EMERGENCY ACTION PLAN

COPPERLODE FALLS DAM

Dam ID: 0257

Dam Owner: Cairns Regional Council

Document: DM#6413959 Version 11

Revision: Rev 14. March 2024

Address: Lake Morris Road, Kanimbla QLD

Lat -16.980083 and Long 145.672629

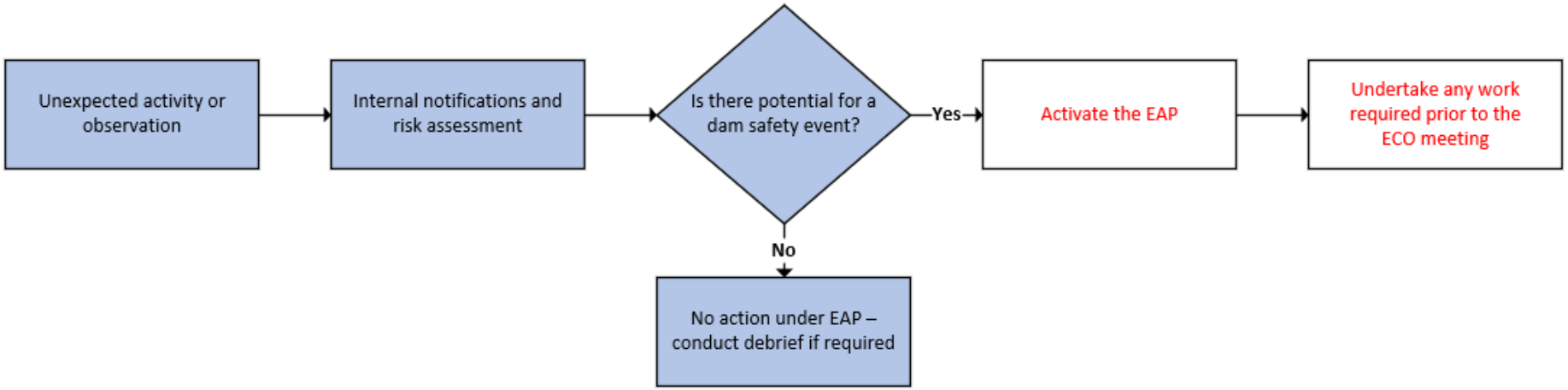
Approved until: 1 September 2027

Approved by the delegate of the Chief Executive, Department of Regional Development, Manufacturing and Water until 1 September 2027.

Controlled Copy No.	of 18
Issued To	
Revision	14
Revision Date	2024 Revision
Dam Owner	Cairns Regional Council

Emergency Activation Quick Reference – Dam Hazards

Pre-EAP activation flow



Dam Hazards and section numbers	"Pre-Alert" Actions managed outside of EAP activation	Activation levels for dam hazards			
		Alert	Lean Forward	Stand Up	Stand Down
Flood Operations See section 6		Storage at 1.5m above spillway crest and rising (EL 399.2 32m)	Storage at 2.2m above spillway crest (EL 399.932m)	Storage at 2.5m above spillway crest (EL 400.232m)	Storage below 1.5m above spillway crest and falling (EL 399.232m)
Embankment Failure See section 7	Unexpected change noted during embankment inspection or observation (CFD Caretaker, SCADA, or other) e.g., change in piezometer pressure outside of normal operating conditions or new seepage observed / change in current seepage	Piezometers outside of recommended alert level ranges as programmed into SCADA (see GHD, 2022 for recommended range, OR New areas of seepage identified, OR Seepage increasing at embankment toe pipe, v-notch weir, within outlet conduit tunnel, OR Collection trench – greater than 200mm from reference point	Increasing change in Piezometer readings outside of recommended alert level ranges as programmed into SCADA (see GHD, 2022 for recommended range), AND Multiple instrument failure/changes in multiple instruments (not communications related), AND/OR Cloudy water observed in seepage and particles visible	Piping condition has been established, OR Evidence of scouring, OR Potential of dam failure	Risk assessment has determined that failure risk has reduced
Spillway Failure See section 8	Unexpected change noted during spillway inspection or observation (CFD Caretaker, CCTV, or other)	A change in seepage observed downstream of spillway, OR Movement or cracking in concrete, OR Large debris lodged on the spillway that could impact on spillway integrity, OR Any form of seepage identified on the left abutment, OR Right abutment seepage measured at greater than 20L per minute	Increase in cloudiness of seepage, OR Increase in flow of seepage, OR Crack/s in the spillway, OR Unexpected change in the flow patterns over the spillway that is not caused as part of normal operation, OR Spillway structural integrity compromised, OR Right abutment seepage identified to be cloudy	Significant scouring of spillway OR Spillway failure imminent	Risk assessment has determined that failure risk has reduced
Earthquake See section 9	Earthquake confirmed <4ML (Richter Scale), OR	Not Applicable	Earthquake confirmed >4ML (Richter Scale)	Not Applicable.	Risk assessment has determined that

Dam Hazards and section numbers	"Pre-Alert" Actions managed outside of EAP activation	Activation levels for dam hazards			
		Alert	Lean Forward	Stand Up	Stand Down
	Tremors felt			Enact Dam Failure response, Sections 7 &/or 8 if: Dam failure path identified, OR Change detected during surveillance inspection	failure risk has reduced
Terrorist Threat/Malicious Activity or High Energy Impact See section 10	Not Applicable	Not Applicable	Not Applicable	Significant threat/verified suspicious activity has compromised dam safety	Risk assessment has determined that failure risk has reduced

Other Emergency Event / Communications Failure	Communications Failure – Dam Site	Communications Failure – Local Area
Communications Failure See section 11	Managed by Dam Owner	Locally Managed by Dam Owner in consultation with ECO and LDMG
Communications Failure See section 11	Unable to communicate to / from dam. Unable to communicate with DEO	Unable to communicate in Local area – Cairns Region

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Controlled Document Distribution List

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1.	Associate Director Service Delivery	Cairns Regional Council, Spence St
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4.	Coordinator Strategic Asset Management & Planning – Water & Resource Recovery	Cairns Regional Council, Spence St
5.	Process & Treatment Coordinator	Cairns Regional Council, Freshwater Creek Water Treatment Plant
6.	Process Engineer Water	Cairns Regional Council, Freshwater Creek Water Treatment Plant
7.	Coordinator Water Reticulation	Cairns Regional Council, Magazine St
8.	Caretaker Copperlode Falls Dam	Copperlode Falls Dam Office
9.	Team Leader Water Treatment	Cairns Regional Council, Freshwater Creek Water Treatment Plant
10.	Executive Manager Business Performance & Compliance	Cairns Regional Council, Spence St
11.	Team Leader Quality & Compliance	Cairns Regional Council, Spence St
12.	Quality & Dam Safety Systems Officer	Cairns Regional Council, Spence St
13.	Director Cairns Infrastructure & Assets	Cairns Regional Council, Spence St
14.	Chief Executive Officer	Cairns Regional Council, Spence St
15.	Local Disaster Coordinator of Local Disaster Management Group - Cairns Region	Cairns Regional Council, Local Disaster Centre
16.	Chair of Local Disaster Management Group – Cairns Region	Cairns Regional Council, Local Disaster Centre
17.	Executive Manager Marketing & Communications	Cairns Regional Council, Spence St
18.	Media Coordinator	Cairns Regional Council, Spence St
19.	Marketing & Communication Account Manager	Cairns Regional Council, Spence St
20.	Associate Director Engineering Services	Cairns Regional Council, Spence St
21.	Executive Manager Strategic Asset Management and Planning	Cairns Regional Council, Spence St

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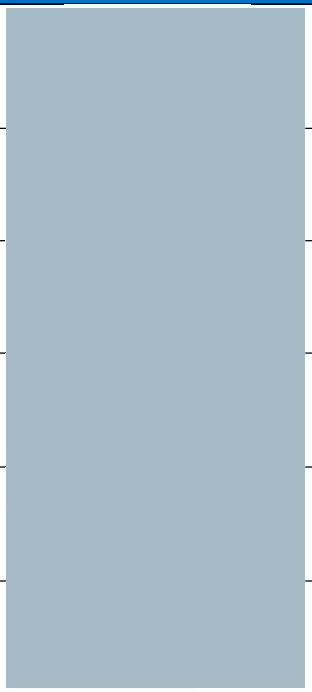
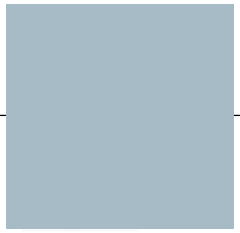
Counter Terrorism Inspector		Queensland Police Service, Cairns
Emergency Management Coordinator QFES		Queensland Fire and Emergency Service, Cairns
Division 6 Councillor		Cairns Regional Council, Spence St

Document Revision Status

Revision Number	Date	Revision Description
0	2013	Draft for LDMG perusal. DM number 4074886
1	2013	LDMG suggestions and GM, CEO approval
2	2014	Review and updates
3	2015	Review by Quality Systems Analyst
6	2016	Review and updates for 2016 by Quality and Compliance Coordinator
7	2017	Review and updates by Quality & Compliance Officer
8	2017	Annual review and update by Quality & Systems Analyst
9	2018	Revision based on external review of EAP following activation in March 2018. New DM number issued 5839418
10	2020	Revision based on outcomes of exercise 2019 and to ensure currency November 2019. New DM number issued 6413959.
11	2021	Revision to address DNRME Notice and 2020 EAP scenario recommendations. Updated format as per RDMW EAP guidelines.
12	2022	Revision to address stakeholder feedback and 2021 scenario recommendations.
13	2023	Revision to incorporate Australian Warning System (AWS) flood warning requirements.
14	2024	Revision to update PAR information and maps

Endorsement Table

This document has been prepared by the Dam Operator Cairns Regional Council, Cairns Infrastructure and Assets Department in consultation with the Dam Owner as well as key disaster and local government personnel. This revision has been endorsed by the following personnel:

Position	Date Endorsed	Print Name	Signed
Director Cairns Infrastructure and Assets Cairns Regional Council	20/06/2024		
Associate Director Service Delivery Cairns Regional Council	17/06/2024		
Associate Director Engineering Services Cairns Regional Council	17/06/2024		
Executive Manager Utility Services Cairns Regional Council	17/06/2024		
Executive Manager Strategic Asset Management & Planning Cairns Regional Council	25/06/2024		
Executive Manager Business Performance and Compliance Cairns Regional Council	19/06/2024		
Pursuant** to section 352HB Water Legislation (Dam Safety) Amendment Act 2017 – the local government has reviewed this Emergency Action Plan and considers it consistent with **Cairns Regional Council's Disaster Management Plan			
Chair Local Disaster Management Group – Cairns Region	01/07/2024		
A/Chief Executive Officer *on behalf of* Cairns Regional Council	01/07/2024		

1 Abbreviations and Definitions

1.1 Abbreviations and acronyms

Abbreviation	Full Form
AEP	Annual Exceedance Probability
AFC	Acceptable Flood Capacity
AHD	Australian Height Datum
AMTD	Adopted Middle Thread Distance
AWS	Australian Warning System
BAU	Business as Usual
BoM	Bureau of Meteorology
BPC	Business Performance & Compliance Branch
CCTV	Closed Circuit Television
CEO	Chief Executive Officer, Cairns Regional Council
CFD	Copperlode Falls Dam ("the dam")
CIA	Cairns Infrastructure and Assets, Cairns Regional Council
CRC	Cairns Regional Council ("Council")
DCL	Dam Crest Level
DDMG	District Disaster Management Group
DEC	Dam Emergency Controller
DECC	Dam Emergency Compliance Coordinator
DEIO	Dam Emergency Intelligence Officer
DEO	Dam Emergency Observer
DRDMW	Department of Regional Development, Manufacturing and Water
DSR	Dam Safety Regulator
DTA	Dam Technical Advisor
EA	Emergency Alerts
EAP	Emergency Action Plan
ECO	Emergency Control Organisation
EER	Emergency Event Report
EL	Elevation Level
EWS	Early Warning System
FIA	Failure Impact Assessment
FSL	Full Supply Level
GUARDIAN IMS	Guardian Incident Management System
IGEM	Inspector-General Emergency Management
LDC	Local Disaster Coordinator
LDCC	Local Disaster Coordination Centre
LDMG-CR	Local Disaster Management Group – Cairns Region
LDMP	Local Disaster Management Plan
LDMP-CR	Local Disaster Management Plan – Cairns Region
NEAS	National Emergency Alert System
O&M Manual	Operation and Maintenance Manual
PAR	Population at Risk
PMF	Probable Maximum Flood
QDMA	Queensland Disaster Management Arrangements
QPS	Queensland Police Service
SCADA	Supervisory Control and Data Acquisition

Abbreviation	Full Form
SDCC	State Disaster Coordination Centre
SDF	Sunny Day Failure
SitRep	Situation Report
SMS	Short Message Service (“text message”)
UHF	Ultra-High Frequency (Radio)
VMR	Virtual Meeting Room

1.2 Business terms and definitions

The meaning of terms used in this section are in accordance with the *Water Supply (Safety and Reliability) Act 2008* (the Act), the Queensland Disaster Management Guidelines and the Emergency Action Plan for Referable Dam Guideline.

Term	Definition
Activation levels	This Emergency Action Plan is activated using an escalation model based on the following levels. The movement through these levels 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 Local Disaster Management Groups or District Disaster Management Groups.
	Alert A heightened level of vigilance due to the possibility of an event occurring. No further action may be required; however, the situation should be monitored by someone capable of assessing the potential of the threat. Moving to an Alert level indicates the Dam Owner is getting ready to activate the Lean Forward level of the Emergency Action Plan if the situation deteriorates. The Emergency Control Organisation is stood up.
	Lean Forward An operational state characterised by a heightened level of situational awareness of an impending disaster event and a state of operational readiness. Local Disaster Coordination Centre on standby and prepared but not activated.
	Stand Up The operational state where resources are mobilised, personnel are activated, and operational activities commenced. Local Disaster Coordination Centre activated. The Dam Owner needs to provide an Emergency Event Report 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.
Australian Warning System	The AWS is a national approach to information and warnings for hazards like bushfire, flood, storm, cyclone, extreme heat, and severe weather. The requirements of the AWS are nationally consistent.
Bureau of Meteorology (BoM) 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

Term	Definition
	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 failure	The physical collapse of all or part of a dam, or the uncontrolled release of any of its contents.
Dam hazard	Means a reasonably foreseeable situation or condition that may: • cause or contribute to the failure of the dam, if the failure may cause harm to persons or property, OR • require an automatic or controlled release of water from the dam, if the release of the water may cause harm to persons or property
Dam hazard event	Means an event arising from a *dam hazard* if: • persons or property may be harmed because of the event, AND • a coordinated response, involving two or more of the following *relevant entities*, is unlikely to be required; each *local group* and *district group* for the EAP, each local government whose area may be affected, the Chief Executive, another entity the owner of the dam considers appropriate, AND • the event is not an *emergency event*
District group (DDMG)	District Disaster Management Group - for an EAP, means a district group established under the *Queensland Disaster Management Act 2003* section 22 whose disaster district under this 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 *Queensland Disaster Management Act 2003*, 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 (LDMG - CR)	Local Disaster Management Group – Cairns Region - for an EAP, means a local group established under the *Queensland Disaster Management Act 2003* section 29 whose local government area could, under the plan, be affected by a *dam hazard*.
Population at Risk (PAR)	Persons at dwellings or other places where people congregate for extended periods that, as a result of a dam failure event, are impacted by flooding or increased flooding.
Probable Maximum Flood (PMF)	The theoretical greatest depth of precipitation for a given duration that is, based on meteorological methods of maximisation, physically possible over a particular catchment area.
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.

Term	Definition
	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 (FIA) 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; for example, the owners of parcels of farmland adjacent to the dam or residents of a township. • each local group and district group for the EAP • each local government whose local government area may be affected if a *dam hazard event* or *emergency event* were to happen. • the Chief Executive • another entity the owner of the dam considers appropriate, e.g., the Queensland Police Service (QPS)
Sunny Day Failure (SDF)	The failure of a dam without any other general flooding or spillway discharges.

2 Introduction

2.1 Context / Background

Under the *Water Supply (Safety & Reliability) Act 2008* (the Act), the owner of a referable dam must have an approved Emergency Action Plan (EAP) for the dam. A dam is referable if a Failure Impact Assessment (FIA) has been carried out and demonstrates that two or more people would be put at risk if it were to fail.

As such, the Copperlode Falls Dam (CFD, "the dam") EAP, this document, has been prepared in accordance with chapter 4 of the Act, the *Queensland State Disaster Management Plan 2023*, and the Emergency Action Plan for Referable Dam Guideline 2023. 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 governments whose areas may be affected by a dam hazard for this Dam, have been determined as Cairns Regional Council **LDMG.** The Dam Owner has provided the LDMG 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 this Dam is Cairns **DDMG**. The Dam Owner has provided the DDMG with a copy of the draft EAP for review.

2.2 Purpose

The purpose of this EAP is:

- to capture and articulate emergency actions taken by the Dam Operator and the Emergency Control Organisation (ECO) personnel in identifying and responding to dam hazards and notifying relevant entities; and
- to minimise where possible, the risk of harm to persons or property if a dam hazard event or emergency event for the dam occurs; and
- to identify dam hazards that could occur at CFD and the area likely to be affected for each hazard.

It is possible for more than one dam hazard to exist at CFD 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 CFD and the communication and notification of dam hazards to the Local Disaster Management Group – Cairns Region (LDMG - CR), the District Disaster Management Group (DDMG) and the broader community. However, it should be acknowledged that the EAP sits within the broader emergency response framework and has been developed to be consistent with the LDMG Cairns Region Local Disaster Management Plan (LDMP-CR).

2.3 Scope

The scope of this EAP covers:

- dam hazards,
- description and details of the dam that are relevant to a dam hazard,
- identification of circumstances that indicates a material increase in the likelihood of a dam hazard event or emergency event,
- triggers for activation of a tiered response to a dam hazard event or emergency event,
- roles and responsibilities in responding to a dam hazard event or emergency event,
- outline of business as usual (BAU) resourcing,
- notification, warning, and communication protocols,
- inspection, monitoring, and reporting protocols during emergencies, and
- identification of the area likely to be affected by a dam hazard.

2.4 Training and Exercises

All staff with responsibilities under this EAP are to undergo training at various times throughout the year. This is to ensure that EAP activation triggers and roles and responsibilities are known and understood, namely:

1. How notification, assessment and activation will occur,
2. What facilities and resources will be used,
3. How the team will function and communicate during an event,
4. What key decisions each role may need to make, and
5. Awareness of the complexities associated with managing a crisis.

EAP exercises are conducted annually and are facilitated by the Executive Manager Business Performance and Compliance (BPC) with assistance from the Local Disaster Coordinator (LDC) to engage with the LDMG.

The BPC branch of Cairns Regional Council (CRC, "Council") will also initiate additional training activities to further support the ECO members, such as Queensland Disaster Management Arrangement (QDMA) training, Dam Safety Training, and training sessions in the incident management and communication tools used during a dam emergency.

When training is provided, attendance records are maintained within individual employee Human Resources files and branch-specific skills and training matrices. Table 1 outlines the minimum training required to undertake EAP tasks for ECO members and selected key staff. Where ECO members are appointed prior to completing training, those members will be provided with internal awareness training and scheduled for the next available formal training session.

Table 1: Dam Safety Training Matrix

Training Requirement	Who
Queensland Disaster Management Arrangements Training (every 3 years)	ECO members Personnel who provide support to the ECO during a dam
Dam Safety Surveillance Training (every 5 years)	ECO members Water Treatment Plant Operators (who undertake dam inspections) CFD Caretaker(s)
EAP training (upon commencement of relevant role and at least annually thereafter)	ECO members Personnel who provide support to the ECO during a dam emergency
EAP exercise participation (annually)	ECO members Personnel who provide support to the ECO during a dam emergency
Internal Communications Platform training (at least annually)	ECO members Personnel who provide support to the ECO during a dam emergency
Whispir (at least annually)	ECO members Personnel who provide support to the ECO during a dam emergency
Fatigue Management Guideline (#5660790)	ECO members Personnel who provide support to the ECO during a dam emergency

3 Roles and Responsibilities

3.1 Normal Operations - Business as Usual

3.1.1 Key Roles and Responsibilities

Roles and Responsibilities	Position Holder
Council / Dam Owner Councils have legislated local government functions, as per section 80 of *Queensland Disaster Management Act 2003.* Functions under this Act include: • Ensure it has a disaster response capability, • Approve its local disaster management plan (LDMP), • Ensure information about an event or a disaster in its area is promptly given to the DDMG for the relevant disaster district, • Perform other functions given to the local government, • As per section 352HB of the Act, assess the EAP (in consultation with its LDMG) for consistency with the LDMP.	Cairns Regional Council – Office of the CEO / Disaster Management Unit
Dam Operator • Develop and maintain an EAP. • Respond in accordance with the approved EAP in all dam related emergencies. • Review and seek approval for updated EAPs as required, to ensure it remains current and includes up to date contact details for relevant parties. • Distribution of current approved EAP to all parties identified in the distribution list. • Regular on-site monitoring and visual inspection of the conditions at the dam. The Dam Operator is responsible for conducting a safety evaluation of the dam and to identify any deficiency in the dam's safety. Where deficiencies exist, the Dam Operator is required to take appropriate steps to minimise the potential risk of dam failure from those deficiencies. • Ensure notification contacts lists remain current. • Where applicable, make appropriate dam safety related decisions based on advice from an experienced and suitably qualified dams engineer. The Dam Owner is also responsible for authorising immediate expenditure so that urgent repair work will not be delayed. • Report incidents and failures at the dam to the Dam Safety Regulator (DSR) in accordance with the EAP. • Activate the EAP and maintain an incident log when an emergency condition is identified at the dam. • Periodic testing of EAP. • Prepare an EER and submit to the DSR within 30 business days after the end of the emergency event. • Ensure a debrief is undertaken to capture any learnings from the emergency event. • During an event, ensure the status of the dam is reported in accordance with the EAP. • Ensure adequate resources are allocated in order to meet Dam Safety regulations and to respond to a dam emergency. • Actively participate in LDMG meetings and disseminate relevant information regarding dam emergency response as appropriate. • Manage water security objectives and activate contingency plans if necessary.	Director Cairns Infrastructure & Assets (CIA) The Dam Owner has nominated the Director Dam Safety as the Standby Operator
Disaster Management Groups/Personnel **LDMG** • As per Inspector-General Emergency Management (IGEM) review recommendation, work together with the Dam Owner and Council to ensure community education around messaging and impacts of EAP related events is undertaken and continually improved.	LDMG DDMG

Roles and Responsibilities	Position Holder
• Work with Council and Dam Owner 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. Council will activate the EAP for safety events unique to the dam. • During a dam hazard event that reaches Stand Up activation level, the LDMG in the affected local government area will take the lead role in notifying the broader community. • Identify and provide advice to the relevant DDMG about support services required by the LDMG to manage an EAP event. • Provide reports and make recommendations to the relevant DDMG about EAP event matters. • Establish and maintain user profiles within the Guardian Incident Management System (GUARDIAN IMS). • Participate in ECO training and exercises. • Conduct annual reviews of Emergency Alerts (EA) polygons/EA request forms. • Send EA Polygons/EA request forms to the State Disaster Coordination Centre (SDCC) Watch Desk, to ensure these have been uploaded in their system prior to wet/cyclone season. • Work with Dam Owner and Dam Operator and LDMGs to ensure EA polygons and EA Request Forms are prepared, stored, and tested at the SDCC Watch Desk. **DDMG** • May review the EAP for consistency with the District Disaster Management Plan.	
Dam Safety Regulator • Liaise with relevant Minister on necessary actions. • Approve this EAP document as required under legislation. • Liaise with Chief Executive as required in administering (regulating) the Act.	DRDMW
Dam Engineer – Dam Technical Advisor (DTA) • Maintain current Registered Professional Engineer of Queensland accreditation and specialisation in dam safety engineering. • Provide structural and hydrological advice with respect to a dam hazard or dam emergency event when requested. • Record communications and provide to CRC as required. • The Dam Safety Section at RDMW can be contacted for dam expert advice if required.	Consultant / DRDMW

3.1.2 Dam Operator Nominal Role (BAU) Responsibilities

Roles and Responsibilities
Associate Director Service Delivery • Ensure the dam is operated and maintained to meet regulatory compliance and provide detail to the Dam Operator.
Associate Director Engineering Services • Ensure dam safety inspections are undertaken in accordance with Dam Safety Conditions. • Deliver capital work projects to maintain the safety of the dam and associated structures. • Ensure a formal agreement with the DTA is in place and up to date to request advice at short notice when required. • Maintain a current Dam Data Book.
Executive Manager Business Performance and Compliance • Provide adequate operational resources to respond to a dam emergency. • Coordinate collaboration with local and district disaster management groups and other entities regarding EAP review and communication with Persons at Risk (PAR). • Ensure support and resourcing is provided for all EAP related training and exercise requirements.

Roles and Responsibilities
• Ensure this plan is reviewed in accordance with statutory timelines. • Ensure procedures are available and up to date. • Ensure adequate training opportunities are provided. • Ensure contacts lists are checked and updated annually and upon any changes to the ECO. • Ensure that CIA collaborates with LDMG to plan for management of assembled people during Sunny Day Failure (SDF) events. • Consult with Marketing and Communications to ensure communication to identified PAR and the broader Cairns community of CRC educational information for CFD, its risks, and associated dam emergency arrangements. • Manage regulatory compliance. • Maintain the Internal Communications Platform.
Executive Manager Utility Services • Provide adequate operational resources to respond to a dam emergency. • Provide resources to support maintenance of dam assets. • Actively participate in LDMG meetings and disseminate relevant information regarding dam emergency response as appropriate. • Maintain current Standard Operating Procedures and detailed Operating and Maintenance (O&M) Manuals. • Regular on-site monitoring and visual inspection of the conditions at the dam. The Dam Operator is responsible for conducting a safety evaluation of the dam and to identify any deficiency in the dam's safety. Where deficiencies exist, the Dam Operator is required to take appropriate steps to minimise the potential risk of dam failure from these deficiencies.
Executive Manager Asset Services • Provide adequate operational resources to respond to a dam emergency. • Liaise with CRC Departments to ensure Early Warning System (EWS) infrastructure is maintained and tested in accordance with technical requirements. • Ensure adequate maintenance of dam assets.

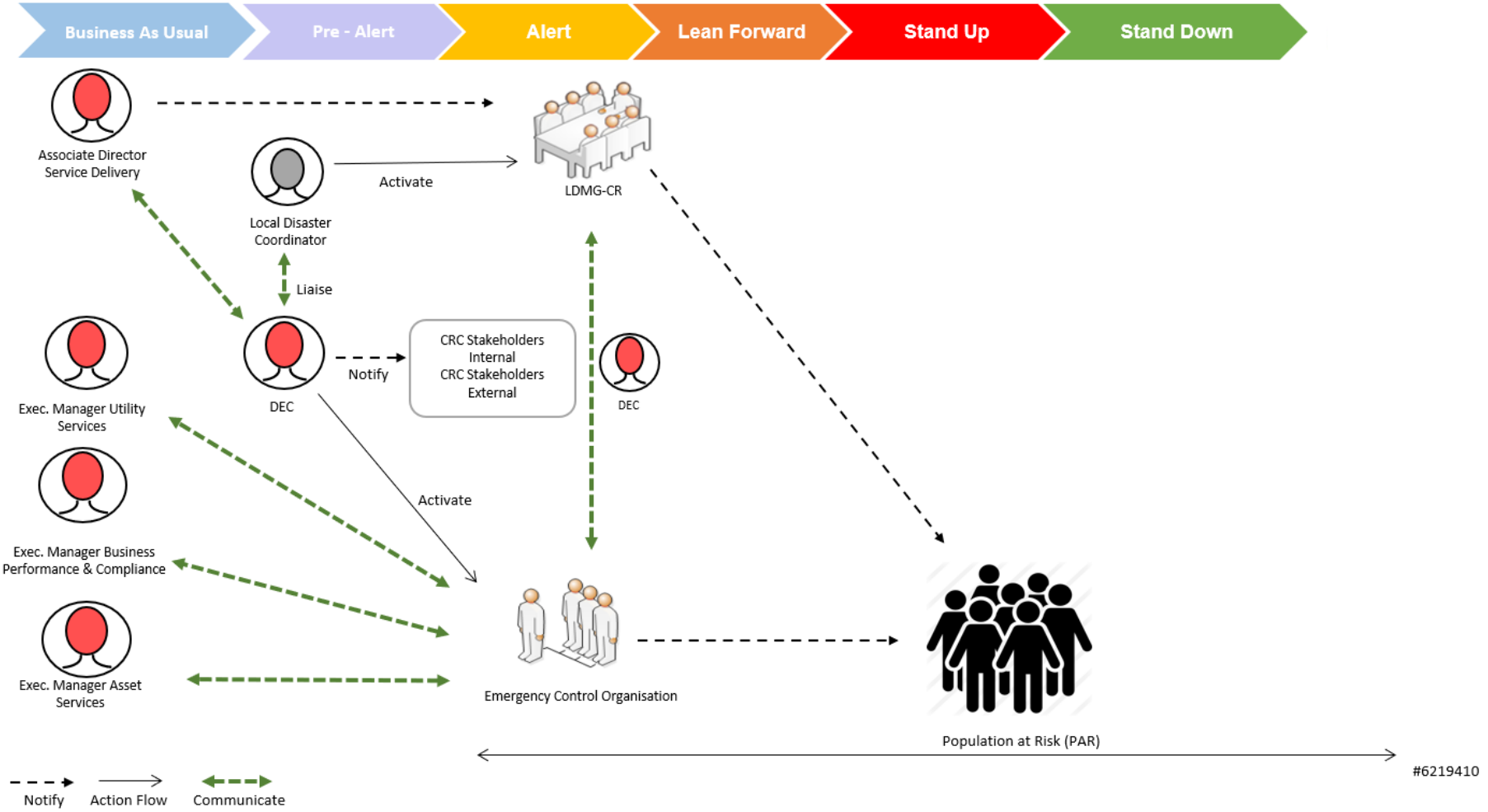
3.2 Dam Emergency Roles

CRC has an emergency response framework for CFD. Figure 1 has been developed to ensure the Dam Operator has a clear understanding of the role they undertake and understands the role of those support agencies available to engage the LDMG resources during a dam emergency. The framework is aligned to disaster management principles and emergency management standards.

3.2.1 Dam Emergency Control Organisation (ECO)

An Emergency Control Organisation (ECO) has been established to monitor, assess, and report on the condition of CFD during a dam hazard or dam emergency event. The ECO consists of four (4) roles; the responsibilities of each are outlined in Section 3.2.2. ECO role holders are identified below, as are alternate holders of each role for contingency backup purposes. The positions and names contained within these sections are correct at the time of approval, however for the most up-to-date contact details refer to Appendix I. The ECO works closely with the LDMG and CRC management to ensure coordination of response, effective use of resources, and provision of information during an emergency event.

Figure 1: Copperlode Falls Dam Emergency Response Framework



3.2.2 Roles and Responsibilities for CRC Including ECO During a Dam Emergency

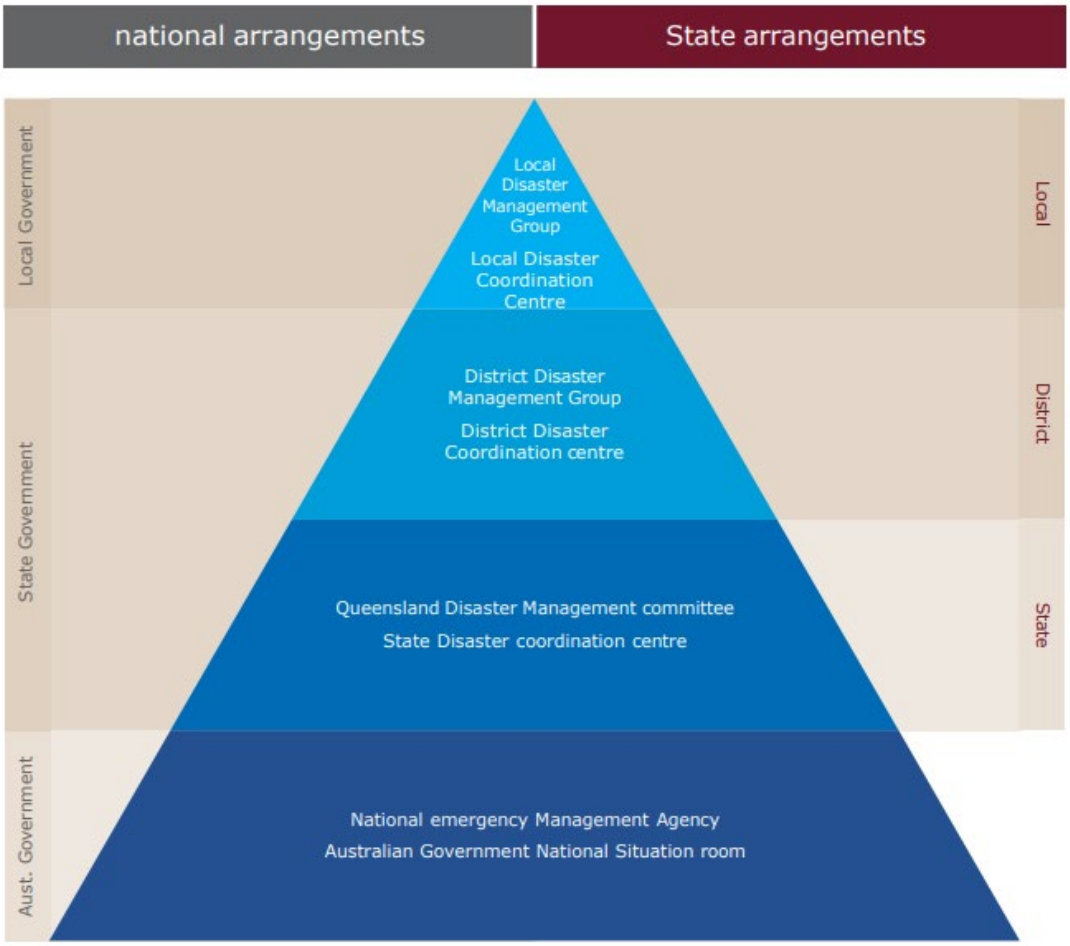
Roles and Responsibilities	Position Holders
Director Cairns Infrastructure and Assets • Engage the EWS (sirens) if required. • Provide event interface between CRC Executive Leadership Team and the ECO. • Ensure all ECO roles are fulfilled to respond to an event.	
Associate Director Service Delivery • Engage the EWS (sirens) if required. • Provide expert advice and technical support to LDMG. • Stay abreast of PAR evacuation status from LDMG and advise ECO accordingly. • Provide support to ECO in preparing the EER within regulatory timeframes. • Ensure timely and accurate notifications to all parties mentioned in the notification list in the event of a dam emergency. • Continuously report the status of the dam and the event in accordance with the EAP.	
Associate Director Engineering Services • Ensure all dam safety engineering functions applicable to the emergency event are provided. • Provide expert advice on dam safety engineering aspects of emergency response. • Liaise with the Associate Director Service Delivery on emergency operations.	
Executive Manager Business Performance and Compliance • Provide support to ECO during a dam emergency, taking into consideration CRC's Fatigue Management Policy. • Provide support to ECO in preparing the EER within regulatory timeframes.	
Executive Manager Marketing & Communications • Prepare and distribute information to PAR (on request of the ECO or LDC) using available platforms, including Whispir. • Prepare and distribute information to broader Cairns community (on request of the ECO or LDC) using available platforms, including Whispir. • Prepare and distribute information to the media and facilitate media requests. • Maintain Council's digital platforms with the latest dam emergency information.	
Dam Emergency Controller (DEC) • Lead the ECO during a dam emergency event. • Dial "000" if dam failure imminent and immediate. • Engage the EWS (sirens) if required. • Co-ordinate notifications of PAR with the LDMG. • Specific tasks as per actions tables in sections 6 -11.	Executive Manager Utility Services Coordinator Strategic Asset Management & Planning – Water & Resource Recovery Executive Manager Strategic Asset Management & Planning Associate Director Service Delivery
Dam Emergency Intelligence Officer (DEIO) • Assist the DEC in the management of the response to a dam emergency event and manage communications with the Dam Emergency Observer (DEO). • Engage the EWS (sirens) if required. • Specific tasks as per actions tables in sections 6 -11.	Process and Treatment Coordinator Process Engineer Water Coordinator Water Reticulation
Dam Emergency Observer (DEO) • Monitor and report on the condition of the dam and manage access to the CFD area during a dam emergency event. • Engage the EWS (sirens) if required. • Specific tasks as per actions tables in sections 6 -11.	CFD Caretaker 1 CFD Caretaker 2 Water Treatment Plant Operator
Dam Emergency Compliance Coordinator (DECC) • Assist the DEC to meet all internal and external compliance obligations and provide requested support to DEC and DEIO. • Specific tasks as per actions tables in sections 6 -11.	Executive Manager Business Performance and Compliance Team Leader Quality and Compliance Quality and Dam Safety Systems Officer

3.2.3 Other Agency Roles and Responsibilities During Dam Emergency

While the Dam Operator and ECO undertake specific dam emergency related actions, CRC acknowledges that a co-ordinated response to any emergency, whether dam related or not, serves to provide the highest level of structure. CRC therefore follows the Queensland Disaster Management Structure as per Figure 2.

Roles and Responsibilities	Position Holder
Local Disaster Coordinator **Role:** • Activate the LDMG to act on reports from the ECO during a dam hazard or emergency event. **Responsibilities:** • Liaise with DEC to ensure the prompt set up of an Operation in GUARDIAN IMS, • Initiate an extraordinary meeting of the LDMG Executive when notified that the dam EAP has been activated, • Brief the LDMG Executive on the situation, • Activate relevant LDMP sub-plans, • Activate the Local Disaster Coordination Centre (LDCC), and • Once the LDMG has been activated, the responsibilities of the LDC are in accordance with the LDC operational checklist and the approved LDMP-CR.	
Local Disaster Management Group – Cairns Region **Role:** • Once the LDMG has been activated, coordinate the response and recovery actions and joint agency responses during a dam emergency event. **Responsibilities:** • Activate LDMG when requested by DEC (if concurrent flooding has not already resulted in the activation of the LDMG), • Communication with PAR and the broader Cairns community during a dam emergency, • Undertake strategic decision making to assess the requirement to evacuate PAR, • Issue voluntary evacuation advice to PAR, • Request directed evacuation through the DDMG Cairns, and • Manage the recovery of PAR (voluntary and directed).	Chair - Deputy Chair
Queensland Police Service (QPS) Manage the situation based on local operational procedures and LDMP, including but not limited to: • Conduct emergency operations, • Coordinate and support Dam Owner during a declared emergency at the dam, • Liaise with relevant organisations, • Evacuation of persons if required, • Control of essential traffic, and • Ensuring security of specific area.	Queensland Police Service – Northern Region

Figure 2: Queensland Disaster Management Structure



4 Copperlode Falls Dam Details

4.1 General Dam Details

Location:

CFD is located at AMTD 22.7km on Freshwater Creek, southwest of Cairns in a 12.8km direct line, see Figure 3. Freshwater Creek is a tributary of the Barron River (confluence at AMTD 12.2km on the Barron River). AMTD is defined as the distance in kilometres, measured along the middle of a watercourse that a specific point in the watercourse is from the watercourse's mouth or junction with the main watercourse.

Access:

- Primary road access to CFD is via Lake Morris Road, travel distance of approximately 22.9km from the city of Cairns.
- Secondary four-wheel-drive only access is via Clohesy River Road, turning off Kennedy Highway at Koah, travel distance 19.3km. NOTE: Clohesy River Road may be impassable following heavy rain.
- In times of extreme emergency, or if all access points are blocked, the dam can be accessed by helicopter when weather conditions allow.
- A walking track from Crystal Cascades to CFD may also be used if deemed appropriate.

See Appendix A for location details of each access option.

Catchment:

The dam is the major water supply storage for the Cairns Region local government area. The dam provides releases to a diversion weir and intake on Freshwater Creek (AMTD 19.8 km). The catchment is bounded by the Davies Creek and Clohesy River catchments to the west, Mulgrave River catchment to the south, and coastal tributaries to the east.

Impoundment:

The impounded waterbody is known as Lake Morris.

Tributaries:

The major tributary is Freshwater Creek.

Construction:

Completed in 1976, CFD is a zoned earth embankment dam with an impervious clay core. It has an un-gated ogee spillway, located at the end of an approach channel away from the right abutment of the dam embankment.

A reinforced masonry wall was constructed along the dam crest in 1993 to prevent wave splash from overtopping the embankment in the event of extreme floods (referred to as the Wave Wall).

Specification:

CFD general specifications are presented as Table 2.

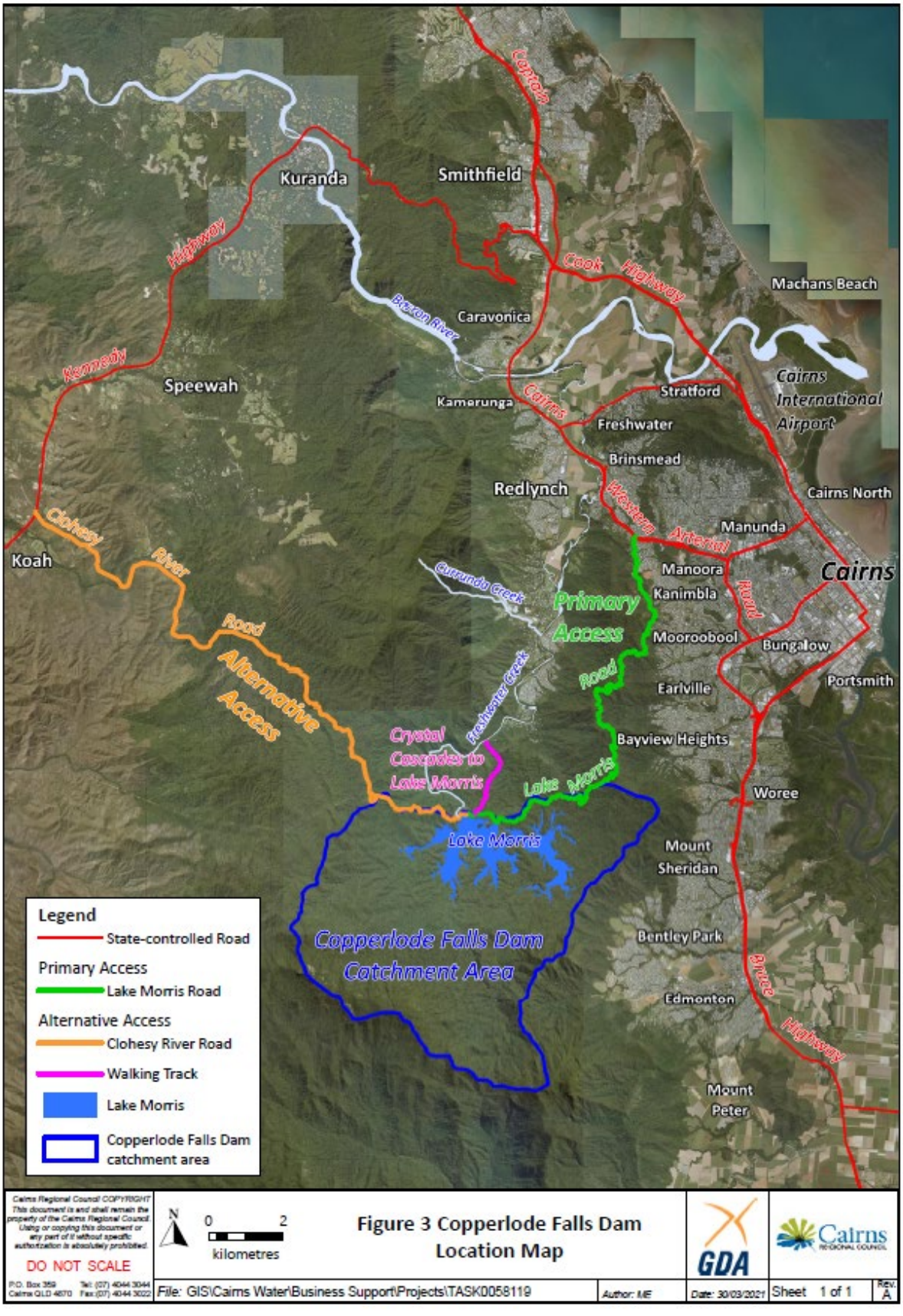
Table 2: Copperlode Falls Dam Specifications

Description	Specification
Full Storage Level	EL 397.732 m (0m above spillway crest)
Dam Crest Level	EL 403.84 m (6.11m above spillway crest)
Top of Wave Wall	EL 404.30 m (6.57m above spillway crest)
Dam height	45 m above foundation (approximately)
Dam length	121 m
Storage capacity at FSL	38,475 ML
Catchment area	44.38 km^2
Spillway type	Approach channel, concrete ogee with flip bucket discharging onto downstream rock channel
Spillway crest level	EL 397.732 m
Spillway capacity	774.6 m^3/s at DCL (66,960 ML/d) 873.4 m^3/s at Top of Wave Wall (76,637 ML/d)
Outlet description	Dry well multi-level intake tower leading to cut and cover conduit with outlet pipeline and downstream valve chamber with flow control valves
Outlet capacity	1.42 m^3/s (123 ML/d)

Table Notes: All levels are to Australian Height Datum, AHD.

See latest version of Dam Data Book for current specifications #5895790.

Figure 3: Copperlode Falls Dam Location Map



4.2 Population at Risk (PAR)

Based on the Dam Break assessment (GHD, 2023a) and the consequence assessment undertaken as part of the Preliminary Risk Assessment (GHD, 2023b) for CFD, the dam has been designated as an *Extreme* hazard dam. This is based on the PAR exceeding 1,000 and a *Catastrophic* severity of damage and loss.

The relevant failure scenarios for CFD are related to the main embankment and spillway. The following failure modes have been considered:

- Embankment – Sunny Day Failure (piping failure mode only – overtopping hazard is not relevant)
- Embankment – Flooding failure (piping as the most likely failure mode as the peak water levels are within the DCL)
- Embankment – Probable Maximum Flood (PMF) failure (overtopping failure)
- Spillway – Sliding failure at FSL
- Spillway – Sliding failure at Dam Crest Level

The PAR estimated considered both the property PAR as well as the Itinerant PAR from roads for all the failure modes considered in the dam break assessment. The largest breach flow resulting from these failure modes was found to be the 1 in 10,000 AEP piping failure scenario. A summary of the PAR estimates reported in the dam break report is provided below in Table 3.

Table 3: Summary of Population at Risk (PAR) (GHD, 2023b)

Emergency Event	Total PAR	Incremental PAR
Sunny Day Failure (SDF)	5,465	5,465
1 in 10,000 AEP flood failure	6,837	5,946
Probable Maximum Flood (PMF) failure	7,741	4,793

4.3 Community Awareness and Engagement

CRC, in conjunction with the LDMG and Disaster Management Unit, is committed to engaging with the Cairns community to increase public awareness and build community resilience around real and potential local hazards, through ongoing disaster education campaigns and projects.

Specific engagement to prepare PAR in the Redlynch Valley area for the unlikely event of a dam-related emergency includes raising awareness of and familiarisation with the community warnings systems used in Section 12.3; being the Cairns Disaster Dashboard, Cairns Alert, National Emergency Alert System, Australian Warning System (AWS), and EWS (sirens). Annual siren testing is communicated to PAR prior to the exercise using roadside corflutes and electronic variable messaging signage, local radio advertisements, and by direct mail out to residents, businesses, schools, and other priority stakeholders. Redlynch Central Shopping Centre and Crystal Cascades are staffed by Council employees during the exercise, to maximise community interaction and provide a conspicuous opportunity to discuss the community warning systems.

An Evacuation Guide which provides steps that persons in the affected area should be familiar with in case of an emergency situation has been developed through workshops and consultation. The guide applies to emergency situations relating to the failure of the dam wall which would require immediate evacuation of PAR downstream of the CFD. The Evacuation Guide:

- includes information regarding EWS and siren sounds that are activated in an emergency; and
- identifies areas of high risk downstream of CFD and details evacuation routes established for people affected by a dam failure; and
- is available on the Cairns Regional Council website, the link for which is contained in the yearly EWS testing mail out: CopperlodeDamEvacuationGuide (cairns.qld.gov.au); and
- is posted to households at least every five years.

4.4 Flood Adequacy

The Acceptable Flood Capacity (AFC) of CFD is the PMF. The dam break assessment (GHD, 2023a) estimated the peak water level for the PMF flood as EL 405.07 m, which is above the DCL and the wave wall level, EL 403.84 m and EL 404.3 m respectively. The peak discharge for the PMF flood event is approximately 1,062.4 m3/s and the spillway can currently safely approximately 774.6 m3/s, meaning that CFD has 73% compliance with AFC.

A 10-year upgrade plan project was first submitted to the DSR in 2022 outlining works to ensure CFD meets AFC requirements, being the PMF, by 2031. Annual progress reports will be submitted each year until the upgrade works have been completed. A spillway rating curve and table of hydrological data is available as Appendix B.

4.4.1 Historical Floods

Table 4 shows historical floods experienced at CFD – those that are 1.5m over spillway (Alert level for flooding).

Table 4: Copperlode Falls Dam Flood History

Flood Rank	Date	Peak Water Level (EL m AHD)	Peak Height (m) Over Spillway Crest
1	Jan 1979*	400.842	3.11
2	Dec 2023	400.431	2.69
3	Feb 1999	400.262	2.53
4	Mar 2018	400.142	2.41
5	Apr 2014	399.782	2.05
6	Feb 2000	399.612	1.88
7	Mar 2012	399.322	1.59
8	Feb 2000	399.272	1.54
9	Jan 2019	399.232	1.50

* Recorded by gauging station 110103A – Freshwater Creek at Lake Morris – operating from 28/01/1976 to 1/06/1996. Potential limitations in the accuracy and certainty of the record are noted with respect to the gauge datum, and station type and accuracy.

4.5 General Arrangement

The following drawings are located in Appendix C:

- Drawing No. 75410: General Arrangement of Dam (#6614539)
- Drawing No. 75411: Embankment Details (#6614553)
- Drawing No. 75423: Spillway – General Arrangement (#6614576)

4.6 Inspections and monitoring

As part of the Preliminary Risk Assessment of CFD (GHD, 2023b) annual probabilities of failure were estimated for the key failure modes:

- Spillway ogee crest sliding/overturning failure due to flooding – 7.59×10^{-6} (1 in 13.2 million)
- Embankment overtopping – 7.51×10^{-7} (1 in 1.3 million)
- Non overflow abutment sliding/overturning failure due to flooding – 6.56×10^{-7} (1 in 1.5 million)

Inspections and monitoring frequency have been determined based on the annual probability of dam failure, while considering the consequence category of the dam. Monitoring requirements are documented in the CFD O&M Manual, which contains detailed schedules. A fulltime caretaker is on site at CFD to carry out general maintenance duties, routine inspections, and surveillance monitoring. The following is applicable to CFD to

maintain the dam in a safe condition and detect any dam hazards as soon as a hazard begins to develop or becomes apparent.

4.6.1 Inspections

- Routine visual inspection - conducted as per routine surveillance by the Caretaker and Water Treatment Operators.
- Annual inspection - once every calendar year.
- Comprehensive inspection - conducted 5-yearly

4.6.2 Instrumentation and Monitoring

The following instrumentation and monitoring are applicable to CFD to confirm the structural behaviour and safety of the embankment and spillway. The location of instrumentation and monitoring equipment are detailed in Figure 4.

4.6.2.1 Settlement/movement measurement

To observe any physical movement occurring in the embankment that could lead to instability there are:

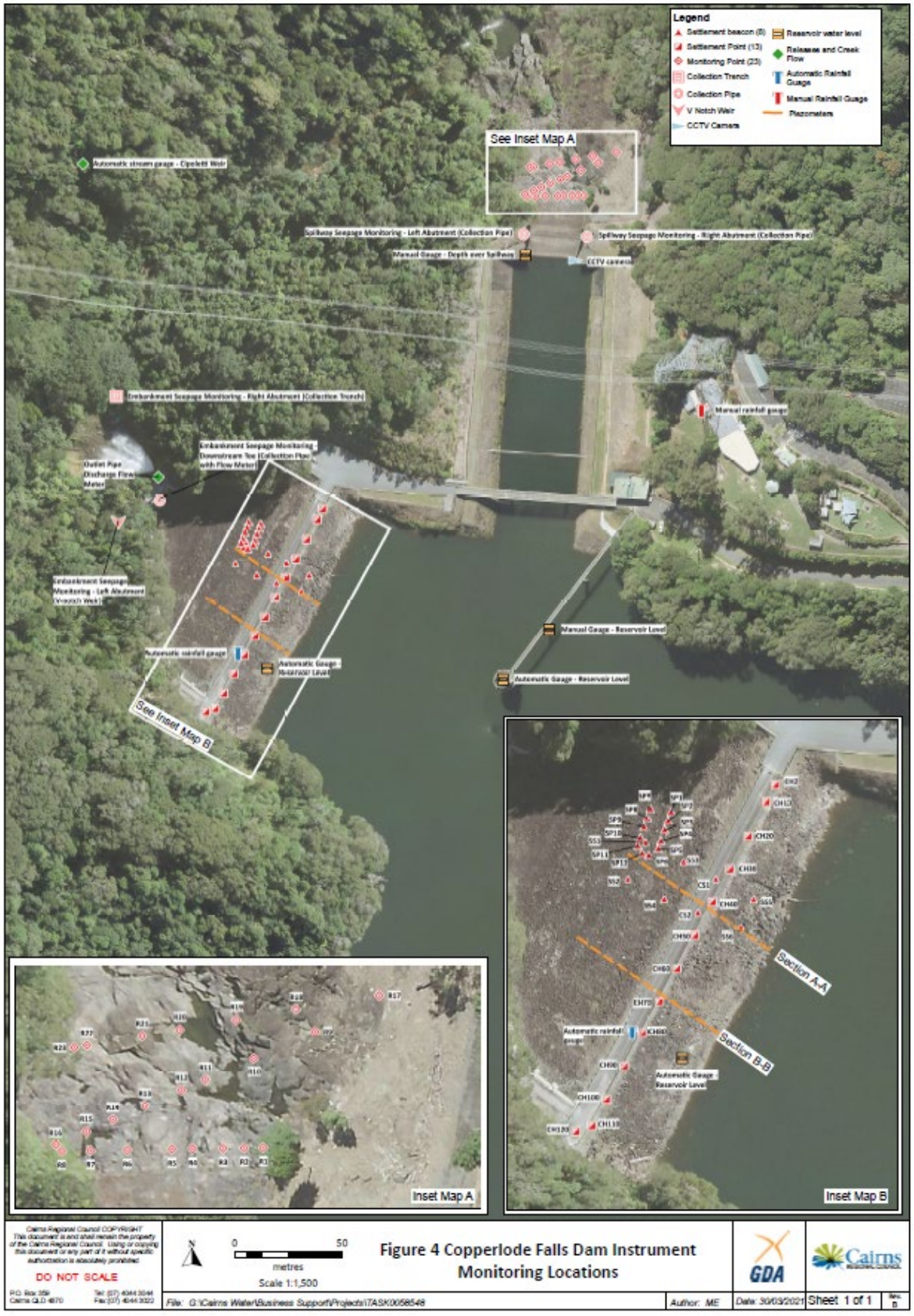
- Eight (8) settlement beacons installed at the time of construction on the upstream slope, crest, and downstream slope of the embankment.
- Thirteen (13) settlement points on the parapet wave wall from the right bank to the left bank.
- Twelve (12) star pickets grouted into the downstream embankment rock protection.
- Twenty-three (23) monitoring points along three (3) cross sections in the rock downstream of the spillway flip bucket. These monitoring points are surveyed annually or after a significant dam emergency event (when requested by Dam Engineer) by a qualified surveyor under direction of the Dam Engineer.

4.6.2.2 Seepage measurement

Water flow through the dam embankment is monitored to identify the start of piping failure. The following seepage measurement points are monitored:

- **V notch weir:** left abutment of the dam embankment, connected to and continuously monitored by Council's SCADA (Supervisory Control and Data Acquisition) telemetry network.
- **Collection pipe with flow meter:** toe of the downstream embankment, connected to and continuously monitored by Council's SCADA telemetry network.
- **Collection trench and pit:** right abutment of the dam embankment (manual depth).
- **Collection pipe:** left and right spillway abutment (manual volume vs time measurements).

Figure 4: Copperlode Falls Dam Instrument Monitoring Locations



4.6.2.3 Embankment soil pore pressure

Water pore pressure in the dam embankment is monitored by piezometers installed at the time of construction to identify the start of piping failure. Piezometers are located in the impervious core, zone 1 of the embankment, at two cross sections located at about 13 m and 39 m respectively to the left of the outlet conduit axis, Figure 5. The piezometers are connected to manual gauges from inside the dam wall via tubes, as well as automatic sensors that are connected to and continuously monitored by Council's SCADA telemetry network.

4.6.2.4 Spillway conditions

Remote visual monitoring of the spillway and embankment can be undertaken through the CCTV (closed circuit television) cameras, installed at the following locations:

- One (1) camera is positioned at the spillway right abutment wall to monitor conditions relevant to the spillway structure,
- Two (2) cameras are positioned at the entrance of the spillway approach channel, right hand side, to monitor conditions relevant to the upstream dam embankment, intake tower and spillway approach channel, and
- One (1) camera is positioned on the outlet valve house to monitor downstream embankment slope condition.

4.6.2.5 Reservoir water level

The reservoir level is primarily monitored through electronic level transmitters, with the data able to be accessed remotely. There are also manual gauge boards installed for visual observation if the level transmitters are unavailable. Device locations as follows:

Automatic gauges:

- One (1) located at the main embankment, connected to, and continuously monitored by, the Bureau of Meteorology's ALERT network.
- One (1) located at the outlet tower, connected to, and continuously monitored by, Council's SCADA telemetry network.

Manual gauges:

- One (1) gauge board located on a column supporting the bridge to the outlet tower, visible from the spillway bridge area and on Council's CCTV camera.
- One (1) gauge board located at the spillway (attached to the left wall), visible from the spillway right abutment wall and on Council's CCTV camera.

4.6.2.6 Rainfall

Rainfall is monitored and recorded at the dam using the following devices:

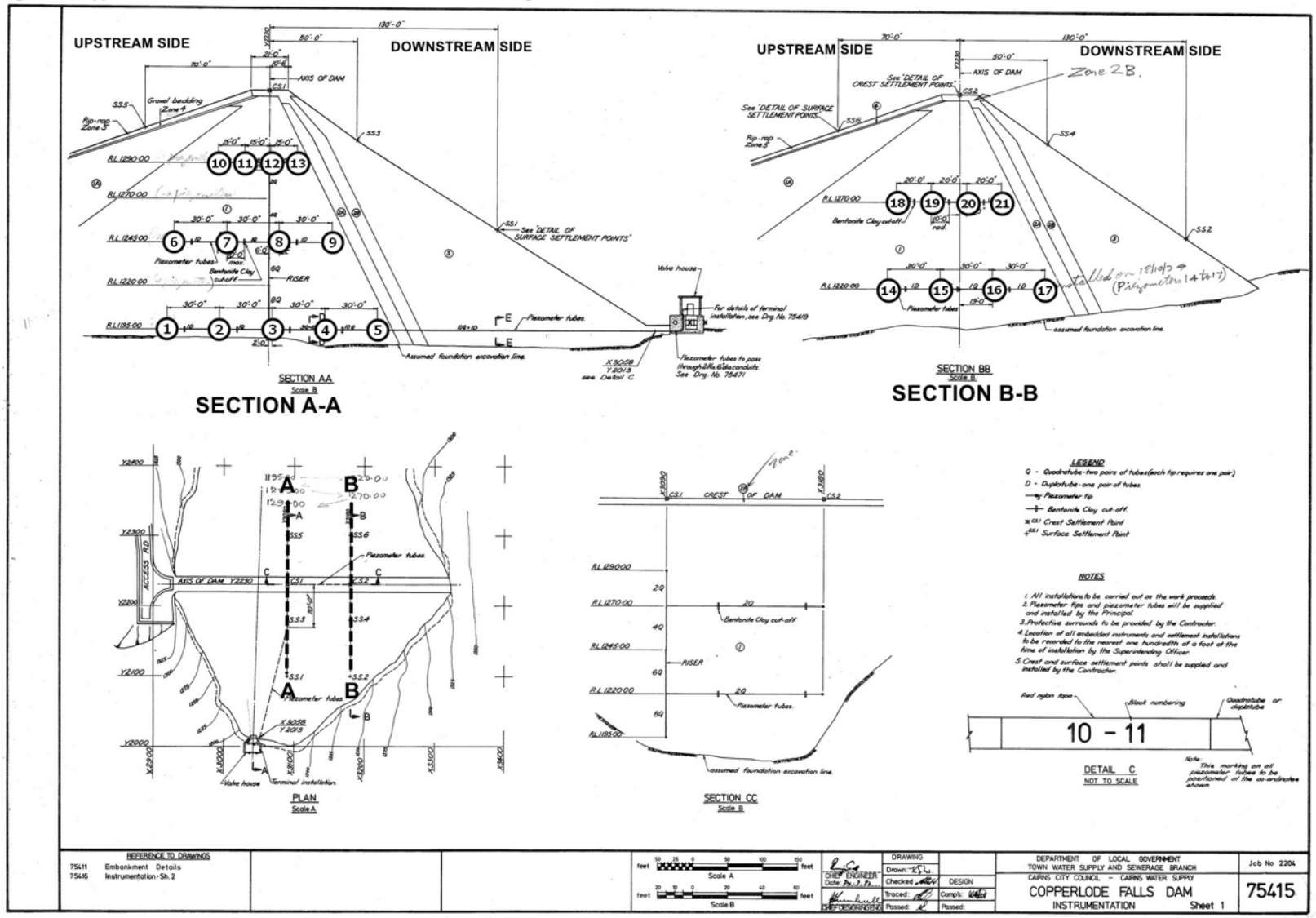
Automatic gauges:

- One (1) located on dam embankment crest, connected to, and continuously monitored by BoM's ALERT (station number 031205).
- One (1) located at the office/kiosk, connected to, and continuously monitored by Council's SCADA telemetry network.

Manual gauge:

- One (1) located at the office/kiosk.

Figure 5: Copperlode Falls Dam Piezometer Locations Diagram



4.6.2.7 Releases and Creek Flow

The outlet works are located on the right flank of the dam. They comprise a circular outlet tower containing a pipe stack, leading to a concrete conduit through the embankment, containing the outlet pipe to the downstream outlet works valve house. The pipe stack has nine (9) offtakes (numbered 2 at the bottom to 10 at the top) spaced relatively closely to allow draw off from the circulation zone in the reservoir or from the lower levels when required. A low-level scour outlet (Valve No 1) is non-operational due to current silt layer level. This scour may however be used in extenuating circumstances.

The outlet pipeline bifurcates at the valve house into twin pipes, each with a cone valve for flow control and energy dissipation. The cone valves are operated in a duty and standby arrangement with valve positions adjusted to regulate dam releases for environmental flow and the water treatment plant requirements. They can be operated remotely or manually.

The following instrumentation is used to monitor releases from the dam:

- One (1) flow meter, located on the outlet pipe to measure releases from the dam, connected to and continuously monitored by Council's SCADA telemetry network.
- Automatic level transmitter and rating curve. A rating curve is applied to the continuously recorded water level, measured at the following locations to derive, and record discharge in Council's SCADA telemetry network:
    - Outlet tower to derive the spillway discharge, and
    - Intake weir to derive total streamflow in Freshwater Creek at the town water supply intake weir, located approximately 2.9 km downstream from the dam embankment.

5 Dam Hazard Identification

The following hazard events may impact on the identified PAR and require activation of this EAP:

- Flooding failure (specifically, 1 in 10,000 AEP),
- Embankment Failure,
- Spillway Failure,
- Earthquakes and Landslides, or
- Terrorist or high energy impact (non-natural events), including deliberate, accidental or vandalism actions against the dam structure – malicious activity.

Other Emergency Situation:

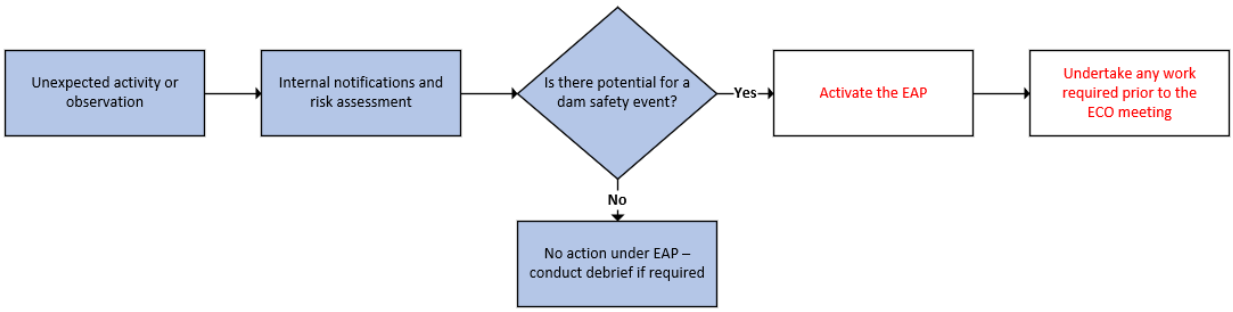
- Communication Failure

The emergency actions for each dam hazard are further explained in the next chapters, along with the associated communication protocols.

5.1 Escalation of Unusual Activity

In accordance with the *Queensland Dam Safety Management Guidelines (DRDMW, 2020)* threats to the safety of CFD, whether they are potential or confirmed threats, are escalated via internal notification protocols (further described in the O&M Manual). Risk should be appropriately assessed in consultation with the LDC and escalated in accordance with the EAP activation triggers. Each event is unique in circumstance and the ECO may elect to activate the EAP before triggers are reached if deemed necessary. Conversely, unexpected changes have been captured herein as "Pre-Alert" level. Pre-Alert actions are not themselves an activation of the EAP, however, may lead to its activation should the unexpected changes result in the activation triggers being met.

Figure 6: Escalation of Unusual Activity



6 Dam Hazard – Flooding

6.1 Overview

The emergency action described in this section relates to rainfall-derived inflows to the storage causing temporary water level rises that could result in the following flood conditions:

- Increased loads on the dam embankment and spillway structure and, therefore, an increased likelihood of a failure.
- Although unlikely, continuing water level rises leading to eventual overtopping of the dam crest and wave wall resulting in an increased likelihood of embankment failure.
- Rapidly increasing spillway discharges from the dam or spillway discharge levels greater than those that cause downstream flooding.

Previous rainfall events and hydrological assessments have demonstrated that concurrent flooding can occur in the Redlynch Valley due to runoff from the downstream catchment or tributaries that are unrelated to conditions at the spillway. Importantly, downstream flooding is therefore managed under separate arrangements by the LDMG that do not rely solely on being informed by spillway conditions. Nevertheless, as some downstream flood hazards could be informed by conditions at the spillway, water level triggers are incorporated into the activation levels to correlate with areas that could be affected. The areas that could be affected (or are already being affected, as noted earlier) by spillway discharges are described as:

- When the water level is at EL 399.73 m (2 m over the spillway), flows remain within the main channel of Freshwater Creek at Mary Parker Drive but are likely to have inundated the bridge crossing.
- When the water level is at EL 400.23 m (2.5 over the spillway), flows breach the right bank, but are yet to breach the left bank of Freshwater Creek at Mary Parker Drive. Some infrastructure along the right bank is likely to have been impacted by flood inundation, along with the Mary Parker Drive bridge.

The catchment of CFD and the downstream catchment are in the same valley, with similar topographical and land cover characteristics, a relatively small catchment area and similar flood causing rainfall drivers. Owing to these factors, the rainfall spatial variability is expected to be low. It is probable that the same flood-causing rainfall event could occur across the entire catchment. The dam break assessment (GHD, 2023a) did not consider the tailwater levels from the Barron River as it was assessed to have minimal influence on the hydraulic simulations of the flooding scenarios considered.

The areas affected by the dam hazard events lie along the valley of Freshwater Creek towards its confluence with the Barron River. A relatively low-lying area in the suburb of Brinsmead is affected by backwater flooding from Freshwater Creek with flows also overtopping the Cairns Western Arterial Road.

The areas affected consist of the following land uses:

- Residential land predominantly comprised of detached housing, but also attached housing such as townhouses, units, and a retirement/home care village,
- Schools (St Andrew's Catholic College and Freshwater Christian College),
- Commercial and light industrial land,
- Caravan parks (Cool Waters Holiday Park, BIG4 Cairns Crystal Cascades Holiday Park),
- Agricultural land for cane, with accompanying houses and sheds, and
- Recreational spaces such as community tennis courts, equestrian centre, and parks.

Flood maps have been developed to identify areas at risk due to dam failure subject to intermediate flooding scenarios and the PMF passing through the dam. The maps define the extent of flooding and categorise the maximum depths of inundation and the time to maximum depth.

The emergency events for which flood maps are provided are listed in Table 5.

Table 5: Inundation Flood Maps

Emergency Event	Map of Maximum Flood Depth	Map of Incremental PAR	Map of Incremental Flood Depth (Flood Afflux)
Sunny Day Failure	Map 1 Map 1a	Map 2 Map 2a	Map 1 Map 1a
1 in 10,000 AEP (piping failure)	Map 3 Map 3a	Map 4 Map 4a	Map 5 Map 5a
PMF (overtopping failure)	Map 6 Map 6a	Map 7 Map 7a	Map 8 Map 8a

Source: GHD, 2023a

The flood maps are complemented by maximum flood depth, depth-velocity, flood afflux as well as incremental PAR mapping for each flood scenario considered. Selected flood inundation maps are presented in Appendix D.

Limitations and accuracy

The flood inundation maps have been prepared using a one metre Digital Elevation Model with a vertical accuracy of +/- 0.4 m. The inundation limits for an actual dam failure may vary in some ways from what is shown on the inundation map.

A dam emergency event resulting from flooding, includes:

- Without dam breach failure, where unprecedented rainfall causes the dam to reach its absolute peak water level and associated peak discharge by overtopping of dam crest and spillway discharge; and
- With dam breach failure, where unprecedented rainfall causes the dam to reach its absolute peak and overtops the embankment damaging the dam wall quickly.

Table 6 outlines the EAP activation triggers, actions and communications during flood events.

Table 6: Dam Hazard – Flooding EAP Activation Triggers, Actions and Communications

Activation level	Alert	Lean Forward	Stand Up Level 1	Stand Up Level 2	Stand Down
Activation trigger	Storage at 1.5m above spillway crest and rising (EL 399.232m)	Storage at 2.2m above spillway crest (EL 399.932m)	Storage at 2.5m above spillway crest (EL 400.232m)	Storage at 3.11m above spillway crest (highest historical spillway level EL 400.842m)	Storage below 1.5m above the spillway crest and falling (EL 399.232m)
Actions NOTE: Changes to dam structure as a result of flooding may trigger emergency actions under Sections 7 & 8 of this EAP	**DEC** Send EAP notification to internal stakeholders using Whispir as per notifications template. Chair meeting with agenda: - Current situation and weather forecast - Assign ECO roles. - Confirm SitRep frequency (typically 12 hourly) - Confirm monitoring expectations and rostering. - Communication system status - Issue situation specific actions (road/site closure/dam access) - Confirm requirement to engage DTA. Within internal communications platform:	**DEC** As per previous activation level, AND Send EAP escalation notification to internal and external stakeholders using Whispir as per notifications template. Note: SitRep frequency typically 6 hourly	**DEC** As per previous activation level, AND Liaise with the LDC/LDMG regarding coordination of evacuation of PAR based on expected inundation (Appendix J) Liaise with DTA as required. Note: SitRep frequency typically 2 hourly	**DEC** As per previous activation level, AND Be prepared to activate EWS sirens if required.	**DEC** Send EAP Stand Down notification to internal and external stakeholders using Whispir as per notifications template. Within internal communications platform: - Close out previous incident and create Stand Down incident. - Create task for DEIO to prepare final SitRep - Review and issue final SitRep to LDMG Coordinate special inspection by DTA to check for damage and/or remedial work as necessary. Prepare Emergency Event Report (EER) if required (must be submitted within 30 business days) Return to routine activities.

Activation level	Alert	Lean Forward	Stand Up Level 1	Stand Up Level 2	Stand Down
NOTE: Changes to dam structure as a result of flooding may trigger emergency actions under Sections 7 & 8 of this EAP	- Set up Operation with relevant activation level status. - Create incident for current activation level tasks. - Create task for DEIO to prepare SitRep/s at agreed frequency. Review SitRep/s and determine if any additional actions are necessary. Issue SitRep to LDMG (if activated) Monitor weather advice and forecast for likelihood of escalation. **DEIO** Attend ECO meeting with: - Latest SCADA data (level, rainfall, piezos, comms status, flowrate) - Permit holder activity status - Operational staff availability	**DEIO** As per previous activation level	**DEIO** As per previous activation level	**DEIO** As per previous activation level	**DEIO** Complete and issue final SitRep to DEC Return to routine activities.

Activation level	Alert	Lean Forward	Stand Up Level 1	Stand Up Level 2	Stand Down
NOTE: Changes to dam structure as a result of flooding may trigger emergency actions under Sections 7 & 8 of this EAP	Complete and issue SitRep/s to DEC (see Appendix E for template) Monitor spillway level, rate of rise, rainfall and weather forecasts and liaise with DEC on potential changes to EAP activation level. **DEO** Attend ECO meeting with: - Latest dam site situational awareness - Public and permit holder status - Lake Morris and Clohesy River Road conditions Undertake dam inspection and continue daily unless otherwise directed by DEC or DEIO Provide updates from inspections to DEIO. Undertake site preparations as related to the emergency.	**DEO** As per previous activation level, AND Close Lake Morris recreational area and ensure safe departure of Permit Holders and Public	**DEO** As per previous activation level	**DEO** As per previous activation level	**DEO** Assist DEIO in completion of the final SitRep Return to routine activities.

Activation level	Alert	Lean Forward	Stand Up Level 1	Stand Up Level 2	Stand Down
	Assist DEIO with completion of SitRep/s Monitor spillway level, rate of rise, rainfall and weather forecasts and liaise with DEIO on potential changes to EAP activation level. **DECC** Attend ECO meeting. Record and circulate minutes. Draft and circulate ECO roster as required (Template #6838574) Provide support to ECO as required. Notify the Dam Safety Regulator **ALL** Record all communication and actions within internal communications platform.	**DECC** As per previous activation level **ALL** Record all communication and actions within internal communications platform.	**DECC** As per previous activation level, **ALL** Record all communication and actions within internal communications platform.	**DECC** As per previous activation level **ALL** Record all communication and actions within internal communications platform.	**DECC** Provide support to ECO as required. Return to routine activities. **ALL** Record all communication and actions within internal communications platform.

Activation level	Alert	Lean Forward	Stand Up Level 1	Stand Up Level 2	Stand Down
Internal notifications	Whispir Template #1	Whispir Template # 2	Whispir Template # 3	Whispir Template # 4	Inform all previously notified contacts of Stand Down Whispir Template # 5
External notifications		Whispir Template # 6 & 10	Whispir Template # 7 & 11	EWS Sirens (if required) Send EA request. Whispir Template # 8 & 12	Inform all previously notified contacts of Stand Down Whispir Template # 9 & 13

7 Dam Hazard – Embankment Failure

7.1 Overview

The emergency actions described in this section relate to a potential dam hazard due to a structural failure condition through the embankment, foundations, or dam abutment. Structural issues may include:

- Unexpected changes in seepage rate and location,
- Abnormal pore pressure readings
- Embankment instability,
- Displacement of the embankment,
- Cracking of the embankment (either transverse cracking or longitudinal cracks), and/or
- Development of seepage at the dam's downstream toe or through the dam abutments.

If a structural condition is established and progresses, a dam failure may result. If a condition is detected early, remedial repairs may be feasible, however in the event of a serious and developing dam safety issue it is unlikely that repairs will be possible.

Assessment of the Hazard

An early indicator of a piping condition may be an increase in seepage or a new area of seepage. If the seepage water is cloudy or coloured, this may indicate that material is being transported and a pipe is being established.

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

Cloudy seepage water is a circumstance that could indicate an increased likelihood of piping. This circumstance is the trigger for the lean forward status for embankment failure.

Flood mapping in Appendix D provides an indicative outline of potentially affected areas caused by embankment failure. The use of flood mapping under this hazard is outlined below:

- SDF when a dam failure is in progress or likely due to embankment damage and no concurrent flooding or downstream releases are occurring or expected to occur, or
- Flood scenarios when a dam failure is in progress or likely due to embankment damage and concurrent flooding or downstream releases are occurring or expected to occur. Currently, the 1 in 10,000 AEP flood event is the critical flood scenario for dam failure for the dam.

A flowchart has been developed, see Figure 7.

Table 7 outlines the EAP activation triggers, actions and communications for dam Embankment Failure.


Figure 7: CFD EAP – Embankment Failure Flowchart
Unusual embankment inspection or observation (CFD Caretaker, SCADA or other) e.g. change in piezometer pressure outside of normal operating conditions or new seepage observed / change in current seepage.
Have any ALERT TRIGGERS been met?
Yes
No
Is further monitoring required?
Yes
No
No action under EAP
Have any LEAN FORWAD TRIGGERS been met?
Yes
No
Dam Emergency Observer conduct surveillance inspection
- Undertake remedial repairs and/or undertake preventative actions as appropriate
- Continue monitoring
Has risk been reduced?
No
Yes
Have any STAND UP TRIGGERS been met?
Yes
No
Arrange immediate inspection by Dam Technical Advisor
- Undertake remedial repairs and/or undertake preventative actions as appropriate, in consultation with Dam Technical Advisor
- Continue monitoring
Has risk been reduced?
No
Yes
IS EMBANKMENT FAILURE LIKELY OR IN PROGRESS
Yes
No
- Undertake remedial repairs and/or undertake preventative actions as appropriate, in consultation with Dam Technical Advisor
- Continue monitoring
Has risk been reduced?
No
Yes
Notify PAR:
• Catastrophic failure - ACTIVATE SIRENS
• Other failure modes - liaise with LDMG for notification and evacuation of PAR
STAND DOWN
Pre-Alert
Alert
Lean Forward
Stand Up
Stand down
ALERT TRIGGERS:
Piezos outside recommended range; OR
New areas of seepage identified; OR
Seepage increase at embankment toe pipe/v-notch weir, within outlet conduit tunnel; OR
Collection trench >200mm from ref. point; OR
LEAN FORWARD TRIGGERS:
Increasing change in Piezometer readings outside recommended range; AND
Instrument failure/changes in multiple instruments (not communications related); AND/OR
Cloudy water observed in seepage and particles visible
STAND UP TRIGGERS:
Piping condition has been established
Evidence of scouring
Signs of displacement
Visible embankment erosion
Dam Engineer (DTA) advice
#6614601v2

Table 7: Dam Hazard – Embankment Failure EAP Activation Triggers, Actions and Communications

Activation level	Pre-Alert	Alert	Lean Forward	Stand Up Level 1	Stand Up Level 2	Stand Down
Activation trigger	Unexpected change noted during embankment inspection or observation (CFD Caretaker, SCADA, or other) e.g., change in piezometer pressure outside of normal operating conditions or new seepage observed / change in current seepage.	Piezometers outside recommended range, OR New areas of seepage identified, OR Seepage increasing at embankment toe pipe, v-notch weir, within outlet conduit tunnel, OR Collection trench – greater than 200mm from reference point	Increasing change in Piezometer readings outside recommended range, AND Multiple instrument failure/changes in multiple instruments (not communications related), AND/OR Cloudy water observed in seepage and particles visible	Piping condition has been established, OR Evidence of scouring, OR Potential of dam failure	Signs of displacement, OR Visible embankment erosion, OR Dam Engineer (DTA) advice, OR Dam failure imminent	Seepage returns to normal, AND Piezometer pressures return to normal ranges, AND Dam Engineer (DTA) advises risk of failure reduced.
Actions	Observer to raise issue with Process and Treatment Coordinator and Executive Manager Utility Services who will then determine if further monitoring or EAP activation is required. Quality check and validation to occur to verify the change and exclude other factors (e.g. piezometer malfunction, reading error, climate impact, stormwater ingress).	**DEC** Send EAP notification to internal stakeholders using Whispir as per notifications template. Chair meeting with agenda: - Current situation and weather forecast - Assign ECO roles. - Confirm SitRep frequency. - Confirm monitoring expectations and rostering. - Communication system status	**DEC** As per previous activation level, AND Send EAP escalation notification to internal and external CRC stakeholders using Whispir as per notifications template. Arrange inspection by DTA. **ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO** **e.g., taking photographs/video, dam inspections, instrument readings** **ALL PHOTOS MUST BE DATE STAMPED**	**DEC** As per previous activation level, AND Liaise with the LDC/LDMG regarding potential of evacuation of PAR. Liaise with the DTA as required.	**DEC** As per previous activation level, AND Be prepared to activate EWS if required.	**DEC** Send EAP Stand Down notification to internal and external stakeholders using Whispir as per notifications template. Within internal communications platform: Close out previous incident and create Stand Down incident. Create task for DEIO to prepare final SitRep

Activation level	Pre-Alert	Alert	Lean Forward	Stand Up Level 1	Stand Up Level 2	Stand Down
		- Issue situation specific actions (road/site closure/dam access) - Confirm requirement to engage DTA. Within internal communications platform: - Set up Operation with relevant activation status. - Create incident for current activation level tasks. - Create task for DEIO to prepare SitRep/s at agreed frequency. Review SitRep/s and determine if any additional actions are necessary. Issue SitRep to LDMG (if activated) Monitor and review situation for likelihood of escalation.				Review and issue final SitRep to LDMG Coordinate special inspection by DTA to check for damage and/or remedial work as necessary. Prepare Emergency Event Report (EER) if required (must be submitted within 30 business days) Return to routine activities.

Activation level	Pre-Alert	Alert	Lean Forward	Stand Up Level 1	Stand Up Level 2	Stand Down
		DEIO Attend ECO meeting with: - Latest SCADA data (level, rainfall, piezos, comms status, flowrate) - Permit holder activity status - Operational staff availability Complete and issue SitRep/s to DEC Monitor conditions at the dam and liaise with DEC on potential changes to EAP activation level. **DEO** Attend ECO meeting with: - Latest dam site situational awareness - Public and permit holder status - Lake Morris and Clohesy River Road conditions	**DEIO** As per previous activation level **DEO** As per previous activation level, AND Close Lake Morris recreational area and ensure safe departure of permit holders and public.	**DEIO** As per previous activation level **DEO** As per previous activation level	**DEIO** As per previous activation level **DEO** As per previous activation level	**DEIO** Complete and issue final SitRep to DEC Return to routine activities. **DEO** Assist DEIO in completion of the final SitRep Return to routine activities.

Activation level	Pre-Alert	Alert	Lean Forward	Stand Up Level 1	Stand Up Level 2	Stand Down
		Undertake dam inspection and continue at agreed frequency as directed by DEC or DEIO Provide updates from inspections to DEIO. Undertake site preparations as related to the emergency. Assist DEIO with completion of SitRep/s. Monitor spillway level, rate of rise, rainfall and weather forecasts and liaise with DEIO on potential changes to EAP activation level. **DECC** Attend ECO meeting. Record and circulate minutes. EAP activation notification to Dam Regulator – following discussion with DEC	 **DECC** As per previous activation level, AND Manage updates and correspondence with the Dam Safety Regulator	**DECC** As per previous activation level	**DECC** As per previous activation level	**DECC** Provide support to ECO as required. Return to routine activities.

Activation level	Pre-Alert	Alert	Lean Forward	Stand Up Level 1	Stand Up Level 2	Stand Down
		Draft and circulate ECO roster as required (Template #6838574) Provide support to ECO as required. **ALL** Record all communication and actions within internal communications platform.	 **ALL** Record all communication and actions within internal communications platform.	**ALL** Record all communication and actions within internal communications platform.	**ALL** Record all communication and actions within internal communications platform.	**ALL** Record all communication and actions within internal communications platform.
Internal notifications	N/A	Whispir Template # 14	Whispir Template # 15	Whispir Template # 16	Whispir Template # 17	Whispir Template # 5
External notifications	N/A	N/A	Whispir Template # 18	Whispir Template # 19 & 21	EWS Sirens Send EA request Whispir Template # 20 & 22	Whispir Template # 9 & 23

8 Dam Hazard - Spillway Failure

8.1 Overview

The actions described in this section relate to a potential emergency event due to failure of the spillway structures, such as the concrete spillway approach channel, control section, chute, and flip bucket. If adverse structural integrity is detected early, remedial action may be possible, depending on the nature of the damage.

Failure of the spillway is not expected to occur under normal conditions. During a large flood event however, it is possible that significant scour may occur in the natural rock in the approach channel. This scour can cause instabilities in the control section walls supporting the chute and flip bucket and must be assessed by the DTA.

SDF could also occur due to failure of the concrete spillway structure. Structural issues may include:

- Unexpected changes in seepage rates or location, and/or
- Sliding or overturning of the ogee crest.

If the ECO forms the view that significant scouring is occurring which will compromise the integrity of the concrete spillway or abutment walls, then the need for evacuations should be considered.

Due to the elevated level of the spillway approach channel, failure of the spillway would result in discharge of less water than failure of the embankment.

Despite this, flood mapping in Appendix D provides an indicative outline of potentially affected areas caused by spillway failure. The use of flood mapping under this hazard is outlined below:

- SDF when a spillway failure is in progress or likely and no concurrent flooding or downstream releases are occurring or expected to occur, or
- Dam Crest Flood (DCF) when a spillway failure is in progress or likely and concurrent flooding, or downstream releases are occurring or expected to occur.

A flowchart has been developed, see Figure 8.

Table 8 outlines the EAP activation triggers, actions and communications for a dam Spillway Failure.

Figure 8: CFD EAP – Spillway Failure Flowchart

Table 8: Dam Hazard - Spillway Failure EAP activation triggers, actions and communications

Activation level	Pre-Alert	Alert	Lean Forward	Stand Up Level 1	Stand Up Level 2	Stand Down
Activation trigger	Unexpected change noted during spillway inspection or observation (CFD Caretaker, CCTV, or other).	An unseasonal change in seepage observed downstream of spillway, OR Movement or cracking in concrete, OR Large debris lodged on the spillway that could impact on spillway integrity, OR Any form of seepage identified on the left abutment, OR Right abutment seepage measured at greater than 20L per minute not caused by rainfall.	Increase in cloudiness of seepage, OR Increase in flow of seepage, OR Crack/s in the spillway, OR Change in the flow patterns over the spillway, OR Spillway structural integrity compromised, OR Right abutment seepage identified to be cloudy.	Significant scouring of spillway – structural integrity further compromised, OR Spillway Failure imminent	Spillway Failure	Seepage and other dam conditions returns to normal, AND Dam Technical Advisor advises risk of failure reduced to acceptable levels, OR Spillway failure occurred, no further risk to PAR and recovery efforts are underway
Actions	Observer to raise issue with Process and Treatment Coordinator and Executive Manager Utility Services who will then determine if further monitoring or EAP activation is required. Quality check and validation to occur to verify the	**DEC** Send EAP notification to internal stakeholders using Whispir as per notifications template. Chair meeting with agenda: - Current situation and weather forecast - Assign ECO roles. - Confirm SitRep frequency. - Confirm monitoring expectations and rostering.	**DEC** As per previous activation level, AND Send EAP escalation notification to internal and external CRC stakeholders using Whispir as per notifications template. Arrange inspection by DTA. **ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO** **e.g., taking photographs/video, dam inspections, instrument readings** **ALL PHOTOS MUST BE DATE STAMPED**	**DEC** As per previous activation level, AND Liaise with the LDC/LDMG regarding potential of evacuation of PAR. Liaise with the DTA as required.	**DEC** As per previous activation level, AND Be prepared to activate EWS if required.	**DEC** Send EAP Stand Down notification to internal and external stakeholders using Whispir as per notifications template. Within internal communications platform: - Close out previous incident and create Stand Down incident. - Create task for DEIO to prepare final SitRep

Activation level	Pre-Alert	Alert	Lean Forward	Stand Up Level 1	Stand Up Level 2	Stand Down
	change and exclude other factors (e.g., human error, climate impact, stormwater ingress).	- Communication system status - Issue situation specific actions (road/site closure/dam access) - Confirm requirement to engage DTA. Within internal communications platform: - Set up Operation with relevant activation status. - Create incident for current activation level tasks. - Create task for DEIO to prepare SitRep/s at agreed frequency. Review SitRep/s and determine if any additional actions are necessary. Issue SitRep to LDMG (if activated) Monitor and review situation for likelihood of escalation. **DEIO** Attend ECO meeting with:				- Review and issue final SitRep to LDMG Coordinate special inspection by DTA to check for damage and/or remedial work as necessary. Prepare Emergency Event Report (EER) if required (must be submitted within 30 business days) Return to routine activities.

Activation level	Pre-Alert	Alert	Lean Forward	Stand Up Level 1	Stand Up Level 2	Stand Down
		- Latest SCADA data (level, rainfall, piezos, comms status, flowrate) - Permit holder activity status - Operational staff availability Complete and issue SitRep/s to DEC Monitor conditions at the dam and liaise with DEC on potential changes to EAP activation level. **DEO** Attend ECO meeting with: - Latest dam site situational awareness - Public and permit holder status - Lake Morris and Clohesy River Road conditions Undertake dam inspection and continue at agree frequency or as directed by DEC or DEIO Provide updates from inspections to DEIO.	**DEIO** As per previous activation level **DEO** As per previous activation level, AND Close Lake Morris recreational area and ensure safe departure of permit holders and public. ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO e.g., taking photographs/video, dam inspections, instrument readings ALL PHOTOS MUST BE DATE STAMPED	**DEIO** As per previous activation level **DEO** As per previous activation level	**DEIO** As per previous activation level **DEO** As per previous activation level	**DEIO** Complete and issue final SitRep to DEC Return to routine activities. **DEO** Assist DEIO in completion of the final SitRep Return to routine activities.

Activation level	Pre-Alert	Alert	Lean Forward	Stand Up Level 1	Stand Up Level 2	Stand Down
		Undertake site preparations as related to the emergency. Assist DEIO with completion of SitRep/s Monitor spillway level, rate of rise, rainfall and weather forecasts and liaise with DEIO on potential changes to EAP activation level. **DECC** Attend ECO meeting. EAP activation notification to Dam Safety Regulator – following discussion with DEC Record and circulate minutes. Draft and circulate ECO roster as required (Template #6838574) Provide support to ECO as required.	**DECC** As per previous activation level, AND Manage updates and correspondence with the Dam Safety Regulator	**DECC** As per previous activation level	**DECC** As per previous activation level	**DECC** Provide support to ECO as required. Return to routine activities.

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

Activation level	Pre-Alert	Alert	Lean Forward	Stand Up Level 1	Stand Up Level 2	Stand Down
		ALL Record all communication and actions within internal communications platform.	**ALL** Record all communication and actions within internal communications platform.	**ALL** Record all communication and actions within internal communications platform.	**ALL** Record all communication and actions within internal communications platform.	**ALL** Record all communication and actions within internal communications platform.
Internal notifications	N/A	Whispir Template # 24	Whispir Template # 25	Whispir Template # 26	Whispir Template # 27	Whispir Template # 5
External notifications	N/A	N/A	Whispir Template # 28	Whispir Template # 29 & 21	EWS Sirens Send EA request. Whispir Template # 30 & 22	Whispir Template # 9 & 23

9 Dam Hazard – Earthquake and Landslides

9.1 Overview

NOTE: If immediate risk of dam failure exists, enact dam failure response, sections 7 & 8.

Slippage of embankment slopes has been assessed as low risk, however an earthquake event near CFD could lead to the following issues:

- Cracking of the embankment,
- Slipping or slumping of the embankment,
- Increased rate of seepage,
- Damage to the concrete spillway structure,
- Damage to the outlet tower, and/or
- Damage to the outlet tunnel.

Should a landslip occur within the catchment, the assessment of the dam hazard will be the same as detailed below.

Assessment of the Dam Hazard

In the event of an earthquake being detected, the following actions are recommended:

- Assess the severity of the tremor. Actions following the assessment are shown in the Figure 9 flowchart. The initial assessment may be revised upon receival of the official earthquake report from Geoscience Australia. In the event an earthquake is felt within a 100km radius of the Dam but not yet 'reported', risk analysis should be undertaken internally by CIA management, using anecdotal felt reports to decide whether to activate prior to receiving the report from Geoscience Australia.
- Log into and review the piezometer readings for the dam on SCADA. Continue to monitor SCADA for any changes on a regular basis (at least 3 hourly) over the next 48 hours.
- Arrange for a dam inspection to be undertaken by the DTA as soon as possible once Lean Forward activation level is reached.

Flood mapping in Appendix D provides an indicative outline of potentially affected areas caused by earthquake damage. The use of flood mapping under this hazard is outlined below:

- SDF when a dam failure is in progress or likely due to earthquake damage and no concurrent flooding or downstream releases are occurring or expected to occur, or
- Flood scenarios when a dam failure is in progress or likely due to earthquake damage and concurrent flooding or downstream releases are occurring or expected to occur. Currently, the 1 in 10,000 AEP flood event is the critical flood scenario for dam failure for the dam.

An earthquake may contribute to, or cause, a structural issue which could result in dam failure. If a structural issue is identified through an inspection refer to sections 7 and 8.

Table 9 outlines the EAP activation triggers, actions and communication steps regarding Earthquakes and Landslide events.

Figure 9: CFD EAP – Earthquake Hazard Flowchart

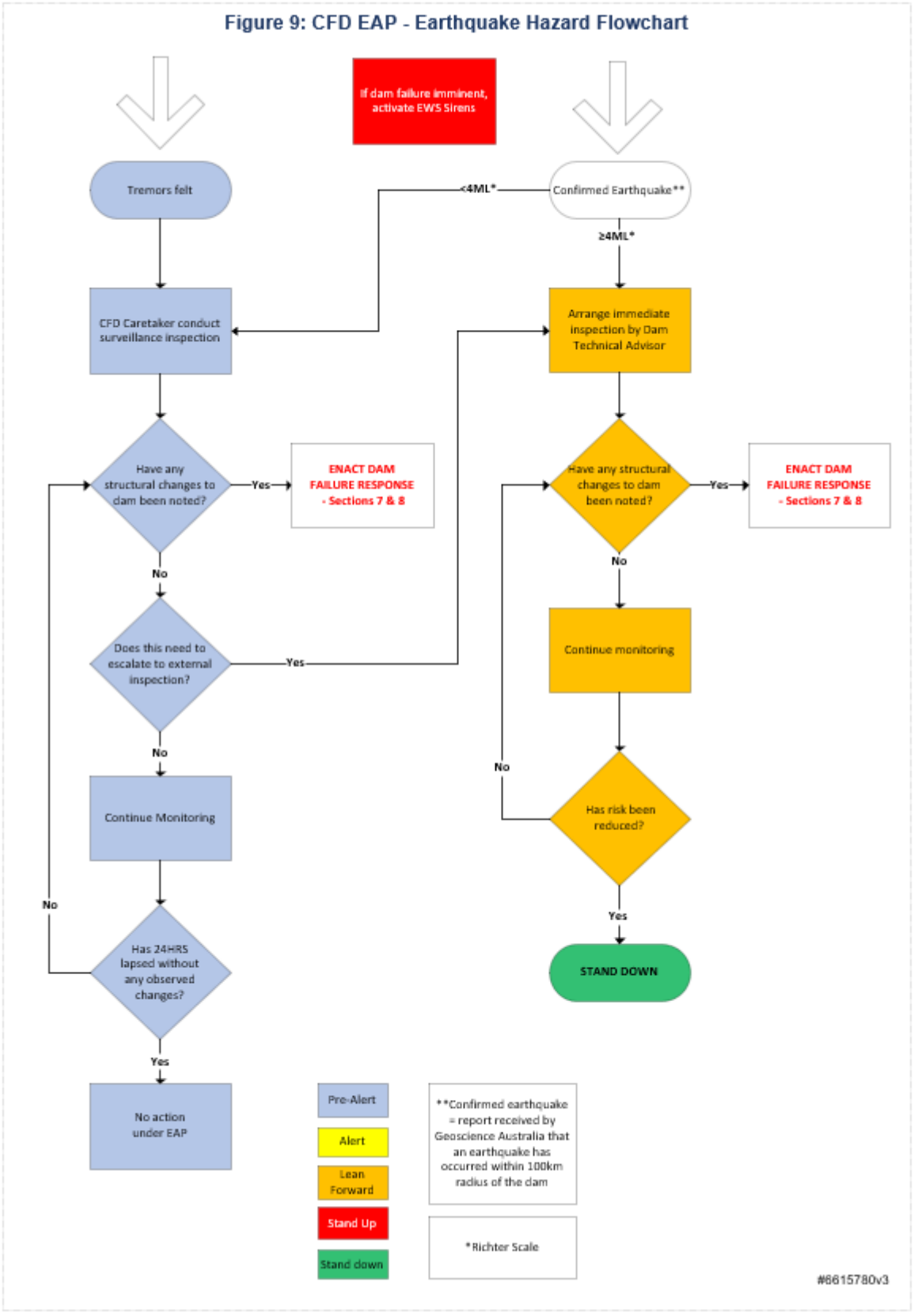


Table 9: Dam Hazard – Earthquake and Landslide EAP activation triggers, actions and communications

Activation level	Pre-Alert	Alert	Lean Forward	Stand Up	Stand Down
Activation trigger	Tremors felt or Earthquake confirmed <4ML (Richter Scale)	N/A	Earthquake confirmed ≥4ML (Richter Scale)	N/A	Failure Risk Reduced Dam Technical Advisor advises risk of failure reduced.
Actions 'Confirmed' is defined as an alert received from Geoscience Australia or other source that advises an Earthquake has occurred within a 100km radius of the Dam.	CFD Caretaker to conduct surveillance inspection. Determination made by CIA management whether to activate the EAP.	N/A	**DEC** Send EAP notification to internal stakeholders using Whispir as per notifications template. Chair meeting with agenda: - Current situation and weather forecast - Assign ECO roles. - Confirm SitRep frequency. - Confirm monitoring expectations and rostering. - Communication system status - Issue situation specific actions (road/site closure/dam access) - Confirm requirement to engage DTA. Within internal communications platform: - Set up Operation with relevant activation level status. - Create incident for current activation level tasks. - Create task for DEIO to prepare SitRep/s at agreed frequency. Arrange immediate inspection by DTA.	N/A Enact Dam Failure response, Sections 7 & 8 if: Dam failure path identified, OR Change detected during surveillance inspection	**DEC** Send EAP Stand Down notification to internal and external stakeholders using Whispir as per notifications template. Within internal communications platform: - Close out previous incident and create Stand Down incident. - Create task for DEIO to prepare final SitRep - Review and issue final SitRep to LDMG Coordinate special inspection by Dam Technical Advisor to check for damage and/or remedial work as necessary. Prepare Emergency Event Report (EER) if required (must be submitted within 30 business days) Return to routine activities.

Activation level	Pre-Alert	Alert	Lean Forward	Stand Up	Stand Down
			Review SitRep/s and determine if any additional actions are necessary. Issue SitRep to LDMG Monitor and review situation for likelihood of escalation. **DEIO** Attend ECO meeting with: - Latest SCADA data (level, rainfall, piezos, comms status, flowrate) - Permit holder activity status - Operational staff availability Complete and issue SitRep/s to DEC Monitor intel (SCADA at least 3 hourly for 48 hours following the event) and liaise with DEC on potential changes to EAP activation level. **DEO** Attend ECO meeting with: - Latest dam site situational awareness - Public and permit holder status - Lake Morris and Clohesy River Road conditions Undertake dam inspection and continue daily unless otherwise directed by DEC or DEIO		**DEIO** Complete and issue final SitRep to DEC Return to routine activities. **DEO** Provide support to DEC as requested. Return to routine activities.

Activation level	Pre-Alert	Alert	Lean Forward	Stand Up	Stand Down
			Provide updates from inspections to DEIO. Undertake site preparations as related to the emergency. Assist DEIO with completion of SitRep/s Monitor for change to dam condition and liaise with DEIO on potential escalation of EAP activation level. **DECC** Attend ECO meeting. Record and circulate minutes. Notify the Dam Safety Regulator Draft and circulate ECO roster as required (Template #6838574) Provide support to ECO as required.		**DECC** Provide support to ECO as required. Return to routine activities.
			**ALL** Record all communication and actions within internal communications platform.		**ALL** Record all communication and actions within internal communications platform.
Internal notifications	N/A	N/A	Whispir Template # 31	N/A	Whispir Template # 5
External notifications	N/A	N/A	Whispir Template # 32 & 33	N/A	Whispir Template # 9 & 38

10 Dam Hazard - Terrorist Threat / Malicious Activity

10.1 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.

The vulnerability of the CFD to a terrorist attack is low, however there is infrastructure such as equipment housings, tower and outlet structures located at the dam which may be the target of malicious activity.

Flood mapping in Appendix D provides an indicative outline of potentially affected areas if malicious activity/high energy impact caused catastrophic failure of the dam. The use of flood mapping under this hazard is outlined below:

- SDF when a dam failure is in progress or likely due to malicious activity/high energy impact and no concurrent flooding or downstream releases are occurring or expected to occur, or
- Flood scenarios when a dam failure is in progress or likely due to malicious activity/high energy impact and concurrent flooding or downstream releases are occurring or expected to occur. Currently, the 1 in 10,000 AEP flood event is the critical flood scenario for dam failure for the dam.

Assessment of the Hazard

Advice from authorities of a specific risk to water infrastructure is a circumstance which may indicate increased likelihood of a terrorist threat. Advice specific enough to name CFD would immediately trigger the EAP to Stand Up 1 level.

The following contact notifications would be issued to assist response to an act of terrorism which may pose a dam hazard:

- Priority 1 - National Security Hotline 1800 123 400
- Priority 2 - Police Link 131 444 or the Local Police Station (if no immediate life threat)
- Priority 3* - 000/112 (*if lives are at immediate risk call 000 immediately)

Figure 10 shows the relevant flowchart.

Table 10 outlines the EAP activation triggers, actions and communication steps.

Figure 10: CFD EAP – Terrorist Threat / Malicious Activity or High Energy Impact Hazard Flowchart

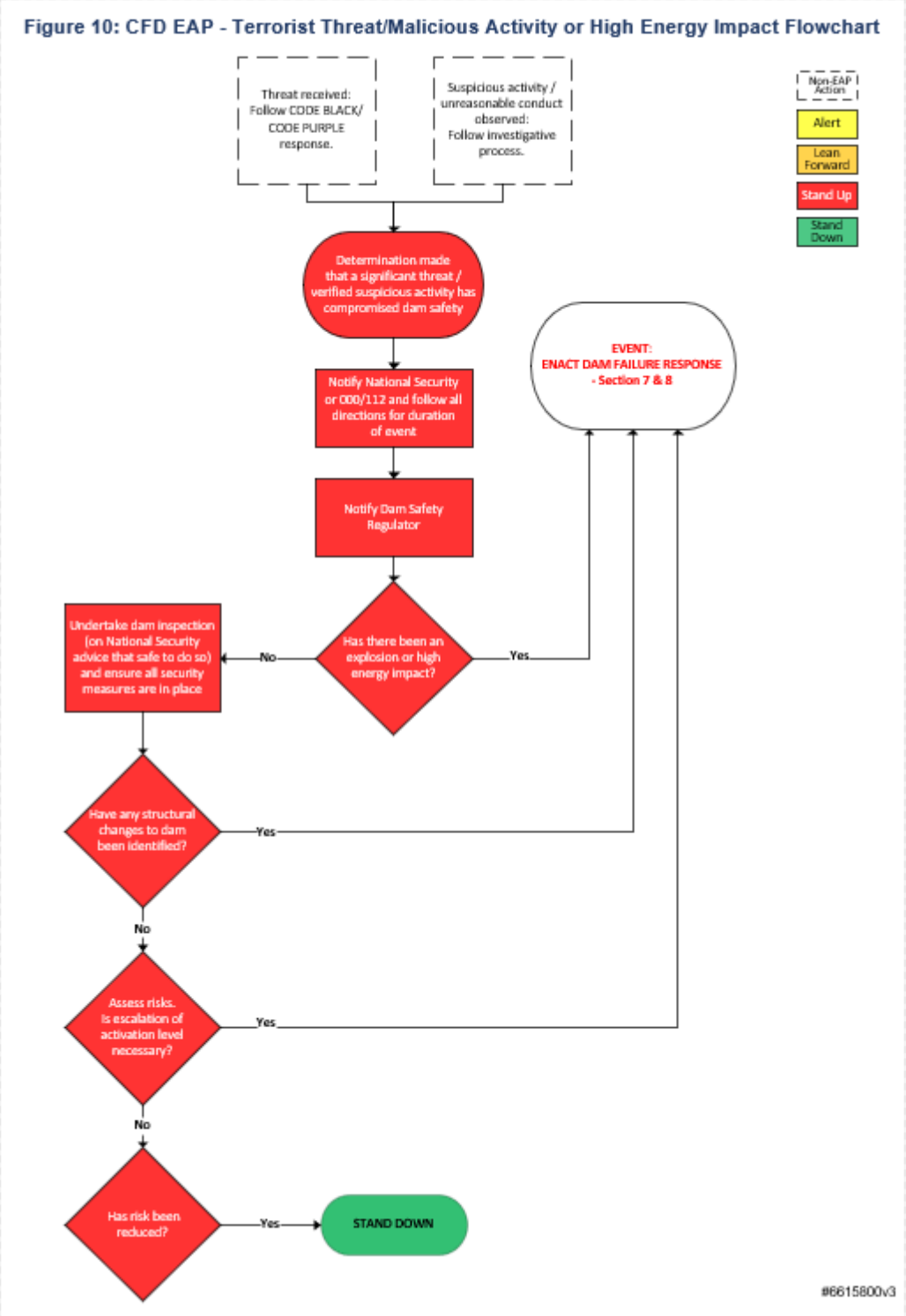


Table 10: Dam Hazard – Terrorist threat / malicious activity EAP trigger activation, Actions and Communications

Activation level	Alert	Lean Forward	Stand Up	Stand Down
Activation trigger	N/A	N/A	Significant threat/verified suspicious activity has compromised dam safety	Risk Assessment has determined that failure risk has reduced
Actions	N/A	N/A	**DEC** Notify National Security Hotline 1800 123 400 Follow direction of police/national security personnel Send EAP activation notification to internal and external stakeholders using Whispir as per notifications template. Chair meeting with agenda: - Current situation and weather forecast - Assign ECO roles. - Confirm SitRep frequency. - Confirm monitoring expectations and rostering. - Communication system status. - Issue situation specific actions (road/site closure/dam access). - Confirm requirement to engage DTA. Within internal communications platform: - Set up Operation with relevant activation level status. - Create incident for current activation level tasks. - Create task for DEIO to prepare SitRep/s at agreed frequency. Review SitRep/s and determine if any additional actions are necessary. Issue SitRep to LDMG.	**DEC** Send EAP Stand Down notification to internal and external stakeholders using Whispir as per notifications template. Within internal communications platform: - Close out previous incident and create Stand Down incident. - Create task for DEIO to prepare final SitRep. - Review and issue final SitRep to LDMG. Coordinate special inspection by Dam Technical Advisor to check for damage and/or remedial work as necessary. Prepare Emergency Event Report (EER) if required (must be submitted within 30 business days). Return to routine activities.

Enact Dam Failure response, Sections 7 & 8 if:
Change detected during surveillance inspection
OR
High energy impact or explosion
OR
Dam failure path identified

Activation level	Alert	Lean Forward	Stand Up	Stand Down
			DEIO Attend ECO meeting with: - Latest SCADA data (level, rainfall, piezos, comms status, flowrate) - Permit holder activity status - Operational staff availability Complete and issue SitRep/s to DEC Monitor situation and liaise with DEC on potential changes to EAP activation level. **DEO** If lives are in immediate danger call 000/112 Attend ECO meeting with: - Latest dam site situational awareness - Public and permit holder status - Lake Morris and Clohesy River Road conditions Undertake dam inspection. Provide updates from inspection/s to DEIO. Close Lake Morris recreational area and ensure safe departure of permit holders and public. Undertake site preparations as related to the emergency. Assist DEIO with completion of SitRep/s. Monitor situation and liaise with DEIO on potential changes to EAP activation level.	**DEIO** Complete and issue final SitRep to DEC Return to routine activities. **DEO** Provide support to DEC as requested. Return to routine activities.

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

Activation level	Alert	Lean Forward	Stand Up	Stand Down
			DECC Attend ECO meeting. Record and circulate minutes. EAP activation notification to Dam Regulator – following discussion with DEC Draft and circulate ECO roster as required (Template #6838574) Provide support to ECO as required. **ALL** Record all communication and actions within internal communications platform.	**DECC** Provide support to ECO as required. Return to routine activities. **ALL** Record all communication and actions within internal communications platform.
Internal notifications	N/A	N/A	Whispir Template # 34	Whispir Template # 5
External notifications	N/A	N/A	Whispir Template # 35 & 36	Whispir Template # 9 & 37

11 Other Emergency Situation – Communications Failure

11.1 Overview

The emergency action described in this section relates to either:

- An emergency situation where all means of communication at the dam site have been lost, or
- An emergency situation where all means of communication with the local area have been lost.

This section specifies actions and provides guidance for each of the two situations.

Activation Triggers

Due to the large number of possible scenarios, only the most common or likely communication failure conditions are covered below.

Comms Failure - Site	Unable to communicate to or from Dam site (usually affects DEO), Managed by Dam Owner.
Comms Failure – Local Area	Unable to communicate to or from Local Area (likely to affect ECO). Managed by Dam Owner in conjunction with ECO and LDMG.

Assessment of the Hazard

Failures may occur during normal operations and may affect the SCADA network, instrumentation, and monitoring equipment, and/or communication systems such as Whispir, Guardian IMS, or an internal communications platform. Such communication failures may occur solely at the CFD site or across the Cairns region. While a communication failure does not necessarily indicate a dam hazard, not having access to information regarding the dam may lead to the identification of a dam hazard being delayed.

If the ECO loses the functionality of Whispir, Guardian IMS, or an internal communications platform during a dam emergency event, it will revert to phone communications (if operational), radio communications, satellite communications, alternative platforms (if available), and the use of paper-based records to record actions and manage an emergency response. CRC Information Branch has a master database of PAR which would be called upon and the CIA Business Continuity Plan would be followed #6929421.

Appendix F contains back-up of the complete text of each Whispir message template in-case of Whispir technical issues. Should the use of Teams online meetings be unavailable, Virtual Meeting Room will be used instead. The Virtual Meeting Room is another room available within the Council Outlook calendar. Search 'W&W VMR EAP' – anyone can select this room to create a meeting. For the person who initiates the meeting invite, instructions for participants will automatically populate into the meeting invite once it is sent. The phone number to dial into the Virtual Meeting Room is [redacted] and this will not change.

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

If communications failure is due to natural disaster conditions such as a cyclone event, the DEC will cooperate with the LDMG (if already in Stand Up) on communicating with PAR as required.

The EWS sirens have solar panel back-ups allowing for battery systems to be charged in the event of mains failure. The expected back-up supply provided is at least 72 hours.

Table 13 outlines the actions and communication steps.

Table 11: Dam Hazard – Other Emergency Situation / Communications Failure Actions and Communications

Activation	Actions - Communications Failure – Dam Site	Actions - Communications Failure – Local Area
	DEC Follow Business Continuity Plan #6929421. Activate EAP should a dam emergency occur during communication failure. Refer to specific dam hazard table for actions. Liaise with DEIO, DEO, and DECC regarding status of communications. **DEIO** Set up manual incident report to record all communications. Every hour attempt communications, via: - Landline phone - Attempt to text mobile phone- instead of calling, much higher probability of success - Radio UHF comms - Social media, e.g., Facebook Liaise with DEC, DEIO and DECC regarding status of communications. As much as is practicable continue other tasks associated with the role in accordance with any other current emergency action. Organise helicopter to access dam if needed. Provide support to DEC as required.	**DEC** Follow Business Continuity Plan #6929421. Establish alternate means of communication and establish runner system if required. Activate EAP should dam emergency occur during communication failure. Refer to specific dam hazard table for actions. Liaise with DEIO, DEO, and DECC regarding status of communications. **DEIO** Set up manual incident report to record all communications. Every hour attempt communications, via: - Landline phone - Attempt to text mobile phone- instead of calling, much higher probability of success - Radio UHF comms - Social media, e.g., Facebook Liaise with DEC, DEIO and DECC regarding status of communications. As much as is practicable continue other tasks associated with the role in accordance with any other current emergency action. Organise helicopter to access dam if needed. Provide support to DEC as required.

Activation	Actions - Communications Failure – Dam Site	Actions - Communications Failure – Local Area
	DEO Attempt to reinstate communications. Every hour attempt communications; - Landline phone - Attempt to text mobile phone- instead of calling, much higher probability of success - Radio UHF comms - Social Media-e.g., Facebook (Internet may be available via landline) Record all communication attempts manually. **DECC** Liaise with DEC and DEIO, and regarding status of communications. Ensure all communications have been manually recorded. Attend meetings as requested, provide support to DEC.	**DEO** Attempt to reinstate communications. Every hour attempt communications; - Landline phone - Attempt to text mobile phone- instead of calling, much higher probability of success - Radio UHF comms - Social Media-e.g., Facebook (Internet may be available via landline) Record all communication attempts manually. **DECC** Liaise with DEC and DEIO, and if possible, DEO regarding status of communications. Ensure all communications have been manually recorded. Attend meetings as requested, provide support to DEC.

12 Notification and Communication Protocols

Communication protocols have been established to ensure effective communication with both internal and external stakeholders during the preparation, response, and recovery stages of a dam emergency event. A communications flowchart is outlined in Figure 11.

12.1 Internal Communications

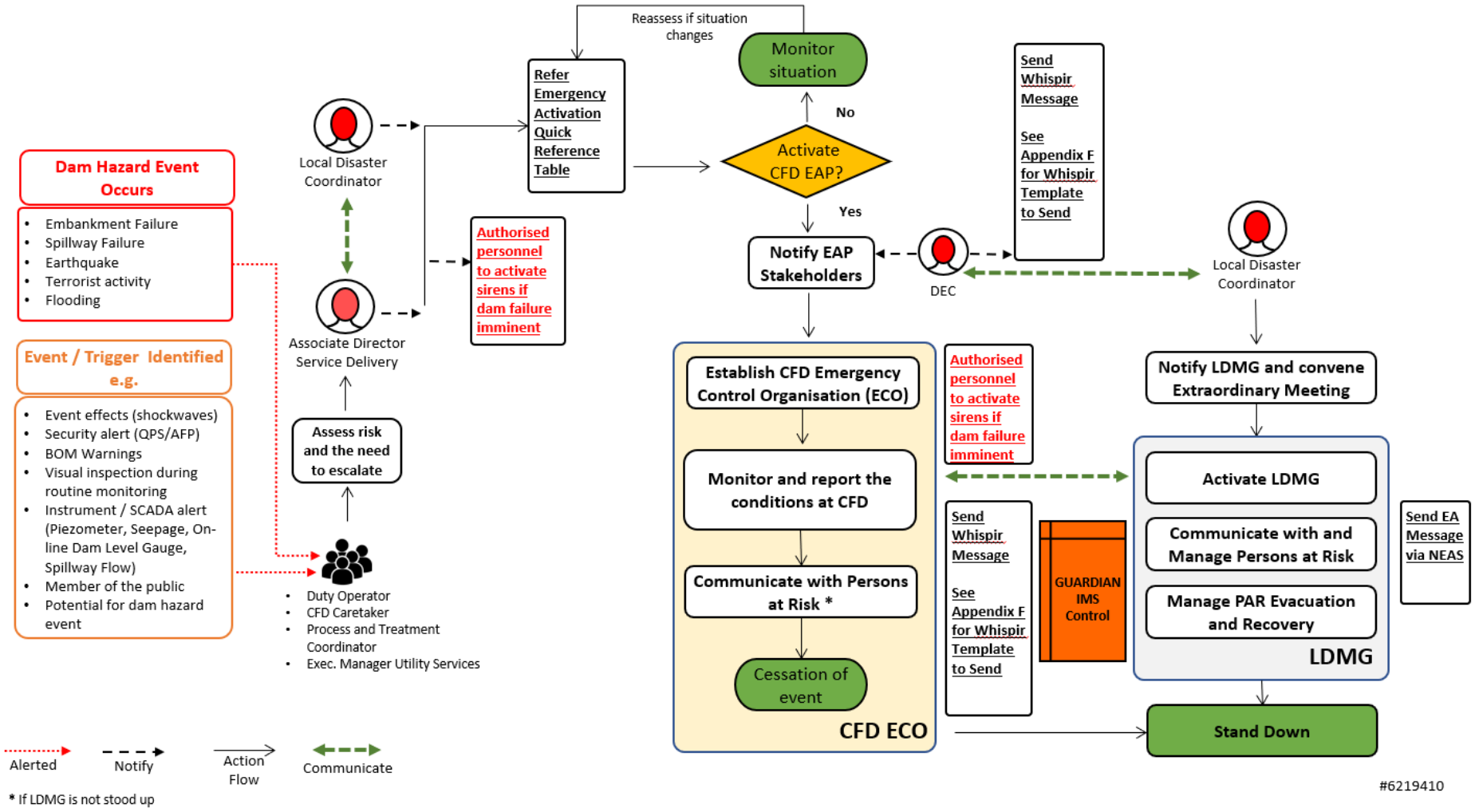
Prior to the activation of the EAP, the primary means of communication between CRC officers and the ECO is via mobile phone communication.

Once the EAP has been activated the ECO members communicate internally via mobile phone, Whispir and through the use of an internal communications platform. These platforms are further described below. Communications with non-ECO members occur via Whispir and Guardian IMS. Email may also be used for non-urgent communications.

During a dam emergency event the ECO (specifically the DEC) liaises with the CRC Executive Manager Marketing and Communications. All media queries should be referred to Marketing and Communications via mobile phone and Whispir. Should the Executive Manager be unavailable or unable to be contacted, the Media Coordinator shall be advised (the mobile for which is staffed 24/7).

Should communication means fail, back up communication is via UHF (Ultra-High Frequency) radio using the following radio frequencies. UHF radios are permanently located and available for use at key dam locations including the CRC Spence Street office, CRC Freshwater Creek Water Treatment Plant, the CFD office and the LDCC. CRC Utility Services vehicles also have car mounted radios.

Figure 11: Copperlode Falls Dam Communications Flowchart



12.2 Whispir Communication Platform

Whispir is a cloud-based communication platform that CRC uses to issue alerts and warnings via text message (SMS), email and voice. It ensures messages are timely, useful and contain relevant content for each situation by using priority communication trees. CRC uses Whispir for internal group communication between the ECO members and CRC management as well as for external communication to emergency service agencies, regulators, the community, and PAR.

Whispir will be used for communication relating to a dam emergency event to CFD internal and external stakeholders, listed as Appendix I. Scenario templates have been set up in Whispir with messages specific to dam hazards and dam emergency events. Each message is linked to a distribution list(s) depending on who and when the communication should be sent. Appendix F outlines the communication plan and Whispir emergency notification messages.

Whispir has an app called OneClick. The App allows the user to quickly locate and run the Whispir scenario templates from any location. CRC personnel authorised to send Whispir messages in the event of a dam emergency are to follow the Whispir OneClick App Instructions #5983168.

12.3 Internal Communications Platform

The Internal Communications Platform to be used in an Event is the Referable Dam Emergency Action Plan Event Microsoft 365 Solution. This is a SharePoint-based internal communications platform that is used to create an auditable Event Log of a dam emergency event. The Solution's functionality allows for meetings to be scheduled and made visible to all ECO members and can be viewed within Microsoft Outlook. Within the Solution, tasks can be created and allocated to specific ECO role holders. Bulletins can be created and published, allowing for relevant updates to be issued to all individuals with a role in the dam emergency response. Incidents occurring during the dam emergency event can also be created and tracked through to completion within the Solution.

The Solution is also used to manage and record all forms of internal and external communication, allowing for accurate recordkeeping. An event-specific documents and records library will contain all relevant documents and records, such as SitRep reports, photographs, and email correspondence. CRC personnel appointed to referable dam emergency response roles are to refer to the Microsoft 365 Solution Guidance Document #7207033.

12.4 Guardian IMS

Guardian IMS is a multi-modal Incident Management System. The web-based software simplifies task management and allows for seamless collaboration between different groups or agencies. Guardian IMS will be used to manage communications and the dissemination of SitReps between the ECO and the LDMG. CRC personnel with authorised dam emergency event access to Guardian are to refer to the Guardian IMS Process Instructions #6663503.

12.5 Community Warnings, Alert Systems and Dissemination of Information

CRC provides those Cairns community members in high-risk areas with relevant and timely information pertaining to CFD status and potential dam safety hazards. Communications serve to provide information which supports people in taking suitable actions to prepare for and respond to a potential or real emergency or disaster event. Communication of information can be actioned through a variety of means including email, web, mobile phones, and social networks (Facebook).

12.5.1 Disaster Dashboard and Cairns Alert

The two key platforms for public notification prior to an emergency event are the Cairns Disaster Dashboard and Cairns Alert. Both tools incorporate existing local context and content with information about weather information, inclusion of safer locations, key road closures and predicted impacts on critical infrastructure.

Cairns Disaster Dashboard

CRC website has a specific Natural Disasters page, which is supported by the Cairns Disaster Dashboard during an emergency, see http://disaster.cairns.qld.gov.au/

The dashboard is a real-time information website, integrating public map overlays, live flood and traffic cameras, live road closure information, weather warnings and alerts, and web sourced data feeds (including BoM weather warnings, Ergon power outages etc.). It allows for emergency services and utilities such as Ergon and Telstra to collate real-time information and show current evacuation routes, shelter locations and up to date, emergency specific mapping.

Cairns Alert

Cairns Alert provides a dedicated platform providing contextualised disaster and emergency information to local communities. Cairns Alert is an opt-in service that operates on the Whispir platform and is available for any person (resident or otherwise) who registers. Members of the public who choose to register will receive disaster and emergency alerts via SMS. These alerts are official communication from the Cairns Disaster Group (LDMG), which manages response to disasters that may or may not be dam related.

This service is available at www.cairns.qld.gov.au/cairnsalert

12.5.2 National Emergency Alert System (NEAS)

Emergency Alert is the national telephone warning system. It may be used by emergency services during likely or actual emergencies to send voice messages to landlines and SMS to mobile phones within a defined area. CRC will use the National Emergency Alert System (NEAS) to ensure those potentially affected by a dam emergency are notified via voice message and SMS in the event of flooding causing inundation or flooding causing dam failure. The request to notify the PAR using this method is lodged with the LDMG and managed through its processes.

NEAS notifications are authorised and requested by the LDMG. In Queensland the NEAS is operated by the SDCC Watch Desk, which approves, tests, and operates Emergency Alerts (EA) and associated polygons. Should dam failure be imminent, the dam operator may also send the NEAS notification.

The CFD NEAS polygon and EA request templates are presented as Appendix H.

12.5.3 Australian Warning System (AWS)

The Australian Warning System (AWS) is the national approach to information and warnings for hazards which aims to provide consistent warnings to communities to ensure people know what to do when they see a warning level. Within the AWS, there are hazard-specific icons supported by call-to-action statements across three (3) warning levels:

Advice: An incident has started. There is no immediate danger. Stay up to date in case the situation changes.

Watch and Act: There is a heightened level of threat. Conditions are changing and you need to start taking action now to protect you and your family.

Emergency Warning: An emergency warning is the highest level of warning. You may be in danger and need to take action immediately. Any delay now puts your life at risk.

Figure 12: AWS Flood Hazard Icons

ADVICE

WATCH AND ACT

EMERGENCY WARNING

The requirements of the AWS are nationally consistent. Accordingly, the flood warnings contained within Appendix G of this document have been developed to satisfy the national AWS framework for all dam hazards and complement all existing warning practices implemented by CRC. These warnings have been designed to inform the community about what impacts are to be expected, and what actions they should take to remain safe in the event of a dam hazard resulting in downstream flooding from the dam. These warning messages have been written using simple, easy to understand language to ensure the information contained within the warnings is as accessible as possible to downstream PAR.

12.5.4 Early Warning System (Redlynch Valley Communications - Sirens)

In the unlikely event of dam failure, time may not permit the standard notifications to PAR by the LDMG. In this instance, notification will be undertaken by the Dam Operator using the EWS, which will be activated as soon as necessary. Table 12 identifies the priority order for communication delivery in the event of a dam emergency.

Table 12: Priority Order for Communications During Emergency

Priority	Communication Type	Responsible
1	EWS (Sirens) for imminent Dam Failure	Dam Operator*
2	NEAS – send request for EA message to be sent	LDMG
3	Send PAR communications via Whispir	M&C through the LDMG (or ECO if required prior to activation of the LDMG)**
4	Publish AWS long-form messages on relevant channels	M&C through the LDMG

*See Table 13 below for Dam Operator roles and priority order.

**During a flooding event, proactive warning to PAR is the responsibility of M&C through the LDMG. If the nature of the event is such that the LDMG has not activated (or if directed by the LDC), these communications shall be actioned by the ECO. Upon dam emergency response activation of the LDMG, responsibility for communication to PAR divests to M&C.

In addition to the Dam Operator, CRC positions with back-up authorisation to activate the system are as per Table 13.

Table 13: Early Warning System Activation Authorisation Priority for Dam Operator

CRC Staff members	Name	Priority	SMS Function Enabled
Chief Executive Officer		1	**Yes**
Director CIA		2	No
Associate Director Service Delivery		3	**Yes**
Dam Emergency Controller (DEC)	Refer to section 3.2.2	4	No
Dam Emergency Intelligence Officer (DEIO)	Refer to section 3.2.2	5	No
Dam Emergency Observer (DEO)	Refer to section 3.2.2	6	No

Executive Manager Utility Services	[redacted]	7	**Yes**
Local Disaster Coordinator	[redacted]	8	**Yes**
Process & Treatment Coordinator	[redacted]	9	**Yes**
Copperlode Falls Dam Caretaker	[redacted]	10	**Yes**
Disaster Management Officer	[redacted]	11	No

The EWS comprises nine speakers mounted on towers, positioned throughout the Redlynch Valley from Crystal Cascades to Brinsmead. The system will transmit automated warning signals (sirens) and broadcast public address and pre-recorded voice messages.

The pre-recorded voice message follows the EWS (siren) with the messaging:

'EMERGENCY – EMERGENCY – EVACUATE NOW – MOVE TO HIGHER GROUND'

An Evacuation Guide has been prepared and distributed, explaining the EWS and outlining how residents and businesses within the evacuation zone should prepare their own evacuation plan using the information, maps and templates provided in the guide. The guide can be accessed via the CRC website at: https://www.cairns.qld.gov.au/__data/assets/pdf_file/0004/285205/CopperlodeDamEvacuationGuide_MAY23.pdf

Specific assembly points are identified within the guide. Residents and business owners within the evacuation zone are advised to prepare, share, and practice their own emergency evacuation route. The guide also provides advice on preparing an emergency kit, immediate actions to take upon hearing the sirens, key information sources, emergency contacts and CRC contacts. See Appendix J for the Flood Evacuation Zone map series.

12.6 Emergency Event Report

An Emergency Event Report (EER) will be submitted within 30 business days after the end of an emergency event. It is important to capture all the information required during an event in Guardian IMS to ensure details can be included in the EER.

The Associate Director Service Delivery will convene a post-event debrief with all ECO members, support personnel and LDMG as necessary, to capture opportunities for improvement.

The Emergency Action Plan for Referable Dam Guidelines (DRDMW, 2023) provides guidance and a template which will be referred to as required.

13 References

Document Title	Reference/Location
Cairns Population & Demand Model (CRC, 2017)	G:\Cairns Water\Service Delivery\Projects\Demand Models\2017\
Copperlode Falls Dam Failure Impact Assessment Report (GHD, 2008)	#1831909
Copperlode Falls Dam Acceptable Flood Capacity Report (GHD, 2009)	#2492753
Copperlode Falls Dam Data Book (CRC, 2023)	#5895790
Copperlode Falls Dam Failure Modes Analysis and EAP Implementation Report (GHD, 2015)	#4642457
Copperlode Falls Dam Flood Hazard Study (Gilbert & Sutherland, 2014)	#4449045
Copperlode Falls Dam Piezometer Trigger Level Assessment Report (GHD, 2017)	#5507288
Copperlode Falls Dam Operation and Maintenance Manual	#6871464
Copperlode Falls Dam Revision of Trigger Levels Report (GHD, 2018)	#5861799
Copperlode Falls Dam Seepage Trigger Level Assessment Report (GHD, 2020)	#6512384
Copperlode Falls Dam Piezometer Alert Level Assessment Review (GHD,2022)	#6979963
Dam Break Assessment, Copperlode Falls Dam (GHD, 2023b)	#7260510
District Disaster Management Plan (DDMG, 2022)	https://www.police.qld.gov.au/qps-corporate-documents/disaster-management-plans
Emergency Action Plan for Referable Dam Guideline (DRDMW, 2023)	https://www.resources.qld.gov.au/__data/assets/pdf_file/0018/84015/eap-guideline.pdf
Guideline for Failure Impact Assessment of Water Dams (DNRME, 2018)	https://www.resources.qld.gov.au/__data/assets/pdf_file/0005/78836/guidelines-failure-impact-assessment.pdf
Guidelines on Safety Assessments for Referable Dams (DRDMW, 2021)	https://www.rdmw.qld.gov.au/__data/assets/pdf_file/0011/1589186/guidelines-safety-assessments-referable-dams.pdf
IGEM Standard for Disaster Management in Queensland, (IGEM, 2019)	https://www.igem.qld.gov.au/sites/default/files/2019-12/NEW%20Standard%20for%20Disaster%20Management%20in%20Queensland%20v2.0.pdf
Local Disaster Management Plan - Cairns Region (LDMG, 2022)	https://www.cairns.qld.gov.au/__data/assets/pdf_file/0009/439506/Local-Disaster-Management-Plan.pdf
Local Government Infrastructure Plan (CRC, 2022)	https://www.cairns.qld.gov.au/property-and-business/planning-schemes/lgip
Microsoft 365 Solution Guidance Document	#7207033.
Queensland Dam Safety Management Guidelines (DNRME, 2024)	https://www.resources.qld.gov.au/__data/assets/pdf_file/0007/78838/dam-safety-management.pdf
Queensland Disaster Management Act 2003 – current as of 1 March 2023	https://www.legislation.qld.gov.au/view/pdf/inforce/current/act-2003-091
Queensland Emergency Alert Manual M.1.174 (QPS, 2023)	https://www.disaster.qld.gov.au/__data/assets/pdf_file/0027/339417/M1174-Queensland-Emergency-Alert-Manual.pdf
Queensland Prevention, Preparedness, Response & Recovery Disaster Management Guideline (QFES, 2018)	https://www.disaster.qld.gov.au/__data/assets/pdf_file/0032/359465/QLD-Disaster-Management-Guideline.pdf
Queensland State Disaster Management Plan (QDMC, 2023)	https://www.disaster.qld.gov.au/__data/assets/pdf_file/0027/339336/Interim-2023-QSDMP-V1.2.pdf

Document Title	Reference/Location
Referable Dam Safety Management General Policy	#6820561
Review of Barron River Delta Flood Model (Connell Wagner, 2007)	#1563025
Water Supply (Safety and Reliability) Act 2008—Current as of 8 March 2022	https://www.legislation.qld.gov.au/view/pdf/inforce/current/act-2008-034
Whispir Communications Procedure	#5748810

14 Appendices

Appendix A: #6605466 Copperlode Falls Dam Access Options

Appendix B: #6603354 Spillway Rating Curve & Hydrological Data

Appendix C: #6621710 General Arrangement Drawings

Appendix D: #7059840 Inundation Maps

Appendix E: #6595048 Situation Report Template

Appendix F: #6485097 Communications Plan and Whispir Emergency Notification Messages

Appendix G: #7219649 Copperlode Falls Dam AWS Message Templates – All Hazards

Appendix H: #7059765 NEAS Polygon for Copperlode Falls Dam

#6485053 EA Request Forms for Copperlode Falls Dam

Appendix I: #6559598 CRC and Other Agency Stakeholder List and Priority Order

Appendix J: #7220227

Copperlode Falls Dam Flood Evacuation Zone - A3 Overview Map

Copperlode Falls Dam Flood Evacuation Zone - Map 1 of 4

Copperlode Falls Dam Flood Evacuation Zone - Map 2 of 4

Copperlode Falls Dam Flood Evacuation Zone - Map 3 of 4

Copperlode Falls Dam Flood Evacuation Zone - Map 4 of 4

Appendix A:

Copperlode Falls Dam Access Options

Appendix A: Copperlode Falls Dam Access Options

Figure 3 shows road and walking access routes during most weather conditions.

Helicopter Access Site Description

A landing site used previously is located at the following coordinates (GDA94):

UTM: 55K 358713 E, 8122225 S	DD: Lat -16.97959 degrees, Long 145.67291 degrees

Access via helicopter may be an option if weather permits and when safe access along road routes is not available, e.g., due to fallen trees or landslide.

The helicopter site is a bitumen hardstand area adjacent to the right abutment of the main embankment of the dam.

CAUTION – High voltage powerlines are located approximately 40 metres immediately north of the landing area.

If deemed safe the dam may also be accessed via walking track from Crystal Cascades.

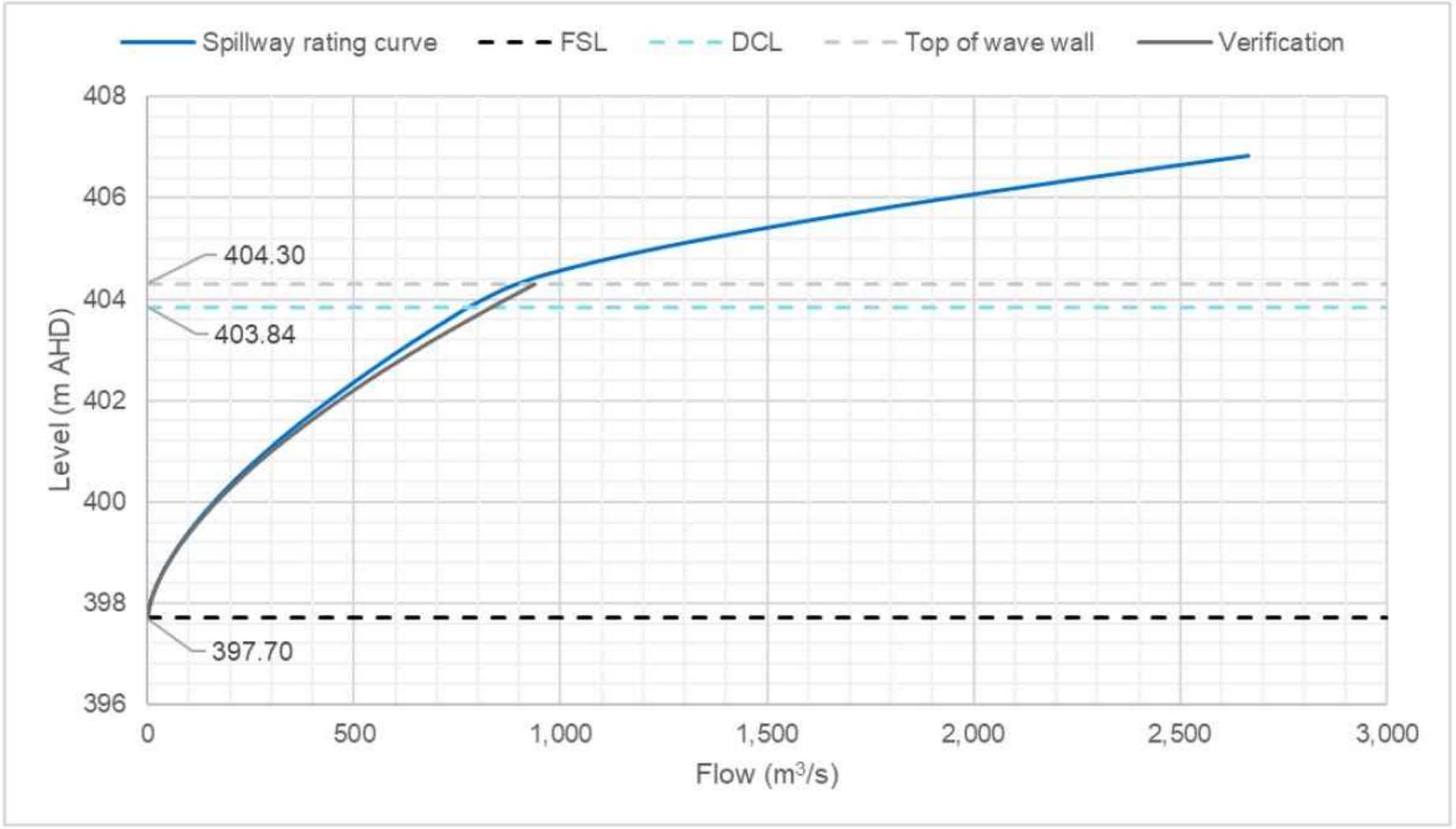
Vehicle Access Description

Details	Road / Walking access route
Primary road access route – Lake Morris Road	
Distance	Approximately 22.9 km from Cairns
Travel time	Approximately 60 minutes from Cairns
Road type	Bitumen
Speed limit	Speed limit signs at 40-60 km/h with warning signs for many hairpin bends, curves, turns, and winding road conditions with frequent advisory speed signage, typically at 20 km/h.
Alternative road access route – Clohesy River Road	
Distance	Approximately 69.3 km from Cairns
Travel time	Approximately 120 minutes from Cairns
Road type	Gravel, 4WD track
Speed limit	Speed limit signs at 40-60 km/h with warning signs for many hairpin bends, curves, turns, and winding road conditions with frequent advisory speed signage, typically at 20 km/h.
Walking track – Crystal Cascades to Lake Morris	
Distance	Approximately 3 km from Crystal Cascades car park
Travel time	Approximately 60 minutes from Cairns

Appendix B:

Spillway Rating Curve & Hydrological Data

Copperlode Falls Dam – Spillway Rating Curve
(Including flow over dam crest and wave wall)



Copperlode Falls Dam – Spillway Rating Curve
(Including flow over dam crest and wave wall)

Copperlode Falls Dam – Spillway Rating Table[1]

Water Elevation (m AHD)	Water Depth Above Spillway (m)	Freeboard to DCL (m)	Spillway Discharge (m^3/s)
397.732	0.000	6.108	0.0
397.832	0.100	6.008	1.3
397.912	0.180	5.928	3.2
397.932	0.200	5.908	3.7
398.032	0.300	5.808	6.9
398.132	0.400	5.708	10.8
398.232	0.500	5.608	15.2
398.332	0.600	5.508	20.1
398.432	0.700	5.408	25.5
398.532	0.800	5.308	31.4
398.632	0.900	5.208	37.7
398.732	1.000	5.108	44.5
398.932	1.200	4.908	59.1
399.132	1.400	4.708	75.2
399.332	1.600	4.508	92.7
399.532	1.800	4.308	111.6
399.732	2.000	4.108	131.8
399.932	2.200	3.908	153.3
400.032	2.300	3.808	164.5
400.232	2.500	3.608	187.5
400.432	2.700	3.408	211.7
400.632	2.900	3.208	237.1
400.832	3.100	3.008	263.8
401.032	3.300	2.808	291.4
401.232	3.500	2.608	319.9
401.432	3.700	2.408	349.4
401.632	3.900	2.208	380.0
401.832	4.100	2.008	411.6
402.032	4.300	1.808	443.9
402.232	4.500	1.608	477.0
402.432	4.700	1.408	510.9
402.632	4.900	1.208	545.5
402.832	5.100	1.008	581.1
403.032	5.300	0.808	617.7
403.232	5.500	0.608	655.2

[1] GHD. (2020). *Copperlode Falls Dam – Dam Data Book.*

Copperlode Falls Dam – Spillway Rating Curve
(Including flow over dam crest and wave wall)

Water Elevation (m AHD)	Water Depth Above Spillway (m)	Freeboard to DCL (m)	Spillway Discharge (m^3/s)
403.432	5.700	0.408	693.6
403.632	5.900	0.208	732.9
403.840	6.108	0.000	774.6
404.040	6.308	-0.200	821.3
404.240	6.508	-0.400	873.4
404.440	6.708	-0.600	940.5
404.440	6.708	-0.600	940.5
404.640	6.908	-0.800	1031.2
404.840	7.108	-1.000	1135.4
405.040	7.308	-1.200	1251.3
405.240	7.508	-1.400	1378.3
405.440	7.708	-1.600	1514.6
405.640	7.908	-1.800	1658.5
405.840	8.108	-2.000	1809.3
406.040	8.308	-2.200	1967.6
406.240	8.508	-2.400	2133.7
406.440	8.708	-2.600	2306.4
406.640	8.908	-2.800	2482.3
406.840	9.108	-3.000	2663.9

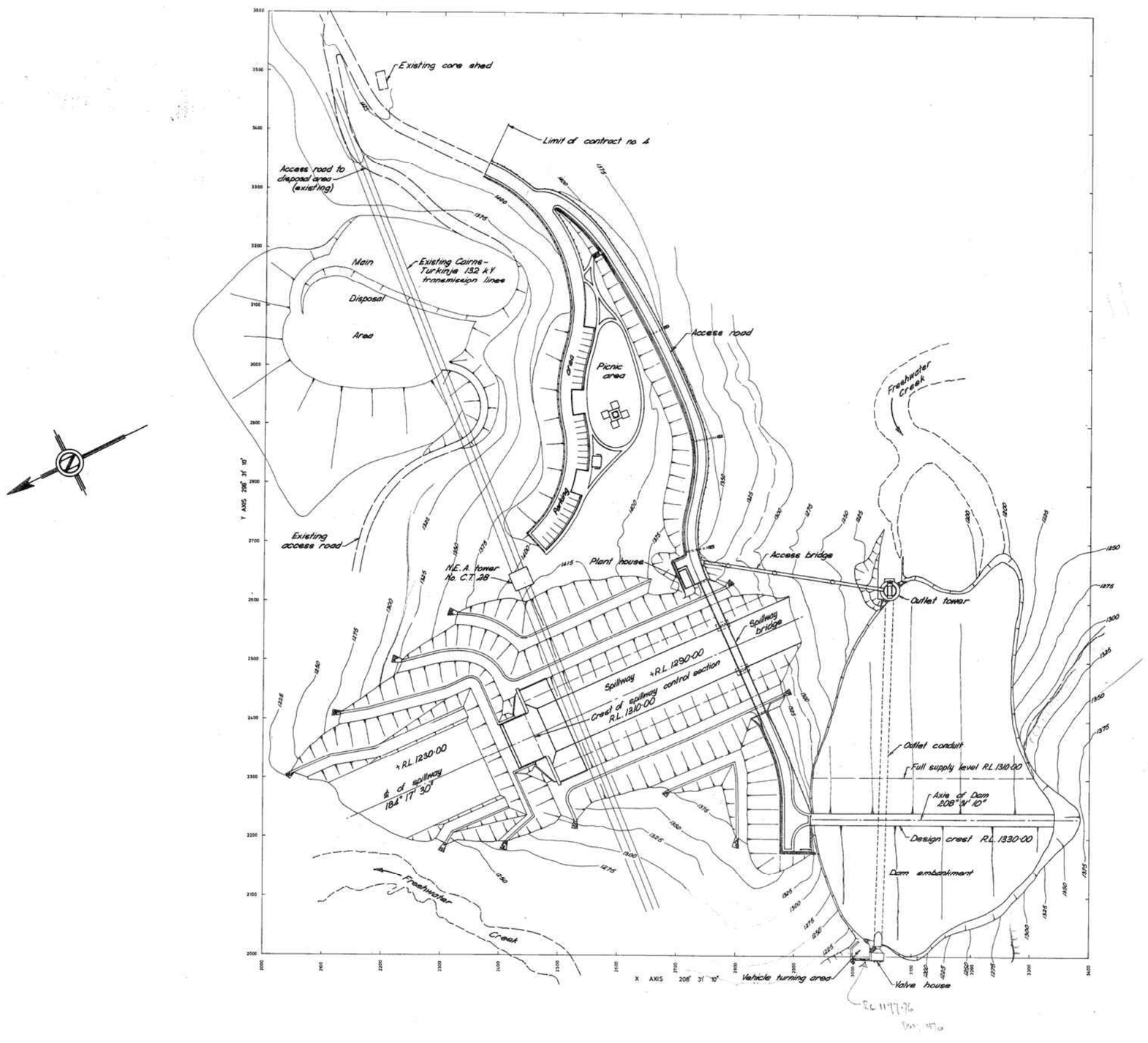
Copperlode Falls Dam – Flood Hydrology Data[2]

Flood ARI (1 in … years)	Peak Water Elevation (m AHD)	Peak Discharge (m^3/s)
50	400.2	189
100	400.4	216
200	400.6	244
500	400.9	284
1,000	401.2	327
2,000	401.5	369
5,000	401.8	416
10,000	402.1	455
20,000	402.4	501
50,000	402.7	563
100,000	403.0	614
500,000	403.5	714
10,000,000	404.6	970

[2] GHD. (2020). *Copperlode Falls Dam – Dam Data Book.*

Appendix C:

General Arrangement Drawings



REFERENCE TO DRAWINGS

75401	Locality and Location Maps
75408	Dam Site Survey - Control Diagram
75407	Main Disposal Area
75411	Embankment Details
75423	Spillway - General Arrangement
75439	Outlet Tower - General Arrangement Sh. 1
75440	" " - " " Sh. 2
75467	Outlet Conduit - Sh. 1
75470	Valve House - Sh. 1
75471	" " - Sh. 2
75481	Outlet Tower Access Bridge - General Arrangement
75496	Spillway Bridge - General Arrangement
75509	Plant House - Layout
75513	Layout of Access Road and Parking Area.
76529	Layout of Picnic Area.

Scale of Feet: 80 40 0 80 150 240

CHIEF ENGINEER
Date: 7-4-72

CHIEF DESIGNING ENG

DRAWING
Drawn:
Checked:
Traced: ——
Passed:

DESIGN
Comp's:
Passed:

DEPARTMENT OF LOCAL GOVERNMENT
TOWN WATER SUPPLY AND SEWERAGE BRANCH

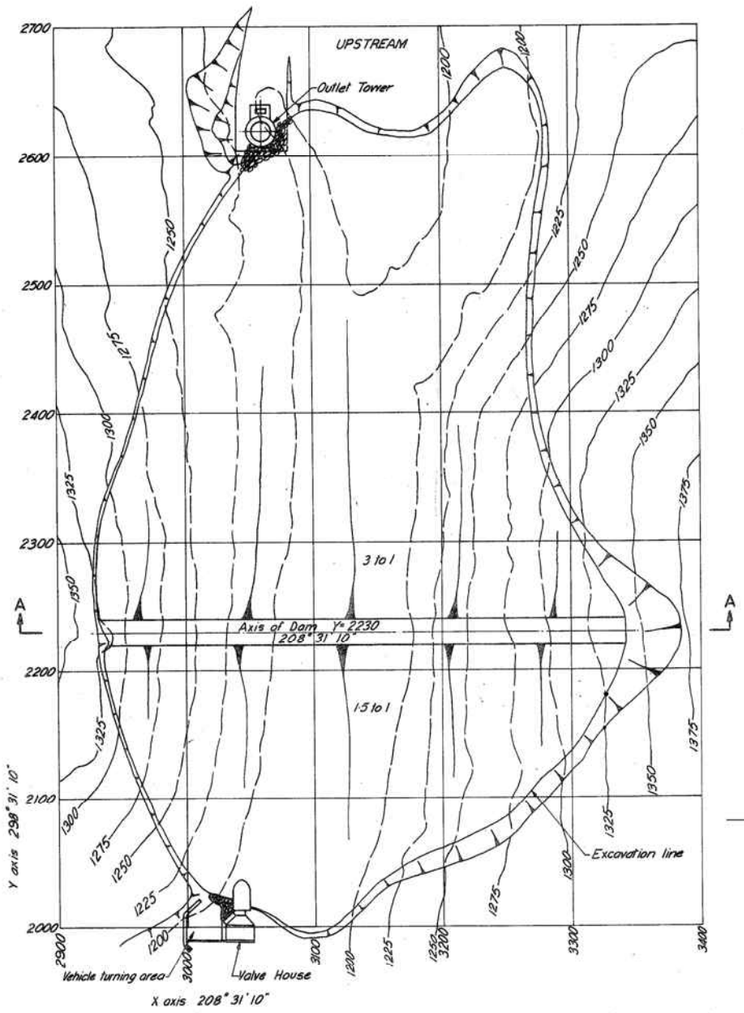
CAIRNS CITY COUNCIL — CAIRNS WATER SUPPLY

COPPERLODE FALLS DAM
GENERAL ARRANGEMENT OF DAM

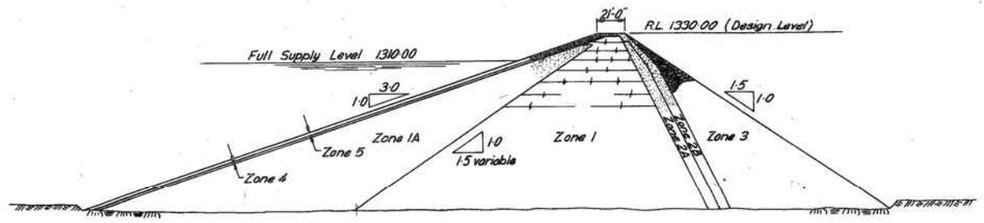
Job No.: 2204

75410

EC 1197-76

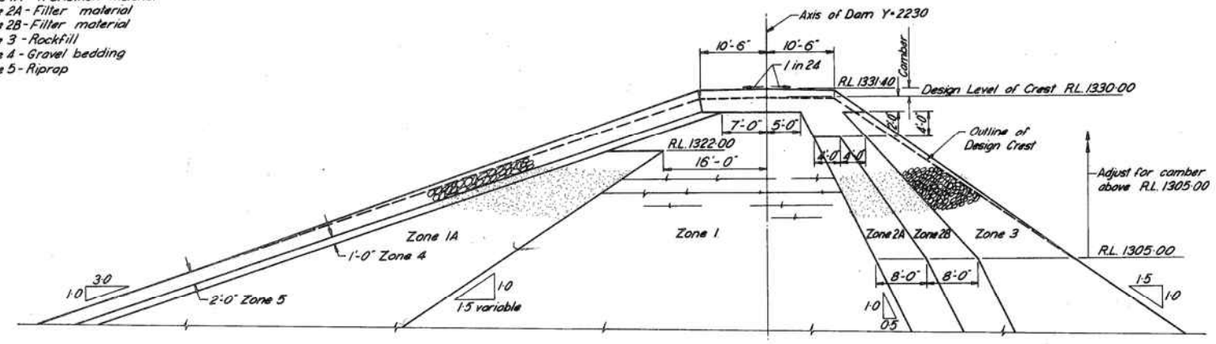


PLAN
Scale A

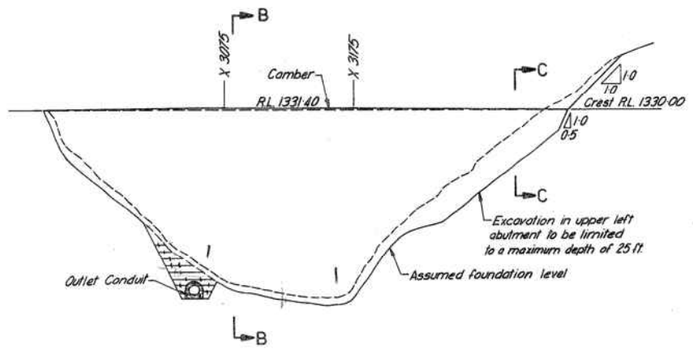


SECTION BB
Scale A

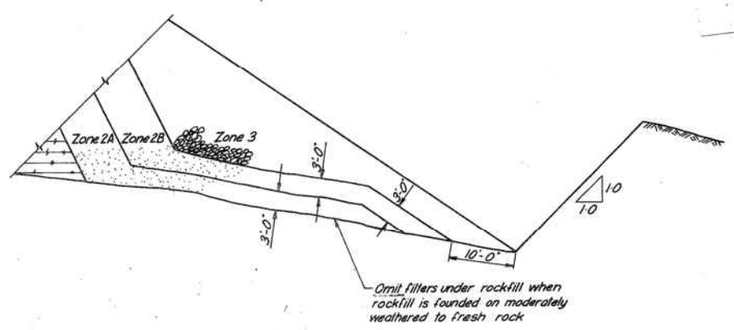
EMBANKMENT MATERIALS
Zone 1 - Earthfill
Zone 1A - Transition material
Zone 2A - Filter material
Zone 2B - Filter material
Zone 3 - Rockfill
Zone 4 - Gravel bedding
Zone 5 - Riprap



DETAIL OF CREST
Scale B



SECTION AA
Scale A



SECTION CC
Scale B

REFERENCE TO DRAWINGS
75410 General Arrangement of Dam

NOTES

Scale A feet 50 25 0 50 100 feet
Scale B feet 10 5 0 10 20 feet

CHIEF ENGINEER
Date: 2-2-22
CHIEF DESIGNING ENG.

DRAWING	Scale:
Drawn:	As Shown
Checked:	DESIGN
Traced:	Comp's:
Passed:	Passed:

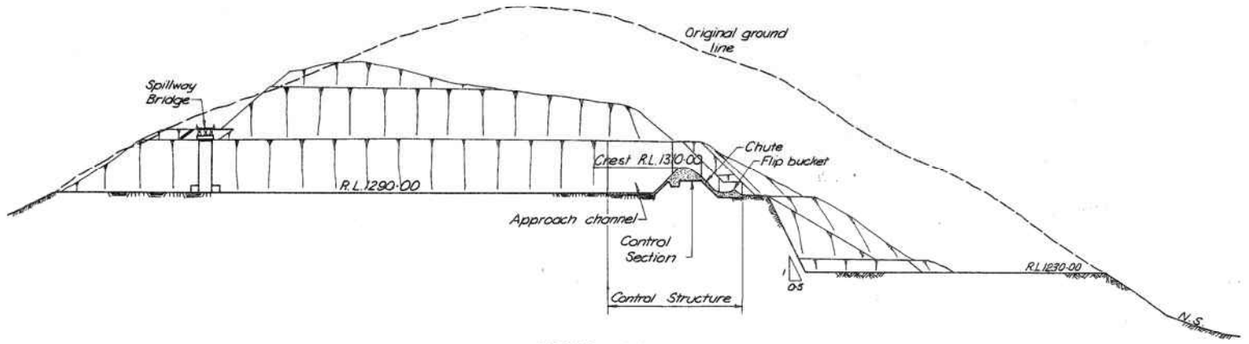
DEPARTMENT OF LOCAL GOVERNMENT
TOWN WATER SUPPLY AND SEWERAGE BRANCH

CAIRNS CITY COUNCIL — CAIRNS WATER SUPPLY

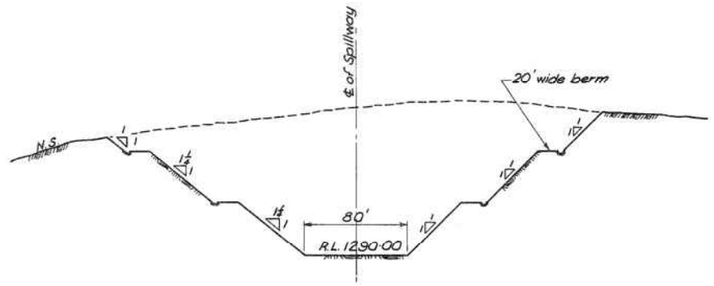
COPPERLODE FALLS DAM
EMBANKMENT DETAILS

Job No: 2204

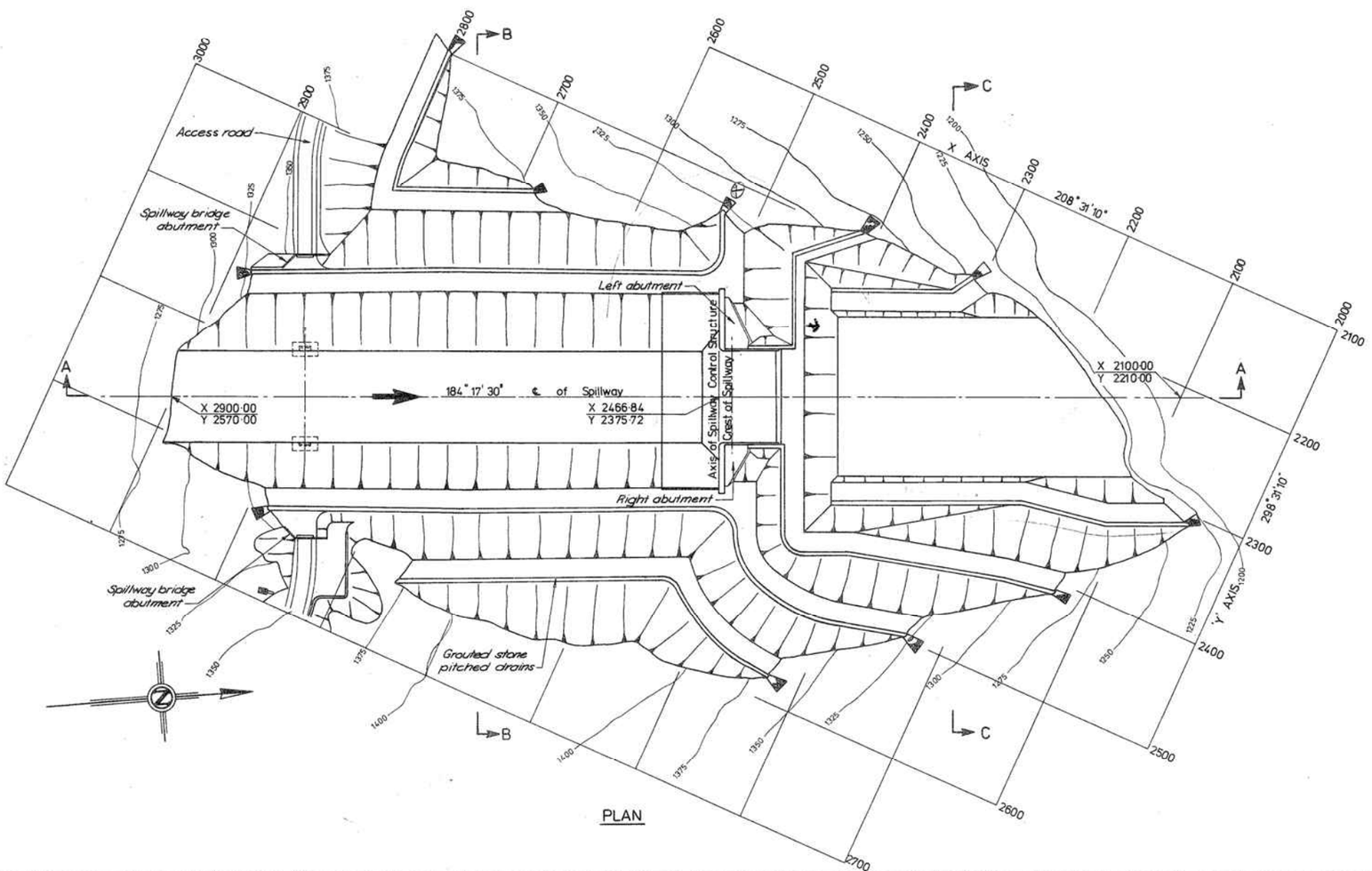
75411



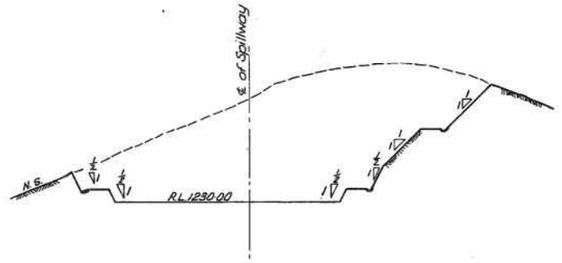
SECTION AA



SECTION BB



PLAN



SECTION CC

REFERENCE TO DRAWINGS

75410 General Arrangement of Dam
75424/5 Earthworks Sh.1 & 2
75427/28 Control Structure - Approach Channel Sh.1 & 2
75429/31 " " Control Section, Structural Details Sh.1-3
75435 " " Chute & Flip Bucket Struct. Details

Scale of Feet: 50 0 50 100 150

CHIEF ENGINEER Date: 4-8-76

CHIEF DESIGNING ENG.

DRAWING		
Drawn:		
Checked:	DESIGN	
Traced:	Comp's:	
Passed:	Passed:	

DEPARTMENT OF LOCAL GOVERNMENT
TOWN WATER SUPPLY AND SEWERAGE BRANCH

CAIRNS CITY COUNCIL CAIRNS WATER SUPPLY

COPPERLODE FALLS DAM
SPILLWAY — GENERAL ARRANGEMENT

Job No: 2204

75423

Appendix D:

Inundation Maps

LOWER FRESHWATER ROAD
BRINSMEAD - KAMERUNGA ROAD
KAMERUNGA ROAD
REDLYNCH INTAKE ROAD
BRINSMEAD ROAD
LARSEN ROAD
REDLYNCH CONNECTOR ROAD
LORIDAN DRIVE
SAWYER ENTRANCE
MAREEBA SHIRE

LEGEND
- CopperlodeDam
- Railway
- Major Roads
- Minor Roads
- Model Extent

Depth (m)
- 0.05 - 0.15
- 0.15 - 0.30
- 0.30 - 0.50
- 0.50 - 1.00
- 1.00 - 2.00
- 2.00 - 5.00
- 5.00 - 10.00

KEY MAP

P.O. Box 359
Cairns QLD 4870
Tel: (07) 4044 3044
Fax:(07) 4044 3022

N
0 500
metres

Copperlode Falls Dam Dambreak Assessment

Copperlode Falls Dam Sunny Day Failure Scenario – Flood Depth – Northern Extent

- Basemap capture August 2023
- Tuflow Model completed by GHD in 2023

GDA

Cairns Regional Council

Projection: *GDA 94 (MGA Zone 55)*

File: \\silonspe-smb\gis\GIS\Work Requests\ServiceNow\TASK0088107_CRyan_CopperlodeDam_Model_Maps\Workings\SDF\CopperlodeSDF_Depth.WOR

Author: DC

Date: 06/02/2024

Sheet 1 of 2

Rev. A

THE ROCKS ROAD

REDLYNCH INTAKE ROAD

XAVIER HERBERT DRIVE

MARY PARKER DRIVE

GAMBURRA DRIVE

LEGEND

Copperlode Dam

Railway

Major Roads

Minor Roads

Model Extent

Depth (m)

0.05 - 0.15

0.15 - 0.30

0.30 - 0.50

0.50 - 1.00

1.00 - 2.00

2.00 - 5.00

5.00 - 10.00

KEY MAP

MAREEBA SHIRE

P.O. Box 359
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N

0 500

metres

Copperlode Falls Dam Dambreak Assessment

Copperlode Falls Dam Sunny Day Failure Scenario – Flood Depth – Southern Extent

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GDA

Cairns Regional Council

Projection: *GDA 94 (MGA Zone 55)*

File: *\\silonspe-smb\gis\GIS\Work Requests\ServiceNow\TASK0088107_CRyan_CopperlodeDam_Model_Maps\Workings\SDF\CopperlodeSDF_Depth.WOR*

Author: *DC*

Date: *06/02/2024*

Sheet 2 of 2

Rev. A

CARAVONICA
KAMERUNGA
BARRON
CAPTAIN COOK HIGHWAY
KAMERUNGA ROAD
FRESHWATER
MAREEBA SHIRE
REDLYNCH
BRINSMEAD
BRINSMEAD ROAD
LAKE MORRIS ROAD
32.6
32.4
32.2
32
31.8
31.6
31.4

LEGEND
- CopperlodeDam
- Railway
- Major Roads
- Minor Roads
- Flood Contours
- Flood Evacuation Zone
- Waterways

P.O. Box 359
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N
0 2
kilometres

Copperlode Falls Dam

Time to Max Flood Contours
No Failure 1:10,000

- Basemap capture August 2023

GDA

Cairns Regional Council

Projection: *GDA 94 (MGA Zone 55)*

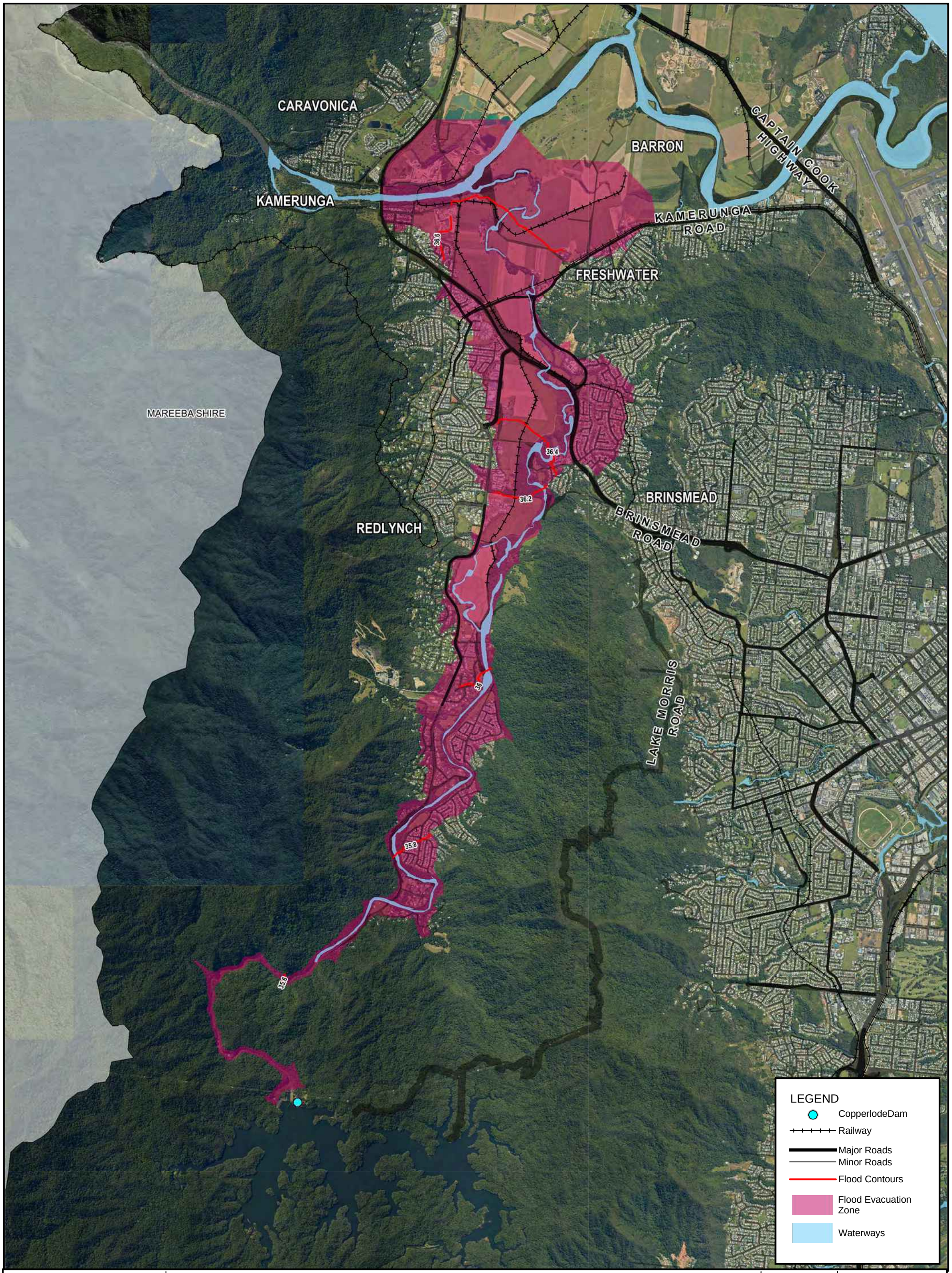
File: *\\silonspe-smb\GIS\GIS\Work Requests\ServiceNow\TASK0088107_CRyan_CopperlodeDam_Model_Maps\Workings\CopperlodeFloodContours.WOR*

Author: *DC*

Date: *15/03/2024*

Sheet Overview

Rev. A



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N

0 2

kilometres

Copperlode Falls Dam

Time to Max Flood Contours
Full Failure 1:10,000

- Basemap capture August 2023

GDA

Cairns Regional Council

Projection: *GDA 94 (MGA Zone 55)*

File: *\\silonspe-smb\GIS\GIS\Work Requests\ServiceNow\TASK0088107_CRyan_CopperlodeDam_Model_Maps\Workings\CopperlodeFloodContours.WOR*

Author: *DC*

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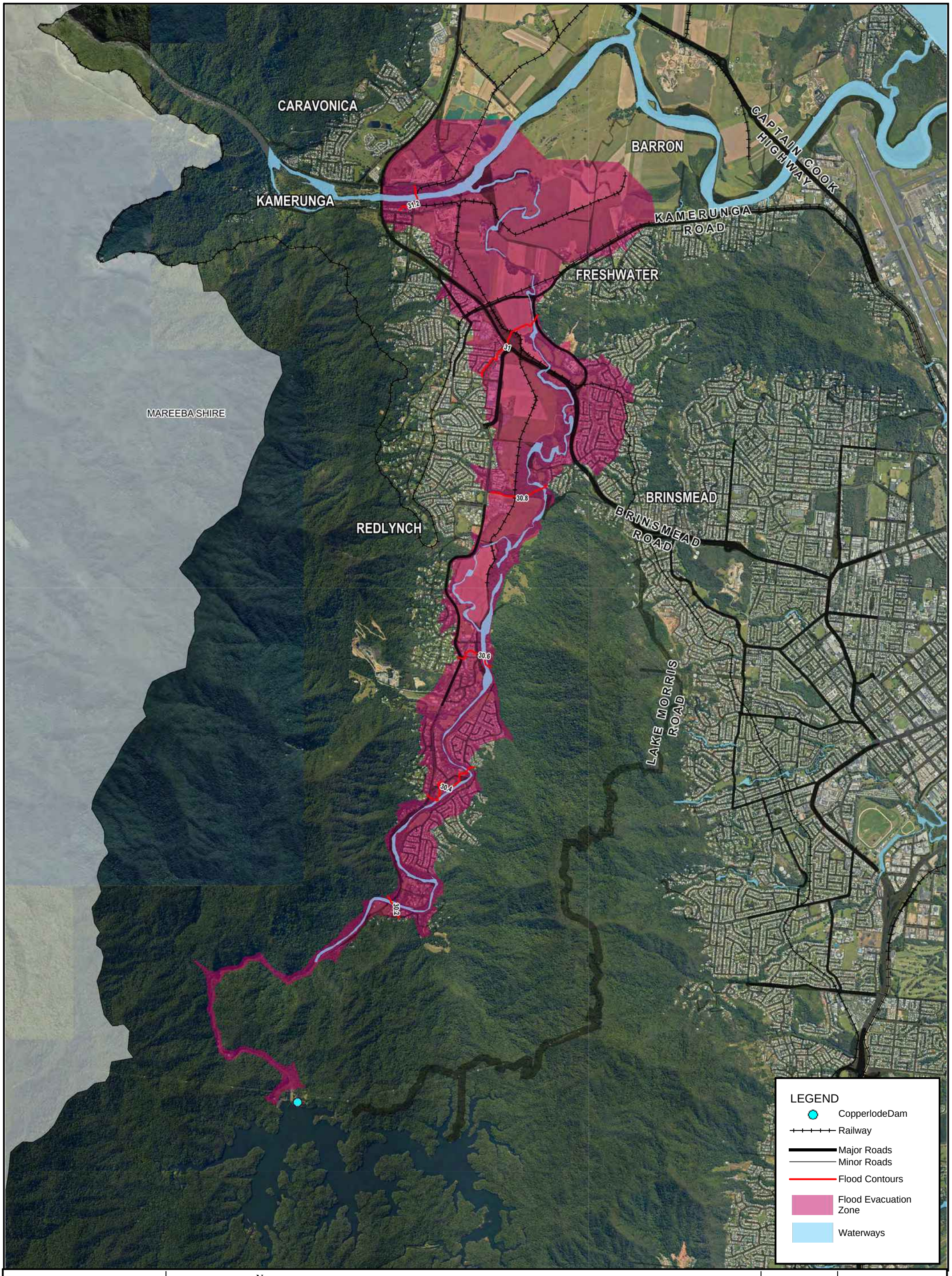

DO NOT SCALE

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Cairns QLD 4870
Tel: (07) 4044 3044
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N

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kilometres

Copperlode Falls Dam

Time to Max Flood Contours
Full Failure Probable Maximum Flood (PMF)

- Basemap capture August 2023

GDA

Cairns Regional Council

Projection: *GDA 94 (MGA Zone 55)*

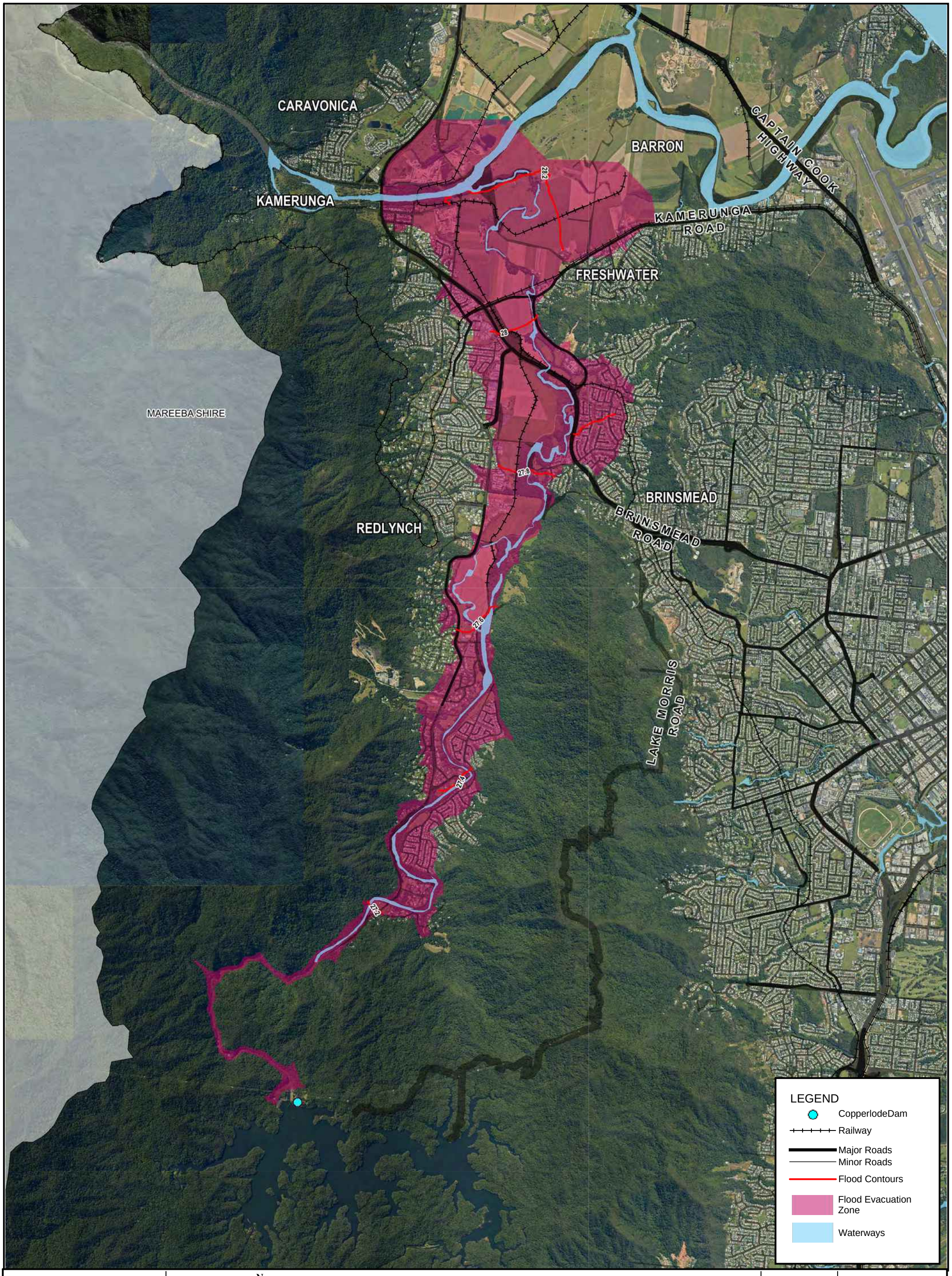
File: *\\silonspe-smb\GIS\GIS\Work Requests\ServiceNow\TASK0088107_CRyan_CopperlodeDam_Model_Maps\Workings\CopperlodeFloodContours.WOR*

Author: *DC*

Date: *15/03/2024*

Sheet Overview

Rev. A



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Cairns QLD 4870
Tel: (07) 4044 3044
Fax:(07) 4044 3022

N

0 2

kilometres

Copperlode Falls Dam

Time to Max Flood Contours
No Failure Probable Maximum Flood (PMF)

- Basemap capture August 2023

GDA

Cairns Regional Council

Projection: *GDA 94 (MGA Zone 55)*

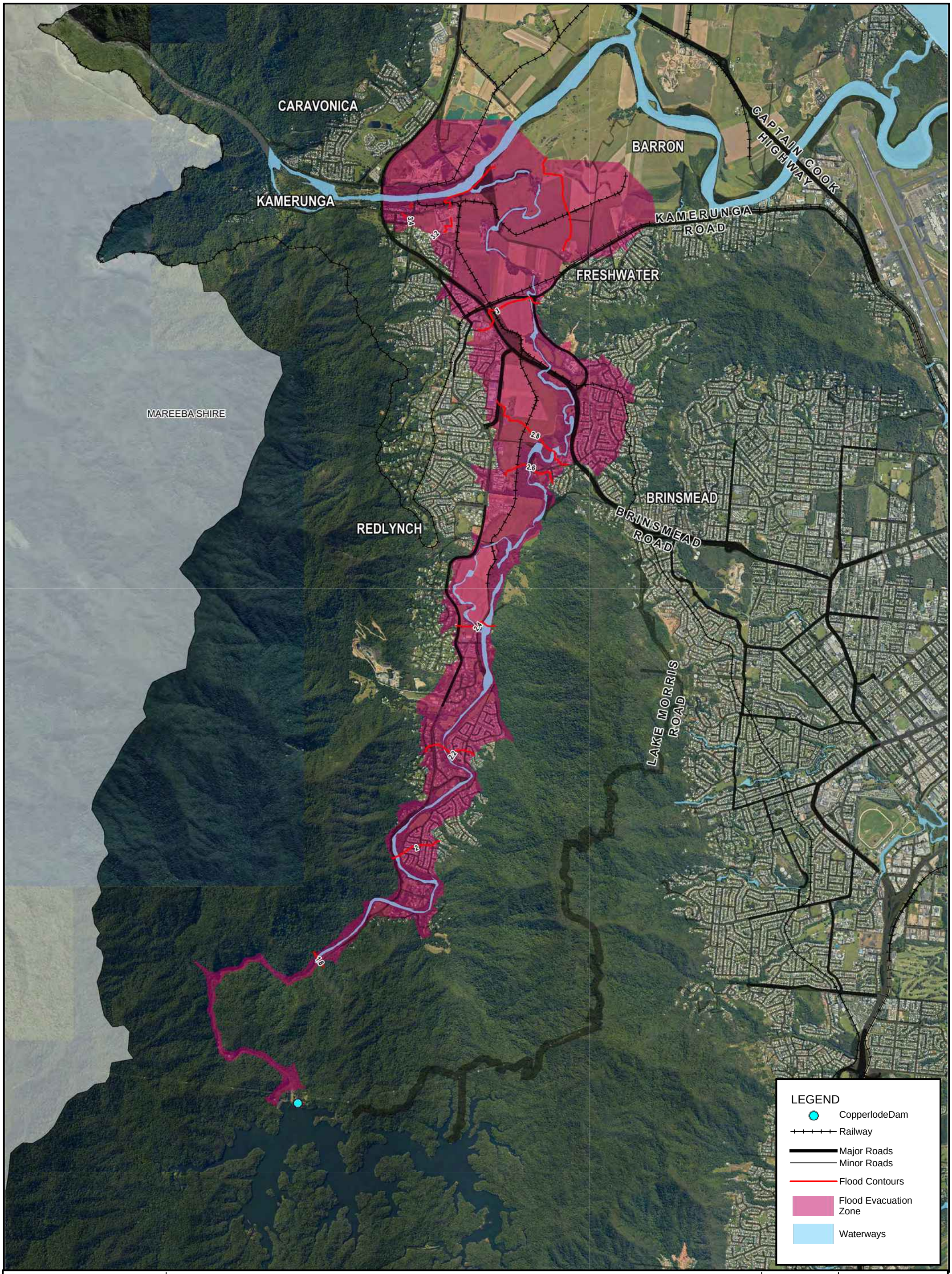
File: *\\silonspe-smb\GIS\GIS\Work Requests\ServiceNow\TASK0088107_CRyan_CopperlodeDam_Model_Maps\Workings\CopperlodeFloodContours.WOR*

Author: *DC*

Date: *15/03/2024*

Sheet Overview

Rev. A



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Tel: (07) 4044 3044
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N

0 2

kilometres

Copperlode Falls Dam

Time to Max Flood Contours
Sunny Day Failure

- Basemap capture August 2023

GDA

Cairns Regional Council

Projection: *GDA 94 (MGA Zone 55)*

File: *\\silonspe-smb\GIS\GIS\Work Requests\ServiceNow\TASK0088107_CRyan_CopperlodeDam_Model_Maps\Workings\CopperlodeFloodContours.WOR*

Author: *DC*

Date: *15/03/2024*

Sheet Overview

Rev. A

LOWER FRESHWATER ROAD
KAMERUNGA ROAD
BRINSMEAD - KAMERUNGA ROAD
BRINSMEAD ROAD
LARSEN ROAD
REDLYNCH CONNECTOR ROAD
REDLYNCH INTAKE ROAD
BRINSMEAD ROAD
MAREEBA SHIRE

KEY MAP

LEGEND
- CopperlodeDam
- PAR locations
- Railway
- Major Roads
- Minor Roads
- Model Extent

P.O. Box 359
Cairns QLD 4870
Tel: (07) 4044 3044
Fax:(07) 4044 3022

N

0 500
metres

Copperlode Falls Dam Dambreak Assessment

Copperlode Falls Dam Flood Failure Scenario – PAR - Sunny Day Failure – Northern Extent

- Basemap capture August 2023
- Tuflow Model completed by GHD in 2023

GDA

Cairns REGIONAL COUNCIL

Projection: *GDA 94 (MGA Zone 55)*

File: *\\Isilonspe-smb\gis\GIS\Work Requests\ServiceNow\TASK0088107_CRyan_CopperlodeDam_Model_Maps\Workings\SDF\CopperlodeSDF_PAR.WOR*

Author: DC

Date: 07/03/2024

Sheet 1 of 2

Rev. A

REDLYNCH INTAKE ROAD

GAMBURRA DRIVE

LEGEND

- Copperlode Dam
- PAR locations
- Railway
- Major Roads
- Minor Roads
- Model Extent

KEY MAP

MAREEBA SHIRE

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Tel: (07) 4044 3044
Fax:(07) 4044 3022

N

0 500

metres

Copperlode Falls Dam Dambreak Assessment

Copperlode Falls Dam Flood Failure Scenario – PAR - Sunny Day Failure – Southern Extent

- Basemap capture August 2023
- Tuflow Model completed by GHD in 2023

GDA

Cairns REGIONAL COUNCIL

Projection: *GDA 94 (MGA Zone 55)*

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Author: *DC*

Date: *07/03/2024*

Sheet 2 of 2

Rev. A

LOWER FRESHWATER ROAD
BRINSMEAD - KAMERUNGA ROAD
KAMERUNGA ROAD
REDLYNCH INTAKE ROAD
BRINSMEAD ROAD
LARSEN ROAD
REDLYNCH CONNECTOR ROAD
LORIDAN DRIVE
BRINSMEAD ROAD
REDLYNCH INTAKE ROAD
SAWYER ENTRANCE
MAREEBA SHIRE
KEY MAP

LEGEND

- CopperlodeDam
- Railway
- Major Roads
- Minor Roads
- Model Extent

Depth (m)

- 0.05 - 0.15
- 0.15 - 0.30
- 0.30 - 0.50
- 0.50 - 1.00
- 1.00 - 2.00
- 2.00 - 5.00
- 5.00 - 10.00

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N

0 500

metres

Copperlode Falls Dam Dambreak Assessment

Copperlode Falls Dam Flood Failure Scenario – Flood Depth 1 in 10,000 AEP – Northern Extent

- Basemap capture August 2023
- Tuflow Model completed by GHD in 2023

GDA

Cairns REGIONAL COUNCIL

Projection: *GDA 94 (MGA Zone 55)*

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Author: DC

Date: 06/02/2024

Sheet 1 of 2

Rev. A

THE ROCKS ROAD

REDLYNCH INTAKE ROAD

XAVIER HERBERT DRIVE

MARY PARKER DRIVE

GAMBURRA DRIVE

LEGEND

Copperlode Dam

Railway

Major Roads

Minor Roads

Model Extent

Depth (m)

0.05 - 0.15

0.15 - 0.30

0.30 - 0.50

0.50 - 1.00

1.00 - 2.00

2.00 - 5.00

5.00 - 10.00

KEY MAP

MAREEBA SHIRE

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Tel: (07) 4044 3044
Fax:(07) 4044 3022

N

0 500

metres

Copperlode Falls Dam Dambreak Assessment

Copperlode Falls Dam Flood Failure Scenario – Flood Depth 1 in 10,000 AEP – Southern Extent

- Basemap capture August 2023
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GDA

Cairns REGIONAL COUNCIL

Projection: *GDA 94 (MGA Zone 55)*

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Author: *DC*

Date: *06/02/2024*

Sheet 2 of 2

Rev. A

LOWER FRESHWATER ROAD
KAMERUNGA ROAD
BRINSMEAD - KAMERUNGA ROAD
BRINSMEAD ROAD
LARSEN ROAD
REDLYNCH CONNECTOR ROAD
REDLYNCH INTAKE ROAD
BRINSMEAD ROAD
MAREEBA SHIRE
KEY MAP

LEGEND
- CopperlodeDam
- PAR Locations
- Railway
- Major Roads
- Minor Roads
- Model Extent

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Cairns QLD 4870
Tel: (07) 4044 3044
Fax:(07) 4044 3022

N

0 500
metres

Copperlode Falls Dam Dambreak Assessment

Copperlode Falls Dam Flood Failure Scenario – PAR - 1 in 10,000 AEP – Northern Extent

- Basemap capture August 2023
- Tuflow Model completed by GHD in 2023

GDA

Cairns Regional Council

Projection: *GDA 94 (MGA Zone 55)*

File: \\Isilonspe-smb\gis\GIS\Work Requests\ServiceNow\TASK0088107_CRyan_CopperlodeDam_Model_Maps\Workings\NF\NF_1_10000_PAR.WOR

Author: DC

Date: 07/03/2024

Sheet 1 of 2

Rev. A

REDLYNCH INTAKE ROAD

GAMBURRA DRIVE

LEGEND

- Copperlode Dam
- PAR Locations
- Railway
- Major Roads
- Minor Roads
- Model Extent

KEY MAP

MAREEBA SHIRE

DO NOT SCALE

P.O. Box 359
Cairns QLD 4870
Tel: (07) 4044 3044
Fax:(07) 4044 3022

N

0 500

metres

Copperlode Falls Dam Dambreak Assessment

Copperlode Falls Dam Flood Failure Scenario – PAR - 1 in 10,000 AEP – Southern Extent

- Basemap capture August 2023
- Tuflow Model completed by GHD in 2023

GDA

Cairns REGIONAL COUNCIL

Projection: *GDA 94 (MGA Zone 55)*

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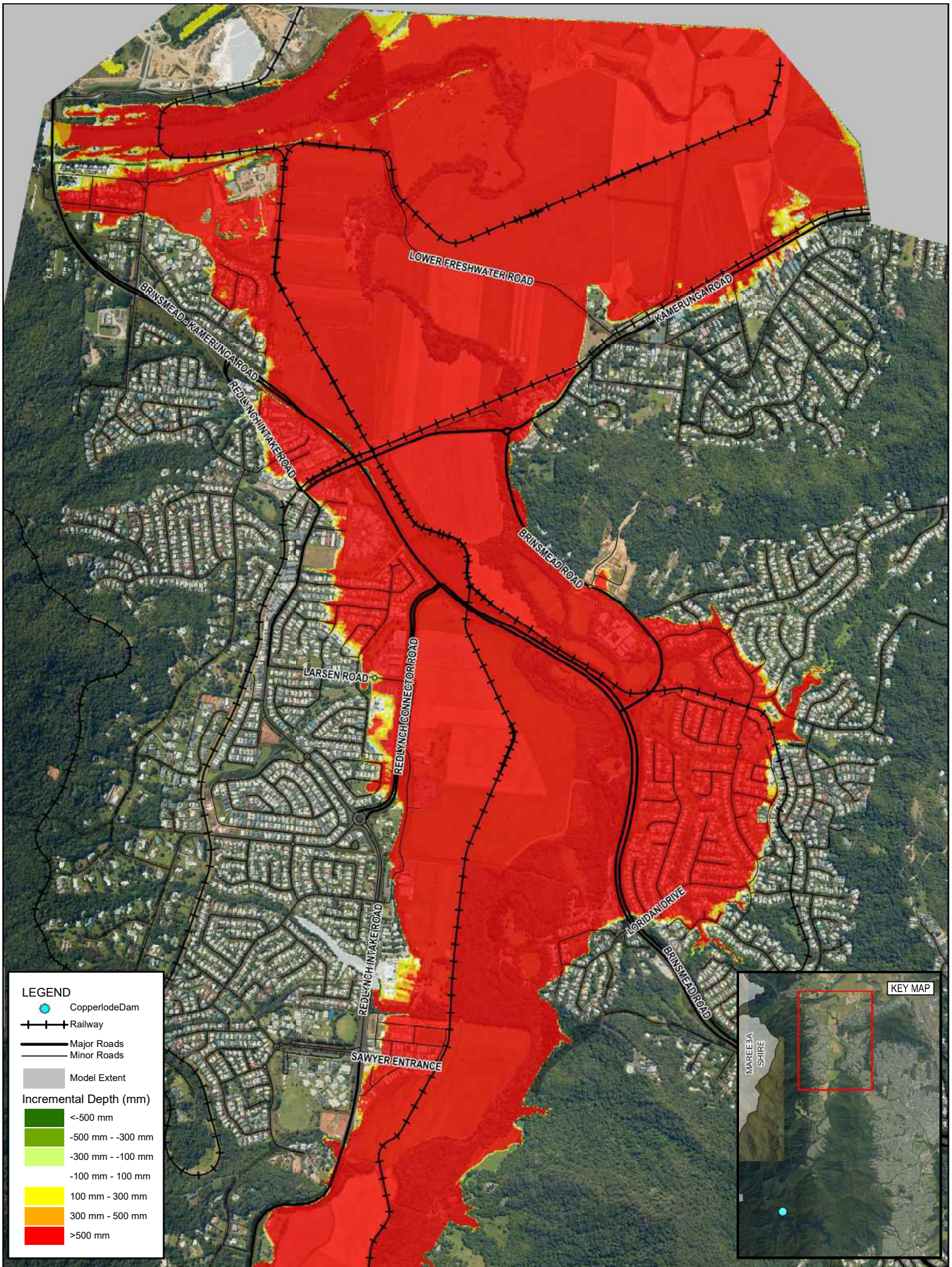
Author: DC

Date: 07/03/2024

Sheet 2 of 2

Rev. A



DO NOT SCALE

P.O. Box 359
Cairns QLD 4870
Tel: (07) 4044 3044
Fax:(07) 4044 3022

N

0 500

metres

Copperlode Falls Dam Dambreak Assessment

Copperlode Falls Dam – Flood Afflux 1 in 10,000 AEP – Northern Extent

- Basemap capture August 2023
- Tuflow Model completed by GHD in 2023

GDA

Cairns REGIONAL COUNCIL

Projection: GDA 94 (MGA Zone 55)

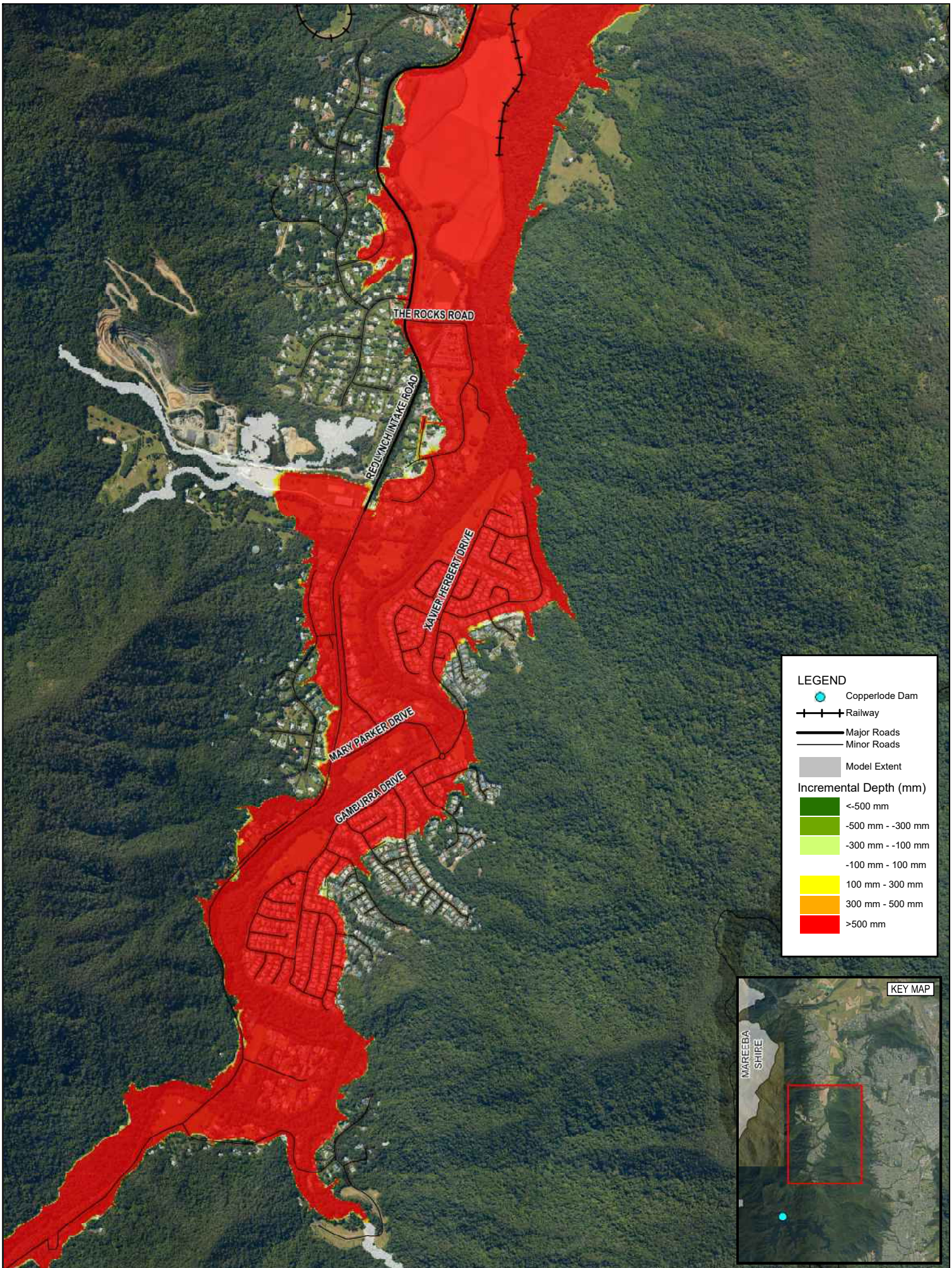
File: \\silonspe-smb\gis\GIS\Work Requests\ServiceNow\TASK0088107_CRyan_CopperlodeDam_Model_Maps\Workings\NF\NF_1_10000_Afflux.WOR

Author: DC

Date: 06/03/2024

Sheet 1 of 2

Rev. A



DO NOT SCALE

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N

0 500

metres

Copperlode Falls Dam Dambreak Assessment

Copperlode Falls Dam – Flood Afflux 1 in 10,000 AEP – Southern Extent

- Basemap capture August 2023
- Tuflow Model completed by GHD in 2023

GDA

Cairns REGIONAL COUNCIL

Projection: GDA 94 (MGA Zone 55)

File: \\silonspe-smb\gis\GIS\Work Requests\ServiceNow\TASK0088107_CRyan_CopperlodeDam_Model_Maps\Workings\NF\NF_1_10000_Afflux.WOR

Author: DC

Date: 06/03/2024

Sheet 2 of 2

Rev. A

LOWER FRESHWATER ROAD
BRINSMEAD - KAMERUNGA ROAD
KAMERUNGA ROAD
REDLYNCH INTAKE ROAD
BRINSMEAD ROAD
LARSEN ROAD
REDLYNCH CONNECTOR ROAD
LORIDAN DRIVE
BRINSMEAD ROAD
REDLYNCH INTAKE ROAD
SAWYER ENTRANCE

LEGEND

- CopperlodeDam
- Railway
- Major Roads
- Minor Roads
- Model Extent

Depth (m)

- 0.05 - 0.15
- 0.15 - 0.30
- 0.30 - 0.50
- 0.50 - 1.00
- 1.00 - 2.00
- 2.00 - 5.00
- 5.00 - 10.00

KEY MAP

MAREEBA SHIRE

P.O. Box 359
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Tel: (07) 4044 3044
Fax:(07) 4044 3022

N

0 500

metres

Copperlode Falls Dam Dambreak Assessment

Copperlode Falls Dam Flood Failure Scenario – Flood Depth PMF – Northern Extent

- Basemap capture August 2023
- Tuflow Model completed by GHD in 2023

GDA

Cairns REGIONAL COUNCIL

Projection: *GDA 94 (MGA Zone 55)*

File: \\silonspe-smb\gis\GIS\Work Requests\ServiceNow\TASK0088107_CRyan_CopperlodeDam_Model_Maps\Workings\FF\FF_PMF_Depth.WOR

Author: DC

Date: 06/02/2024

Sheet 1 of 2

Rev. A

THE ROCKS ROAD

REDLYNCH INTAKE ROAD

XAVIER HERBERT DRIVE

MARY PARKER DRIVE

GAMBURRA DRIVE

LEGEND

Copperlode Dam

Railway

Major Roads

Minor Roads

Model Extent

Depth (m)

0.05 - 0.15

0.15 - 0.30

0.30 - 0.50

0.50 - 1.00

1.00 - 2.00

2.00 - 5.00

5.00 - 10.00

KEY MAP

MAREEBA SHIRE

P.O. Box 359
Cairns QLD 4870

Tel: (07) 4044 3044
Fax:(07) 4044 3022

N

0 500

metres

Copperlode Falls Dam Dambreak Assessment

Copperlode Falls Dam Flood Failure Scenario – Flood Depth PMF – Southern Extent

- Basemap capture August 2023
- Tuflow Model completed by GHD in 2023

GDA

Cairns REGIONAL COUNCIL

Projection: *GDA 94 (MGA Zone 55)*

File: *\\silonspe-smb\gis\GIS\Work Requests\ServiceNow\TASK0088107_CRyan_CopperlodeDam_Model_Maps\Workings\FF\FF_PMF_Depth.WOR*

Author: DC

Date: 06/02/2024

Sheet 2 of 2

Rev. A

LOWER FRESHWATER ROAD
BRINSMEAD - KAMERUNGA ROAD
KAMERUNGA ROAD
BRINSMEAD ROAD
LARSEN ROAD
REDLYNCH CONNECTOR ROAD
REDLYNCH INTAKE ROAD
BRINSMEAD ROAD
MAREEBA SHIRE
KEY MAP

LEGEND
- CopperlodeDam
- PAR Locations
- Railway
- Major Roads
- Minor Roads
- Model Extent

DO NOT SCALE

P.O. Box 359
Cairns QLD 4870
Tel: (07) 4044 3044
Fax:(07) 4044 3022

N

0 500
metres

Copperlode Falls Dam Dambreak Assessment

Copperlode Falls Dam Flood Failure Scenario – PAR - PMF – Northern Extent

- Basemap capture August 2023
- Tuflow Model completed by GHD in 2023

GDA

Cairns Regional Council

Projection: *GDA 94 (MGA Zone 55)*

File: \\Isilonspe-smb\gis\GIS\Work Requests\ServiceNow\TASK0088107_CRyan_CopperlodeDam_Model_Maps\Workings\NF\NF_PMF_PAR.WOR

Author: DC

Date: 07/03/2024

Sheet 1 of 2

Rev. A

THE ROCKS ROAD

REDLYNCH INTAKE ROAD

GAMBURRA DRIVE

LEGEND

- Copperlode Dam
- PAR Locations
- Railway
- Major Roads
- Minor Roads
- Model Extent

KEY MAP

MAREEBA SHIRE

P.O. Box 359
Cairns QLD 4870
Tel: (07) 4044 3044
Fax:(07) 4044 3022

N

0 500

metres

Copperlode Falls Dam Dambreak Assessment

Copperlode Falls Dam Flood Failure Scenario – PAR - PMF – Southern Extent

- Basemap capture August 2023
- Tuflow Model completed by GHD in 2023

GDA

Cairns Regional Council

Projection: *GDA 94 (MGA Zone 55)*

File: *\\Isilonspe-smb\gis\GIS\Work Requests\ServiceNow\TASK0088107_CRyan_CopperlodeDam_Model_Maps\Workings\NF\NF_PMF_PAR.WOR*

Author: *DC*

Date: *07/03/2024*

Sheet 2 of 2

Rev. A

LOWER FRESHWATER ROAD
KAMERUNGA ROAD
BRINSMEAD - KAMERUNGA ROAD
REDLYNCH INTAKE ROAD
BRINSMEAD ROAD
LARSEN ROAD
REDLYNCH CONNECTOR ROAD
LORIDAN DRIVE
SAWYER ENTRANCE
MAREEBA SHIRE

LEGEND

- CopperlodeDam
- Railway
- Major Roads
- Minor Roads
- Model Extent

Incremental Depth (mm)

- <-500 mm
- -500 mm - -300 mm
- -300 mm - -100 mm
- -100 mm - 100 mm
- 100 mm - 300 mm
- 300 mm - 500 mm
- >500 mm

KEY MAP

P.O. Box 359
Cairns QLD 4870
Tel: (07) 4044 3044
Fax:(07) 4044 3022

N

0 500

metres

Copperlode Falls Dam Dambreak Assessment

Copperlode Falls Dam – Flood Afflux PMF – Northern Extent

- Basemap capture August 2023
- Tuflow Model completed by GHD in 2023

GDA

Cairns REGIONAL COUNCIL

Projection: *GDA 94 (MGA Zone 55)*

File: *\\lsilonspe-smb\gis\GIS\Work Requests\ServiceNow\TASK0088107_CRyan_CopperlodeDam_Model_Maps\Workings\NF\NF_PMF_Afflux.WOR*

Author: DC

Date: 06/03/2024

Sheet 1 of 2

Rev. A

THE ROCKS ROAD

REDLYNCH INTAKE ROAD

XAVIER HERBERT DRIVE

MARY PARKER DRIVE

GAMBURRA DRIVE

LEGEND

- Copperlode Dam
- Railway
- Major Roads
- Minor Roads
- Model Extent

Incremental Depth (mm)

- <-500 mm
- -500 mm - -300 mm
- -300 mm - -100 mm
- -100 mm - 100 mm
- 100 mm - 300 mm
- 300 mm - 500 mm
- >500 mm

KEY MAP

MAREEBA SHIRE

P.O. Box 359
Cairns QLD 4870
Tel: (07) 4044 3044
Fax:(07) 4044 3022

N

0 500

metres

Copperlode Falls Dam Dambreak Assessment

Copperlode Falls Dam – Flood Afflux PMF – Southern Extent

- Basemap capture August 2023
- Tuflow Model completed by GHD in 2023

GDA

Cairns REGIONAL COUNCIL

Projection: *GDA 94 (MGA Zone 55)*

File: *\\silonspe-smb\gis\GIS\Work Requests\ServiceNow\TASK0088107_CRyan_CopperlodeDam_Model_Maps\Workings\NF\NF_PMF_Afflux.WOR*

Author: DC

Date: 06/03/2024

Sheet 2 of 2

Rev. A

Appendix E:

Situation Report Template

SiTREP Number:		EAP Activation Level:		EAP Hazard Table:	
Date:					
Time of issue:					
Sent by:					
Distribution List:					

Latest Water Levels for Copperlode Falls Dam

Date/Time	Water Level (m AHD)	Rise since last observation (m)	Freeboard to DCL embankment (m)	Freeboard to Flood of Record (m)

Latest Water Levels for Freshwater Creek at Redlynch Estate

Date/Time	Water Level (m AHD)	Rise since last observation (m)	Freeboard to Mary Parker Dr Bridge Deck (m)	Freeboard to Flood of Record (m)

Latest Spillway Operation for Copperlode Falls Dam

Date/Time	Height above spillway crest (m)	Spillway discharge (m^3/s)	Percentage of spillway capacity (%)

Latest Outlet Operation at Copperlode Falls Dam

Date/Time	Cone Valve 1 % Open	Cone Valve 2 % Open	Outlet Discharge (m^3/s)

Latest Piezometer Readings

Date/Time	Piezometric Level (m AHD) at Piezometer No.													
	2	3	4	6	7	8	9	10	14	15	17	18	19	20

NOTE: Piezometers 1, 12, 16, and 21 are not within specification and have been disregarded.
Piezometers 5, 11, and 13 are showing erratic or erroneous behaviour and have been disregarded.
Note: Piezometric levels in the table above should be **bold red** if outside the alert limits defined in Tables 4-1 to 4-5 in the Piezometer Trigger Level Assessment report #5507288. If this is the case, would expect the PLC has issued a separate alert.

Latest Rainfall

Rainfall (mm) recorded in last:	Copperlode Falls Dam*	Brinsmead	Kamerunga Br	Cairns Airport
1 Hour				
12 Hours				
18 Hours				
24 Hours				

*NOTE: This gauge is located - need to specify - manual at office, SCADA at office, BOM at Dam Wall Crest

Element	Report
Current Dam Condition	Advise physical changes to dam wall including damage to the dam, spillway, or outlet.
Summary	Describe the major occurrences/events in the reporting period, the actions taken, and resources deployed. Cross-reference to any other outputs submitted since the last SITREP where appropriate.
Intentions	Describe actions planned for the next reporting period including staffing and resources; and for mid/longer-term intentions.
Issues	Highlight any issues that may: impact on CRC WW achieving its desired outcomes; attract media attention; or are likely to have major community consequences.
Other	Insert any administrative or other issues that CRC or its stakeholders should be made aware of.
Assessment	Include an overall assessment of the situation from CRC WW's perspective.

Appendix F:

Communications Plan and Whispir Emergency Notification Messages

Appendix F: Communications Plan and *Whispir* Emergency Notification Messages

Activation Level:	Alert	Lean Forward	Stand Up Level 1	Stand Up Level 2	Stand Down
Trigger for Communications: Dam Hazard – Flooding					
1. CRC Internal Stakeholder Communications					
Whispir template details & priority **1 - SMS** **2 - Email**	CFD EAP has been activated to Alert. Dam Hazard – Flooding. Attend ECO meeting & follow directions of DEC. (Template #1)	CFD EAP has been activated to Lean Forward. Dam Hazard – Flooding. Attend ECO meeting & follow directions of DEC. (Template #2)	CFD EAP has been activated to Stand Up 1. Dam Hazard – Flooding. Attend ECO meeting & follow directions of DEC. (Template #3)	CFD EAP has been activated to Stand Up 2. Dam Hazard – Flooding. Attend ECO meeting & follow directions of DEC. (Template #4)	CFD EAP is at Stand Down. Attend ECO meeting & follow directions of DEC. (Template #5)
2. CRC External Stakeholder Communications					
Whispir template details & priority **1 - SMS** **2 - Email**	N/A	CFD EAP has been activated to Lean Forward. Dam Hazard – Flooding. Follow Directions of LDC. (Template #6)	CFD EAP has been activated to Stand Up 1. Dam Hazard – Flooding. Follow Directions of LDC. (Template #7)	CFD EAP has been activated to Stand Up 2. Dam Hazard – Flooding. Follow Directions of LDC. (Template #8)	CFD EAP is at Stand Down. Follow Directions of LDC. (Template #9)
3. External Communications					
Whispir template details & priority **1 – SMS** **2 – Email** **3 - Voice**	N/A	FLOOD ADVICE message from Cairns Disaster Group: Be aware for potential flash flooding. Monitor local weather conditions. Check your emergency kits. Go to www.disaster.cairns.qld.gov.au or listen to ABC radio. (Template #10)	FLASH FLOOD WATCH and ACT message from Cairns Disaster Group: Rapidly rising water levels downstream of Copperlode Dam may pose a threat to people and property in Redlynch, Brinsmead, Lower Freshwater and Kamerunga. Warn neighbours. Prepare to move to higher ground. Go to www.disaster.cairns.qld.gov.au or listen to ABC radio. (Template #11)	EMERGENCY. EMERGENCY. EVACUATE NOW. Flash Flood Emergency Warning from Cairns Disaster Group: Redlynch, Brinsmead, Lower Freshwater and Kamerunga may experience dangerous flash flooding. Immediate threat to life. Warn neighbours. Move to higher ground now. Go to www.disaster.cairns.qld.gov.au or listen to ABC radio. (Template #12)	Cairns Disaster Group advises Copperlode Dam outflows have decreased. Immediate risk has reduced. (Template #13)

Activation Level:	Alert	Lean Forward	Stand Up Level 1	Stand Up Level 2	Stand Down
Trigger for Communications: Dam Hazard – Embankment Failure					
1. CRC Internal Stakeholder Communications					
Whispir template details & priority **1 - SMS** **2 - Email**	CFD EAP has been activated to Alert. Dam Hazard – Embankment Failure. Attend ECO meeting & follow directions of DEC. (Template #14)	CFD EAP has been activated to Lean Forward. Dam Hazard – Embankment Failure. Attend ECO meeting & follow directions of DEC. (Template #15)	CFD EAP has been activated to Stand Up 1. Dam Hazard – Embankment Failure. Attend ECO meeting & follow directions of DEC. (Template #16)	CFD EAP has been activated to Stand Up 2. Dam Hazard – Embankment Failure. Attend ECO meeting & follow directions of DEC. (Template #17)	CFD EAP is at Stand Down. Attend ECO meeting & follow directions of DEC. (Template #5)
2. CRC External Stakeholder Communications					
Whispir template details & priority **1 - SMS** **2 - Email**	N/A	CFD EAP has been activated to Lean Forward. Dam Hazard – Embankment Failure. Follow Directions of LDC. (Template #18)	CFD EAP has been activated to Stand Up 1. Dam Hazard – Embankment Failure. Follow Directions of LDC. (Template #19)	CFD EAP has been activated to Stand Up 2. Dam Hazard – Embankment Failure. Follow Directions of LDC. (Template #20)	CFD EAP is at Stand Down. Follow Directions of LDC. (Template #9)
3. External Communications					
Whispir template details & priority **1 - SMS** **2 - Email** **3 - Voice**	N/A	N/A	EMERGENCY WATCH AND ACT message from Cairns Disaster Group: Copperlode Dam failure possible. Redlynch, Brinsmead, Lower Freshwater and Kamerunga may experience dangerous flash flooding. Be ready for evacuation advice. (Template #21)	EMERGENCY. EMERGENCY. EVACUATE NOW. MOVE TO HIGHER GROUND. COPPERLODE DAM FAILURE. Emergency Warning from Cairns Disaster Group: Redlynch, Brinsmead, Lower Freshwater and Kamerunga will experience dangerous flash flooding. IMMEDIATE THREAT TO LIFE. Warn neighbours. Go to www.disaster.cairns.qld.gov.au or listen to ABC radio (Template #22)	Cairns Disaster Group advises risk of Copperlode Dam failure is over. (Template #23)

Activation Level:	Alert	Lean Forward	Stand Up Level 1	Stand Up Level 2	Stand Down
Trigger for Communications: Dam Hazard – Spillway Failure					
1. CRC Internal Stakeholder Communications					
Whispir template details & priority **1 - SMS** **2 - Email**	CFD EAP has been activated to Alert. Dam Hazard – Spillway Failure. Attend ECO meeting & follow directions of DEC. (Template #24)	CFD EAP has been activated to Lean Forward. Dam Hazard – Spillway Failure. Attend ECO meeting & follow directions of DEC. (Template #25)	CFD EAP has been activated to Stand Up 1. Dam Hazard – Spillway Failure. Attend ECO meeting & follow directions of DEC. (Template #26)	CFD EAP has been activated to Stand Up 2. Dam Hazard – Spillway Failure. Attend ECO meeting & follow directions of DEC. (Template #27)	CFD EAP is at Stand Down. Attend ECO meeting & follow directions of DEC. (Template #5)
2. CRC External Stakeholder Communications					
Whispir template details & priority **1 - SMS** **2 - Email**	N/A	CFD EAP has been activated to Lean Forward. Dam Hazard – Spillway Failure. Follow Directions of LDC. (Template #28)	CFD EAP has been activated to Stand Up 1. Dam Hazard – Spillway Failure. Follow Directions of LDC. (Template #29)	CFD EAP has been activated to Stand Up 2. Dam Hazard – Spillway Failure. Follow Directions of LDC. (Template #30)	CFD EAP is at Stand Down. Follow Directions of LDC. (Template #9)
3. External Communications					
Whispir template details & priority **1 - SMS** **2 – Email** **3 - Voice**	N/A	N/A	EMERGENCY WATCH AND ACT message from Cairns Disaster Group: Copperlode Dam failure possible. Redlynch, Brinsmead, Lower Freshwater and Kamerunga may experience dangerous flash flooding. Be ready for evacuation advice (Template #21)	EMERGENCY. EMERGENCY. EVACUATE NOW. MOVE TO HIGHER GROUND. COPPERLODE DAM FAILURE. Emergency Warning from Cairns Disaster Group: Redlynch, Brinsmead, Lower Freshwater and Kamerunga will experience dangerous flash flooding. IMMEDIATE THREAT TO LIFE. Warn neighbours. Go to www.disaster.cairns.qld.gov.au or listen to ABC radio. (Template #22)	Cairns Disaster Group advises risk of Copperlode Dam failure is over. (Template #23)

Activation Level:	Alert	Lean Forward	Stand Up	Stand Down
Trigger for Communications: Dam Hazard – Earthquake and Landslide		****Enact dam (embankment/spillway) failure messaging if required****		
1. CRC Internal Stakeholder Communications				
Whispir template details & priority **1 - SMS** **2 - Email**	N/A	CFD EAP has been activated to Lean Forward. Dam Hazard – Earthquake or Landslide. Attend ECO meeting & follow directions of DEC. (Template #31)	N/A	CFD EAP is at Stand Down. Attend ECO meeting & follow directions of DEC. (Template #5)
2. CRC External Stakeholder Communications				
Whispir template details & priority **1 - SMS** **2 - Email**	N/A	CFD EAP has been activated to Lean Forward. Dam Hazard – Earthquake or Landslide. Follow Directions of LDC. (Template #32)	N/A	CFD EAP is at Stand Down. Follow Directions of LDC. (Template #9)
3. External Communications via Whispir				
Whispir template details & priority **1 - SMS** **2 – Email** **3 - Voice**	N/A	EMERGENCY ADVICE message from Cairns Disaster Group: Possible earthquake damage at Copperlode Dam. Stay alert for further advice. (Template #33)	N/A	Cairns Disaster Group advises earthquake risk at Copperlode Dam is over. (Template #38)

Activation Level:	Alert	Lean Forward	Stand Up	Stand Down
Trigger for Communications: Dam Hazard – Terrorist threat, malicious activity			****Enact dam (embankment/spillway) failure messaging if required****	
1. CRC Internal Stakeholders Communications				
Whispir template details & priority **1 - SMS** **2 - Email**	N/A	N/A	CFD EAP has been activated to Stand Up. Dam Hazard – Terrorist threat, malicious activity. Attend ECO meeting & follow directions of DEC. (Template #34)	CFD EAP is at Stand Down. Attend ECO meeting & follow directions of DEC. (Template #5)
2. CRC External Stakeholder Communications				
Whispir template details & priority **1 - SMS** **2 - Email**	N/A	N/A	CFD EAP has been activated to Stand Up. Dam Hazard – Terrorist threat, malicious activity. Follow Directions of LDC (Template #35)	CFD EAP has been activated to Stand Down. Follow Directions of LDC (Template #9)
3. External Communications				
Whispir template details & priority **1 – SMS** **2 – Email** **3 - Voice**	N/A	N/A	EMERGENCY WATCH AND ACT message from Cairns Disaster Group: Copperlode Dam security threat under investigation. Stay alert for further advice. (Template #36)	Cairns Disaster Group advises security risk at Copperlode Dam is over. (Template #37)

Trigger for Communications: Dam Hazard – Communications Failure		
Activation Trigger:	Communications Failure – Dam Site	Communications Failure – Local Area
1. CRC Internal Stakeholder Communications		
Whispir template details & priority **1 - SMS** **2 - Email**	Communication Failure - unable to communicate to or from CFD dam site and DEO is unreachable. Attend ECO meeting & follow directions of DEC. Attempt contact via Whispir message. Attempt communications every hour: - Landline phone - Attempt to text Mobile phone- instead of calling, much higher probability of success - Radio UHF comms - Social Media, e.g. Facebook (Internet may be available via landline) Refer to CIA Business Continuity Plan	Communication Failure - unable to receive communication in Cairns Region. Attend ECO meeting & follow directions of DEC. Attempt contact via Whispir message. Attempt communications every hour: - Landline phone - Attempt to text Mobile phone- instead of calling, much higher probability of success - Radio UHF comms - Social Media, e.g. Facebook (Internet may be available via landline) Refer to CIA Business Continuity Plan
2. CRC External Stakeholder Communications		
Whispir template details & priority **1 - SMS** **2 - Email**	N/A	Communication Failure - unable to receive communication in Cairns Region. Follow directions of LDC. Attempt contact via Whispir message. Attempt communications every hour: - Landline phone - Attempt to text Mobile phone- instead of calling, much higher probability of success - Radio UHF comms - Social Media, e.g. Facebook (Internet may be available via landline) Refer to CIA Business Continuity Plan
3. External Communications		
Whispir template details & priority **1 – SMS** **2 – Email** **3 - Voice**	N/A	N/A

Appendix G:

Copperlode Falls Dam AWS Message Templates – All Hazards

COPPERLODE FALLS DAM – FLOOD OPERATIONS – AWS

EAP LEVEL	ALERT		LEAN FORWARD	STAND UP		STAND DOWN	
AWS	**ADVICE: STAY INFORMED**	**ADVICE: PREPARE NOW**	**WATCH & ACT: PREPARE TO LEAVE**	**WATCH & ACT: MOVE TO HIGHER GROUND**	**EMERGENCY WARNING: LEAVE IMMEDIATELY**	**WATCH & ACT: AVOID THE AREA**	**ADVICE: SAFE TO RETURN**

LONG-FORM TEXT	**STAY INFORMED – Copperlode Falls Dam spilling excess water into Freshwater Creek as at [time, day, date, year]**
	
	Warning Level: ADVICE
	
	Warning Area: Areas downstream of Copperlode Falls Dam and in proximity to Freshwater Creek [Redlynch, Brinsmead, Lower Freshwater and Kamerunga].
	
	Copperlode Falls Dam is spilling excess water into Freshwater Creek. There is a chance of [widespread, localized, fast-moving, overland] flooding in [Redlynch, Brinsmead, Lower Freshwater and Kamerunga] by [timeframe – later today, tonight, tomorrow].
	
	What you should do:
	• Stay up to date because conditions could change overnight.
	• Decide what you will do if flooding starts.
	• Stay out of rivers, creeks, and flood water.
	
	If you are camping or caravanning:
	• Check water levels and warning updates through the night.
	• Be ready to move people, pets, camping gear, and vehicles to higher ground if it starts to flood.
	
	More information:
	• Stay informed at Cairns Disaster Dashboard https://disaster.cairns.qld.gov.au/
	• Tune in to 105.1 for ABC Radio National
	• Weather warnings go to http://www.bom.gov.au/qld/cairns/
	• For flood and storm emergency help, call the SES on 132 500 or download the SES Assistance QLD app.
	
	The next update will be sent when the situation changes.
	
	This warning has been issued by Cairns Disaster Group.
		PREPARE NOW – Copperlode Falls Dam spilling excess water into Freshwater Creek as at [time, day, date, year]
		
		Warning Level: ADVICE
		
		Warning Area: Areas downstream of Copperlode Falls Dam and in proximity to Freshwater Creek [Redlynch, Brinsmead, Lower Freshwater and Kamerunga].
		
		Water levels in Freshwater Creek are rising. [Widespread/localized/overland] flooding is [likely/possible] [later today, tonight, tomorrow]. People downstream of the Copperlode Falls Dam should PREPARE NOW in case it starts to flood/flooding gets worse.
		
		What you should do:
		• Stay up to date because conditions could change overnight.
		• Decide if you and the people you live with will leave if floodwaters get close to your house.
		• Stay away from rivers and creeks.
		
		If you decide to leave early:
		• Go to a safe and high place, away from flooding.
		• If you come to a flooded road, turn around and go the other way. Do not drive through floodwater.
		
		If you are camping or caravanning:
		• Pack up your campsite.
		• Check water levels and warning updates through the night.
		• Be ready to move people, pets, your camping gear, and vehicle to higher ground.
		
		More information:
		• Click here for all local warnings https://disaster.cairns.qld.gov.au/
		• Tune in to 105.1 for ABC Radio National.
		• Weather warnings go to http://www.bom.gov.au/qld/cairns/
		• For flood and storm emergency help, call the SES on 132 500 or download the SES Assistance QLD app.
		• **If your life is in danger, call Triple Zero (000) immediately.**
		
		The next update will be sent at [time, day, date] or when the situation changes.
		
		This warning has been issued by Cairns Disaster Group.
			PREPARE TO LEAVE – Copperlode Falls Dam catchment flood as at [time, day, date, year]
			
			Warning Level: WATCH AND ACT
			
			Warning Area: Areas downstream of Copperlode Falls Dam and in proximity to Freshwater Creek [Redlynch, Brinsmead, Lower Freshwater and Kamerunga].
			
			People downstream of Copperlode Falls Dam must **PREPARE TO LEAVE**. Water in Freshwater Creek is rising and there is [dangerous, widespread] flooding.
			
			If your life is in danger, call Triple Zero (000) immediately. For flood and storm emergency help, call the SES on 132 500 or download the SES Assistance QLD app.
			
			What you should do:
			• Prepare to leave so you can go quickly and safely if the flood gets worse. Get ready now.
			• If you do not have a safe place, [muster points] are located at [add map link to evac guide].
			• Stay away from creeks and rivers.
			• If you come to a flooded road, turn around and go another way. If it's flooded, forget it.
			
			If you are camping or caravanning:
			• Pack up your campsite.
			• Move people, pets, your camping gear, and vehicle to higher ground.
			
			Impacts in your area:
			• Flooding above ground floor level [possible] in some places.
			• Flooding above first floor level [possible] in some places.
			
			More information:
			• Click here for all local warnings https://disaster.cairns.qld.gov.au/
			• Tune in to 105.1 for ABC Radio National.
			• Weather warnings go to http://www.bom.gov.au/qld/cairns/
			
			The next update will be sent at [time, day, date] or when the situation changes.
			
			This warning has been issued by Cairns Disaster Group.
				MOVE TO HIGHER GROUND AWAY FROM CREEKS AND RIVERS – Copperlode Falls Dam catchment flood as at [time, day, date, year]
				
				Warning Level: WATCH AND ACT
				
				Warning Area: Areas downstream of Copperlode Falls Dam and in proximity to Freshwater Creek [Redlynch, Brinsmead, Lower Freshwater and Kamerunga].
				
				People downstream of Copperlode Falls Dam must **move to higher ground away from creeks and rivers.**
				
				Water in Freshwater Creek is rising quickly and there is [dangerous, major, widespread] flooding.
				
				Do not expect emergency services to come to your door.
				
				If your life is in danger, call Triple Zero (000) immediately. For flood and storm emergency help, call the SES on 132 500.
				
				What you should do:
				• Go to a safe place away from the flood now. Stay away from creeks and rivers.
				• If you do not have a safe place, [muster points] are located at [add link to evac guide].
				• If you come to a flooded road, turn around and go another way. If it's flooded, forget it.
				
				Impacts in your area:
				• Flooding above ground floor level [likely] in some places.
				• Flooding above first-floor level [likely] in some places.
				
				More information:
				• Click here for all local warnings https://disaster.cairns.qld.gov.au/
				• Tune in to 105.1 for ABC Radio National.
				• Weather warnings go to http://www.bom.gov.au/qld/cairns/
				
				The next update will be sent at [time, day, date] or when the situation changes.
				
				This warning has been issued by Cairns Disaster Group.
					LEAVE IMMEDIATELY – Copperlode Falls Dam catchment flood as at [time, day, date, year]
					
					Warning Level: EMERGENCY WARNING
					
					Warning Area: Areas downstream of Copperlode Falls Dam and in proximity to Freshwater Creek [Redlynch, Brinsmead, Lower Freshwater and Kamerunga].
					
					People downstream of Copperlode Falls Dam must **LEAVE IMMEDIATELY.** [Dangerous, Major, Widespread] flooding is happening **now**. **Your life is at risk.**
					
					If your life is in danger call Triple Zero (000) immediately. If you are flooded in your home, call the SES on 132 500.
					
					What you should do:
					• GO **NOW** to a safe place away from the flood.
					• If you do not have a safe place, [muster points] are located at [add link to evac guide].
					
					Impacts in your area:
					• Flooding to second-storey floors is [possible].
					• Single-storey buildings [could] be fully flooded.
					
					More information:
					• Click here for all local warnings https://disaster.cairns.qld.gov.au/
					• Tune in to 105.1 for ABC Radio National.
					• Weather warnings go to http://www.bom.gov.au/qld/cairns/
					
					The next update will be sent at [time, day, date] or when the situation changes.
					
					This warning has been issued by Cairns Disaster Group.
						AVOID THE AREA – Copperlode Falls Dam catchment flood as at [time, day, date, year]
						
						Warning Level: WATCH AND ACT
						
						Warning Area: Areas downstream of Copperlode Falls Dam and in proximity to Freshwater Creek [Redlynch, Brinsmead, Lower Freshwater and Kamerunga].
						
						Flood water downstream of Copperlode Falls Dam is starting to go down, but it is still too dangerous to start cleaning up and making repairs. Avoid the area.
						
						What you should do:
						• If you evacuated, stay where you are until you are told it is safe to go back.
						• If you did not leave, stay in your safe place.
						• Floodwater is dangerous - never drive, walk, or ride through floodwater. If it's flooded, forget it.
						
						More information:
						• Click here for all local warnings https://disaster.cairns.qld.gov.au/
						• Tune in to 105.1 for ABC Radio National.
						• Weather warnings go to http://www.bom.gov.au/qld/cairns/
						• For flood and storm emergency help, call the SES on 132 500.
						• If your life is in danger, call Triple Zero (000) immediately.
						
						The next update will be issued when the situation changes.
						
						This warning has been issued by Cairns Disaster Group.
							THREAT IS REDUCED (SAFE TO RETURN) – Copperlode Falls Dam catchment flood as at [time, day, date, year]
							
							Warning Level: ADVICE
							
							Warning Area: Areas downstream of Copperlode Falls Dam and in proximity to Freshwater Creek [Redlynch, Brinsmead, Lower Freshwater and Kamerunga].
							
							Flooding downstream of Copperlode Falls Dam has stopped and the water has gone down. If you left, it is now safe to return.
							
							Be careful of damage and never drive through floodwaters. If it's flooded, forget it.
							
							What you should do if your home or business has been flooded:
							• Check for building damage before you go inside.
							• Have all electrical and gas equipment professionally tested before use.
							• If water went above power points have the house checked by an electrician before turning the power back on.
							• Clean and dry out the building as soon as you can.
							• Protect your health and safety:
							  ○ Wear strong boots, gloves and protective clothing when cleaning up.
							  ○ Wash your hands and clothes often.
							  ○ Do not eat food that has touched floodwater or mud.
							  ○ Throw away food that should be kept cold or frozen if you lost power.
							  ○ Drink only fresh drinking water, like bottled water.
							
							Support and recovery help:
							• For flood and storm emergency help, call the SES on 132 500 or download the SES Assistance Queensland app.
							• Go to https://disaster.cairns.qld.gov.au/ for local updates including road closures and power outages.
							• Tune in to 105.1 for ABC Radio National.
							• Weather warnings go to http://www.bom.gov.au/qld/cairns/
							• For general relief and recovery information go to https://www.getready.qld.gov.au/after-disaster
							
							This warning has been issued by Cairns Disaster Group.

COPPERLODE FALLS DAM – FAILURE (EMBANKMENT/SPILLWAY) – AWS

EAP LEVEL	ALERT	LEAN FORWARD	STAND UP		STAND DOWN	
AWS	NOT APPLICABLE	NOT APPLICABLE	WATCH & ACT: PREPARE TO LEAVE	EMERGENCY WARNING: MOVE TO HIGHER GROUND	WATCH & ACT: AVOID THE AREA	ADVICE: SAFE TO RETURN
LONG-FORM TEXT	NOT APPLICABLE	NOT APPLICABLE	**PREPARE TO LEAVE – Possible failure of Copperlode Falls Dam as at [time, day, date, year]** **Warning Level: WATCH AND ACT** **Warning Area: Areas downstream of Copperlode Falls Dam and in proximity to Freshwater Creek [Redlynch, Brinsmead, Lower Freshwater and Kamerunga].** People in the following areas of **[Redlynch, Brinsmead, Lower Freshwater and Kamerunga]** must **PREPARE TO LEAVE.** **[insert polygon].** Water levels in Freshwater Creek may rise rapidly. Prepare to move to higher ground and for isolation. Do not expect emergency services to come to your door. **If your life is in danger, call Triple Zero (000) immediately.** **What you should do:** • Prepare to leave so you can go quickly if the water levels in in Freshwater Creek start to rise. Get ready now. • Decide where you and the people you live with will go. Find a safe and high place away from flooding. • If you do not have a safe place, muster points are located at [insert link to evac guide]. • Warn friends, family, and neighbours in your area. **More information:** • Click here for all local warnings https://disaster.cairns.qld.gov.au/ • Tune in to 105.1 for ABC Radio National. **The next update will be sent at [time, day, date] or when the situation changes.** This warning has been issued by Cairns Disaster Group.	**MOVE TO HIGHER GROUND – Failure of Copperlode Falls Dam as at [time, day, date, year]** **Warning Level: EMERGENCY WARNING** **Warning Area: Areas downstream of Copperlode Falls Dam and in proximity to Freshwater Creek [Redlynch, Brinsmead, Lower Freshwater and Kamerunga].** People downstream of Copperlode Falls Dam in **[Redlynch, Brinsmead, Lower Freshwater and Kamerunga]** must **IMMEDIATELY MOVE TO HIGHER GROUND.** **[insert polygon].** Get up as high as you can. There is likely to be dangerous, fast-moving flooding and debris along Freshwater Creek. **You are in serious danger**. You must get up as high as you can to survive. **What you should do:** • Get up as high as you safely can. • Muster points are located at [insert link to evac guide]. • Help other people who are with you if you can. • If your life is in danger, call Triple Zero (000) immediately. **More information:** • Click here for all local warnings https://disaster.cairns.qld.gov.au/ • Tune in to 105.1 for ABC Radio National. **The next update will be sent at [time, day, date] or when the situation changes.** This warning has been issued by Cairns Disaster Group.	**AVOID THE AREA – Copperlode Falls Dam catchment flood as at [time, day, date, year]** **Warning Level: WATCH AND ACT** **Warning Area: Areas downstream of Copperlode Falls Dam and in proximity to Freshwater Creek [Redlynch, Brinsmead, Lower Freshwater and Kamerunga].** Flood water downstream of Copperlode Falls Dam is starting to go down, but it is still too dangerous to start cleaning up and making repairs. Avoid the area. **What you should do:** • If you evacuated, stay where you are until you are told it is safe to go back. • If you did not leave, stay in your safe place. • Floodwater is dangerous - never drive, walk, or ride through floodwater. If it's flooded, forget it. **More information:** • Click here for all local warnings https://disaster.cairns.qld.gov.au/ • Tune in to 105.1 for ABC Radio National. • Weather warnings go to http://www.bom.gov.au/qld/cairns/ • For flood and storm emergency help, call the SES on 132 500. • If your life is in danger, call Triple Zero (000) immediately. **The next update will be issued when the situation changes.** This warning has been issued by Cairns Disaster Group.	**THREAT IS REDUCED (SAFE TO RETURN) – Copperlode Falls Dam catchment flood as at [time, day, date, year]** **Warning Level: ADVICE** **Warning Area: Areas downstream of Copperlode Falls Dam and in proximity to Freshwater Creek [Redlynch, Brinsmead, Lower Freshwater and Kamerunga].** Flooding downstream of Copperlode Falls Dam has stopped and the water has gone down. If you left, it is now safe to return. Be careful of damage and never drive through floodwaters. If it's flooded, forget it. **What you should do if your home or business has been flooded:** • Check for building damage before you go inside. • Have all electrical and gas equipment professionally tested before use. • If water went above power points have the house checked by an electrician before turning the power back on. • Clean and dry out the building as soon as you can. • Protect your health and safety: ○ Wear strong boots, gloves and protective clothing when cleaning up. ○ Wash your hands and clothes often. ○ Do not eat food that has touched floodwater or mud. ○ Throw away food that should be kept cold or frozen if you lost power. ○ Drink only fresh drinking water, like bottled water. **Support and recovery help:** • For flood and storm emergency help, call the SES on 132 500 or download the SES Assistance Queensland app. • Go to https://disaster.cairns.qld.gov.au/ for local updates including road closures and power outages. • Tune in to 105.1 for ABC Radio National. • Weather warnings go to http://www.bom.gov.au/qld/cairns/ • For general relief and recovery information go to https://www.getready.qld.gov.au/after-disaster This warning has been issued by Cairns Disaster Group.

COPPERLODE FALLS DAM – EARTHQUAKE – AWS

EAP LEVEL	ALERT	LEAN FORWARD	STAND UP		STAND DOWN	
AWS	**NOT APPLICABLE**	**ADVICE: STAY INFORMED**	**WATCH & ACT: PREPARE TO LEAVE**	**EMERGENCY WARNING: MOVE TO HIGHER GROUND**	**WATCH & ACT: AVOID THE AREA**	**ADVICE: SAFE TO RETURN**

LONG-FORM TEXT	**NOT APPLICABLE**	**STAY INFORMED – [Cairns] – earthquake as at [time, day, date, year]**
		Warning Level: ADVICE
		Warning Area: Areas downstream of Copperlode Falls Dam and in proximity to Freshwater Creek [Redlynch, Brinsmead, Lower Freshwater and Kamerunga].
		
		An earthquake has occurred in the Cairns region. Possible earthquake damage is being investigated at Copperlode Falls Dam.
		
		What you should do:
		• Stay up to date because conditions could change quickly.
		• Decide what you will do if you need to leave.
		
		More information:
		• Click here for all local warnings https://disaster.cairns.qld.gov.au/
		• Tune in to 105.1 for ABC Radio National.
		• Weather warnings go to http://www.bom.gov.au/qld/cairns/
		
		The next update will be sent when the situation changes.
		
		This warning has been issued by Cairns Disaster Group.
			PREPARE TO LEAVE – Possible failure of Copperlode Falls Dam as at [time, day, date, year]
			
			Warning Level: WATCH AND ACT
			
			Warning Area: Areas downstream of Copperlode Falls Dam and in proximity to Freshwater Creek [Redlynch, Brinsmead, Lower Freshwater and Kamerunga].
			
			People in the following areas of **[Redlynch, Brinsmead, Lower Freshwater and Kamerunga]** must **PREPARE TO LEAVE.**
			
			[insert polygon].
			
			Water levels in Freshwater Creek may rise rapidly. Prepare to move to higher ground and for isolation.
			
			Do not expect emergency services to come to your door.
			
			If your life is in danger, call Triple Zero (000) immediately.
			
			What you should do:
			• Prepare to leave so you can go quickly if the water levels in in Freshwater Creek start to rise. Get ready now.
			• Decide where you and the people you live with will go. Find a safe and high place away from flooding.
			• If you do not have a safe place, muster points are located at [insert link to evac guide].
			• Warn friends, family, and neighbours in your area.
			
			More information:
			• Click here for all local warnings https://disaster.cairns.qld.gov.au/
			• Tune in to 105.1 for ABC Radio National.
			
			The next update will be sent at [time, day, date] or when the situation changes.
			
			This warning has been issued by Cairns Disaster Group.
				MOVE TO HIGHER GROUND – Failure of Copperlode Falls Dam as at [time, day, date, year]
				
				Warning Level: EMERGENCY WARNING
				
				Warning Area: Areas downstream of Copperlode Falls Dam and in proximity to Freshwater Creek [Redlynch, Brinsmead, Lower Freshwater and Kamerunga].
				
				People downstream of Copperlode Falls Dam in **[Redlynch, Brinsmead, Lower Freshwater and Kamerunga]** must **IMMEDIATELY MOVE TO HIGHER GROUND.**
				
				[insert polygon].
				
				Get up as high as you can. There is likely to be dangerous, fast-moving flooding and debris along Freshwater Creek.
				
				You are in serious danger. You must get up as high as you can to survive.
				
				What you should do:
				• Get up as high as you safely can.
				• Muster points are located at [insert link to evac guide].
				• Help other people who are with you if you can.
				• Stay in place until you are rescued, or the water goes down enough to safely leave.
				• If your life is in danger, call Triple Zero (000) immediately.
				
				More information:
				• Click here for all local warnings https://disaster.cairns.qld.gov.au/
				• Tune in to 105.1 for ABC Radio National.
				
				The next update will be sent at [time, day, date] or when the situation changes.
				
				This warning has been issued by Cairns Disaster Group.
					AVOID THE AREA – Copperlode Falls Dam catchment flood as at [time, day, date, year]
					
					Warning Level: WATCH AND ACT
					
					Warning Area: Areas downstream of Copperlode Falls Dam and in proximity to Freshwater Creek [Redlynch, Brinsmead, Lower Freshwater and Kamerunga].
					
					Flood water downstream of Copperlode Falls Dam is starting to go down, but it is still too dangerous to start cleaning up and making repairs. Avoid the area.
					
					What you should do:
					• If you evacuated, stay where you are until you are told it is safe to go back.
					• If you did not leave, stay in your safe place.
					• Floodwater is dangerous - never drive, walk, or ride through floodwater. If it's flooded, forget it.
					More information:
					• Click here for all local warnings https://disaster.cairns.qld.gov.au/
					• Tune in to 105.1 for ABC Radio National.
					• Weather warnings go to http://www.bom.gov.au/qld/cairns/
					• For flood and storm emergency help, call the SES on 132 500.
					• If your life is in danger, call Triple Zero (000) immediately.
					
					The next update will be issued when the situation changes.
					
					This warning has been issued by Cairns Disaster Group.
						THREAT IS REDUCED (SAFE TO RETURN) – Copperlode Falls Dam catchment flood as at [time, day, date, year]
						
						Warning Level: ADVICE
						
						Warning Area: Areas downstream of Copperlode Falls Dam and in proximity to Freshwater Creek [Redlynch, Brinsmead, Lower Freshwater and Kamerunga].
						
						Flooding downstream of Copperlode Falls Dam has stopped and the water has gone down. If you left, it is now safe to return.
						
						Be careful of damage and never drive through floodwaters. If it's flooded, forget it.
						
						What you should do if your home or business has been flooded:
						• Check for building damage before you go inside.
						• Have all electrical and gas equipment professionally tested before use.
						• If water went above power points have the house checked by an electrician before turning the power back on.
						• Clean and dry out the building as soon as you can.
						• Protect your health and safety:
						  ○ Wear strong boots, gloves and protective clothing when cleaning up.
						  ○ Wash your hands and clothes often.
						  ○ Do not eat food that has touched floodwater or mud.
						  ○ Throw away food that should be kept cold or frozen if you lost power.
						  ○ Drink only fresh drinking water, like bottled water.
						
						Support and recovery help:
						• For flood and storm emergency help, call the SES on 132 500 or download the SES Assistance Queensland app.
						• Go to https://disaster.cairns.qld.gov.au/ for local updates including road closures and power outages.
						• Tune in to 105.1 for ABC Radio National.
						• Weather warnings go to http://www.bom.gov.au/qld/cairns/
						• For general relief and recovery information go to https://www.getready.qld.gov.au/after-disaster
						
						This warning has been issued by Cairns Disaster Group.

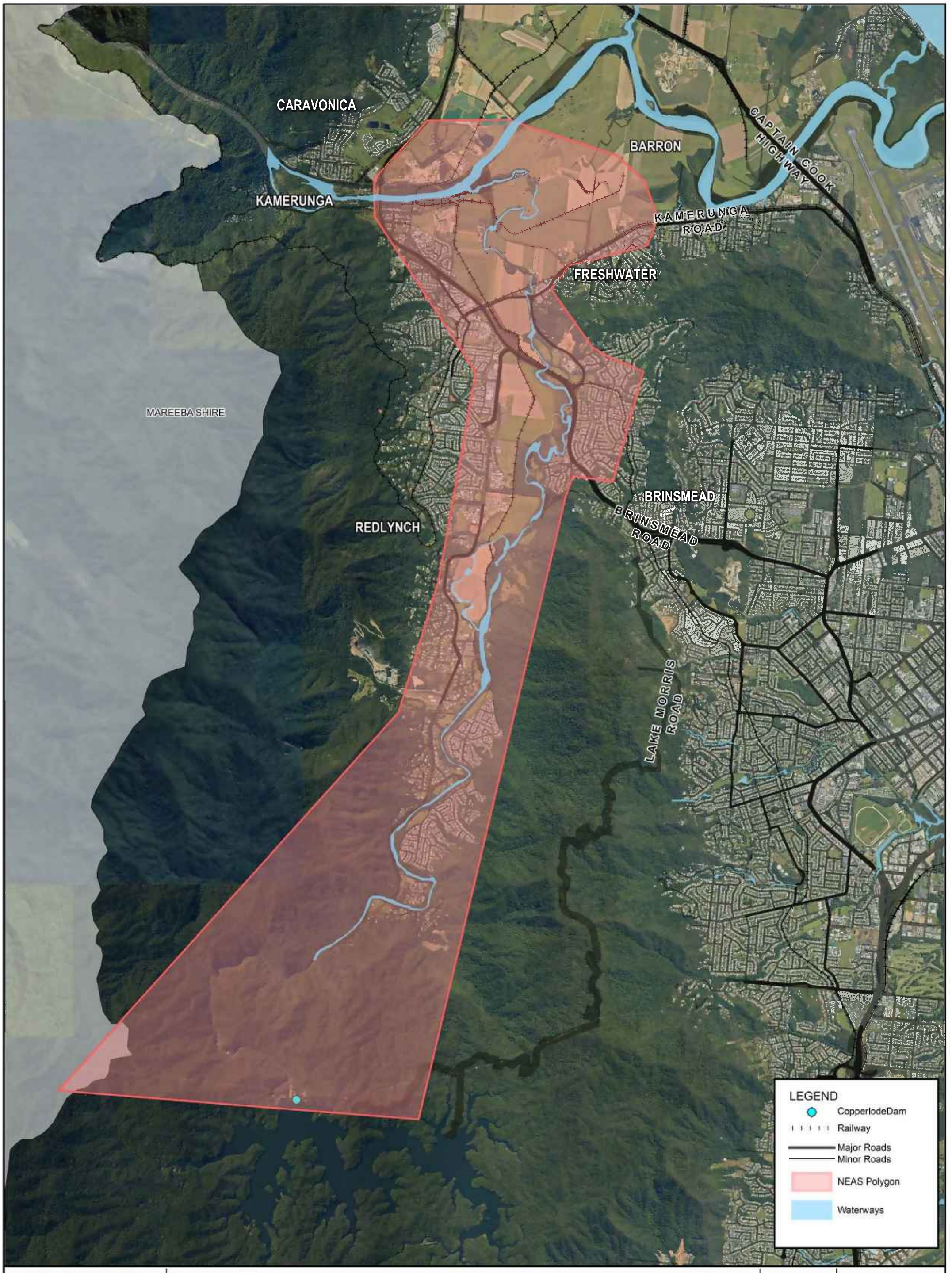
COPPERLODE FALLS DAM – TERRORIST THREAT/MALICIOUS ACTIVITY/HIGH-ENERGY IMPACT – AWS

EAP LEVEL	ALERT	LEAN FORWARD	STAND UP			STAND DOWN	
AWS	**NOT APPLICABLE**	**NOT APPLICABLE**	**ADVICE: STAY INFORMED**	**WATCH & ACT: PREPARE TO LEAVE**	**EMERGENCY WARNING: MOVE TO HIGHER GROUND**	**WATCH & ACT: AVOID THE AREA**	**ADVICE: SAFE TO RETURN**

LONG-FORM TEXT	**NOT APPLICABLE**	**NOT APPLICABLE**	**STAY INFORMED – Security threat under investigation at Copperlode Falls Dam as at [time, day, date, year]**
			
			Warning Level: ADVICE
			
			Warning Area: Areas downstream of Copperlode Falls Dam and in proximity to Freshwater Creek [Redlynch, Brinsmead, Lower Freshwater and Kamerunga].
			
			A security threat is under investigation at Copperlode Falls Dam.
			
			What you should do:
			• Stay up to date because conditions could change quickly.
			• Decide what you will do if you need to leave.
			
			More information:
			• Click here for all local warnings https://disaster.cairns.qld.gov.au/
			• Tune in to 105.1 for ABC Radio National.
			
			The next update will be sent when the situation changes.
			
			This warning has been issued by Cairns Disaster Group.
				PREPARE TO LEAVE – Possible failure of Copperlode Falls Dam as at [time, day, date, year]
				
				Warning Level: WATCH AND ACT
				
				Warning Area: Areas downstream of Copperlode Falls Dam and in proximity to Freshwater Creek [Redlynch, Brinsmead, Lower Freshwater and Kamerunga].
				
				People in the following areas of **[Redlynch, Brinsmead, Lower Freshwater and Kamerunga]** must **PREPARE TO LEAVE.**
				
				[insert polygon].
				
				Water levels in Freshwater Creek may rise rapidly. Prepare to move to higher ground and for isolation.
				
				Do not expect emergency services to come to your door.
				
				If your life is in danger, call Triple Zero (000) immediately.
				
				What you should do:
				• Prepare to leave so you can go quickly if the water levels in in Freshwater Creek start to rise. Get ready now.
				• Decide where you and the people you live with will go. Find a safe and high place away from flooding.
				• If you do not have a safe place, muster points are located at [insert link to evac guide].
				• Warn friends, family, and neighbours in your area.
				
				More information:
				• Click here for all local warnings https://disaster.cairns.qld.gov.au/
				• Tune in to 105.1 for ABC Radio National.
				
				The next update will be sent at [time, day, date] or when the situation changes.
				
				This warning has been issued by Cairns Disaster Group.
					MOVE TO HIGHER GROUND – Failure of Copperlode Falls Dam as at [time, day, date, year]
					
					Warning Level: EMERGENCY WARNING
					
					Warning Area: Areas downstream of Copperlode Falls Dam and in proximity to Freshwater Creek [Redlynch, Brinsmead, Lower Freshwater and Kamerunga].
					
					People downstream of Copperlode Falls Dam in **[Redlynch, Brinsmead, Lower Freshwater and Kamerunga]** must **IMMEDIATELY MOVE TO HIGHER GROUND.**
					
					[insert polygon].
					
					Get up as high as you can. There is likely to be dangerous, fast-moving flooding and debris along Freshwater Creek.
					
					You are in serious danger. You must get up as high as you can to survive.
					
					What you should do:
					• Get up as high as you safely can.
					• Muster points are located at [insert link to evac guide].
					• Help other people who are with you if you can.
					• Stay in place until you are rescued, or the water goes down enough to safely leave.
					• If your life is in danger, call Triple Zero (000) immediately.
					
					More information:
					• Click here for all local warnings https://disaster.cairns.qld.gov.au/
					• Tune in to 105.1 for ABC Radio National.
					
					The next update will be sent at [time, day, date] or when the situation changes.
					
					This warning has been issued by Cairns Disaster Group.
						AVOID THE AREA – Copperlode Falls Dam catchment flood as at [time, day, date, year]
						
						Warning Level: WATCH AND ACT
						
						Warning Area: Areas downstream of Copperlode Falls Dam and in proximity to Freshwater Creek [Redlynch, Brinsmead, Lower Freshwater and Kamerunga].
						
						Flood water downstream of Copperlode Falls Dam is starting to go down, but it is still too dangerous to start cleaning up and making repairs. Avoid the area.
						
						What you should do:
						• If you evacuated, stay where you are until you are told it is safe to go back.
						• If you did not leave, stay in your safe place.
						• Floodwater is dangerous - never drive, walk, or ride through floodwater. If it's flooded, forget it.
						
						More information:
						• Click here for all local warnings https://disaster.cairns.qld.gov.au/
						• Tune in to 105.1 for ABC Radio National.
						• Weather warnings go to http://www.bom.gov.au/qld/cairns/
						• For flood and storm emergency help, call the SES on 132 500.
						• If your life is in danger, call Triple Zero (000) immediately.
						
						The next update will be issued when the situation changes.
						
						This warning has been issued by Cairns Disaster Group.
							THREAT IS REDUCED (SAFE TO RETURN) – Copperlode Falls Dam catchment flood as at [time, day, date, year]
							
							Warning Level: ADVICE
							
							Warning Area: Areas downstream of Copperlode Falls Dam and in proximity to Freshwater Creek [Redlynch, Brinsmead, Lower Freshwater and Kamerunga].
							
							Flooding downstream of Copperlode Falls Dam has stopped and the water has gone down. If you left, it is now safe to return.
							
							Be careful of damage and never drive through floodwaters. If it's flooded, forget it.
							
							What you should do if your home or business has been flooded:
							• Check for building damage before you go inside.
							• Have all electrical and gas equipment professionally tested before use.
							• If water went above power points have the house checked by an electrician before turning the power back on.
							• Clean and dry out the building as soon as you can.
							• Protect your health and safety:
							  ○ Wear strong boots, gloves and protective clothing when cleaning up.
							  ○ Wash your hands and clothes often.
							  ○ Do not eat food that has touched floodwater or mud.
							  ○ Throw away food that should be kept cold or frozen if you lost power.
							  ○ Drink only fresh drinking water, like bottled water.
							
							Support and recovery help:
							• For flood and storm emergency help, call the SES on 132 500 or download the SES Assistance Queensland app.
							• Go to https://disaster.cairns.qld.gov.au/ for local updates including road closures and power outages.
							• Tune in to 105.1 for ABC Radio National.
							• Weather warnings go to http://www.bom.gov.au/qld/cairns/
							• For general relief and recovery information go to https://www.getready.qld.gov.au/after-disaster
							
							This warning has been issued by Cairns Disaster Group.

Appendix H:

NEAS Polygon & EA Request Forms for Copperlode Falls Dam



DO NOT SCALE

P.O. Box 359
Cairns QLD 4870
Tel: (07) 4044 3044
Fax:(07) 4044 3022

N

0 2
kilometres

Copperlode Falls Dam

National Emergency Alert System (NEAS) Polygon

Basemap capture August 2023

GDA

Cairns Regional Council

Projection: GDA 94 (MGA Zone 55)

File: \\cairnsps-sm01\gis\GIS\Work Requests\ServiceNow\TASK0069107_CRyan_CopperlodeDam_Model_Maps\Workings\CopperlodeEvacuationOverview.WOR

Author: DC

Date: 14/03/2024

Sheet Overview

Rev. A

Alert 1 – CFD Flood – Advice Stay Informed

PHONE THE [redacted] – ADVISE EA IS BEING DEVELOPED

EMERGENCY ALERT REQUEST

Location of Alert: Copperlode Falls Dam /Redlynch, Redlynch Valley, Brinsmead, Lower Freshwater & Kamerunga	**Date:**
LGA/Agency requesting: Cairns Regional Council	**Time:**

Requesting Officer (e.g. Disaster Coordinator/Incident Controller) **Name:** **Agency/Position: LDC, Cairns Regional Council**	**Telephone:** (SDCC Watch Desk may telephone you)
Email: [redacted]	

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):	
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, Chemical Spill, 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): **CFD Flood Advice Stay Informed**	**Polygon Filename, (Kml, Kmz, Gml, GeoJSON):** [redacted] **Number of polygons ___1__** (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)

ADVICE from Cairns Disaster Group. Copperlode Falls Dam is spilling excess water into Freshwater Creek. If you are downstream of the dam, avoid fast flowing or deep water near waterways and floodplains. These hazards potentially threaten the safety of you and your property. Go to www.disaster.cairns.qld.gov.au or ABC Radio.

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

ADVICE from Cairns Disaster Group. Copperlode Falls Dam is spilling excess water into Freshwater Creek. If you are downstream of the dam, avoid fast flowing or deep water near waterways and floodplains. These hazards potentially threaten the safety of you and your property. Go to www.disaster.cairns.qld.gov.au or ABC Radio.

Remove EA from websites:	☒ 12 hrs ☐ 24 hrs ☐ 48 hrs ☐ Replace previous EA message ☐ Specify Date & Time: / / : hrs ☐ Check back in 12 hrs: Contact #:-

Requesting Officer:	**Signature:**	**Date:**
Send to		**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

Alert 2 – CFD Flood – Advice Prepare Now

PHONE THE [redacted] – ADVISE EA IS BEING DEVELOPED

EMERGENCY ALERT REQUEST

Location of Alert: Copperlode Falls Dam /Redlynch, Redlynch Valley, Brinsmead, Lower Freshwater & Kamerunga	**Date:**
LGA/Agency requesting: Cairns Regional Council	**Time:**

Requesting Officer (e.g. Disaster Coordinator/Incident Controller) **Name:** **Agency/Position: LDC, Cairns Regional Council**	**Telephone:** (SDCC Watch Desk may telephone you)
Email: [redacted]	
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):
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, Chemical Spill, 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): **CFD Flood Advice Stay Informed**	**Polygon Filename, (Kml, Kmz, Gml, GeoJSON):** [redacted] **Number of polygons ___1__** (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)

ADVICE from Cairns Disaster Group. Water in Freshwater Creek is rising quickly. Flooding is likely later today. People downstream of the dam should PREPARE NOW in case it starts to flood. Tell neighbours, friends, and family. 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 www.disaster.cairns.qld.gov.au

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

ADVICE from Cairns Disaster Group. Water in Freshwater Creek is rising quickly. Flooding is likely later today. People downstream of the dam should PREPARE NOW in case it starts to flood. Tell neighbours, friends, and family. 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 www.disaster.cairns.qld.gov.au

Remove EA from websites:	☒ 12 hrs ☐ 24 hrs ☐ 48 hrs ☐ Replace previous EA message ☐ Specify Date & Time: / / : hrs ☐ Check back in 12 hrs: Contact #:-

Requesting Officer:	**Signature:**	**Date:**
Send to		**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

Alert 3 – CFD Flood – Watch and Act Prepare to Leave

PHONE THE [redacted] – ADVISE EA IS BEING DEVELOPED

EMERGENCY ALERT REQUEST

Location of Alert: Copperlode Falls Dam /Redlynch, Redlynch Valley, Brinsmead, Lower Freshwater & Kamerunga	**Date:**
LGA/Agency requesting: Cairns Regional Council	**Time:**

Requesting Officer (e.g. Disaster Coordinator/Incident Controller) **Name:** **Agency/Position: LDC, Cairns Regional Council**	**Telephone:** (SDCC Watch Desk may telephone you)
Email: [redacted]	
Advised LDMG/LGA: ☒ YES ☐ N/A	**LDC/LDMG:** ☒ YES **DDC/DDMG:** ☒ YES **Neighbouring**
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):
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, Chemical Spill, 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): **CFD Watch & Act**	**Polygon Filename, (Kml, Kmz, Gml, GeoJSON):** [redacted] **Number of polygons ___1__** (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)

FLASH FLOOD WATCH and ACT message from the Cairns Disaster Group. Areas of Redlynch, Brinsmead, Lower Freshwater and Kamerunga may experience rapidly rising water levels downstream of the Copperlode Falls Dam and surrounding catchments, posing a potential threat to people and property. Warn your neighbours and PREPARE TO LEAVE. Go to www.disaster.cairns.qld.gov.au or listen to ABC radio.

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

FLASH FLOOD WATCH and ACT message from Cairns Disaster Group. Rapidly rising water levels downstream of Copperlode Dam may pose a threat to people and property in Redlynch, Brinsmead, Lower Freshwater and Kamerunga. Warn neighbours. PREPARE TO LEAVE. Go to www.disaster.cairns.qld.gov.au or listen to ABC radio.

Remove EA from websites:	☒ 12 hrs ☐ 24 hrs ☐ 48 hrs ☐ Replace previous EA message ☐ Specify Date & Time: / / : hrs ☐ Check back in 12 hrs: Contact #:-

Requesting Officer:	**Signature:**	**Date:**
Send to		**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

Alert 4 – CFD Flood – Watch & Act Move to Higher Ground

PHONE THE [redacted] – ADVISE EA IS BEING DEVELOPED

EMERGENCY ALERT REQUEST

Location of Alert: Copperlode Falls Dam /Redlynch, Redlynch Valley, Brinsmead, Lower Freshwater & Kamerunga	**Date:**
LGA/Agency requesting: Cairns Regional Council	**Time:**

Requesting Officer (e.g. Disaster Coordinator/Incident Controller) **Name:** **Agency/Position: LDC, Cairns Regional Council**	**Telephone:** (SDCC Watch Desk may telephone you)
Email: [redacted]	

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

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):	
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, Chemical Spill, 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): **CFD Flood Warning EA**	**Polygon Filename, (Kml, Kmz, Gml, GeoJSON):** [redacted] **Number of polygons ___1__** (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)

FLASH FLOOD WATCH and ACT message from the Cairns Disaster Group. Areas of Redlynch, Brinsmead, Lower Freshwater and Kamerunga may experience rapidly rising water levels downstream of the Copperlode Falls Dam and surrounding catchments, posing a potential threat to people and property. MOVE TO HIGHER GROUND AWAY FROM CREEKS AND RIVERS. Go to www.disaster.cairns.qld.gov.au or listen to ABC radio.

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

FLASH FLOOD WATCH and ACT message from Cairns Disaster Group. Redlynch, Brinsmead, Lower Freshwater and Kamerunga may experience dangerous flash flooding. MOVE TO HIGHER GROUND AWAY FROM CREEKS AND RIVERS. Go to www.disaster.cairns.qld.gov.au or listen to ABC radio.

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

Requesting Officer:	**Signature:**	**Date:**
Send to		**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

Alert 5 – CFD Flood – Emergency Warning Leave Immediately

PHONE THE [redacted] – ADVISE EA IS BEING DEVELOPED

EMERGENCY ALERT REQUEST

Location of Alert: Copperlode Falls Dam /Redlynch, Redlynch Valley, Brinsmead, Lower Freshwater & Kamerunga	**Date:**
LGA/Agency requesting: Cairns Regional Council	**Time:**

Requesting Officer (e.g. Disaster Coordinator/Incident Controller)
Name:
Agency/Position: LDC, Cairns Regional Council

Telephone:
(SDCC Watch Desk may telephone you)

Email: [redacted]

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):

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, Chemical Spill, 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):
CFD Failure

Polygon Filename, (Kml, Kmz, Gml, GeoJSON):
[redacted]
Number of polygons ___1__ (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)

EMERGENCY. EMERGENCY. EVACUATE IMMEDIATELY. MOVE TO HIGHER GROUND NOW. Emergency Warning from the Cairns Disaster Group. Areas in Redlynch, Brinsmead, Lower Freshwater and Kamerunga will experience dangerous flash flooding posing an immediate threat to life. Go to www.disaster.cairns.qld.gov.au or listen to ABC radio.

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

EMERGENCY. EMERGENCY. EVACUATE IMMEDIATELY. MOVE TO HIGHER GROUND NOW. Emergency Warning from Cairns Disaster Group. Redlynch, Brinsmead, Lower Freshwater and Kamerunga will experience dangerous flash flooding. IMMEDIATE THREAT TO LIFE. Go to www.disaster.cairns.qld.gov.au or listen to ABC radio.

Remove EA from websites:
☒ 12 hrs ☐ 24 hrs ☐ 48 hrs ☐ Replace previous EA message
☐ Specify Date & Time: / / : hrs
☐ Check back in 12 hrs: Contact #:-

Requesting Officer:	**Signature:**	**Date:**
Send to		**to confirm receipt**
FOR USE BY SDCC		
EA Request Form completed by: SDCC Watch Desk ☐ Requesting Officer ☐		
Notification of any delays provided to Requestor: ☐ YES ☐ NO		
EA User Name: Signature:	Date: / /	Emergency Alert No:
Authorising Officer Name: Signature:	Date: / /	EMS EA Campaign Report ID:
Report provided to Requestor on EA outcomes: ☐ YES ☐ NO		

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

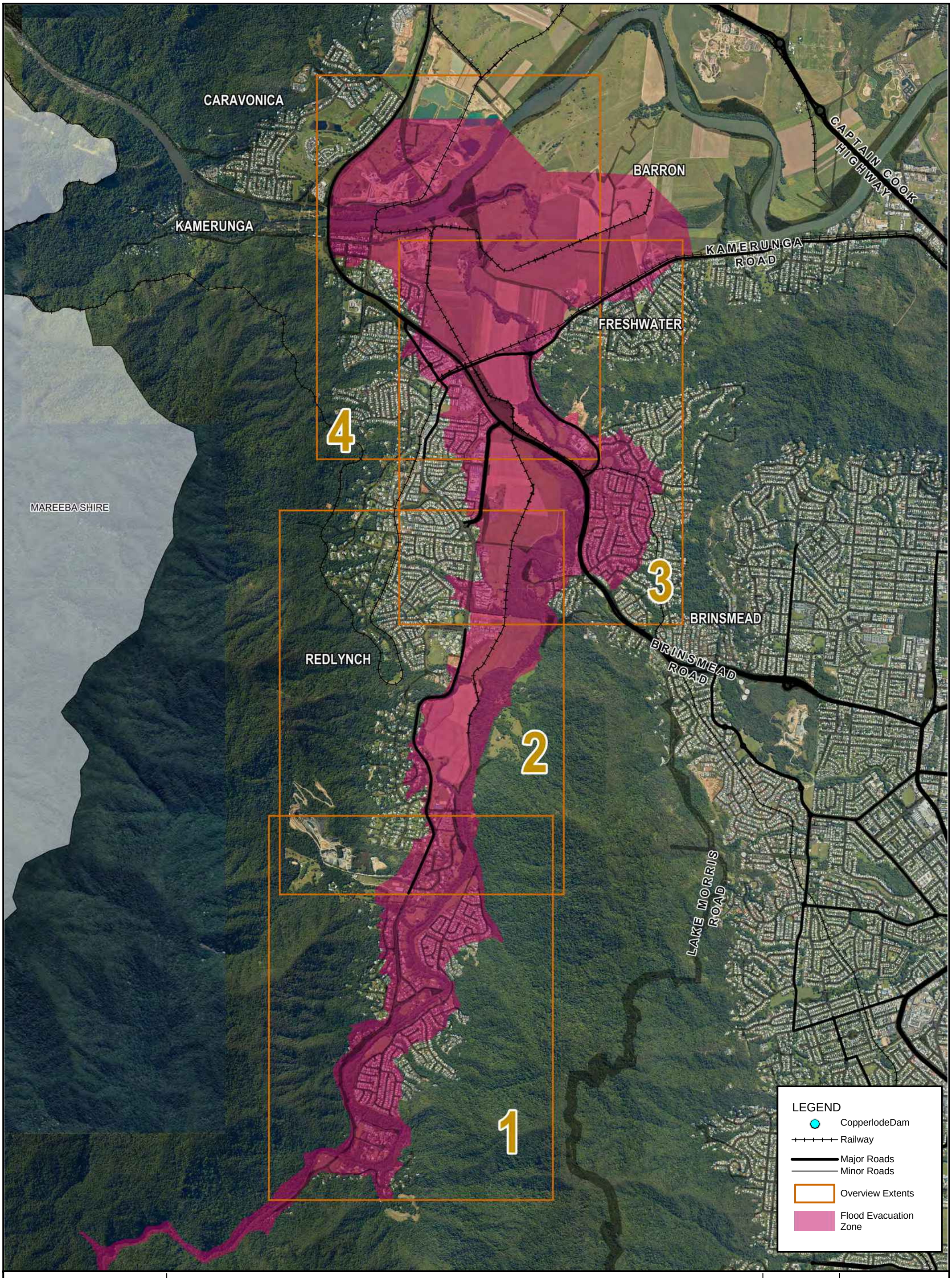
Appendix I:

CRC and Other Agency Stakeholder List and Priority Order

Appendix I has been redacted

Appendix J:

Copperlode Falls Dam Flood Evacuation Zone Maps



P.O. Box 359
Cairns QLD 4870
Tel: (07) 4044 3044
Fax:(07) 4044 3022

N

0 500

metres

Copperlode Falls Dam

Flood Evacuation Zone Overview

- Basemap capture August 2023

GDA

Cairns Regional Council

Projection: *GDA 94 (MGA Zone 55)*

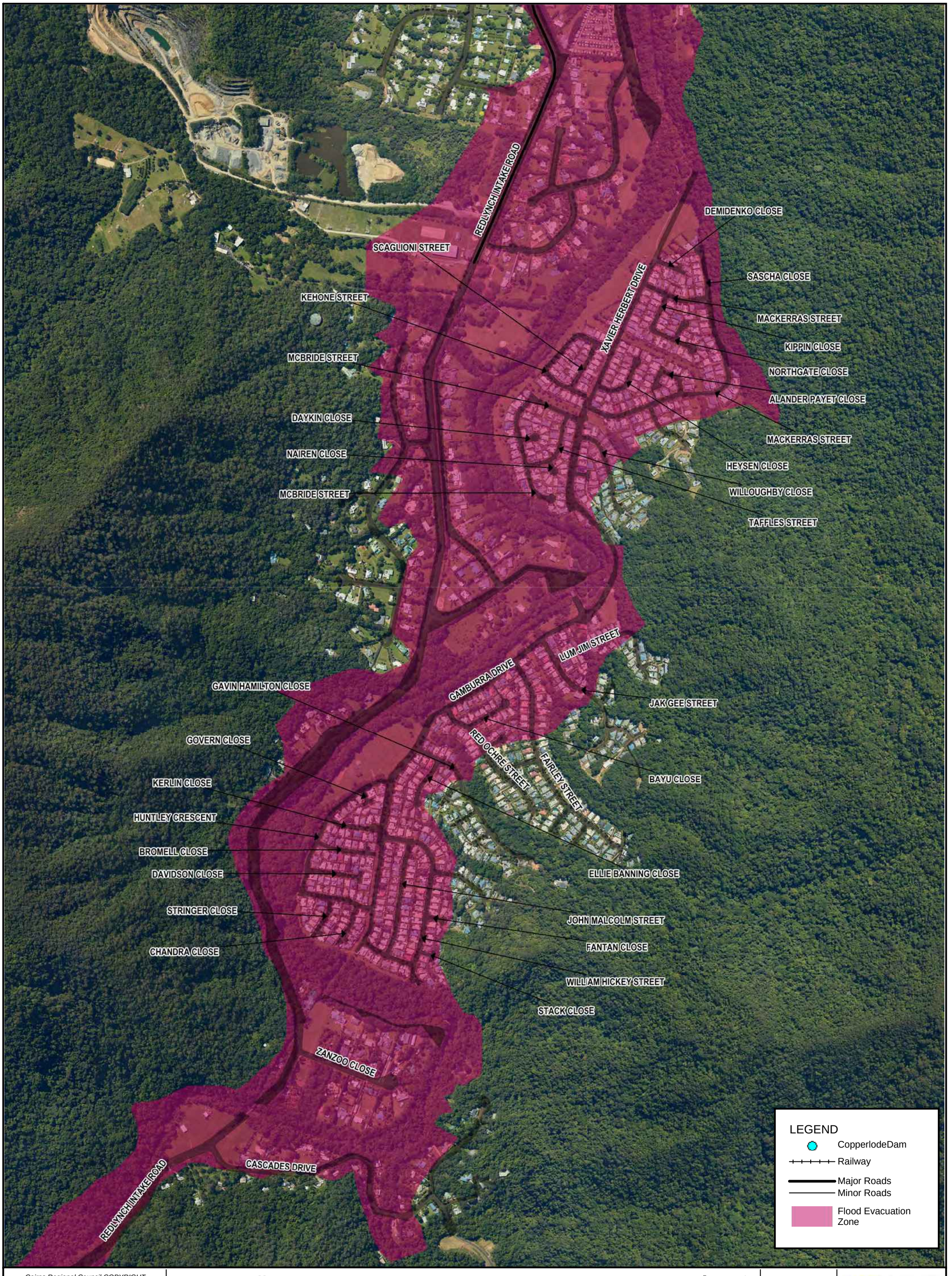
File: *\\silonspe-smb\GIS\GIS\Work Requests\ServiceNow\TASK0088107_CRyan_CopperlodeDam_Model_Maps\Workings\CopperlodeEvacuationOverview.WOR*

Author: *DC*

Date: *15/03/2024*

Sheet Overview

Rev. A



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N

0 500

metres

Copperlode Falls Dam

Flood Evacuation Zone Map 1 of 4

- Basemap capture August 2023

GDA

Cairns Regional Council

Projection: *GDA 94 (MGA Zone 55)*

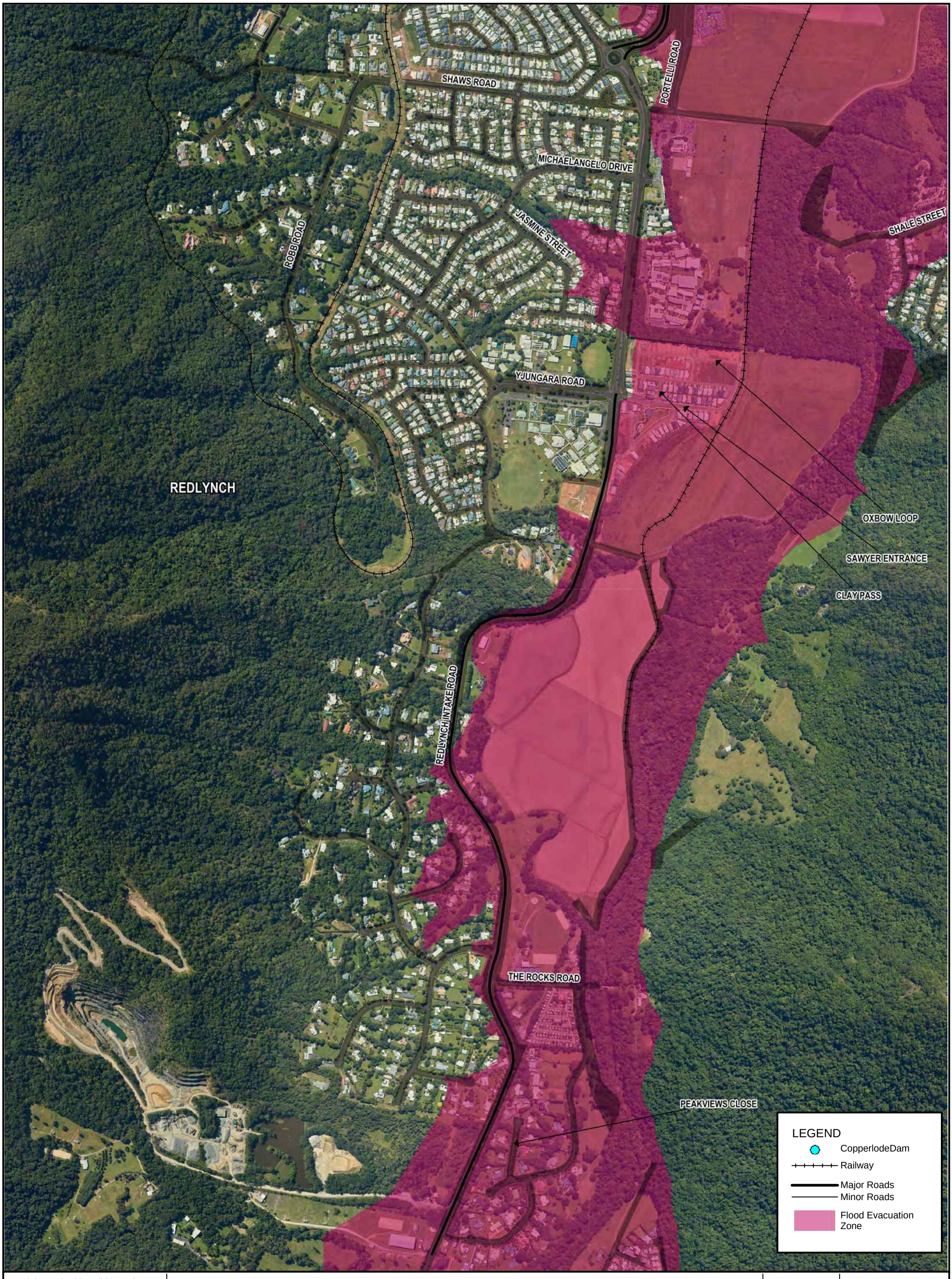
File: \\isilonspe-smb\GIS\GIS\Work Requests\ServiceNow\TASK0088107_CRyan_CopperlodeDam_Model_Maps\Workings\CopperlodeEvacuationOverview.WOR

Author: DC

Date: 15/03/2024

Sheet 1 of 4

Rev. A



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N

0 500

metres

Copperlode Falls Dam

Flood Evacuation Zone Map 2 of 4

- Basemap capture August 2023

GDA

Cairns Regional Council

Projection: *GDA 94 (MGA Zone 55)*

File: *\\silonspe-smb\GIS\GIS\Work Requests\ServiceNow\TASK0088107_CRyan_CopperlodeDam_Model_Maps\Workings\CopperlodeEvacuationOverview.WOR*

Author: *DC*

Date: *15/03/2024*

Sheet 2 of 4

Rev. A

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metres

Copperlode Falls Dam

Flood Evacuation Zone Map 3 of 4

- Basemap capture August 2023

GDA

Cairns Regional Council

Projection: *GDA 94 (MGA Zone 55)*

File: *\\silonspe-smb\GIS\GIS\Work Requests\ServiceNow\TASK0088107_CRyan_CopperlodeDam_Model_Maps\Workings\CopperlodeEvacuationOverview.WOR*

Author: *DC*

Date: *15/03/2024*

Sheet 3 of 4

Rev. A

STEWARTS ROAD
LAKE PLACID ROAD
LOWER FRESHWATER ROAD
SANDWICH STREET
HARLEY STREET
ROMNEY STREET
WARDEN STREET
LOWER FRESHWATER ROAD
MELLER STREET
TYSON PLACE
KAMERUNGA ROAD
ERNEST STREET
BRINSMEAD ROAD
BRINSMEAD - KAMERUNGA ROAD

LEGEND
- CopperlodeDam
- Railway
- Major Roads
- Minor Roads
- Flood Evacuation Zone

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Fax:(07) 4044 3022

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0 500

metres

Copperlode Falls Dam

Flood Evacuation Zone Map 4 of 4

- Basemap capture August 2023

GDA

Cairns Regional Council

Projection: *GDA 94 (MGA Zone 55)*

File: *\\isilonspe-smb\GIS\GIS\Work Requests\ServiceNow\TASK0088107_CRyan_CopperlodeDam_Model_Maps\Workings\CopperlodeEvacuationOverview.WOR*

Author: *DC*

Date: *15/03/2024*

Sheet 4 of 4

Rev. A