EMERGENCY ACTION PLAN

MOODY CREEK DETENTION BASINS 1 & 1A

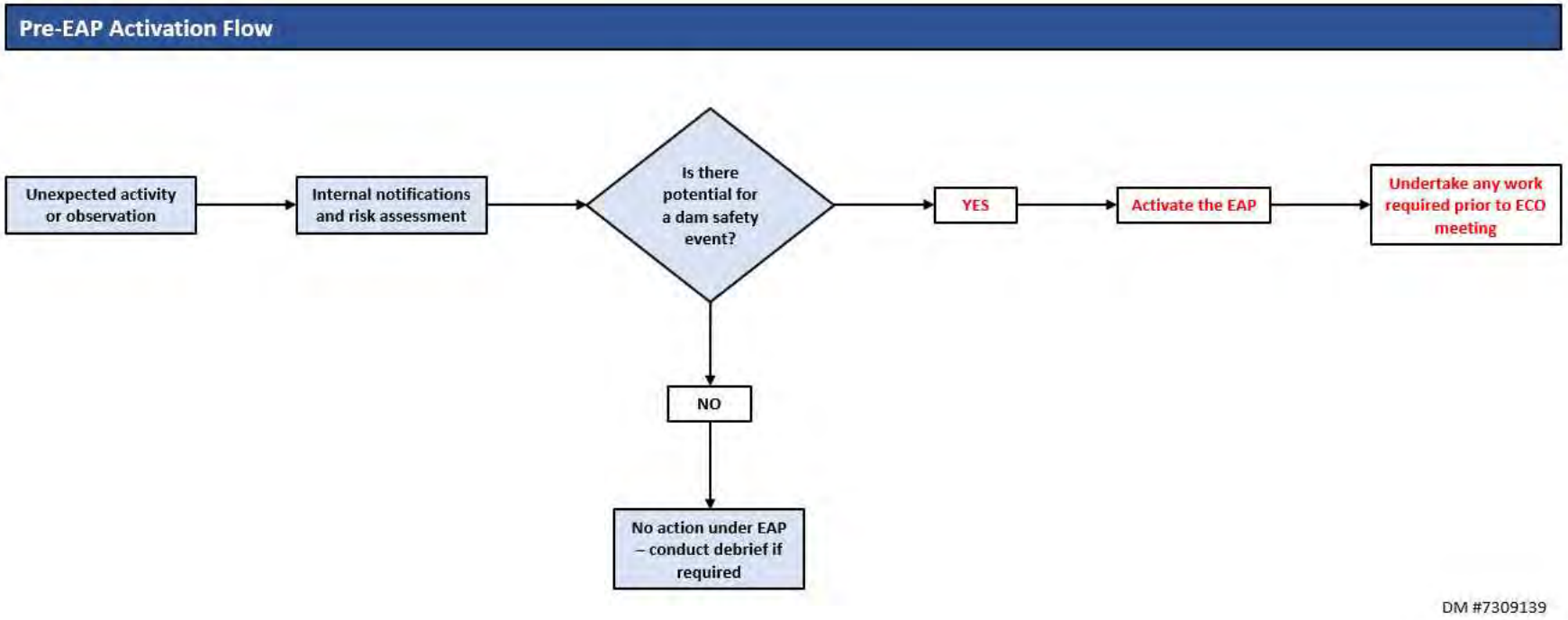
Dam IDs:	2470 & 1946
Dam Owner:	Cairns Regional Council
Document:	DM #6580336 v11A
Revision:	Revision 10 – September 2025
Address:	Lot 812 Ramsey Drive Kanimbla Lat -16.9195448 and Long 145.7246160

Approved Until: 1 September 2027

Approved by the delegate of the Chief Executive, Department of Local Government, Water and Volunteers until 1 September 2027.

Controlled Copy No.	of 19
Issued To	
Revision	10
Revision Date	2025 Revision
Dam Owner	Cairns Regional Council

Quick Reference Guide



Dam Hazards	Activation Levels for Dam Hazards				
	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Down
Flooding	Basin 1 storage at 1.15m below spillway and rising (27.7m AHD or 7.2m Gauge Datum).	Basin 1 storage reaches spillway crest and rising (28.85m AHD or 8.35m Gauge Datum).	Basin 1 storage at 0.15m above spillway and rising (29.0m AHD or 8.5m Gauge Datum).	Basin 1 storage at 2.15m above spillway (31.0m AHD or 10.5m Gauge Datum).	Basin 1 storage at 1.15m below spillway and falling, with discharge controlled by pipe conduit.
Embankment Failure	Not Applicable.	Not Applicable.	. Basin impounding water Observed damage to spillway or embankment toe. Observed increased or new seepage through the embankment.	Not Applicable.	Risk assessment has determined that failure risk has reduced; OR Embankment failure occurred, no further risk to PAR and recovery efforts are underway.
Terror Threat / Malicious Activity	Not Applicable.	Not Applicable.	Significant threat / verified suspicious activity has compromised dam safety.	Not Applicable.	Risk assessment has determined that failure risk has reduced.

Other Emergency Situation	Communications Failure – Local Area
Communications Failure	Unable to communicate in Local area – Cairns Region during significant localised weather event. Locally managed by Dam Owner in consultation with ECO and LDMG-CR.

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Controlled Copy	Position	Location
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5.	Executive Manager Works	Cairns Regional Council, Martyn Street Depot
6.	Executive Manager Strategic Asset Management & Planning	Cairns Regional Council, Spence Street
7.	Executive Manager Business Performance & Compliance	Cairns Regional Council, Martyn Street Depot
8.	Construction Engineer/Coordinator	Cairns Regional Council, Martyn Street Depot
9.	Coordinator Maintenance South	Cairns Regional Council, Gordonvale Depot
10.	Team Leader Works South A	Cairns Regional Council, Martyn Street Depot
11.	Coordinator Strategic Asset Management & Planning – Water & Resource Recovery	Cairns Regional Council, Spence Street
12.	Senior Engineer Dams	Cairns Regional Council, Spence Street
13.	Team Leader Quality & Compliance	Cairns Regional Council, Martyn Street Depot
14.	Quality & Dam Safety Systems Officer	Cairns Regional Council, Martyn Street Depot
15.	Local Disaster Coordinator	Cairns Regional Council, Local Disaster Coordination Centre
16.	Executive Manager Strategic Communications & Engagement	Cairns Regional Council, Spence Street
17.	Public Affairs Coordinator	Cairns Regional Council, Spence Street
18.	~~Marketing & Communications Account Manager~~	Cairns Regional Council, Spence Street
19.	Chair Local Disaster Management Group – Cairns Region	Cairns Regional Council, Spence Street

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Emergency Management Coordinator QPS	[redacted]	Queensland Police Service
Division 4 Councillor	[redacted]	Cairns Regional Council Spence Street

Revision History

Revision	Date	Revision Description
1.	2015	DM #4742955 original version.
2.	2016	Modifications following DEWS review and LDMG-CR review.
3.	2018	Annual review and update for DNRME submission.
4.	2019	Review and updates for 2019.
5.	2020	Annual review and updates for 2020.
6.	2021	New DM #6578422 issued. Revision to incorporate changes to *Emergency Action Plan for Referable Dam Guideline (RDMW, 2021).*
7.	2022	Revision to update position descriptions, consistency of triggers, previous Regulator comments.
8.	2023	Revision to incorporate Australian Warning System (AWS) flood warning requirements.
9.	2024	Renewed Emergency Action Plan submitted for assessment and approval by the Chief Executive, Department of Regional Development, Manufacturing and Water (RDMW). Renewal incorporates changes to *Emergency Action Plan for Referable Dam Guideline (RDMW, 2023)*, includes details from the 2023 Dam Break Assessment and 2022 Failure Impact Assessment, dam hazard identification improvements, updated inundation mapping, a revised communications plan, and addresses Schedule of Matters substantive and non-substantive changes.
10.	2025	Annual review and updates for 2025. Refer DM# 6580336 V11B for changes.

Endorsement

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

Position	Date Endorsed	Print Name	Signed
Director Cairns Infrastructure & Assets Cairns Regional Council	7/5/2024		
Associate Director Service Delivery Cairns Regional Council	3/5/2024		
Associate Director Engineering Services Cairns Regional Council	8/5/2024		
Executive Manager Works Cairns Regional Council	7/5/2024		
Executive Manager Strategic Asset Management & Planning Cairns Regional Council	7/5/2024		
Executive Manager Business Performance & Compliance Cairns Regional Council	03 May 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	27.5.24		
Acting - Chief Executive Officer *on behalf of* Cairns Regional Council	14/05/2024		

Abbreviations and Definitions

Abbreviations

Abbreviation	Full Form
AEP	Annual Exceedance Probability
AFC	Acceptable Flood Capacity
AHD	Australian Height Datum
AWS	Australian Warning System
BAU	Business as Usual
BoM	Bureau of Meteorology
BPC	Business Performance & Compliance Branch, Cairns Regional Council
CEO	Chief Executive Officer, Cairns Regional Council
CIA	Cairns Infrastructure & Assets Directorate, Cairns Regional Council
CRC	Cairns Regional Council
DCL	Dam Crest Level
DDMG	District Disaster Management Group
DDMG Cairns	District Disaster Management Group Cairns
DEC	Dam Emergency Controller
DECC	Dam Emergency Compliance Coordinator
DEO	Dam Emergency Observer
DSR	Dam Safety Regulator (see also RDMW)
DTA	Dam Technical Advisor
EA	Emergency Alert
EAP	Emergency Action Plan (This Document)
ECO	Emergency Control Organisation
EER	Emergency Event Report
EL	Elevation Level

Abbreviation	Full Form
FIA	Failure Impact Assessment
FSL	Full Supply Level
IGEM	Inspector-General Emergency Management
LDC	Local Disaster Coordinator
LDCC	Local Disaster Coordination Centre
LDMG-CR	Local Disaster Management Group – Cairns Region
LDMP-CR	Local Disaster Management Plan – Cairns Region
NEAS	National Emergency Alert System
O&M Manual	Operation & Maintenance Manual
PAR	Population at Risk
PMP-F	Probable Maximum Precipitation Flood
PMF	Probable Maximum Flood
QDMA	Queensland Disaster Management Arrangements
QFES	Queensland Fire & Emergency Services
QPS	Queensland Police Service
RDMW	Department of Regional Development, Manufacturing & Water
RPEQ	Registered Professional Engineer of Queensland
SCADA	Supervisory Control and Data Acquisition
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

Business Terms

The meaning of terms used in this section are in accordance with the *Water Supply (Safety & Reliability) Act 2008* (the Act), the Queensland Prevention, Preparedness, Response & Recovery Disaster Management Guideline (QFES, 2018), and the Emergency Action Plan for Referable Dam Guideline (RDMW, 2023).

Term	Definition
Activation Levels	This Emergency Action Plan (EAP) is activated using an escalation model based on the following levels. The movement through these levels is not necessarily sequential. The model should be applied with flexibility and adaptability and be tailored to the location and the event. Triggering one of these levels of activation may not necessarily mean a similar activation of the Local Disaster Management Group – Cairns Region (LDMG-CR) or the Cairns District Disaster Management Group (Cairns DDMG).
	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 that the Dam Owner is preparing to activate the Lean Forward level of the EAP if the situation escalates. The Emergency Control Organisation (ECO) is activated.
	Lean Forward An operational state characterized by a heightened level of situational awareness of an impending disaster event and a state of operational readiness. The Local Disaster Coordination Centre (LDCC) Is on standby and prepared, but not activated.
	Stand Up The operational state where resources are mobilized, personnel are deployed, and operational activities commence. LDCC is activated. The Dam Owner must provide an Emergency Event Report (EER) in accordance with the provision of the Act.
	Stand Down Transition from responding to an event back to normal core business and/or continuance of recovery operations. There is no longer a requirement to respond to the event and the threat is no longer present.
Australian Warning System (AWS)	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	The three levels of flooding are:

Term	Definition
(BoM) Flood Level Classifications	• **Minor Flooding:** This causes inconvenience such as closing of minor roads and the submergence of low-level bridges and makes the removal of pumps located adjacent to the river necessary. • **Moderate Flooding:** This causes the inundation of low-lying areas requiring the removal of stock and/or the evacuation of some houses. Main traffic bridges may be closed by flood waters. • **Major Flooding:** This causes inundation of large areas, isolating towns, and cities. Major disruptions occur to road and rail links. Evacuation of many houses and business premises may be required. In rural areas, widespread flooding of farmland is likely.
Concurrent Flooding	Flood flows downstream of a dam that are not a result of dam outflows; for instance, those from adjacent catchments or from the sea, and which occur in the same period as downstream releases or flooding from the dam.
Dam 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.*
Dam Failure	The physical collapse of all or part of a dam, or the uncontrolled release of any of its contents.
District Group (DDMG)	District Disaster Management Group – for an EAP, means a district group established under the *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: o A coordinated response involving two or more of the following *relevant entities* is likely to be required; each *local group* and *district group* for the EAP, each local government whose area may be affected, the Chief Executive, another entity the owner of the dam considers appropriate, OR

Term	Definition
	o The event may arise because of a disaster situation declared under the *Disaster Management Act 2003*, OR o An entity performing functions under the State Disaster Management Plan may, under that plan, require the owner of the dam to give the entity information about the event.
Local Group (LDMG-CR)	Local Disaster Management Group – for an EAP, means a local group established under the *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 (FIA) 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 this assessment. Also, a dam is a referable dam if: • Under section 342B of the Act, the owner of a dam is given a referable dam notice and, before the effective day for the notice, does not give the Chief Executive a FIA for the dam, AND • The Chief Executive has not, under section 349 of the Act, accepted a FIA 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).

1. Introduction

1.1. Context

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 placed at risk if the dam were to fail.

As such, the Moody Creek Detention Basins 1 & 1A EAP, this document, has been prepared in accordance with Chapter 4 of the Act, the Queensland State Disaster Management Plan 2023 (QDMC, 2023), and the Emergency Action Plan for Referable Dam Guideline (RDMW, 2023). The content requirements for EAPs are contained in section 352H of the Act and summarised below.

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 of the dam 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 providing the Chief Executive with an EAP, the owner of the dam must give a copy of the EAP to each local government whose area may be affected by a dam hazard identified in the EAP; and each district group for the EAP.

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 EAP.

Within 30 business days of receiving an EAP, the local government must give the owner of the dam a notice, which states whether it considers the plan to be consistent with its Disaster Management Plan; and if not, provide reason as to why it considers the EAP not to be 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-CR**. The dam owner has provided the LDMG-CR with a copy of the EAP for assessment against the Local Disaster Management Plan – Cairns Region (LDMP-CR).

Section 352HC of the Act states that a district group may review the EAP for consistency with its District Disaster Management Plan. The district group for this dam is **Cairns DDMG**. The dam owner has provided the DDMG with a copy of the EAP for review.

1.2. Purpose

The purpose of this EAP is:

- To capture and articulate the 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 Moody Creek Detention Basins 1 & 1A occurs; and
- To identify dam hazards that could occur at Moody Creek Detention Basins 1 & 1A and the area likely to be affected for each hazard.

It is possible for more than one dam hazard to exist at either or both of the Moody Creek Detention Basins 1 & 1A at the one time. In such a circumstance, it may be necessary to act on the procedures within separate sections simultaneously. Emergency response personnel should always maintain situational awareness and exercise their best judgement in their response. The safety of the public and all emergency response personnel should not be compromised in implementing this EAP.

The focus of this EAP is the management of dam hazards at Moody Creek Detention Basins 1 & 1A and the communication and notification of dam hazards to the LDMG-CR, DDMG, and the broader Cairns 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 LDMP-CR.

1.3. Scope

The scope of this EAP covers:

- Dam hazards;
- Details about the dam that are relevant to a dam hazard;
- Identification of circumstances that indicates a material increase in the likelihood of a dam hazard event or emergency event;
- Triggers for activation of a tiered response to a dam hazard event or emergency event;
- Roles and responsibilities in responding to a dam hazard event or emergency event;
- Business as usual (BAU) resourcing;

- Notification, warning, and communication protocols;
- Inspection, monitoring, and reporting protocols during and after emergencies; and
- Identification of the areas likely to be affected by a dam hazard.

1.4. Training & Exercises

All personnel 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:

- How notification, assessment, and activation will occur;
- What facilities and resources will be used;
- How the team will function and communicate during an event;
- What key decisions each role may need to make; and
- Awareness of the complexities associated with managing a dam hazard event or emergency event.

EAP training exercises are conducted annually and facilitated by the Business Performance & Compliance (BPC) Branch of Cairns Regional Council (CRC) with assistance from the Local Disaster Coordinator (LDC) to engage with the LDMG-CR. The BPC Branch of Cairns Regional Council will also initiate additional training activities to further support the Emergency Control Organisation (ECO) members. These include the Queensland Disaster Management Arrangements (QDMA) training, Dam Safety Surveillance training, and training sessions on the use of the relevant incident management and communications tools used during dam hazard events or emergency events.

When training is provided, attendance records are maintained within individual employee Human Resources files and branch-specific skills and training matrices. Table 1 below outlines the minimum training required to undertake EAP tasks for ECO members and relevant personnel. 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
QDMA (every 3 years)	ECO members Personnel providing support during a dam emergency
Dam Safety Surveillance Training (every 5 years)	ECO members Personnel providing support during a dam emergency
Referable Dam Induction (upon commencement of relevant role)	ECO members Personnel providing support during a dam emergency
EAP Exercise Participation (annually)	ECO members Personnel providing support during a dam emergency
Whispir (annually)	ECO members Personnel providing support during a dam emergency

Training Requirement	Who
Internal Communications Platform training (at least annually)	ECO members Personnel providing support during a dam emergency
Fatigue Management Awareness Training	ECO members Personnel providing support during a dam emergency

2. Roles and Responsibilities

2.1. Normal Operations – Business as Usual

Roles and Responsibilities	Position Holder
Cairns Regional Council Councils have legislated local government functions, as per section 80 of the *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 the LDMG-CR) for consistency with the LDMP-CR.	Cairns Regional Council Office of the CEO / Disaster Management Unit
Dam Owner / 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. • Distribute current approved EAP to all parties identified in the controlled distribution list. • Conduct regular onsite monitoring and visual inspections 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 contact lists remain current. • Where applicable, make appropriate dam safety-related decisions based on advice from an experienced and suitably qualified dam engineer. The dam operator 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 and Dam Safety Conditions Schedule.	Cairns Infrastructure & Assets Directorate, Cairns Regional Council

Roles and Responsibilities	Position Holder
• Activate the EAP and maintain an incident log when an emergency condition is identified at the dam. • Conduct periodic testing of the EAP. • Prepare an Emergency Event Report (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 to meet dam safety regulations and to respond to a dam emergency. • Actively participate in LDMG-CR meetings and disseminate relevant information regarding dam emergency response as appropriate. • Manage regional water security objectives and activate contingency plans if necessary.	
Disaster Management Groups **LDMG-CR** • As per Inspector-General Emergency Management (IGEM) review recommendation, work together with the dam owner to ensure community education around messaging and impacts of EAP-related events is undertaken and continually improved. • Work with the 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. The dam owner will activate the EAP for safety events unique to the dam. • During a dam hazard event that reaches Stand Up activation level, the LDMG-CR 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-CR to manage an EAP event. • Provide reports and make recommendations to the relevant DDMG about EAP event matters. • Participate in ECO training and exercises. • Conduct annual reviews of National Emergency Alert System (NEAS) polygons and Emergency Alert (EA) request forms. • Send NEAS polygons and EA request forms to the State Disaster Coordination Centre (SDCC) Watch Desk to ensure these have been uploaded into the system prior to the annual wet season. • Collaborate with relevant key stakeholders within CRC and the LDMG-CR to ensure NEAS polygons and EA request forms are prepared, stored, and tested by the SDCC Watch Desk. **DDMG -Cairns** • Review the EAP for consistency with the District Disaster Management Plan (DDMP).	LDMG-CR / DDMG Cairns

Roles and Responsibilities	Position Holder
Dam Safety Regulator (DSR) • Liaise with relevant Minister on necessary actions; • Assess and approve this EAP as required under legislation; • Liaise with Chief Executive as required in administering (regulating) the Act.	RDMW
Dam Technical Advisor (DTA) • Maintain current Registered Professional Engineer of Queensland (RPEQ) accreditation and specialisation in dam safety engineering; • Provide structural and hydrological advice with respect to a dam hazard or emergency event when requested; • Record communications and provide to CRC as required; • The Dam Safety Team at RDMW can be contacted for dam expert advice if required.	Consultant / RDMW

2.2. Dam Operator – Business as Usual

Roles and Responsibilities
Associate Director Service Delivery • Ensure the dam is operated and maintained in line with regulatory requirements and provide executive oversight of the Referable Dam Safety Management Program.
Associate Director Engineering Services • Provide adequate operational resources to respond to a dam emergency. • Deliver capital works projects to maintain the safety of the dam and associated structures.
Executive Manager Works • Provide adequate operational resources to respond to a dam emergency. • Provide resources to support maintenance of dam assets. • Actively participate in Referable Dam Steering Committee meetings and disseminate relevant information regarding dam emergency response as appropriate. • Ensure regular onsite monitoring and visual inspections of the conditions at the dam are undertaken by appropriately trained and experienced personnel. • Ensure relevant procedures are formalized, developed, implemented and are current.
Executive Manager Business Performance & Compliance • Provide adequate operational resources to respond to a dam emergency. • Coordinate collaboration with local and district disaster management groups and relevant entities regarding EAP reviews and communication with Population at Risk (PAR). • Ensure adequate support and resourcing is provided for all EAP-related training and exercise requirements. • Ensure the EAP, this document, is reviewed in accordance with statutory timelines. • Ensure relevant procedures are in compliance with internal processes.

Roles and Responsibilities
• Ensure contact lists are checked and updated at least annually and upon any changes. • Consult with CRC Marketing & Communications and Engagement Units to ensure communication to identified PAR and the broader Cairns community of CRC educational information for Moody Creek Detention Basins 1 & 1A, their risks, and associated dam emergency arrangements. • Manage regulatory compliance of the Referable Dam Safety Management Program. • Maintain the Internal Communications Platform to be used in a dam emergency.
Executive Manager Strategic Asset Management & Planning • Ensure dam safety inspections are undertaken in accordance with Dam Safety Conditions Schedule. • 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 Operation & Maintenance Manual (O&M Manual) and Dam Data Book.
Executive Manager Asset Services • Ensure adequate maintenance of dam assets is undertaken at the required frequency.
Executive Manager Marketing & Communications • Ensure Australian Warning System (AWS) Media Release templates are current and up to date. • Ensure Referable Dam information is kept current and up to date on Cairns Regional Council's website and the Cairns Disaster Dashboard. • Manage day to day communications with Population at Risk (PAR) outside of an event. • Review and approve messages to PAR via Cairns Alert and Whispir communications platform.

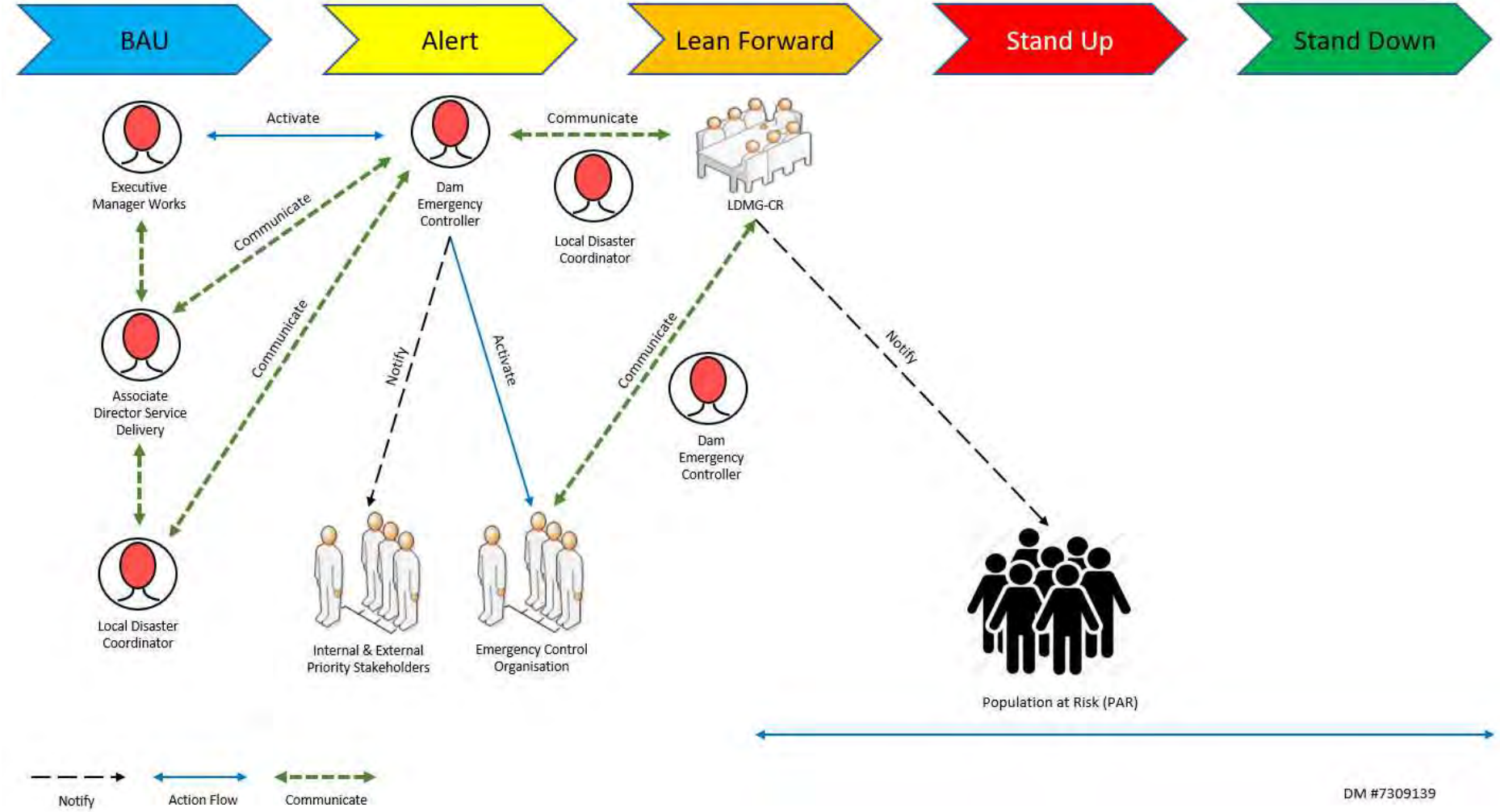
2.3. Dam Emergency Roles

CRC has an emergency response framework implemented for Moody Creek Detention Basins 1 & 1A. Figure 1 below has been developed to ensure roles and responsibilities are clearly understood, including those of the support agencies available to engage the LDMG-CR resources during a dam emergency. This framework is aligned to disaster management principles and emergency management standards.

2.4. Emergency Control Organisation

An Emergency Control Organisation (ECO) has been established to monitor, assess, and report on the condition of Moody Creek Detention Basins 1 & 1A during a dam hazard event or emergency event. The ECO consists of three roles; the responsibilities of each which are outlined in Section 3.1 below. ECO primary and alternate role holders are identified, with positions and names correct at the time of approval; however, for the most up-to-date contact details, refer to Appendix L. The identified role holders may, as necessary, delegate assigned tasks to other appropriately trained and experienced personnel. It may be necessary to support the ECO with additional support personnel during a dam hazard event or emergency event. The ECO works closely with the LDMG-CR and CRC management to ensure coordination of response, effective use of resources, and provision of information during an emergency event.

Figure 1 – Moody Creek Detention Basins 1 & 1A EAP – Emergency Response Framework



3. Emergency Response Framework

3.1. CRC and ECO – Dam Emergency Event

Table 2 - CRC Roles and Responsibilities During a Dam Emergency Event

CRC Roles and Responsibilities
Director Cairns Infrastructure & Assets • 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 • Provide expert advice and technical support to the LDMG-CR. • Stay abreast of PAR evacuation status from LDMG-CR and advise ECO accordingly. • Provide support to ECO in preparing the EER within regulatory timeframes. • 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 Associate Director Service Delivery on emergency operations.
Executive Manager Business Performance & Compliance • Ensure timely and accurate notifications to all parties mentioned in the notification list in the event of a dam emergency. • 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 LDC) using available platforms. • Prepare and distribute information to broader Cairns community (on request of LDC) using available platforms. • Prepare and distribute information to the media and facilitate media requests. • Maintain CRC's digital platforms with the latest dam emergency information.
Executive Manager Strategic Asset Management & Planning • Provide adequate operational resources to respond to a dam emergency event. • Ensure adequate maintenance of Moody Creek Detention Basins 1 & 1A assets. • Ensure pathway is available to engage external engineering consultants as Dam Technical Advisor (DTA) where required during a dam emergency event.
Senior Engineer Dams • Maintain current Registered Professional Engineer of Queensland (RPEQ) accreditation and are experienced in dam engineering. • Provide structural and hydrological advice with respect to a dam hazard or emergency event when requested.

CRC Roles and Responsibilities
• Undertake site inspections when safe to do so in response to a developing dam hazard event or emergency event. • Liaise with external engineering consultants engaged as DTA as necessary to provide technical support during and after a dam emergency event. • Provide expert advice to the Dam Emergency Controller (DEC) on engineering decisions relating to dam safety during a dam hazard event or emergency event.

Table 3 - ECO Roles and Responsibilities During a Dam Emergency Event

ECO Roles and Responsibilities	Position Holders
Dam Emergency Controller (DEC) • Nominate a DEO to monitor and report on the condition of the dams during a dam emergency event. • Lead the ECO during a dam emergency event. • Dial "000" if dam failure imminent. • Coordinate notification to PAR through LDMG-CR. • Specific tasks as per actions tables in Sections 6 to 11.	Executive Manager Works Construction Engineer / Coordinator Coordinator Maintenance South
Dam Emergency Observer (DEO) • Assist the DEC in the management of the response to a dam emergency event. • Monitor and report on the condition of the dam and manage access to the area during a dam emergency event. • Specific tasks as per actions tables in Sections 6 to 11.	Team Leader Works South A Ganger Road & Drainage Maintenance
Dam Emergency Compliance Coordinator (DECC) • Assist the DEC to meet all internal and external compliance obligations. • Provide requested support to the DEC and DEO. • Establish and maintain all communications with the DSR. • Specific tasks as per actions tables in Sections 6 to 11.	Executive Manager Business Performance & Compliance Team Leader Quality & Compliance Quality & Dam Safety Systems Officer

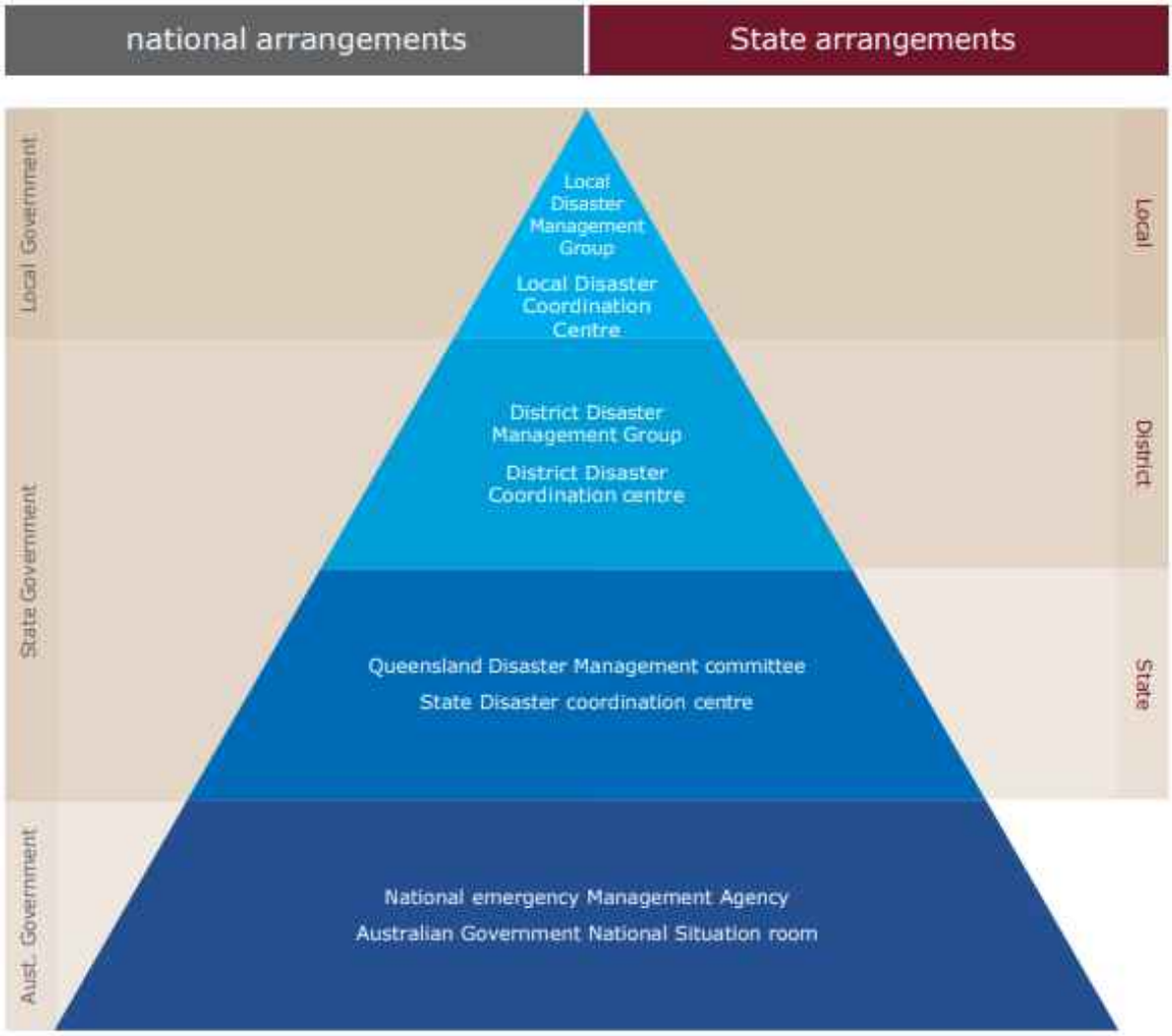
3.2. Other Agencies

While the Dam Operator and ECO undertake specific dam emergency related actions, CRC acknowledges that a coordinated response to any emergency, whether dam related or not, serves to provide the highest level of structure. CRC therefore follows the QDMA structure as per Figure 2 below.

Roles and Responsibilities	Position Holder
Local Disaster Coordinator **Role:** • Activate the LDMG-CR to act on reports from the ECO during a dam hazard event or dam emergency event. **Responsibilities:** • Initiate an extraordinary meeting of the LDMG-CR Executive when notified that the dam EAP has been activated. • Brief the LDMG-CR Executive on the situation. • Activate the relevant LDMP-CR sub plans. • Activate the Local Disaster Coordination Centre (LDCC). • Once the LDMG-CR has been activated, the responsibilities of the LDC are in accordance with the LDC Operational Checklist and the approved LDMP-CR.	Disaster & Community Resilience Manager
Local Disaster Management Group – Cairns Region **Role:** • Once the LDMG-CR has been activated, coordinate the response and recovery actions and joint agency responses during a dam emergency event. **Responsibilities:** • Activate LDMG-CR when requested by LDC (if concurrent flooding has not already resulted in the activation of the LDMG-CR). • Communicate 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 Cairns DDMG. • Manage the recovery of PAR (voluntary and directed).	Chairperson LDMG-CR
Role: Upholding the law and providing assistance to the community particularly in times of emergency, disaster and crisis. Responsibilities: • Manage the situation based on local operational procedures and LDMP, including but not limited to: • Provide evacuation support if required directly where LDMG has not stood up yet, • Conduct emergency operations -Provide point of contact (Counter Terrorism Liaison Officer) is possible terrorism situation, • Coordinate and support Dam Owner through LDMG during a declared emergency at the dam, • Liaise with relevant organisations, • Support LDMG to provide evacuation assistance if required , • Control of essential traffic, and • Providing security support for LDMG as required ring security of specific area.	Queensland Police Service – Northern Region

3.3. Queensland Disaster Management Arrangements

Figure 2 - Queensland Disaster Management Arrangements



4. Dam Details

4.1. General Details

Locations: Moody Creek Detention Basin 1 is situated on Lot 812 Ramsey Drive, Kanimbla, Cairns QLD 4870. Moody Creek Detention Basin 1A is situated on Lot 810 Ramsey Drive, Kanimbla, Cairns QLD 4870.

Access: Access to Moody Creek Detention Basins 1 & 1A is via the access driveways off Ramsey Drive, Kanimbla, Cairns QLD 4870.

Construction: Moody Creek Detention Basin 1 is a homogenous earth fill dam with a concrete-lined spillway and ogee control crest, and an uncontrolled low flow outlet pipe, constructed in 2015. Moody Creek Detention Basin 1A is a zoned earth fill dam with a broad crested weir spillway with a reinforced concrete slab and downstream chute, and an uncontrolled low flow outlet pipe, constructed in 2002. Both Basins were constructed for the purpose of providing suitable detention of floodwater to temporarily mitigate floods.

Specifications: The tables below list general specifications of Moody Creek Detention Basins 1 & 1A.

4.1.1. Moody Creek Detention Basins 1 & 1A Specifications

Table 4 - Moody Creek Detention Basin 1 Specifications

Description	Specification
Full Supply Level (FSL)	28.85 m AHD
Storage Capacity at FSL	98.4 ML
Dam Crest Level (DCL)	31.5 m AHD
Dam Crest Length	230 m
Crest Width	4.0 m
Dam Height Above Foundation	11.5 m
Catchment Area	194 hectares
Spillway Type	Concrete lined with an ogee control crest
Spillway Crest Height	28.85 m AHD
Spillway Width	30 m
Spillway Capacity	190 m^3/s (approximately the Probable Maximum Flood discharge, RL 31 m AHD)
Outlet Description	Single 1800mm reinforced concrete pipe with steel trash rack
Outlet Capacity	21.2 m^3/s (@RL 31.50 m AHD) at DCL
Operational Control	There are no operational controls built into the Moody Creek Detention Basin 1, therefore there cannot be any manual changes applied to control flows through the low-flow pipe or over the spillway. A remote monitoring system including CCTV to monitor rainfall and storage levels is installed, with further details provided in Appendix G. Moody Creek Detention Basin 1 is monitored by CRC personnel with routine maintenance inspections undertaken at the required frequency.

Table Notes: All levels are to Australian Height Datum (AHD). Refer to current approved version of the Dam Data Book for further specifications DM #6997318.

Table 5 - Moody Creek Detention Basin 1A Specifications

Description	Specification
Full Supply Level (FSL)	22.2 m AHD
Storage Capacity at FSL	29 ML
Dam Crest Level (DCL)	24.5 m AHD
Dam Crest Length	118 m
Crest Width	4.5 m
Dam Height Above Foundation	7.5 m (approximately)
Spillway Type	Broad crested weir with reinforced concrete slab and downstream chute
Spillway Crest Height	22.2 m AHD
Spillway Width	20 m
Spillway Capacity	128 m^3/s (approximately the 1 in 5,000-year event)
Outlet Description	Single 1500mm reinforced concrete pipe
Outlet Capacity	14.2 m^3/s (@RL 24.5 m AHD) at DCL
Operational Control	There are no operational controls built into the Moody Creek Detention Basin 1A, therefore there cannot be any manual changes applied to control flows through the low-flow pipe or over the spillway. Moody Creek Detention Basin 1A is monitored by CRC personnel with routine maintenance inspections undertaken at the required frequency.
Design Capacity	Modelling indicates that the Moody Creek Detention Basin 1A spillway will flow during a 5% AEP (1 in 20 AEP event). Overtopping of the embankment is expected between the 1% AEP and the PMP-F event (incremental PAR of 24). The 5% AEP event discharging from Moody Creek Detention Basin 1A with a concurrent downstream flooding event of 5% AEP resulted in the critical incremental PAR of 30.

4.1.2. Detail and Locality Map

Figure 3 - Moody Creek Detention Basins 1 & 1A Locality Map

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

N
0 500
metres

Moody Creek Detention Basins 1 and 1A

Detail and Locality Map

File: \\slonspe-smb\gis\GIS\Work Requests\ServiceNow\TASK0087445_CRyan_MoodyCrkDetBasinMap\Workings\MoodyCrkDetBasin.WOR | Author: DC | Date: 11/01/2024 | Sheet 1 of 1 | MAP A

GDA
Projection: GDA 94 (MGA Zone 55)

4.2. Population at Risk

The *Guideline for Failure Impact Assessment of Water Dams* (RDMW, 2018) defines two categories of dams according to the number of people at risk by the dam failing, as detailed below:

- Category 1 – between 2 and 100 people at risk by the dam failing. All Category 1 dams are Referable Dams under the Act.
- Category 2 – more than 100 people at risk by the dam failing. All Category 2 dams are Referable Dams under the Act.

Total Population at Risk (PAR) figures for Moody Creek Detention Basins 1 & 1A are calculated for persons at risk when a no-failure flood event accompanies a dam failure event. Incremental PAR figures are calculated for persons who are not at risk from a flood but are placed at risk when the same flood accompanies a dam failure event.

A Dam Break Assessment undertaken in 2023 by GHD determined Moody Creek Detention Basin 1 met criteria and was rated a Category 2 Referable Dam under the Act. This is based on an incremental PAR of 228 for the critical 0.1% Annual Exceedance Probability (AEP) event (1 in 1,000 AEP event).

A Failure Impact Assessment (FIA) undertaken in 2022 by GHD determined Moody Creek Detention Basin 1A met criteria and was rated a Category 1 Referable Dam under the Act. This is based on an incremental Population at Risk (PAR) of 30 for the critical 5% AEP event.

The relevant failure scenarios for Moody Creek Detention Basins 1 & 1A are related to the main embankment and spillway. The events with the largest breach flows resulting from these failure modes that have been catered for within this document for Moody Creek Detention Basins 1 & 1A are:

- Basin 1 embankment wall piping failure in the 0.1% AEP event (1 in 1,000 AEP event); and
- Probable Maximum Precipitation Flood (PMP-F) without failure (1 in 10,000,000 AEP event).

A Sunny Day Failure (SDF) event has not been considered as the Moody Creek Detention Basins 1 & 1A hold no permanent water storage and as such would be dry in such a scenario.

A summary of the PAR estimates for Moody Creek Detention Basins 1 & 1A is provided in Table 6 below. A location map detailing total and incremental PAR is provided in Appendix E.

Table 6 - Summary of Population at Risk (PAR)

Emergency Event	Total PAR	Incremental PAR
Basin 1 – 0.1% AEP Event	379	228
Basin 1 – 1% AEP Event	219	193
Basin 1 – 20% AEP Event	66	42
Basin 1A – 5% AEP Event	87	30
Basin 1A – 20% AEP Event	69	12
Probable Maximum Flood (PMF)	797	-

4.3. Cascade Failure

Moody Creek Detention Basin 1 was constructed approximately 100m upstream of Moody Creek Detention Basin 1A, with the purpose of achieving the Acceptable Flood Capacity (AFC) requirements. As an existing water detention structure is located immediately downstream of Moody Creek Detention Basin 1, cascade failure due to overtopping of Moody Creek Detention Basin 1A has been assessed.

In this scenario, the outflow of a Moody Creek Detention Basin 1 dam break was used as the inflow into Moody Creek Detention Basin 1A, and overtopping failure was assumed to initiate when the reservoir level reached the top of the spillway training walls (RL 23.7m). Peak water levels reached in Moody Creek Detention Basin 1A due to a dam break of the upstream Moody Creek Detention Basin 1 are presented in Table 7 below:

Table 7 - Basin 1A Cascade Failure Peak Water Levels

Flood Event	Basin 1A Peak Water Level (m)
20% AEP	23.82
5% AEP	24.54
1% AEP	24.77
0.1% AEP	24.87
0.1% AEP (Climate Change)	24.95
0.05% AEP	24.93
0.02% AEP	24.83
0.01% AEP	24.95
PMF	24.92

4.4. Community Awareness and Engagement

CRC, in conjunction with the LDMG-CR 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 Moody Creek catchment area for the unlikely event of a dam-related emergency at Moody Creek Detention Basins 1 & 1A includes raising awareness of and familiarising the community with community warning systems used in Section 11.5; being the Cairns Disaster Dashboard, Cairns Alert, National Emergency Alert System (NEAS), and the Australian Warning System (AWS).

An Information Guide which provides steps that persons in the affected area should be familiar with in case of a dam-related emergency has been developed and is mailed out to residents, businesses,

and other priority stakeholders in the Moody Creek area. The Information Guide, along with a link to this Emergency Action Plan, is also freely available on the CRC's website via the Natural Disasters Home Page which is dedicated to providing up to date information for all Referable Dams in the Cairns Local Government Area.

4.5. Flood Adequacy

4.5.1. Acceptable Flood Capacity

The Acceptable Flood Capacity (AFC) is the flood event the dam spillway must have the capacity to pass without causing failure of the dam. AFC is generally expressed as a flood with a specific Annual Exceedance Probability (AEP). For Moody Creek Detention Basin 1, the spillway is capable of passing the standards-based assessed AFC event of a Probable Maximum Precipitation Flood (PMP-F event, being the 1 in 10,000,000 AEP event), based on the requirements outlined in the *Guidelines on the Consequence Categories for Dams* (ANCOLD, 2012) and the *Guidelines on Safety Assessments for Referable Dams* (RDMW, 2023), without overtopping the embankment where the low flow outlet is functional. In the case where the low flow outlet is blocked, both the PMP-F and PMF overtop the embankment by 20mm and 160mm respectively.

4.6. Inundation Mapping

4.6.1. Statement of Limitations

Whilst every care has been taken to prepare the inundation maps contained within this document, CRC make no representations or warranties about its accuracy, reliability, completeness, or suitability for any particular purpose and disclaims all responsibility and all liability (including, without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damages) and costs which may be incurred as a result of the product being inaccurate or incomplete in any way and for any reason.

4.6.2. How to Use the Maps

The inundation maps contained within this document provide an indication of potential flood inundation resulting from a failure of either or both of the Moody Creek Detention Basins 1 & 1A. Determining the extent of these flood inundations involves complex modelling techniques that contain considerable uncertainties. These maps have been developed to assist emergency event response and evacuation. The purpose of these maps is to provide a guide that allows emergency response personnel to understand the potential areas that may be impacted by a dam failure scenario.

A dam failure may cause considerable damage to the road network downstream of the Moody Creek Detention Basins due to flood levels, high velocities and debris that could potentially be generated by the failure. Therefore, for emergency event planning purposes, it should be assumed that all roads within the inundation extents on the following maps would be rendered unserviceable should a failure of either or both of the Moody Creek Detention Basins 1 & 1A occur. These maps do not define property flood risks and do not in any way relate to flooding potential associated with natural flood events that do not involve a failure of either or both of the Moody Creek Detention Basins 1 & 1A. Furthermore, these maps do not define the probability of a flood or the probability of a failure of either or both of the Moody Creek Detention Basins 1 & 1A. The risk of failure of either or both of the Moody Creek Detention Basins 1 & 1A is very low.

In an actual dam failure scenario, the time to peak inundation will be heavily influenced by factors that cannot be predicted with any degree of certainty. Such factors include the specific nature of the failure, the speed at which the failure develops, the size of the dam breach, and concurrent rainfall and associated flooding within the catchment area.

4.7. General Arrangement

The following general arrangement drawings for Moody Creek Detention Basins 1 & 1A are in Appendix D:

Moody Creek Detention Basin 1:

- Drawing No. 301015-03402-CI-DRG-0205: Site Plan
- Drawing No. 301015-03402-CI-DRG-0210: Typical Embankment Cross Section
- Drawing No. 301015-03402-CI-DRG-0215: Spillway Layout
- Drawing No. 301015-03402-CI-DRG-0217: Spillway Section
- Drawing No. 301015-03402-CI-DRG-0220: Low Flow

Moody Creek Detention Basin 1A:

- Drawing No. 20127-01– Site and Locality Plan
- Drawing No. 20127-02– General Arrangement and Embankment
- Drawing No. 20127-03– Spillway

4.8. Inspections and Monitoring

The frequency of routine inspections and monitoring of Moody Creek Detention Basins 1 & 1A have been determined based on the very low probability of failure of either or both of the dams. Monitoring requirements are documented in the Moody Creek Detention Basins 1 & 1A Operation & Maintenance Manual (O&M Manual) #6974259 which contains detailed schedules. The following is applicable to Moody Creek Detention Basins 1 & 1A to maintain the structures in a safe condition and enable the rapid detection of any potential dam hazards as soon as a hazard begins to develop or becomes apparent.

4.8.1. Inspections

- Routine visual inspection – conducted monthly by the Technical Officer Maintenance Management Systems and informed by the O&M Manual (refer to Appendix H for sample Inspection Schedule).
- Annual inspection – conducted annually in accordance with the prescribed Moody Creek Detention Basins 1 & 1A Dam Safety Conditions Schedule No. 8(d) and *Queensland Dam Safety Management Guidelines* (RDMW, 2024).
- Comprehensive inspection – conducted every five (5) years in accordance with the prescribed Moody Creek Detention Basins 1 & 1A Dam Safety Conditions Schedule No. 8(b) and *Queensland Dam Safety Management Guidelines* (RDMW, 2024).
- Special inspections – conducted as required if a potential deficiency at the dam is identified or the dam has been through abnormal loading conditions. Special inspections of Moody Creek Detention Basins 1 & 1A will be undertaken in response to a developing dam hazard event or a

significant storm event, defined as any flow event that fully submerges the low flow outlet (nominally 1.8m in depth).

4.8.2. Instrumentation

The following instrumentation and monitoring are applicable to Moody Creek Detention Basins 1 & 1A to confirm the structural behaviour and safety of the embankment and spillway. The location of instrumentation and monitoring equipment are detailed in the above Section 4.1.2 *Figure 3 – Detail and Locality Map.*

4.8.2.1. Settlement/Movement Measurement

To observe any physical movement occurring in the Moody Creek Detention Basin 1 embankment and spillway that could lead to instability, sixteen (16) permanent survey markers are installed on the concrete spillway structure, and six (6) marker posts are installed on the crest of the embankment. Additionally, there are two (2) survey points installed on Moody Creek Detention Basin 1A. These monitoring points are surveyed every 2 years or more frequently when requested by the Senior Engineer Dams. The survey pickup is completed by a qualified surveyor.

4.8.2.2. Spillway Conditions

Remote visual monitoring of the Moody Creek Detention Basin 1 spillway and embankment can be undertaken through the Closed-Circuit Television (CCTV) camera installed on the embankment crest above the low flow pipes.

4.8.2.3. Reservoir Water Levels

The reservoir water level of Moody Creek Detention Basin 1 is primarily monitored through an electronic level transmitter with the data able to be accessed remotely. There are also manual gauge boards installed for visual observation if the level transmitters are unavailable. There are no manual gauge boards or level transmitters installed at Moody Creek Detention Basin 1A.

4.8.2.4. Automatic and Manual Gauges

Automatic Gauges: One (1) automatic gauge located at the base of the inlet to the low flow pipes, connected to, and continuously monitored by, CRC's Supervisory Control and Data Acquisition (SCADA) telemetry network.

Manual Gauges: Four (4) gauge boards located on the upstream slope of the embankment visible from the right-side embankment crest and on CRC's CCTV camera.

4.8.2.5. Rainfall

Rainfall levels are monitored and recorded onsite at Moody Creek Detention Basin 1 via an automatic rain gauge located on communications and CCTV tower on the embankment crest.

5. Dam Hazard Identification

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

- Flooding;
- Embankment Failure;
- Terrorist Threat or Malicious Activity;

- Non-Flood Related Events:
  - Earthquake;
  - Cracking or other signs of abnormal behaviour;
  - Blockage of the low flow pipe.

Other Emergency Situation:

- Communications Failure.

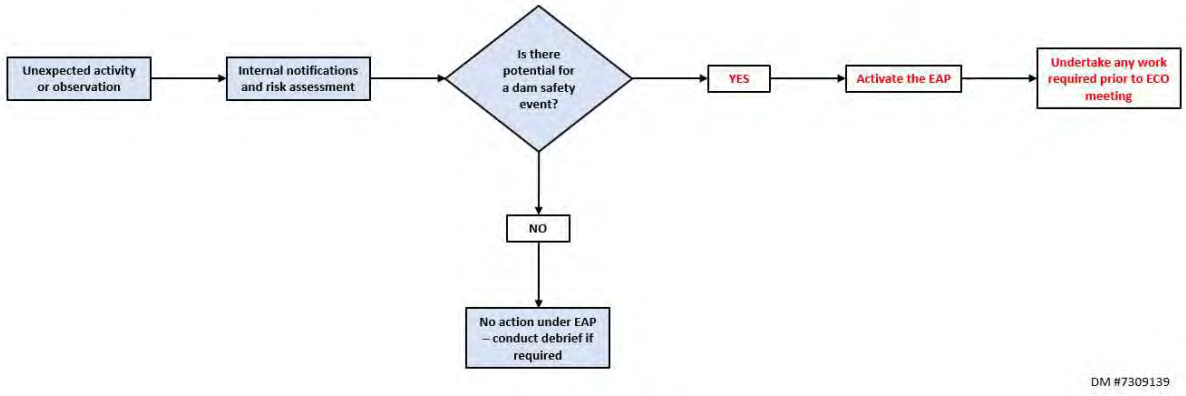
The EAP activation response protocols for each dam hazard are further explained in the following sections along with the associated communication protocols for notifying internal and external key stakeholders, and downstream PAR.

5.1. Escalation of Unusual Activity

In accordance with the *Queensland Dam Safety Management Guidelines* (RDMW, 2024) threats to the safety of Moody Creek Detention Basins 1 & 1A, whether they are potential or confirmed threats, are escalated via internal notification protocols further described in the O&M Manual #6974259.

Risks should be appropriately assessed in consultation with the Local Disaster Coordinator 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.

Figure 4 - Escalation of Unusual Activity



6. Dam Hazard – Flooding

6.1. Overview

The EAP activation response protocols described in this section relate to rainfall-derived inflows to the Moody Creek Detention Basins 1 & 1A causing temporary water level rises that could result in the following flood conditions:

- Increased loads on dam embankment and critical infrastructure resulting in an increased likelihood of failure;
- Continuing storage level rises leading to embankment overtopping, resulting in an increased likelihood of embankment failure;
- Rapidly increasing spillway discharges from either or both of the Basins or spillway discharge levels greater than those that cause downstream flooding.

The Moody Creek catchment is relatively small with short times of travel for flood flows downstream of the Moody Creek Detention Basins. Storage releases from Moody Creek Detention Basins 1 & 1A can occur via both the low flow conduits and the spillways and are uncontrolled during weather events (as the Basins do not have installed flood gates or valves, there is no existing mechanism to control the release of water from either Basin).

6.2. Assessment of the Hazard

Very heavy rainfall and extensive flooding can occur throughout the Cairns Local Government Area, and whilst the Moody Creek Detention Basins do not commence spilling until a rainfall event between 5% to 1% AEP (1 in 20-year to 1 in 100-year event) (a major flood event per BoM flood level classification) when a localised flooding event develops in the Moody Creek catchment area that could potentially affect either or both of the Moody Creek Detention Basins, cooperation between CRC and the LDMG-CR must be maintained. In any such event, it is expected that the LDMG-CR and supporting agencies will already be activated under the LDMP-CR in response to concurrent flooding in the catchment area.

In the below scenarios, significant rainfall is occurring in the catchment area causing storage levels in either or both of the Moody Creek Detention Basins 1 & 1A to rise rapidly with abnormally high spillway discharges expected. The activation status of the EAP (this document) will change depending on the amount of rainfall and water levels within the catchment area. The EAP activation response protocols for a flood event are detailed in the below Table 8 along with the associated communication protocols for notifying internal and external key stakeholders, and downstream PAR.

6.3. Understanding the Dam Hazard – Flooding EAP Activation Triggers

Alert:

Scenario: During a significant rainfall event, Moody Creek Detention Basin 1 is likely to commence filling with the potential for significant discharges to occur through the low flow pipe. Whilst this scenario may present a potential hazard to users of the open space inside Basin 1, such a scenario will not necessarily result in a dam emergency event.

If, however, such rainfall occurs over a short timeframe, the magnitude of the storm and consequent flooding downstream could be greater. In a scenario such as this, surveillance monitoring of Basin 1 will be conducted via the remote monitoring station (refer to Appendix G for further details) or by onsite personnel who can access the best vantage points for monitoring the earth dam crest via the Ramsey Drive access point if conditions are safe to do so.

Trigger: Alert is triggered when the Basin 1 storage water levels reach 27.7m AHD (7.2m Gauge Datum) equates to 1.15m below the spillway

Lean Forward:

Scenario: An event resulting in flood flows which will overtop the Moody Creek Detention Basin 1 spillway and significantly increase downstream flows.

Whilst this scenario may present a potential hazard to users of the open space inside Basin 1, such a scenario will not necessarily result in a dam emergency event.

Trigger: Basin 1 storage reaches spillway crest and rising (28.85m AHD or 8.35m Gauge Datum).

Stand Up 1:

Scenario: Once the water level in Moody Creek Detention Basin 1 reaches 29.0m AHD (8.5m Gauge Datum), this equates to 0.15m over the spillway. In this scenario, there is expected to be significant flooding across the downstream floodplain of Moody Creek due to both outflows from Basin 1 and flows along downstream tributaries not regulated by Basin 1.

Trigger: Basin 1 storage at 0.15m above spillway and rising (29.0m AHD or 8.5m Gauge Datum).

Stand Up 2:

Scenario: Water levels in Moody Creek Detention Basin 1 rising to within 500mm of the embankment crest level can occur either as a result of the water filling the Basin to 31.0m AHD (10.5m Gauge Datum) or as a result of damage to the embankment effectively lowering the crest height. This scenario equates to water levels reaching 2.15m over the spillway and will generate extreme spillway flows in the order of the PMF, causing extensive flooding downstream.

In this scenario, there becomes an increased risk that Basin 1 may be overtopped, which may cause a cascade failure of Moody Creek Detention Basin 1A. At this stage, evacuation routes leading from Moody Creek Detention Basins 1 & 1A along Ramsey Drive will be impassable.

Whilst the general embankment of Moody Creek Detention Basin 1 is not expected to be overtopped during normal operation, even in the PMF, excessive wave action in the Basin could also result in overtopping; noting however that the structure is able to tolerate minor embankment overtopping as a result of wave action.

Overtopping may also occur as a result of excessive filling of the Basin in the unlikely event that the overflow spillway becomes obstructed; however, there is additional by-wash capacity along Ramsey Drive so overtopping of Basin 1 as a result of excessive filling is unlikely.

Trigger: Basin 1 storage at 2.15m above spillway (31.0m AHD or 10.5m Gauge Datum).

Stand Down:

Scenario: In this scenario, flooding within the catchment area is receding with no significant rainfall occurring since drawdown, and no further significant rainfall is forecast for the catchment area. Storage levels in Basin 1 have fallen below the spillway, and discharges in both Basins are being controlled by the outlet pipe conduits; or the Basins may no longer be impounding water. Any contamination has been contained and/or any blockages have been cleared from the low flow conduits.

Trigger: Basin 1 storage at 1.15m below spillway and falling, with discharge controlled by pipe conduit.

6.4. Flooding – EAP Activation Response Protocols

Table 8 - Flood Event Response Protocols

Activation Level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Down
Activation Trigger	Basin 1 storage at 1.15m below spillway and rising (27.7m AHD or 7.2m Gauge Datum).	Basin 1 storage reaches spillway crest and rising (28.85m AHD or 8.35m Gauge Datum).	Basin 1 storage at 0.15m above spillway and rising (29.0m AHD or 8.5m Gauge Datum).	Basin 1 storage at 2.15m above spillway (31.0m AHD or 10.5m Gauge Datum).	Basin 1 storage at 1.15m below spillway and falling, with discharge controlled by pipe conduit.
Internal Stakeholder Notifications Appendix I	Whispir Template #80	Whispir Template #81	Whispir Template #82	Whispir Template #83	Whispir Template #84
External Stakeholder Notifications Appendix I	Not Applicable.	Whispir Template #85	Whispir Template #86	Whispir Template #87	Whispir Template #88
PAR Notifications Appendix J Appendix K	Not Applicable.	Emergency Alert #1 AWS Message #1	Emergency Alert #2 AWS Message #2	Emergency Alert #3 AWS Message #3	AWS Message #4 and/or #5
Response Actions ***Note: Changes to dam structure as a result of flooding may trigger EAP activation response protocols under Section 7 of this EAP.***					
DEC	• Send EAP activation notification to priority stakeholders. • Schedule and chair ECO meeting if required. • Assign ECO roles.	• As per previous activation level; AND • Issue EAP escalation notification to internal and external stakeholders via email.	• As per previous activation level; AND • Liaise with LDMG-CR regarding coordination of PAR notifications and evacuation based on	• As per previous activation level.	• Issue EAP Stand Down notification to priority stakeholders. • Send request to LDMG-CR to issue PAR notifications. • Review, approve, and issue final SITREP to LDMG-CR.

	• Confirm SITREP frequency. • Issue SITREP to ECO members. • Confirm Basins are cleared for operations. • Confirm monitoring expectations and rostering. • Advise of communication systems status. • Issue situation-specific actions (road/site closure/dam access). • Monitor weather intelligence and forecast for likelihood of escalation. • Confirm with Senior Engineer Dams requirements for engaging Dam Technical Advisor (DTA). • Commence event log. • **If notified by DEO of observed erosion or seepage flows, or changes to dam structure as a result of flooding, determine need to trigger response protocols under Section 7.**	• Provide SITREP/s to LDMG-CR. • Send request to LDMG-CR to issue PAR notifications.	expected inundation (Appendix E). • Liaise with Senior Engineer Dams and DTA as required.		• Coordinate inspection by engaged DTA to check for damage and/or propose a program for the undertaking of remedial works as necessary and to the satisfaction of the Dam Safety Regulator. • Prepare Emergency Event Report per Section 13. • Return to routine activities.

DEO	• Attend ECO meeting if required. • **If safe to do so,** attend site and conduct surveillance inspections and monitor onsite rainfall conditions. • Provide updates from inspections to DEC. • **If safe to do so,** prevent public access to Basins. • Monitor water levels in the Basins (onsite or via remote monitoring). • **If safe to do so,** check for erosion downstream of the Basins and notify DEC. • **If safe to do so,** check for new or increased seepage flows through the Basins and notify DEC. • Assist DEC with completion of SITREPs.	• As per previous activation level.	• As per previous activation level.	• As per previous activation level.	• Complete and issue final SITREP to DEC. • Assist with preparation of Emergency Event Report per Section 13. • Return to routine activities.
DECC	• Create Operation within Internal Communications Platform. • Attend ECO meeting if required. Record and circulate minutes. • Issue EAP activation notification to Dam Safety Regulator following discussion with DEC and manage ongoing regulatory	• As per previous activation level.	• As per previous activation level.	• As per previous activation level.	• Issue EAP Stand Down notification to Dam Safety Regulator following discussion with DEC. • Within Internal Communications Platform, finalise Event Log and ensure all documentation and records are accurately recorded within Document Library. • Provide support to ECO as required. • Assist with preparation of Emergency Event Report per Section 13 and submit to Dam Safety Regulator

	updates and correspondence. • Provide support to ECO as required.				within 30 business days following cessation of event. • Return to routine activities.
ALL	• Record all communication, actions, and event-related documentation within Internal Communications Platform. **ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO.** *e.g., taking photographs/video, undertaking dam inspections, taking instrument readings etc.* **ALL PHOTOS MUST BE TIME AND DATE STAMPED.**				

7. Dam Hazard – Embankment Failure

7.1. Overview

The EAP activation response protocols described in this section relate to a potential dam hazard due to a structural failure condition through the Moody Creek Detention Basin 1 embankment as a result of piping whilst the Basin is impounding water.

If a structural condition is established and progresses whilst the Basin is impounding water, a dam failure may result. If a condition is detected whilst the Basin is not impounding water, remedial repairs may be feasible, however in the event of a serious and developing dam safety issue with significant rainfall forecast for the catchment, it is unlikely that remedial repairs will be possible.

7.2. Assessment of the Hazard

Embankment wall failure as a result of piping is the critical failure event for Moody Creek Detention Basin 1. The event which results in the highest incremental PAR is the 0.1% AEP, or 1 in 1000 AEP, event. The highest total PAR (i.e., the highest number of people affected due to an embankment failure and concurrent downstream flooding) is the 0.02% AEP, or 1 in 5000 AEP, event.

The failure impact zone is the area affected by flooding as a result of the failure of the dam, and the critical failure event is that which causes the greatest difference between a no-flood and flood event. In this scenario, embankment failure is likely to occur as a result of piping from the upstream invert of the outlet structure to the downstream invert of the outlet structure, following the general alignment of the outlet structure.

Whilst impounding water, an increase in seepage or a new area of seepage is a circumstance that could indicate an increased likelihood of piping through the Moody Creek Detention Basin 1 embankment. This circumstance is the trigger for the EAP activation to Stand Up status for embankment failure.

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

- 0.1% AEP event when a dam failure is in progress or likely due to embankment damage as a result of piping and concurrent flooding or downstream releases are occurring.
- PMF event when a dam failure is in progress or likely due to embankment damage as a result of piping and concurrent flooding or downstream releases are occurring.

The EAP activation response protocols for an embankment failure event are detailed in the below Table 9 along with the associated communication protocols for notifying internal and external key stakeholders, and downstream PAR.

7.3. Understanding the Dam Hazard – Embankment Failure EAP Activation Triggers

Stand Up:

Signs that the spillway could be damaged and/or the embankment toe is eroding can include:

- Uneven flows across the spillway crest, in the spillway chute, or in the stilling basin;
- The presence of standing waves or 'roosters tails' formations in the spillway chute;
- Shifting or movement of the concrete slabs forming the spillway;
- Erosion of embankment material on the outside of the spillway sidewalls;
- Erosion of embankment material around the outlet of the low flow pipe;
- Appearance of any new seepage locations or a significantly increased rate of seepage;
- Seepage water appears cloudy/muddy with visible particles; or
- Flows downstream from the structure appear muddy.

The appearance of any of the above during operation of the spillway or whilst the Basin is impounding water indicates that failure of the embankment may be occurring. Immediate action is to be taken to ensure the safety of those monitoring the structure and downstream PAR.

Stand Down:

A risk assessment has determined that the risk of failure has reduced; OR a dam failure has occurred with no further risk to downstream PAR and recovery efforts are underway.

Any flooding within the catchment area is receding with no significant rainfall occurring since drawdown, and no further significant rainfall is forecast for the catchment area. Storage levels in the Basin have fallen below the spillway, and discharges are being controlled by the outlet pipe conduit; or the Basin may no longer be impounding water.

7.4. Embankment Failure – EAP Activation Response Protocols

Table 9 - Embankment Failure Event Response Protocols

Activation Level	Alert	Lean Forward	Stand Up	Stand Down
Activation Trigger	Not Applicable.	Not Applicable.	Basin impounding water and Observed damage to spillway or embankment toe. Observed increased or new seepage through the embankment.	Risk assessment has determined that failure risk has reduced; OR Embankment failure occurred, no further risk to PAR and recovery efforts are underway.
Internal Stakeholder Notifications Appendix I	Not Applicable.	Not Applicable.	Whispir Template #89	Whispir Template #84
External Stakeholder Notifications Appendix I	Not Applicable.	Not Applicable.	Whispir Template #90	Whispir Template #88
PAR Notifications Appendix J Appendix K	Not Applicable.	Not Applicable.	Emergency Alert #2 and/or #3 AWS Message #2 and/or #3	AWS Message #4 and/or #5
Response Actions				
DEC	Not Applicable.	Not Applicable.	• Send EAP activation notifications to priority stakeholders. • Send request to LDMG-CR to issue PAR notifications and coordinate evacuation based on expected inundation (Appendix E). • Schedule and chair ECO meeting if required. • Assign ECO roles. • Confirm SITREP frequency. • Issue SITREP to LDMG-CR. • Confirm monitoring expectations and rostering. • Advise of communication systems status. • Issue situation-specific actions (road/site closure/dam access).	• Issue EAP Stand Down notification to priority stakeholders. • Send request to LDMG-CR to issue PAR notifications. • Review, approve, and issue final SITREP to LDMG-CR. • Coordinate inspection by engaged DTA to assess any damage and/or propose a program for the undertaking of any remedial works to the satisfaction of the Dam Safety Regulator. • Prepare Emergency Event Report per Section 14. • Return to routine activities.

			• Monitor weather intelligence and rainfall forecasts. • Confirm with Senior Engineer Dams requirements for engaging DTA to conduct Special Inspection. • Commence event log. • If failure pathway identified, issue order for any remaining onsite personnel to evacuate site.	
DEO	Not Applicable.	Not Applicable.	• Attend ECO meeting if required. • **If safe to do so,** attend site and conduct surveillance inspections and monitor onsite rainfall conditions. • Provide updates from inspections to DEC. • **If safe to do so,** prevent public access to Basins. • Monitor water levels in the Basins (onsite or via remote monitoring). • Assist DEC with completion of SITREPs.	• Complete and issue final SITREP to DEC. • Assist with preparation of Emergency Event Report per Section 14. • Return to routine activities.
DECC	Not Applicable.	Not Applicable.	• Create Operation within Internal Communications Platform. • Attend ECO meeting if required. Record and circulate minutes. • Issue EAP activation notification to Dam Safety Regulator following discussion with DEC and manage ongoing regulatory updates and correspondence. • Provide support to ECO as required.	• Issue EAP Stand Down notification to Dam Safety Regulator following discussion with DEC. • Within Internal Communications Platform, finalise Event Log and ensure all documentation and records are accurately recorded within Document Library. • Provide support to ECO as required. • Assist with preparation of Emergency Event Report per Section 14 and submit to Dam Safety Regulator within 30 business days following cessation of event. • Return to routine activities.
ALL	Not Applicable.	Not Applicable.	• Record all communication, actions, and event-related documentation within Internal Communications Platform.	• Record all communication, actions, and event-related documentation within Internal Communications Platform.
	ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO. *e.g., taking photographs/video, undertaking dam inspections, taking instrument readings etc.* **ALL PHOTOS MUST BE TIME AND DATE STAMPED.**			

8. Dam Hazard – Terror Threat / Malicious Activity

8.1. Overview

The emergency actions described within this section relate to a potential dam hazard due to a terrorist threat or the occurrence of malicious activity at either or both of the dam sites. The vulnerability of Moody Creek Detention Basins 1 & 1A to a terrorist attack is low, however there is critical infrastructure located at the dam sites which may be the target of malicious activity; therefore, acts of sabotage or vandalism at either or both of the dam sites must be responded to accordingly. Such critical infrastructure includes:

- The main embankments and dam crests;
- The spillways and stilling basins;
- The low flow pipes and energy dissipators; and
- The riprap and scour protection upstream or downstream of the embankments.

Due to the nature of the Moody Creek Detention Basins, a terrorist threat, or the occurrence of malicious activity at either or both of the dam sites only represents a risk to the downstream PAR in the event of a significant rainfall and flooding event occurring whilst the dam or dams are in a damaged state. If a dam failure path was identified in such a situation, response protocols per Section 7 above would be enacted accordingly.

Flood mapping in Appendix E provides an indicative outline of potentially affected areas if malicious activity resulted in a catastrophic failure of either or both of the dams. The use of flood mapping under this hazard is for the Probable Maximum Flood (PMF) when a dam failure is in progress or likely due to malicious activity and concurrent flooding or downstream releases are occurring or expected to occur.

8.2. 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 or the occurrence of malicious activity at either or both of the dam sites. Advice specifically identifying Moody Creek Detention Basins 1 & 1A would immediately trigger the EAP to Stand Up activation level.

The following contact notifications would be issued to assist in the response to an act of terrorism which may pose a threat to the safety of the either or both of the dams and downstream PAR, with further response protocols to be undertaken by the ECO detailed in Table 10 below:

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

8.3. Terror Threat / Malicious Activity – EAP Activation Response Protocols

Table 10 - Terror Threat / Malicious Activity Event Response Protocols

Activation Level	Alert	Lean Forward	Stand Up	Stand Down
Activation Trigger	Not Applicable.	Not Applicable.	Significant threat / verified suspicious activity has compromised dam safety.	Risk assessment has determined that failure risk has reduced.
Internal Stakeholder Notifications Appendix I	Not Applicable.	Not Applicable.	Whispir Template #91	Whispir Template #84
External Stakeholder Notifications Appendix I	Not Applicable.	Not Applicable.	Whispir Template #92	Whispir Template #88
PAR Notifications Appendix J Appendix K	Not Applicable.	Not Applicable.	Emergency Alert #2 and/or #3 AWS Message #2 and/or #3	AWS Message #4 and/or #5
Response Actions ***Enact dam failure response Section 7 if change detected during surveillance inspection OR dam failure path identified.***				
DEC	Not Applicable.	Not Applicable.	• Immediately report the incident to the National Security Hotline 1800 123 400, Police Link 131 444, or 000/112. • Follow all directions of police/national security personnel. • Send EAP activation notification to priority stakeholders. • Schedule and chair ECO meeting if required. • Assign ECO roles. • Confirm SITREP frequency. • Issue SITREP to LDMG-CR. • Confirm monitoring expectations and rostering. • Advise of communication systems status. • Issue situation-specific actions (road/site closure/dam access). • Monitor weather intelligence and rainfall forecasts.	• Issue EAP Stand Down notification to priority stakeholders. • Review, approve, and issue final SITREP to LDMG-CR. • Coordinate inspection by engaged DTA to check for damage and/or propose a program for the undertaking of remedial works as necessary and to the satisfaction of the Dam Safety Regulator. • Prepare Emergency Event Report per Section 14. • Return to routine activities.

			• Confirm with Senior Engineer Dams requirements for engaging DTA to conduct Special Inspection. • Commence event log. • **If notified by DEO of observed changes or damage to dam structures as a result of sabotage and heavy rainfall is predicted or Basins begin to impound water, determine need to trigger response protocols under Section 7.**	
DEO	Not Applicable.	Not Applicable.	• Attend ECO meeting if required. • **If safe to do so,** attend site and conduct surveillance inspection and monitor onsite conditions. • Provide updates from inspections to DEC. • **If safe to do so,** prevent public access to Basins. • If Basins begin to impound or are impounding water, monitor water levels (onsite or via remote monitoring). • Assist DEC with completion of SITREPs.	• Complete and issue final SITREP to DEC. • Assist with preparation of Emergency Event Report per Section 14. • Return to routine activities.
DECC	Not Applicable.	Not Applicable.	• Create Operation within Internal Communications Platform. • Attend ECO meeting if required. Record and circulate minutes. • Issue EAP activation notification to Dam Safety Regulator following discussion with DEC and manage ongoing regulatory updates and correspondence. • Provide support to ECO as required.	• Issue EAP Stand Down notification to Dam Safety Regulator following discussion with DEC. • Within Internal Communications Platform, finalise Event Log and ensure all documentation and records are accurately recorded within Document Library. • Provide support to ECO as required. • Assist with preparation of Emergency Event Report per Section 14 and submit to Dam Safety Regulator within 30 business days following cessation of event. • Return to routine activities.
ALL	Not Applicable.	Not Applicable.	• Record all communication, actions, and event-related documentation within Internal Communications Platform.	• Record all communication, actions, and event-related documentation within Internal Communications Platform.
	ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO. *e.g., taking photographs/video, undertaking dam inspections, taking instrument readings etc.* **ALL PHOTOS MUST BE TIME AND DATE STAMPED.**			

9. Dam Hazard – Non-Flood Related Events

Moody Creek Detention Basins 1 & 1A are also susceptible to non-flood related events which do not pose an immediate hazard to the downstream community. There may be no need to activate this EAP if minor defects (for example, cracking, small slips, sinkholes etc) which do not endanger the integrity of the dams occur. Any identified defects will be appropriately investigated and monitored, with remedial works undertaken as required to prevent deterioration. If, operational awareness identifies a threat to the community that may be widespread and require a coordinated response from LDMS , the EAP will be activated accordingly. Furthermore, any significant rainfall during any of the below events leading to an identified failure mode of the embankment or dam wall will trigger the relevant flood-related emergency response protocols detailed in Section 7 above:

- Earthquake;
- Cracking or other signs of abnormal behaviour;
- Blockage of the low flow pipe.

9.1. Earthquake

9.1.1. Overview

Earthquakes are Queensland's fifth natural hazard risk priority. Earthquakes are a frequently occurring phenomenon in Queensland with some geographic areas registering clusters of events. Whilst the magnitude of earthquakes is often less than 3.5 on the Richter scale, with the effects seldom felt, some areas have experienced an earthquake with a magnitude of greater than 5 on the Richter scale. An earthquake of this magnitude occurring in or near a built environment is likely to cause significant damage to structures, particularly underground services and critical piping infrastructure, with potential risk to life due to the collapse of structures. Potential failure modes of the earth embankment section, including the spillway, resulting from a seismic event include:

- Piping through embankment – whereby an earthquake causes transverse cracking in the upper section of the embankment. There is potential for these cracks to further propagate and cause piping in the event of a flood occurring prior to the undertaking of remedial works.
- Slope failure – whereby following a seismic event the embankment material could lose strength resulting in strain softening under cyclic loading.
- Liquefaction – whereby an earthquake event could result in liquefaction of the low plasticity clay/silt and river alluvial material.

Potential failure modes of the outlet conduits resulting from a seismic event include:

- Structural failure as a result of damage to the outlet pipes;
- Structural failure as a result of damage to the bandage joint.

Following a seismic event in the vicinity of the Moody Creek Detention Basins, signs of distress or abnormalities in the dam embankments like cracking or deformation/sliding, or any other structural damage may occur. Whilst there may be defects present that pose a potential safety hazard to users of the open space inside the Moody Creek Detention Basins, these will not necessarily result in a dam hazard event or emergency event unless the Basins begin to impound water during a significant weather event. Upon receipt of advice that damage to the Moody Creek Detention Basins and/or any of their associated structures has occurred following a seismic event, the following response protocols in Table 11 below are to be followed.

9.1.2. Assessment of the Dam Hazard

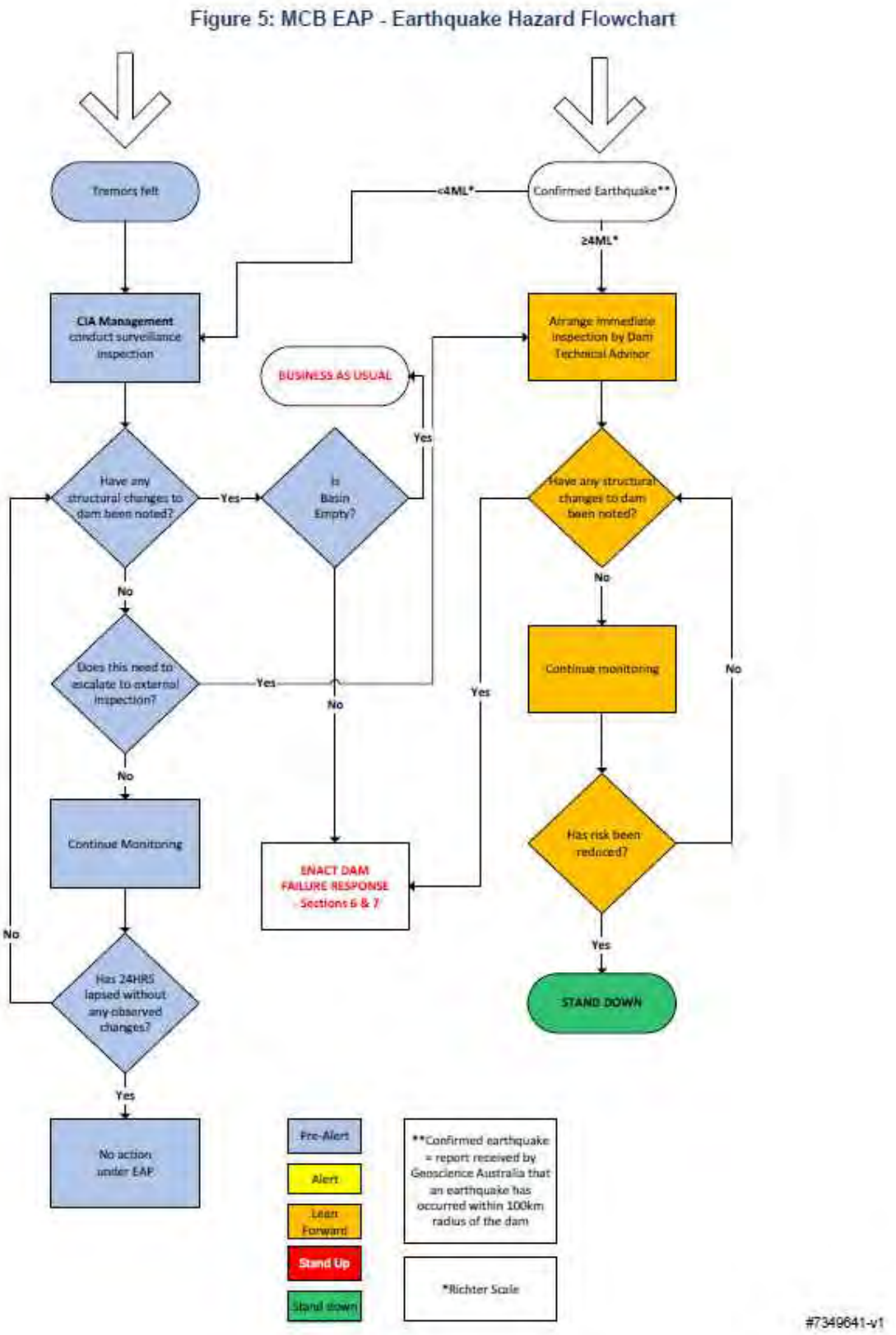
In the event of an earthquake being detected, the following actions are recommended:

- Assess the severity of the tremor, GeoScience Australia preliminary earthquake notifications for the region.
- 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
- Advise Senior Engineer Dams of current Detention Basin conditions, any additional observations, and response actions undertaken.

CIA management will conduct a surveillance inspection to determine the response if sunny day failure and basin has no water or no severe weather warnings the earthquake would present no escalation to activate the EAP and would be managed as business as usual.

After CIA management surveillance inspection the earthquake may contribute to, or cause, a structural issue which could result in dam failure AND water level in the basin AND rising the EAP would be activated refer to sections 6.and /or a structural issue which could result in dam failure and embankment is compromised with no water refer to section 7.

Figure 5 – MCB EAP – Earthquake Hazard Flowchart



9.1.3. Earthquake Event Response Protocols

Table 11 - Earthquake Event Response Protocols

Activation Level	Pre-Alert	Alert	Lean Forward	Stand Up	Stand Down
Activation Trigger	Tremors felt or Earthquake confirmed less than or equal to 4ML	Not Applicable.	Earthquake reported or felt in the area AND Intensity less than or equal to 4ML AND Change detected during inspection.	Earthquake reported greater than 4ML AND Change detected during inspection. AND A possible failure path had been identified	Risk assessment has determined that failure risk has reduced.
Internal Stakeholder Notifications Appendix I	Determination made by CIA Management whether to activate the EAP.	Not Applicable.	Not Applicable.	Whispir Template #91	Whispir Template #84
External Stakeholder Notifications Appendix I	Not Applicable	Not Applicable.	Not Applicable.	Whispir Template #92	Whispir Template #88
PAR Notifications Appendix J Appendix K	Not Applicable	Not Applicable.	Not Applicable.	Emergency Alert #2 and/or #3 AWS Message #2 and/or #3	AWS Message #4 and/or #5
Response Actions ***Enact dam failure response*** Section 7 – Embankment Failure. ***if change detected during surveillance inspection OR dam failure path identified.***					

DEC	'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.	Not Applicable.	Not Applicable.	• Engage DEO to conduct a visual inspection to monitor the condition of the structures • Send EAP activation notification to priority stakeholders. • Schedule and chair ECO meeting if required. • Assign ECO roles. • Confirm SITREP frequency. • Issue SITREP to LDMG-CR. • Confirm monitoring expectations and rostering. • Advise of communication systems status. • Issue situation-specific actions (road/site closure/dam access). • Monitor weather intelligence and rainfall forecasts. • Confirm with Senior Engineer Dams requirements for engaging DTA to conduct Special Inspection. • Commence event log. • **If notified by DEO of observed changes or damage to dam structures as a result of earthquake and heavy rainfall is predicted or Basins begin to impound water, determine need to trigger response protocols under Section 7.** Enact Dam Failure response, Sections 6 & 7 if: Dam failure path identified, OR Change detected during surveillance inspection	• Issue EAP Stand Down notification to priority stakeholders. • Review, approve, and issue final SITREP to LDMG-CR. • Coordinate inspection by engaged DTA to check for damage and/or propose a program for the undertaking of remedial works as necessary and to the satisfaction of the Dam Safety Regulator. • Prepare Emergency Event Report per Section 14. • Return to routine activities.

DEO		Not Applicable.	Not Applicable.	• Attend ECO meeting if required. • **If safe to do so,** attend site and conduct surveillance inspection and monitor onsite conditions. • Provide updates from inspections to DEC. • **If safe to do so,** prevent public access to Basins. • If Basins begin to impound or are impounding water, monitor water levels (onsite or via remote monitoring). • Assist DEC with completion of SITREPs.	• Complete and issue final SITREP to DEC. • Assist with preparation of Emergency Event Report per Section 14. • Return to routine activities.
DECC		Not Applicable.	Not Applicable.	• Create Operation within Internal Communications Platform. • Attend ECO meeting if required. Record and circulate minutes. • Issue EAP activation notification to Dam Safety Regulator following discussion with DEC and manage ongoing regulatory updates and correspondence. • Provide support to ECO as required.	• Issue EAP Stand Down notification to Dam Safety Regulator following discussion with DEC. • Within Internal Communications Platform, finalise Event Log and ensure all documentation and records are accurately recorded within Document Library. • Provide support to ECO as required. • Assist with preparation of Emergency Event Report per Section 14 and submit to Dam Safety Regulator within 30 business days following cessation of event. • Return to routine activities.
ALL		Not Applicable.	Not Applicable.	• Record all communication, actions, and event-related documentation within Internal Communications Platform.	• Record all communication, actions, and event-related documentation within Internal Communications Platform.

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

9.2. Cracking or Other Signs of Abnormal Behaviour

9.2.1. Overview

Routine maintenance inspections as well as pre-and-post annual wet season inspections are in place for Moody Creek Detention Basins 1 & 1A to review the condition of the dam embankment, upstream and downstream embankment slopes, spillways and spillway batters, low level outlet, and miscellaneous equipment (e.g., gauge boards, CCTV equipment, signage etc.) to specifically check for and record details of any signs of cracking or other abnormal behaviour (refer to Appendix H for sample Inspection Schedule).

In addition to cracking, other abnormal behaviour at either of both of the Moody Creek Detention Basins 1 & 1A can include, but is not limited to:

- Depressions;
- Deformation of crest or settlement;
- Changes to structural alignment;
- Sinkholes;
- Sliding, slumping, bulging;
- Erosion;
- Damage caused by animal activity (i.e., burrows);
- Cracking or deterioration in the joints or joint sealants.

Cracking or other abnormal activity may result in damage to the following at either or both of the Moody Creek Detention Basins 1 & 1A, and require an assessment of the hazard prior to any remedial works being undertaken:

- Main dam embankment and crest;
- Spillway;
- Stilling basin;
- Low flow pipe;
- Energy dissipator;
- Riprap and scour protection upstream or downstream of the dam embankment.

9.2.2. Assessment of the Hazard

Whilst there may be defects present that pose a potential safety hazard to users of the open space inside the Moody Creek Detention Basin, these will not necessarily result in a dam hazard event or emergency event unless the Basin begins to impound water during a significant weather event.

Upon receipt of advice that damage to the Moody Creek Detention Basin and/or any of its associated structures has occurred, the following response protocols in Table 12 below are to be followed

9.2.3. Cracking or Abnormal Behaviour Event Response Protocols

Table 12 - Cracking or Abnormal Behaviour Event Response Protocols

ECO Position	Cracking or Abnormal Behaviour Event – Response Actions
DEC	• Engage DEO to conduct a visual inspection to monitor the condition of the structures. • Advise Senior Engineer Dams of current Detention Basin conditions, any additional observations, and response actions undertaken. • Monitor weather forecasts for the region. • If the Detention Basins begin to impound water, enact dam hazard response Section 6 – Flooding. • If dam failure path identified, enact dam hazard response Section 7 – Embankment Failure.
DEO	• **If safe to do so, c**onduct a surveillance inspection to monitor the condition of the structures. • Communicate Detention Basin conditions and any additional observations or notable defects to the DEC.
DECC	• Provide support to ECO as required. • Record all communication, actions, and event-related documentation within Internal Communications Platform. • Notify the Dam Safety Regulator if required.
Senior Engineer Dams	• Provide expert advice to DEC on engineering decisions relating to dam safety. • **If safe to do so**, attend dam site and conduct a surveillance inspection of the structures to assess their structural integrity and any remedial works which may be required. • Oversee all communications with the engaged Dam Technical Advisor and coordinate a Special Inspection to assess and propose a program to undertake any remedial works required.
	ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO. *e.g., taking photographs/video, undertaking dam inspections, taking instrument readings etc.* **ALL PHOTOS MUST BE TIME AND DATE STAMPED.**

9.3. Blockage of Low Flow Pipe

9.3.1. Overview

Blockages of the low flow pipe may occur at the trash rack upstream of the low flow pipe (Basin 1 only), inside the pipe, or in the lined channel downstream of the structure. These locations are checked for blockages, damage, and cleared of built-up debris or vegetation during routine maintenance inspections and pre-and-post wet season inspections (refer to Appendix H for sample Inspection Schedule).

9.3.2. Assessment of the Hazard

A blockage of the low flow pipe reduces the flood mitigation capacity of the structure but does not compromise the capacity of the Moody Creek Detention Basin 1 to safely pass a flood up to the PMP-F event. Modelling demonstrates that in the case where the low-lying outlet is blocked, both PMP-F and PMF overtop the embankment by 20mm and 160mm respectively. In this scenario, Moody Creek Detention Basin 1 is not capable of passing the standards-based assessed AFC event of PMP-F.

Whilst conditions which may result in longer term impoundment of water can increase the likelihood of seepage and reduce embankment stability, both the Moody Creek Detention Basins 1 & 1A have been designed to account for longer-term water impoundment resulting from blockages of the low flow pipes. Should a blockage of the low flow pipe in either or both of the Basins be identified however, the following response protocols in Table 13 below are to be followed.

9.3.3. Blockage of Low Flow Pipe Event Response Protocols

Table 13 - Blockage of Low Flow Pipe Event Response Protocols

ECO Position	Blockage of Low Flow Pipe – Response Actions
DEC	• Engage DEO to conduct a visual inspection to monitor the condition of the structures. • Advise Senior Engineer Dams of current Detention Basin conditions, any additional observations, and response actions undertaken. • Monitor weather forecasts for the region. • If the Detention Basins begin to impound water, enact dam hazard response Section 6 – Flooding. • If dam failure path identified, enact dam hazard response Section 7 – Embankment Failure.
DEO	• Conduct a surveillance inspection to monitor the condition of the structures. • **If safe to do so**, clear the blockage from the pipe. • Communicate Detention Basin conditions and any additional observations to the DEC.
DECC	• Provide support to ECO as required. • Record all communication, actions, and event-related documentation within Internal Communications Platform. • Notify the Dam Safety Regulator if required.
Senior Engineer Dams	• Provide expert advice to DEC on engineering decisions relating to dam safety. • Attend dam site if required and conduct a surveillance inspection of the low flow pipe to assess its structural integrity and any remedial works which may be required if a blockage has resulted in structural damage. • Oversee all communications with the engaged Dam Technical Advisor and coordinate a Special Inspection to assess and propose a program to undertake any remedial works if required.
	ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO. *e.g., taking photographs/video, undertaking dam inspections, taking instrument readings etc.* **ALL PHOTOS MUST BE TIME AND DATE STAMPED.**

10. Other Emergency Situation – Communications Failure

10.1. Overview

The emergency action described within this section relates to an event where all means of communication with the local area have been lost. This section specifies actions and provides guidance for the effective management of the event.

10.2. Activation Trigger

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

Communications Failure – Local Area	Unable to communicate to or from Local Area (likely to affect ECO). Managed by dam owner in conjunction with the ECO and LDMG-CR.

10.3. Assessment of the Hazard

Communications failures may occur during normal operations and may affect the SCADA network, instrumentation, monitoring equipment, and/or communications systems like the Internal Communications Platform. Such communication failures may occur across the Cairns region, and whilst a communications 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 internal communications methods during a dam hazard event or emergency event, the ECO will revert to mobile telephone communications (if operational), UHF radio communications, satellite communications, alternative platforms (if available), and the use of paper-based records to record actions and manage an emergency response. The CRC Information and Technology Services Department has a master database of PAR which would be called upon and the CIA Business Continuity Plan would be followed #6929421.

Should the use of Teams online meetings be unavailable when convening meetings of the ECO, a Virtual Meeting Room (VMR) will be used instead. The VMR is another room available within the CRC Outlook calendar. Search 'W&W VMR EAP' – anyone can select this room to create a meeting. For the person initiating the meeting invite, instructions for participants will automatically populate into the meeting invite once it has been sent. The phone number to dial into the VMR is [redacted] and this will not change.

The DEC will determine whether it is reasonably likely that there may be a 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 a communications failure occurs as a result of natural disaster conditions such as a cyclone event, the DEC will cooperate with the LDMG-CR (if already activated to Stand Up level) on communicating with PAR as required. Table 14 below outlines the actions and communications process to be followed in the event that all means of communication within the local area fail.

10.4. Communications Failure Event Response Protocols

Table 14 - Other Emergency Situation - Communications Failure Event Response Protocols

ECO Position	Local Area Communications Failure – Response Actions
DEC	• Follow CIA Business Continuity Plan #6929421. • Establish alternate means of communication and establish a runner system if required. • Activate EAP should a dam emergency occur during a local area communications failure event – refer to specific dam hazard table for response protocols. • Liaise with DEO and DECC regarding status of communications.
DEO	• Every hour attempt communications via: o Landline telephone; o SMS text message (higher probability of successful transmission than calling); o UHF radio; o Social media platform (e.g., Facebook). • Liaise with DEC and DECC regarding status of communications. • As much as is practicable, continue other tasks associated with the ECO position in accordance with any other current emergency action. • Provide support to DEC as required.
DECC	• Set up paper-based Event Log to record all event-related information. • Every hour attempt communications via: o Landline telephone; o SMS text message (higher probability of successful transmission than calling); o UHF radio; o Social media platform (e.g., Facebook). • Liaise with DEC and DEO regarding status of communications. • Attend meetings as requested, providing support to DEC and DEO as required.

11. Notification and Communications 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 4 below.

11.1. Internal Communications

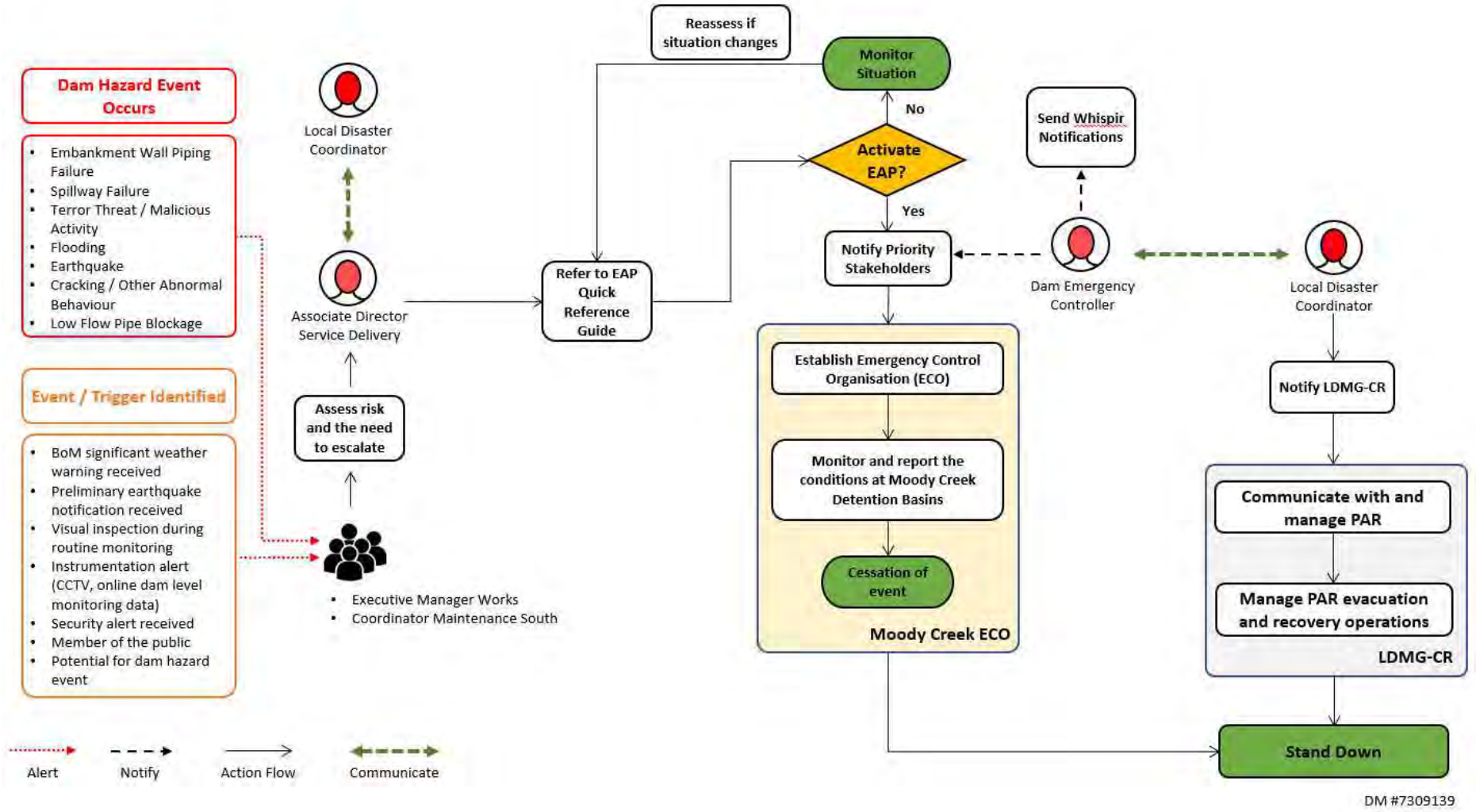
Prior to the activation of the Moody Creek Detention Basins 1 & 1A EAP, the primary means of communication between CRC officers and the ECO is via mobile telephone. Once the EAP has been activated, the ECO members communicate internally and with non-ECO members via mobile telephone, Ultra-High Frequency (UHF) radio, and through the use of an internal communications platform. This platform is further described in Section 11.4 below. Email may also be used for non-urgent communications and for the issuance of Situation Reports (SITREPs).

During a dam emergency event the ECO (specifically the Dam Emergency Controller [DEC]) liaises with the Local Disaster Coordinator (LDC) to ensure public communications and all media queries are being managed effectively through the LDMG-CR.

UHF radios to be used in a dam emergency event use the following radio frequencies and are permanently located and available for use at the Martyn Street Depot, Spence Street Council Chambers, and the LDCC.

11.2. Communications Flowchart

Figure 6 - Moody Creek Detention Basins 1 & 1A EAP – Communications Flowchart



11.3. Whispir Communications Platform

Whispir is a cloud-based communications 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 to issue group communications from the Moody Creek Detention Basins ECO to priority internal and external stakeholders listed in Appendix L.

Scenario templates have been created within Whispir with messages specific to dam hazards and dam emergency events. Each message is linked to a distribution list depending on who and when the communication should be sent. Appendix I outlines the communication plan and Whispir emergency notification messages.

Whispir has an app called OneClick which allows the user to quickly locate and run the Whispir scenario templates from any location. CRC personnel authorised under this EAP to send Whispir messages in the event of an EAP activation are to follow the Whispir OneClick App Instructions #5983168.

11.4. Internal Communications Platform

The Internal Communications Platform to be used in an event if 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. 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 SITREPs, photographs, and email correspondence. CRC personnel appointed to the ECO are to refer to the Microsoft 365 Solution Guidance Document #7207033.

11.5. 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 the status of its referable dams 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 telephone, and social network platforms like Facebook.

The two primary platforms for public notification prior to an emergency event are the Cairns Disaster Dashboard and Cairns Alert opt-in message service. Both tools incorporate existing local context and content with information about weather, safe locations, key road closures, and predicted impacts on critical infrastructure and services.

11.5.1. Cairns Disaster Dashboard

The CRC website has a specific Natural Disasters page, which is supported by the Cairns Disaster Dashboard during an emergency event https://disaster.cairns.qld.gov.au/. The Cairns Disaster 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). The Dashboard allows for emergency services and critical service utilities such as Ergon and Telstra to collate real-time information and show current evacuation routes, shelter locations, and up to date emergency-related mapping.

11.5.2. Cairns Alert

Cairns Alert is a dedicated platform which provides contextualised disaster and emergency information to the Cairns community. Cairns Alert is an opt-in messaging service and is freely available for any person (resident or otherwise) to register. Members of the public who opt into the service will receive disaster and emergency alerts via Short Message Service (SMS) text messages. These alerts are official communications from the Cairns Disaster Group (LDMG-CR) which manages the response to disasters which may or may not be dam related. The Cairns Alert opt-in service is available at https://www.cairns.qld.gov.au/community-environment/natural-disasters/cairns-alert.

11.5.3. National Emergency Alert System (NEAS)

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

NEAS notifications are authorised and requested by the LDMG-CR. In Queensland, the NEAS is operated by the State Disaster Coordination Centre (SDCC) Watch Desk. The SDCC Watch Desk approves, tests, and operates Emergency Alerts (EAs) and associated polygons. Should dam failure be imminent, the dam operator may also send NEAS notifications. The Moody Creek Detention Basins 1 & 1A NEAS polygon and EA request forms are presented within Appendix K of this document.

11.5.4. 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 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 7 - AWS Flood Hazard Icons

The requirements of the AWS are nationally consistent. Accordingly, the flood warnings contained within Appendix J 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 that 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. Conclusion of the Emergency Event

The deactivation of this Emergency Action Plan and transition from response operations back to business-as-usual (BAU) and/or recovery operations shall occur only once there is no longer a requirement to respond to the event and the threat of an emergency at the Moody Creek Detention Basins has passed. The threat of immediate danger is considered to have passed once the following conditions are met and can be verified by visual inspection of the Moody Creek Detention Basins:

- The Detention Basins are no longer impounding water;
- No significant rainfall has occurred since drawdown;
- No further significant rainfall is forecast; and
- Any contamination of the Detention Basins has been cleaned or contained.

At such time, the DEC shall determine whether it is appropriate for the ECO to Stand Down. If the above conditions are not met, but an assessment of the structure has deemed that the threat to PAR has sufficiently reduced, it may be appropriate for the ECO to resume operations under an ongoing Alert status until such time that Stand Down status can be achieved.

However, if the Detention Basins have incurred structural damage, the complete deactivation of the EAP can only occur once the structure has been assessed by the engaged DTA and remedial works have been undertaken to the satisfaction of the Dam Safety Regulator (DSR) in accordance with the prescribed Dam Safety Conditions Schedule for Moody Creek Detention Basins 1 & 1A, and it has been confirmed that they are safe for continued operation.

13. Emergency Event Report

An Emergency Event Report (EER) will be submitted within 30 business days following the cessation of a dam emergency event to the Chief Executive. It is necessary to capture all relevant information during a dam emergency event in the Internal Communications Platform (see Section 11.4 above) to ensure appropriate details and evidence can be extrapolated and included within the EER.

The Associate Director Service Delivery and Executive Manager Business Performance & Compliance are responsible for convening a post-event debrief with all ECO members, support personnel and the LDMG-CR as necessary to capture opportunities for improvement. The *Emergency Action Plan for Referable Dam Guideline* (RDMW, 2023) provides EER guidance and a report template which will be referred to as required.

14. References

Document Title	Reference / Location
Water Supply (Safety & Reliability) Act 2008 – current as of 20 September 2023	https://www.legislation.qld.gov.au/view/pdf/inforce/current/act-2008-034
Queensland Disaster Management Act 2003 – current as of 1 July 2023	https://www.legislation.qld.gov.au/view/pdf/inforce/current/act-2003-091
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
Guideline for Failure Impact Assessment of Water Dams (RDMW, 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 (RDMW, 2023)	https://www.rdmw.qld.gov.au/__data/assets/pdf_file/0011/1589186/guidelines-safety-assessments-referable-dams.pdf
Queensland Dam Safety Management Guideline (RDMW, 2024)	https://www.resources.qld.gov.au/__data/assets/pdf_file/0007/78838/dam-safety-management.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
Emergency Action Plan for Referable Dam Guideline (RDMW, 2023)	https://www.resources.qld.gov.au/__data/assets/pdf_file/0018/84015/eap-guideline.pdf

15. Appendices

Appendix A. Access Options

Appendix B. Storage Capacity Curve

Appendix C. Spillway Rating Curve

Appendix D. General Arrangement Drawings

Appendix E. Inundation Maps

Appendix F. Event Log and SITREP Template

Appendix G. Remote Monitoring Station Details

Appendix H. Detention Basin Inspection Schedule

Appendix I. Communications Plan

Appendix J. AWS Message Templates

Appendix K. NEAS Polygon and Emergency Alert Request Form Templates

Appendix L. CRC and Key Stakeholder Contacts Lists

A. Access Options

B. Storage Capacity Curve

Figure 8 - Level Versus Reservoir Capacity for Moody Creek Detention Basin 1

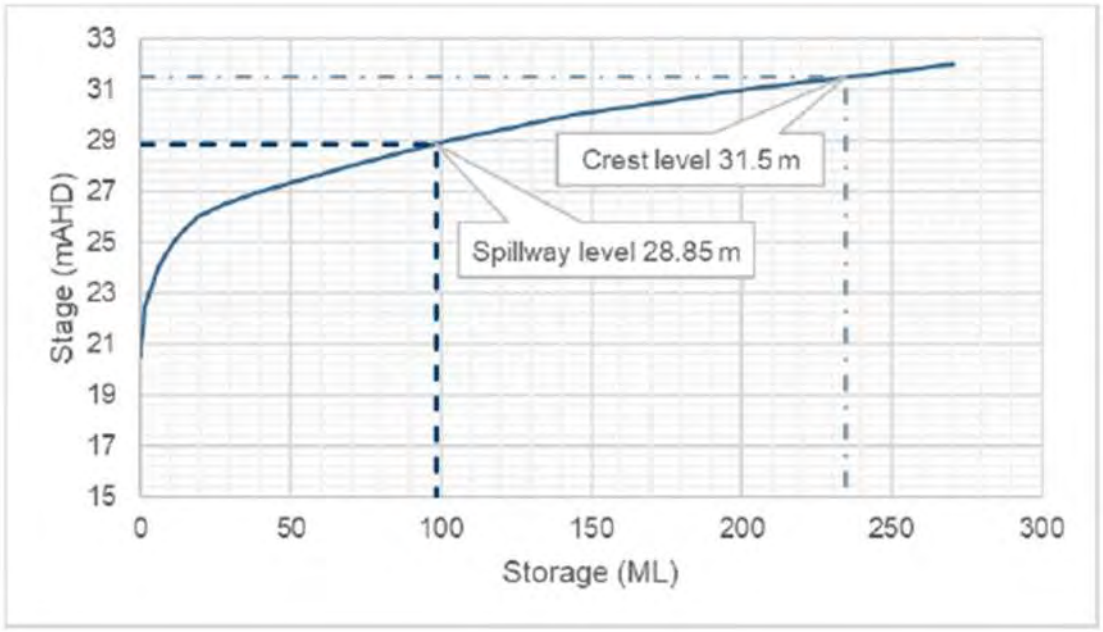
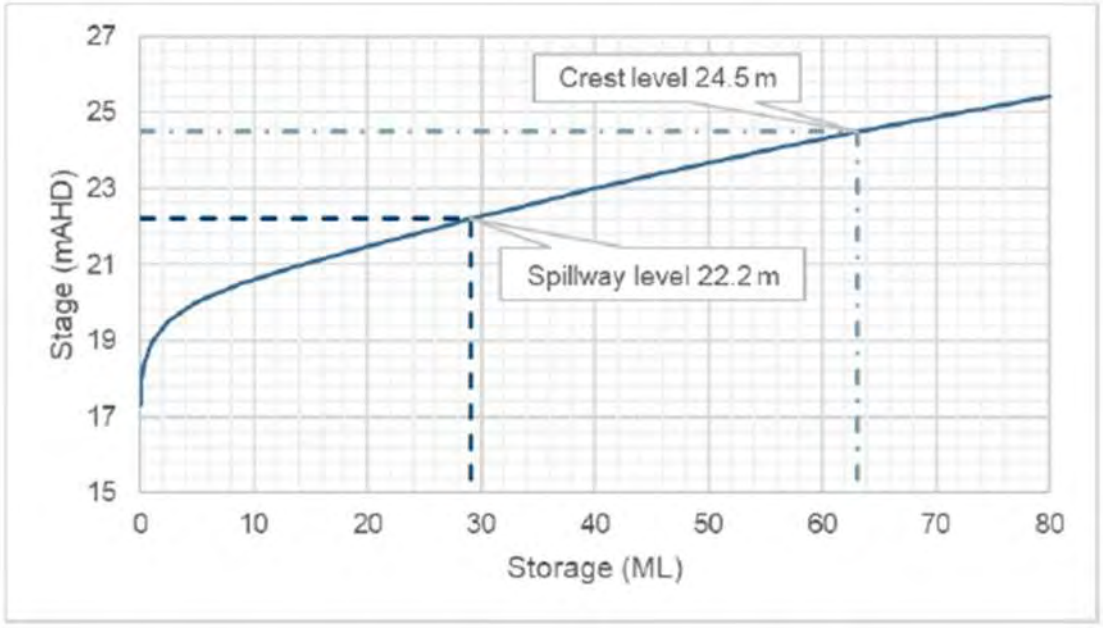


Figure 9 - Level Versus Reservoir Capacity for Moody Creek Detention Basin 1A



* From Moody Creek Detention Basin 1 Dam Break Assessment (GHD, 2023) #7260512.

C. Spillway Rating Curve

Figure 10 - Level Versus Discharge for Moody Creek Detention Basin 1 (Unblocked)

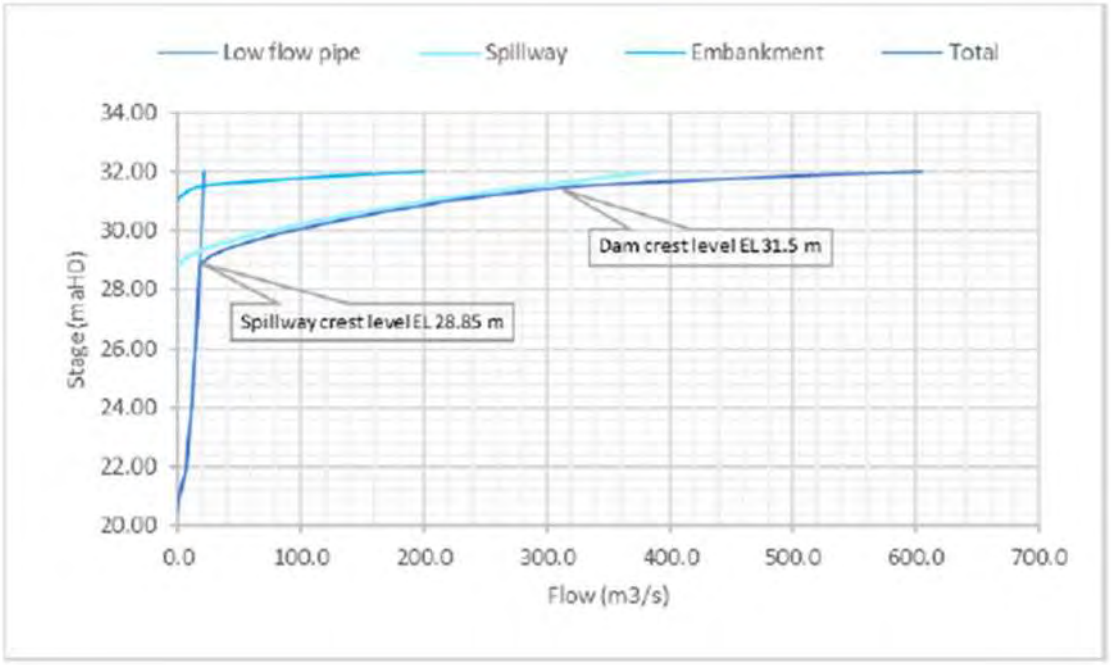


Figure 11 - Level Versus Discharge for Moody Creek Detention Basin 1 (Blocked)

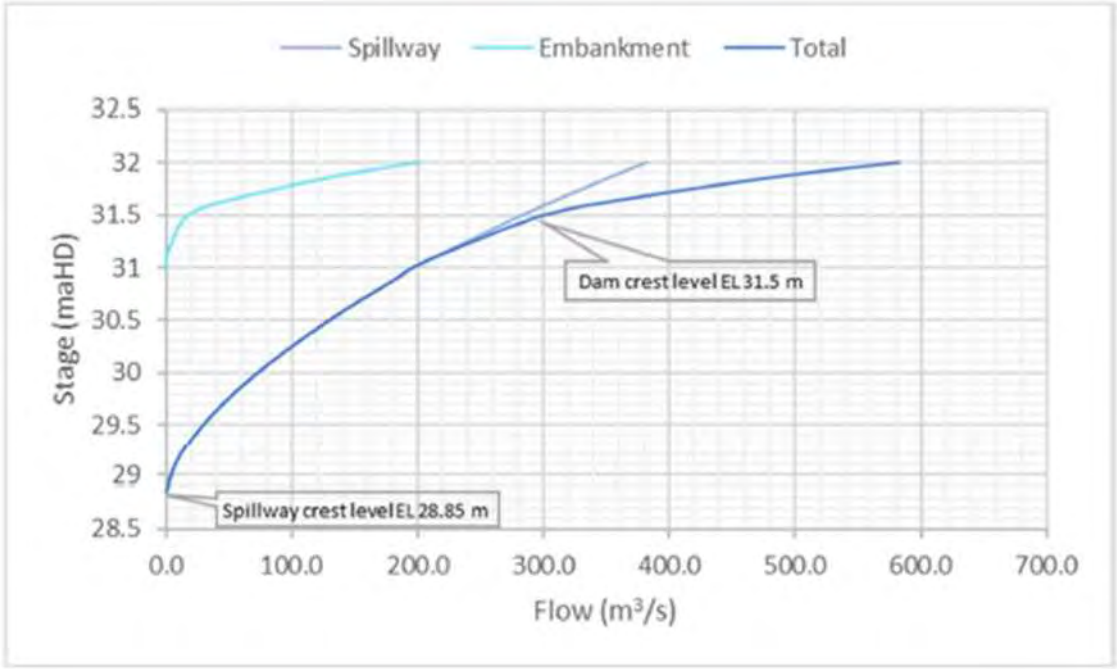
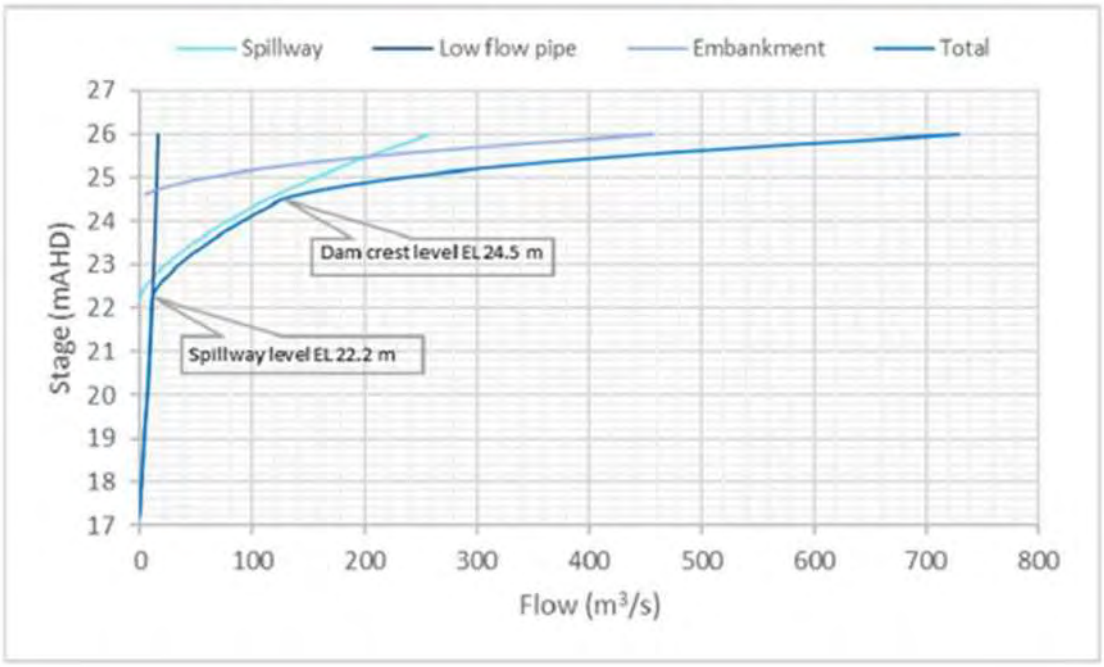


Figure 12 - Level Versus Discharge for Moody Creek Detention Basin 1A (Unblocked)



*From Moody Creek Detention Basin 1 Dam Break Assessment (GHD, 2023) #7260512.

D. General Arrangement Drawings

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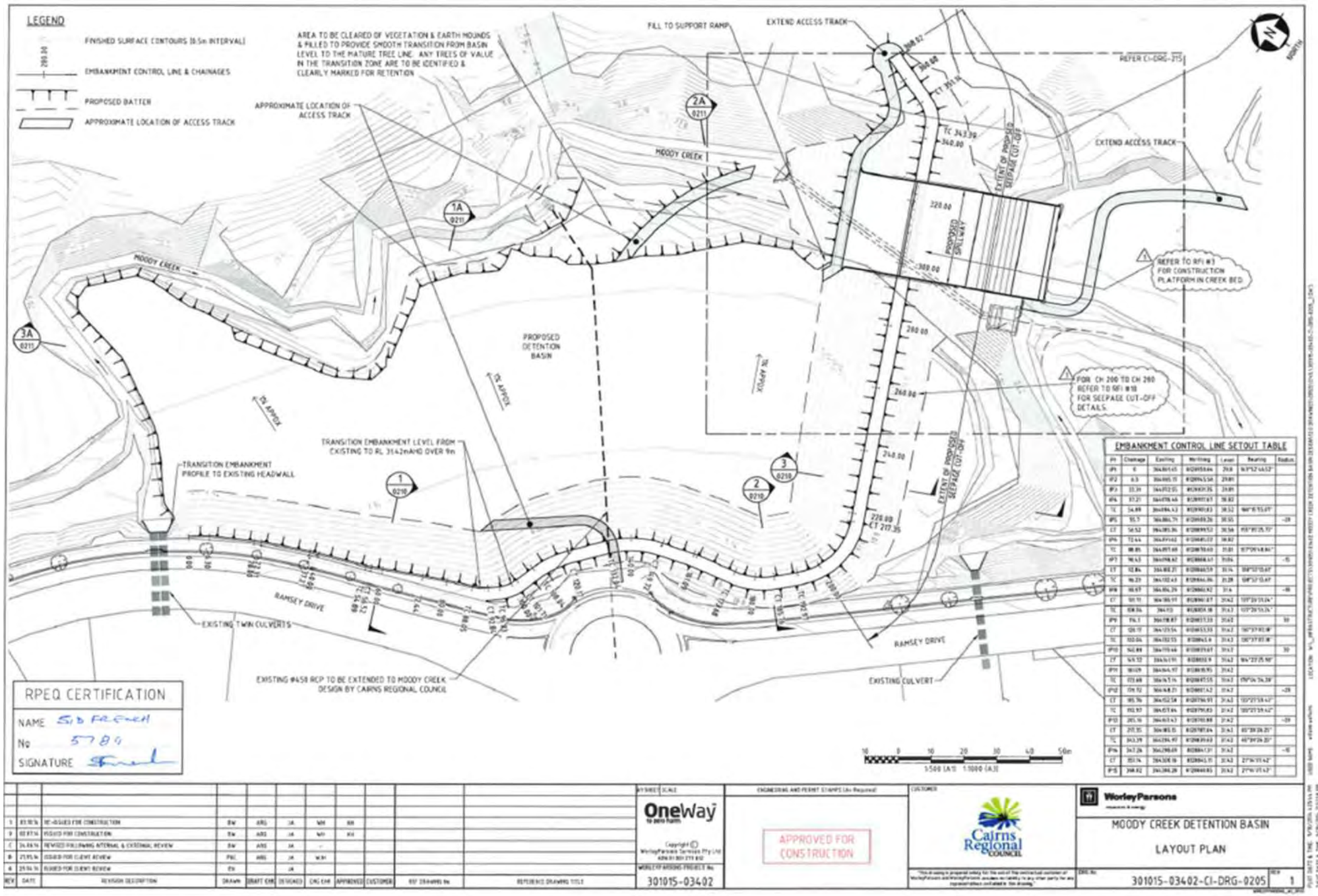
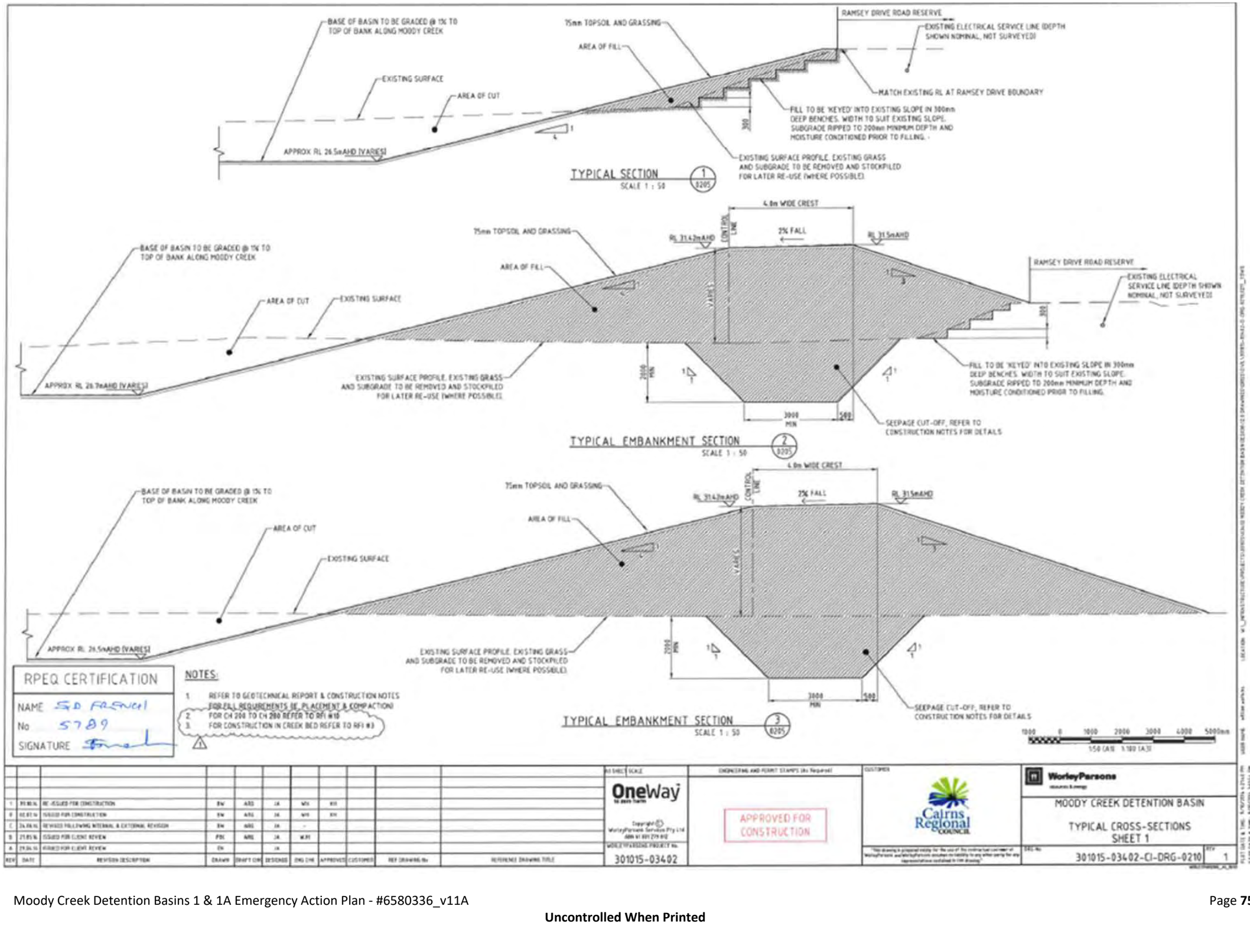
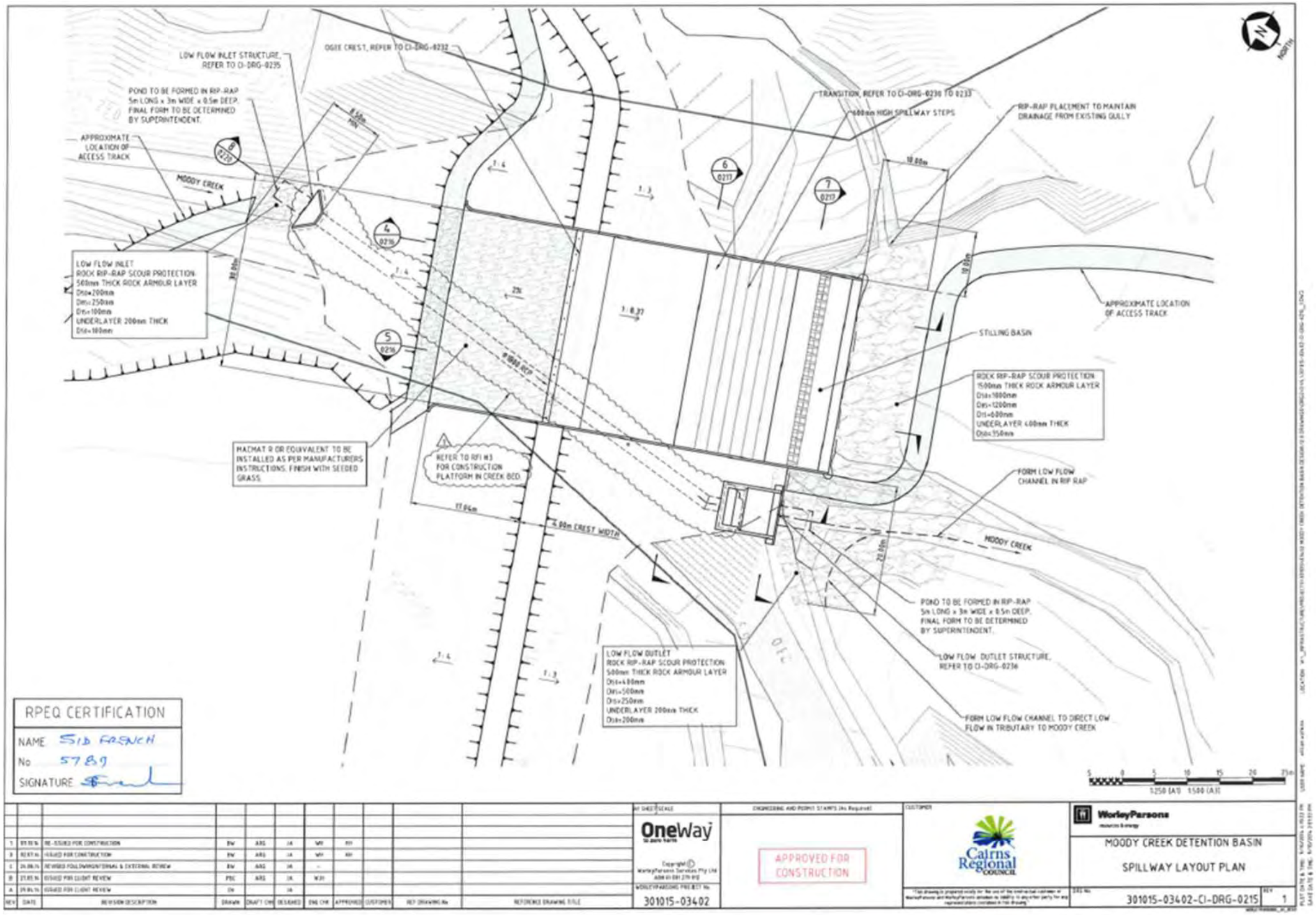



BASE OF BASIN TO BE GRADED @ 1% TO TOP OF BANK ALONG MOODY CREEK
75mm TOPSOIL AND GRASSING
AREA OF FILL
EXISTING SURFACE
AREA OF CUT
RAMSEY DRIVE ROAD RESERVE
EXISTING ELECTRICAL SERVICE LINE (DEPTH SHOWN NOMINAL, NOT SURVEYED)
MATCH EXISTING RL AT RAMSEY DRIVE BOUNDARY
FILL TO BE 'KEYED' INTO EXISTING SLOPE IN 300mm DEEP BENCHES. WIDTH TO SUIT EXISTING SLOPE. SUBGRADE RIPPED TO 200mm MINIMUM DEPTH AND MOISTURE CONDITIONED PRIOR TO FILLING.
APPROX RL 26.5mAHD (VARIES)
EXISTING SURFACE PROFILE. EXISTING GRASS AND SUBGRADE TO BE REMOVED AND STOCKPILED FOR LATER RE-USE (WHERE POSSIBLE)
TYPICAL SECTION 1 8205
SCALE 1 : 50
4.0m WIDE CREST
CONTROL LINE
2% FALL
RL 31.42mAHD
RL 31.5mAHD
VARIES
2000 MIN
3000 MIN
500
SEEPAGE CUT-OFF, REFER TO CONSTRUCTION NOTES FOR DETAILS
TYPICAL EMBANKMENT SECTION 2 8205
SCALE 1 : 50
TYPICAL EMBANKMENT SECTION 3 8205
SCALE 1 : 50
1000 0 1000 2000 3000 4000 5000mm
1:50 (A1) 1:100 (A3)
RPEQ CERTIFICATION
NAME S.D FRENCH
No 5789
SIGNATURE
NOTES:
1. REFER TO GEOTECHNICAL REPORT & CONSTRUCTION NOTES FOR FILL REQUIREMENTS (E. PLACEMENT & COMPACTION)
2. FOR CH 200 TO CH 280 REFER TO RFI #10
3. FOR CONSTRUCTION IN CREEK BED REFER TO RFI #3
OneWay
APPROVED FOR CONSTRUCTION
Cairns Regional Council
WorleyParsons
MOODY CREEK DETENTION BASIN
TYPICAL CROSS-SECTIONS SHEET 1
301015-03402
301015-03402-CI-DRG-0210
REV 1



RPEQ CERTIFICATION
NAME SID FRENCH
No 5789
SIGNATURE

REV	DATE	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
1	07.10.16	RE-ISSUED FOR CONSTRUCTION	BW	ARG	JA	WH	RH			
0	02.07.16	ISSUED FOR CONSTRUCTION	BW	ARG	JA	WH	RH			
C	24.06.16	REVISED FOR AWP/INTERNAL & EXTERNAL REVIEW	BW	ARG	JA	-				
B	27.05.16	ISSUED FOR CLIENT REVIEW	PEC	ARG	JA	WH				
A	29.04.16	ISSUED FOR CLIENT REVIEW	CH		JA					

OneWay
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WORLEYPARSONS PROJECT No. 301015-03402

APPROVED FOR CONSTRUCTION

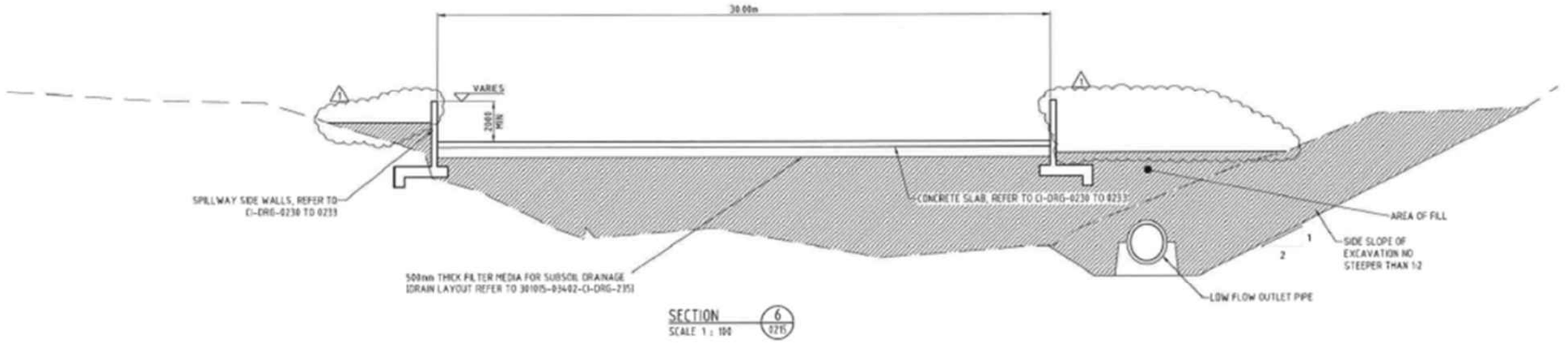
Cairns Regional Council

WorleyParsons

MOODY CREEK DETENTION BASIN

SPILLWAY LAYOUT PLAN

DRG No. 301015-03402-CI-DRG-0215 REV 1



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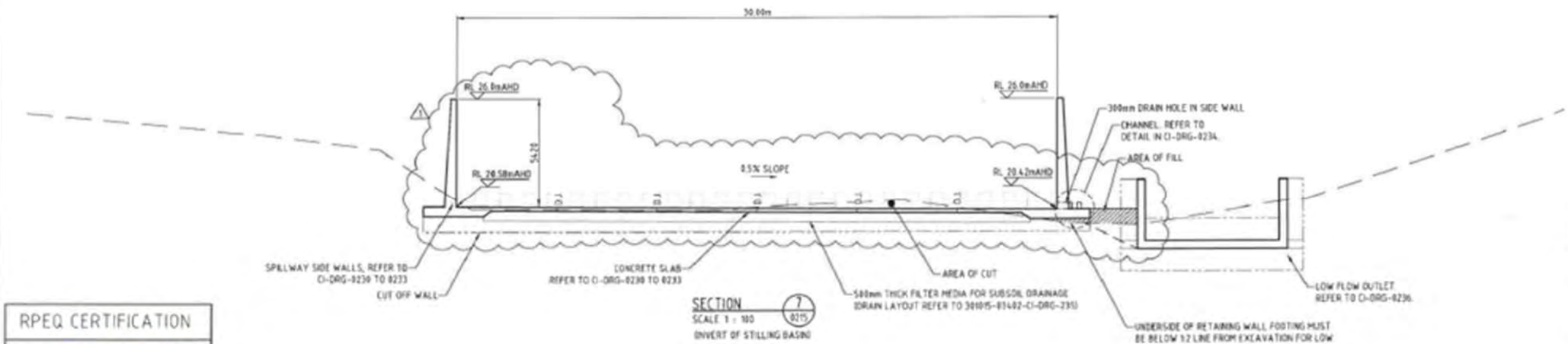

SECTION 7 / 0215
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DIVERT OF STILLING BASIN

RPEQ CERTIFICATION
NAME Sid Frenkel
No 5789
SIGNATURE

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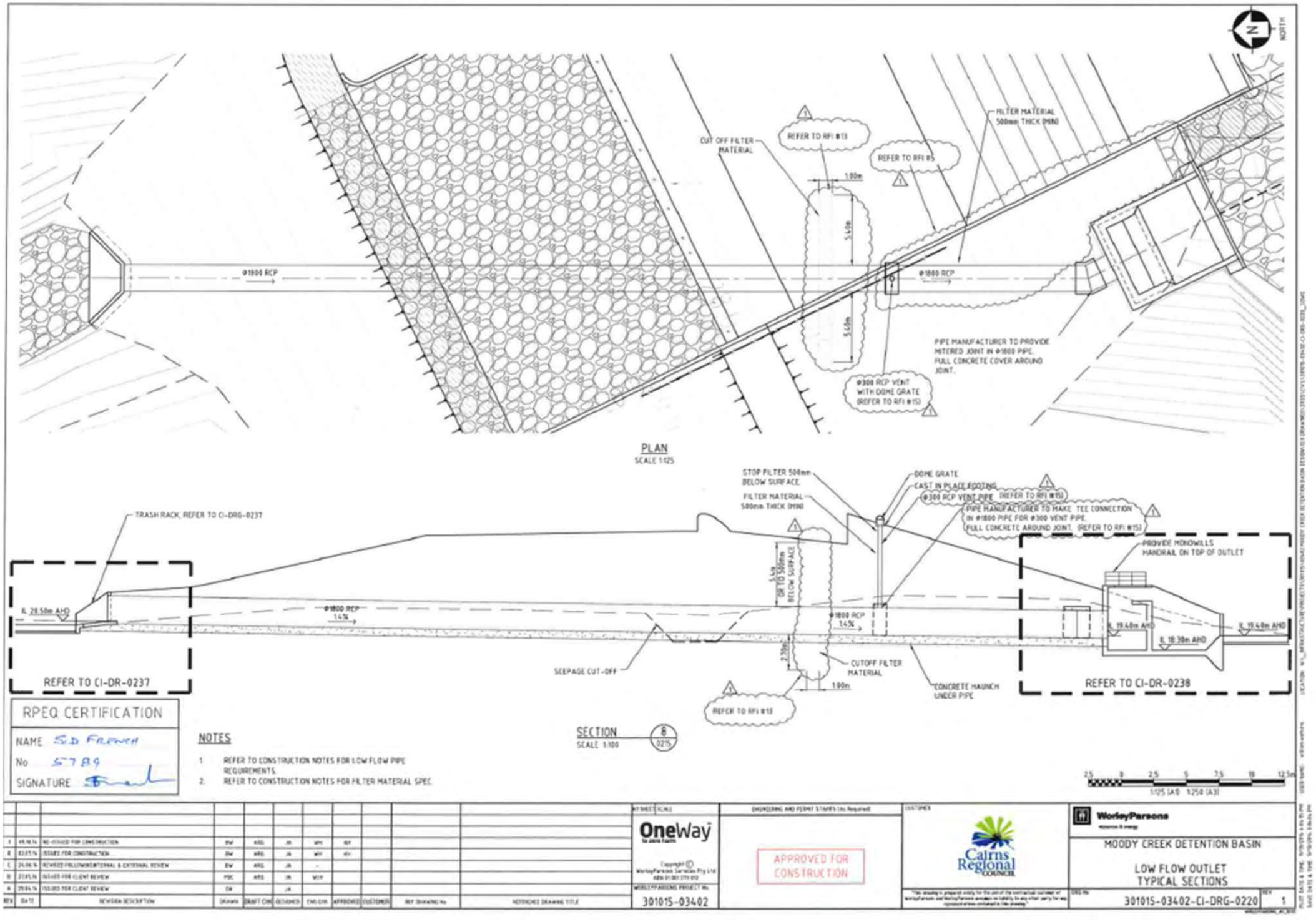
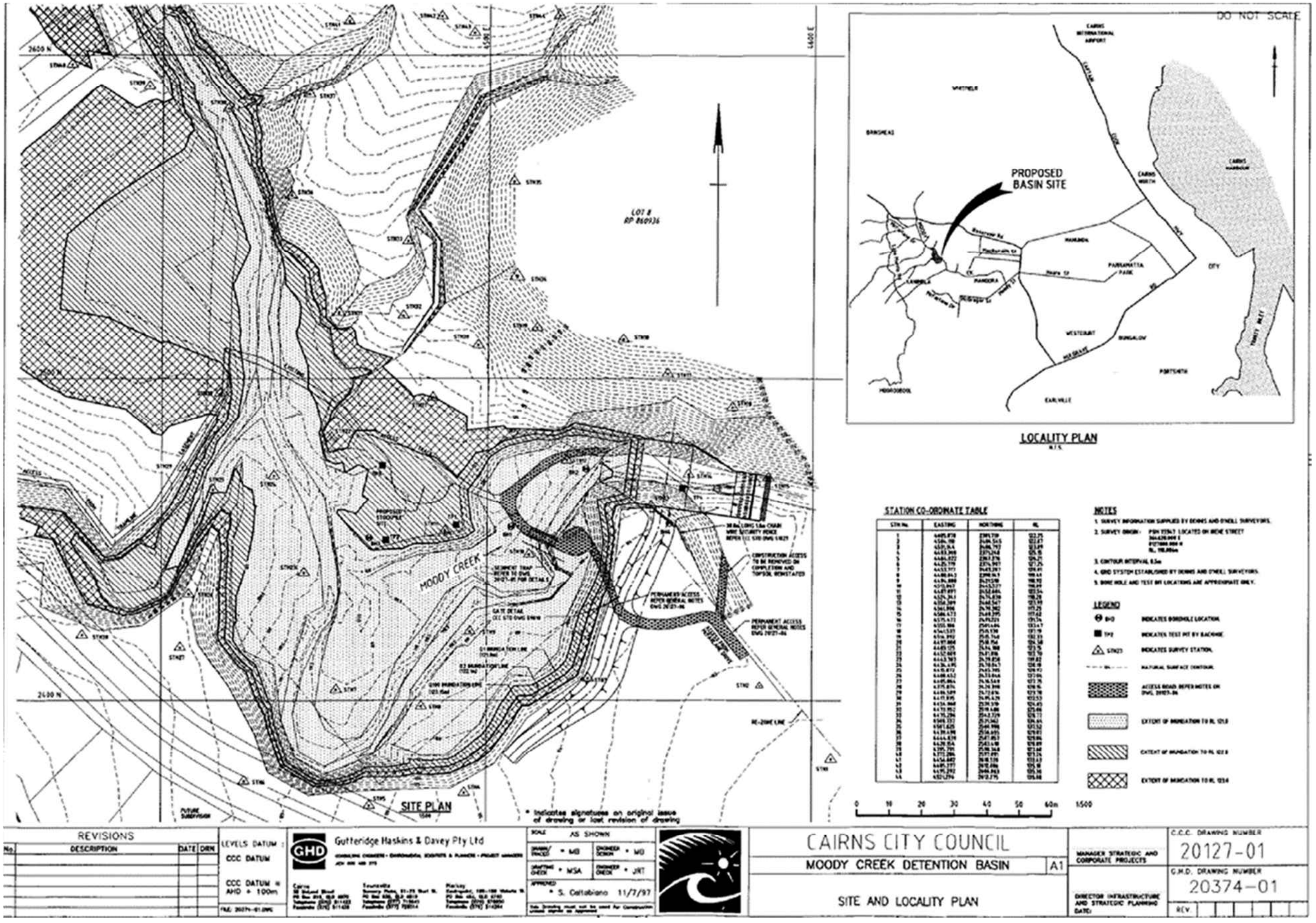
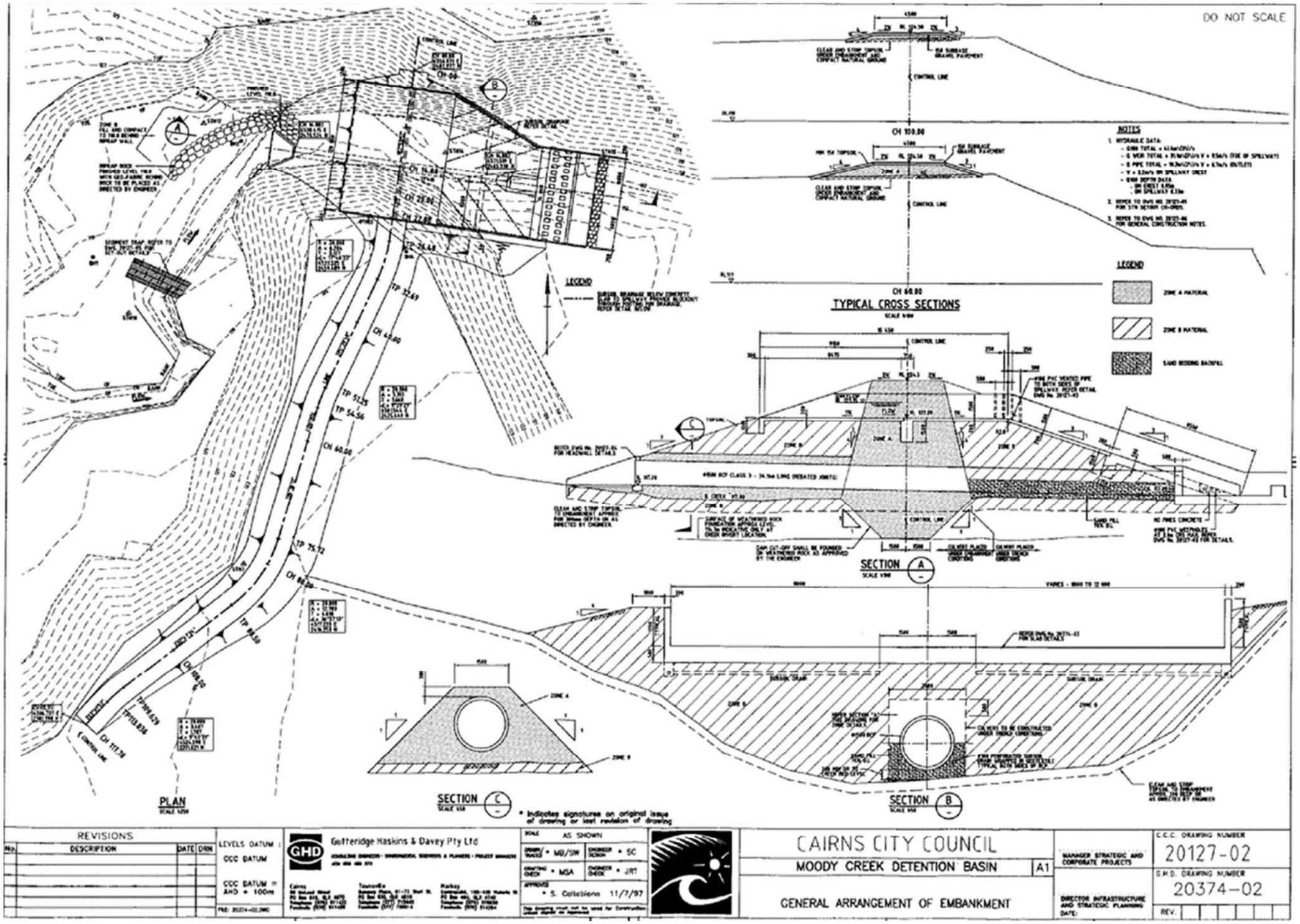
0	02.07.14	ISSUED FOR CONSTRUCTION	BW	ARG	JA	WH	BH			
C	24.06.14	REVISED FOLLOWING INTERNAL & EXTERNAL REVIEW	BW	ARG	JA	-				
B	27.05.14	ISSUED FOR CLIENT REVIEW	ER	ARG	JA	WH				
A	23.04.14	ISSUED FOR CLIENT REVIEW	CH		JA					

OneWay
APPROVED FOR CONSTRUCTION
Cairns Regional Council
WorleyParsons
MOODY CREEK DETENTION BASIN
SPILLWAY TYPICAL SECTIONS SHEET 2
WORLEYPARSONS PROJECT No 301015-03402
DRG No 301015-03402-CI-DRG-0217
REV 1

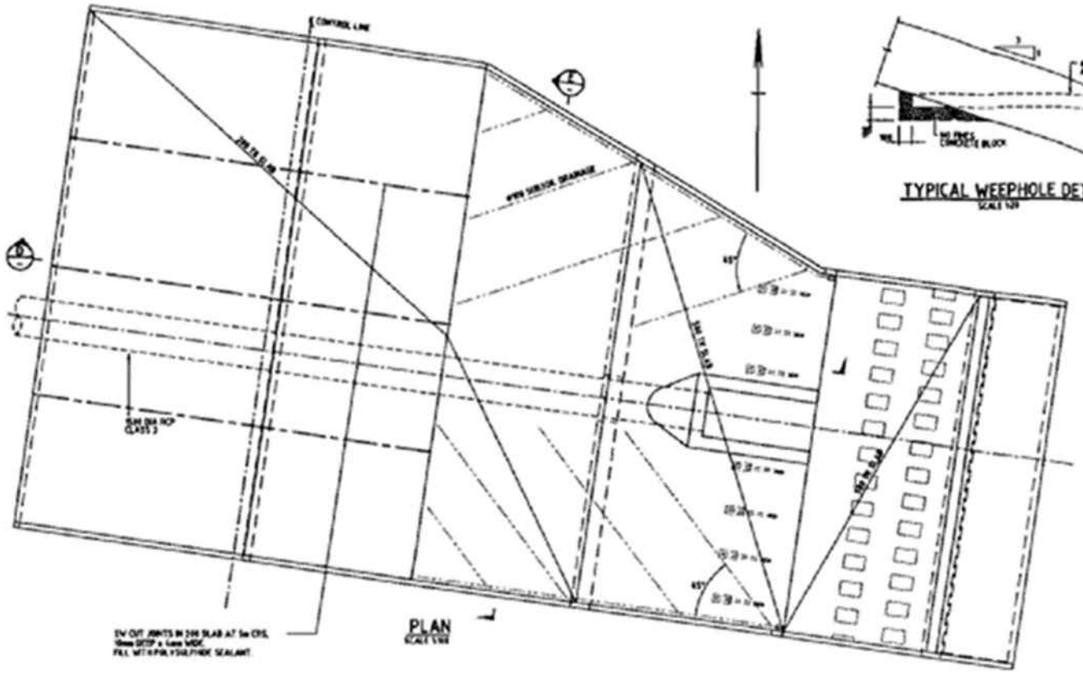

NORTH
FILTER MATERIAL 500mm THICK (MIN)
CUT OFF FILTER MATERIAL
REFER TO RFI #13
REFER TO RFI #5
1.00m
5.6m
Φ1800 RCP
Φ1800 RCP
5.6m
PIPE MANUFACTURER TO PROVIDE MITERED JOINT IN Φ1800 PIPE. FULL CONCRETE COVER AROUND JOINT.
Φ300 RCP VENT WITH DOME GRATE (REFER TO RFI #15)
PLAN
SCALE 1:125
STOP FILTER 500mm BELOW SURFACE
FILTER MATERIAL 500mm THICK (MIN)
DOME GRATE
CAST IN PLACE FOOTING
Φ300 RCP VENT PIPE
REFER TO RFI #15
PIPE MANUFACTURER TO MAKE TEE CONNECTION IN Φ1800 PIPE FOR Φ300 VENT PIPE. FULL CONCRETE AROUND JOINT. (REFER TO RFI #15)
PROVIDE MONOWILLS HANDRAIL ON TOP OF OUTLET
TRASH RACK, REFER TO CI-DRG-0237
IL 20.50m AHD
Φ1800 RCP 14%
5.1m OR TO 500mm BELOW SURFACE
Φ1800 RCP 14%
IL 19.40m AHD
IL 18.30m AHD
IL 19.40m AHD
2.30m
SEEPAGE CUT-OFF
CUTOFF FILTER MATERIAL
1.00m
CONCRETE HAUNCH UNDER PIPE
REFER TO RFI #13
REFER TO CI-DR-0237
REFER TO CI-DR-0238
SECTION
SCALE 1:100
8
0275
2.5 0 2.5 5 7.5 10 12.5m
1:125 (A1) 1:250 (A3)
RPEQ CERTIFICATION
NAME S.D FRENCH
No 5789
SIGNATURE
NOTES
1. REFER TO CONSTRUCTION NOTES FOR LOW FLOW PIPE REQUIREMENTS.
2. REFER TO CONSTRUCTION NOTES FOR FILTER MATERIAL SPEC.
OneWay
APPROVED FOR CONSTRUCTION
Cairns Regional Council
WorleyParsons
MOODY CREEK DETENTION BASIN
LOW FLOW OUTLET TYPICAL SECTIONS
301015-03402
301015-03402-CI-DRG-0220
REV 1

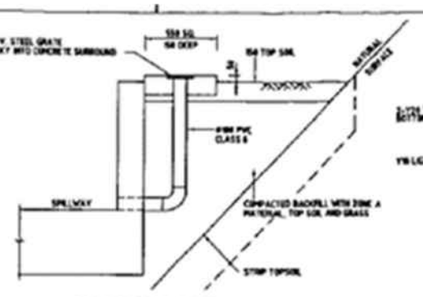
Moody Creek Detention Basin 1A:

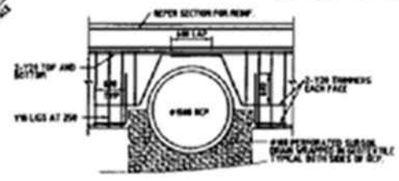


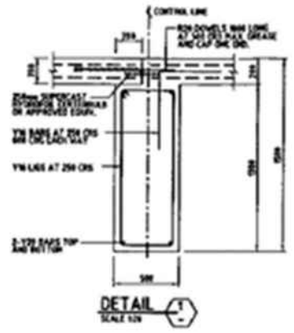

DO NOT SCALE
NOTES
LEGEND
ZONE A MATERIAL
ZONE B MATERIAL
SAND BEDDING BACKFILL
TYPICAL CROSS SECTIONS
SECTION A
SECTION B
SECTION C
PLAN
* Indicates signatures on original issue of drawing or last revision of drawing
REVISIONS
DESCRIPTION
DATE
DRN
LEVELS DATUM : CCC DATUM
CCC DATUM = AHD + 100m
Gutteridge Haskins & Davey Pty Ltd
AS SHOWN
DRAWN • MB/SW
ENGINEER DESIGN • SC
DRAWING CHECK • MSA
ENGINEER CHECK • JRT
APPROVED • S. Colebiano 11/7/97
CAIRNS CITY COUNCIL
MOODY CREEK DETENTION BASIN
A1
GENERAL ARRANGEMENT OF EMBANKMENT
MANAGER STRATEGIC AND CORPORATE PROJECTS
DIRECTOR INFRASTRUCTURE AND STRATEGIC PLANNING
DATE:
C.C.C. DRAWING NUMBER
20127-02
G.H.D. DRAWING NUMBER
20374-02
REV.

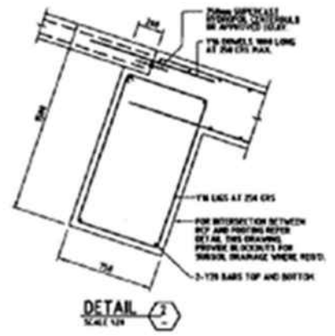
DO NOT SCALE

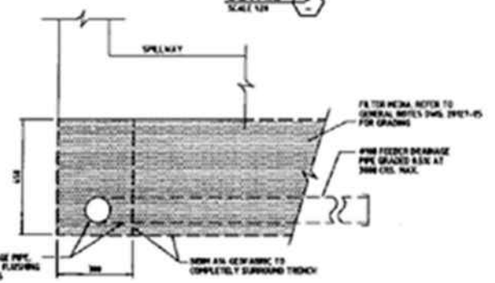


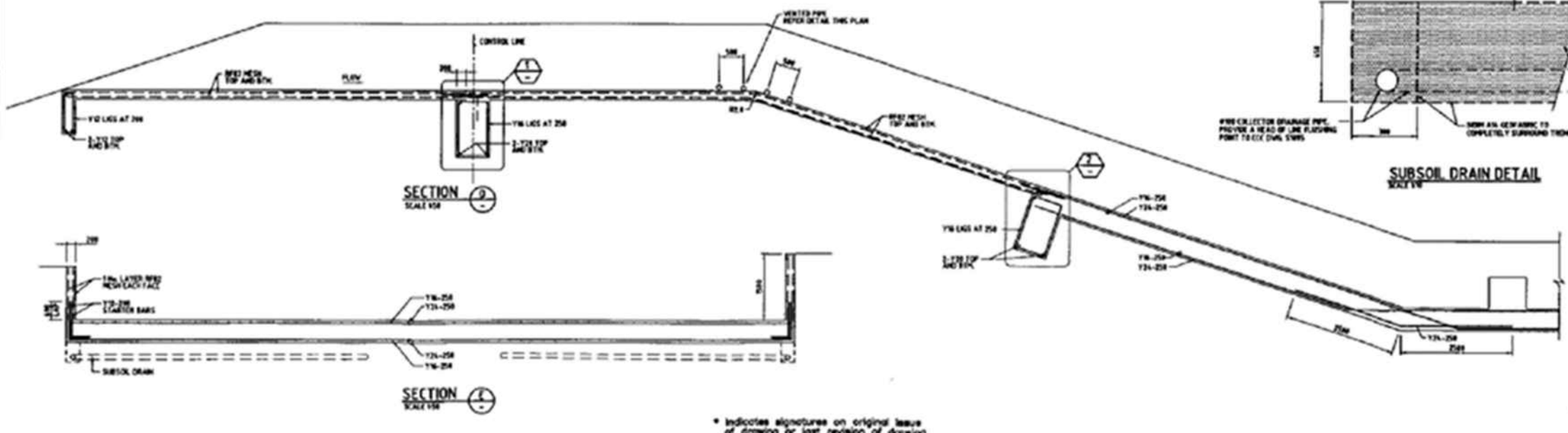












NOTE
1. REFER DWG No. 20127-00 FOR GENERAL NOTES.

* Indicates signatures on original issue of drawing or last revision of drawing

REVISIONS			
No.	DESCRIPTION	DATE	DRN

LEVELS DATUM : CCC DATUM
CCC DATUM = AHD + 100m

Gutteridge Haskins & Davey Pty Ltd

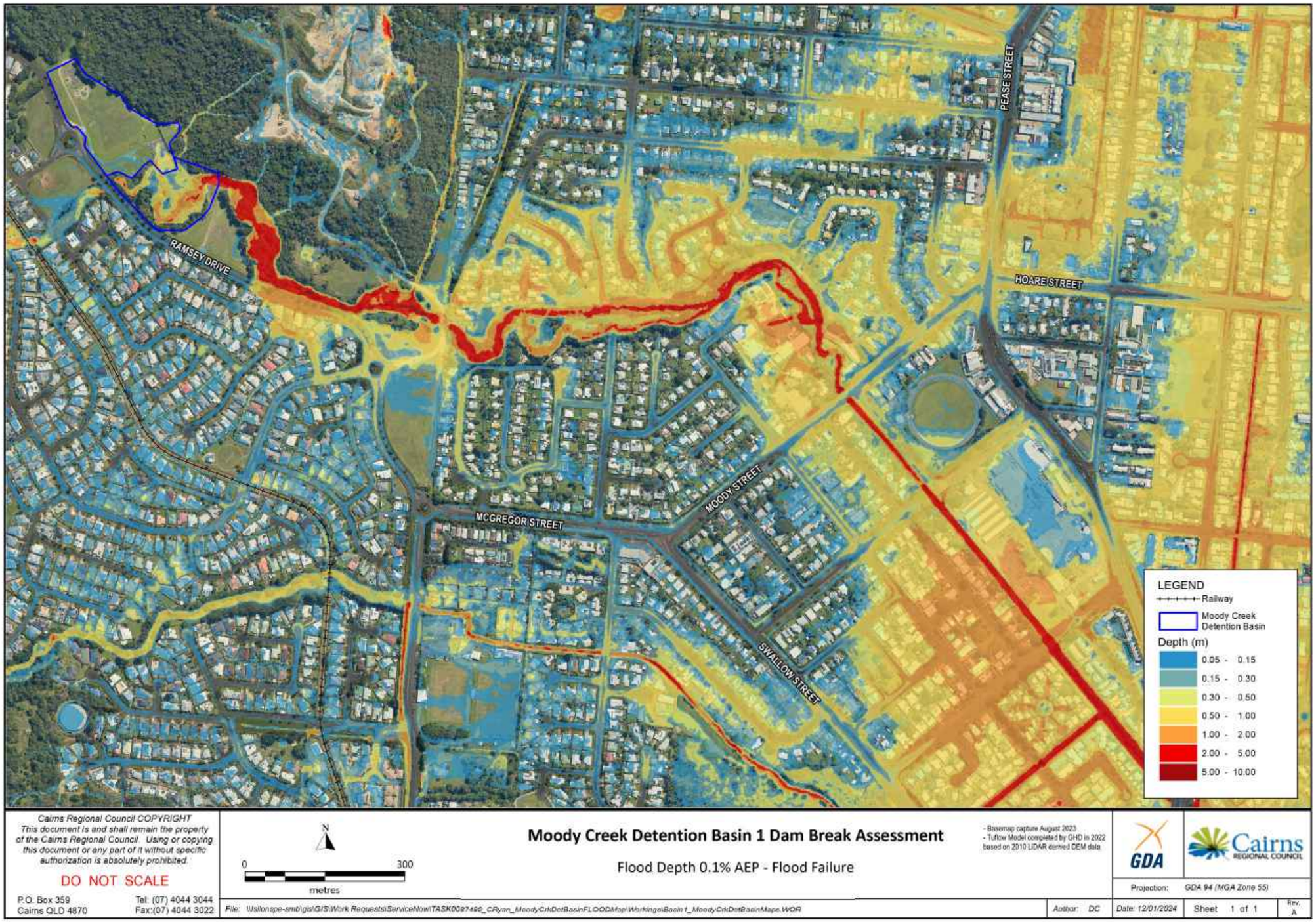
SCALE AS SHOWN
DRAWN/TRACED • SN
DESIGNER/DESIGN • AA
DRAFTING CHECK • RPT
DESIGNER CHECK • NM
APPROVED • S. Cattabiani 11/7/97

CAIRNS CITY COUNCIL
MOODY CREEK DETENTION BASIN A1
SPILLWAY – STRUCTURAL DETAILS

MANAGER STRATEGIC AND CORPORATE PROJECTS
DIRECTOR INFRASTRUCTURE AND STRATEGIC PLANNING DATE:

C.C.C. DRAWING NUMBER 20127-03
G.H.D. DRAWING NUMBER 20374-03
REV.

E. Inundation Maps



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N

0 300

metres

Moody Creek Detention Basin 1 Dam Break Assessment

Flood Depth 0.1% AEP - No Failure

- Basemap capture August 2023
- Tuflow Model completed by GHD in 2022 based on 2010 LIDAR derived DEM data

GDA

Projection: GDA 94 (MGA Zone 55)

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Date: 12/01/2024

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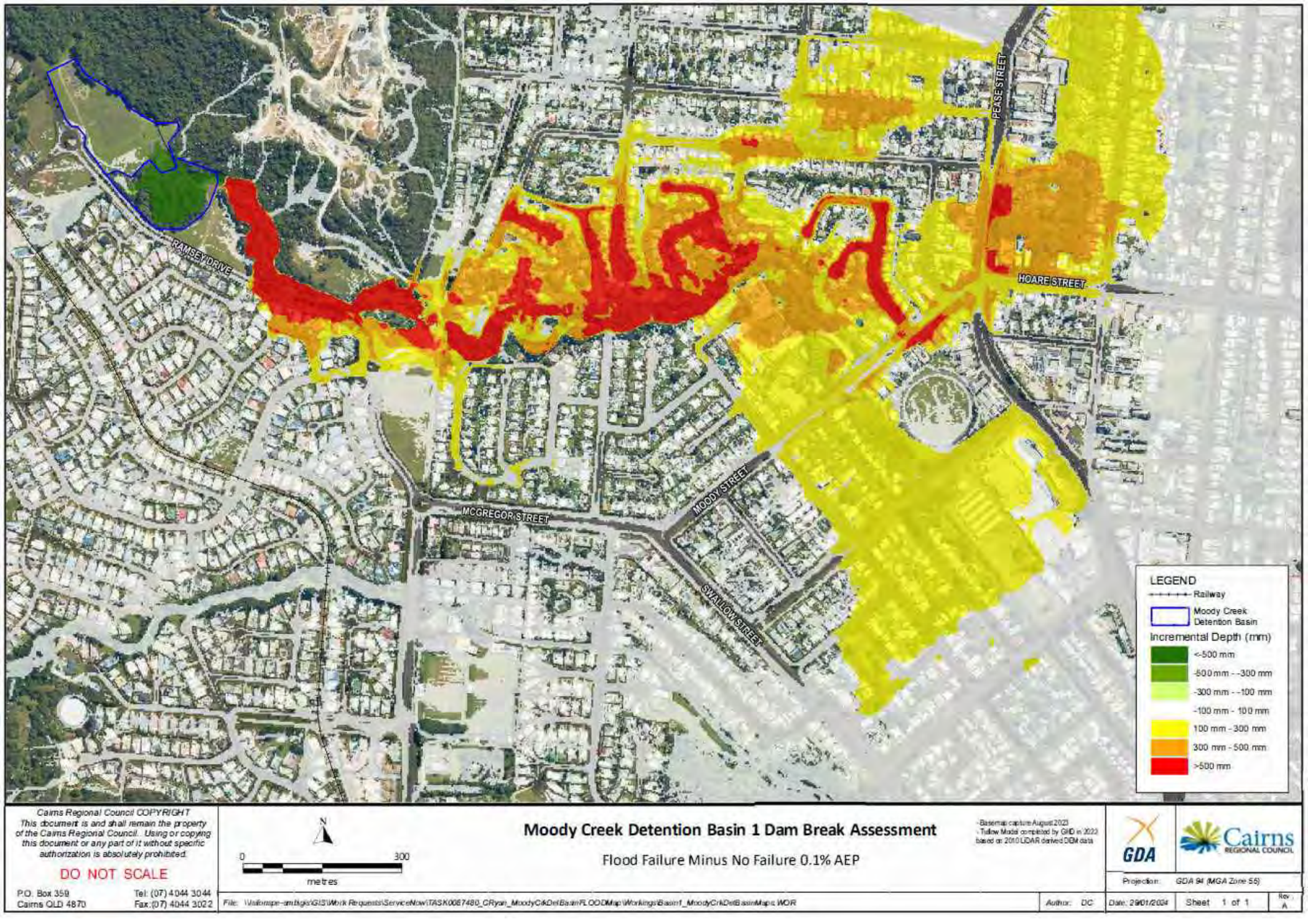

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GDA

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Projection: GDA 94 (MGA Zone 55)

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metres

Moody Creek Detention Basin 1 Dam Break Assessment

Total PAR locations 0.1% AEP

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GDA

Projection: GDA 94 (MGA Zone 55)

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metres

Moody Creek Detention Basin 1 Dam Break Assessment

Flood Depth 0.1% AEP and PAR - Flood Failure

- Basemap capture August 2023
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GDA

Projection: GDA 94 (MGA Zone 55)

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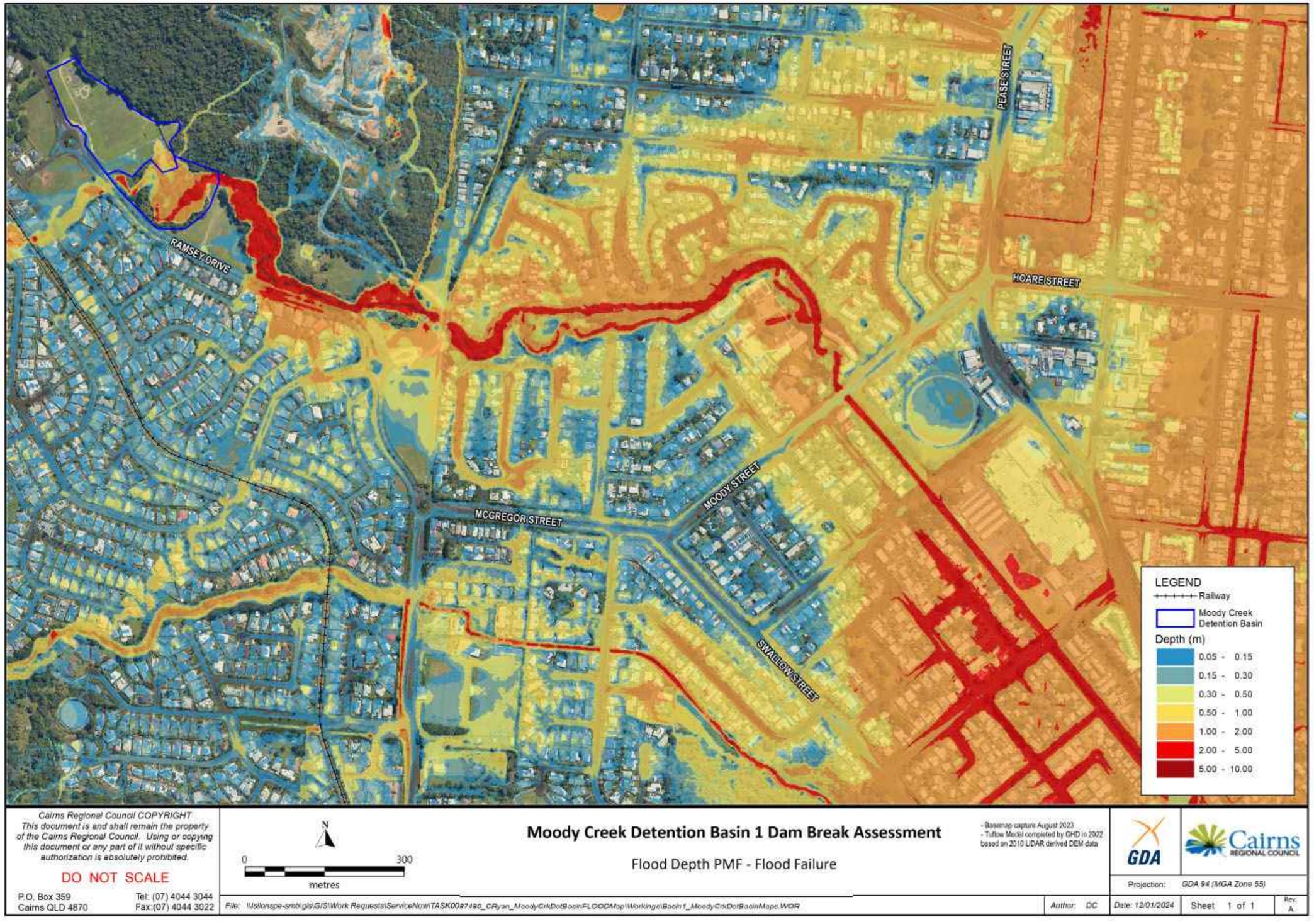

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metres

Moody Creek Detention Basin 1 Dam Break Assessment

Flood Depth PMF - Flood Failure

- Basemap capture August 2023
- Tuflow Model completed by GHD in 2022 based on 2010 LiDAR derived DEM data

GDA

Projection: GDA 94 (MGA Zone 55)

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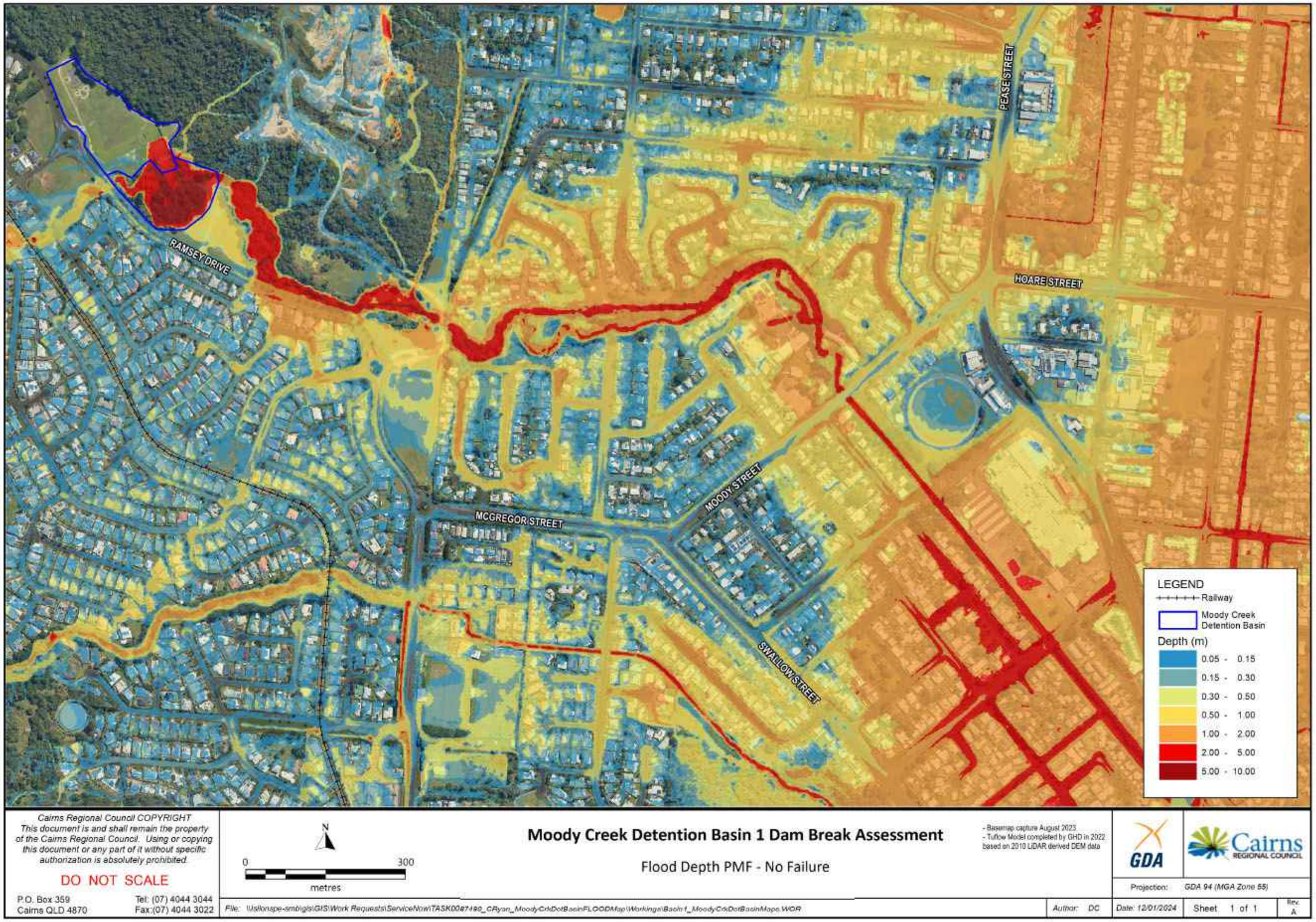

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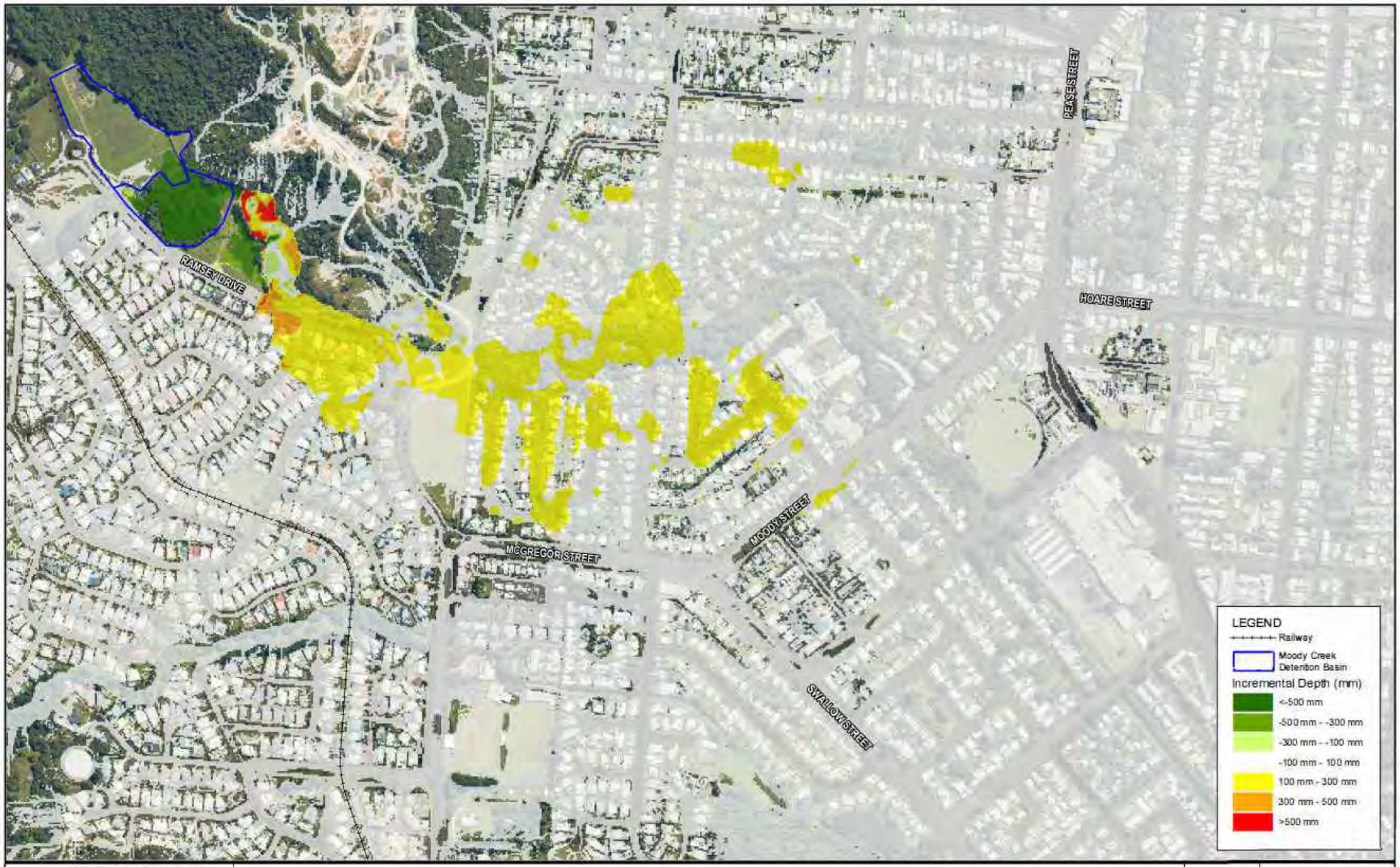

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Moody Creek Detention Basin 1 Dam Break Assessment

Flood Failure Minus No Failure - PMF

- Basemap capture August 2023
- Tuflow Model completed by GHD in 2022 based on 2018 LIDAR derived DEM data

GDA

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Projection: GDA 94 (MGA Zone 55)

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metres

Moody Creek Detention Basin 1 Dam Break Assessment

Total PAR locations PMF

- Basemap capture August 2023
- Tuflow Model completed by GHD in 2022 based on 2010 LiDAR derived DEM data

GDA

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Projection: GDA 94 (MGA Zone 55)

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metres

Moody Creek Detention Basin 1 Dam Break Assessment

Flood Depth PMF and PAR - Flood Failure

- Basemap capture August 2023
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GDA

Projection: GDA 94 (MGA Zone 55)

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N

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metres

Moody Creek Detention Basin 1A Failure Impact Assessment

Flood Depth 5% AEP - Flood Failure

- Basemap capture August 2023
- Tuflow Model completed by GHD in 2022 based on 2010 LIDAR derived DEM data

GDA

Projection: GDA 94 (MGA Zone 55)

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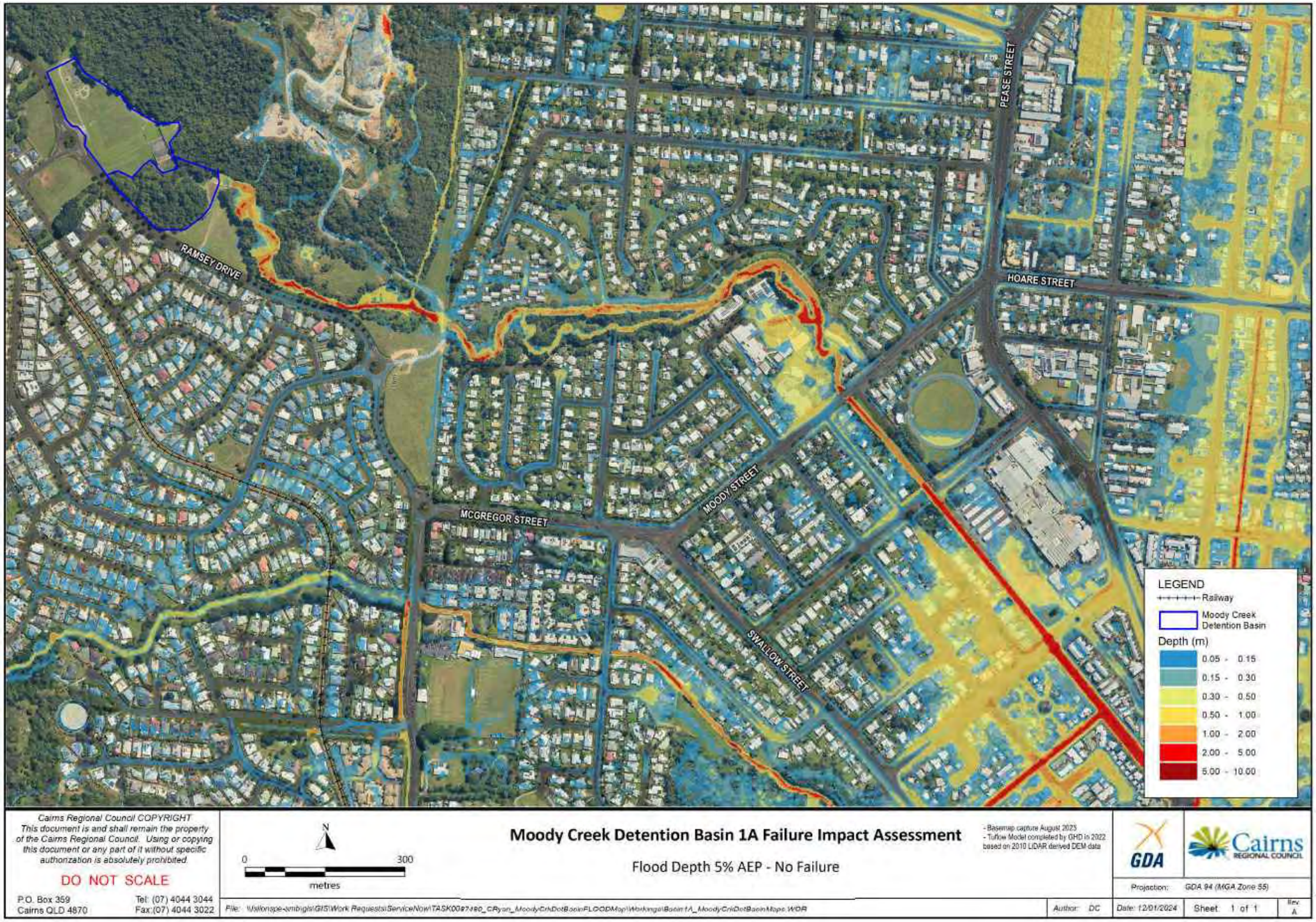
RAMSEY DRIVE
PEASE STREET
HOARE STREET
MCGREGOR STREET
MOODY STREET
SWALLOW STREET
LEGEND
Railway
Moody Creek Detention Basin
Depth (m)
0.05 - 0.15
0.15 - 0.30
0.30 - 0.50
0.50 - 1.00
1.00 - 2.00
2.00 - 5.00
5.00 - 10.00
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Moody Creek Detention Basin 1A Failure Impact Assessment
Flood Depth 5% AEP - No Failure
- Basemap capture August 2023
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GDA
Cairns REGIONAL COUNCIL
Projection: GDA 94 (MGA Zone 55)
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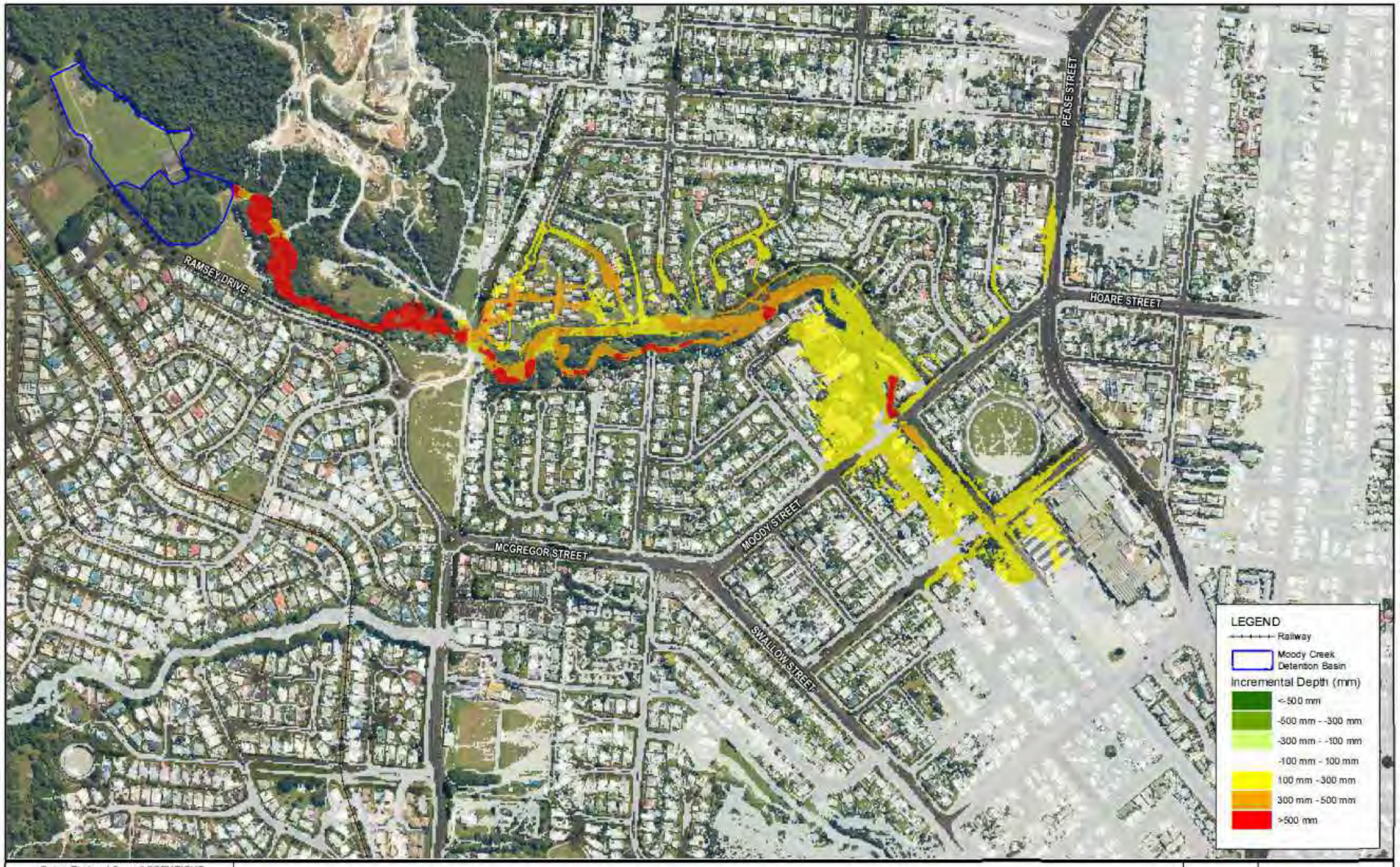

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Moody Creek Detention Basin 1A Failure Impact Assessment

Flood Failure Minus No Failure 5% AEP

- Basemap capture August 2023
- Tuflow Model completed by GHD in 2022 based on 2019 LiDAR derived DEM data

GDA
Projection: GDA 94 (MGA Zone 55)

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PEASE STREET
RAMSEY DRIVE
HOARE STREET
MOODY STREET
MCGREGOR STREET
SWALLOW STREET
LEGEND
Total Population at Risk
Railway
Moody Creek Detention Basin
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Moody Creek Detention Basin 1A Failure Impact Assessment
Total PAR locations 5% AEP
- Basemap capture August 2023
- Tuflow Model completed by GHD in 2022 based on 2018 LiDAR derived DEM data
GDA
Cairns Regional Council
Projection: GDA 94 (MGA Zone 55)
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Fax:(07) 4044 3022

N

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metres

Moody Creek Detention Basin 1A Failure Impact Assessment

Flood Depth 5% AEP and PAR - Flood Failure

- Basemap capture August 2023.
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GDA

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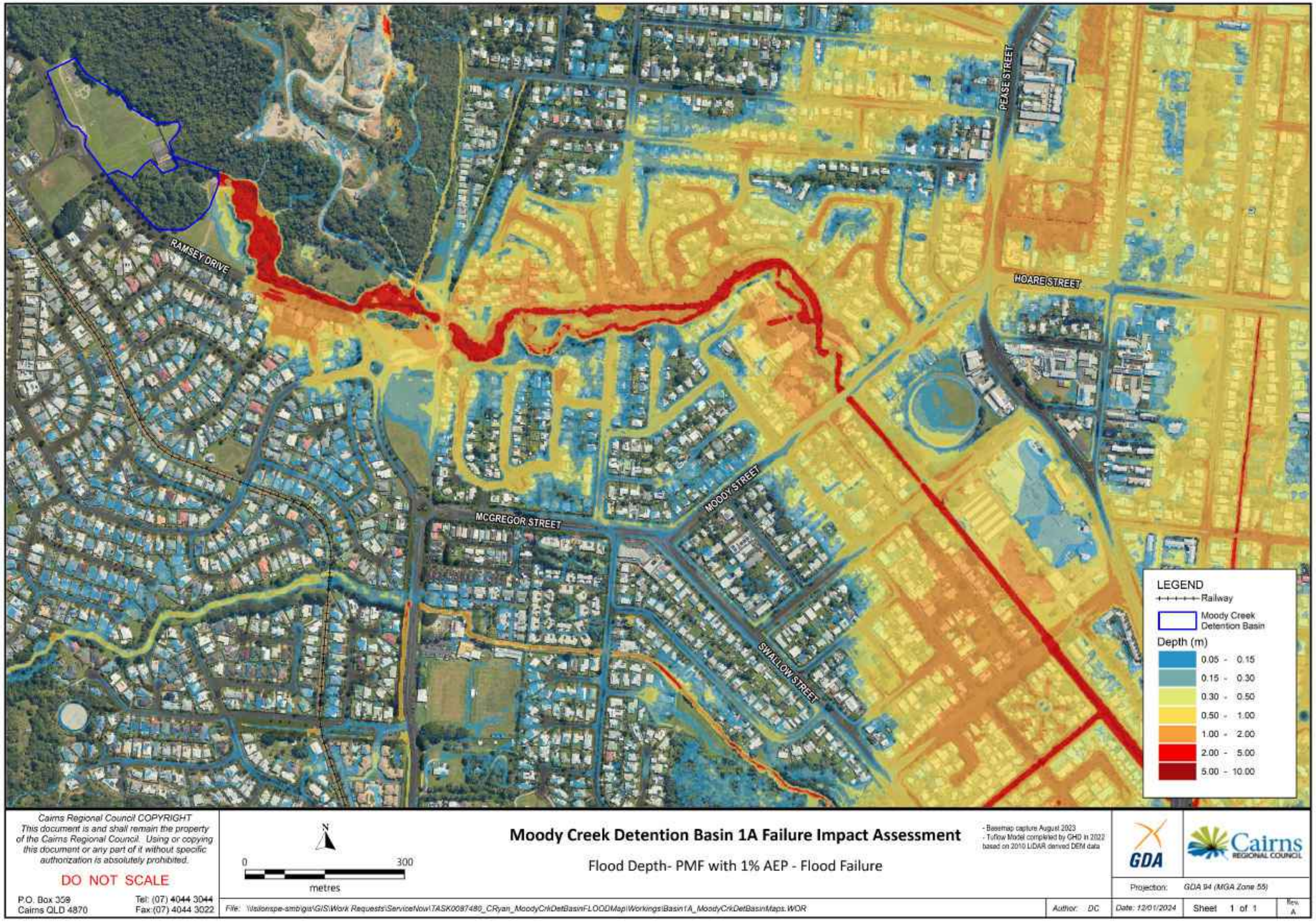
PEASE STREET
RAMSEY DRIVE
HOARE STREET
MOODY STREET
MCGREGOR STREET
SHALLOW STREET
LEGEND
Railway
Moody Creek Detention Basin
Depth (m)
0.05 - 0.15
0.15 - 0.30
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Moody Creek Detention Basin 1A Failure Impact Assessment
Flood Depth- PMF with 1% AEP - Flood Failure
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- TuFlow Model completed by GHD in 2022 based on 2010 LiDAR derived DEM data
GDA
Cairns REGIONAL COUNCIL
Projection: GDA 94 (MGA Zone 55)
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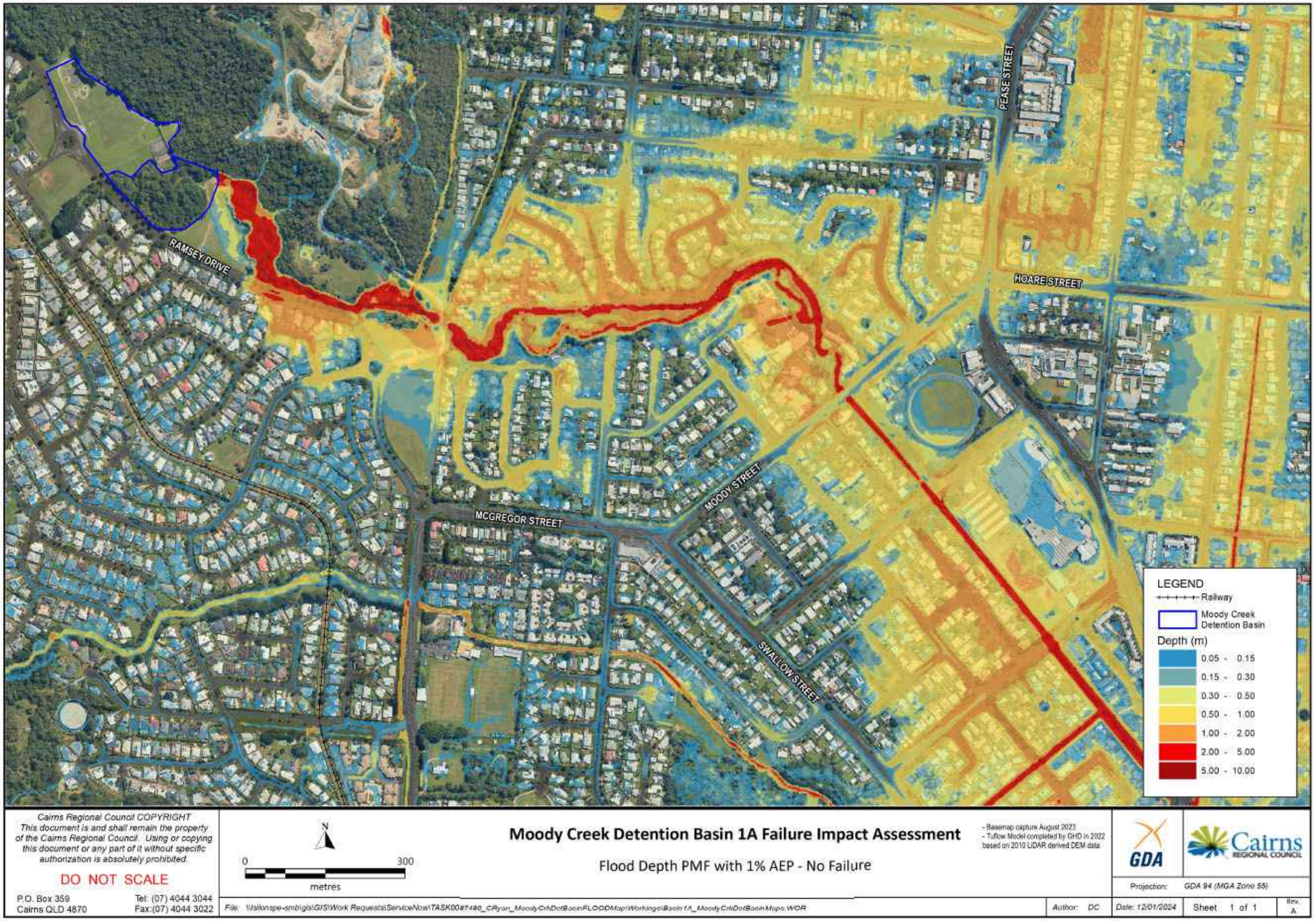
RAMSEY DRIVE
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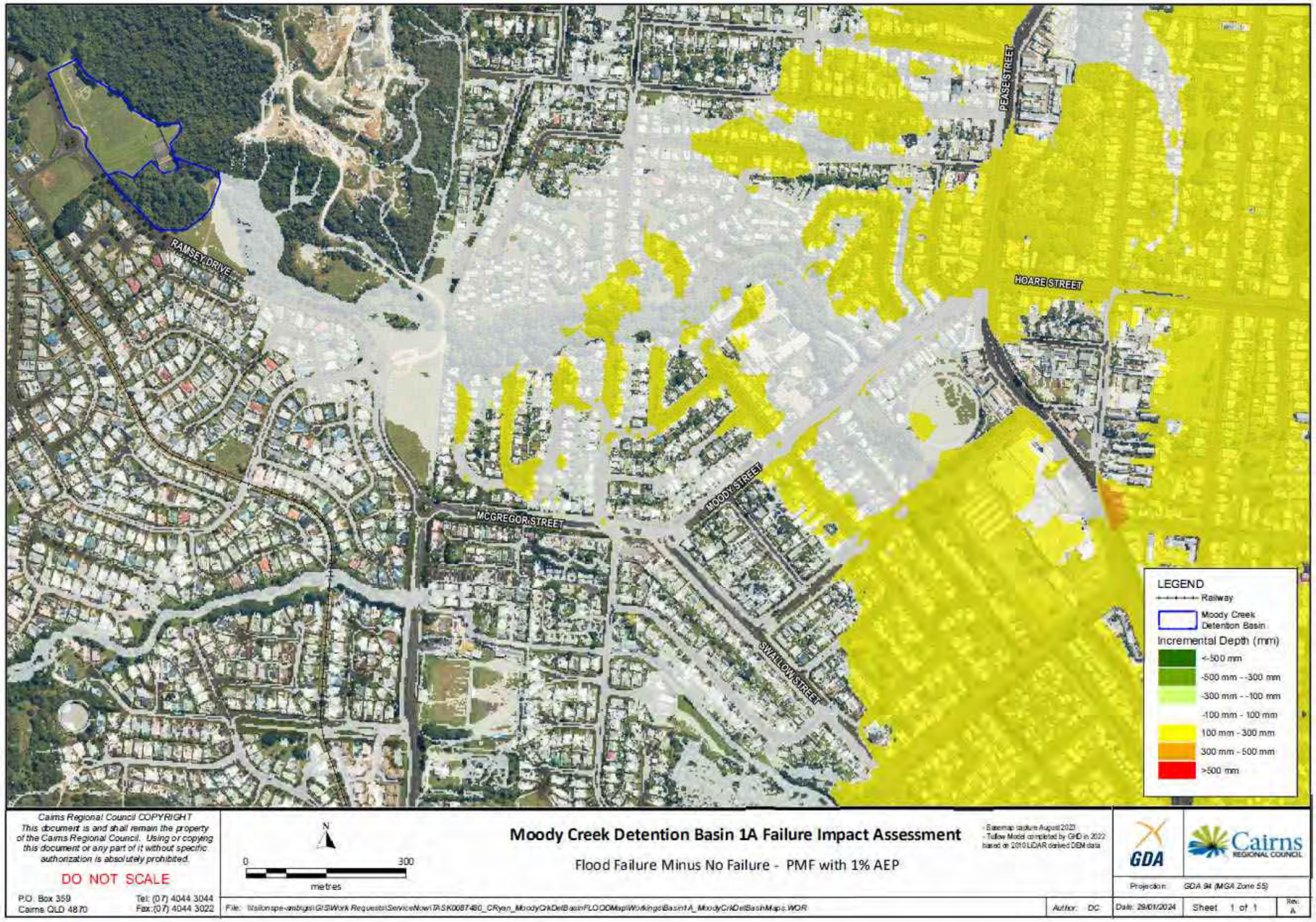

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Flood Failure Minus No Failure - PMF with 1% AEP

- Basemap capture August 2023
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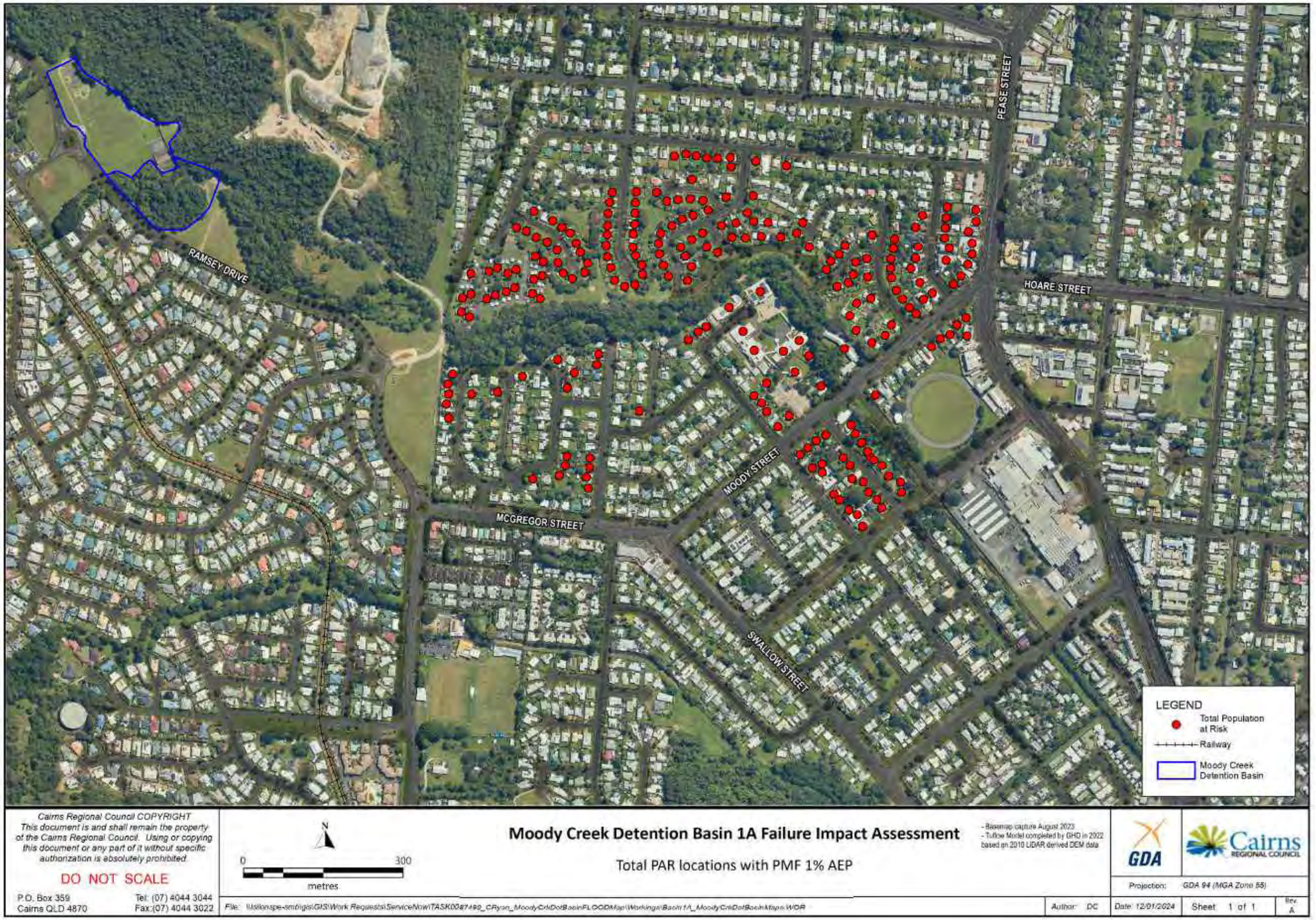
RAMSEY DRIVE
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LEGEND
Total Population at Risk
Railway
Moody Creek Detention Basin
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Cairns REGIONAL COUNCIL
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Projection: GDA 94 (MGA Zone 55)

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F. Event Log and SITREP Template

Event Log

EVENT LOG					
DATE:			**ROLE/SHIFT:**		**PAGE:**
Serial	**Time**	**From**	**To**	**Item / Event**	**Comments/Action**

Record all major observations, decisions, actions, messages IN and OUT etc.

SITREP Template

Advice Number:	
Date:	
Time of issue:	
Sent by:	

Current Water Levels

Location	Level (m AHD)	Rate of Rise Since Last Advice (m per hour)	Time of Observation
Moody Creek Detention Basin 1			
Moody Creek Detention Basin 1A			

Current Spillway Operations

Location	Spillway Outflow Level (m AHD)	Spillway Outflow (m^3/s)	Time of Observation
Moody Creek Detention Basin 1			
Moody Creek Detention Basin 1A			

Rainfall

Gauge Location	Rainfall Recorded (mm)	Time of Observation

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

G. Remote Monitoring Station Details

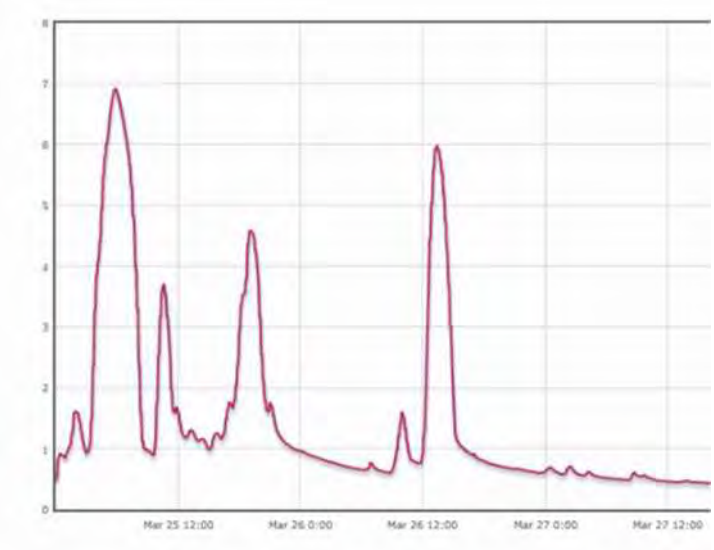
Remote Monitoring Station Login Details

It is recommended that each user set up their own account, however a general CRC login is as follows:

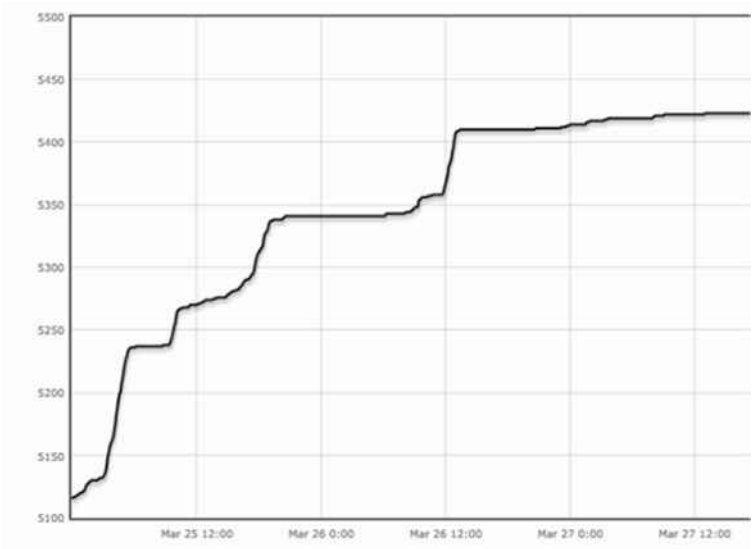
CCTV Access	https://cairns.disasterwatch-iotp.com.au
Monitoring Data Access	https://www.dataonline.io/

Example Monitoring Outputs

Water Level



Cumulative Rainfall



Pre-Set Camera Footage Angles

Moody Creek-Moody Ck - Detention Basin Overview - 22/01/24 16:59:06

Moody Ck - Low Flow Pipe Inlet - 22/01/24 17:31:04

Moody Creek-Moody Ck - Gauge Board 3-8m - 22/01/24 17:33:02

Moody Creek-Moody Ck - Gauge Board 7-9m - 22/01/24 16:59:59

Moody Creek-Moody Ck - Spillway Channel - 22/01/24 17:01:14

Moody Creek-Moody Ck - Spillway Toe - 22/01/24 17:32:03

H. Detention Basin Inspection Schedule (SAMPLE ONLY)

Score	0 / 2 (0%)	Flagged items	0	Actions	0
Document No.					
Inspectors Name					
Inspectors Position					
Conducted on					
Site					

SECTION	0 / 2 (0%)
Weather Conditions	
Rainfall past 24 hours (mm)	
Rainfall past 7 days (mm)	
Water level on gauge board (m)	
EMBANKMENT	
Is dam vegetation <300mm high for inspection?	
DAM CREST	
Depressions, cracks / changes?	
Deformation of crest or settlement?	
Alignment unchanged?	
Vegetation maintained (e.g., low grass, no trees, or shrubs)?	
Animal activity (e.g., burrows, termites)?	
Overall condition:	
DOWNSTREAM SLOPES	
Depressions, sinkholes, cracks / changes?	
Deformation, sliding, slumping, or bulging?	
Erosion?	
Vegetation maintained (e.g., low grass, no trees, or shrubs)?	
Wet spots or seepage?	
Animal activity (e.g., burrows, termites)?	
Overall condition:	
UPSTREAM SLOPES	
Depressions, sinkholes, cracks / changes?	
Deformation, sliding, slumping, or bulging?	
Erosion?	
Vegetation maintained (e.g., low grass, no trees, or shrubs)?	
Animal activity (e.g., burrows, termites)?	

Any noticeable water surface conditions (i.e., waves, ripples, or whirlpools?)	
Overall condition:	
SPILLWAY	0 / 1 (0%)
Unobstructed and clear of debris?	
Significant cracking or movement?	
Approach slab change in cracking or movement since previous inspection?	
Ogee crest change in cracking or movement since previous inspection?	
Spillway chute change in cracking or movement since previous inspection?	
Left training wall change in cracking or movement since previous inspection?	
Right training wall change in cracking or movement since previous inspection?	
Stilling basin change in cracking or movement since previous inspection?	
Stilling basin is clear of accumulated material?	
Seepage/ springs observed?	
Any cracking or deformation observed in the joints or joint sealant?	
Overall condition:	
LOW LEVEL OUTLET	0 / 1 (0%)
Head works (culvert) in good condition?	
Trash rack free of debris?	
Dissipator structure outlet unobstructed and clear of vegetation?	
Any concrete damage to dissipator structure?	
Fencing in good condition?	
Outlet free of debris?	

Changes in cracking or seepage observed from joints (if an internal inspection completed)?	
Overall condition:	
MISCELLANEOUS	
Drains are clear of debris?	
Signage is free of damage and graffiti?	
Gauge boards are clearly readable?	
Remote monitoring system is in good condition?	
Camera unobstructed?	
Any public safety issues or vandalism?	
Overall condition:	
FINAL COMMENTS OR ISSUES?	
Any further comments	
Signature	

I. Communications Plan

Activation Level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Down
Trigger for Communications: Dam Hazard – Flooding ***CRC Internal Stakeholder Communications***					
Contacted By: Dam Emergency Controller **Contact Group: Appendix I – CRC Internal Stakeholders**					
Whispir 1 – SMS 2 – Email	Moody Creek Detention Basin EAP has been activated to ALERT. Dam Hazard – Flooding. Attend ECO meeting and follow directions of the DEC. (Template #80)	Moody Creek Detention Basin EAP has been activated to LEAN FORWARD. Dam Hazard – Flooding. Attend ECO meeting and follow directions of the DEC. (Template #81)	Moody Creek Detention Basin EAP has been activated to STAND UP 1. Dam Hazard – Flooding. Attend ECO meeting and follow directions of the DEC. (Template #82)	Moody Creek Detention Basin EAP has been activated to STAND UP 2. Dam Hazard – Flooding. Attend ECO meeting and follow directions of the DEC. (Template #83)	Moody Creek Detention Basin EAP is at STAND DOWN. Attend ECO meeting and follow directions of the DEC. (Template #84)
Trigger for Communications: Dam Hazard – Flooding ***External Stakeholder Communications***					
Contacted By: Dam Emergency Controller and/or Local Disaster Coordinator **Contact Group: Appendix I – Key External Agencies**					
Whispir 1 – SMS 2 – Email	Not Applicable.	Moody Creek Detention Basin EAP has been activated to LEAN FORWARD. Dam Hazard – Flooding. Follow directions of Local Disaster Coordinator. (Template #85)	Moody Creek Detention Basin EAP has been activated to STAND UP 1. Dam Hazard – Flooding. Follow directions of Local Disaster Coordinator. (Template #86)	Moody Creek Detention Basin EAP has been activated to STAND UP 2. Dam Hazard – Flooding. Follow directions of Local Disaster Coordinator. (Template #87)	Moody Creek Detention Basin EAP is at STAND DOWN. Follow directions of Local Disaster Coordinator. (Template #88)
Trigger for Communications: Dam Hazard – Flooding ***PAR Communications***					
Contacted By: LDMG-CR **Contact Group: Appendix K – NEAS Polygon – PAR**					
1 – Emergency Alert 2 – AWS	Not Applicable.	Emergency Alert #1 AWS Message #1	Emergency Alert #2 AWS Message #2	Emergency Alert #3 AWS Message #3	AWS Message #4 and/or #5
Trigger for Communications: Dam Hazard – Embankment Failure ***CRC Internal Stakeholder Communications***					
Contacted By: Dam Emergency Controller **Contact Group: Appendix I – CRC Internal Stakeholders**					
Whispir 1 – SMS 2 – Email	Not Applicable.	Not Applicable.	Moody Creek Detention Basin EAP has been activated to STAND UP. Dam Hazard – Embankment Failure. Attend ECO meeting and follow directions of the DEC. (Template #89)	Not Applicable.	Moody Creek Detention Basin EAP is at STAND DOWN. Attend ECO meeting and follow directions of the DEC. (Template #84)
Trigger for Communications: Dam Hazard – Embankment Failure ***External Stakeholder Communications***					
Contacted By: Dam Emergency Controller and/or Local Disaster Coordinator **Contact Group: Appendix I – Key External Agencies**					
Whispir 1 – SMS 2 – Email	Not Applicable.	Not Applicable.	Moody Creek Detention Basin EAP has been activated to STAND UP. Dam Hazard – Embankment Failure. Follow directions of Local Disaster Coordinator. (Template #90)	Not Applicable.	Moody Creek Detention Basin EAP is at STAND DOWN. Follow directions of Local Disaster Coordinator. (Template #88)

Activation Level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Down
Trigger for Communications: Dam Hazard – Embankment Failure ***PAR Communications***					
Contacted By: LDMG-CR **Contact Group: Appendix K – NEAS Polygon – PAR**					
1 – Emergency Alert 2 – AWS	Not Applicable.	Not Applicable.	Emergency Alert #2 and/or #3 AWS Message #2 and/or #3	Not Applicable.	AWS Message #4 and/or #5
Trigger for Communications: Dam Hazard – Terror Threat / Malicious Activity ***CRC Internal Stakeholder Communications***					
Contacted By: Dam Emergency Controller **Contact Group: Appendix I – CRC Internal Stakeholders**					
Whispir 1 – SMS 2 – Email	Not Applicable.	Not Applicable.	Moody Creek Detention Basin EAP has been activated to STAND UP. Dam Hazard – Terror Threat/Malicious Activity. Attend ECO meeting and follow directions of the DEC. (Template #91)	Not Applicable.	Moody Creek Detention Basin EAP is at STAND DOWN. Attend ECO meeting and follow directions of the DEC. (Template #84)
Trigger for Communications: Dam Hazard – Terror Threat / Malicious Activity ***External Stakeholder Communications***					
Contacted By: Dam Emergency Controller and/or Local Disaster Coordinator **Contact Group: Appendix I – Key External Agencies**					
Whispir 1 – SMS 2 – Email	Not Applicable.	Not Applicable.	Moody Creek Detention Basin EAP has been activated to STAND UP. Dam Hazard – Terror Threat/Malicious Activity. Follow directions of Local Disaster Coordinator. (Template #92)	Not Applicable.	Moody Creek Detention Basin EAP is at STAND DOWN. Follow directions of Local Disaster Coordinator. (Template #88)
Trigger for Communications: Dam Hazard – Terror Threat / Malicious Activity ***PAR Communications***					
Contacted By: LDMG-CR **Contact Group: Appendix K – NEAS Polygon – PAR**					
1 – Emergency Alert 2 – AWS	Not Applicable.	Not Applicable.	Emergency Alert #2 and/or #3 AWS Message #2 and/or #3	Not Applicable.	AWS Message #4 and/or #5
Trigger for Communications: Dam Hazard – Earthquake ***CRC Internal Stakeholder Communications***					
Contacted By: Dam Emergency Controller **Contact Group: Appendix I – CRC Internal Stakeholders**					
Whispir 1 – SMS 2 – Email	Not Applicable.	Not Applicable.	Moody Creek Detention Basin EAP has been activated to STAND UP 1. Dam Hazard – Flooding. Follow directions of Local Disaster Coordinator. (Template #86) or Moody Creek Detention Basin EAP has been activated to STAND UP. Dam Hazard – Embankment Failure. Follow directions of Local Disaster Coordinator.	Not Applicable.	Moody Creek Detention Basin EAP is at STAND DOWN. Attend ECO meeting and follow directions of the DEC. (Template #84)

Activation Level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Down
			(Template #90)		
Trigger for Communications: Dam Hazard – Earthquake ***External Stakeholder Communications***					
Contacted By: Dam Emergency Controller and/or Local Disaster Coordinator **Contact Group: Appendix I – Key External Agencies**					
Whispir 1 – SMS 2 – Email	Not Applicable.	Not Applicable.	Moody Creek Detention Basin EAP has been activated to STAND UP 1. Dam Hazard – Flooding. Follow directions of Local Disaster Coordinator. (Template #86) or Moody Creek Detention Basin EAP has been activated to STAND UP. Dam Hazard – Embankment Failure. Follow directions of Local Disaster Coordinator. (Template #90)	Not Applicable.	Moody Creek Detention Basin EAP is at STAND DOWN. Follow directions of Local Disaster Coordinator. (Template #88)
Trigger for Communications: Dam Hazard – Earthquake ***PAR Communications***					
Contacted By: LDMG-CR **Contact Group: Appendix K – NEAS Polygon – PAR**					
1 – Emergency Alert 2 – AWS	Not Applicable.	Not Applicable.	Emergency Alert #2 and/or #3 AWS Message #2 and/or #3	Not Applicable.	AWS Message #4 and/or #5

J. AWS Message Templates

QDMA	ALERT	LEAN FORWARD	STAND UP		STAND DOWN	
AWS	NOT APPLICABLE	ADVICE: PREPARE NOW	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	**PREPARE NOW – Moody Creek Detention Basins spilling excess water as at [time, day, date, year].**
		
		Warning Level: ADVICE
		
		Warning Area: Areas downstream of Moody Creek Detention Basin and in proximity to Moody Creek [Kanimbla, Manoora, Mooroobool, and Manunda].
		
		Water flows from the Moody Creek Detention Basins are contributing to rising water levels in Moody Creek, Cochrane Creek, Chinaman Creek, and Clarkes Creek. [Widespread/localized/overland] flooding is [likely/possible] [later today, tonight, tomorrow].
		
		People downstream of the Moody Creek Detention Basins should **PREPARE NOW** in case it starts to flood/flooding gets worse.
		
		What you should do:
		• Stay up to date because conditions could change quickly.
		• 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.
		
		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 – Moody Creek Detention Basins catchment flood as at [time, day, date, year].
			
			Warning Level: WATCH AND ACT
			
			Warning Area: Areas downstream of the Moody Creek Detention Basins and in proximity to Moody Creek [Kanimbla, Manoora, Mooroobool, and Manunda].
			
			People downstream of the Moody Creek Detention Basins must PREPARE TO LEAVE. Water in Moody Creek, Cochrane Creek, Chinaman Creek, and Clarkes 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.
			• 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.
			
			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 – Moody Creek Detention Basins catchment flood as at [time, day, date, year].
				
				Warning Level: EMERGENCY WARNING
				
				Warning Area: Areas downstream of the Moody Creek Detention Basins and in proximity to Moody Creek [Kanimbla, Manoora, Mooroobool, and Manunda].
				
				People downstream of the Moody Creek Detention Basins must MOVE TO HIGHER GROUND AWAY FROM CREEKS AND RIVERS.
				
				Water in Moody Creek, Cochrane Creek, Chinaman Creek, and Clarkes 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 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.
					AVOID THE AREA – Moody Creek Detention Basins catchment flood as at [time, day, date, year].
					
					Warning Level: WATCH AND ACT
					
					Warning Area: **Areas downstream of the Moody Creek Detention Basins and in proximity to Moody Creek [Kanimbla, Manoora, Mooroobool, and Manunda].**
					
					Flood water downstream of the Moody Creek Detention Basins 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) – Moody Creek Detention Basins catchment flood as at [time, day, date, year].
						
						Warning Level: ADVICE
						
						Warning Area: Areas downstream of the Moody Creek Detention Basins and in proximity to Moody Creek [Kanimbla, Manoora, Mooroobool, and Manunda].
						
						Flooding downstream of the Moody Creek Detention Basins 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:
						• 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.

K. NEAS Polygon and Emergency Alert Request Form Templates

Emergency Alert Request Form Templates

Alert 1 – Moody Creek Flood – Advice – Prepare Now

Queensland Government	PHONE THE [redacted] – ADVISE EA IS BEING DEVELOPED	
	EMERGENCY ALERT REQUEST	
	Location of Alert: Moody Creek Detention Basin, Kanimbla, Cairns QLD 4870 (e.g. Suburb, Town)	**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): Moody Creek Flood Advice Prepare Now		**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 < 460 characters)		
ADVICE from Cairns Disaster Group. Water in Moody Creek Detention Basin 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 Moody Creek Detention Basin 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 [redacted] **to confirm receipt**		
FOR USE BY SDCC		
EA Request Form completed by: SDCC Watch Desk ☐ Requesting Officer ☐		
Notification of any delays provided to Requestor: ☐ YES ☐ NO		
EA User Name:		**Emergency Alert No:**
Signature:	**Date:** / /	
Authorising Officer Name:		**EMS EA Campaign Report ID:**
Signature:	**Date:** / /	
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		
EA Request Form – F.1.177 Last Updated: November 2024 Version: 4.0		

Queensland Government

PHONE THE [redacted] – ADVISE EA IS BEING DEVELOPED

EMERGENCY ALERT REQUEST

Location of Alert: Moody Creek Detention Basin, Kanimbla, Cairns QLD 4870 (e.g. Suburb, Town)	**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): Moody Creek Detention Basin Failure Watch and Act Prepare to Leave		**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 in Kanimbla, Manoora, Mooroobool, Manunda near Moody Creek may experience rapidly rising water levels and property flooding. Possible danger to residents. Warn your neighbours and PREPARE TO LEAVE. If your life is in danger, Call Triple Zero.
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. Areas in KANIMBLA, MANOORA, MOOROOBOOL, MANUNDA near Moody Creek may experience rapidly rising water levels and property flooding. Possible danger to residents. Warn your neighbours and PREPARE TO LEAVE. If your life is in danger, Call 000.
Go to www.disaster.cairns.qld.gov.au or listen to ABC radio.

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

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

Send to [redacted] **to confirm receipt**

FOR USE BY SDCC

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

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

EA User Name: Signature: Date: / /	Emergency Alert No:
Authorising Officer Name: Signature: Date: / /	EMS EA Campaign Report ID:
Report provided to Requestor on EA outcomes: ☐ YES ☐ NO	

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

EA Request Form – F.1.177 Last Updated: November 2024 Version: 4.0

Alert 3 – Moody Creek Detention Basin Failure – Emergency Warning Move to Higher Ground

Queensland Government

PHONE THE [redacted] – ADVISE EA IS BEING DEVELOPED

EMERGENCY ALERT REQUEST

Location of Alert: Moody Creek Detention Basin, Kanimbla, Cairns QLD 4870 (e.g. Suburb, Town)	**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): Moody Creek Detention Basin Failure Emergency Warning Move to Higher Ground	**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. This is a Flash Flood Emergency Warning from the Cairns Disaster Group. Areas in Kanimbla, Manoora, Mooroobool, Manunda near Moody Creek will experience rapidly rising water levels. Immediate danger to residents. MOVE TO HIGHER GROUND NOW. If your life is in danger, Call Triple Zero.
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. Flash Flood Warning from Cairns Disaster Group. Areas in KANIMBLA, MANOORA, MOOROOBOOL, MANUNDA near Moody Creek will experience rapidly rising water levels. Immediate danger to residents. MOVE TO HIGHER GROUND NOW. If your life is in danger, Call 000.
Go to www.disaster.cairns.qld.gov.au or listen to ABC radio.

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

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

Send to [redacted] **to confirm receipt**

FOR USE BY SDCC

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

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

EA User Name: Signature: Date: / /	Emergency Alert No:
Authorising Officer Name: Signature: Date: / /	EMS EA Campaign Report ID:
Report provided to Requestor on EA outcomes: ☐ YES ☐ NO	

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

EA Request Form – F.1.177 Last Updated: November 2024 Version: 4.0

Appendix L has been redacted