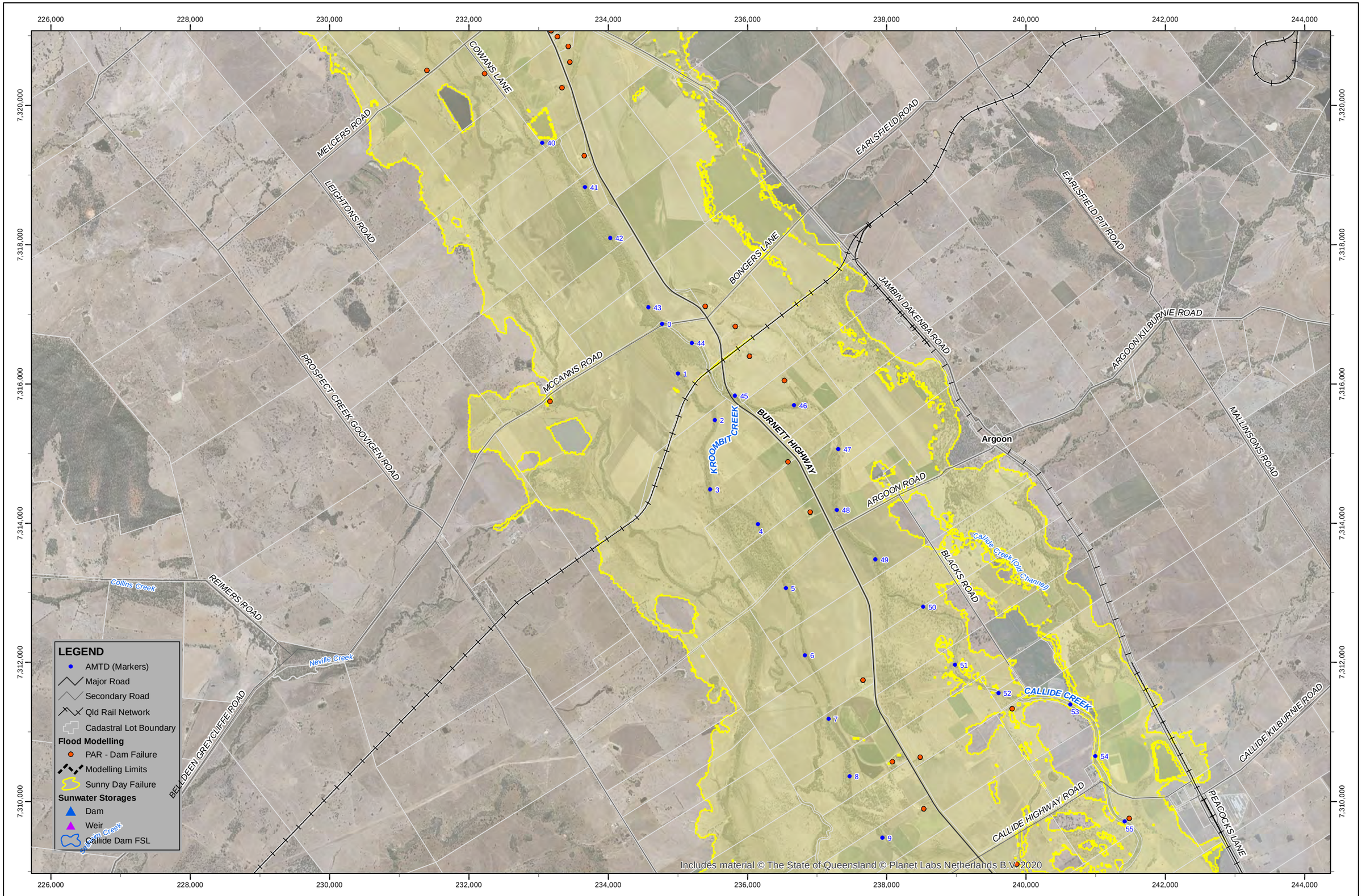
Tel: (07) 3120 0000



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03/12/18	A	ISSUED FOR USE	IDH	MGH
DATE		REMARKS	CKD	PSD

MAP INFORMATION
Projected Coordinate System: Mapping Grid of Australia (MGA2020) Zone 56.

REFERENCE DRAWINGS
250794 - Keymap

SCALES (A3 SIZE)
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DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	MGH
APPROVED	
M.G. HUGHES 3/12/2018	RPEQ: 18351

CALLIDE DAM
DAM BREAK ANALYSIS 2017
SUNNY DAY FAILURE
SPILLWAY EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
250795	B

SHEET **3 OF 4**

DATE **SEPTEMBER 2018**

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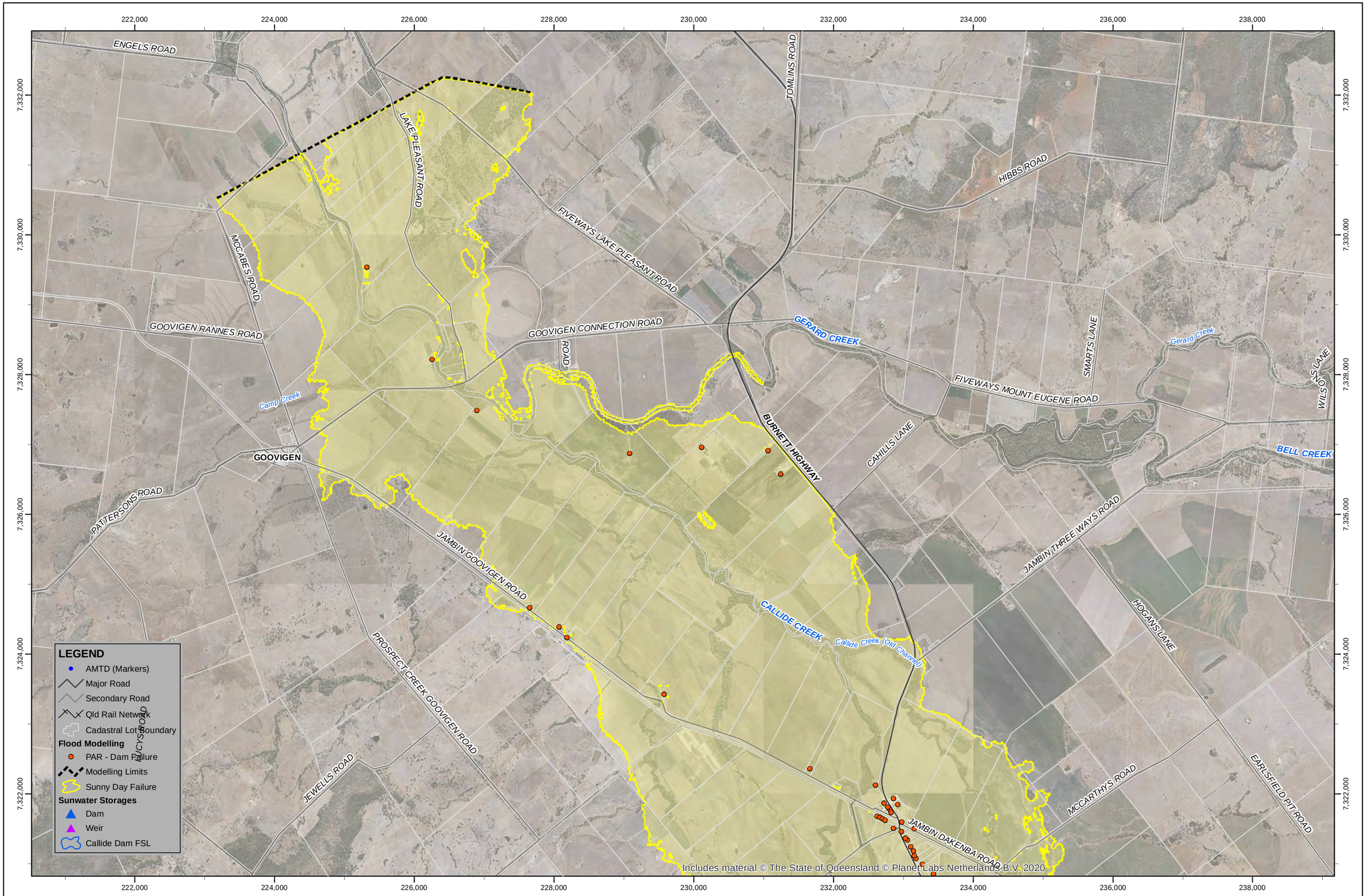

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DATE		REMARKS	CKD	PSD

MAP INFORMATION
Projected Coordinate System: Mapping Grid of Australia (MGA2020) Zone 56.

REFERENCE DRAWINGS
250794 - Keymap

SCALES (A3 SIZE)
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1:50,000

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	MGH
APPROVED	
M.G. HUGHES 3/12/2018	RPEQ: 18351

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CALLIDE DAM
DAM BREAK ANALYSIS 2017
SUNNY DAY FAILURE
SPILLWAY EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
250795	B

SHEET 4 OF 4
DATE SEPTEMBER 2018

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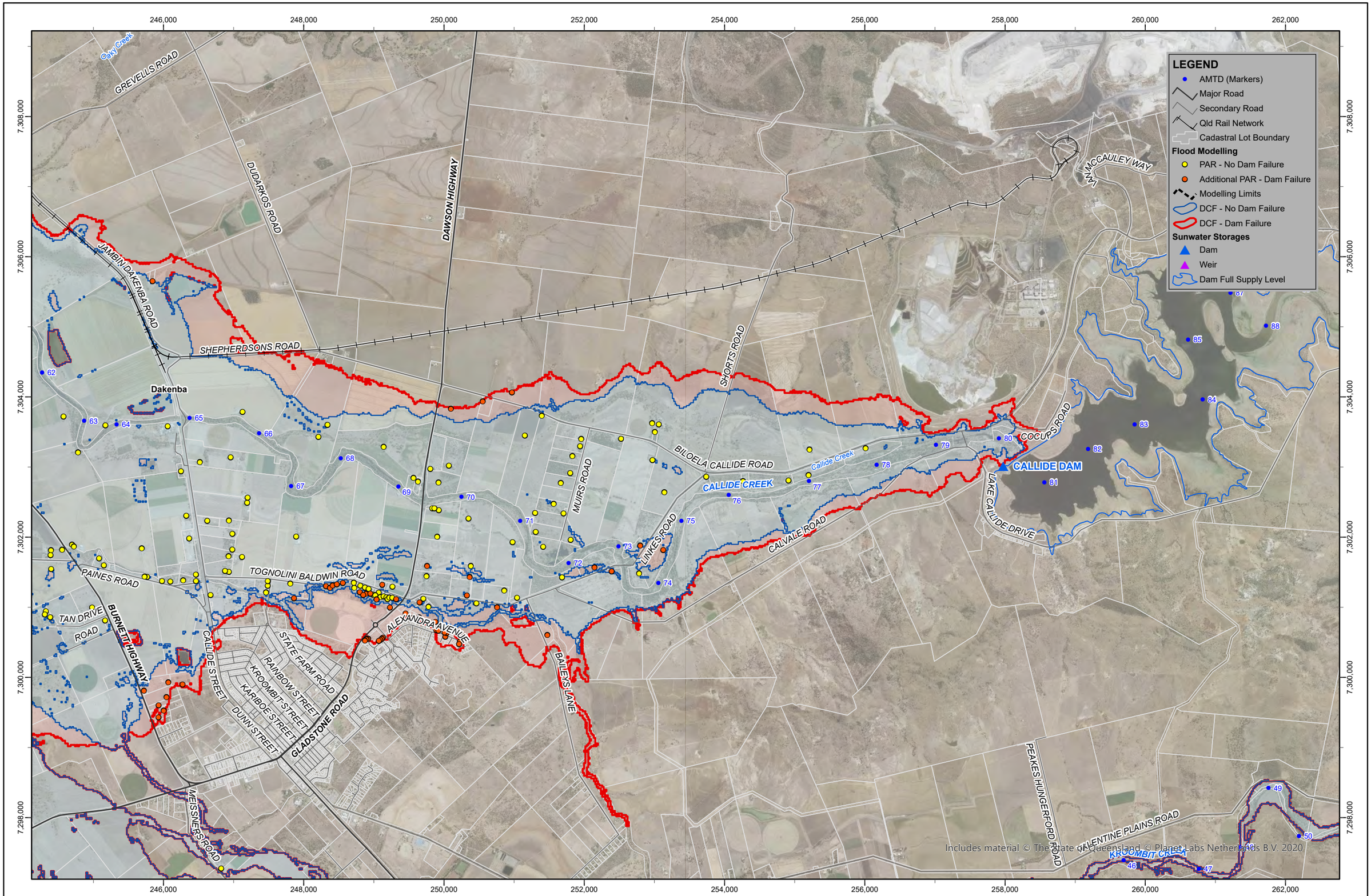

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GISAdmin@sunwater.com.au

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25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH	
03/12/18	A	ISSUED FOR USE	IDH	MGH	
DATE		REMARKS	CKD	PSD	

MAP INFORMATION

Projected Coordinate System: Mapping Grid of Australia (MGA2020) Zone 56.
Note: The 2017 analysis assumes downstream coincident flooding of 1 in 10 AEP.

REFERENCE DRAWINGS
250794 - Keymap

SCALES (A3 SIZE)

0 500 1,000 1,500 2,000 2,500 m

1:50,000

DRAWN	DESIGNED
HS	
CHECKED	CHECKED
	MGH
APPROVED	
M.G. HUGHES 3/12/2018	RPEQ: 18351

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CALLIDE DAM
DAM BREAK ANALYSIS 2017
DAM CREST FLOOD
SPILLWAY EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER **250796** REV. **C**

SHEET **1 OF 4**

DATE **NOVEMBER 2018**

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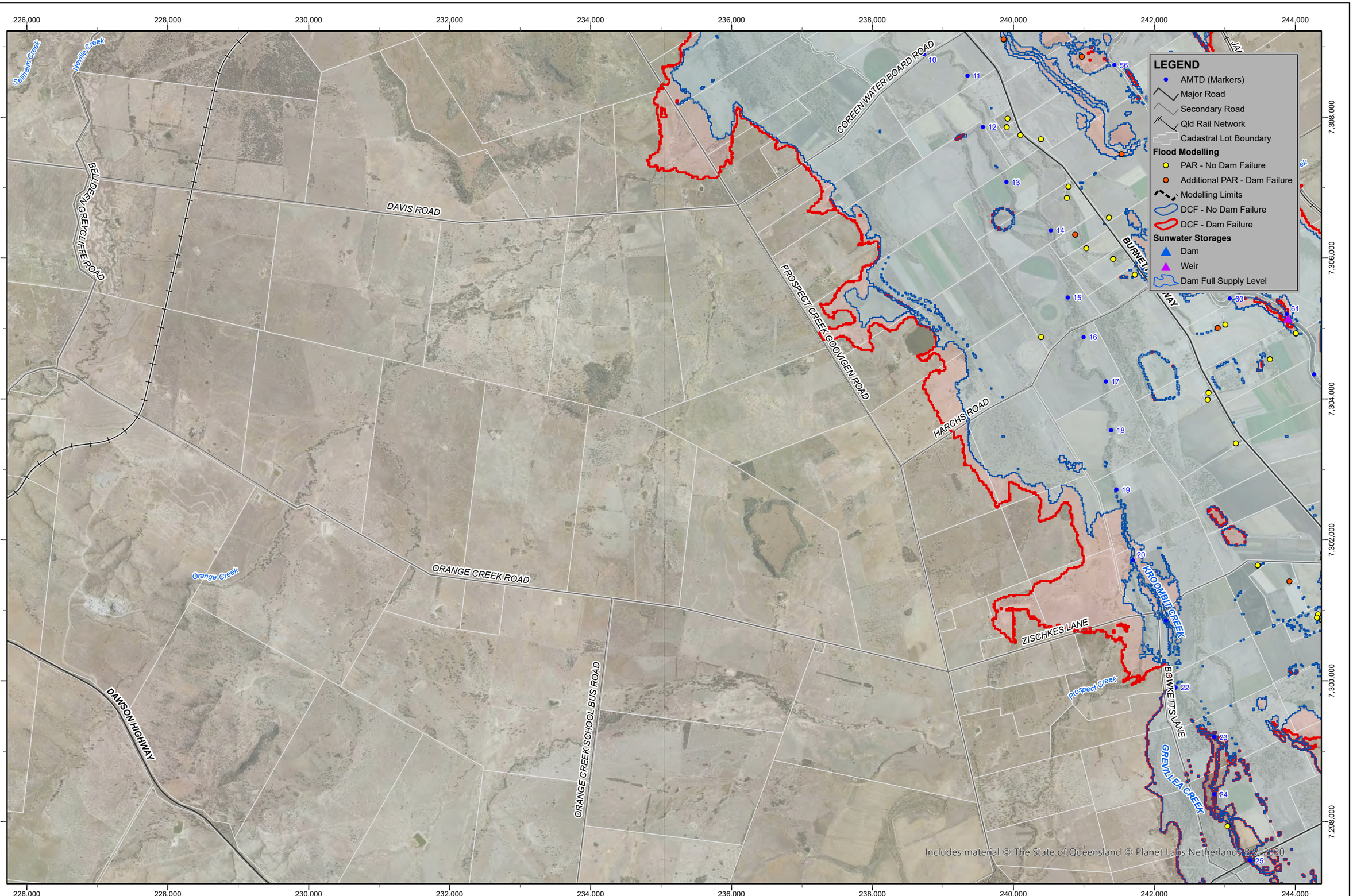
GISAdmin@sunwater.com.au



REVISION					
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25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH
03/12/18	A	ISSUED FOR USE	IDH	MGH
DATE		REMARKS	CKD	PSD

MAP INFORMATION

Projected Coordinate System: Mapping Grid of Australia (MGA2020) Zone 56.
Note: The 2017 analysis assumes downstream coincident flooding of 1 in 10 AEP.

REFERENCE DRAWINGS
250794 - Keymap

SCALES (A3 SIZE)

0 500 1,000 1,500 2,000 2,500 m

1:50,000

DRAWN	DESIGNED
HS	
CHECKED	CHECKED
	MGH

APPROVED
M.G. HUGHES
3/12/2018
RPEQ: 18351

sunwater

CALLIDE DAM
DAM BREAK ANALYSIS 2017
DAM CREST FLOOD
SPILLWAY EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
250796	C

SHEET 2 OF 4

DATE NOVEMBER 2018

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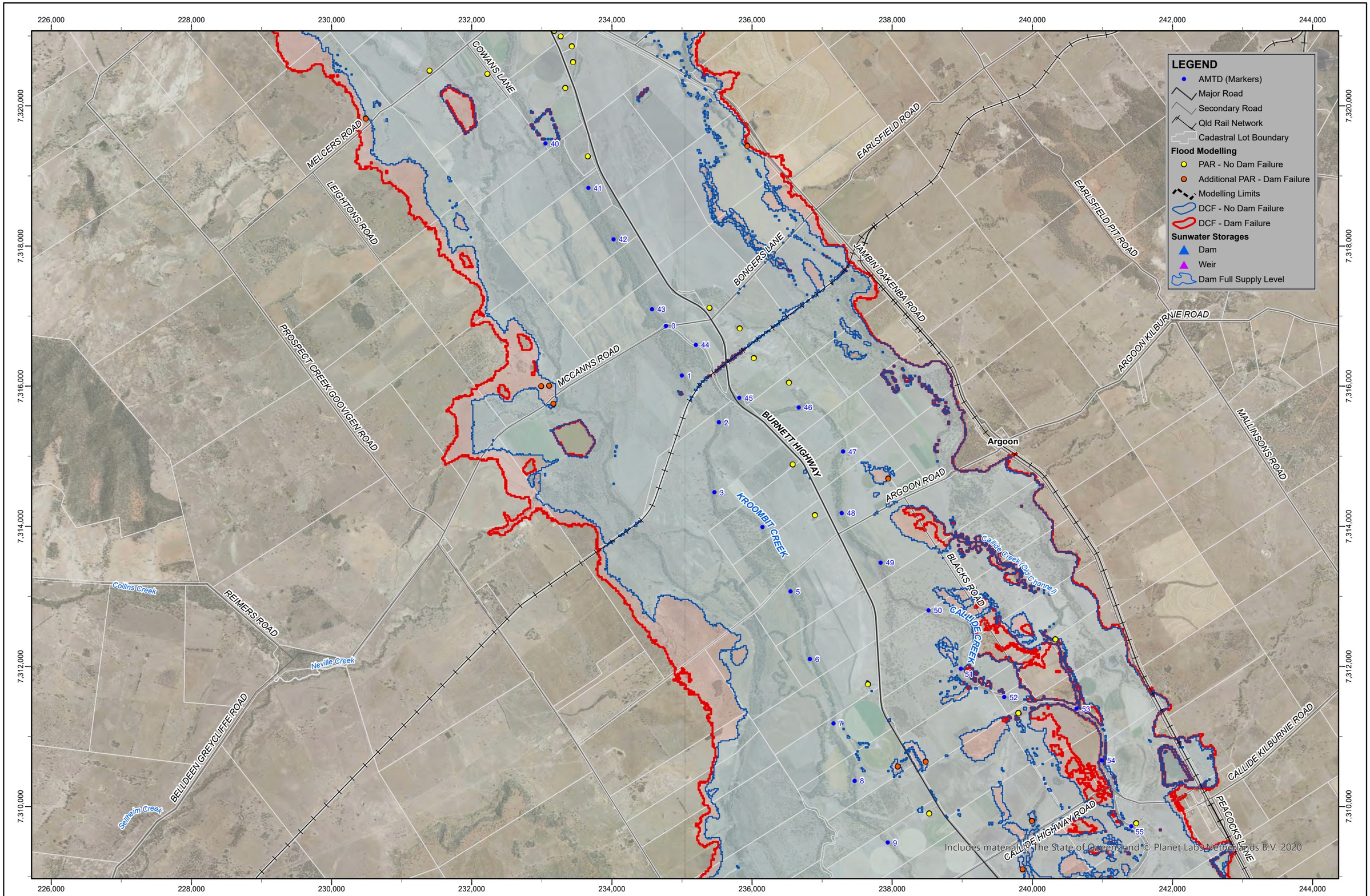
Sunwater GIS
GISAdmin@sunwater.com.au



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25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH
03/12/18	A	ISSUED FOR USE	IDH	MGH
DATE		REMARKS	CKD	PSD

MAP INFORMATION
Projected Coordinate System: Mapping Grid of Australia (MGA2020) Zone 56.
Note: The 2017 analysis assumes downstream coincident flooding of 1 in 10 AEP.

REFERENCE DRAWINGS
250794 - Keymap

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

DRAWN	DESIGNED
HS	
CHECKED	CHECKED
	MGH
APPROVED	
M.G. HUGHES 3/12/2018	RPEQ: 18351

sunwater

CALLIDE DAM
DAM BREAK ANALYSIS 2017
DAM CREST FLOOD
SPILLWAY EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
250796	C

SHEET 3 OF 4

DATE NOVEMBER 2018

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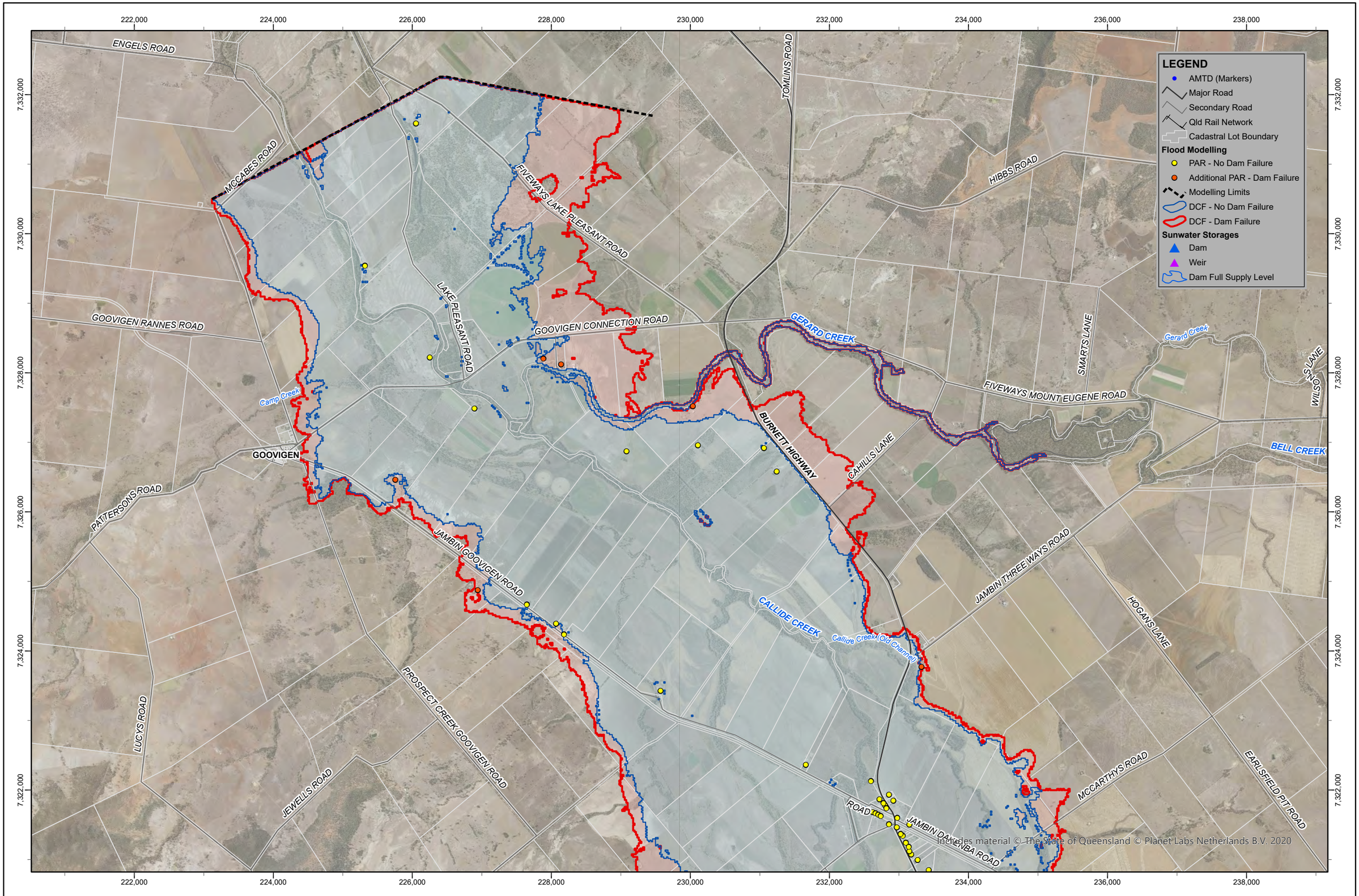

LEGEND

- AMTD (Markers)
- Major Road
- Secondary Road
- Qld Rail Network
- Cadastral Lot Boundary

Flood Modelling

- PAR - No Dam Failure
- Additional PAR - Dam Failure
- Modelling Limits
- DCF - No Dam Failure
- DCF - Dam Failure

Sunwater Storages

- Dam
- Weir
- Dam Full Supply Level

REVISION				
11/06/25	C	ADDED DOWNSTREAM COINCIDENT FLOOD NOTE	LCJ	MGH
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH
03/12/18	A	ISSUED FOR USE	IDH	MGH
DATE		REMARKS	CKD	PSD

MAP INFORMATION

Projected Coordinate System: Mapping Grid of Australia (MGA2020) Zone 56.
Note: The 2017 analysis assumes downstream coincident flooding of 1 in 10 AEP.

REFERENCE DRAWINGS

250794 - Keymap

SCALES (A3 SIZE)

0 500 1,000 1,500 2,000 2,500 m

1:50,000

DRAWN	DESIGNED
HS	
CHECKED	CHECKED
	MGH
APPROVED	
M.G. HUGHES 3/12/2018	RPEQ: 18351

sunwater

CALLIDE DAM
DAM BREAK ANALYSIS 2017
DAM CREST FLOOD
SPILLWAY EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER	
DRAWING NUMBER 250796	REV. C
SHEET 4 OF 4	
DATE NOVEMBER 2018	

Map Produced By:
Sunwater GIS
GISAdmin@sunwater.com.au

246,000 248,000 250,000 252,000 254,000 256,000 258,000 260,000 262,000

7,296,000 7,294,000 7,292,000 7,290,000 7,288,000 7,286,000

SARAS LANE
VALENTINE PLAINS ROAD
VAN ITALLIES ROAD
SCHLOSS ROAD
KROOMBIT CREEK
GREVILLEA CREEK
Grevillea Creek
MULLERS LANE
MULLERS ROAD
EICHMANNS ROAD
COX MILLARD ROAD
MEISSNERS ROAD
SEMPLES ROAD
HINTONS LANE
Clinker Creek
BLANCHS ROAD
PARKERS LANE
THANGOOL
AERODROME ROAD
RUSSIAN CLUB ROAD
DRUMBURLIE ROAD
MAGGACISS ROAD
RUSSELLS LANE
KARIBOE CREEK
BURNETT HIGHWAY
TOLLEMACHES ROAD
BLACKS ROAD
THANGOOL LOOKERBIE ROAD
DIMITRIEFFS LANE
MCLAUGHLINS ROAD
KIRKWOODS LANE
RED HILL ROAD
Scoria Creek

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 47

LEGEND

- AMTD (Markers)
- Major Road
- Secondary Road
- Qld Rail Network
- Cadastral Lot Boundary

Flood Modelling

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

Sunwater Storages

- Dam
- Weir
- Dam Full Supply Level

REVISION				
11/06/25	C	ADDED DOWNSTREAM COINCIDENT FLOOD NOTE	LCJ	MGH
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH
03/12/18	A	ISSUED FOR USE	IDH	MGH
DATE		REMARKS	CKD	PSD

MAP INFORMATION

Projected Coordinate System: Mapping Grid of Australia (MGA2020) Zone 56.
Note: The 2017 analysis assumes downstream coincident flooding of 1 in 100 AEP.

REFERENCE DRAWINGS

250794 - Keymap

SCALES (A3 SIZE)

0 500 1,000 1,500 2,000 2,500 m

1:50,000

DRAWN	DESIGNED
HS	
CHECKED	CHECKED
	MGH
APPROVED	
M.G. HUGHES 3/12/2018	RPEQ: 18351

sunwater

CALLIDE DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
SPILLWAY EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER	
DRAWING NUMBER	REV.
250797	C
SHEET 1 OF 6	
DATE NOVEMBER 2018	

Document: S:\BW_WaterResources\GIS_Data\SW_Callide Valley WSS\CallideDam_EAP2025\Drawings\Arcmap\250797-C.pagx
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REVISION				
11/06/25	C	ADDED DOWNSTREAM COINCIDENT FLOOD NOTE	LCJ	MGH
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DATE		REMARKS	CKD	PSD

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SCALES (A3 SIZE)

0 500 1,000 1,500 2,000 2,500 m

1:50,000

DRAWN	DESIGNED
HS	
CHECKED	CHECKED
	MGH

APPROVED
M.G. HUGHES
3/12/2018
RPEQ: 18351

sunwater

CALLIDE DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
SPILLWAY EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
250797	C

SHEET **2 OF 6**

DATE **NOVEMBER 2018**

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GISAdmin@sunwater.com.au

246,000 248,000 250,000 252,000 254,000 256,000 258,000 260,000 262,000

7,308,000 7,306,000 7,304,000 7,302,000 7,300,000 7,298,000

Oaky Creek
GREVELLS ROAD
DUDARKOS ROAD
DAWSON HIGHWAY
JAMBIN DAKENBA ROAD
SHEPHERDSONS ROAD
Dakenba
SHORTS ROAD
MCCAULEY WAY
LANE
COAL ROAD
COCUPS ROAD
BILOELA CALLIDE ROAD
Callide Creek
CALLIDE CREEK
MUIRS ROAD
LINKES ROAD
CALVALE ROAD
LAKE CALLIDE DRIVE
CALLIDE DAM
PAINES ROAD
TOGNOLINI BALDWIN ROAD
TAN DRIVE
BURNE
CALLIDE STREET
STATE FARM ROAD
RAINBOW STREET
KROOMBIT STREET
KARIBOE STREET
DUNN STREET
GLADSTONE ROAD
ALEXANDRA AVENUE
BAILEYS LANE
PEAKES HUNGERFORD ROAD
VALENTINE PLAINS ROAD
KROOMBIT CREEK

62 63 64 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 46 47 48 49 50

LEGEND
- AMTD (Markers)
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DATE		REMARKS	CKD	PSD	

MAP INFORMATION
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REFERENCE DRAWINGS
250794 - Keymap

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

DRAWN	DESIGNED
HS	
CHECKED	CHECKED
	MGH

APPROVED
M.G. HUGHES
3/12/2018
RPEQ: 18351

sunwater

CALLIDE DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
SPILLWAY EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
250797	C

SHEET 3 OF 6
DATE NOVEMBER 2018

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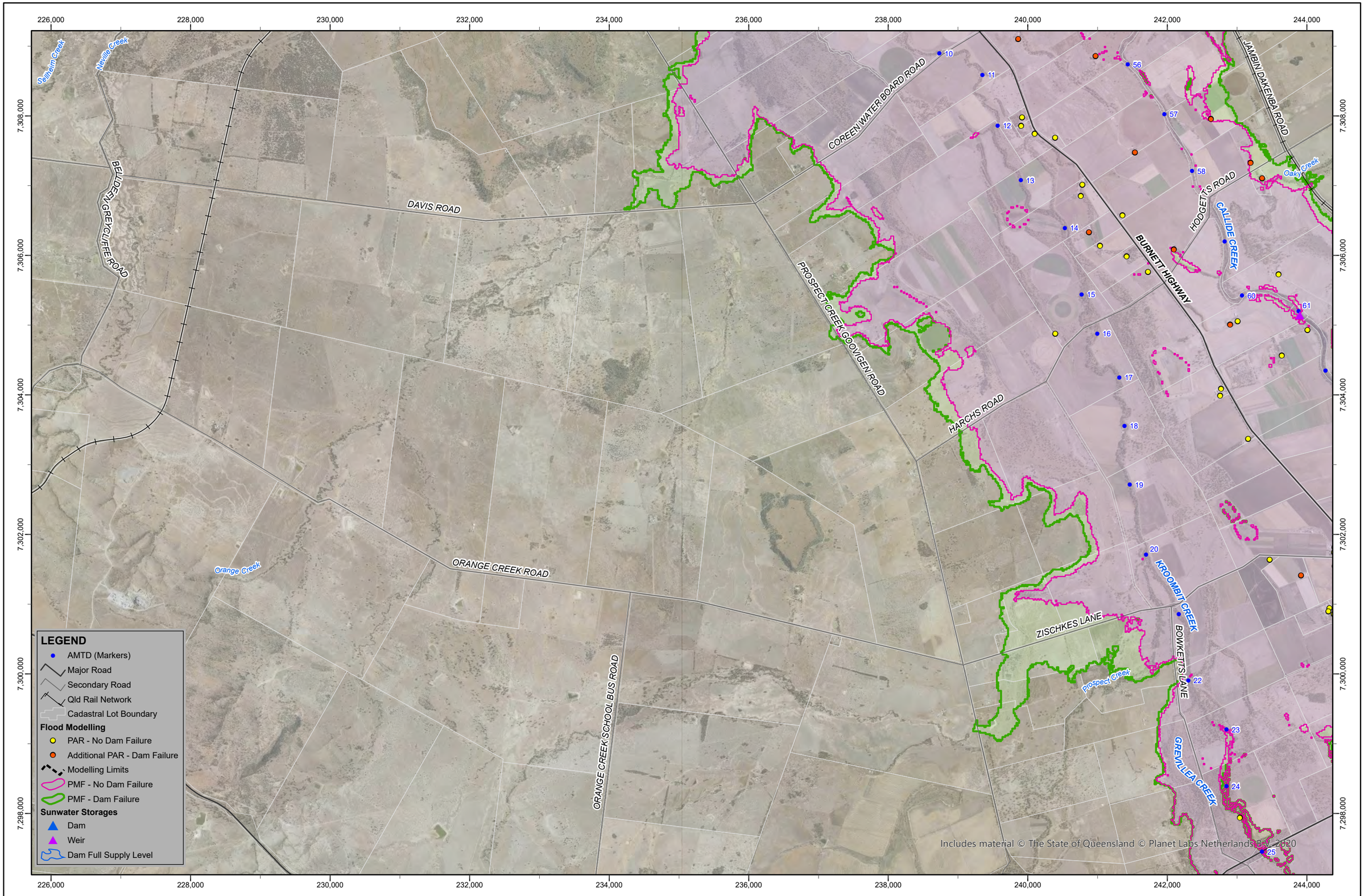

REVISION				
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25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH
03/12/18	A	ISSUED FOR USE	IDH	MGH
DATE		REMARKS	CKD	PSD

MAP INFORMATION

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REFERENCE DRAWINGS

250794 - Keymap

SCALES (A3 SIZE)

0 500 1,000 1,500 2,000 2,500 m

1:50,000

DRAWN	DESIGNED
HS	
CHECKED	CHECKED
	MGH

APPROVED
M.G. HUGHES
3/12/2018
RPEQ: 18351

sunwater

CALLIDE DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
SPILLWAY EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER **250797** | REV. **C**

SHEET **4 OF 6**

DATE **NOVEMBER 2018**

Document: S:\BW_WaterResources\GIS_Data\SW_Callide Valley WSS\CallideDam_EAP2025\Drawings\Arcmap\250797-C.pagx
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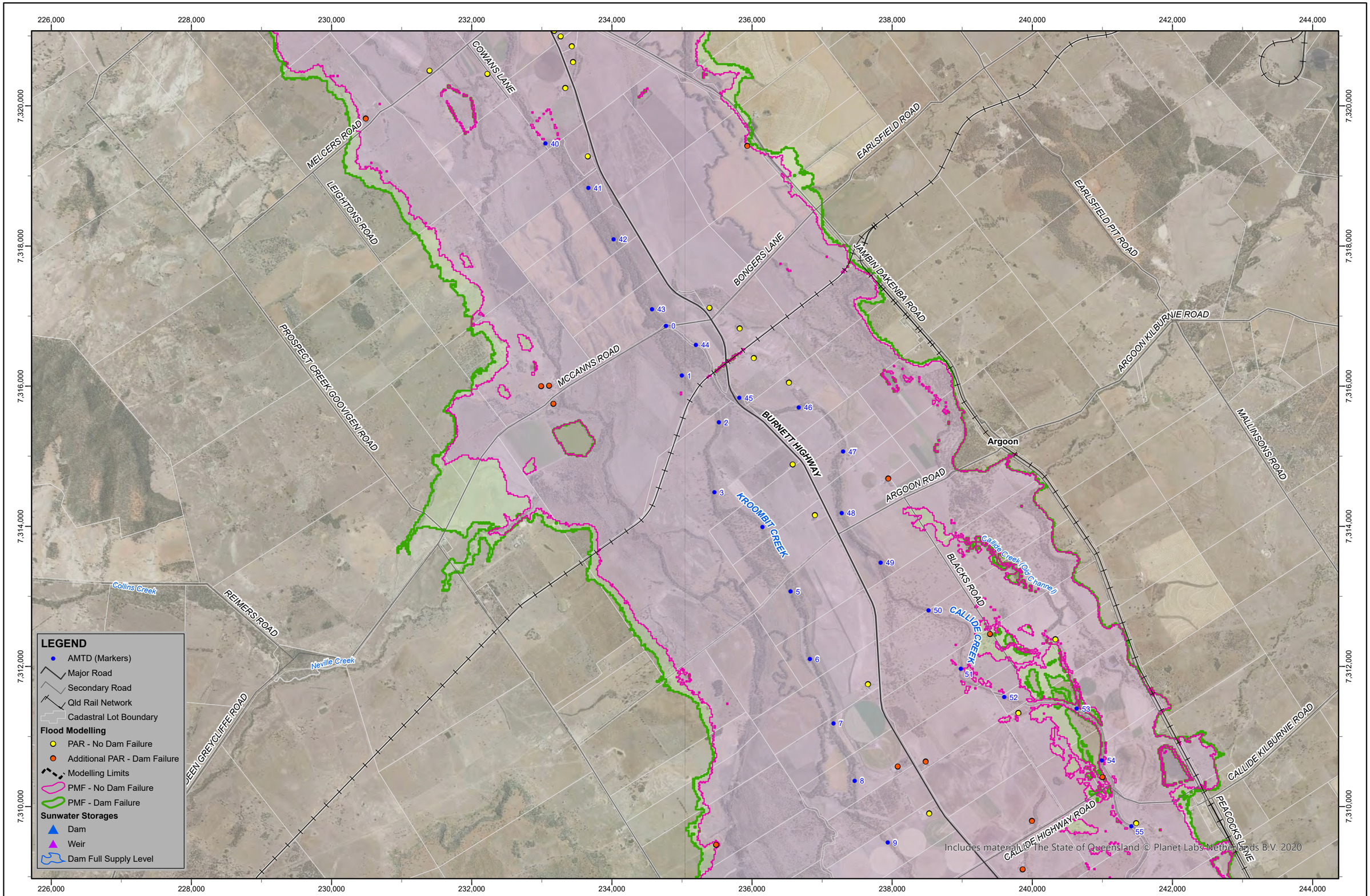

REVISION				
DATE		REMARKS	CKD	PSD
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25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH
03/12/18	A	ISSUED FOR USE	IDH	MGH

MAP INFORMATION
Projected Coordinate System: Mapping Grid of Australia (MGA2020) Zone 56.
Note: The 2017 analysis assumes downstream coincident flooding of 1 in 100 AEP.

REFERENCE DRAWINGS
250794 - Keymap

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

DRAWN	DESIGNED
HS	
CHECKED	CHECKED
	MGH

APPROVED
M.G. HUGHES
3/12/2018
RPEQ: 18351

sunwater

CALLIDE DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD SPILLWAY EMBANKMENT INUNDATION PLAN

CONTRACT NUMBER
DRAWING NUMBER **250797** REV. **C**
SHEET **5 OF 6**
DATE **NOVEMBER 2018**

Map Produced By:
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GISAdmin@sunwater.com.au

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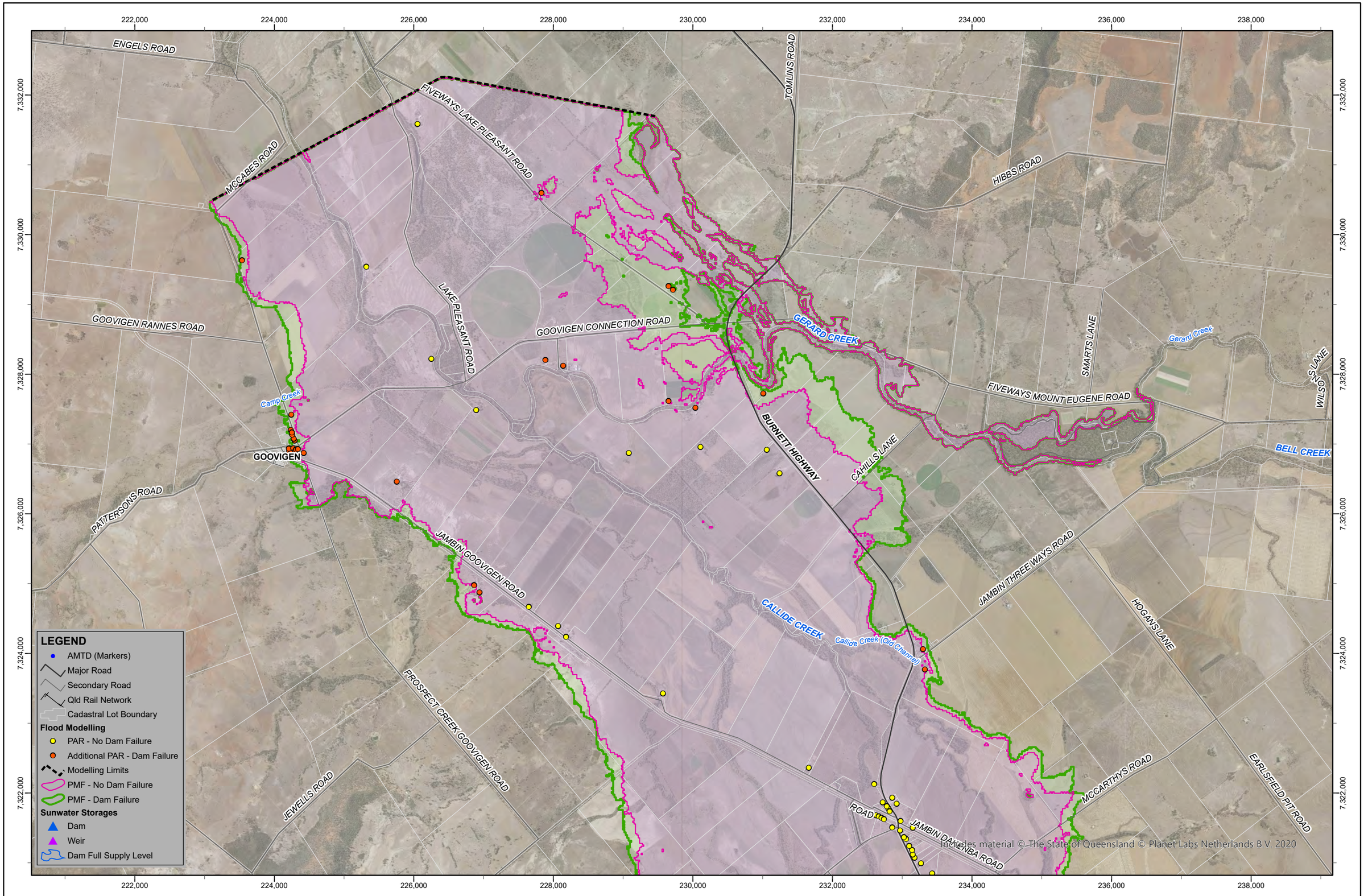
Date Exported: 13/06/2025 11:10 AM

Map Produced By:
Sunwater GIS
GISAdmin@sunwater.com.au



REVISION					
11/06/25	C	ADDED DOWNSTREAM COINCIDENT FLOOD NOTE	LCJ	MGH
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH
03/12/18	A	ISSUED FOR USE	IDH	MGH
DATE		REMARKS	CKD	PSD

MAP INFORMATION

Projected Coordinate System: Mapping Grid of Australia (MGA2020) Zone 56.
Note: The 2017 analysis assumes downstream coincident flooding of 1 in 100 AEP.

REFERENCE DRAWINGS

250794 - Keymap

SCALES (A3 SIZE)

0 500 1,000 1,500 2,000 2,500 m

1:50,000

DRAWN	DESIGNED
HS	
CHECKED	CHECKED
	MGH
APPROVED	
M.G. HUGHES 3/12/2018	RPEQ: 18351

sunwater

CALLIDE DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
SPILLWAY EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

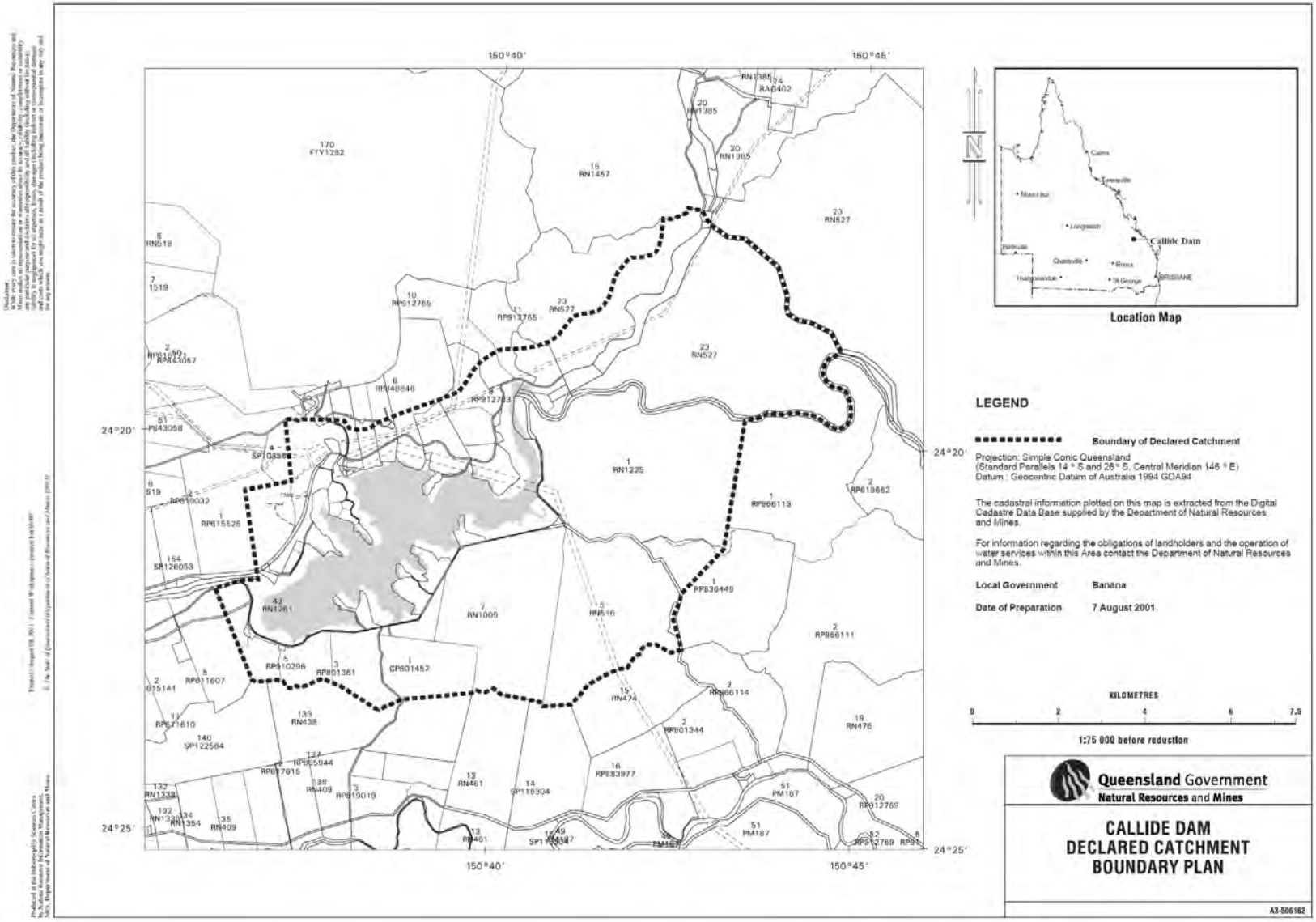
DRAWING NUMBER	REV.
250797	C

SHEET 6 OF 6

DATE NOVEMBER 2018

Appendix B4: Catchment area

Figure B1: Callide Dam declared catchment boundary plan



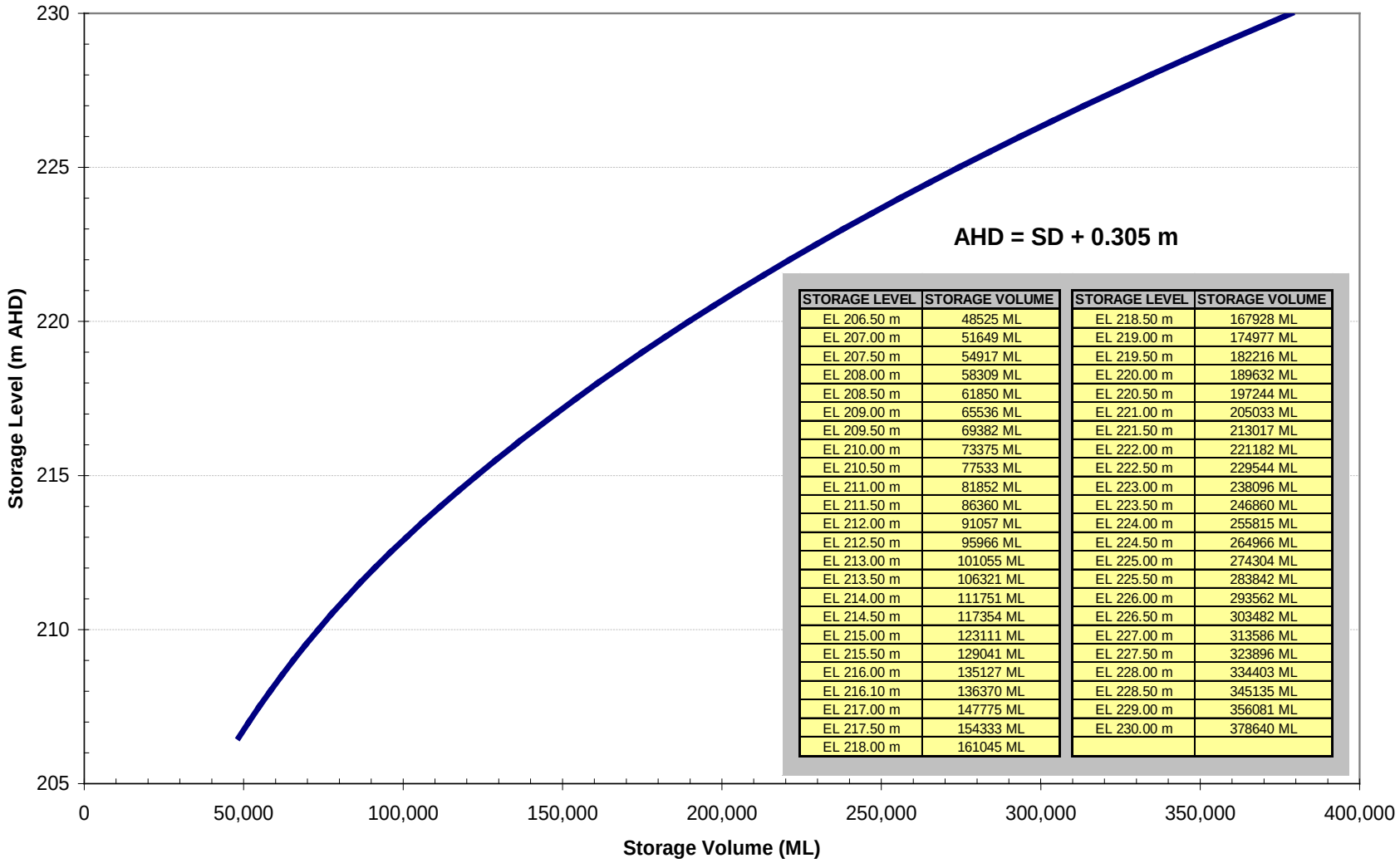
APPENDIX C Equipment and technical information

C1 List of equipment available during an emergency
C2 Callide Dam storage curve I
C3 Callide Dam storage curve II
C4 Gate discharge calculation
C5 Callide Dam spillway gate operation during flood events
C6 Discharge table for one gate pair (m^3/s)
C7 Cone regulator valve discharge curves

Appendix C1 has been redacted

Appendix C2: Callide Dam storage curve I

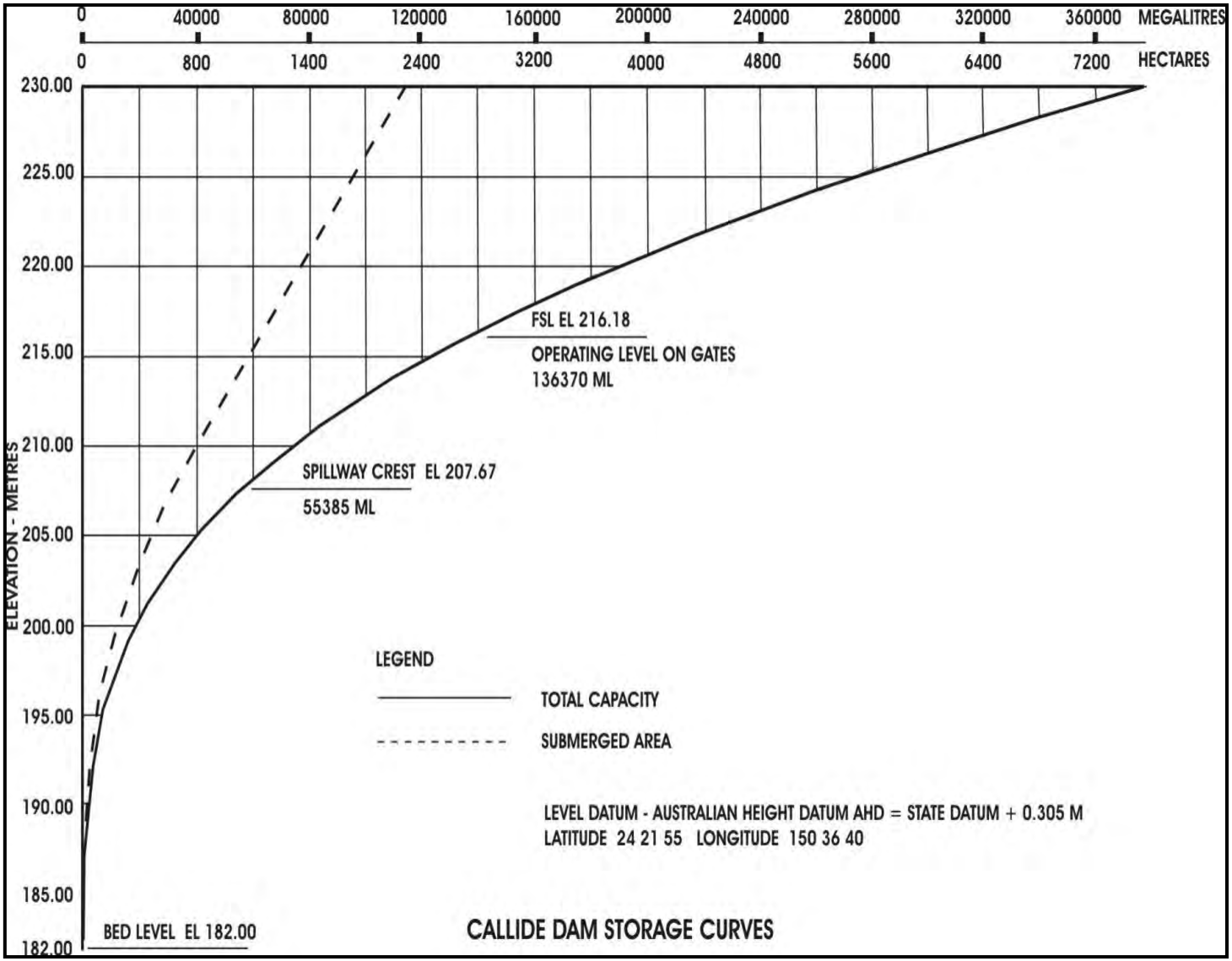
Figure C1: Callide Dam storage curve I



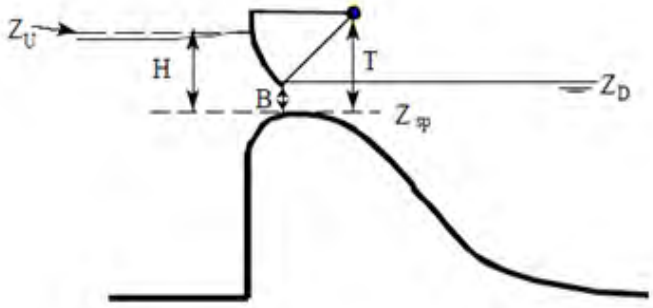
STORAGE LEVEL	STORAGE VOLUME	STORAGE LEVEL	STORAGE VOLUME
EL 206.50 m	48525 ML	EL 218.50 m	167928 ML
EL 207.00 m	51649 ML	EL 219.00 m	174977 ML
EL 207.50 m	54917 ML	EL 219.50 m	182216 ML
EL 208.00 m	58309 ML	EL 220.00 m	189632 ML
EL 208.50 m	61850 ML	EL 220.50 m	197244 ML
EL 209.00 m	65536 ML	EL 221.00 m	205033 ML
EL 209.50 m	69382 ML	EL 221.50 m	213017 ML
EL 210.00 m	73375 ML	EL 222.00 m	221182 ML
EL 210.50 m	77533 ML	EL 222.50 m	229544 ML
EL 211.00 m	81852 ML	EL 223.00 m	238096 ML
EL 211.50 m	86360 ML	EL 223.50 m	246860 ML
EL 212.00 m	91057 ML	EL 224.00 m	255815 ML
EL 212.50 m	95966 ML	EL 224.50 m	264966 ML
EL 213.00 m	101055 ML	EL 225.00 m	274304 ML
EL 213.50 m	106321 ML	EL 225.50 m	283842 ML
EL 214.00 m	111751 ML	EL 226.00 m	293562 ML
EL 214.50 m	117354 ML	EL 226.50 m	303482 ML
EL 215.00 m	123111 ML	EL 227.00 m	313586 ML
EL 215.50 m	129041 ML	EL 227.50 m	323896 ML
EL 216.00 m	135127 ML	EL 228.00 m	334403 ML
EL 216.10 m	136370 ML	EL 228.50 m	345135 ML
EL 217.00 m	147775 ML	EL 229.00 m	356081 ML
EL 217.50 m	154333 ML	EL 230.00 m	378640 ML
EL 218.00 m	161045 ML		

Appendix C3: Callide Dam storage curve II

Figure C2: Callide Dam storage curve II



Appendix C4: Gate discharge calculation



Example Radial Gate with an Ogee Spillway Crest

The flow through the gate is considered to be "Free Flow" when the downstream tailwater elevation (Z_D) is not high enough to cause an increase in the upstream headwater elevation for a given flow rate. The equation used for a Radial gate under free flow conditions is as follows:

$$Q = C\sqrt{2g}\, W\, T^{TE}\, B^{BE}\, H^{HE}$$

Where: Q = Flow rate in cfs
C = Discharge coefficient (typically ranges from 0.6 - 0.8)
W = Width of the gated spillway in feet
T = Trunnion height (from spillway crest to trunnion pivot point)
TE = Trunnion height exponent, typically about 0.16 (default 0.0)
B = Height of gate opening in feet
BE = Gate opening exponent, typically about 0.72 (default 1.0)
H = Upstream Energy Head above the spillway crest $Z_U - Z_{sp}$
HE = Head exponent, typically about 0.62 (default 0.5)
Z_U = Elevation of the upstream energy grade line
Z_D = Elevation of the downstream water surface
Z_{sp} = Elevation of the spillway crest through the gate

Co-efficients to use for maintaining Reduced Supply Level 215.50 m AHD:

C = **0.6**
g = **32.2**(ft./s^2)
W = width of one gate = **84**(ft.)
T = **20**(ft.)
TE = **0.16**
B = Height of opening in metres multiplied by 3.281 to convert to feet (so can be used in the above formula)
BE = **0.72**
H = **24.44**(ft.)
HE = **0.56**

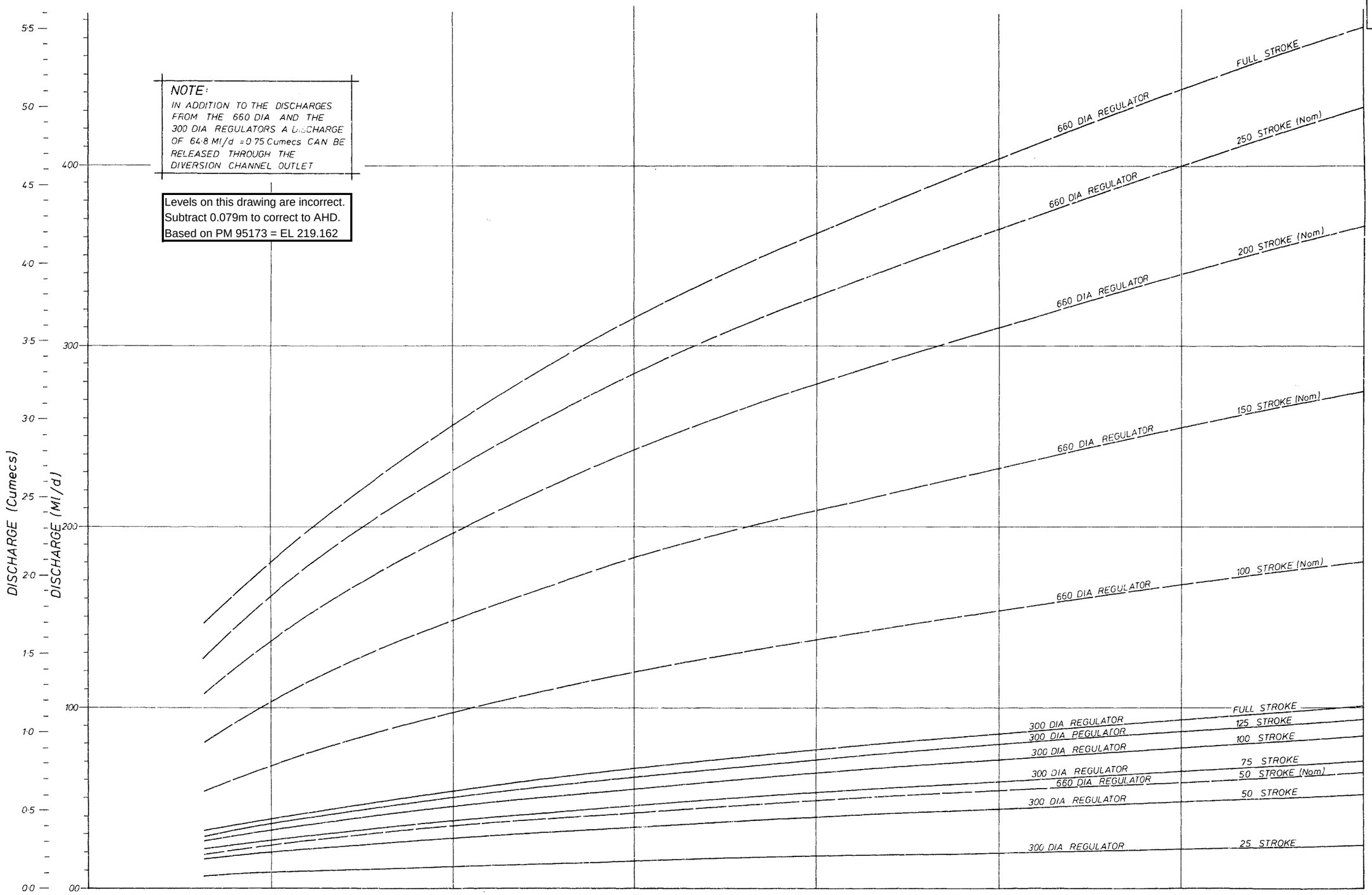
Formula above gives discharge for one gate in ft^3/s.

Multiply final answer from the formula by 2.45 to convert from ft^3/s to ML/d, for one gate.

A1-71546

NOTE:
IN ADDITION TO THE DISCHARGES FROM THE 660 DIA AND THE 300 DIA REGULATORS A DISCHARGE OF 64·8 Ml/d = 0·75 Cumecs CAN BE RELEASED THROUGH THE DIVERSION CHANNEL OUTLET

Levels on this drawing are incorrect.
Subtract 0.079m to correct to AHD.
Based on PM 95173 = EL 219.162



COMPILED FROM DRAWINGS A3-49764 & S 24095

REVISION					SCHEDULE	SCALE	DESIGN	DRAFTING
DATE	REMARKS	ZONE	CKD	PSD	DRAWING		PREP	DR GIG
							CKD	CKD M.J.C.
							SUPV	SUPV M.J.C.
							SUBMITTED	SUBMITTED
							EXEC ENGINEER	SUPV D'MAN

Queensland Water Resources Commission

RECOMMENDED SENIOR ENGINEER DESIGNS

APPROVED CHIEF DESIGNING ENGINEER

CALLIDE CREEK AMTD 80·1 km
CALLIDE DAM - STAGE II

DISPERSION VALVES DISCHARGE CURVES

CONTRACT NUMBER
DRAWING NUMBER A1-71546
DATE 15-9-83

DWG 71546.TIF

Appendix C6 : Key Levels per EAP Phase

EAP Phase	Key Levels	Lake Level (m AHD)	Outer Gate 1&2 (m)	Centre Gate 3&4 (m)	Outer Gate 5&6 (m)	Total Discharge (m^3/s)	Total Discharge (ML/d)
Stand Down	Temporary reduced full supply level (RFSL)	215.5	closed	closed	closed	-	-
Alert	**Pre-release (forecast to exceed 215.5 m AHD within 12 hours within 12 hours and storage is forecast to be above 215.5 m AHD)**	**212.50**	**0.6**	**closed**	**closed**	112	9,670
Lean Forward	Temporary reduced full supply level (RSL)	215.50	**0.6**	closed	closed	142	12,283
	100 mm below FSL and rising	**216.00**	**0.6**	**closed**	**closed**	147	12,665
	Full Supply Level (FSL)	216.10	**0.6**	closed	closed	147	12,742
	Start of auto for centre gates*	216.20	**0.6**	closed	closed	148	12,819
	Centre gates - point of inflection	216.23	**0.6**	0.1	closed	176	15,200
		216.30	**0.6**	0.57	closed	291	25,183
Stand Up 1	Start of auto for outer gates*	216.37	**0.6**	1.01	closed	392	33,856
	Outer gates - point of inflection	216.39	**0.6**	1.16	0.04	436	37,702
		216.40	**0.6**	1.25	0.13	480	41,499
	Gates 1&2 transition to automatic mode	216.47	**0.6**	1.72	0.6	731	63,129
Stand Up 2	**Minor flooding in Upper Callide Creek**	**216.49**	**0.73**	**1.85**	**0.73**	802	69,310
		216.50	0.81	1.93	0.81	838	72,398
		216.53	1.02	2.13	1.02	970	83,827
		216.55	1.15	2.27	1.15	1,058	91,449
		216.57	1.29	2.41	1.29	1,147	99,070
		216.60	1.49	2.61	1.49	1,279	110,497
Stand Up 3	**Moderate flooding in Upper Callide Creek**	**216.66**	**1.92**	**3.03**	**1.92**	1,535	132,628
		216.70	2.18	3.29	2.18	1,706	147,378
	Gate top (when fully closed)	216.80	2.86	3.97	2.86	2,113	182,597
		216.90	3.54	4.65	3.54	2,507	216,570
		217.00	4.22	5.33	4.22	2,885	249,294
	Gate bottom (when fully open)	217.10	4.91	6.01	4.91	3,252	280,988
Stand Up 4		217.18	5.48	6.58	5.48	3,953	341,572
	Flood of record All gates commence rapid opening	**217.20**	**6.9**	**7.64**	**6.9**	**4,129**	**356,723**
		217.21	7.65	8.2	7.65	4,740	409,493
	Gates become fully open	217.23	9.8	9.8	9.8	4,754	410,704
		217.50	9.8	9.8	9.8	4,943	427,080
		218.00	9.8	9.8	9.8	5,295	457,461
		218.50	9.8	9.8	9.8	5,646	487,803
Stand Up 5	**Embankment crest**	**219.16**	**9.8**	**9.8**	**9.8**	**6,106**	**527,568**
		219.50	9.8	9.8	9.8	6,400	552,960
		219.50	9.8	9.8	9.8	6,400	552,960
		219.80	9.8	9.8	9.8	6,865	593,136
		220.00	9.8	9.8	9.8	7,451	643,766
		221.00	9.8	9.8	9.8	12,663	1,094,083
		222.00	9.8	9.8	9.8	20,174	1,743,034
		223.00	9.8	9.8	9.8	29,359	2,536,618

Appendix D Interaction with local government and district groups & schedule of matters

To be populated as interactions occur

Appendix D has been redacted

Annexe — Callide Dam SMS Messages

	Advice Stay informed 	**Watch and Act** Prepare to leave 	**Emergency** Leave immediately To be issued in consultation with council 	**Advice** Stand Down 
SMS	ADVICE from Sunwater. Callide Dam is likely to release / releasing excess water into Callide Creek. People downstream of Callide Creek and those in the Callide Valley should STAY INFORMED and MONITOR CONDITIONS. Water flows from Callide Dam expected to remain within beds and banks of the creek / may contribute to widespread/ localised/ overland flooding. Expect increased flows in 6-12 hours / later today/ overnight/ tomorrow.	FLOOD WATCH AND ACT from Sunwater. Excess water releasing from Callide Dam into Callide Creek has increased significantly. Water flows from Callide Dam may contribute to dangerous/widespread flooding in the Callide Valley in 6-12 hours / later today/ overnight/ tomorrow. People downstream of Callide Creek and those in the Callide Valley 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 Callide Creek and those in the Callide Valley must LEAVE IMMEDIATELY. Callide 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 Banana Shire Council http://emd.banana.qld.gov.au	ADVICE from Sunwater. Callide Dam is continuing to release/has stopped releasing excess water into Callide Creek. Callide Dam has returned to regular operating conditions. Expect decreased river flows in timeframe. Stay informed.