EMERGENCY ACTION PLAN — KINCHANT DAM (ID 301)

ISSUE: 7.2 — September 2024 **Expiry:**

Prepared by **Sunwater Limited**

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Project: Kinchant Dam EAP **File no.:** 08-000370/001

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Approved by the delegate of the Chief Executive, Department of Regional Development, Manufacturing and Water until 1 July 2026.

Emergency activation quick reference–Dam Hazards

The Emergency Action Plan (EAP) for Kinchant Dam covers five 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 FODM or DSTDM is responsible for informing the IC decision to activate the EAP. The IC is the lead coordinator in the implementation of any EAP in events for Sunwater. Should the IC be unavailable, the Local Event Coordinator (LEC) followed by the Dam Duty Officer (DDO) is responsible for the implementation of the EAP.**

Table 1: Emergency activation quick reference

Dam Hazards and section numbers	Activation levels			
	Alert	Lean Forward	Stand Up	Stand Down
	Activation triggers for dam hazards			
Flood operations See section 5	• Storage above EL 57.21m and rising (Max. OL)	• Storage above EL 58.00m and rising (0.21 below Spillway Crest Level)	• Storage above EL 58.21m and rising (Spillway Crest Level)	• Storage EL 57.21m and outflows no longer occurring
Piping: embankment, foundation, or abutments See section 6	• Increasing leakage through an embankment, the foundations, or abutments, OR • Storage above 57.71m and rising	• 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 reported or felt in the area, AND • Intensity less than 5 Modified Mercalli (MM)	• Earthquake reported or felt in the area, AND • Intensity greater than or equal to 5MM, OR • Intensity less than 5MM and change detected during surveillance inspection	• Earthquake reported 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		• 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 an emergency event	• Risk assessment has determined that failure risk has reduced

Next page: Emergency activation quick reference — Other Emergency Situations

Emergency activation quick reference – Other Emergency Situations

The EAP for Kinchant 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 FODM or DSTDM is responsible for informing the IC decision to activate the EAP. The IC is the lead coordinator in the implementation of any EAP in events for Sunwater. Should the IC be unavailable, the Local Event Coordinator (LEC) followed by the Dam Duty Officer (DDO) is responsible for the implementation 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 9	• Unable to communicate to or from Dam site	• Unable to communicate to or from Local Area	• Unable to communicate to or from Sunwater Brisbane

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Document control

Authorisation of document

Name	Position/role	Signature	Date
	EAP Program Lead — Prepared for submission		20/09/2024

Document revision history

Issue	Date	Prepared by	Reason for change	Ref no.
2	May 2008		Significant changes of Kinchant Dam Emergency Action Plan to reflect Sunwater Management structure and other minor changes (refer HB # 599428 for amendments issued).	HB # 599428
3	October 2011		Significant changes to all sections of Kinchant Dam Emergency Action Plan to reflect current Sunwater Management structure and other changes.	HB # 1061734
3C	September 2013		Amendments due to new legislative requirements	HB # 1061734
4	August 2016		New Emergency Action Plan developed at expiry of 3E approval. Issued for consultation with Relevant Disaster Management Groups.	HB # 1874527
4	December 2016		Updates to contacts and added missing inundation maps.	HB # 1874527
5	October 2017		Updates to contacts and notification lists and minor amendments.	HB # 2224231
6	October 2018		Revised and reviewed Emergency Action Plan 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 # 2091809
6.1	September 2019		Amended contacts and associated sections, e.g., Organisation chart & Controlled Copy Holders list. Minor error corrections and other non-substantive changes including adding Emergency siren instructions; updated messaging to suit. Updated inundation maps utilizing the same data as the previous maps which had been copied directly from the 2018 FIA.	HB # 2454507
6.2	September 2020		Amended contacts and associated sections, e.g., Organisation chart & Controlled Copy Holders list. Minor error corrections and other non-substantive changes.	HB # 2570764
6.3	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 deleting the original para 5.2.2.	HB # 2653081
6.4	September 2022		Amended contacts and associated sections. Minor error corrections and other non-substantive changes. The Chemical Hazard section has been removed as it is not a Dam Safety Hazard and is dealt with in other more relevant documents.	HB # 2726135
7.0	March 2023		Updates to inundation maps in Appendix B, minor amendments to dam details (s3), and historical flood table (s5). Changes to flood operations activation triggers (s5), and minor changes to emergency action tables (s5 to 9). Emergency alert updated to comply with AWS in Appendix A.	# 2743891
7.1	September 2023		Non-substantive updates as part of Annual Safety Statement. Minor error corrections and readability improvements.	# 2809510

7.2	September 2024		Wet Season Preparedness Contact Updates	# 2865445

Controlled document distribution list

Copy no.	Position	Location
1.	Storage Supervisor	Sunwater, Kinchant Dam
2.	General Manager — Central	Sunwater, Moranbah
3.	Emergency Action Plan Program Lead	Sunwater, Brisbane
4.	Local Disaster Coordinator — Mackay LDMG	Mackay Regional Council, Mackay
Notes: Communication information for each 'Controlled Copy Holder' is attached in Appendix A.		

Electronic document distribution list

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Position	Location
Executive Officer — Mackay DDMG	Police, Mackay
Police Communications Centre	Police, Mackay
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 1.1 References/associated documents

Ref	Document title	Reference/location
A	Emergency action plan for referable dam guideline (DRDMW 2021)	https://www.resources.qld.gov.au/__data/assets/pdf_file/0018/84015/eap-guideline.pdf
B	Guidelines on Selection of Acceptable Flood Capacity for Dams (ANCOLD, 2000)	Hard Copy Only
C	Guidelines on Consequence Categories for Dams (ANCOLD, 2012)	Hard Copy Only
D	Australian Rainfall and Runoff (ARR) 2016	http://book.arr.org.au.s3-website-ap-southeast-2.amazonaws.com/
E	Guideline for Failure Impact Assessment of Water Dams (DNRME 2018)	https://www.dews.qld.gov.au/__data/assets/pdf_file/0005/78836/guidelines-failure-impact-assessment.pdf
F	Water Act 2000	https://www.legislation.qld.gov.au/view/pdf/inforce/current/act-2000-034
G	Water Supply (Safety and Reliability) Act 2008 (March 2022)	https://www.legislation.qld.gov.au/view/whole/pdf/inforce/current/act-2008-034
H	Queensland Dam Safety Management Guidelines (DNRME October 2020)	https://www.dnrme.qld.gov.au/__data/assets/pdf_file/0007/78838/dam-safety-management.pdf
I	Professional Engineers Act 2002 (RPEQ) (September 2013)	https://www.legislation.qld.gov.au/view/pdf/inforce/2013-09-23/act-2002-054
J	Queensland Disaster Management Act 2003 (April 2022)	https://www.legislation.qld.gov.au/view/pdf/inforce/current/act-2003-091
K	Queensland Emergency Alert Manual – M.1.174 (February 2022)	https://www.disaster.qld.gov.au/dmg/st/Documents/M1174-Queensland-Emergency-Alert-Manual.pdf
L	Queensland Government Communications and systems for public information and warnings	https://www.disaster.qld.gov.au/dmg/Response/Pages/5-6.aspx
M	Guidelines for the Development of Communication Education, Awareness and Engagement Programs (2010)	https://knowledge.aidr.org.au/media/1970/manual-45-guidelines-for-the-development-of-communication-education-awareness-and-engagement-programs.pdf
N	Sunwater (internal) Strategic Event Procedure	Strategic Event Procedure
O	Queensland State Disaster Management Plan 2018 (Queensland's Disaster Management Committee)	https://www.disaster.qld.gov.au/cdmp/Documents/Queensland-State-Disaster-Management-Plan.pdf
P	Queensland Disaster Management Guidelines	https://www.disaster.qld.gov.au/dmg/Pages/DM-Guideline.aspx
Q	Queensland Rainfall and River Conditions (BOM-Flood Warning)	http://www.bom.gov.au/qld/flood/index.shtml?ref=hdr
R	Sunwater (internal) Emergency Alert Protocol	eDOCS# 2156253
S	Sunwater (internal) Kinchant Dam Operation and Maintenance Manual	Kinchant Dam O&M Manual
T	Sunwater (internal) Kinchant Dam Safety Condition Schedule	eDOCS# 1740584
U	Sunwater (internal) Kinchant Dam Failure Impact Assessment (May 2018)	eDOCS# 2367469
V	Dam Safety Management Program (Sunwater internal)	DSMP001, eDOCS #2678412
W	Sunwater Operations (internal) Kinchant Dam — Hazard Management Toolkit (HMT)	Only available with Sunwater internal versions of EAPs
X	Sunwater (internal) Fatigue Management Procedure	Fatigue Management Procedure

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
BOM	Bureau of Meteorology
CED	Chief Engineer Dams
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
DSR	Dam Safety Regulator
DSSC	Dam Safety Surveillance Coordinator
DSTDM	Dam Safety Technical Decision Maker
EAP	Emergency Action Plan
EA	Emergency Alert
EER	Emergency Event Report
EGMO	Executive General Manager Operations
EGME&WR	Executive General Manager Engineering & Water Resources
EL	Elevation Level
FCL	Fixed Crest Level
FODM	Flood Operations Decision Maker
FSL	Full Supply Level
GM	General Manager
IC	Incident Coordinator
IFHC	Incremental Flood Hazard Category
IGEM	Inspector-General Emergency Management
LB	Left Bank
LDC	Local Disaster Coordinator
LDMG	Local Disaster Management Group
LDMP	Local Disaster Management Plan
LEC	Local Event Coordinator
MAP	Manager Asset Planning
Max. OL	Maximum Operating Level
ME	Manager Environment
MM	Modified Mercalli
O&M	Operation & Maintenance
OB	Observation Bore
OC	Operations Centre
OCDO	Operations Centre Duty Officer
OCO	Operations Coordinator
OM	Operator Maintainer
OMGR	Operations Manager
OS	Operations Supervisor
ORR	Owner's Regional Representative
PAR	Population at Risk
PDSE	Principal Dam Safety Engineer
PFRM	Predictive Flood Routing Model
PLL	Probable Loss of Life
PMF	Probable Maximum Flood
PMP	Probable Maximum Precipitation
PMPF	Probable Maximum Precipitation Flood
PWRE	Principal Water Resources Engineer
QDMC	Queensland Disaster Management Committee
QFD	Queensland Fire Department
QPS	Queensland Police Service
RB	Right Bank
RC	Regional Council
RCC	Roller Compacted Concrete
RDMW	Department of Regional Development, Manufacturing and Water
ROC	Regional Operations Centre
RPEQ	Registered Professional Engineer of Queensland
RSL	Reduced Supply Level
SCED	Senior Civil Engineer Dams
SCTN	Security and Counter Terrorism Network
SDCC	State Disaster Coordination Centre
SDF	Sunny Day Failure
SDTE	Senior Dam Technical Engineer
SES	State Emergency Service
SMS	Short Message Service
SMT	Sunwater Media Team
SO	Standby Operator
SOP	Standing Operating Procedure
SRT	Strategic Response Team
SS	Storage Supervisor
SWL	Storage Water Level
SWRE	Senior Water Resources Engineer
U/S	Upstream
WHS	Workplace Health & Safety
WQ	Water Quality

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 with reference to the *Water Supply (Safety and Reliability) Act 2008* (reference G)	
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 2 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	Of a *district group* or local government, means the group's or local government's disaster management plan under the Disaster Management Act.
District group (District Disaster Management Group)	For an emergency action plan (EAP), means a district group established under the Disaster Management Act, section 22 whose disaster district under that Act could, under the plan, be affected by a *dam hazard*.

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:
	  ○ 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
	  ○ the event may arise because of a disaster situation declared under the Disaster Management Act, OR
	  ○ 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 (Local Disaster Management Group)	For an EAP, means a local group established under the Disaster Management Act, 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* (reference P)	
Activation levels	The four levels of EAP activation are: • **Alert:** A heightened level of vigilance due to the possibility of an event occurring. No further action may be required; however, the situation should be monitored by someone capable of assessing the potential of the threat. Moving to an *Advice* level indicates the dam owner is getting ready to activate the *Watch and Act* level of the EAP if the situation deteriorates. • **Lean Forward:** An operational state characterised by a heightened level of situational awareness of an impending disaster event and a state of operational readiness. Disaster coordination centres are on standby and prepared but not activated. • **Stand Up:** The operational state where resources are mobilised, personnel are activated, and operational activities commenced. Disaster coordination centres are activated. The dam owner needs to provide an Emergency Event Report (EER) in accordance with the provision of the Act. • **Stand Down:** Transition from responding to an event back to normal core business and/or continuance of recovery operations. There is no longer a requirement to respond to the event and the threat is no longer present. The movement through these levels of activation is not necessarily sequential. It should be applied with flexibility and adaptability and be tailored to the location and event. Triggering one of these levels of activation may not necessarily mean a similar activation of LDMGs or DDMGs.

Term	Definition
Bureau of Meteorology flood level classifications	The three levels of flooding are: • **Minor flooding:** This causes inconvenience such as closing of minor roads and the submergence of low-level bridges and makes the removal of pumps located adjacent to the river necessary. • **Moderate flooding:** This causes the inundation of low-lying areas requiring the removal of stock and/or the evacuation of some houses. Main traffic bridges may be closed by flood waters. • **Major flooding:** This causes inundation of large areas, isolating towns and cities. Major disruptions occur to road and rail links. Evacuation of many houses and business premises may be required. In rural areas widespread flooding of farmland is likely.
Concurrent Flooding	Flood flows downstream of a dam that are not a result of dam outflows, for instance those from adjacent catchments or from the sea, and which occur in the same period as downstream releases or flooding from the dam.
Dam crest	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	The flood event which, when routed through the reservoir, results in a still water reservoir level equivalent to the lowest dam crest level.
Dam failure	Dam failure is the physical collapse of all or part of a dam or the uncontrolled release of any of its contents.
Downstream releases	Downstream releases are outflows from the dam made through appurtenant structures such as spillways or outlet works that are in accordance with the design of the dam.
Earthquake	A sudden release of energy in the Earth's crust or upper mantle, usually caused by movement along a fault plane or by volcanic activity, resulting in the generation of seismic waves that can be destructive. The potential consequences of an earthquake include: • settlement, sliding, or overturning of monoliths in the dam wall • initiation of seepage lines in the foundations or abutments that could lead to piping damage and potential inoperability of appurtenant works.
Flood release	A flood release from a dam occurs when catchment inflows raise the storage level above the Full Supply Level (FSL) resulting in a discharge from the spillway of the dam.
Piping	Internal scour caused by the water flow and seepage that occurs through earth dams, dam foundations, or dam abutments. The internal scour can lead to the formation of a pipe, which can lead to a failure of the dam.
Plane strike or other impact	The impact of a plane, meteorite, or other high-energy item on or in close vicinity of a dam that could damage the dam structure or create a wave that could overtop the dam.
Probable maximum flood	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	The theoretical greatest depth of precipitation for a given duration that is physically possible over a particular drainage basin.

Term	Definition
Probable maximum precipitation flood	The flood resulting from the probable maximum precipitation coupled with typical catchment conditions.
'Sunny day' failure	'Sunny day' dam failure is where the failure occurs at the full supply level 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* (the Act), the owner of a referable dam must have an approved EAP for the dam. Referable dams, by definition, would put lives at risk if they were to fail.

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

Summary of legal requirements – Section 352H

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

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

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 district 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 Kinchant Dam has been determined as **Mackay Regional Council (MRC)**. Sunwater has provided the MRC 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 Kinchant Dam is **Mackay Police District Disaster Management Group (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 emergency situations. 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 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 Kinchant 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 Kinchant 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 Kinchant 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 assessed and considered to be consistent with the Mackay Local Disaster Management Plan and associated disaster management sub plans.

2.3 Scope

The Kinchant Dam EAP covers:

- dam hazards evaluated within Sunwater's Dam Safety Management Program
- details about the dam that are relevant to a dam hazard
- identification of circumstances that indicates a material increase in the likelihood of a dam hazard event and/or emergency event happening
- triggers for activation of a tiered response to dam hazard event and/or emergency event
- roles and responsibilities in responding to a dam hazard event and/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 management.

2.4 Sunwater provides training

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

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

The EAP training that is carried out on-site includes walkthroughs of new changes, scenario (role play) and Q&A to check the knowledge and competency of all those who attended. This on-site training is presented to relevant Sunwater staff (DDOs, LECs, and ICs) and disaster management stakeholders. DSTDM and FODM 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 employees to these various roles would also have a walkthrough of the EAP to understand after they start at Sunwater.

Sunwater works towards carrying out a full test once annually involving each local authority and disaster management stakeholders. Where there is more than one referable dam in a local area, the exercise could involve more than one dam, or the location will be rotated. This full test would involve the SDCC and include the (non-live) testing of Emergency Alerts. The test results relating to numbers of alerts generated will be shared with local authority and disaster management stakeholders.

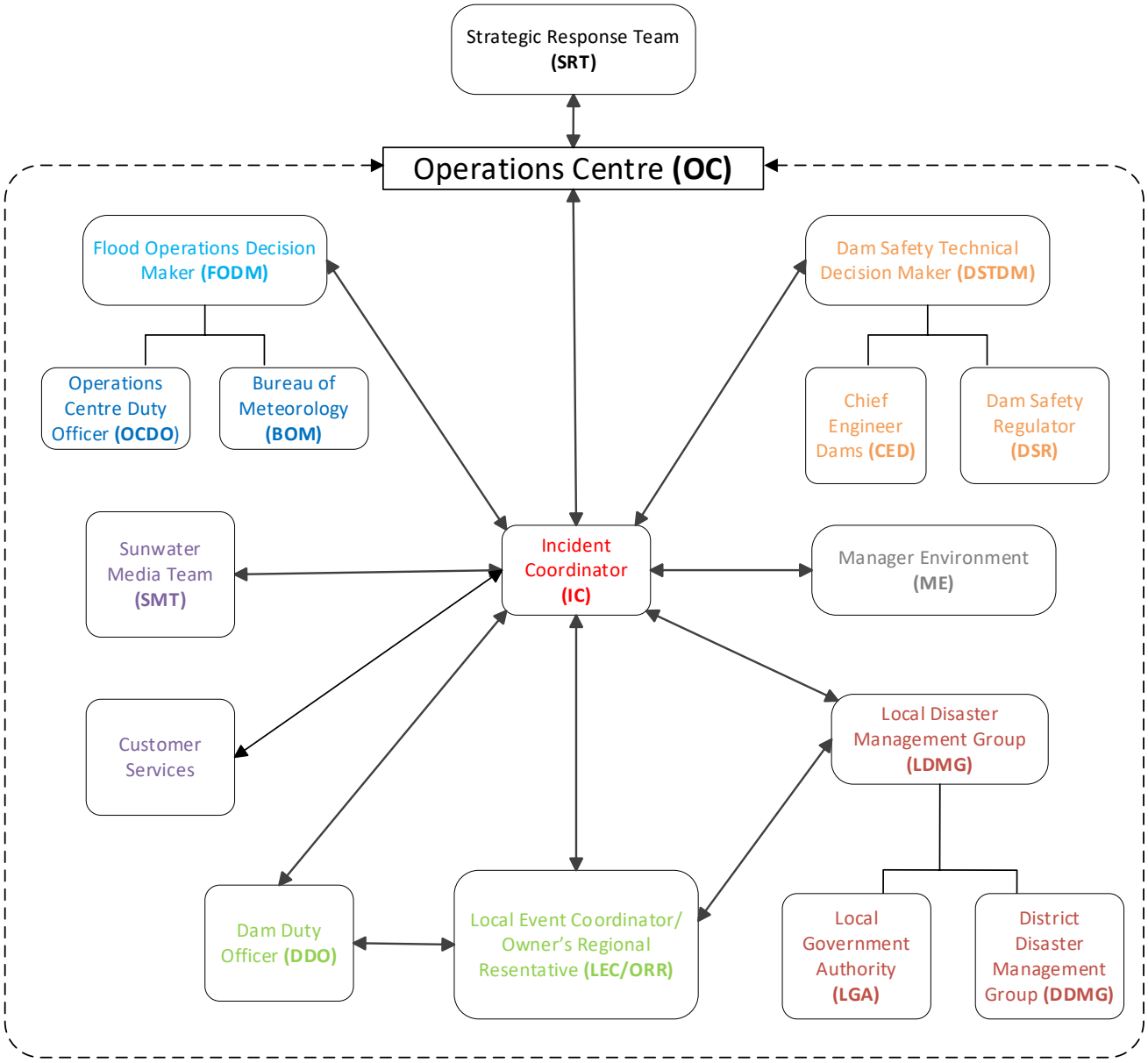
2.5 Fatigue Management Plan

Sunwater has a Fatigue Management Procedure (ref X). 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.

2.6 Dam emergency organisation 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 IC for any dam hazard at a dam. The IC will maintain overall responsibility for a coordinated response to the dam hazard incident.
- The IC is responsible for activating the EAP when the dam reaches an EAP activation level, unless instructed to activate by the FODM or the DSTDM who have determined that it is reasonable likely that the dam could reach an EAP activation level. Should the IC be unavailable, the LEC followed by the DDO is responsible for the activation. 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 responsibilities of the IC. However, loss of communications could result in some communication processes defined in this EAP not being carried out.

- Sunwater's in-house engineering (includes FODM and DSTDM) and technical staff will provide technical advice to the IC, LEC and DDO on an as needs basis. The FODM and DSTDM will also make flood and dam engineering decisions respectively during a dam hazard. These roles are filled by RPEQs (or by experienced engineers under the direct supervision of an RPEQ) and are suitably qualified professionals as defined in reference I. Such advice will be provided within an established framework of SOPs, models, standards, and manuals.

2.7 Community information

Sunwater with the assistance of Mackay Regional Council (MRC) will ensure community education around messaging and impacts of the EAP and its related events is undertaken and continually improved by incorporating actions from Lessons Learnt (section 2.8).

Sunwater currently provides information externally to customers, downstream residents and the community in a range of ways or channels in relation to dam hazards and Emergency Situations. Individuals can access information through Facebook, Twitter, the Sunwater web page, the Sunwater App and at several regional show/field days across regional Queensland where Sunwater may have stalls and information available.

Downstream residents are also provided information in text message/phone calls in the event of an activation of this EAP. This is undertaken by Sunwater when outlet releases occur but would transition to MRC during spilling flows events.

In the event of an emergency event or when otherwise required, Sunwater and MRC also have the use of the National Emergency Alert System to send a voice message and SMS. This service is provided by Telstra and managed by the State Disaster Coordination Centre. The process Sunwater follows is documented in Appendix 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 details.

2.8 Lessons Learnt

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

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

2.9 Downstream notification lists

Sunwater has compiled the notification lists through an iterative process. At least every three years Sunwater writes to all lot on plan landholders that are impacted in the downstream zones. In addition to individual letters, advertisements are placed yearly in local papers to capture any new residents in the areas. All year, individuals can register to receive notifications for this EAP and are able to register either through the Sunwater website or by calling the Sunwater call centre on 13 15 89.

3. Dam details

3.1 General dam information

Location: Kinchant Dam is an earth and rock-fill embankment dam situated on the north branch of Sandy Creek at AMTD 9.4km. The dam is located approximately 30 km south-west of Mackay. The spillway is located towards the left abutment of the dam. The dam has an uncontrolled concrete spillway discharging into a tributary of Sandy Creek that is only used as the emergency spillway.

Purpose: Kinchant Dam supplies irrigation water to the Eton irrigation area.

Catchment: Most of the dam catchment is the lake area itself, although there is also a small catchment of Sandy Creek. Most of the water held in Kinchant Dam is pumped across from the Pioneer River via the Mirani Diversion Channel.

Construction: The dam was constructed in stages commencing in 1974 and was completed in 1986.

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

Table 2: Kinchant Dam specifications

Description	Specification
Dam type	**Earth-fill and rock-fill dam**
Nominal crest elevation	EL 61.21 m
Embankment length	5,325 m (excluding spillway)
Dam Height (m) (above D/S toe)	22.3 m above streambed
Built height (above lowest foundation)	29.1 m
Catchment area	30.84 km^2
Dam Crest Level Flood (DCF)	1 in 10,000,000 AEP (<PMF)
Reservoir	
Maximum operating level (Max. OL)	EL 57.21 m
Full supply level (FSL)	EL 58.21 m
Historical recorded max storage — January 1991	EL 58.56 m
Storage (at Max. OL)	62,800 ML
Storage (at FSL)	72,235 ML
Reservoir surface area (at FSL)	920 ha
Minimum drawdown level	EL 42.30 m
Emergency spillway type	**Uncontrolled mass gravity ogee crest**
Crest level	EL 58.21 m
Crest length	60 m
Maximum discharge capacity	30,240 ML/d (350 m^3/s)
Maximum spillway depth at DCF	3 m
Outlet works	
Outlet pipe size	2 x 1,350 mm
Guard valves	2 x 1,350 mm butterfly
Regulating valves	2 x 1,220 mm cone dispersion
Pipe centreline	EL 42.91 m

Description	Specification
Discharge capacity at EL 57.21m (one valve open)	860 ML/d (9.95 m^3/s)
Discharge capacity (two valves open)	1760 ML/d (20.3 m^3/s)
Saddle Dam wall type	**Homogenous earth-fill**
Wall height (above D/S toe)	3.0 m
Built height (above lowest foundation)	2.7 m
Wall length	170 m
Crest height	EL 61.21 m
Crest length	170 m

3.2 Population at risk

The 2022 Comprehensive Risk Assessment estimated the highest total failure PAR for Kinchant Dam is 2295 due to the spillway failure under PMF conditions. The SDF scenario has a PAR of 362 caused due to the piping of the South – East embankment.

3.3 General arrangement

The general arrangement drawing is in Appendix B1.

3.4 Emergency inspections and monitoring

The Kinchant 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 hazard, as soon as it begins to develop, or becomes apparent, the following is applicable to Kinchant Dam.

3.4.1 Inspections

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

3.4.2 Instrumentation and monitoring

To confirm the structural behaviour and safety of the embankment, the following instrumentation was installed, and is monitored, at Kinchant Dam

Main Dam

- **Settlement/movement measurement** (Refer to drawing 102269)
  - 4 survey control stations
  - 8 surface settlement points along the crest of the dam
  - **Note:** surface settlement points SS1, SS3, SS5, and SS7 were destroyed during the 2014 dam safety upgrade and were replaced with SS9, SS10, SS11, and SS12
  - 2 internal settlement points
  - 5 spillway wing wall movement measurement points
- **Piezometers** (Refer to drawing 245547)
  - 14 operating hydraulic piezometers
  - 28 vibrating wire piezometers on telemetry (21 in closed bores, 7 in open bores)
- **Others** (Refer to drawing 102269 & 245548)
  - 6 v-notch seepage measurement weirs (v-notch VN05 remains dry since 2004)
  - 63 observation bores (7 have VWP installed and are recorded on telemetry)
  - 69 pressure relief wells

The location of instrumentation and monitoring equipment are shown in the drawings in Appendix B1.

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 event
• Maintain an up-to-date list of immediately D/S residents (Appendix A3) of Kinchant Dam. The downstream limit is indicated in the drawing in Appendix B2 by the zone labelled *Limit of downstream notification area*
• At all times, aim to provide timely advice and support to the 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:
  ○ notify the residents listed in Appendix A3 via SMS
  ○ contact SDCC Watch Desk to request an Emergency Alert campaign throughout the Kinchant Dam Emergency polygon
• During a dam hazard event that occurs with adequate warning; notify the residents listed in Appendix A3 via SMS, **unless otherwise agreed with the LDMGs**
• Record communications, notifications and observations as required
	CEO
	EGMO
	EGM E&WR

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 Logbooks, SOPs, Data Books, and EAPs are reviewed annually as per the Condition Schedule • Undertake and prepare the 5 yearly Comprehensive Inspection Reports with suitably qualified personnel within the time specified in the Condition Schedule and that work orders are created for recommendations and work is undertaken as required • Undertake Annual Inspections and prepare reports within the time frames specified in the Condition Schedule and that work orders are created for recommendations and work is undertaken as required • Review the Dam Safety Instrumentation Database and evaluate data to verify the structural integrity of the dams on a regular basis and maintain a spread sheet for verification for audit and quality control • Record communications, notifications and observations as required	GM Asset Integrity GM Asset Management

Roles and responsibilities	Position holder
Owner's Regional Representative (ORR) • Liaise with the Storage Supervisor/Operator Maintainer • Arrange dam specific training and accreditation for relevant staff • Ensure competent, trained and accredited personnel operate the storages • 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 OCO OS
Technical Advisor • Analyse the situation and provide expert technical advice • Discuss issue with peers and other technical experts and make sound decisions to mitigate the risk • Determine response to incidents and emerging issues • Record communications, notifications and observations as required	GM Environment
Dam Safety Technical Decision Maker (DSTDM) • 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 Regulator as required • Record communications, notifications and observations as required	Various personnel as per DSTDM roster
Flood Operations Decision Maker (FODM) • 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 SOP. • Interpret and apply rainfall data in accordance with the OC SOP, including, as required under the OC SOP, liaising with BOM. • 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 FODM roster
Operations Centre Duty Officer (OCDO) • Decide if a flood is imminent and record modes of operation • Extract data relative to the event from available sources • Utilise this data in predictive flood models and determine results from these models for approval by FODM • Liaise with the FODM or IC to update current flood situation and routing data • 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 SDMG of flood events • Record communications, notifications and observations as required	Various personnel as per Media Team roster

Roles and responsibilities	Position holder
Incident Coordinator (IC) • Notify LDMG/s, or council/s if LDMG not at Emergency Warning level, of intent to use the Emergency Alert (EA) • Activate the EAP • Ensure the EAP is implemented appropriately and carry out the IC role as required • Arrange Situation Reports and determine frequency, as required • Record communications, notifications and observations as required	Various personnel as per IC roster
Local Event Coordinator (LEC) • Liaise with the Local Disaster Coordinator or proxy • Activate the EAP, when necessary • 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 • Ensure the EAP is implemented appropriately and carry out the DDO role as required • Take direction from the DSTDM and IC as requested • Arrange immediate site inspection and make informed assessment of the situation • Escalate any issue not covered in the EAP or where actions are not clear • Record communications, notifications and observations as required	SOM SS OM
Mackay Regional Council Councils have legislated local government functions, as per Section 80 of the *Disaster Management Act (2003)*. These include: • Ensure it has a disaster response capability • Approve its local disaster management plan • Ensure information about an event or a disaster in its area is promptly given to the district disaster coordinator for the disaster district in which area it is situated • Perform other functions given to the local government under the Act And as per Section 352HB of the *Water Legislation (Dam Safety) Amendment Act (2017)*: • Must assess (in consultation with its LDMG) the EAP for consistency with the Local Disaster Management Plan • Is responsible for messaging to the community when LDMG is at Stand Up activation Level	

Roles and responsibilities	Position holder
Disaster Management Groups/Personnel - (In addition to requirements outlined in the *Disaster Management Act (2003)*). LDMG • As per IGEM review recommendation, work together with Sunwater and the affected Councils to ensure community education around messaging and impacts of EAP related events is undertaken and continually improves • Work with Council/s 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 council to initiate • During a dam hazard event, providing they are at Emergency Warning level, the LDMGs in the affected local government areas will take the lead role in notifying the broader community • Identify and provide advice to DDMG about support services required by the LDMG to manage an EAP event • Provide reports and make recommendations to the relevant DDMG about matters relating to EAP events and any support required QFD • Work with dam owner and LDMG to ensure Emergency Alerts polygons are prepared, stored and tested at the State Watch Desk And as per Section 352HC of the *Water Legislation (Dam Safety) Amendment Act (2017)*: DDMG • May review the EAP for consistency with the District Disaster Management Plan	LDMG QFD DDMG
Dam Safety Regulator (DSR) • Liaise with relevant Minister on necessary actions. • Approve this document as required under legislation • Liaise with Chief Executive as required in administering (regulating) the *Water Supply (Safety and Reliability) Act 2008*	DDS

5. Dam hazard — flood operations

5.1 Overview

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

- A dam hazard where natural catchment inflows fill Kinchant Dam to max. OL, 57.21m, and discharges are made downstream into Sandy Creek. These flood flows can create a dam hazard event. Inflows will also cause the storage to temporarily rise above the max. OL. 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.
- A dam hazard where natural catchment inflows fill Kinchant dam to Max. OL and the rate of inflow exceeds the capacity of the outlet works and flow over the spillway results. The area likely to be affected by this dam hazard is described as:
  - When the rate of discharge increases there will be an impact on low-level road crossings of the Sandy Creek and other infrastructure in the river such as pump sites.
  - Detailed information on downstream flood impacts, including tables and maps, is presented in Appendix B.

The following table shows historical floods experienced at Kinchant Dam.

Table 3: Historical floods experienced at Kinchant Dam

Flood rank	Date	Peak Height EL(m)	Peak Height (m over Max. OL)	Peak Height (m over Spillway Crest)
1	Jan-91	58.56	1.35	0.35
2	Mar-17	58.50	1.29	0.29
3	Feb-91	58.47	1.26	0.26
4	Mar-12	58.16	0.95	–
5	Feb-00	57.92	0.71	–

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

Alert	• Storage above EL 57.21m and rising (Max. Operating Level)
Lean Forward	• Storage above EL 58.00m and rising (0.21m below Spillway Crest Level)
Stand Up — 1	• Storage above EL 58.21m (Spillway Crest Level)
Stand Up — 2	• Storage above EL 58.56m (Flood of record — January 1991)
Stand Up — 3	• Storage above EL 61.21m (allowing for wave action) OR • As advised by the DSTDM
Stand Down	• Storage level EL 57.21m and falling with no forecast increase in EL

While this EAP is not triggered until Kinchant Dam reaches a level of EL 57.21 m, Sunwater, Mackay Regional Council and the Mackay LDMG will work cooperatively and will endeavour to share intelligence of any rainfall event when either organisation becomes aware of a situation that could result in the activation of the EAP.

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

The activation of Stand Up – 3 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 1m high waves, Stand Up – 3 will be triggered. Furthermore, the DSTDM may also trigger this activation if there are any dam safety concerns as the storage approaches dam crest level.

5.2.2 Emergency action roles

Table 5 to Table 9 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).

5.2.3 Flood release valve operation nominal openings and release volumes

Valve 1 (% open)	Valve 2 (% open)	Total (% open)	ML/hr	ML/d
25	closed	25	9.0	216
50	closed	50	18.0	432
75	closed	75	27.0	648
100	closed	100	36.0	864
100	25	125	45.0	1080
100	50	150	54.0	1296
100	75	175	63.0	1512
100	100	200	72.0	1728

Table 5: Flood operations — DDO emergency action

Activation level	Alert	Lean Forward	Stand Up — 1	Stand Up — 2	Stand Up — 3	Stand Down
Activation trigger	• Storage above EL 57.21m and rising (Max. OL)	• Storage above EL 58.00m and rising (0.21m below Spillway Crest Level)	• Storage above EL 58.21m and rising (Spillway Crest Level)	• Storage above EL 58.56m	• Storage above EL 61.21m (PMPF) (allowing for wave action) OR • As advised by the DSTDM	• Storage level EL 57.21m and falling with no forecast increase in EL
Actions	• Note: Commence flood releases when storage level is above EL 57.21m. Refer to reference S, Section 2.5.4.4 (pp. 101) for WP 06-04 Flood Releases into Sandy Creek. • Inspect the dam daily (or as instructed by the DSTDM) and photograph/video and record using approved forms in HMT and send to IC & DSTDM • Undertake site preparations including but not limited to: • check fuel and operation of backup generator • check communication systems • Record the Storage Level twice daily (or as instructed by the DSTDM) using the gauge boards and confirm accuracy of gauging station • Record rainfall — daily • Record all communication • Update Dam Logbook as per Sop 12	• As per previous activation level, AND • Inspect the dam daily (or as instructed by the DSTDM) and photograph/video and record using approved forms in HMT and send to IC & DSTDM. Attention will be given to: • inspect embankment for leaks, deformation, and erosion • inspect borrow pit embankment • Report any unusual readings or observations to the DSTDM and IC as soon as practical • Read instrumentation daily (or as instructed by the DSTDM)	• As per previous activation level, AND • Monitor Spillway and D/S channel for signs of scouring • Photograph spillway chute and the backwater level at the toe of main embankment	• As per previous activation level, AND • Inspect the dam 6-hourly (or as instructed by the DSTDM) and photograph/video and record using approved forms in HMT and send to IC & DSTDM • Evacuate any plant and/or vehicles to higher ground • Carry out dam surveillance twice daily for evidence of piping in vicinity of spillway abutments	• As per previous activation level	• Return to routine surveillance activities and frequencies — inspect the dam for any damage identified • Forward information for EER to IC email • Update Dam Logbook as per SOP 12
Internal notifications	• IC • SO	• 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
External notifications	• As required	• As required	• As required	• As required	• As required	• As per previous activation level

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 Down
Activation trigger	• Storage above EL 57.21m and rising (Max. OL)	• Storage above EL 58.00m and rising (0.21m below Spillway Crest Level)	• Storage above EL 58.21m and rising (Spillway Crest Level)	• Storage above EL 58.56m	• Storage above EL 61.21m (PMPF) (allowing for wave action) OR • As advised by the DSTDM	• Storage level EL 57.21m and falling with no forecast increase in EL
Actions	• Liaise with LDMG re: situation and discuss potential road/bridge closures, especially Anthony's crossing and Curran's crossing; indicated on map in Appendix B2. • Give direction to the DDO regarding operational releases including time to start releases, percent opening of values, estimated discharge; refer to Table in 5.2.3 • Develop/implement staff roster • Record all communication	• As per previous activation level, AND • Ensure all abnormal observations or damage has been reported to DSTDM & IC • LDMG assume responsibility for downstream messaging if the LDMG has reached Stand Up activation level • See note*	• As per previous activation level	• As per previous activation level	• As per previous activation level	• Forward information for EER to IC email • Return to routine activities
Internal notifications	• DDO • IC	• 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
External notifications	• LDMG	• 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: Mackay Regional Council assumes responsibility for downstream communications at EAP Lean Forward activation level, provided that LDMG is at Stand Up activation level.**

Table 7: Flood operations — IC emergency action

Activation level	Alert	Lean Forward	Stand Up — 1	Stand Up — 2	Stand Up — 3	Stand Down
Activation trigger	• Storage above EL 57.21m and rising (Max. OL)	• Storage above EL 58.00m and rising (0.21m below Spillway Crest Level)	• Storage above EL 58.21m and rising (Spillway Crest Level)	• Storage above EL 58.56m	• Storage above EL 61.21m (PMPF) (allowing for wave action) OR • As advised by the DSTDM	• Storage level EL 57.21m and falling with no forecast increase in EL
Actions	• Liaise with Sunwater Customer Support to send SMS to D/S residents • Obtain catchment conditions from the DDO • Create Incident Report Record • Update Sunwater Intranet with dam status • Record all communication NOTE: IC to carry out LEC actions if the LEC is not contactable.	• As per previous activation level, AND • Ensure all abnormal observations or damage has been reported to DSTDM • Liaise with LEC re: MRC assuming responsibility for downstream messaging • See note* • 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: Mackay Regional Council assumes responsibility for downstream communications at EAP Lean Forward level, provided that LDMG is at Stand Up activation level.**	• As per previous activation level	• As per previous activation level, AND • Liaise with the DSTDM to confirm that dam failure is in progress	• Deactivate EAP • Compile EER and deliver to DSR if required • Create Incident Report Record • Update Sunwater Intranet with dam status • Return to routine activities
Internal notifications	• DDO • DSTDM • FODM • LEC/ORR • SMT • SRT	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level	• Inform previous notifications of deactivation as required

Activation level	Alert	Lean Forward	Stand Up — 1	Stand Up — 2	Stand Up — 3	Stand Down
External notifications	• DDMG • QPS	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level, AND • SDCC Watch Desk, • Emergency siren	• As required

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

Activation level	Trigger for communications	Group to contact	Method	Message text
Alert	• Storage above EL 57.21m (Max. OL) and rising (preparedness)	• LDMG • DDMG • QPS	• Phone	Describe current situation with dam — What is the event? What is the status? Discuss any potential road/bridge closures, especially Anthony's crossing and Curran's crossing; indicated on downstream notification map in Appendix B2. Advise of current storage level and current flood releases
Lean Forward	• Storage above EL 58.00m and rising (0.21m below Spillway Crest Level)	• LDMG • DDMG • QPS	• Phone	Describe current situation with dam — What is the event? What is the status? Advise of current storage level and current flood releases. Also advise if Spillway discharge is likely. Advise of any forecasts you are aware of
		• D/S Residents	• SMS (Phone for those without mobiles)	Liaise with Sunwater customer support and communications to send appropriate messaging via SMS
Stand Up — 1	• Storage above EL 58.21m and rising (Spillway Crest Level)	• MRC • LDMG • DDMG • QPS	• Phone	Describe current situation with dam — What is the event? What is the status? Advise of current storage level Advise of any forecasts you are aware of
		• D/S Residents	• SMS (Phone for those without mobiles)	Liaise with Sunwater customer support and communications to send appropriate messaging via SMS

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

Activation level	Trigger for communications	Group to contact	Method	Message text
Stand Up — 2	• Storage above EL 58.56m (flood of record — Jan 1991)	• MRC • LDMG • DDMG • QPS	• Phone	Describe current situation with dam — What is the event? What is the status? (storage is greater than flood of record) Advise of current storage level Advise of any forecasts you are aware of
		• D/S Residents	• SMS (Phone for those without mobiles)	Liaise with Sunwater customer support and communications to send messaging via SMS, if appropriate
Stand Up - 3	• Storage above EL 60.98m (PMPF) (allowing for wave action) OR • As advised by the DSTDM	• MRC • LDMG • DDMG • QPS	• Phone	Describe current situation with dam — What is the event? What is the status? Advise of current storage level Advise of any forecasts you are aware of Discuss the need for an Emergency Alert
		• SDCC Watch Desk	• Phone & Email	Sunwater to issue Emergency Alert in conjunction with MRC Copies of Emergency Alert Request form in Appendix A8 - email to SDCC Watch Desk to send.
		• D/S Residents	• SMS • (Phone for those without mobiles)	Liaise with Sunwater customer support and communications to send messaging via SMS, if appropriate
		• Emergency siren	• Phone & Email	**Complete Emergency siren instructions in Appendix A9 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 level EL 57.21m and falling with no forecast increase in EL	• LDMG • DDMG • QPS	• Phone	Describe current situation with dam — What is the event? What is the status? Advise of current storage level Advise of any forecasts you are aware of Advise EAP has been deactivated

Table 9: Flood operations — DSTDM emergency action

Activation level	Alert	Lean Forward	Stand Up — 1	Stand Up — 2	Stand Up — 3	Stand Down
Activation trigger	• Storage above EL 57.21m and rising (Max. OL)	• Storage above EL 58.00m and rising (0.21m below Spillway Crest Level)	• Storage above EL 58.21m and rising (Spillway Crest Level)	• Storage above EL 58.56m	• Storage above EL 61.21m (PMPF) (allowing for wave action)	• Storage level EL 57.21m and outflows no longer occurring
Action	• Provide technical advice to DDO and IC on a need's basis • Review surveillance reports and determine if any additional responses are required • Record all communication	• As per previous activation level	• 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	• Forward information for EER to IC email • Return to routine activities
Internal notifications	• DDO • IC	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level, AND • CEO — if time permits	• As per previous activation level
External notifications	• 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

Table 10: Flood operations — FODM emergency action

Activation level	Alert	Lean Forward	Stand Up — 1	Stand Up — 2	Stand Up — 3	Stand Down
Activation trigger	• Storage above EL 57.21m and rising (Max. OL)	• Storage above EL 58.00m and rising (0.21m below Spillway Crest Level)	• Storage above EL 58.21m and rising (Spillway Crest Level)	• Storage above EL 58.56m	• Storage above EL 61.21m (PMPF) (allowing for wave action) OR • As advised by the DSTDM	• Storage level EL 57.21m and outflows no longer occurring
Action	• Record all communication and decisions • Provide technical advice to DDO, DSTDM, and IC on a need's basis • Inform IC of any EAP decisions • Review SDCC reports and determine if any additional responses are required • Undertake inflow assessment as per the OC SOP and update as necessary • Update and issue Status Updates if required	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level	• Forward information for EER to IC email • Return to routine activities
Notifications	• DDO • IC	• 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

13 15 89 Sunwater Customer Support
24-hour contact line

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

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 increase likelihood of piping. This circumstance is the trigger for the Advice status for piping.

Cloudy seepage water is a circumstance that could indicate an increase likelihood of piping. This circumstance is the trigger for the Watch and Act 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

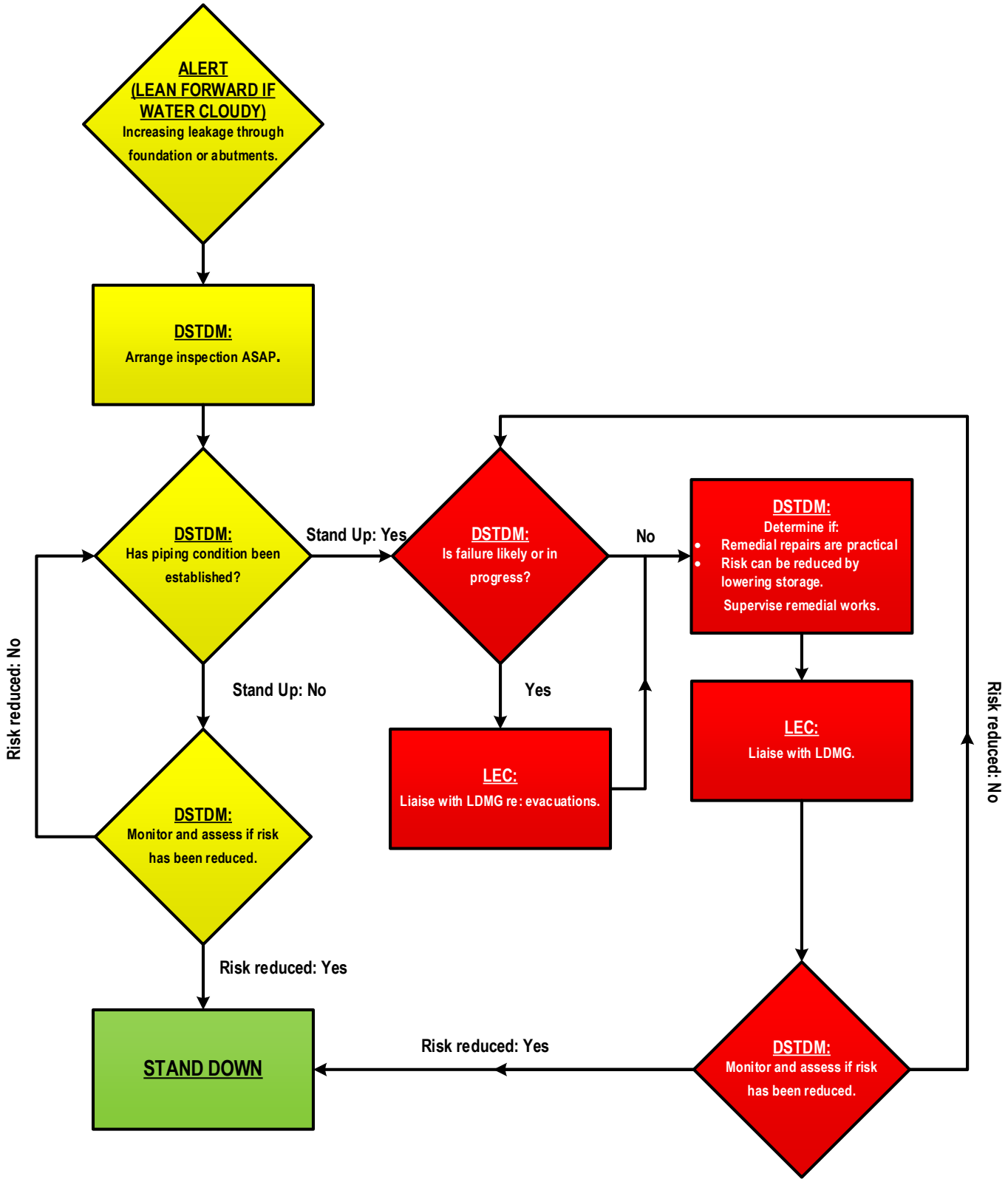


Table 11: Piping: embankment, foundation, or abutments — DDO emergency action

Activation level	Alert	Lean Forward	Stand Up — 1	Stand Up — 2	Stand Down
Activation trigger	• Increasing leakage through the embankment, the foundations, or abutments, OR • Storage above EL 57.71m and rising	• 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	• Monitor flows every 6 hours (or as otherwise instructed by the DSTDM) until a decreasing trend is observable, or as directed by the IC • Photograph/video the piping from a safe point and record using the approved forms in HMT and send to IC & DSTDM • Update Dam Logbook as per SOP 12 • Record all communication	• As per previous activation level	• As per previous activation level, AND • Support/supervise remedial works as required • Lower the storage if directed • Close any affected roads 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 • Record/photograph the piping damage and/or dam failure from a safe point	• Inspect the dam for any damage and photograph any damage identified during the event. • Forward information for EER to IC email • Update Dam Logbook as per SOP 12 • Return to routine activities
Internal notifications	• DSTDM • IC • SO	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level
External notifications	• As required	• As required	• As required	• As required	• As per previous activation level

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, OR • Storage above EL 57.71m and rising	• 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	• As per previous activation level	• As per previous activation level • Liaise with relevant Council(s) regarding potential road/bridge closures	• As per previous activation level	• Forward information for EER to IC email • Return to routine activities
Internal notifications	• IC • DDO	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level
External notifications	• LDMG	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level

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, OR • Storage above EL 57.71m and rising	• 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	• Create Incident Report Record • Update Sunwater Intranet with EAP status • Record all communication • Complete Situation Report, unless otherwise directed **NOTE: IC to carry out LEC actions unless LDMG has reached Stand Up level**	• 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 • Liaise with Sunwater Customer Support to send SMS to D/S residents and phone those without mobiles • Mobilise resources to undertake remedial works if directed by DSTDM	• As per previous activation level, AND, • Liaise with the DSTDM to confirm that dam failure is in progress • Confirm that remedial works have ceased if directed by the DSTDM and plant and personnel have been moved to a safe location • Liaise with DDO and DSTDM re: potential for evacuations	• Deactivate EAP • Compile EER and organise delivery to the Dam Safety Regulator by the due date • Close Incident Report Record • Update Sunwater Intranet with dam status • Return to routine activities
Internal notifications	• DSTDM • DDO • LEC/ORR • SMT • SRT	• As per previous activation level	• As per previous activation level	• As per previous activation level	• Inform previous notifications of deactivation as required
External notifications	• As required	• As per previous activation level, AND • DDMG • QPS	• As per previous activation level, AND • D/S Residents • SDCC Watch Desk	• As per previous activation level	• As per previous activation level

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	• Increase in leakage through an embankment, the foundations, or abutments, OR • Storage above 57.71m and rising	• 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	• Increase in leakage through an embankment, the foundations, or abutments with cloudy water	• LDMG • DDMG • QPS	• Phone	Describe current situation with dam — What is the event? *(Unconfirmed piping risk)* What is the status? (Unconfirmed leakage — Investigation continues) Advise of current storage level Advise any issues you are aware of Standby for further advice
Stand Up — 1	• Piping condition has been established	• LDMG • DDMG • QPS	• Phone	Describe current situation with dam — What is the event? *(Confirmed piping risk)* What is the status? (Confirmed piping/leakage) Advise of current storage level Advise any issues you are aware of. Discuss any potential road/bridge closures Prepare for possible evacuations
		• SDCC Watch Desk	• Phone & Email	Complete Emergency Alert Request Form as per instructions (copies in Appendix A8 and ref W) and email to SDCC Watch Desk to send. Develop messages in consultation with DSTDM.
		• D/S Residents	• SMS (Phone for those without mobiles)	Liaise with Sunwater customer support and communications to send appropriate messaging via SMS

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	• LDMG • DDMG • QPS	• Phone	Describe current situation with dam — What is the event? *(Confirmed piping risk)* What is the status? (Possible Dam Failure) Advise of current storage level Prepare coordinated evacuations
		• SDCC Watch Desk	• Phone & Email	Complete Emergency Alert Request Form as per instructions (blank copy in ref W) and email to SDCC Watch Desk to send. Develop messages in consultation with DSTDM.
		• D/S Residents	• SMS (Phone for those without mobiles)	Liaise with Sunwater customer support and communications to send appropriate messaging via SMS
	• Dam failure in progress	• LDMG • DDMG • QPS	• 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 Coordinate evacuations of affected Downstream Residents and move people to higher ground
		• SDCC Watch Desk	• Phone & Email	Complete Emergency Alert Request Form as per instructions (copies in Appendix A8 and ref W) and email to SDCC Watch Desk to send.
		• D/S Residents	• SMS (Phone for those without mobiles)	Liaise with Sunwater customer support and communications to send appropriate messaging via SMS
		• Emergency siren	• Phone & Email	**Complete Emergency siren instructions in Appendix A9 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	• LDMG • DDMG (if from Watch and Act) • QPS (if from Watch and Act)	• 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
		• D/S Residents (if from Emergency Warning)	• SMS (Phone for those without mobiles)	Liaise with Sunwater customer support and communications to send appropriate messaging via SMS

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, OR • Storage above 57.71m and rising	• 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	• 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 • Record all communication • Advise DSR on EAP activation	• As per previous activation level	• As per previous activation level, AND • Assess risk and determine if failure likely or in progress • Determine if remedial repairs are practical • Determine if risks can be reduced by lowering storage (if the storage is required to be drawn down, then the DSTDM needs to assess the maximum rate of drawn down based on latest available data and advise in writing to IC and DDO) • Supervise* remedial repairs (if applicable)	• 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 information for EER to IC email • Return to routine activities
Internal notifications	• DDO • IC	• As per previous activation level	• As per previous activation level, AND • LEC/ORR	• As per previous activation level, AND • CEO — if time permits	• As per previous activation level
External notifications	• DSR	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level

* Supervise means provide technical oversight to the work. It does not necessarily mean on-site supervision.

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 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 Sunny Day Failure (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 Probable Maximum Flood (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

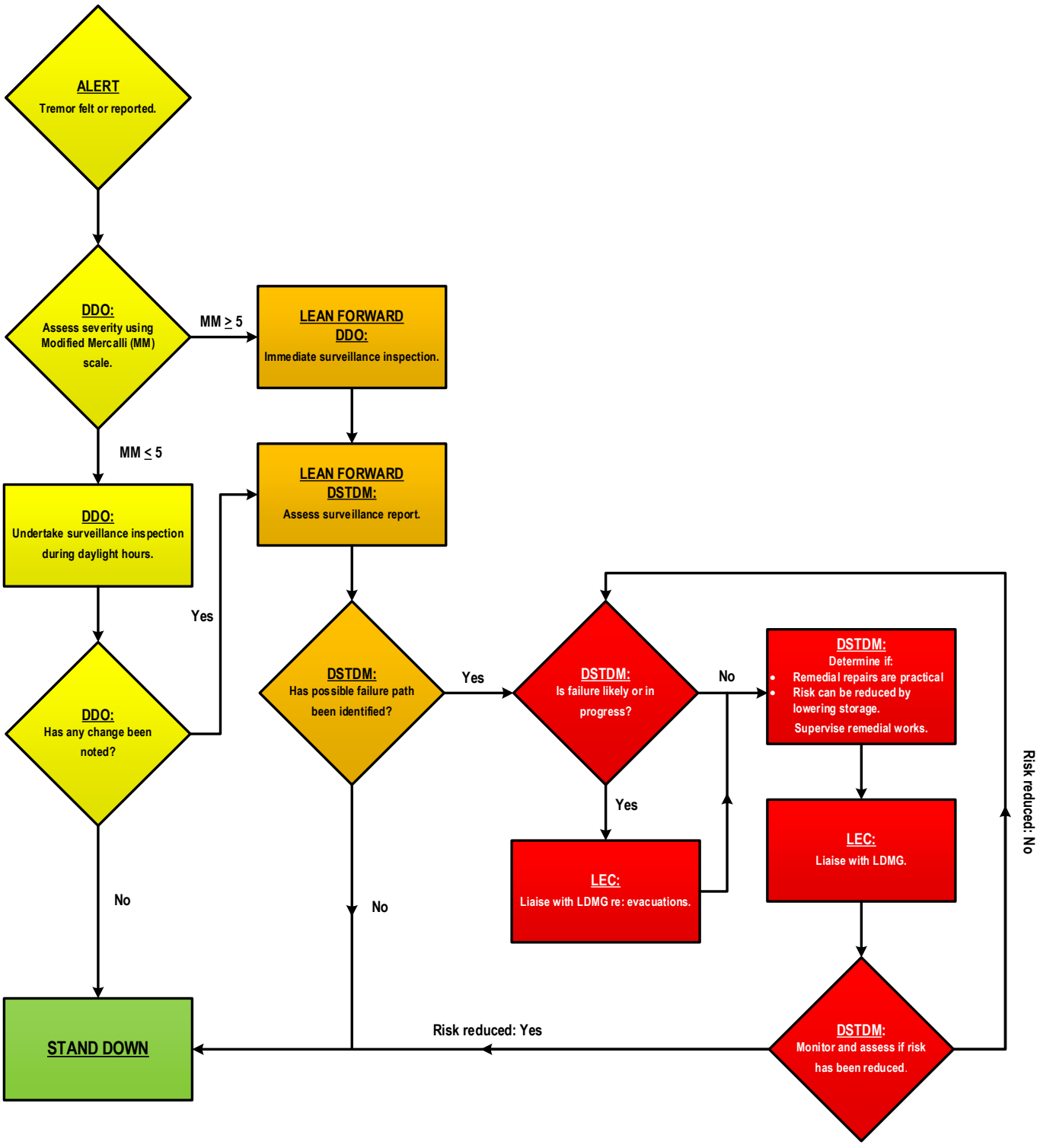


Table 16: Earthquake — DDO emergency action

Activation level	Alert	Lean Forward	Stand Up — 1	Stand Up — 2	Stand Down
Activation trigger	• Earthquake confirmed (by DSTDM) or felt in the area, AND • Intensity less than 5MM*	• Earthquake confirmed (by DSTDM) or felt in the area, AND • Intensity greater than or equal to 5MM*, OR • Intensity less than 5MM* and change detected during surveillance inspection	• Earthquake confirmed (by DSTDM) or felt in the area, AND • A possible failure path has been identified	• Failure in progress or likely due to earthquake, AND • Sufficient water in storage to create a dam hazard	• Risk assessment has been determined that failure risk has reduced
Actions	• Immediately inspect the embankment, spillway structure, abutments, and Saddle Dam in daylight hours (if safe to do so) and report to the DSTDM and IC — photograph/video and record using forms in HMT and send to IC & DSTDM • Check for leaks, deformation, erosion, and concrete damage • Update Dam Logbook as per SOP 12 • Record all communication	• Immediately inspect the embankment, spillway structure, abutments, and Saddle Dam (if safe to do so) and report to the DSTDM and IC — photograph/video and record using forms in HMT and send to IC & DSTDM • Repeat the inspection as directed • Update Dam Logbook as per SOP 12	• As per previous activation level, AND • Support/supervise remedial work as required • Lower the storage if directed • Close any affected roads, if not already closed by others • Maintain surveillance of area immediately downstream of dam or Saddle Dam (if safe to do so) and move on any members of the public • Record/photograph the damage from a safe point • 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 • Forward information for EER to IC email • Update Dam Logbook as per SOP 12 • Return to routine activities
Internal notifications	• DSTDM • IC • SO	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level
External notifications	• As required	• As required	• As required	• As required	• As per previous activation level

* DDO to assess magnitude (MM scale) at dam location.

Table 17: Earthquake — LEC emergency action

Activation level	Alert	Lean Forward	Stand Up — 1	Stand Up — 2	Stand Down
Activation trigger	• Earthquake confirmed (by DSTDM) or felt in the area, AND • Intensity less than 5MM*	• Earthquake confirmed (by DSTDM) or felt in the area, AND • Intensity greater than or equal to 5MM*, OR • Intensity less than 5MM* and change detected during surveillance inspection	• Earthquake confirmed (by DSTDM) or felt in the area, AND • A possible failure path has been identified	• Failure in progress or likely due to earthquake, AND • Sufficient water in storage to create a dam hazard	• Risk assessment has been determined that failure risk has reduced
Actions	• Record all communication	• 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 information for EER to IC email • Return to routine activities
Internal notifications	• IC • DDO	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level
External notifications	• LDMG	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level

* DDO to assess magnitude (MM scale) at dam location.

Table 18: Earthquake — IC emergency action

Activation level	Alert	Lean Forward	Stand Up — 1	Stand Up — 2	Stand Down
Activation trigger	• Earthquake confirmed* or felt in the area, AND • Intensity less than 5MM˜	• Earthquake confirmed* or felt in the area, AND • Intensity greater than or equal to 5MM˜, OR • Intensity less than 5MM˜ and change detected during surveillance inspection	• Earthquake confirmed* or felt in the area, AND • A possible failure path has been identified	• Failure in progress or likely due to earthquake, AND • Sufficient water in storage to create a dam hazard	• Risk assessment has been determined that failure risk has reduced
Actions	• Record all communication • Liaise with DDO, LEC and DSTDM • Create Incident Report Record • Update Sunwater Intranet with dam status **NOTE 1: IC to carry out LEC actions unless LDMG has reached Stand Up level**	• As per previous activation level, AND • Investigate availability of machinery and materials (if insufficient stockpiles available) • Place machinery operators on standby if directed by DSTDM • Consider the need to appoint a Sunwater Recovery Coordinator. The Sunwater Recovery Coordinator is responsible for the follow through on actions to close out all matters and works outstanding after the initial emergency is over. • Confirm EAs and other messages are prepared in advance – if required.	• As per previous activation level. AND • Liaise with Sunwater Customer Support to send SMS to D/S residents and phone those without mobiles • Liaise with DDO and relevant Council(s) regarding potential road/bridge closures • Mobilise resources to undertake remedial works if directed by DSTDM	• As per previous activation level, AND • Liaise with the DSTDM to confirm that dam failure is in progress • Confirm that remedial works have ceased if directed by the DSTDM and plant and personnel have been moved to a safe location • Liaise with DDO and DSTDM re: potential for evacuations	• Deactivate EAP • Compile EER and deliver to DSR if required • Close Incident Report Record • Update Sunwater Intranet with dam status • Return to routine activities
Internal notifications	• DDO • DSTDM • LEC/ORR • SMT • SRT	• As per previous activation level	• As per previous activation level	• As per previous activation level	• Inform previous notifications of deactivation as required
External notifications	• As required	• As per previous activation level, AND • DDMG • QPS	• As per previous activation level, AND • D/S Residents • SDCC Watch Desk	• As per previous activation level	• As per previous activation level

˜ DDO to assess magnitude (MM scale) at dam location

* 'Confirmed' is defined as an alert received from Geoscience Australia or other source that advises an Earthquake >4.9 ML (Richter Scale) has occurred within a 200km radius of the Dam

Table 19: Earthquake — LEC and IC external communication plan

Activation level	Trigger for communications	Group to contact	Method	Message text
Alert	• Earthquake confirmed or felt in the area, AND • Intensity less than 5MM	• 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 Advise EAP has been activated Stand by for further information
Lean Forward	• Earthquake confirmed or felt in the area, AND • Intensity greater than or equal to 5MM, OR • Intensity less than 5MM and change detected during surveillance inspection	• LDMG • DDMG • QPS	• 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 Advise EAP has been activated Stand by for further information
Stand Up — 1	• Earthquake confirmed or felt in the area, AND • A possible failure path has been identified	• LDMG • DDMG • QPS	• Phone	Describe current situation with dam — What is the event? *(Dam Safety Risk — Earthquake felt or reported in area)* What is the status? (Possible earthquake damage to dam) Advise of current storage level. Discuss any potential road/bridge closures LDMG to activate LDMP
		• SDCC Watch Desk	• Phone & Email	Complete Emergency Alert Request Form as per instructions (blank copy in ref W) and email to SDCC Watch Desk to send. Develop messages in consultation with DSTDM.
		• D/S Residents	• SMS (Phone for those without mobiles)	Liaise with Sunwater customer support and communications to send appropriate messaging via SMS

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	• LDMG • DDMG • QPS	• Phone	Describe current situation with dam — What is the event? *(Dam Safety Risk — Earthquake damage)* What is the status? (Dam Failure Likely) Advise of current storage level. Discuss any potential road/bridge closures (if not discussed at Emergency Warning previously) LDMG to activate LDMP
		• SDCC Watch Desk	• Email & Phone	**Complete Emergency Alert Request Form as per instructions (blank copy in ref W) and email to SDCC Watch Desk to send.** ***Develop messages in consultation with DSTDM***
		• D/S Residents	• SMS (Phone for those without mobiles)	Liaise with Sunwater customer support and communications to send appropriate messaging via SMS
	• Dam failure in progress	• LDMG • DDMG • QPS	• Phone	Describe current situation with dam — What is the event? *(Dam Safety Risk — Earthquake damage)* What is the status? (Dam Failure In Progress) Advise of current storage level LDMG to activate LDMP
		• SDCC Watch Desk	• Email & Phone	**Complete Emergency Alert Request Form as per instructions (copies in Appendix A8 and ref W) and email to SDCC Watch Desk to send.**
		• D/S Residents	• SMS (Phone for those without mobiles)	Liaise with Sunwater customer support and communications to send appropriate messaging via SMS
		• Emergency siren	• Phone & Email	**Complete Emergency siren instructions in Appendix A9 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	• LDMG • DDMG (if from Watch and Act) • QPS (if from Watch and Act)	• 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
		• D/S Residents (if from Emergency Warning)	• SMS (Phone for those without mobiles)	Liaise with Sunwater customer support and communications to send appropriate messaging via SMS

Table 20: Earthquake — DSTDM emergency action

Activation level	Alert	Lean Forward	Stand Up — 1	Stand Up — 2	Stand Down
Activation trigger	• Earthquake confirmed* or felt in the area, AND • Intensity less than 5MM~	• Earthquake confirmed* or felt in the area, AND • Intensity greater than or equal to 5MM~, OR • Intensity less than 5MM~ and change detected during surveillance inspection	• Earthquake confirmed* or felt in the area, AND • A possible failure path has been identified	• Failure in progress or likely due to earthquake, AND • Sufficient water in storage to create a dam hazard	• Risk assessment has been determined that failure risk has reduced
Action	• Monitor situation and assess risks • Review surveillance inspection of the dam and assess its condition as soon as possible • Review instrumentation data and determine if any additional responses are required • Advise DSR of EAP activation • Record all communication	• As per previous activation level, AND • Determine if there are any possible failure paths from reported damage	• 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) • 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	• Forward information for EER to IC email • Return to routine activities
Internal notifications	• DDO • IC	• As per previous activation level	• As per previous activation level, AND • CEO — if time permits	• As per previous activation level	• As per previous activation level
External notifications	• DSR	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level

~DDO to assess magnitude (MM scale) at dam location

*'Confirmed' is defined as an alert received from Geoscience Australia or other source that advises an Earthquake >4.9 ML (Richter Scale) has occurred within a 200km radius of the Dam

^Supervise means provide technical oversight to the work. It does not necessarily mean on-site supervision.

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 Kinchant Dam to a terrorist attack is low.

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

- Use the Sunny Day Failure (SDF) outline when a dam failure is in progress or likely due to terrorist threat/activity or high energy impact and no concurrent flooding or downstream releases are occurring or expected to occur, or
- Use the Probable Maximum Flood (PMF) outline when a dam failure is in progress or likely due to terrorist threat/activity or 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 a terrorist threat. If this were specific enough to name a dam, this circumstance would trigger the Emergency Warning 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

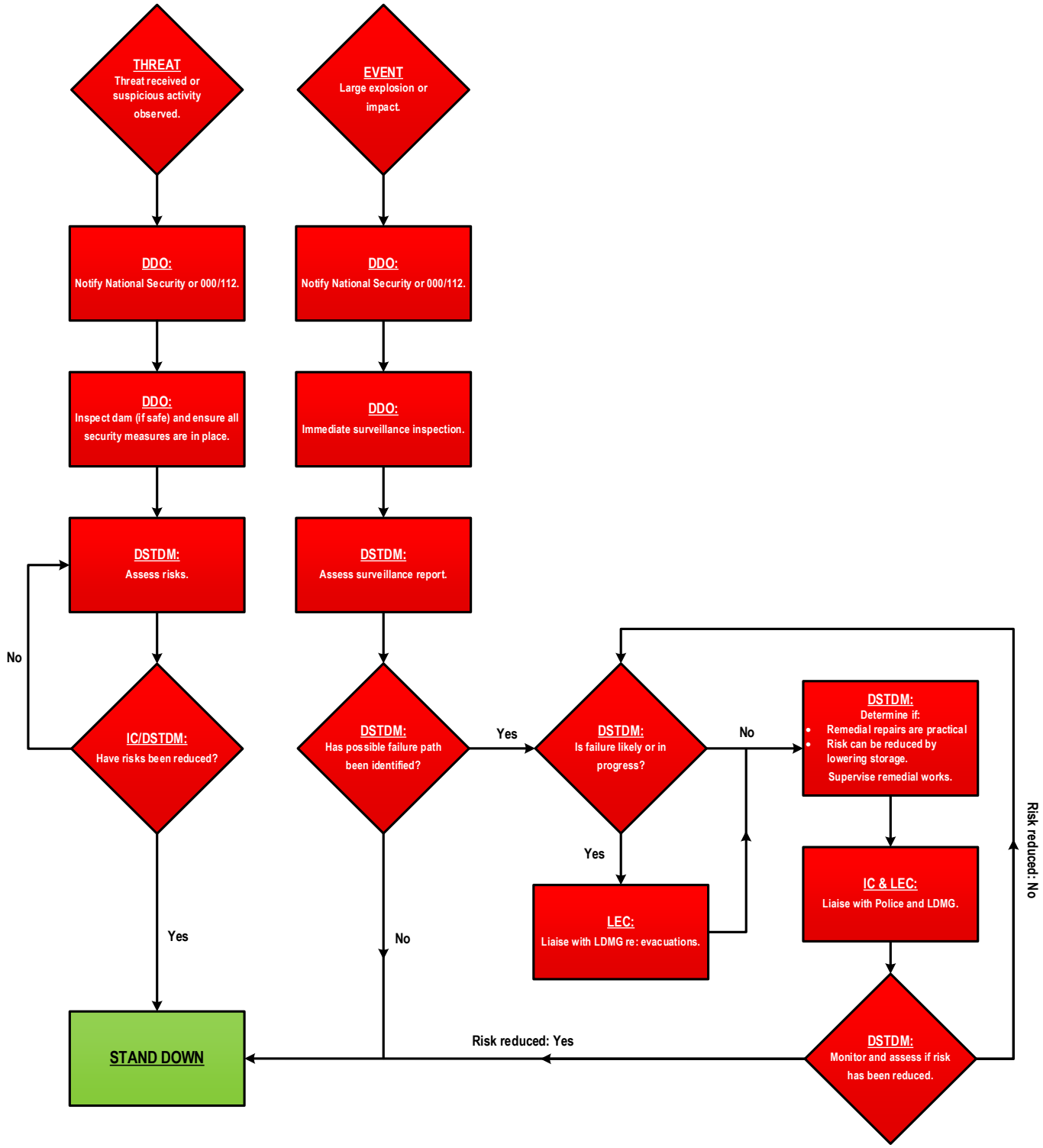


Table 21: Terrorist threat/activity or high energy impact — DDO emergency action

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, OR • 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 in HMT and send to IC & DSTDM • If Police appoint Incident Manager support and follow instructions • Close any affected roads as directed • Update Dam Logbook as per SOP12	• As per previous activation level, AND • Undertake surveillance inspect dam (if safe) • Vacate the immediate vicinity of the affected area	• As per previous activation level, AND • Lower reservoir level, if directed	• Forward information for EER to IC email • Update Dam Logbook as per SOP12 • Return to routine activities
Internal notifications	• Not applicable	• DSTDM • ICSO	• As per previous activation level	• As per previous activation level	• As per previous activation level
External notifications	• Not applicable	• #000 Emergency	• As per previous activation level	• As per previous activation level	• As per previous activation level

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, OR • 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	• 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 • Record all communication	• As per previous activation level	• As per previous activation level, AND • Liaise with DDO and LDMG re: potential for evacuations	• Forward information for EER to IC email • Return to routine activities
Internal notifications	• Not applicable	• DDO • IC	• As per previous activation level	• As per previous activation level	• As per previous activation level
External notifications	• Not applicable	• LDMG	• As per previous activation level	• As per previous activation level	• As per previous activation level

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, OR • Threat received	EVENT • Large explosion heard/observed at dam (e.g., bomb explosion, aircraft hit)	RESPONSE • Failure in progress or likely due to impact or explosion, AND • Sufficient water in storage to create a dam hazard	• Risk assessment has determined that failure risk has reduced
Actions	• Not applicable	• Record all communication • Contact National Security • If Police appoint Incident Manager support and follow instructions • Create Incident Report Record • Update Sunwater Intranet with dam status • Consider the need to appoint a Sunwater Recovery Coordinator. The Sunwater Recovery Coordinator is responsible for the follow through on actions to close out all matters and works outstanding after the initial emergency is over. • Confirm EAs and other messages are prepared in advance – if required. **NOTE**: IC to carry out LEC actions unless LDMG1 has reached Emergency Warning level	• As per previous activation level	• 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	• Deactivate EAP event • Compile EER and organise delivery to the Dam Safety Regulator by the due date • Close Incident Report Record • Update Sunwater Intranet with dam status • Return to routine activities
Internal notifications	• Not applicable	• DDO • DSTDM • LEC/ORR • SMT • SRT	• As per previous activation level	• As per previous activation level	• Inform previous notifications of deactivation as required
External notifications	• Not applicable	• CTG • DDMG • QPS	• As per previous activation level, AND • D/S Residents • SDCC	• As per previous activation level, AND • Emergency siren	• As per previous activation level

Table 24: Terrorist threat/activity or high energy impact — LEC and IC communication plan

Activation level	Trigger for communications	Group to contact	Method	Message text
Alert	'ADVICE' NOT APPLICABLE			
Lean Forward	'WATCH AND ACT' NOT APPLICABLE			
Stand Up — 1	THREAT • Possible terrorist activity/suspicious behaviour notice at the dam, OR • Threat received	• LDMG • DDMG • QPS • CTG	• Phone	Describe current situation with dam — What is the event? (Dam Safety Risk — Security threat/ impact/explosion, etc.) What is the status? (Received/noted terrorist threat) Discuss any potential road/bridge closures LDMG to activate LDMP
	EVENT • Large explosion heard/observed at dam (e.g., bomb explosion, aircraft hit)	• LDMG • DDMG • QPS • CTG	• Phone	Describe current situation with dam — What is the event? (Dam Safety Risk — Security threat/ impact/explosion, etc.) What is the status? (Under Investigation) Discuss any potential road/bridge closures (if not already discussed at Emergency Warning level) LDMG to activate LDMP
Stand Up — 2		• SDCC Watch Desk	• Phone & Email	Complete Emergency Alert Request Form as per instructions (copies in Appendix A8 and ref W) and email to SDCC Watch Desk to send. Develop messages in consultation with DSTDM.
		• D/S Residents	• SMS (Phone for those without mobiles)	Liaise with Sunwater customer support and communications to send appropriate messaging via SMS

Table 24(Continued): Terrorist threat/activity or high energy impact — LEC and IC communication plan

Activation level	Trigger for communications	Group to contact	Method	Message text
Stand Up — 3	RESPONSE • Failure in progress or likely due to impact or explosion, AND • Sufficient water in storage to create a dam hazard	• LDMG • DDMG • QPS	• 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) Initiate evacuations
		• SDCC Watch Desk	• Phone & Email	Complete Emergency Alert Request Form as per instructions (copies in Appendix A8 and ref W) and email to SDCC Watch Desk to send.
		• D/S Residents	• SMS (Phone for those without mobiles)	Liaise with Sunwater customer support and communications to send appropriate messaging via SMS
		• Emergency siren	• Phone & Email	**Complete Emergency siren instructions in Appendix A9 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	• LDMG • DDMG • QPS	• 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
		• D/S Residents (if from Emergency Warning level)	• SMS (Phone for those without mobiles)	Liaise with Sunwater customer support and communications to send appropriate messaging via SMS

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, OR • 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) • 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 information for EER to IC email • Return to routine activities
Internal notifications	• Not applicable	• IC • DDO • SRT	• As per previous activation level, AND • LEC/ORR	• As per previous activation level	• As per previous activation level
External notifications	• Not applicable	• DSR	• As per previous activation level	• As per previous activation level	• As per previous activation level

* Supervise means provide technical oversight to the work. It does not necessarily mean on-site supervision.

9. Other emergency situation — communications failure

9.1 Overview

The emergency action described in this section (Other Emergency Situation — Communications Failure) relates to either:

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

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

9.2 Emergency actions

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

9.2.1 Activation triggers

Table 26: 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)

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

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

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

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

9.2.3 Emergency action roles

Table 27 to Table 32 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 27: 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: – Mobile phone-try texting instead of voice, much higher probability of success – Satellite Phone-needs to access open sky unless external antenna fitted – Social media-e.g., Facebook (Internet may be available via landline) • Record all communication and attempts via Dam Logbook entries as per SOP12 and communications 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: – Mobile phone-try texting instead of voice, much higher probability of success – Satellite Phone-needs to access open sky unless external antenna fitted – Social media-e.g., Facebook (Internet may be available via landline) • Record all communication and attempts via Dam Logbook entries as per SOP12 and communications log if EAP event is current
Internal Notifications	• IC • SO (if available)	• LEC • SO (if available)
External Notifications	• As required	• As required

Table 28: 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: – Mobile phone-try texting instead of voice, much higher probability of success – Satellite Phone-needs to access open sky unless external antenna fitted – Social media-e.g., Facebook (Internet may be available via landline) • Record all communication and attempts • Assume that the DDO is carrying out IC 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: – Mobile phone-try texting instead of voice, much higher probability of success – Satellite Phone-needs to access open sky unless external antenna fitted – 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
Internal Notifications	• IC • DSTDM • SO (if available)	• DDO • DSTDM (if available) • SO
External Notifications	• LDMG	• LDMG • DDMG • QPS

Table 29: 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	• Issue Sunwater Incident Alert • Every hour attempt communications noting the following: – Mobile phone-try texting instead of voice, much higher probability of success – Satellite Phone-needs to access open sky unless external antenna fitted – 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	• Issue Sunwater Incident Alert • Every hour attempt communications noting the following: – Mobile phone-try texting instead of voice, much higher probability of success – Satellite Phone-needs to access open sky unless external antenna fitted – 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
Internal Notifications	• LEC • DSTDM • SO (if available)	• DDO (if available) • DSTDM • SO (if available)
External Notifications	• DDMG • QPS	• LDMG (if available) • DDMG (if available) • QPS (if available)

Table 30: Communications failure — LEC and IC communication plan

Activation level	Trigger for communications	Group to contact	Method	Message code	Message text
Comms Failure – Site	• Unable to communicate to or from dam site, AND • DDO is at Dam site	• IC/LEC • DSTDM • SO (if available) • LDMG • DDMG • QPS	• Phone		Describe current situation with dam communications. What is the status – estimated time to restore communications?
		IC to send Sunwater Incident and Near Miss Alert			EAP Alert Notification — Kinchant Dam — Site Communications Failure
Comms Failure – Local Area	• Unable to communicate to or from Local Area including LEC and ORR	• DDO (if available) • DSTDM • SO (if available) • LDMG (if available) • DDMG (if available) • QPS (if available)	• Phone		Describe current situation with dam communications. What is the status – estimated time to restore communications?
		IC to send Sunwater Incident and Near Miss Alert			EAP Alert Notification — Kinchant Dam — Local Area Communications Failure
Comms Failure – Brisbane	• Unable to communicate to or from Sunwater Brisbane	• DSTDM (if available) • LDMG • DDMG • QPS	• Phone		Describe current situation with dam communications. What is the status – estimated time to restore communications?
		LEC to send Sunwater Incident and Near Miss Alert			EAP Alert Notification — Sunwater Brisbane Communications Failure

Table 31: 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 on a need's basis • 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 on a need's basis • 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
Internal Notifications	• IC • LEC • CEO (if time permits)	• IC • DDO (if available) • CEO (if time permits)
External Notifications	• DSR (if applicable)	• DSR (if available)

Table 32: Communications failure — FODM 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	• Record all communication • As much as is practicable. continue other tasks associated with the role in accordance with any other current Emergency Action	• 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
Internal Notifications	• IC • LEC • DSTDM	• IC • DDO (if available) • DSTDM
External Notifications	• Not applicable	• Not applicable

APPENDIX A Notification and communication lists

A1 Sunwater regional notification list
A2 Sunwater Brisbane notification list
A3 External notification list
A4 D/S resident notification list
A5 Other D/S resident notification list (outside area — requested messaging)
A6 Other reference contacts
A7 Emergency alert polygon
A8 Dam failure emergency alert request
A9 Dam failure emergency siren

Appendix A1 to Appendix A6 has been redacted

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

Document: S:\BW Asset Delivery\SW-BW Service Delivery\R-WSRW-38-01-05-01 EAP Mapping\Drawings\ArcMap\Emergency Alerts\249580-B.mxd
Printed: Monday, 03/09/2018 03:24:21 PM

21°0'0"S
21°15'0"S
149°15'0"E
149°0'0"E
148°45'0"E

LEGEND
- Major City
- Regional City
- Town
- Dam
- State Roads (DMR)
- Major Watercourses
- Dam Full Supply
- PMPDF Modelling Limits
- PMPDF - Dam Failure (Breach 3)
- Local Authority Boundary
- Emergency Alert Area

CAMPWIN BEACH
SARINA BEACH
GRASSTREE
HALF TIDE
ARMSTRONG BEACH
SLADE POINT
SARINA
MCEWENS BEACH
DOLPHIN HEADS
MACKAY
EIMEO
BUCASIA
BAKERS CREEK
ALLIGATOR CREEK
GLENELLA
SANDY CREEK
BELL CREEK
BAKERS CREEK
FARLEIGH
RELIANCE CREEK
WALKERSTON
PROSPECT CREEK
THREAT DIRECTION
MACKAY REGIONAL
ISAAC REGIONAL
CONSTANT CREEK
ETON
SANDY CREEK (NORTH BRANCH)
MARIAN
BLACK WATERHOLE CREEK
Kinchant Dam
KUTTABUL
PALM TREE CREEK
MC GREGOR CREEK
MIRANI
STOCKYARD CREEK
MACQUARIE CREEK
PIONEER RIVER
DENISON CREEK
CATTLE CREEK

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

SCALE 1:300,000
0 3 6 9 12 15 km

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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

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

KINCHANT DAM
EMERGENCY ACTION PLAN
EMERGENCY ALERT AREA

CONTRACT NUMBER
DRAWING NUMBER 249580 | REV. B
SHEET 1 OF 1
DATE JANUARY 2018

Appendix A8: Dam failure emergency alert request

Queensland emergency alert request guidelines

An Emergency Alert Request form should be completed, if required (see Sections 5 to 9 for actions) and sent to the SDCC Watch Desk to activate the Kinchant Dam Emergency Polygon.

Instructions

- This form is not to be used for Flood UNLESS a flood has triggered an emergency event.
- Print off the following Queensland Emergency Alert Request form.
- Telephone the SDCC Watch Desk on [redacted] and tell them your intention to use the Emergency Alert for a dam hazard for Kinchant Dam.
- A KML Polygon for this dam is stored in the Sunwater area of the Disaster Management Portal in the Emergency Alert area. Ask the SDCC operative to locate the polygon. It will be a KML file called [redacted]
- Give them your phone number, confirm their name, and end the call after advising the form will be sent shortly.
- IC and DSTDM will work together to craft a message relevant to the hazard and discuss with the LDMG, if there is time.
- Fill in the form and send to SDCC watch desk email: [redacted] This form must come from the IC, DSTDM, or member of the Executive.
- Phone back to check the message has been sent and ask for an email to confirm.
- Send an internal Incident Alert to advise of completion.
- This form MUST be sent from a Sunwater email address. If Sunwater email is not functional, they can confirm identification through the Regulator, if required.
- Use the following text to complete the emergency alert request:

Filename:	Voice Message:	SMS:
[redacted]	FLOOD EMERGENCY WARNING from Sun Water. People near Sandy Creek, Mirani and Eton must LEAVE IMMEDIATELY. Kinchant Dam possible failure/is failing. Major flooding is happening now. Your life is at risk. Go now to a safe place away from the flood. Get full warnings and what you should do at Mackay Regional Council disaster dot Mackay dot q l d dot gov dot ay you or call Triple 0 if your life is in danger.	FLOOD EMERGENCY WARNING from Sunwater: People near Sandy Creek, Mirani and Eton must LEAVE IMMEDIATELY. Kinchant Dam possible failure/is failing. Major flooding is happening now. Your life is at risk. Go now to a safe place away from the flood. Get full warnings and what you should do at Mackay Regional Council http://disaster.mackay.qld.gov.au. Call 000 if your life is in danger.

A prefilled Kinchant dam EMERGENCY ALERT REQUEST form is provided in the following pages.

Queensland Government

PHONE THE SDCC WATCH DESK [redacted] – ADVISE EA IS BEING DEVELOPED

EMERGENCY ALERT REQUEST

Location of Alert: Kinchant 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. Fire, 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 Sun Water. People near Sandy Creek, Mirani and Eton must LEAVE IMMEDIATELY. Kinchant Dam possible failure/is failing. Major flooding is happening now. Your life is at risk. Go now to a safe place away from the flood. Get full warnings and what you should do at Mackay Regional Council disaster dot mackay dot q l d dot gov dot ay you or call Triple 0 if your life is in danger.

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 near Sandy Creek, Mirani and Eton must LEAVE IMMEDIATELY. Kinchant Dam possible failure/is failing. Major flooding is happening now. Your life is at risk. Go now to a safe place away from the flood. Get full warnings and what you should do at Mackay Regional Council http://disaster.mackay.qld.gov.au. Call 000 if your life is in danger.

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

DO NOT SEND THIS PAGE

GUIDE TO COMPLETE STEPS 1 – 4	
STEP 1.	EA Polygon Area (e.g. detailed description and location reference to allow positive identification of message area, including street names with cross street, areas of interest such as parks, rivers, dams, coastal areas) it is preferable to attach a map identifying the message area. If a Threat Direction has been requested, please clearly indicate it on the map.
STEP 2.	Tick applicable box and note the file name.
STEP 3.	Voice Message: type or handwritten the required message. As the message will be translated by a text-to-speech process it is important that words are not unintelligible when translated e.g. "qld" used in a web site address must be entered as "q l d", similarly the word "dot" must be entered into a web address instead of a full stop. Voice Message ideally should have no more than 450 characters including spaces. Do not use special characters – refer to EA Manual for details. Warning message must start with "Emergency Emergency"
STEP 4.	SMS Is restricted to a maximum of 160 characters including spaces and punctuation. Either type the message or handwrite the characters into the boxes.

Example: *SMS Flash Flood Warning from SES for Opal Valley-immediate threat to life/property-Warn others-Leave area/prepare NOW or seek higher ground-Listen to local radio*

If using template EA messages, please provide the appropriate variables that are in the template message guides. Refer to the Queensland Emergency Alert Manual for copies of the template message guides.

//RELEVANTAUTHORITY//

//DIRECTIONANDAREA//

//NAME//

//NUMBER//

//TIME//

//TIMEandDAY//

//DIRECTIONandPLACE//

//HOURSMINUTES//

//PLACE//

//PLACEPLACE//

//EXTERNAL/INTERNAL//

//SUBURBS//

//FireIncident//

Appendix A9: Dam failure Emergency siren activation

Emergency siren activation

Notes: The Emergency siren is not to be activated UNLESS; a confirmed dam failure is in progress, the appropriate EAP trigger has been exceeded and the Emergency Alert is being sent out via SDCC and/or an Emergency broadcast by ABC radio.

IC will take the lead to initiate the activation of the Emergency siren but may delegate to on-call DSTDM or FODM depending on the situation; noting that EA and Emergency broadcast are priority. The CEO or Executive Leadership Team member should be made aware if time permits.

Instructions

1. Telephone the [redacted] and tell them your intention to use the dam failure Emergency siren for an emergency event for Kinchant Dam.
2. Email previously sent Emergency Alert Request form to: [redacted]
3. Advise the LDMGs, Media and CEO if time permits.
4. Sound Emergency siren following Technical Instructions below.
5. Create Sunwater Incident report to advise of the completion of the sounding of the siren.

Technical Instructions

The Emergency siren alarm sequence is activated remotely via the SiRcom SMART Alert (*SiSA) software. The SiSA software is accessed either via the client software installed on the local PC located in the Sunwater Operations Centre or 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) navigate to the Citrix Remote Access [redacted]
2) log in using your **Sunwater user credentials** (*you will also be prompted for a security code via Office 365)*
3) go to the **APPS** section
4) select the **Remote Desktop Connection** application and **Open**
5) type the IP address [redacted] into the 'Computer' field and click **Connect**
6) once prompted, enter your **Sunwater user credentials** into the fields in the dialogue box (*if you are prompted with a security prompt, click the **'Yes'** button)*
7) once you are logged into the **Jump-Box** click the **Start Menu** button and type [redacted] again to open a new **Remote Desktop Connection** session
8) type the address [redacted] into the 'Computer' field and click **Connect** (*you may be prompted, enter your **Sunwater user credentials** into the fields in the dialogue box again).*

Once the User has access to the SiSA software, the alarm is activated by following this procedure:

1) Log on to (SiSA) software.
2) Select the Siren/s that require activation using the **SELECT UNITS** button.
3) Once the Siren/s are selected press the **EVACUATE** button.
4) Confirm activation request by selecting the **ACTIVATE** button. Once the alarm is activated the **SiRcom icon** will flash red.
5) Allow the Alarm sequence to run to end. If the Alarm needs to be cancelled before the sequence is completed press the **STOP ACTIVE SCRIPT** button.

APPENDIX B Drawings, maps and emergency control measures

B1 Drawings

B2 Flood impact — downstream

B3 Inundation maps

B4 Locality plan

B5 Catchment area

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

Appendix B1: Drawings

Figure B1: Kinchant Dam general arrangement

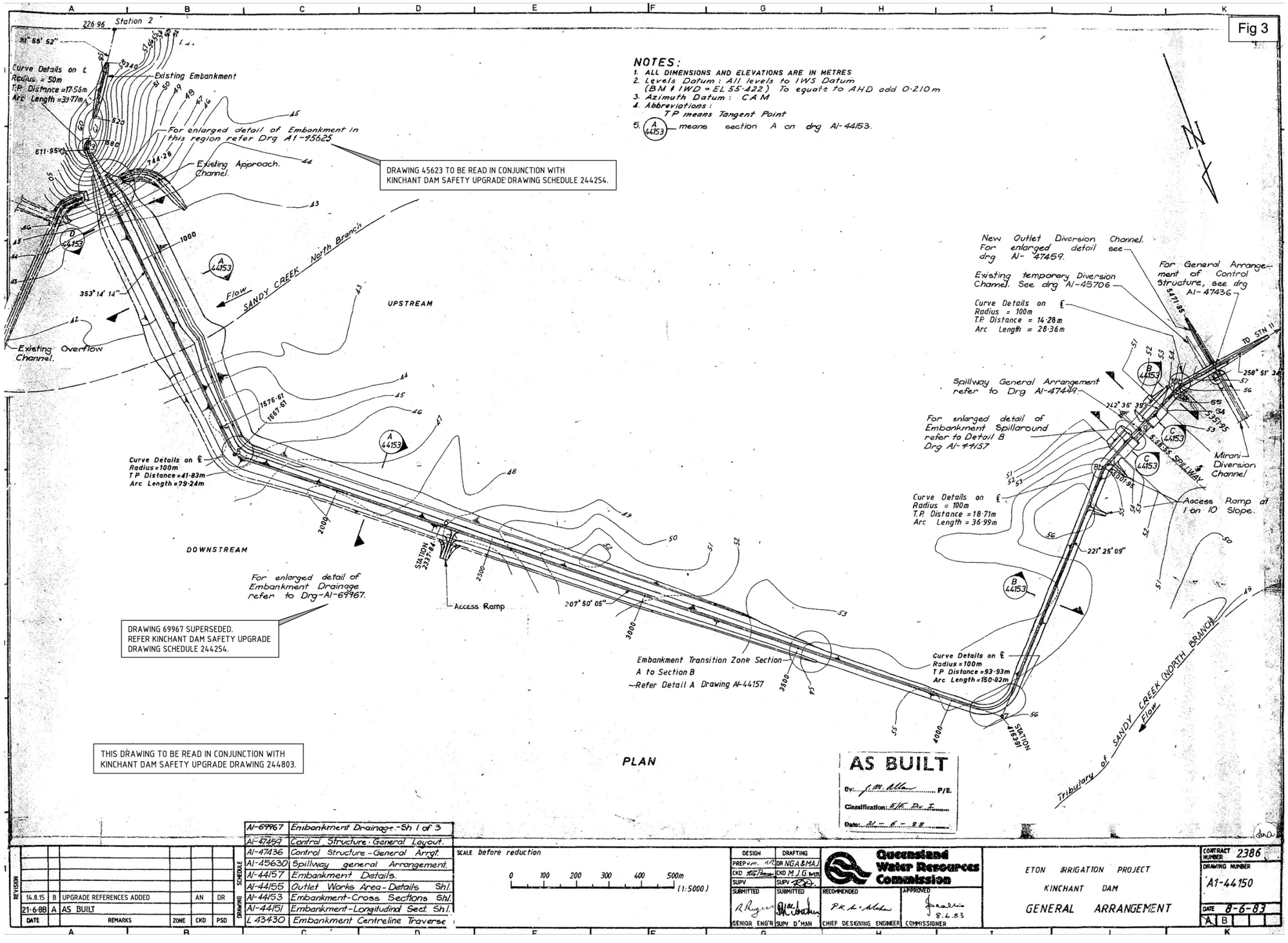


Figure B2: Kinchant Dam instrumentation layout

5

SURVEY CONTROL STATIONS

No	Old No	EASTING	NORTHING	ELEVATION	REMARKS
101	KIN1	697096.469	7652849.487	62.756	PILLAR
102	KIN2	697400.265	7653698.439	43.566	PILLAR
103	KIN3	697366.777	7653096.349	45.378	PILLAR
105	MI15	697116.273	7652843.780	60.313	PM45441

SURFACE SETTLEMENT POINTS

No	AXIS DISTANCE	OFFSET FROM AXIS	EASTING	NORTHING	ELEVATION
~~SS1~~	~~900.03~~	~~3.79 D/S~~	~~697094.533~~	~~7653100.809~~	~~63.071~~
SS2	900.29	25.75 D/S	697116.505	7653100.702	53.276
~~SS3~~	~~100.01~~	~~3.79 D/S~~	~~697097.925~~	~~7653300.760~~	~~63.031~~
SS4	1099.97	25.59 D/S	697119.617	7653300.359	53.070
~~SS5~~	~~1300.01~~	~~3.81 D/S~~	~~697101.133~~	~~7653500.720~~	~~63.046~~
SS6	1299.81	25.62 D/S	697122.928	7653500.162	52.943
~~SS7~~	~~1500.01~~	~~3.81 D/S~~	~~697104.411~~	~~7653700.699~~	~~63.049~~
SS8	1500.02	25.57 D/S	697126.170	7653700.344	53.171
SS9	-	-	697094.281	7653101.329	63.180
SS10	-	-	697097.550	7653300.651	62.940
SS11	-	-	697100.802	7653500.790	62.854
SS12	-	-	697104.409	7653700.769	63.001
SS13	-	-	697109.734	7653101.233	57.451
SS14	-	-	697112.825	7653300.337	57.498
SS15	-	-	697116.123	7653500.568	57.367
SS16	-	-	697119.536	7653700.827	57.332

INTERNAL SETTLEMENT POINTS

No	AXIS DISTANCE	OFFSET FROM AXIS	EASTING	NORTHING	ELEVATION
IS1	1080.00	3.00 D/S	97096.895	653280.979	61.538
IS2	1480.00	3.00 D/S	97102.195	653600.677	61.585

V-NOTCH WEIRS

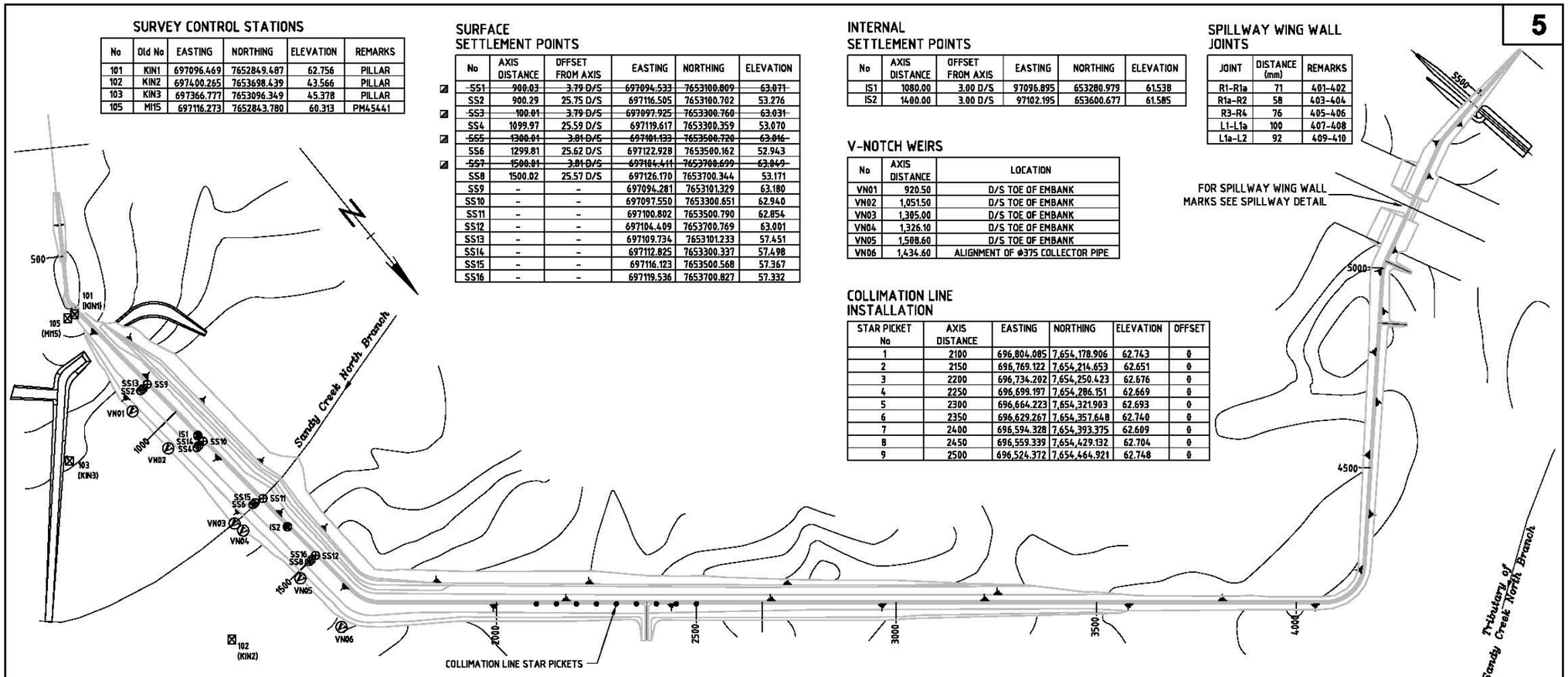
No	AXIS DISTANCE	LOCATION
VN01	920.50	D/S TOE OF EMBANK
VN02	1,051.50	D/S TOE OF EMBANK
VN03	1,305.00	D/S TOE OF EMBANK
VN04	1,326.10	D/S TOE OF EMBANK
VN05	1,508.60	D/S TOE OF EMBANK
VN06	1,434.60	ALIGNMENT OF ø375 COLLECTOR PIPE

COLLIMATION LINE INSTALLATION

STAR PICKET No	AXIS DISTANCE	EASTING	NORTHING	ELEVATION	OFFSET
1	2100	696,804.085	7,654,178.906	62.743	0
2	2150	696,769.122	7,654,214.653	62.651	0
3	2200	696,734.202	7,654,250.423	62.676	0
4	2250	696,699.197	7,654,286.151	62.669	0
5	2300	696,664.223	7,654,321.903	62.693	0
6	2350	696,629.267	7,654,357.648	62.740	0
7	2400	696,594.328	7,654,393.375	62.609	0
8	2450	696,559.339	7,654,429.132	62.704	0
9	2500	696,524.372	7,654,464.921	62.748	0

SPILLWAY WING WALL JOINTS

JOINT	DISTANCE (mm)	REMARKS
R1-R1a	71	401-402
R1a-R2	58	403-404
R3-R4	76	405-406
L1-L1a	100	407-408
L1a-L2	92	409-410



KEY PLAN
SCALE 1:10000

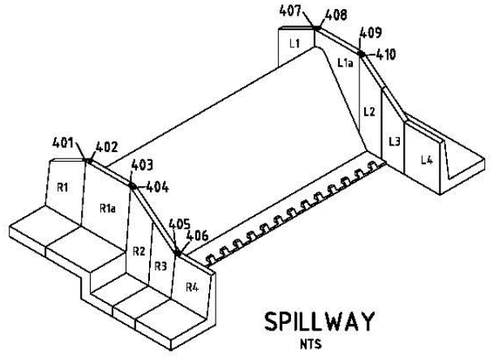
NOTES:

1. LEVELS DATUM : AHD (IWS DATUM +0.21 = AHD). ORIGIN PM45441 EL 60.313m AHD.
2. AZIMUTH DATUM : AMG .
3. COORDINATES AND LEVELS FROM INITIAL SURVEY IN DECEMBER 1986 AGD84 ZONE 55.
4. TOP OF PILLAR AND SETTLEMENT MARKS ARE 0.055m LOWER THAN LEVELS SHOWN IN TABLES.
5. SPILLWAY WING WALL MARKERS INSTALLED NOV 2005
6. FOR DETAILS OF V-NOTCH WEIR VN-01 TO VN-04 INCLUSIVE - REFER TO DRG 244249
7. FOR DETAILS OF V-NOTCH WEIR VN-06 - REFER TO DRG 244250

AS BUILT

LEGEND

- SURFACE SETTLEMENT POINT
- INTERNAL SETTLEMENT POINT
- SURVEY CONTROL STATION
- SPILLWAY WING WALL JOINT
- V-NOTCH WEIR
- COLLIMATION LINE STAR PICKETS
- SURFCE SETTLEMENT POINTS DESTROYED DURING 2014 DAM SAFETY UPGRADE



SPILLWAY
NTS

OTHER DAM SAFETY INSTRUMENTATION DRAWINGS

DRAWING No	TITLE
245547	PIEZOMETERS
245548	OBSERVATION BORES
245549	PRESSURE RELIEF WELLS

DRAWING PRODUCED BY: BULK WATER, ASSET DELIVERY TEL: (07) 3120 0000
SVBW Asset Delivery\SW-Eton WSSW-WKRE-02-01-01 Kinchant Dam Deformation Survey 2016\Drawings\AutoCAD\102269-1.dwg 04 Oct 2016 12:39 PM

REVISION				
19.09.14	F	SHEET 2 AND DATA ADDITION	IDH	K.E
21.05.10	E	DATA ADDITION		
23.11.09	D	V-NOTCH WEIR SYMBOLS UPDATED		DL
28.08.18	J	SS13 TO SS16 ADDED	MR	K. EHM
14.12.15	H	DATA BOOK INFORMATION ADDED (NOTES 6 & 7)	MC	K.E
DEC 2014	G	DATA REV. PIEZOS TO 245547. OBSERV BORES TO 245548	MC	K.E
DATE		REMARKS	CKD	PASSED

REFERENCE DRAWINGS		
A3-223728	PIEZOMETER & COLLIMATION SPV MARKS	
AI-69980	PRESSURE RELIEF WELLS PLAN	
AI-69975	INTERNAL SETTLEMENT INSTALLATION DETAILS	
AI-69957	EMBANKMENT INSTRUMENTATION	
AI-69956	BORE HOLE LOCATIONS	
AI-49308	1982 DRY SEASON CONSTR EMBANKMENT INSTRUMENT	
A3-45687	PIEZOMETER & COLLIMATIONMARKS	

SCALES (A3 SIZE)
0 100 200 300 400 500 METRES
1:10000

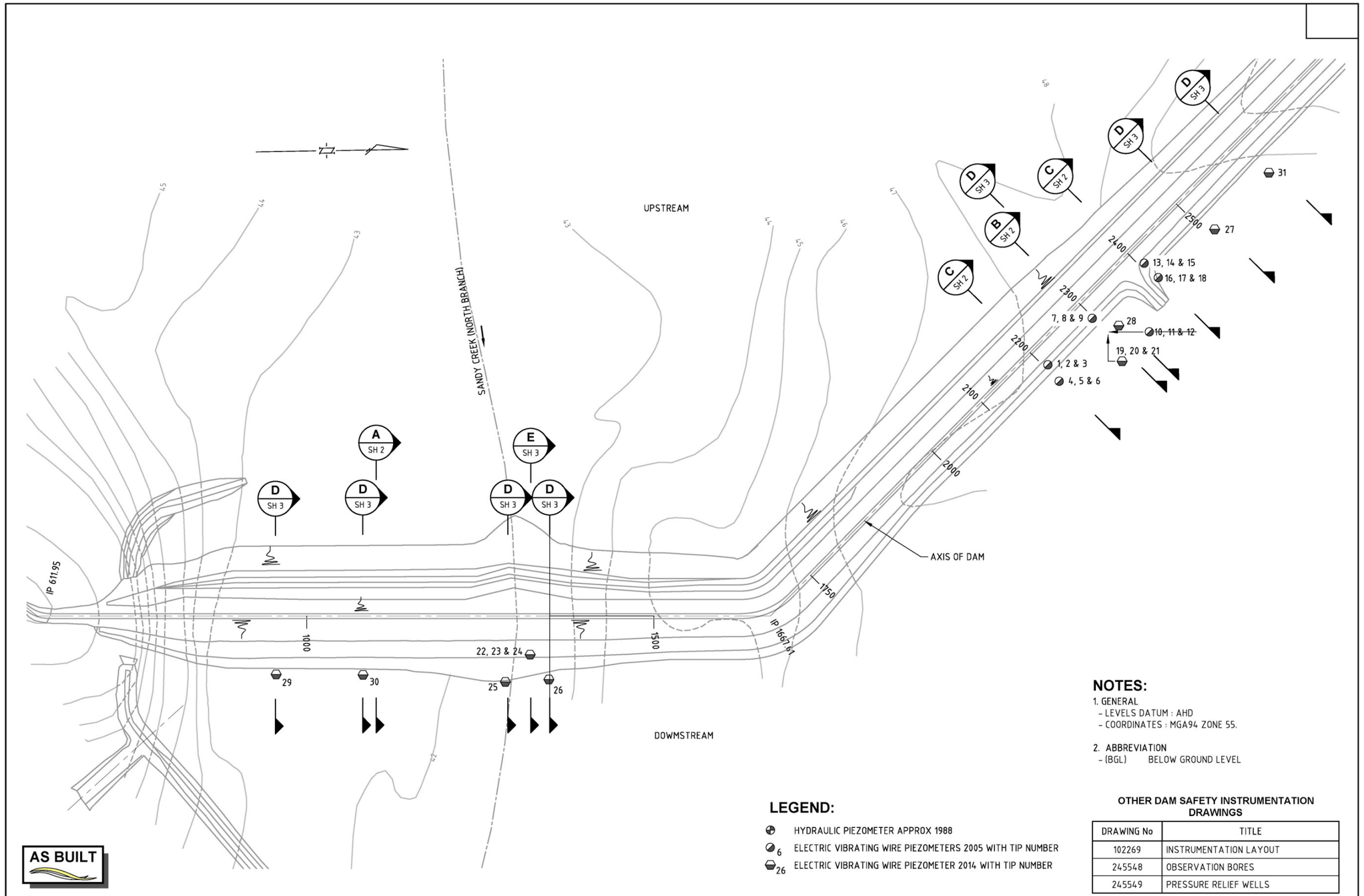
DRAWN BY	DESIGNED
CHECKED DNH	CHECKED
APPROVED K. EHM 23-08-10	RPEQ 2930

SunWater
©SUNWATER LIMITED ACN 131 034 985

KINCHANT DAM (SANDY CK NTH BCH 9.4km)
INSTRUMENTATION LAYOUT
SURFACE SETTLEMENT, INTERNAL SETTLEMENT, SPILLWAY WINGWALL JOINTS AND NOTCH WEIR

CONTRACT NUMBER
DRAWING NUMBER **102269**
DATE AUG 2014
F G H I E

Figure B3: Kinchant Dam instrumentation — piezometers



NOTES:

1. GENERAL
   - LEVELS DATUM : AHD
   - COORDINATES : MGA94 ZONE 55.
2. ABBREVIATION
   - (BGL) BELOW GROUND LEVEL

LEGEND:

- HYDRAULIC PIEZOMETER APPROX 1988
- 6 ELECTRIC VIBRATING WIRE PIEZOMETERS 2005 WITH TIP NUMBER
- 26 ELECTRIC VIBRATING WIRE PIEZOMETER 2014 WITH TIP NUMBER

OTHER DAM SAFETY INSTRUMENTATION DRAWINGS

DRAWING No	TITLE
102269	INSTRUMENTATION LAYOUT
245548	OBSERVATION BORES
245549	PRESSURE RELIEF WELLS

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13 Oct 2015 3:54 PM

Drawing Produced By:
SUNWATER LIMITED
ABN 49 078 848 375
BRISBANE QLD 4000
TEL: (07) 3120 0000

REVISION					
13/10/15	2	DATA BOOK INFORMATION ADDED	MC	K. EHM	
12/06/15	1	NOTES ADDED SHEET 2	MC	K. EHM	
DEC 2014	0	AS BUILT	MC	K. EHM	
DATE		REMARKS	CKD	PASSED	

REFERENCE DRAWINGS	
239849	EMBANKMENT FOUNDATION INTRUSIVE GEOTECHNICAL
244828	VIBRATING WIRE PIEZOMETERS INSTALLATION
243891	2012 TO 2014 DRILLING PROGRAM

SCALES (A3 SIZE)
0 50 100 150 200 250 METRES
1:5000

DRAWN LMD	DESIGNED
CHECKED MC	CHECKED
APPROVED K. EHM 20/03/15	RPEQ 2930

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ACN 131 034 985

KINCHANT DAM (SANDY CK NTH BCH 9.4km)
INSTRUMENTATION
PIEZOMETERS

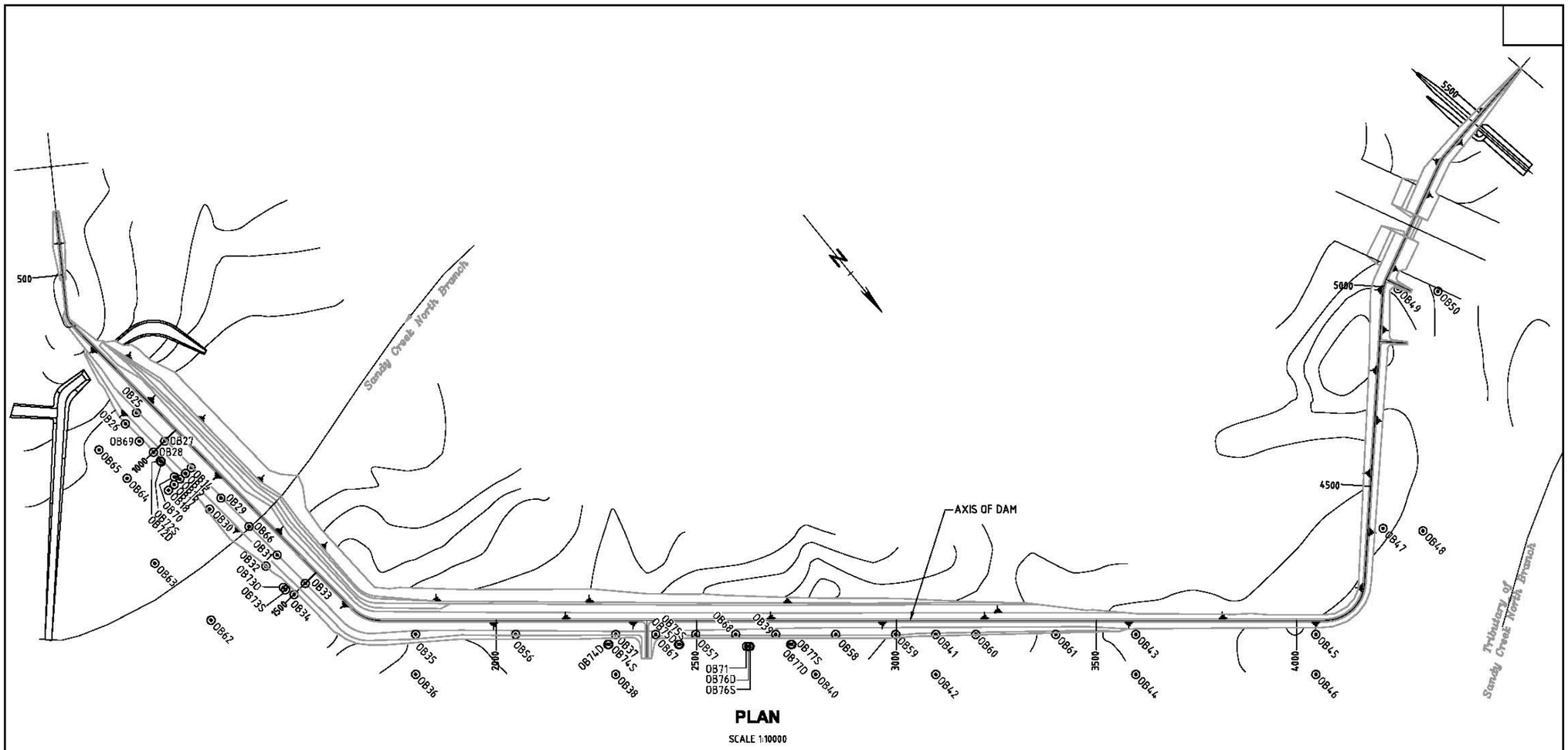
CONTRACT NUMBER

DRAWING NUMBER
245547
SHEET 1 OF 3

DATE DEC 2014

0 / 2

Figure B4: Kinchant Dam instrumentation — observation bores



PLAN

SCALE 1:10000

NOTES:

1. LEVELS DATUM : AHD (IWS DATUM +0.21 = AHD) .
2. AZIMUTH DATUM : AMG .
3. COORDINATES AND LEVELS FROM INITIAL SURVEY IN DECEMBER 1986
4. AXIS DISTANCE AND OFFSET DISTANCE IS IN METRES

LEGEND

⊙ OBSERVATION BORE

OTHER DAM SAFETY INSTRUMENTATION DRAWINGS

DRAWING No	TITLE
102269	INSTRUMENTATION LAYOUT
245547	PIEZOMETERS
245549	PRESSURE RELIEF WELLS

AS BUILT

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DRAWING PRODUCED BY:
SUNWATER LIMITED
179 Turbot St.
BRISBANE QLD 4000
TEL: (07) 3120 0000

REVISION					
DATE		REMARKS	CKD	PASSED	
DEC 2014	D	AS BUILT	MC	K. EHM	

REFERENCE DRAWINGS	
A3-22378	PIEZOMETER & COLLIMATION SPY MARKS
AI-69980	PRESSURE RELIEF WELLS PLAN
AI-69975	INTERNAL SETTLEMENT INSTALLATION DETAILS
AI-69957	EMBANKMENT INSTRUMENTATION
AI-69956	BORE HOLE LOCATIONS
AI-49308	1982 DRY SEASON CONSTR EMBANKMENT INSTRUMENT
A3-45697	PIEZOMETER & COLLIMATIONMARKS

SCALES (A3 SIZE)

0 100 200 300 400 500 METRES
1:10000

DRAWN LMD	DESIGNED
CHECKED MC	CHECKED
APPROVED K. EHM 20-03-15 RPEQ 2930	

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ACN 131 034 985

KINCHANT DAM (SANDY CK NTH BCH 9.4km)
OBSERVATION BORES

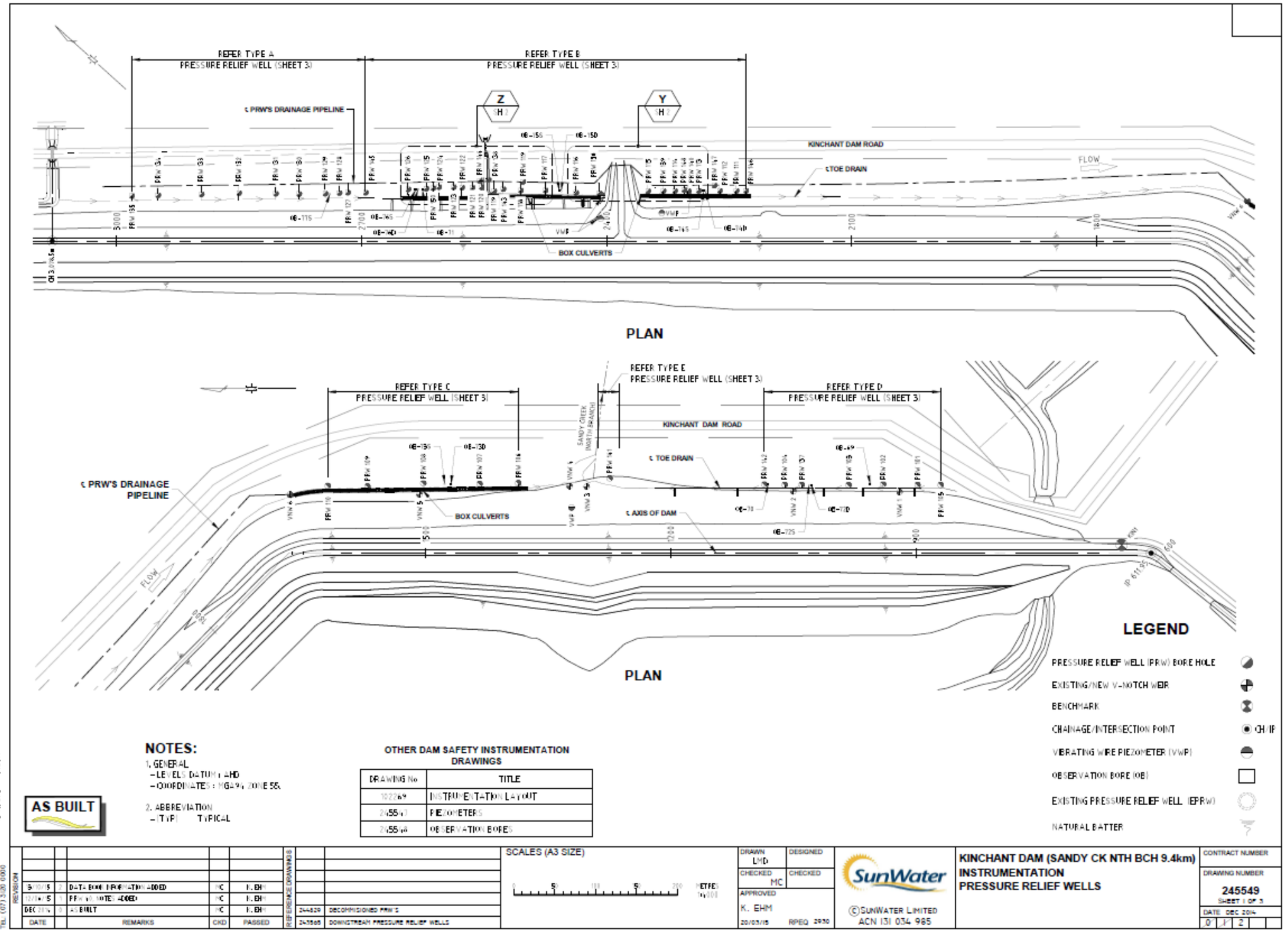
CONTRACT NUMBER

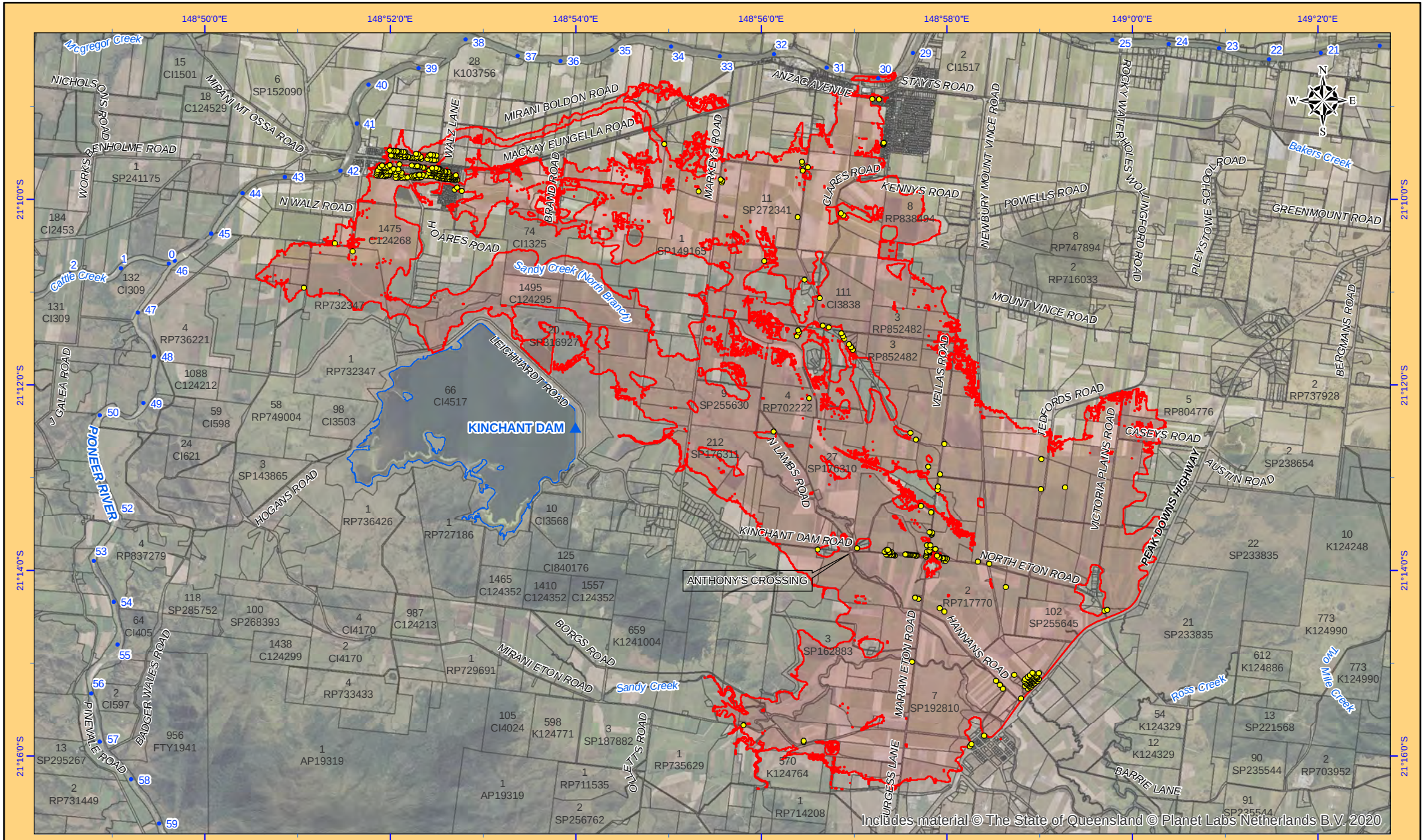
DRAWING NUMBER
245548
SHEET 1 OF 2

DATE DEC 2014

0

Figure B5: Kinchant Dam instrumentation — pressure relief wells





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While every care is taken to ensure the accuracy of this product, SunWater makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose.

MAP INFORMATION

Coordinate System: Geocentric Datum of Australia (GDA2020).

SCALE (A4 SIZE)

0 1,000 2,000 3,000 4,000 5,000 m 1:100,001

LEGEND

- AMTD (Markers)
- PAR - No Dam Failure
- Kinchant Dam FSL
- Limit of Downstream Notification Area

KINCHANT 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. 250716 E

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Appendix B3: Inundation maps

Drawings:

- Keymap
- SDF_N Embankment (1-6)
- SDF_SE Embankment (1-6)
- PMF_N Embankment (1-6)
- PMF_SE Embankment (1-6)

Disclaimer: Every effort has been made to ensure the currency of the flood inundation maps reproduced in this EAP. However, as the maps have been extracted from external sources, their accuracy cannot be guaranteed.

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680000 700000 720000 740000

7660000

7640000

KUTTABUL
BUCASIA
EIMEO
DOLPHIN HEADS
SLADE POINT
FARLEIGH
GLENELLA
MACKAY
PINNACLE
MIRANI
MARIAN
WALKERSTON
ETON
OAKDALE
BAKERS CREEK
MCEWENS BEACH
HALF TIDE
GRASSTREE
CAMPWIN BEACH
SARINA BEACH
SARINA
ARMSTRONG BEACH

MIRANI - MT OSSA ROAD
MARIAN - HAMPDEN ROAD
MARAJU - YAKAPARI ROAD
MACKAY - HABANA ROAD
EIMEO ROAD
MACKAY - BUCASIA ROAD
MACKAY - SLADE POINT ROAD
MACKAY - EUNGELLA ROAD
PIONEER RIVER
Marian Weir
Dumbleton Weir
Mirani Weir
MARIAN - ETON ROAD
GARGETT - MIA MIA ROAD
KINCHANT DAM
MIRANI - ETON ROAD
HOMEBUSH ROAD
BLACKS CREEK
HAY POINT ROAD
SARINA - HOMEBUSH ROAD
BRUCE HIGHWAY
SARINA - COAST ROAD
PLANE CREEK
BLUE MOUNTAIN ROAD
PEAK DOWNS HIGHWAY
DENISON CREEK

SHEET 1 OF 6
SHEET 2 OF 6
SHEET 3 OF 6
SHEET 4 OF 6
SHEET 5 OF 6
SHEET 6 OF 6

MACKAY REGIONAL COUNCIL
ISAAC REGIONAL COUNCIL

N W E S

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

Sunwater Storages
- Dam
- Weir
- Dam Reservoir

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

DRAWING REFERENCE
256959, 256960 and 256961 - Sunny Day Failure
256962, 256963 and 256964 - Probable Maximum Flood

SCALES (A3 SIZE)
0 2 4 6 8 10 km 1:200,000

REVISION					
13/12/22	A	ISSUED FOR USE	LH	MGH	
DATE		REMARKS	CKD	PSD	

DRAWN IDH | DESIGNED
CHECKED | CHECKED LH
APPROVED M.G. HUGHES 13/12/2022 RPEQ: 18351

sunwater

KINCHANT DAM
DAM BREAK ANALYSIS 2022
INUNDATION PLANS
KEYMAP

CONTRACT NUMBER
DRAWING NUMBER 256958 | REV. A
SHEET 1 OF 1
DATE DECEMBER 2022

MAP PRODUCED BY:
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TEL: (07) 3120 0000

690,000 695,000 700,000

7,660,000

7,655,000

VENTONS ROAD
DEVEREUX CREEK ROAD
DOYLES ROAD
MCINTOSHS ROAD
OLD HAMPDEN ROAD
VICKERS ROAD
MARIAN HAMPDEN ROAD
NEWMANS ROAD
PIONEER RIVER
MARIAN WEIR
MARIAN
ANZAC AVENUE
POULSENS DRIVE
HOFFMANS DRIVE
KENNYS ROAD
CLARES ROAD
PEACHS ROAD
MILLARDS ROAD
Silver Creek
NICHOLSONS ROAD
BIRKETTS ROAD
MIRANI MT OSSA ROAD
MOUNT MARTIN LOOP ROAD
MCGREGOR CREEK ROAD
Mcgregor Creek
SWANS ROAD
MIRANI BOLDON ROAD
WALZ LANE
R MCCLURES ROAD
M MCCLURES ROAD
Benholme
WORKS BENHOLME ROAD
ALICE STREET
MIRANI
MACKAY EUNGELLA ROAD
MARY STREET
BRAND ROAD
N WALZ ROAD
NICHOLSONS CROSSING ROAD
HOARES ROAD
MARKEYS ROAD
Cattle Creek
MIRANI WEIR
Sandy Creek (North Branch)
R WATTS ROAD
NIGHTS ROAD
LUSCOMBE HEADS ROAD
GALEA ROAD
MIRANI ETON ROAD
MARGE CAMERONS ROAD
LEICHHARDT ROAD
PLATHS ROAD
KINCHANT DAM
N LAMBS ROAD
MARIAN ETON ROAD
HOGANS ROAD
Mia Mia
MA MA CONNECTION ROAD
JACKSONS ROAD
KINCHANT DAM ROAD

0 1 2 3 4 5 38 37 36 35 34 33 32 31 29 30 39 40 41 42 43 44 45 0 46 47 48 49 50 51 52

LEGEND

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

Flood Modelling

- PAR - Dam Failure
- Model Limits
- Sunny Day Failure

Sunwater Storages

- Dam
- Weir
- Kinchant Dam FSL

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

REVISION					
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DATE		REMARKS	CKD	PSD	

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

REFERENCE DRAWINGS
256958 - Keymap

SCALES (A3 SIZE)
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1:50,000

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	LH
APPROVED	
M.G. HUGHES 13/12/2022	RPEQ: 18351

sunwater

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

CONTRACT NUMBER

DRAWING NUMBER	REV.
256960	A

SHEET 1 OF 6

DATE DECEMBER 2022

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Water Resources and Dam Safety
Tel.: (07) 3120 0000

690,000 695,000 700,000

7,650,000 7,645,000 7,640,000

KINCHANT DAM ROAD
North Eton
Sandy Creek (North Branch)
JONES ROAD
HILLS ROAD
MARIAN ETON ROAD
MUSCATS ROAD
BURGESS LANE
ELVINS ROAD
PEAK DOWNS HIGHWAY
Stony Creek
BORGS ROAD
MIRANI ETON ROAD
Sandy Creek
OLLETTS ROAD
GARGETT MIA MIA ROAD
BADGER WALES ROAD
Bustard Creek
WELSHS ROAD
PINEVALE ROAD
PIONEER RIVER
Pioneer River
Blacks Creek
Stockyard Creek
Black Waterhole Creek
BLACKS CREEK
53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69

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

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

Sunwater Storages
- Dam
- Weir
- Kinchant Dam FSL

REVISION					
13/12/22	A	ISSUED FOR USE	LH	MGH	
DATE		REMARKS	CKD	PSD	

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

REFERENCE DRAWINGS
256958 - Keymap

SCALES (A3 SIZE)
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1:50,000

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	LH
APPROVED	
M.G. HUGHES 13/12/2022	RPEQ: 18351

sunwater

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

CONTRACT NUMBER

DRAWING NUMBER	REV.
256960	A

SHEET 2 OF 6

DATE DECEMBER 2022

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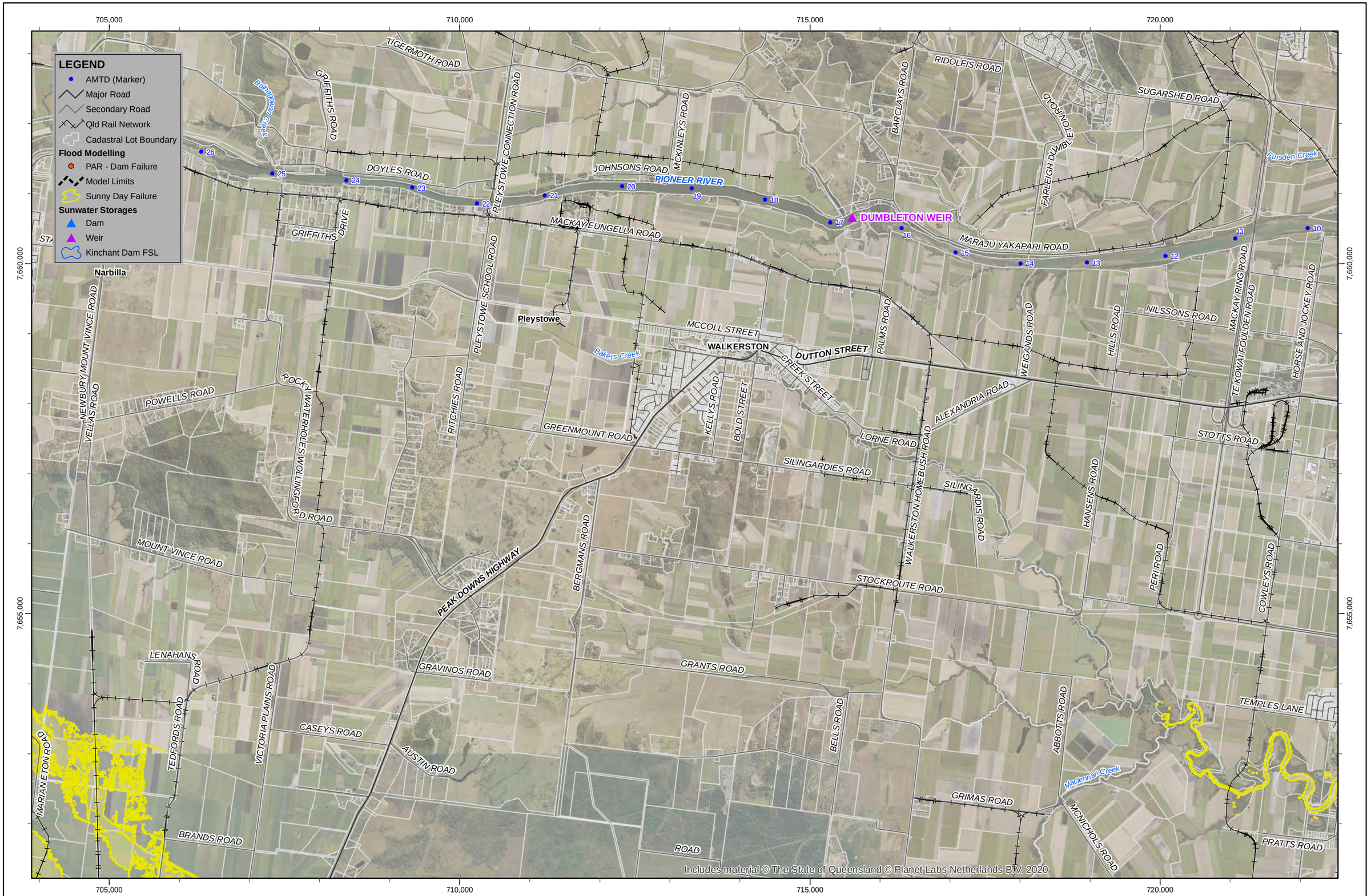
MAP PRODUCED BY:
WATER RESOURCES AND DAM SAFETY
TEL: (07) 3120 0000



REVISION					
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DATE		REMARKS	CKD	PSD

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

REFERENCE DRAWINGS
256958 - Keymap

SCALES (A3 SIZE)
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1:50,000

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	LH

APPROVED
M.G. HUGHES
13/12/2022
RPEQ: 18351

sunwater

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

CONTRACT NUMBER

DRAWING NUMBER	REV.
256960	A

SHEET 3 OF 6
DATE DECEMBER 2022

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

705,000 710,000 715,000 720,000

7,650,000 7,645,000 7,640,000

NORTH ETON ROAD
PEAKDOWNS HIGHWAY
HANNANS ROAD
QUATTROMANS ROAD
Ross Creek
Two Mile Creek
ROAD
BENTLEYS ROAD
CLAUSENS ROAD
WALKERSTON HOMEBUSH ROAD
Maclennan Creek
HOMEBUSH ROAD
PETERSENS ROAD
BRIEFFIES ROAD
CHELONA SANDIFORD ROAD
BRUCE HIGHWAY
ETON
Sandy Creek
BARRIE LANE
ETON HOMEBUSH ROAD
Homebush
PALM TREE ROAD
OSHEAS ROAD
Stony Creek
Oakenden
SARINA HOMEBUSH ROAD
MASOTTIS ROAD
COUSENS AND BRANDS ROAD
IWERS ROAD
CAMPBELLS RIDGE ROAD
OAKENDEN SCHOOL ROAD
STANFORDS ROAD
TURNERS ROAD
THOMAS ROAD
BALBERRA ROAD
Rock Creek
Frenchmans Creek
Balberra
OAKENDEN SARINA ROAD
OAKENDEN ROAD
Arthur Creek
GRAHAM ROAD
VAGGS ROAD
B L Creek
AARWOOD SUNNYSIDE ROAD
MEZZENS ROAD
Oakenden Creek

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

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

Sunwater Storages
- Dam
- Weir
- Kinchant Dam FSL

REVISION					
13/12/22	A	ISSUED FOR USE	LH	MGH	
DATE		REMARKS	CKD	PSD	

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

REFERENCE DRAWINGS
256958 - Keymap

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

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	LH
APPROVED	
M.G. HUGHES 13/12/2022	RPEQ: 18351

sunwater

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

CONTRACT NUMBER

DRAWING NUMBER 256960 | REV. A

SHEET 4 OF 6

DATE DECEMBER 2022

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

REVISION					
13/12/22	A	ISSUED FOR USE	LH	MGH	
DATE		REMARKS	CKD	PSD	

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

REFERENCE DRAWINGS
256958 - Keymap

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

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	LH

APPROVED
M.G. HUGHES
13/12/2022
RPEQ: 18351

sunwater

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

CONTRACT NUMBER	
DRAWING NUMBER	REV.
256960	A
SHEET 5 OF 6	
DATE DECEMBER 2022	

Document: S:\BW_WaterResources\GIS_Data\SW_Eton WSS\KinchantDam_CRA2022\Drawings\ArcMap\256960-A.mxd
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Map Produced By:
Water Resources and Dam Safety
Tel: (07) 3120 0000

725,000 730,000 735,000 740,000

7,645,000

7,640,000

FENNERS ROAD
MCEWENS BEACH
DUNNROCK ROAD
Dunnrock
Sandy Creek
Louisa Creek
Hay Point
EDMUNDS AVENUE
BALLY KEEL ROAD
LOUISA CREEK ROAD
SHAMROCK ROAD
MUNBURA ROAD
WENTZELS ROAD
BRUCE HIGHWAY
DIGGINGS ROAD
HAY POINT ROAD
BENSON ROAD
COLESHILL DRIVE
FENECH AVENUE
Bay Point
HALF TIDE
PACIFIC DRIVE
Salonika Beach
TENNIS COURT ROAD
Alligator Creek
Bell Creek
Alligator Creek
HACKETTS ROAD
BORGS ROAD
GRASSTREE ROAD
BOYDS ROAD
Splitters Creek
EVERSLEIGH ROAD
Clifton Vale
GARRETT ROAD
Cabbage Tree Creek
Munburra

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

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

Sunwater Storages
- Dam
- Weir
- Kinchant Dam FSL

REVISION					
13/12/22	A	ISSUED FOR USE	LH	MGH	
DATE		REMARKS	CKD	PSD	

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

REFERENCE DRAWINGS
256958 - Keymap

N W E S

SCALES (A3 SIZE)
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IDH	
CHECKED	CHECKED
	LH
APPROVED	
M.G. HUGHES	
13/12/2022	RPEQ: 18351

sunwater

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

CONTRACT NUMBER

DRAWING NUMBER	REV.
256960	A

SHEET 6 OF 6

DATE DECEMBER 2022

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

690,000 695,000 700,000

7,660,000 7,655,000

VENTONS ROAD
DEVEREUX CREEK ROAD
DOYLES ROAD
MCINTOSHS ROAD
OLD HAMPDEN ROAD
VICKERS ROAD
MARIANI HAMPDEN ROAD
NEWMANS ROAD
Mcgregor Creek
PIONEER RIVER
MARIAN WEIR
MARIAN
ANZAC AVENUE
POULSEN DRIVE
HOFFMAN DRIVE
KENNYS ROAD
PEACHS ROAD
MIRANI BOLDON ROAD
SWANS ROAD
WALZ LANE
MOUNT MARTIN LOOP ROAD
MCGREGOR CREEK ROAD
MIRANI MT OSSA ROAD
R MCCLURES ROAD
M MCCLURES ROAD
MILLARDS ROAD
Silver Creek
NICHOLSONS ROAD
BIRKETTS ROAD
Benholme
WORKS BENHOLME ROAD
MIRANI
ALICE STREET
MACKAY EUNGELLA ROAD
MARY STREET
BRAND ROAD
CLARES ROAD
N WALZ ROAD
NICHOLSONS CROSSING ROAD
HOARES ROAD
MARKEYS ROAD
Cattle Creek
MIRANI WEIR
Sandy Creek (North Branch)
R WATTS ROAD
NIGHTS ROAD
HEADS ROAD
LUSCOMBE HEADS ROAD
GALEA ROAD
MIRANI ETON ROAD
LEICHHARDT ROAD
MARGE CAMERONS ROAD
PLATHS ROAD
ALLANZ ROAD
MARIANI ETON ROAD
N LAMBS ROAD
KINCHANT DAM
HOGANS ROAD
Mia Mia
MA MIA CONNECTION ROAD
JACKSONS ROAD
KINCHANT DAM ROAD

0 1 2 3 4 5 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52

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

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

Sunwater Storages
- Dam
- Weir
- Kinchant Dam FSL

REVISION					
13/12/22	A	ISSUED FOR USE	LH	MGH	
DATE		REMARKS	CKD	PSD	

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

REFERENCE DRAWINGS
256958 - Keymap

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

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	LH
APPROVED	
M.G. HUGHES 13/12/2022	
RPEQ: 18351	

sunwater

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

CONTRACT NUMBER	
DRAWING NUMBER	REV.
256961	A
SHEET 1 OF 6	
DATE DECEMBER 2022	

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

690,000 695,000 700,000

7,650,000 7,645,000 7,640,000

KINCHANT DAM ROAD
North Eton
Sandy Creek (North Branch)
JONES ROAD
HILLS ROAD
MARIAN ETON ROAD
MUSCATS ROAD
BURGESS LANE
ELVINS ROAD
PEAK DOWNS HIGHWAY
Stony Creek
BORGS ROAD
MIRANI ETON ROAD
Sandy Creek
OLLETTS ROAD
GARGETT MIA MIA ROAD
BADGER WALES ROAD
Bustard Creek
WELSHS ROAD
PINEVALE ROAD
PIONEER RIVER
Pioneer River
Blacks Creek
Stockyard Creek
Black Waterhole Creek
BLACKS CREEK
53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69

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

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

Sunwater Storages
- Dam
- Weir
- Kinchant Dam FSL

REVISION					
13/12/22	A	ISSUED FOR USE	LH	MGH	
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
IDH	
CHECKED	CHECKED
	LH
APPROVED	
M.G. HUGHES 13/12/2022	RPEQ: 18351

sunwater

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

CONTRACT NUMBER

DRAWING NUMBER	REV.
256961	A

SHEET 2 OF 6

DATE DECEMBER 2022

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LEGEND
AMTD (Marker)
Major Road
Secondary Road
Qld Rail Network
Cadastral Lot Boundary
Flood Modelling
PAR - Dam Failure
Model Limits
Sunny Day Failure
Sunwater Storages
Dam
Weir
Kinchant Dam FSL
705,000
710,000
715,000
720,000
7,660,000
7,655,000
PIONEER RIVER
DUMBLETON WEIR
Narbilla
Pleystowe
WALKERSTON
TIGERMOTH ROAD
RIDOLFIS ROAD
SUGARSHED ROAD
GRIFFITHS ROAD
PLEYSTOWE CONNECTION ROAD
MCKINLEYS ROAD
BARCLAYS ROAD
FARLEIGH DUMBLETON ROAD
DOYLES ROAD
JOHNSONS ROAD
GRIFFITHS DRIVE
MACKAY EUNGELLA ROAD
MARAJU YAKAPARI ROAD
PLEYSTOWE SCHOOL ROAD
MCCOLL STREET
DUTTON STREET
CREEK STREET
PALMS ROAD
WEIGANDS ROAD
HILLS ROAD
NILSSONS ROAD
MACKAY RING ROAD
TE KOWAI FOULDEN ROAD
HORSE AND JOCKEY ROAD
NEWBURY MOUNT VINCE ROAD
VELLAS ROAD
POWELLS ROAD
ROCKY WATERHOLES WOLLINGFORD ROAD
RITCHIES ROAD
GREENMOUNT ROAD
KELLYS ROAD
BOLD STREET
LORNE ROAD
ALEXANDRIA ROAD
STOTTS ROAD
SILINGARDIES ROAD
WALKERSTON HOMEBUSH ROAD
HANSENS ROAD
MOUNT VINCE ROAD
PEAK DOWNS HIGHWAY
BERGMANS ROAD
STOCKROUTE ROAD
PERI ROAD
COWLEYS ROAD
LENAHANS ROAD
GRAVINOS ROAD
GRANTS ROAD
TEMPLES LANE
ABBOTTS ROAD
TEDFORDS ROAD
VICTORIA PLAINS ROAD
CASEYS ROAD
AUSTIN ROAD
BELLS ROAD
MARIAN ETON ROAD
GRIMAS ROAD
MCNICHOLS ROAD
PRATTS ROAD
BRANDS ROAD
ROAD
Bakers Creek
Fursden Creek
Maclennan Creek
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DATE		REMARKS	CKD	PSD
13/12/22	A	ISSUED FOR USE	LH	MGH

REVISION

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

REFERENCE DRAWINGS
256958 - Keymap

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

DRAWN: IDH
DESIGNED:
CHECKED:
CHECKED: LH
APPROVED: M.G. HUGHES 13/12/2022 RPEQ: 18351

sunwater
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KINCHANT DAM
DAM BREAK ANALYSIS 2022
SUNNY DAY FAILURE
(SE EMBANKMENT FAILURE)
INUNDATION PLAN

CONTRACT NUMBER:
DRAWING NUMBER: 256961
REV.: A
SHEET 3 OF 6
DATE: DECEMBER 2022

Map produced by:
Water Resources and Dam Safety
Tel: (07) 3120 0000

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

705,000 710,000 715,000 720,000

7,650,000 7,645,000 7,640,000

NORTH ETON ROAD
PEAK DOWNS HIGHWAY
HANNANS ROAD
QUATTROMANIS ROAD
ROAD
Two Mile Creek
Ross Creek
BENTLEYS ROAD
CLAUSENS ROAD
WALKERSTON HOMEBUSH ROAD
Maclennan Creek
HOMEBUSH ROAD
PETERSENS ROAD
BRIEFFIES ROAD
CHELONA SANDIFORD ROAD
BRUCE HIGHWAY
ETON
Sandy Creek
BARRIE LANE
ETON HOMEBUSH ROAD
Homebush
PALMTREE ROAD
OSHEAS ROAD
Stony Creek
SARINA HOMEBUSH ROAD
MASOTTIS ROAD
COUSENS AND BRANDS ROAD
IWERS ROAD
CAMPBELLS RIDGE ROAD
Oakenden
OAKENDEN SCHOOL ROAD
STANFORDS ROAD
TURNERS ROAD
THOMAS ROAD
BALBERRA ROAD
Rock Creek
Frenchmans Creek
Balberra
OAKENDEN SARINA ROAD
OAKENDEN ROAD
Arthur Creek
GRAHAM ROAD
VAGGS ROAD
B L Creek
MARWOOD SUNNY SIDE ROAD
MEZZENS ROAD
Oaky Creek

LEGEND

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

Flood Modelling

- PAR - Dam Failure
- Model Limits
- Sunny Day Failure

Sunwater Storages

- Dam
- Weir
- Kinchant Dam FSL

REVISION					
13/12/22	A	ISSUED FOR USE	LH	MGH	
DATE		REMARKS	CKD	PSD	

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

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SCALES (A3 SIZE)
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CHECKED	CHECKED
	LH
APPROVED	
M.G. HUGHES 13/12/2022	
RPEQ: 18351	

sunwater

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

CONTRACT NUMBER
DRAWING NUMBER 256961
REV. A
SHEET 4 OF 6
DATE DECEMBER 2022

Document: S:\BW_WaterResources\GIS_Data\SW_Eton WSS\KinchantDam_CRA2022\Drawings\ArcMap\256961-A.mxd
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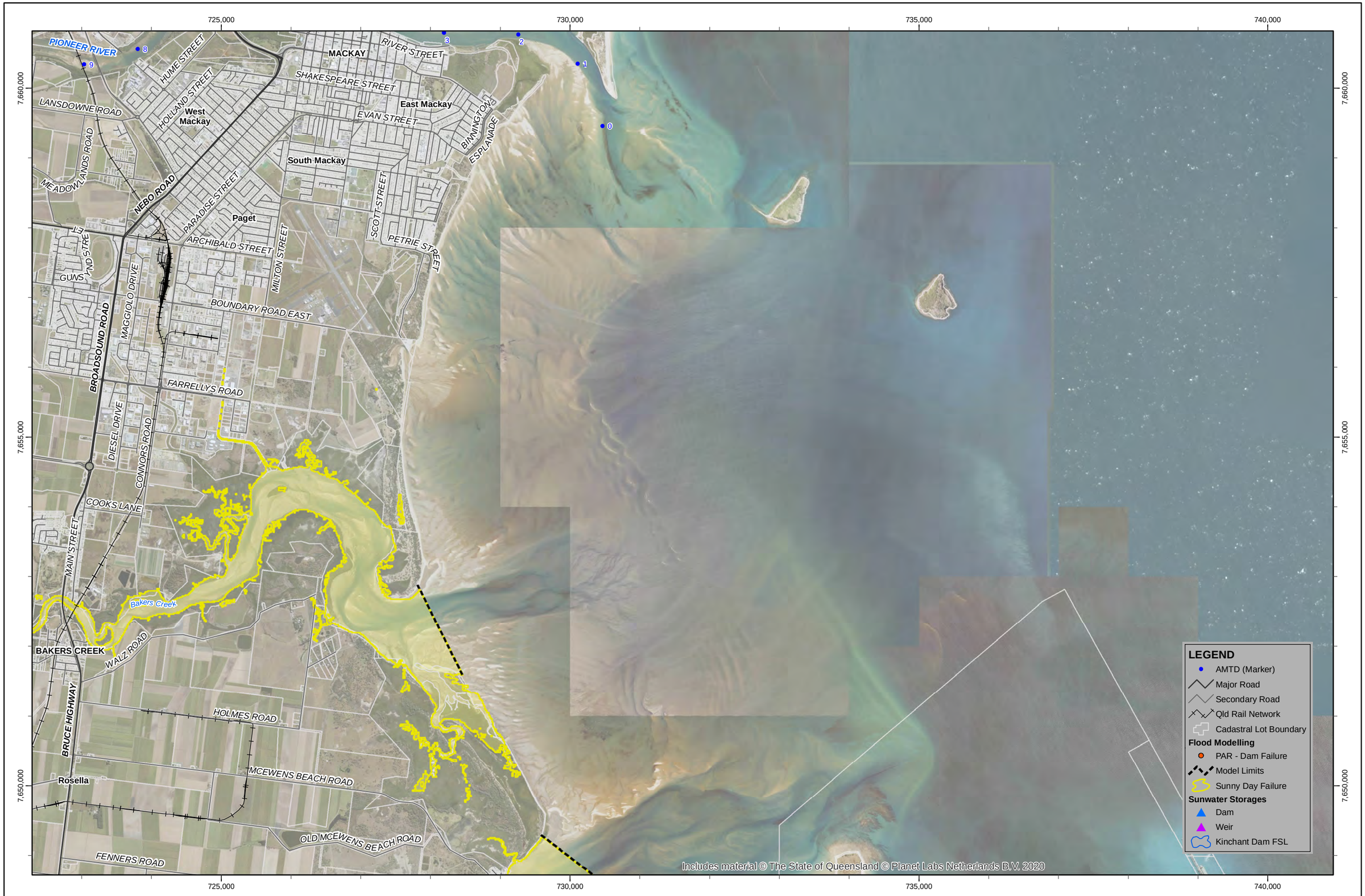
Map Produced By:
Water Resources and Dam Safety
Tel: (07) 3120 0000



REVISION					
DATE		REMARKS	CKD	PSD	
13/12/22	A	ISSUED FOR USE	LH	MGH	

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

REFERENCE DRAWINGS
256958 - Keymap

SCALES (A3 SIZE)
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1:50,000

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CHECKED	CHECKED
	LH

APPROVED
M.G. HUGHES
13/12/2022
RPEQ: 18351

sunwater

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

CONTRACT NUMBER

DRAWING NUMBER	REV.
256961	A

SHEET 5 OF 6
DATE DECEMBER 2022

Document: S:\BW_WaterResources\GIS_Data\SW_Eton WSS\KinchantDam_CRA2022\Drawings\ArcMap\256961-A.mxd
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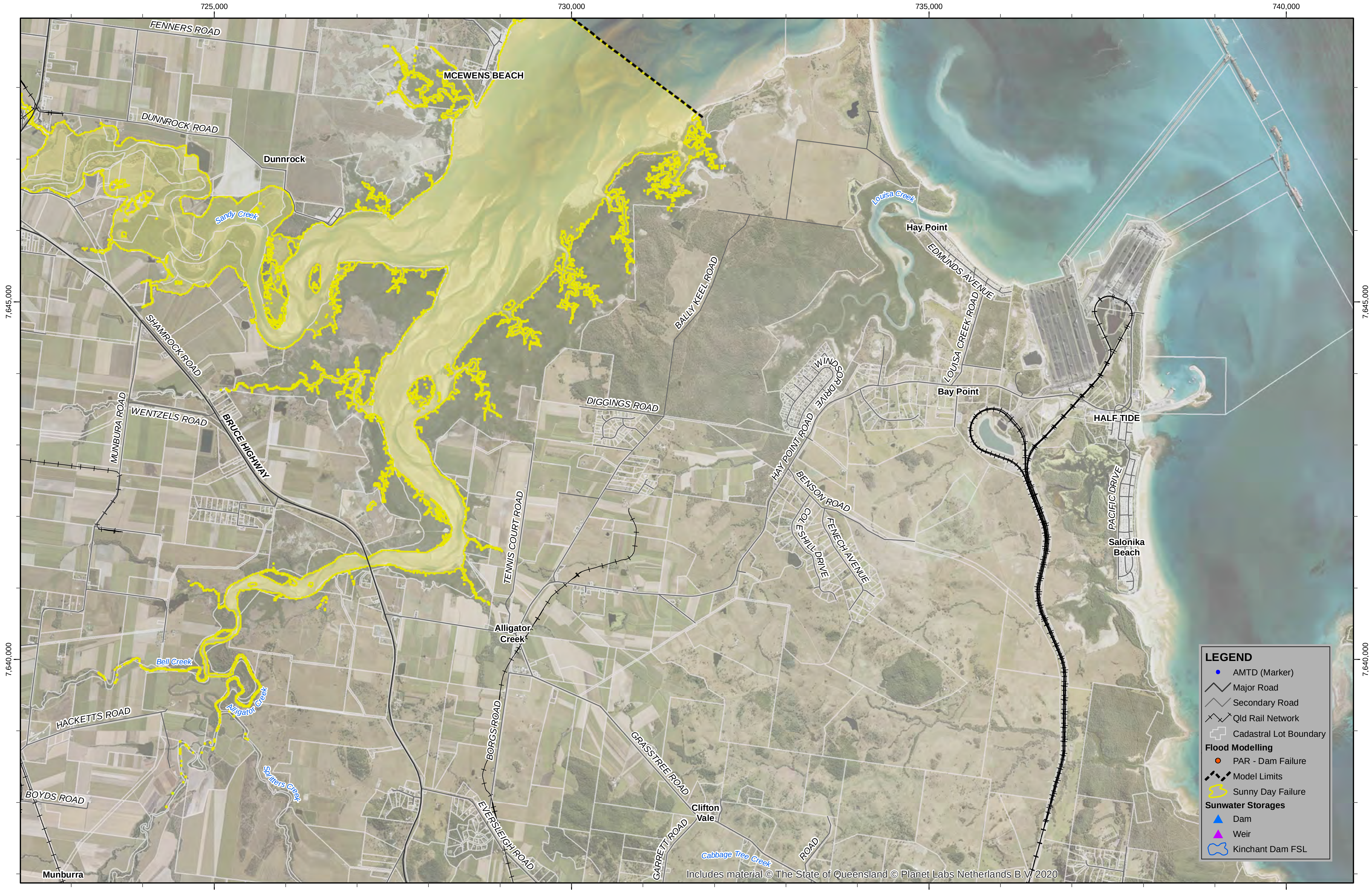

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FENNERS ROAD
MCEWENS BEACH
DUNNROCK ROAD
Dunnrock
Sandy Creek
Louisa Creek
Hay Point
EDMUNDS AVENUE
BALLY KEEL ROAD
LOUISA CREEK ROAD
SHAMROCK ROAD
WINDSOR DRIVE
Bay Point
HALF TIDE
DIGGINGS ROAD
WENTZELS ROAD
MUNBURA ROAD
BRUCE HIGHWAY
HAY POINT ROAD
BENSON ROAD
COLESHILL DRIVE
FENECH AVENUE
PACIFIC DRIVE
TENNIS COURT ROAD
Salonika Beach
Alligator Creek
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GRASSTREE ROAD
Splitters Creek
BOYDS ROAD
EVERSLEIGH ROAD
Clifton Vale
GARRETT ROAD
ROAD
Cabbage Tree Creek
Munburra
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LEGEND
AMTD (Marker)
Major Road
Secondary Road
Qld Rail Network
Cadastral Lot Boundary
Flood Modelling
PAR - Dam Failure
Model Limits
Sunny Day Failure
Sunwater Storages
Dam
Weir
Kinchant Dam FSL

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

REVISION				
13/12/22	A	ISSUED FOR USE	LH	MGH
DATE		REMARKS	CKD	PSD

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

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SCALES (A3 SIZE)
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APPROVED M.G. HUGHES 13/12/2022 RPEQ: 18351

sunwater

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

CONTRACT NUMBER
DRAWING NUMBER 256961
REV. A
SHEET 6 OF 6
DATE DECEMBER 2022

690,000 695,000 700,000

7,660,000 7,655,000

VENTONS ROAD
DEVEREUX CREEK ROAD
DOYLES ROAD
MCINTOSHS ROAD
OLD HAMPDEN ROAD
VICKERS ROAD
MARIAN HAMPDEN ROAD
NEWMANS ROAD
Mcgregor Creek
PIONEER RIVER
MARIAN WEIR
MARIAN
ANZAC AVENUE
POULSEN DRIVE
HOFFMAN DRIVE
KENNYS ROAD
CLARES ROAD
MILLARDS ROAD
Silver Creek
NICHOLSONS ROAD
BIRKETTS ROAD
MIRANI MT OSSA ROAD
MOUNT MARTIN LOOP ROAD
MCGREGOR CREEK ROAD
R MCCLURES ROAD
WALZ LANE
SWANS ROAD
MIRANI BOLDON ROAD
MARKEY S ROAD
PEACHS ROAD
Benholme
WORKS BENHOLME ROAD
MIRANI
ALICE STREET
MARY STREET
MACKAY EUNGELLA ROAD
BRAND ROAD
M MCCLURES ROAD
N WALZ ROAD
NICHOLSONS CROSSING ROAD
HOARES ROAD
LEICHARDT ROAD
Cattle Creek
MIRANI WEIR
R WATTS ROAD
HEADS ROAD
NIGHTS ROAD
COMBE HEADS ROAD
MIRANI ETON ROAD
MARGE CAMERONS ROAD
PLATHS ROAD
ALLANDALE ROAD
Sandy Creek (North Branch)
KINCHANT DAM
HOGANS ROAD
KINCHANT DAM ROAD
N LAMBS ROAD
JACKSONS ROAD
a Mia
MA MA CONNECTION ROAD

0 1 2 3 4 5 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52

LEGEND

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

Flood Modeling

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

Sunwater Storages

- Dam
- Weir
- Kinchant Dam FSL

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Tel: (07) 3120 0000

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13/12/22	A	ISSUED FOR USE	LH	MGH	
DATE		REMARKS	CKD	PSD	

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

REFERENCE DRAWINGS
256958 - Keymap

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

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	LH
APPROVED	
M.G. HUGHES 13/12/2022	
RPEQ: 18351	

sunwater

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

CONTRACT NUMBER	
DRAWING NUMBER	REV.
256963	A
SHEET 1 OF 4	
DATE DECEMBER 2022	

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

690,000 695,000 700,000

7,650,000 7,645,000 7,640,000

KINCHANT DAM ROAD
North Eton
Sandy Creek (North Branch)
JONES ROAD
HILLS ROAD
MARIAN ETON ROAD
MUSCATS ROAD
BORGS ROAD
MIRANI ETON ROAD
Sandy Creek
OLLETTS ROAD
BURGESS LANE
ELVINS ROAD
PEAK DOWNS HIGHWAY
Stony Creek
GARGETT MIA MIA ROAD
BADGER WALES ROAD
Bustard Creek
WELSHS ROAD
PINEVALE ROAD
PIONEER RIVER
Pioneer River
Blacks Creek
Stockyard Creek
Black Waterhole Creek
BLACKS CREEK
53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69

LEGEND

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

Flood Modeling

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

Sunwater Storages

- Dam
- Weir
- Kinchant Dam FSL

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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
IDH	
CHECKED	CHECKED
	LH
APPROVED	
M.G. HUGHES 13/12/2022	RPEQ: 18351

sunwater

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

CONTRACT NUMBER

DRAWING NUMBER	REV.
256963	A

SHEET 2 OF 4

DATE DECEMBER 2022

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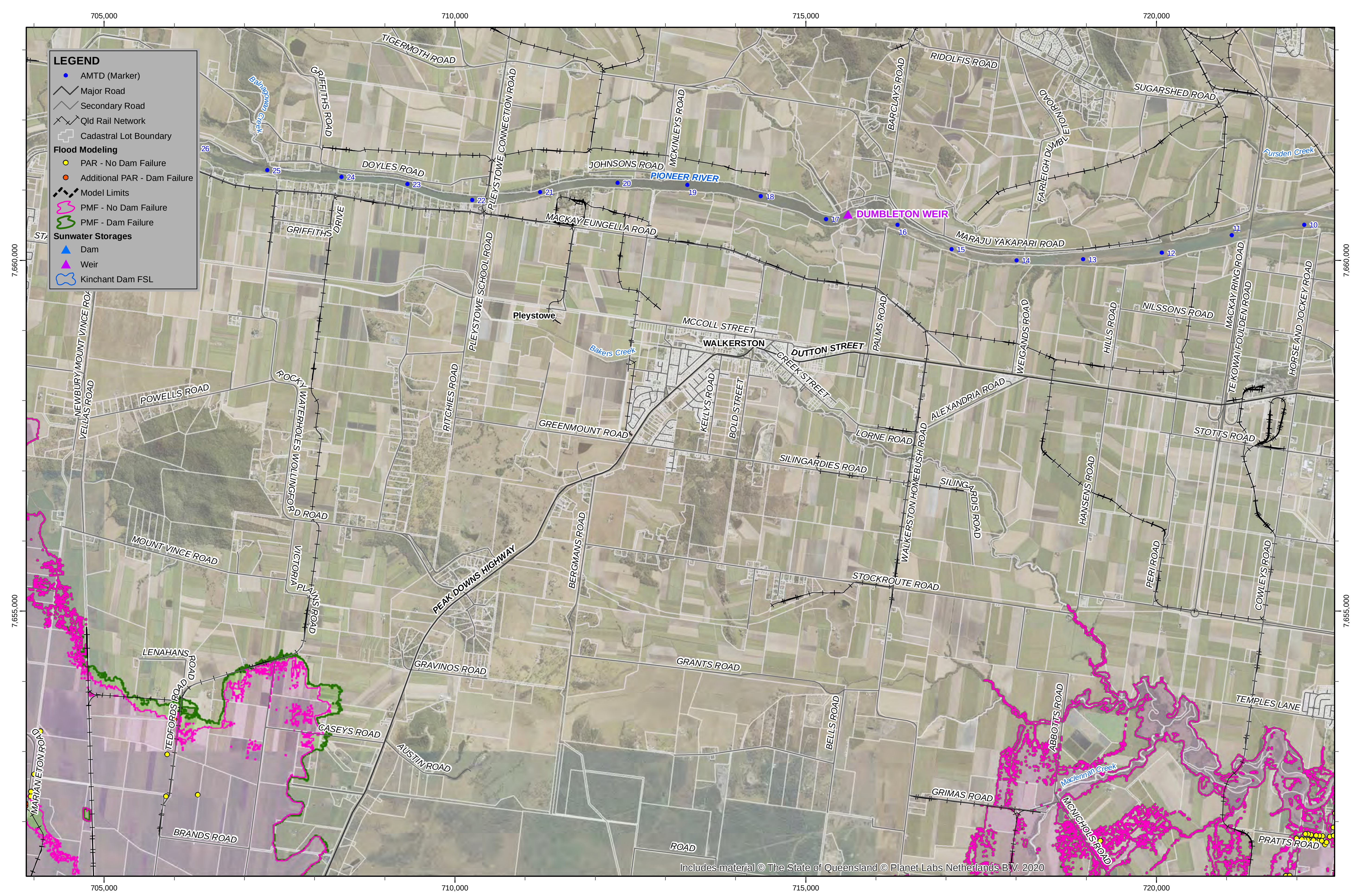

LEGEND
AMTD (Marker)
Major Road
Secondary Road
Qld Rail Network
Cadastral Lot Boundary
Flood Modeling
PAR - No Dam Failure
Additional PAR - Dam Failure
Model Limits
PMF - No Dam Failure
PMF - Dam Failure
Sunwater Storages
Dam
Weir
Kinchant Dam FSL
705,000
710,000
715,000
720,000
7,660,000
7,655,000
PIONEER RIVER
DUMBLETON WEIR
Pleystowe
WALKERSTON
TIGERMOTH ROAD
GRIFFITHS ROAD
PLEYSTOWE CONNECTION ROAD
MCKINLEYS ROAD
BARCLAYS ROAD
RIDOLFIS ROAD
SUGARSHED ROAD
FARLEIGH DUMBLETON ROAD
Fursden Creek
Bakers Creek
DOYLES ROAD
JOHNSONS ROAD
MACKAY EUNGELLA ROAD
GRIFFITHS DRIVE
MARAJU YAKAPARI ROAD
PLEYSTOWE SCHOOL ROAD
MCCOLL STREET
DUTTON STREET
CREEK STREET
PALMS ROAD
WEIGANDS ROAD
HILLS ROAD
NILSSONS ROAD
MACKAY RING ROAD
TE KOWAI FOULDEN ROAD
HORSE AND JOCKEY ROAD
NEWBURY MOUNT VINCE ROAD
VELLAS ROAD
POWELLS ROAD
ROCKY WATERHOLES WOLLINGFORD ROAD
RITCHIES ROAD
GREENMOUNT ROAD
KELLYS ROAD
BOLD STREET
ALEXANDRIA ROAD
LORNE ROAD
STOTTS ROAD
SILINGARDIES ROAD
WALKERSTON HOMEBUSH ROAD
HANSENS ROAD
MOUNT VINCE ROAD
VICTORIA PLAINS ROAD
PEAK DOWNS HIGHWAY
BERGMANS ROAD
STOCKROUTE ROAD
PERI ROAD
COWLEYS ROAD
LENAHANS ROAD
GRAVINOS ROAD
GRANTS ROAD
TEMPLES LANE
TEDFORDS ROAD
CASEYS ROAD
AUSTIN ROAD
BELLS ROAD
ABBOTTS ROAD
Maclennan Creek
MARIAN ETON ROAD
GRIMAS ROAD
MCNICHOLS ROAD
BRANDS ROAD
PRATTS ROAD
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13/12/22	A	ISSUED FOR USE	LH	MGH
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MAP INFORMATION
Projected Coordinate System: Mapping Grid of Australia (MGA2020) Zone 55.

REFERENCE DRAWINGS
256958 - Keymap

SCALES (A3 SIZE)
0 500 1,000 1,500 2,000 2,500 m
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DRAWN: IDH
DESIGNED:
CHECKED:
CHECKED: LH
APPROVED: M.G. HUGHES 13/12/2022
RPEQ: 18351

sunwater
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KINCHANT DAM
DAM BREAK ANALYSIS 2022
PROBALE MAXIMUM FLOOD (NORTH EMBANKMENT FAILURE) INUNDATION PLAN

CONTRACT NUMBER
DRAWING NUMBER: 256963
REV.: A
SHEET 3 OF 4
DATE: DECEMBER 2022

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

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Map Produced By:
Water Resources and Dam Safety
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NORTH ETON ROAD
PEAK DOWNS HIGHWAY
HANNANS ROAD
ETON
ETON HOMEBUSH ROAD
Sandy Creek
Stony Creek
Oakenden
OAKENDEN SCHOOL ROAD
OAKENDEN ROAD
Oaky Creek
Ross Creek
QUATTROMANIS ROAD
ROAD
Two Mile Creek
BARRIE LANE
Rock Creek
OAKENDEN SARINA ROAD
Arthur Creek
GRAHAM ROAD
STANFORDS ROAD
BENTLEYS ROAD
Homebush
SARINA HOMEBUSH ROAD
VAGGS ROAD
MASOTTIS ROAD
CLAUSENS ROAD
Maclennan Creek
KERSTON HOMEBUSH ROAD
PALM TREE ROAD
COUSENS AND BRANDS ROAD
TURNERS ROAD
Frenchmans Creek
THOMAS ROAD
OSHEAS ROAD
B L Creek
MARWOOD SUNNYSIDE ROAD
PETERSENS ROAD
HOMEBUSH ROAD
BRIEFFIES ROAD
CHELONA SANDIFORD ROAD
BRUCE HIGHWAY
IWERS ROAD
BALBERRA ROAD
Balberra
CAMPBELLS RIDGE ROAD
MEZZENS ROAD

LEGEND

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

Flood Modeling

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

Sunwater Storages

- Dam
- Weir
- Kinchant Dam FSL

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KINCHANT DAM
DAM BREAK ANALYSIS 2022
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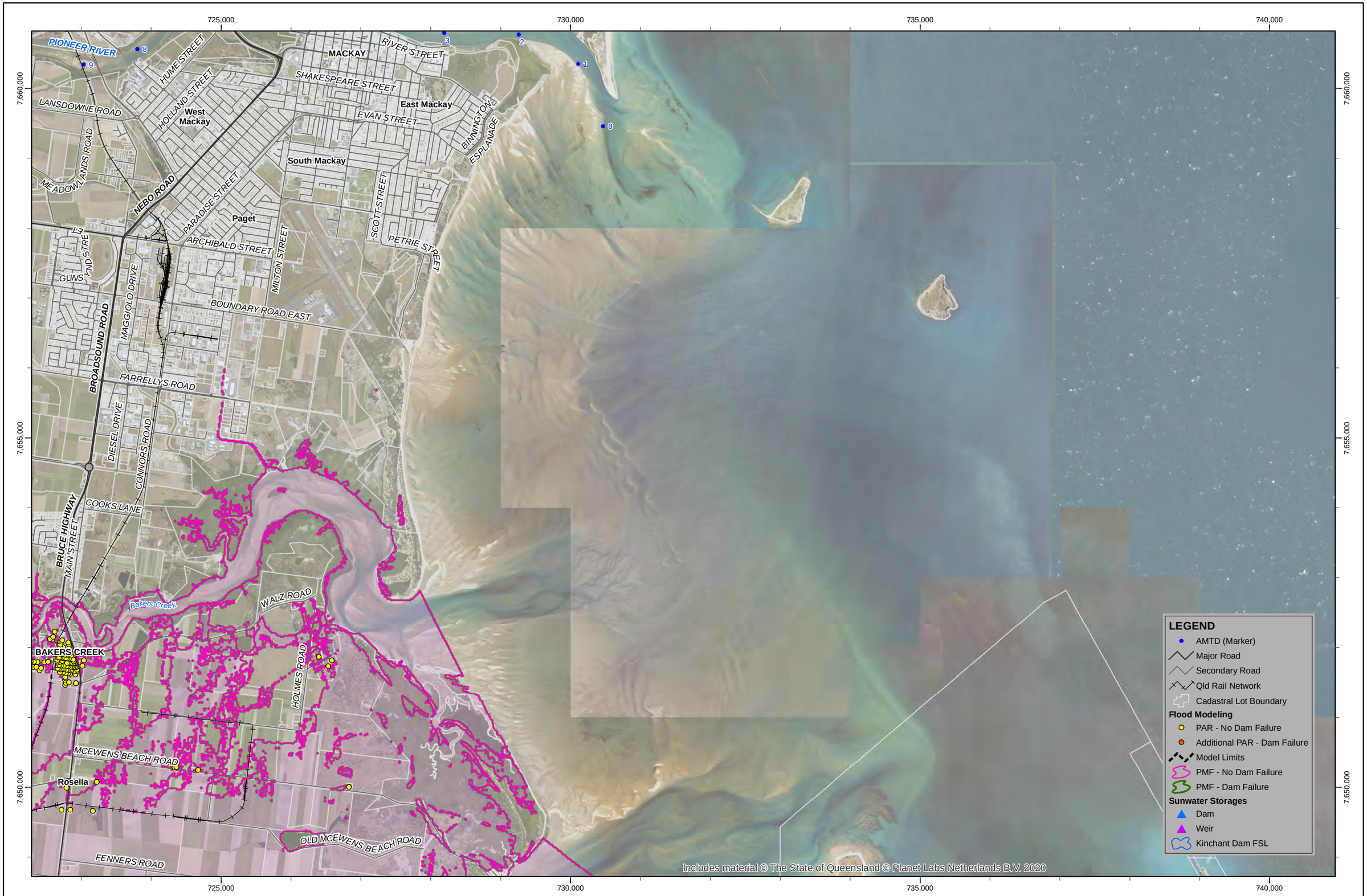

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KINCHANT DAM
DAM BREAK ANALYSIS 2022
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725,000 730,000 735,000 740,000

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FENNERS ROAD
MCEWENS BEACH
DUNNROCK ROAD
Dunnrock
Sandy Creek
SHAMROCK ROAD
WENTZELS ROAD
DIGGINGS ROAD
BALLY KEEL ROAD
Louisa Creek
Hay Point
EDMUNDS AVENUE
LOUISA CREEK ROAD
SCENIC DRIVE
HAY POINT ROAD
Bay Point
HALF TIDE
BENSON ROAD
COLESHILL DRIVE
FENECH AVENUE
PACIFIC DRIVE
Salonika Beach
TENNIS COURT ROAD
Alligator Creek
BRUCE HIGHWAY
MUNBURA ROAD
Bee Creek
HACKETTS ROAD
BORGS ROAD
GRASSTREE ROAD
Spitters Creek
BOYDS ROAD
Alligator Creek
EVERSLEIGH ROAD
Clifton Vale
GARRETT ROAD
Cabbage Tree Creek
ROAD
Munburra

LEGEND

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

CONTRACT NUMBER

DRAWING NUMBER	REV.
256963	A

SHEET 6 OF 4

DATE DECEMBER 2022

690,000 695,000 700,000

7,660,000 7,655,000

VENTONS ROAD
DEVEREUX CREEK ROAD
DOYLES ROAD
MCINTOSHS ROAD
OLD HAMPDEN ROAD
VICKERS ROAD
MARIAN HAMPDEN ROAD
NEWMANS ROAD
PIONEER RIVER
MARIAN WEIR
MARIAN
ANZAC AVENUE
POULSEN DRIVE
HOFFMAN DRIVE
KENNYS ROAD
CLARES ROAD
MARKEY S ROAD
PEACHS ROAD
SWANS ROAD
MIRANI BOLDON ROAD
WALZ LANE
MOUNT MARTIN LOOP ROAD
MCGREGOR CREEK ROAD
Mcgregor Creek
MIRANI MT OSSA ROAD
R MCCLURES ROAD
M MCCLURES ROAD
BIRKETTS ROAD
NICHOLSONS ROAD
MILLARDS ROAD
Silver Creek
Benholme
WORKS BENHOLME ROAD
MIRANI
ALICE STREET
MARY STREET
MACKAY EUNGELLA ROAD
BRAND ROAD
N WALZ ROAD
NICHOLSONS CROSSING ROAD
HOARES ROAD
LEICHHARDT ROAD
Cattle Creek
MIRANI WEIR
Sandy Creek (North Branch)
R WATTS ROAD
NIGHTS ROAD
MARGE CAMERONS ROAD
PLATHS ROAD
MARIAN ETON ROAD
ALLANDALE ROAD
N LAMBS ROAD
JACKSONS ROAD
KINCHANT DAM
KINCHANT DAM ROAD
HOGANS ROAD
MA MA CONNECTION ROAD
a Mia

AMTD (Marker): 0, 1, 2, 3, 4, 5, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52

LEGEND

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

Flood Modeling

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

Sunwater Storages

- Dam
- Weir
- Kinchant Dam FSL

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SCALES (A3 SIZE)
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CHECKED	CHECKED
	LH
APPROVED	
M.G. HUGHES 13/12/2022	RPEQ: 18351

sunwater

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

CONTRACT NUMBER	
DRAWING NUMBER	REV.
256964	A
SHEET 1 OF 4	
DATE DECEMBER 2022	

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Water Resources and Dam Safety
Tel.: (07) 3120 0000

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KINCHANT DAM ROAD
North Eton
JONES ROAD
Sandy Creek (North Branch)
GARGETT MIAMIA ROAD
BADGER WALES ROAD
BORGS ROAD
MIRANI ETON ROAD
HILLS ROAD
MARIAN ETON ROAD
MUSCATS ROAD
Bustard Creek
Sandy Creek
OLLETTS ROAD
BURGESS LANE
ELVINS ROAD
WELSHS ROAD
PINEVALE ROAD
PEAK DOWNS HIGHWAY
PIONEER RIVER
Pioneer River
Blacks Creek
Stockyard Creek
Black Waterhole Creek
Stony Creek
BLACKS CREEK

53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69

LEGEND

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

Flood Modeling

- PAR - No Dam Failure
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- Dam
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- Kinchant Dam FSL

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APPROVED	
M.G. HUGHES 13/12/2022	RPEQ: 18351

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

CONTRACT NUMBER

DRAWING NUMBER	REV.
256964	A

SHEET 2 OF 4

DATE DECEMBER 2022

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

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7,655,000

LEGEND

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

Flood Modeling

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

Sunwater Storages

- Dam
- Weir
- Kinchant Dam FSL

TIGERMOTH ROAD
GRIFFITHS ROAD
Bakers Creek
PLEYSTOWE CONNECTION ROAD
MCKINLEY'S ROAD
BARCLAYS ROAD
RIDOLFIS ROAD
FARLEIGH DUMBLETON ROAD
SUGARSHED ROAD
Tursden Creek
DOYLES ROAD
JOHNSONS ROAD
PIONEER RIVER
DUMBLETON WEIR
MACKAY EUNGELLA ROAD
MARAJU YAKAPARI ROAD
GRIFFITHS DRIVE
PLEYSTOWE SCHOOL ROAD
Pleystowe
MCCOLL STREET
WALKERSTON
DUTTON STREET
PALMS ROAD
WEIGANDS ROAD
HILLS ROAD
NILSSONS ROAD
MACKAY RING ROAD
TE KOWAI FOULDEN ROAD
HORSE AND JOCKEY ROAD
NEWBURY MOUNT VINCE ROAD
VELLAS ROAD
POWELL'S ROAD
ROCKY WATERHOLES WOLLINGFORD ROAD
RITCHIES ROAD
Bakers Creek
KELLY'S ROAD
BOLD STREET
CREEK STREET
ALEXANDRIA ROAD
GREENMOUNT ROAD
LORNE ROAD
STOTTS ROAD
SILINGARDIES ROAD
WALKERSTON HOMEBUSH ROAD
HANSENS ROAD
PERI ROAD
COWLEYS ROAD
MOUNT VINCE ROAD
VICTORIA PLAINS ROAD
PEAK DOWNS HIGHWAY
BERGMANS ROAD
STOCKROUTE ROAD
LENAHANS ROAD
GRAVINOS ROAD
GRANTS ROAD
TEMPLES LANE
ABBOTTS ROAD
CASEYS ROAD
AUSTIN ROAD
BELLS ROAD
Maclennan Creek
GRIMAS ROAD
MCNICHOLS ROAD
PRATTS ROAD
MARIANETON ROAD
JEDFORDS ROAD
BRANDS ROAD

REVISION					
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SCALES (A3 SIZE)
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APPROVED
M.G. HUGHES
13/12/2022
RPEQ: 18351

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

CONTRACT NUMBER

DRAWING NUMBER	REV.
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SHEET 3 OF 4
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Map Produced By:
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Tel: (07) 3120 0000

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NORTH ETON ROAD
PEAK DOWNS HIGHWAY
HANNANS ROAD
ETON
ETON HOMEBUSH ROAD
Sandy Creek
Stony Creek
Oakenden
OAKENDEN SCHOOL ROAD
OAKENDEN ROAD
Oaky Creek
Ross Creek
Two Mile Creek
ROAD
QUATTROMANIS ROAD
BARRIE LANE
Rock Creek
OAKENDEN SARINA ROAD
Arthur Creek
GRAHAM ROAD
STANFORDS ROAD
BENTLEYS ROAD
CLAUSENS ROAD
Homebush
MASOTTIS ROAD
TURNERS ROAD
SARINA HOMEBUSH ROAD
VAGGS ROAD
Frenchmans Creek
COUSENS AND BRANDS ROAD
THOMAS ROAD
Maclennan Creek
KERSTON HOMEBUSH ROAD
PALMTREE ROAD
OSHEAS ROAD
B L Creek
PETERSENS ROAD
HOMEBUSH ROAD
CHELONA SANDIFORD ROAD
BRIEFFIES ROAD
BRUCE HIGHWAY
IWERS ROAD
BALBERRA ROAD
Balberra
MARWOOD SUNNYSIDE ROAD
CAMPBELLS RIDGE ROAD
MEZZENS ROAD

LEGEND

- AMTD (Marker)
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Flood Modeling

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Sunwater Storages

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PIONEER RIVER
MACKAY
West Mackay
East Mackay
South Mackay
Paget
Rosella
BAKERS CREEK
Bakers Creek
HUME STREET
HOLLAND STREET
LANSDOWNE ROAD
MEADOWLANDS ROAD
NEBO ROAD
PARADISE STREET
ARCHIBALD STREET
MILTON STREET
SCOTT STREET
PETRIE STREET
RIVER STREET
SHAKESPEARE STREET
EVAN STREET
BINNINGTON ESPLANADE
GUNS
MAGGIOLO DRIVE
BOUNDARY ROAD EAST
BROADSOUND ROAD
FARRELLYS ROAD
DIESEL DRIVE
CONNORS ROAD
BRUCE HIGHWAY
COOKS LANE
MAIN STREET
WALZ ROAD
HOLMES ROAD
MCEWENS BEACH ROAD
OLD MCEWENS BEACH ROAD
FENNERS ROAD
0 1 2 3 8 9

LEGEND
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MCEWENS BEACH
DUNNROCK ROAD
Dunnrock
Sandy Creek
Louisa Creek
Hay Point
EDMUNDS AVENUE
BALLY KEEL ROAD
LOUISA CREEK ROAD
SHAMROCK ROAD
DIGGINGS ROAD
SCENIC DRIVE
HAY POINT ROAD
Bay Point
HALF TIDE
BENSON ROAD
COLESHILL DRIVE
FENECH AVENUE
PACIFIC DRIVE
Salonika Beach
WENTZELS ROAD
TENNIS COURT ROAD
BRUCE HIGHWAY
MUNBURA ROAD
Alligator Creek
Bee Creek
HACKETTS ROAD
BORGS ROAD
GRASSTREE ROAD
BOYDS ROAD
Splitters Creek
EVERSLEIGH ROAD
Clifton Vale
GARRETT ROAD
Cabbage Tree Creek
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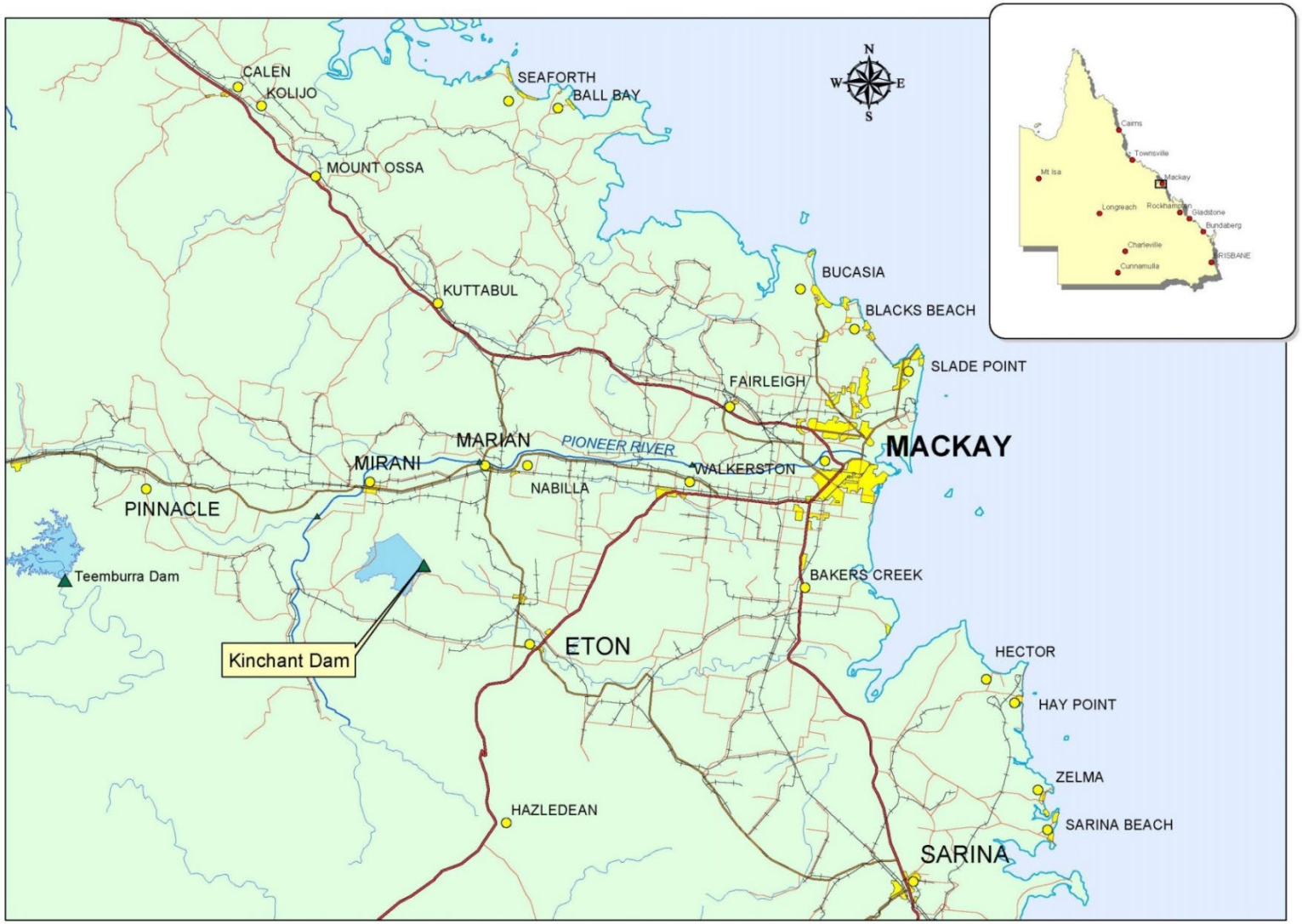
Appendix B4: Locality plan

Figure B6: Kinchant Dam locality plan



Document: S:\BW Asset Delivery\GIS_Data\Enterprise_GIS\Water_Supply_Schemes\Eton\Drawings\ArcMap\253497-A.mxd
Printed: Friday, 16/10/2020 01:05:11 PM

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

148°48'0"E 148°49'0"E 148°50'0"E 148°51'0"E 148°52'0"E 148°53'0"E 148°54'0"E 148°55'0"E 148°56'0"E

21°11'0"S 21°12'0"S 21°13'0"S 21°14'0"S 21°15'0"S 21°16'0"S

125007A
MIRANI WEIR AL
MIRANI WEIR TM

N
W E
S

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

LEGEND
DNRM Water Monitoring Station
Rain / River Monitoring Station
Rainfall Station
Rainfall & River Station
River Station
Major Watercourse
Creek
State Road (DTMR)
Kinchant Dam Embankment

SANDY CREEK (NORTH BRANCH)
KINCHANT DAM TM
MIA MIA CONNECTION ROAD
GARGETT - MIA MIA ROAD
MIRANI - ETON ROAD
100010A - BRIGHTLY STORAGE TBR
BRIGHTLEY TM
125002C
SARICH'S AL

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

SCALES (A3 SIZE)
0 0.5 1 1.5 km
1:40,000

sunwater

KINCHANT DAM
SANDY CREEK (NORTH BRANCH)
CATCHMENT MAP

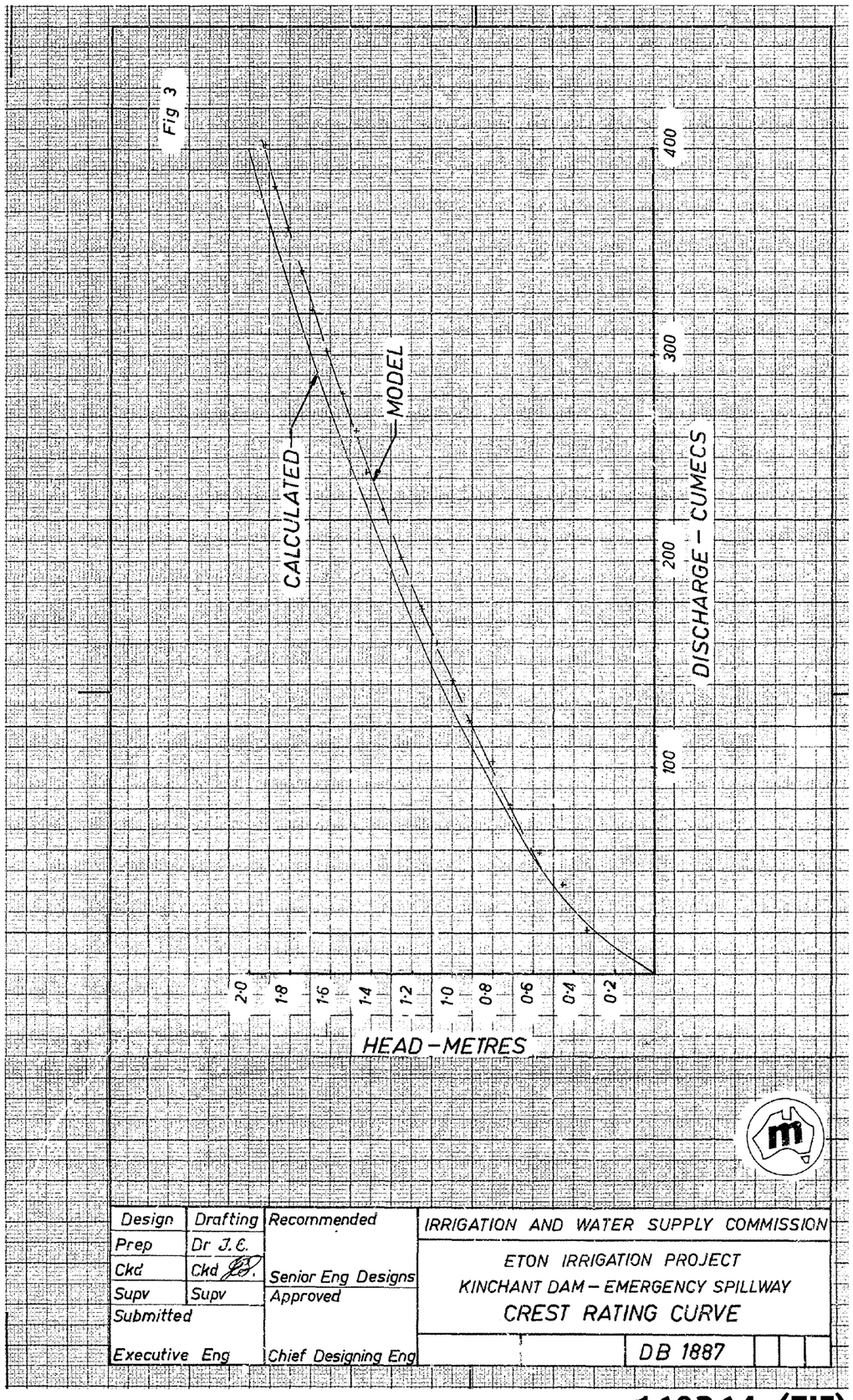
Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

DRAWING No. 253497 A

APPENDIX C Equipment and technical information

C1 List of equipment available during an emergency
C2 Kinchant Dam spillway discharge
C3 Kinchant Dam storage curves
C4 Kinchant Dam rating curves

Appendix C1 has been redacted

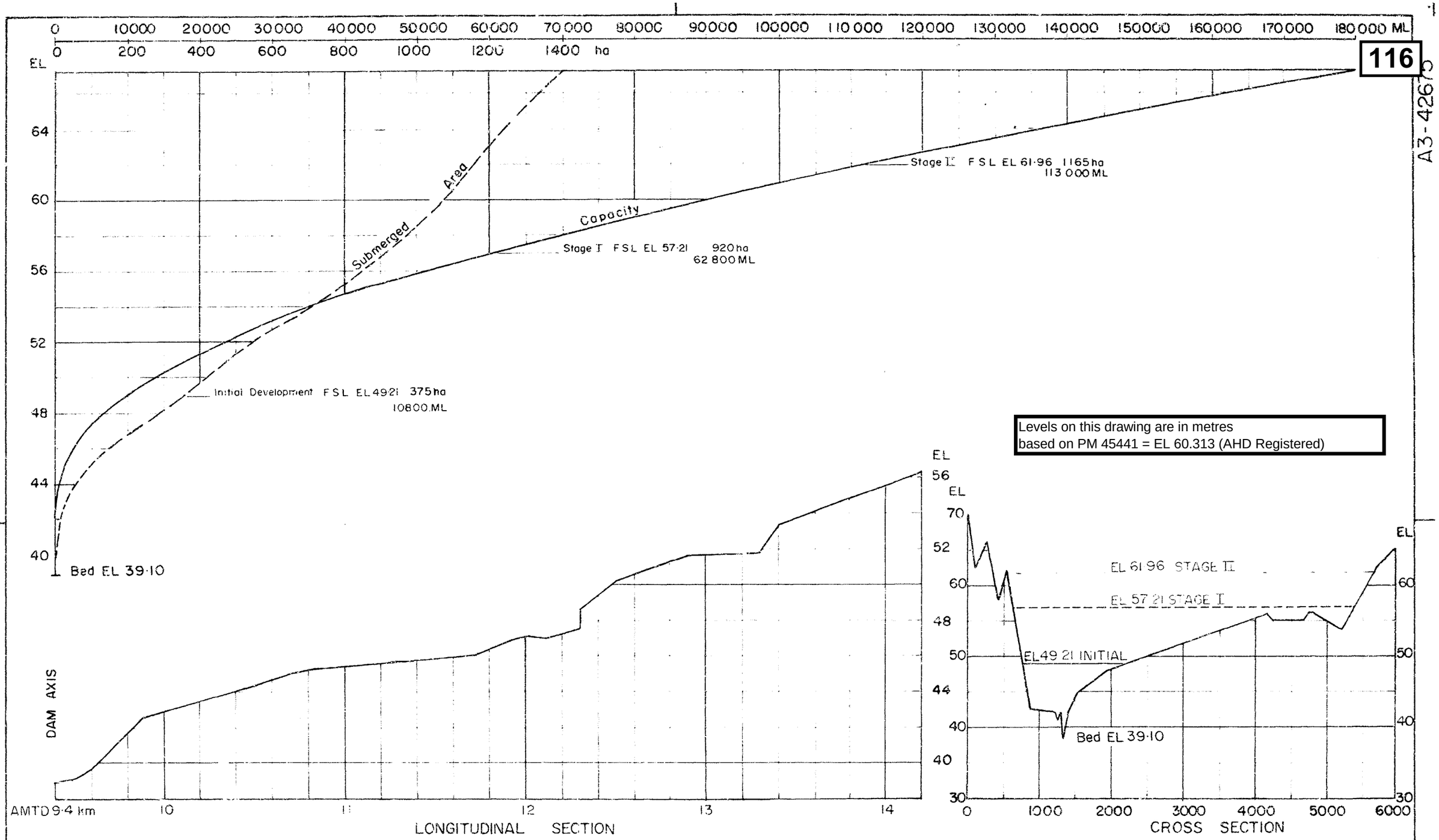


Design	Drafting	Recommended	IRRIGATION AND WATER SUPPLY COMMISSION
Prep	Dr J.C.		ETON IRRIGATION PROJECT
Ckd	Ckd	Senior Eng Designs	KINCHANT DAM – EMERGENCY SPILLWAY
Supv	Supv	Approved	CREST RATING CURVE
Submitted			DB 1887
Executive Eng		Chief Designing Eng	

160264 (TIF)

116

A3-42675



Levels on this drawing are in metres
based on PM 45441 = EL 60.313 (AHD Registered)

This plan supersedes S 42675 C

Revision				
20-12-78	D	Curves redrawn to AHD		
Date		Remarks	Ckd	Psd

Compiled from Plans S 42675 & L 24992 & L 43430
Catchment Area 32 km²
Latitude 21° 12' 33"
Longitude 148° 53' 56"
Levels Datum: AHD

Drafting	
Dr	
Ckd M.O.	
Supv	
Submitted	

Recommended

Approved
6-2-79
Sen Eng Proj Plan

IRRIGATION AND WATER SUPPLY COMMISSION

SANDY CREEK NORTH BRANCH-BASIN 126
KINCHANT DAM

STORAGE CURVES

16-9-74 | A3-42675 | D

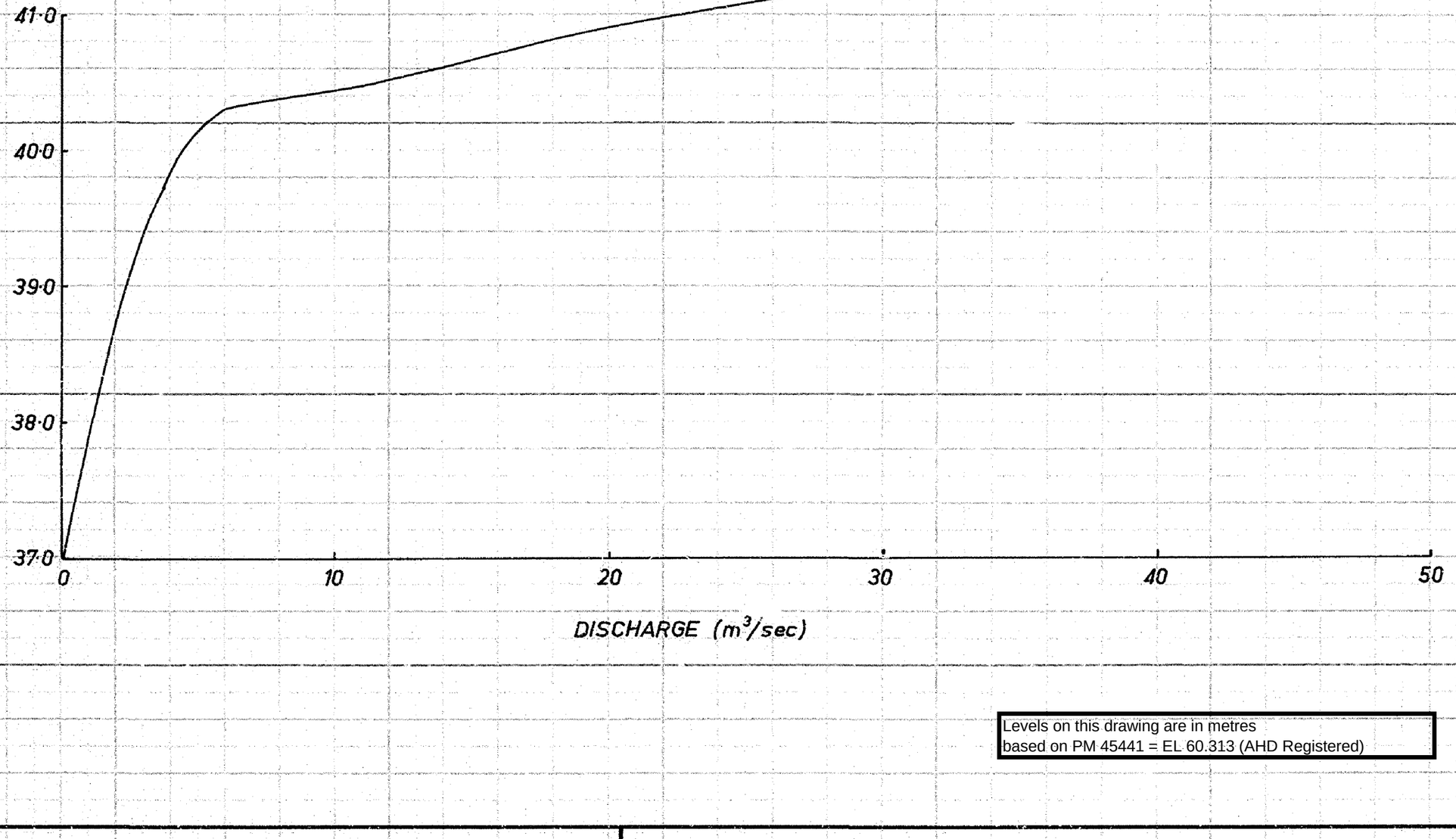
42675D (tif)

121

KINCHANT DAM OVERFLOW CHANNEL

DISCHARGE RATING CURVE

DB 1936



Levels on this drawing are in metres
based on PM 45441 = EL 60.313 (AHD Registered)

FIG 3

160311 (TIF)

122

KINCHANT DAM SIPHON STRUCTURE

DISCHARGE RATING CURVE

DB 1937

H.W. EL (m)

45·5
·4
·3
·2
·1
45·0
·9
·8

U/S Lip

Lower edge of Guide Vanes

Crest EL 44·7

D/S Lip 37.0

D/S Lip 39.0 & 40.0

PRIMING REGION

OPERATING REGION

Levels on this drawing are in metres
based on PM 45441 = EL 60.313 (AHD Registered)

0 1 2 3 4 5 6 7 8 9 10 11 12 13

Q (m^3/sec)

FIG 8

160312 (TIF)

APPENDIX D Interaction with Local Government and District Groups

To be populated when EAP next completes a substantive review

Annexe — Kinchant Dam SMS Messages

	Advice Stay informed 	**Watch and Act** Prepare to leave 	**Emergency warning** Leave immediately To be issued in consultation with council 
SMS	ADVICE from Sunwater. Kinchant Dam has exceeded its maximum operating level (87%) and is releasing excess water into Sandy Creek. People near Sandy Creek, Mirani and Eton should STAY INFORMED. Water flows from Kinchant Dam expected to remain within beds and banks of river / may impact Antoneys Crossing and Curran's Crossing / may contribute to widespread/ localised/ overland flooding. Expect increased river flows in 6-12 hours / later today/ overnight/ tomorrow. There is no danger yet. Call Triple Zero (000) if your life is in danger. Call the SES on 132 500 for flood help. Get full warnings and what you should do at https://bit.ly/RecandSafety	FLOOD WATCH AND ACT from Sunwater. Water flowing from Kinchant Dam has increased significantly and is now flowing over the spillway into Sandy Creek. Water flows from Kinchant Dam may contribute to dangerous/widespread flooding near Sandy Creek, Mirani and Eton. Expect increased river flows in 6-12 hours / later today/ overnight/ tomorrow. People near Sandy Creek, Mirani and Eton must PREPARE TO LEAVE in case the flood gets worse. Tell others. Call Triple Zero (000) if your life is in danger. Call the SES on 132500 for flood help. Get full warnings and what you should do at https://bit.ly/RecandSafety	FLOOD EMERGENCY WARNING from Sunwater: People near Sandy Creek, Mirani and Eton must LEAVE IMMEDIATELY. Kinchant Dam possible failure/is failing. Major flooding is happening now. Your life is at risk. Go now to a safe place away from the flood. Get full warnings and what you should do at Mackay Regional Council http://disaster.mackay.qld.gov.au/