EMERGENCY ACTION PLAN

DAM ID 1198
VERSION 8 – SEPTEMBER 2020

Approved by the delegate of the Chief Executive, Department of Natural Resources, Mines and Energy until 1 September 2023.

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DOCUMENT CONTROL SHEET

CONTROLLED COPY NUMBER: 7

AUTHORISATION:

Approved by: ................................................................................
(Manager Waters and Lands Regional Council)

Date: 10 / 09 / 2020

Draft: ☐ Final: ☑ Version: 8

File Ref: ____________________________

Date Submitted: September 2020 Review Date: May 2021

DOCUMENT REVISION HISTORY

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Officer Name</th>
<th>Change Summary</th>
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<td>September 2013</td>
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<td>Re-written with new DNRME requirements</td>
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<td>Outcomes of Failure Impact Assessment and Dam Safety Report undertaken by SKM in December 2013 and March 2014 respectively.</td>
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<td>Amendments made to document as requested by DNRME</td>
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<td>4</td>
<td>September 2015</td>
<td></td>
<td>2015 Review &amp; Update (REVA)</td>
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<tr>
<td>5</td>
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<td>2017 Review &amp; Update – Approval until 1 November 2018</td>
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<tr>
<td>6</td>
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<td>2019 Review and Update to address Matters of Concern</td>
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<th>Description</th>
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<tr>
<td>AEP</td>
<td>Annual Exceedance Probability</td>
</tr>
<tr>
<td>AHD</td>
<td>Australian Height Datum</td>
</tr>
<tr>
<td>AMTD</td>
<td>Adopted Middle Thread Distance</td>
</tr>
<tr>
<td>ARI</td>
<td>Average Recurrence Interval</td>
</tr>
<tr>
<td>BoM</td>
<td>Bureau of Meteorology</td>
</tr>
<tr>
<td>CEO</td>
<td>Chief Executive Officer</td>
</tr>
<tr>
<td>DCL</td>
<td>Dam Crest Level</td>
</tr>
<tr>
<td>DDMG</td>
<td>District Disaster Management Group</td>
</tr>
<tr>
<td>DDS</td>
<td>Director Dam Safety</td>
</tr>
<tr>
<td>DEHP</td>
<td>Department of Environment and Heritage Protection</td>
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<td>DNRME</td>
<td>Department of Energy and Water Supply</td>
</tr>
<tr>
<td>DICL</td>
<td>Ductile Iron Concrete Lined (in reference to water pipe)</td>
</tr>
<tr>
<td>DN</td>
<td>Diameter Nominal</td>
</tr>
<tr>
<td>DSR</td>
<td>Dam Safety Review</td>
</tr>
<tr>
<td>EA</td>
<td>Emergency Alert</td>
</tr>
<tr>
<td>EAP</td>
<td>Emergency Action Plan</td>
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<tr>
<td>EER</td>
<td>Emergency Event Report</td>
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<td>EWN</td>
<td>Early Warning Network</td>
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<tr>
<td>FIA</td>
<td>Failure Impact Assessment</td>
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<td>FSL</td>
<td>Full supply level is the level of the water surface of the dam when the water storage is at maximum operating level when not affected by flood</td>
</tr>
<tr>
<td>GMIS</td>
<td>General Manager Infrastructure Services</td>
</tr>
<tr>
<td>HICB</td>
<td>Hazardous Industries &amp; Chemical Branch WH&amp;S Qld</td>
</tr>
<tr>
<td>IROL</td>
<td>Interim Resource Operations Licence</td>
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<tr>
<td>LDC</td>
<td>Local Disaster Coordinator</td>
</tr>
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<td>LDCC</td>
<td>Local Disaster Coordination Centre</td>
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<tr>
<td>LDMG</td>
<td>Local Disaster Management Group</td>
</tr>
<tr>
<td>LiDAR</td>
<td>Laser Interferometry Detection and Ranging (remote sensing for survey)</td>
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<tr>
<td>MMI</td>
<td>Modified Mercalli Intensity</td>
</tr>
<tr>
<td>MWW</td>
<td>Manager Water and Waste</td>
</tr>
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<td>PAR</td>
<td>Population at Risk</td>
</tr>
<tr>
<td>PAR(^1)</td>
<td>Population at Risk with a travel time for a failure wave from the dam of less than 10 minutes.</td>
</tr>
<tr>
<td>PAR(^2)</td>
<td>Population at Risk with a travel time for a failure wave from the dam of greater than 10 minutes.</td>
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<tr>
<td>PMF</td>
<td>Probable Maximum Flood</td>
</tr>
<tr>
<td>PMP</td>
<td>Probable Maximum Precipitation</td>
</tr>
<tr>
<td>PMPDF</td>
<td>Probable Maximum Precipitation Design Flood</td>
</tr>
<tr>
<td>PMPDFNF</td>
<td>Probable Maximum Precipitation Design Flood No Dam Failure</td>
</tr>
<tr>
<td>PMPDFF</td>
<td>Probable Maximum Precipitation Design Flood Dam Failure</td>
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<tr>
<td>QPS</td>
<td>Queensland Police Service</td>
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<td>SCADA</td>
<td>Supervisory Control and Data Acquisition</td>
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<td>RE</td>
<td>Relevant Entities</td>
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<td>SDCC</td>
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<td>SDF</td>
<td>Sunny Day Failure</td>
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<td>SES</td>
<td>State Emergency Service</td>
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<td>SOP</td>
<td>Standard Operating Procedure</td>
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<td>Tablelands Regional Council</td>
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TERMS AND DEFINITIONS USED IN THIS TEXT

The meaning of terms used in this Emergency Action Plan are set out in Section 352A of the Water Supply (Safety and Reliability) Act 2008 (Qld) – Amended 3 July 2017.
1. INTRODUCTION

1.1 PURPOSE

Tablelands Regional Council (TRC) has prepared this EAP for Wild River Dam in accordance with the requirements of the Queensland Water Supply (Safety and Reliability) Act 2008 (the Act) that the owner of a referable dam must have an approved Emergency Action Plan (EAP) for the dam.

The purpose of an EAP under the Act is to “minimise the risk of harm to persons or property if a dam hazard event or emergency event for the dam happens”.

This EAP outlines procedures to be followed to manage the consequences of a dam hazard or emergency event at the dam. It includes the roles, responsibilities and procedures for TRC as the dam owner and local government, as well as those for the Local, District and State Disaster Management Groups, emergency agencies and affected persons.

1.2 WILD RIVER DAM

Wild River Dam is owned and operated by Tablelands Regional Council.

Construction of the new Wild River Dam (Figure 1) was completed in 1994. The dam is located at the headwaters of the Wild River (AMTD 335.4 km) approximately 5 km northeast of Herberton. The dam consists of a compacted earth and rock fill embankment with central clay core, vertical filter zone, upstream riprap and a grassed downstream embankment.

It is located approximately 790 m upstream of the original mass concrete dam (Figure 1) known as ‘Old Wild River Dam’ (Figure 3) which was the only town water supply storage for Herberton prior to 1994. Wild River Dam has a gravity feed outlet that releases into the Wild River by means of a Floating gravity syphon Intake, Outlet Conduit and Outlet Valve (Figure 4).

An intake pipe for the gravity feed pipeline to Herberton is located in the base of a Town Water Supply Weir (Figure 5) immediately downstream of the Old Wild River Dam.

The purpose of these dams and weir is to supply water to Herberton.

Figure 1 Wild River Dam
Figure 2  Wild River Dam Location Map

Figure 3  Old Wild River Dam
Figure 4  Herberton Town Water Supply

Figure 5  Schematic Diagram of Dams
1.3 FAILURE IMPACT ASSESSMENT

Sinclair Knight Merz Pty Ltd (now Jacobs Group (Australia) Pty Ltd) were engaged by Tablelands Regional Council in 2013 to undertake a Failure Impact Assessment (FIA) study and Dam Safety Review (DSR) report. The FIA study was finalised in December 2013, and the DSR was completed in March 2014.

The Population at Risk (PAR) was calculated in accordance with the QLD Government Guidelines for Failure Impact Assessment of Water Dams (2012).

The FIA undertaken by Sinclair Knight Merz Pty Ltd (Jacobs Group (Australia) Pty Ltd) identified 26 people at risk in a Sunny Day Failure (SDF) event and 81 people at risk due to a Probable Maximum Flood (PMF) event in either a dam failure or no dam failure scenario. It is noted that all PAR affected in a PMF dam failure scenario are also affected by flooding in a PMF event without dam failure.

The PAR identified for the SDF event, is associated with 9 houses. The PAR identified for the PMF events is associated with 20 houses, 1 unit block and 9 terraced/row houses.

Further analysis in 2019, assessed the potential consequences in the event of the failure of Wild River Dam causing a cascade failure of Old Wild River dam downstream. Given the small volume and close proximity of the Old Wild River Dam to the Wild River Dam, the effects with and without cascade failure are very similar.

This analysis identified no additional buildings affected under cascade failure in the SDF event. One additional building was identified as impacted in a cascade failure during the PMFF event, with an associated additional 2.9 incremental PAR. Lower lying parts of the lot associated with this building are affected by the PMFF event without cascade failure so no additional properties are required to be notified during an event. Evacuation maps prepared for each affected lot have been updated to show impacted areas with and without cascade failure.

The PAR for the flooding in a PMF event has been broken into 2 groups, PAR\(^1\) for Population at Risk with a travel time for a failure wave from the dam of less than 10 minutes and PAR\(^2\) for Population at Risk with a travel time for a failure wave from the dam of greater than 10 minutes. 2 houses are associated with PAR\(^1\) and 18 houses, 1 unit block and 9 terraced/row houses are associated with PAR\(^2\).

Section 2 has been redacted
3. ROLES AND RESPONSIBILITIES

As the owner of the dam, TRC has responsibility for implementation of the Wild River Dam EAP. TRC has identified a team to undertake this responsibility. The roles and responsibilities within this team are outlined within Section 3.1.

Outside TRC, other entities also have roles and responsibilities under this EAP. These are outlined in Section 3.1.5.

Affected persons, or Population at Risk (PAR), identified within this EAP also have a role in the effective implementation of this plan to minimise the consequences of a dam hazard or emergency event. This role is outlined in Section 3.3.

3.1 TRC ROLES

The EAP is implemented within TRC by a team which comprises four key roles:
- EAP Officer
- EAP Backup Officers and Maintenance Personnel
- Manager Water and Waste
- GMIS
- CEO
- Tablelands Local Disaster Coordinator

Figure 6: TRC Roles

The responsibilities of each of these officers are outlined in the following sections. Key actions for each role are outlined within the flowcharts and tables for each emergency event. Contact details for the TRC officers with these roles and responsibilities are included in Section 2.

Each officer is to undergo initial EAP training when identified for one of these roles and participated in continuing refresher training and annual Scenario Event exercises. EAP Training exercises consist of understanding triggers for when EAP is to be enacted, roles and responsibilities of each person, communication / notification protocols and preventative and remediation actions under different EAP events.
3.1.1 EAP Officer

The EAP Officer shall:

- Keep the Emergency Action Plan in a clean, secure facility.
- In the event that the EAP Officer is unable to fulfil these duties advise MWW.
- Notify MWW of names and contact details of personnel undertaking and/or relieving the role of Backup EAP Officer and Maintenance personnel.
- Monitor the storage water level of the dam.
- If possible, monitor Bureau of Meteorology website for forecasted extreme weather events.
- Immediately notify the EAP Backup officers when the Emergency Action Plan is being initiated.
- Follow the Emergency Action Plan in time of emergency.
- During an emergency event, report to and receive instructions from the MWW or if he cannot be contacted, the GMIS, or if he cannot be contacted, the CEO TRC.
- In an emergency event, take steps to ensure personal safety and the safety of other EAP Officers and the public.
- Provide regular reports to the MWW for evaluation during the emergency or the person who will undertake that role during the emergency event.
- If contacted by media during an emergency event the EAP Officer should refer the media to the TRC Media Officer and record time, date and action taken.
- On the Log of Events/Actions Sheet (refer to Appendix A) and the Record of Communications Sheet (refer to Appendix A) keep a daily running record of all actions/events and telephone calls to and from the MWW, EAP Backup Officers and other personnel (in relation to the event) for the duration of the emergency event.
  - Record: to and from - who requested actions; what actions were requested and carried out; and the time and the date they were carried out. Record any rainfall at the dam during the event using the Record of Rainfall form (Appendix A).
  - After the event compile an Emergency Event Report and forward unedited copies to the MWW.
  - Transfer the Record of Events/Actions, Communications and Rainfall to the Storage Data Book after the Event.

3.1.2 EAP Backup Officer and Maintenance Officers

EAP Backup Officer and Maintenance Officers shall:

- Assist the EAP Officer in times of emergency.
- Follow the Emergency Action Plan during emergency events.
- During adverse weather conditions, EAP Backup Officer and Maintenance Officers shall attempt to contact the EAP Officer.
- If the EAP Officer is unavailable, they shall undertake the responsibilities of the EAP Officer.

3.1.3 Manager Water and Waste

Manager Water and Waste shall:

- Review the Emergency Action Plan in consultation with LDMG, DDMG and TRC by 1st August each year (to enable submission to DDMG and LDMG for 30 business days if an amendment is required) and provide notice to DNRME Dam Safety by 1 October each year.
- Ensure the Emergency Action Plan is distributed according to the Distribution List and that the
police and disaster management organisations are conversant with the plan.

- Ensure this Emergency Action Plan is implemented.
- Approve the person undertaking and/or relieving in the role of EAP Officer and EAP Backup Officers.
- Ensure the EAP Officer and Backup Officers are conversant with the Emergency Action Plan.
- Ensure that the PAR in Herberton and Wondecla are contacted annually and informed about the EAP and the expectations of them in dam safety emergency events.
- Ensure that the PAR contact details are checked and updated annually.
- Ensure that the PAR in Herberton and Wondecla are warned of dam safety emergency events (in collaboration with the LDC).
- Notify the CEO and GMIS of any emergency event.
- Monitor all emergency events.
- Provide regular updates during emergency events to the CEO and LDC.
- Evaluate reports from EAP Officers and provide directions where required in this plan.
- Undertake verification of / inspection of deficiencies identified by the EAP Officer and provide directions where required in this plan.
- Coordinate with external dam safety consultants (RPEQ) where additional expertise is required.
- Within thirty (30) days of an event, present an Emergency Event Report to Director Dam Safety.
- Ensure that EAP training including initial training, annual refresher training and annual Event Scenario exercises are undertaken in coordination with the LDC.

3.1.4 Tablelands Local Disaster Coordinator

The Local Disaster Coordinator shall on behalf of the Tablelands LDMG (excerpt taken from Disaster Management Act 2003):

(a) coordinate disaster operations for the local group;
(b) report regularly to the local group about disaster operations;
(c) ensure, as far as practicable, that any strategic decisions of the local group about disaster operations are implemented; and
(d) Issue Early Warning Network (EWN) and Emergency Alert (EA) messages to the PAR on behalf of the dam owner as required.

3.1.5 Dam Safety Consultant

For the purposes of the Wild River EAP, the responsibility of the Dam Safety Consultant is to provide advice to TRC as requested by the Manager Water and Waste. The Dam Safety Consultant is to be a Registered Professional Engineer of Queensland (RPEQ) with appropriate expertise relevant to the issue to be considered.

3.2 EXTERNAL ENTITY ROLES

External entities with responsibilities under this EAP include the Local Disaster Management Group, District Disaster Management Group, State Disaster Coordination Centre, Queensland Police Service, and Dam Safety Regulator, DNRME.

This section outlines the responsibilities of each of these entities. Contact details for the external entities with these roles and responsibilities are included in Section 2.
3.2.1 Local Disaster Management Group

For the purposes of the Wild River EAP, the responsibilities of the Local Disaster Management Group are undertaken by the Local Disaster Coordinator (TRC officer) in collaboration with the Local Disaster Management Group. See Section 1.

3.2.2 District Disaster Management Group

The role of the District Disaster Management Group in relation to this EAP is to support the disaster response by providing support to the LDMG where capacity and capability to respond is exceeded.

3.2.3 State Disaster Coordination Centre

The role of the State Disaster Coordination Centre in relation to this EAP is to store and test emergency alert polygons and messages, and issue when requested by the LDC.

3.2.4 Police COMMUNICATIONS CENTRE CAIRNS

The role of the Police Communications Centre Cairns in relation to this EAP is to:
- contact Herberton Police and advise them to activate their local SOP to co-ordinate the evacuation of the PAR.

3.2.5 Queensland Police, Herberton

When directed by the Police Communications Centre Cairns, Queensland Police, Herberton, will:
- activate their local SOP to co-ordinate the evacuation of the PAR.

3.3 AFFECTED PAR

Persons likely to be affected in a dam hazard or emergency event have been identified through failure impact assessment for a range of potential events as outlined in Section 1.3.

The details of each affected PAR including contact details are identified in Appendix D. Evacuation maps for each PAR are also included in Appendix D. Communication protocols for providing notifications and warnings to PAR are identified in Section 8.

The responsibility of the affected PAR under this EAP are to:
- Provide updated contact details annually when contacted by TRC officers to allow subscription to the EWN service used for dissemination of warnings by TRC.
- Prepare for an emergency event by reviewing the evacuation plans and EAP information provided.
- Follow the instructions of warnings and notifications.
4. COMMUNICATIONS

4.1 COMMUNICATION PROTOCOLS

Figure 7 identifies the lines of communication during an event.

All media queries should be referred to the TRC media coordinator. Notification and warning of affected PAR is the responsibility of the MWW in liaison with the LDC. All other external communications are the responsibility of the MWW.

Figure 7  Communications Protocols

4.2 COMMUNICATION MECHANISMS

The primary means of communications between the EAP Officer and parties external to Herberton and Wondecla shall be by mobile telephone or Council radio.

Messages are to be confirmed as being received, leaving a voicemail and assuming it has been received is not sufficient.

It is noted that effective communication and warning within this plan is heavily reliant on the mobile telephone network. Following cyclone events, the loss of power and mobile reception is likely. If an emergency event were to occur during the aftermath of a cyclone, implementation of the EAP may be compromised due to loss of communications and difficulty accessing the dam.

The following back-up procedures are currently in place:

- Solar power back up for telemetry at dam site;
- Redundancy of monitoring at dam via CCTV on 3G/4G link;
- Generator back up at Council depots (not all have automatic fail over) and availability of Council radio; and
• Potential for relay of warnings to PAR via SES and Police communications e.g. door knocking, radio systems.

4.3 COMMUNICATION SYSTEM

TRC has its own licenses to operate radio communication equipment under the Australian Communications and Media Authority (the AMCA), which are renewed annually. TRC currently has two (2) licenses under the AMCA, details are as follows:

Table 1: Details of TRC’s licenses to operate radio communications equipment

<table>
<thead>
<tr>
<th>License No.</th>
<th>Site/Area</th>
<th>Callsign</th>
<th>Service / Subservice</th>
<th>Expiry Date</th>
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<tr>
<td>103090/2</td>
<td>Austek Site, 1.5km NE of Cnr Kennedy Hwy and Longlands Gap Rd</td>
<td>VL4QI</td>
<td>Land Mobile / Land Mobile System - &gt; 30MHz</td>
<td>14/06/2021</td>
</tr>
<tr>
<td>103113/1</td>
<td></td>
<td>VMO692</td>
<td>Land Mobile Ambulatory System</td>
<td>14/06/2021</td>
</tr>
</tbody>
</table>

The primary repeaters for the TRC radio network are located at Longlands Gap. This includes the previous Southern and Central zone radios that are now linked and interoperable. The base stations for the radio systems are located in the Local Disaster Coordination Centre (LDCC). Some TRC vehicles are fitted with a UHF radio, in particular the EAP Officer, Backup EAP Officer and Coordinator Water and Wastewater Reticulation vehicles.

The Tablelands Local Disaster Management Group has a Resilient Communications Sub Plan under the disaster management plan under the following:

TRC promotes the use of UHF CB 10 as a community solution. UHF-CB radio is primarily for members of a community to communicate with each other during and after a disaster so that they can assist one another. Emergency aid may not be available to some people whether or not they have a radio. They may be isolated due to impassable conditions, flooding, down power lines, fire, fallen structures, blocked roads, or there may not be public safety or other resources to assist them. It should be noted that possession and use of a two-way radio does not guarantee an instant and reliable or an immediate and effective response to an individual’s call for help – calling out on a two-way radio does NOT guarantee a response. Whilst it cannot be guaranteed, having a two-way radio may enable community members and appropriate officials to communicate with persons affected by disaster.
# 5. DAM OVERVIEW

## 5.1 DAM DETAILS

<table>
<thead>
<tr>
<th>Name and location</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of Dam</td>
<td>Wild River Dam</td>
</tr>
<tr>
<td>Other Names</td>
<td>None</td>
</tr>
</tbody>
</table>
| Location          | Latitude 17°21'59.56"S  
                    | Longitude 145°25'52.20"E |
| DERM Region       | North |
| Shire             | Tablelands Regional Council |
| Nearest Town      | Herberton and Wondecla |
| Stream and AMTD   | Wild River 335.4 km |
| Licence No        | No ‘Interim Resource Operations Licence (IROL) |
| Development Permit| Development Permit Dam Safety Conditions for Wild River Dam issued by DNRW in February 2006 |
| Current Owner     | Tablelands Regional Council |
| Designer & Date   | Gutteridge Haskins and Davey Pty Ltd, July 1993 |
| Construction Contractor | Beckhaus Civil Pty Ltd, 1994 |
| Safety review dates | 2004 (SunWater) and 2013 (SKM, now Jacobs Group (Australia)) |

<table>
<thead>
<tr>
<th>Storage characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Full supply level (FSL)</td>
<td>1046.6 m AHD</td>
</tr>
<tr>
<td>Storage capacity</td>
<td>290 ML</td>
</tr>
<tr>
<td>Surface area</td>
<td>6.2 Ha at FSL</td>
</tr>
<tr>
<td>Length of shoreline</td>
<td>Unknown</td>
</tr>
<tr>
<td>Catchment area</td>
<td>530 Ha</td>
</tr>
<tr>
<td>Catchment description</td>
<td>Steep hills covered in thick vegetation</td>
</tr>
<tr>
<td>Dam Crest Level</td>
<td>EL 1050.15 m AHD (3550 mm above the spillway)</td>
</tr>
<tr>
<td>Population at Risk</td>
<td>81</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description of dam wall</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Wall Type-Main Wall</td>
<td>Compacted earth and rockfill embankment with central clay core, vertical filter zone and upstream riprap protection.</td>
</tr>
<tr>
<td>Wall Height (max. D/S toe)</td>
<td>16 m</td>
</tr>
<tr>
<td>Dam Crest Elevation</td>
<td>EL 1050.15 m AHD (3550 mm above the spillway)</td>
</tr>
<tr>
<td>Embankment Length</td>
<td>230 m</td>
</tr>
</tbody>
</table>
Description of spillway

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spillway Description</td>
<td>Broad-crested weir</td>
</tr>
<tr>
<td>Spillway Elevation</td>
<td>EL 1046.6 m AHD</td>
</tr>
<tr>
<td>Crest Width</td>
<td>45 m</td>
</tr>
<tr>
<td>Spillway outflow Capacity</td>
<td>approximately 456 m³/s</td>
</tr>
<tr>
<td>(at DCL)</td>
<td></td>
</tr>
<tr>
<td>Spillway capacity (AEP)</td>
<td>Approximately 1 in 1,700,000 AEP</td>
</tr>
<tr>
<td>Auxiliary spillway</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Description of outlet works

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intake Works</td>
<td>Floating intake raft</td>
</tr>
<tr>
<td>River Release Conduit</td>
<td>Concrete encased DN 200 mm DICL Outlet Pipe</td>
</tr>
<tr>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>Outlet Valve Arrangement</td>
<td>Outlet conduit terminates at an Outlet Valve Box containing a 200 mm</td>
</tr>
<tr>
<td></td>
<td>diameter sluice valve, a 200 mm diameter to 150 mm DICL reducer and a</td>
</tr>
<tr>
<td></td>
<td>150 mm diameter Bermad (constant) flow control valve.</td>
</tr>
</tbody>
</table>

5.2 CRITICAL STORAGE WATER LEVEL TRIGGERS

Figure 8 identifies the critical water level triggers within the reservoir for the escalation of activation levels within the EAP.

Access to the dam and nearby properties is cut by the Wild River in even minor flood events, thus observation of the dam during flooding events is wholly reliant on remote monitoring. Reservoir water levels are monitored in multiple ways to provide communication link redundancy in the EAP.

1. A pressure sensor was installed in November 2013 to measure the reservoir water level with the data relayed to the Council depot via a SCADA/Telemetry system.
2. In late 2018, a series of additional monitoring systems including a bubbler water level sensor were installed at the dam with images and data transmitted to the Council depot via 3/4G signal.
3. Additional redundancy within the system was included via the installation of a CCTV camera. The camera can be operated remotely allowing the operators to zoom in on the spillway. A reflector-style gauge is installed on a centre-post to allow accurate visual assessment of the depth of flow over the spillway. The camera functions including the ability to pan, enabling view of the seepage control structure and the dam wall alignment. The system captures fixed images of the spillway, seepage structure and dam wall alignment every 15 minutes under normal operations.

The EAP officer on duty monitors the reservoir level primarily using the SCADA system with automated alarms set at EAP trigger levels to allow rapid escalation of EAP activation levels as required.

An alarm is also triggered if there is an outage of the SCADA system. In the case of an outage, the EAP officer on duty will continually monitor the reservoir level using the backup information from the bubbler system and CCTV camera.

While the systems utilise different communication protocols and infrastructure, and are isolated in case of a lightning strike, there is a possibility of loss of both systems in a cyclone event. For this reason, loss of communications warning messages and evacuation procedures are included within this EAP.
Figure 8: Dam Embankment Cross Section with Critical Storage Water Level Triggers

5.3 POTENTIAL PROBLEM IDENTIFICATION

Potential problem identification through routine inspections is the key trigger for activation of and escalation of activation levels within the EAP. TRC may become aware of an Earthquake (by way of community reports, employee advice or alerts via GeoScience Australia) which may trigger the Local Disaster Management Group and may trigger EAP activation.

Officers inspect the dam weekly and complete an inspection checklist. The weekly inspection checklists are sent to Manager Water and Waste who will check and evaluate these reports.

The monitoring equipment installed in late 2018 also allows remote monitoring of conditions at the dam where access to the dam is not possible such as during an earthquake, significant rainfall event, or in the event of a terrorist threat/ attack. This allows the following to be undertaken remotely:

- Visual inspection of the dam wall, spillway, walkway access and tailwater conditions.
- Visual inspection of deformities in the dam wall
- Visual inspection of the v-notch weir in the seepage monitoring station to provide an indication of seepage flow.

It is important that the dam is inspected during an emergency event or shortly thereafter by the EAP officer, providing it is safe to do so. Potential problems that can be identified during these inspections are discussed within Appendix C.

Any abnormalities shall be immediately brought to the attention of Manager Water and Waste, and General Manager Infrastructure Services. In the event of an identified issue or potential deficiency, inspection by an RPEQ should be undertaken. In the first instance, this would be undertaken by the Manager Water and Waste. However, if deemed necessary by the Manager Water and Waste, inspection by a dam safety consultant may also be undertaken.
6. PREDICTED FLOOD LEVELS AND FLOOD TRAVEL TIMES

6.1 PREDICTED DEPTH OF FLOODING

Hydraulic modelling was undertaken by SKM (Jacobs Group (Australia)) as part of the Failure Impact Assessment in 2013 using the MIKEFLOOD computer package.

Further analysis was undertaken in 2019 to identify any additional impacts in a cascade failure scenario should Old Wild River Dam fail due to failure of the upstream Wild River Dam. This analysis concluded there was very little difference in the impacted area in a cascade failure event.

Predicted flood depths in the Wild River have been extracted for specific locations and are listed in the table below:

<table>
<thead>
<tr>
<th>Location</th>
<th>SDF</th>
<th>PMPDFNF</th>
<th>PMPDFF</th>
<th>Incremental difference of PMPDFNF – PMPDFF (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D/S of Wild River Dam</td>
<td>2.8</td>
<td>4.1</td>
<td>4.4</td>
<td>0.3</td>
</tr>
<tr>
<td>D/S of Old Concrete Dam</td>
<td>3.3</td>
<td>6.0</td>
<td>6.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Railway Bridge</td>
<td>2.1</td>
<td>5.1</td>
<td>5.2</td>
<td>0.1</td>
</tr>
<tr>
<td>Herberton Bridge</td>
<td>1.1</td>
<td>5.1</td>
<td>5.2</td>
<td>0.1</td>
</tr>
<tr>
<td>Wondecla</td>
<td>4.9</td>
<td>9.9</td>
<td>9.9</td>
<td>0.0</td>
</tr>
<tr>
<td>End of model</td>
<td>4.1</td>
<td>19.0</td>
<td>19.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

6.2 FLOOD WAVE TRAVEL TIMES

The ability of PAR to evacuate is heavily dependent on whether they receive warning before the dam failure wave flood wave arrives at their property. In general, warning of at least 60 minutes is required to be considered best endeavours.

Warning time is dependent on:
- Time for breach formation (and whether breach formation is identified early);
- Travel time for flood wave; and
- Time to deliver warning.

SKM (Jacobs Group (Australia)) (2013) identified breach formation parameters including the likely breach formation time based on the Guidelines for Failure Impact Assessment of Water Dams (DNRME, 2012).

The adopted breach parameters are presented in the table below:

<table>
<thead>
<tr>
<th>Event</th>
<th>Volume of water discharged at time of breach (ML)</th>
<th>Volume of material removed from breach (m³)</th>
<th>Breach Initiation Level (mAHĐ)</th>
<th>Breach Level Final (mAHĐ)</th>
<th>Final Breach Base Width (m)</th>
<th>Breach Slope (degrees)</th>
<th>Breach Develop’t. Time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunny Day</td>
<td>290</td>
<td>2460</td>
<td>1050.15</td>
<td>1034</td>
<td>1.7</td>
<td>10</td>
<td>38</td>
</tr>
<tr>
<td>PMPDF</td>
<td>600</td>
<td>4760</td>
<td>1050.15</td>
<td>1034</td>
<td>5.1</td>
<td>10</td>
<td>48</td>
</tr>
</tbody>
</table>
The failure wave travel time (time for the failure wave to travel from the dam to each PAR) increases with distance downstream of the dam. It ranges from less than 10 minutes for the closest PAR (2 properties) to 1.5 hours for PAR in Herberton and 2-2.5 hours for PAR in Wondecla.

The minimum time to send out an Emergency Alert using the Early Warning Network system is approximately 20 minutes, while the minimum time to send out an Emergency Alert using the State-wide system is approximately 40 minutes.

It is clear that providing adequate warning of more than 60 minutes will not be possible for the 2 properties immediately downstream of the dam and will be difficult for PAR located further downstream, if warning does not occur until the dam begins to fail.

Due to the isolated nature of the dam, early identification of breach initiation is also unlikely.

The following are therefore critical:
- early identification and management of potential failure events;
- early and effective warning to PAR occurs; and
- effective prior communication with PAR to understand what to do if they receive a warning.

7. EMERGENCY EVENTS AND ACTIONS

7.1 DAM HAZARDS

The following events are defined as emergency events for the Wild River Dam:
- Flooding Event
- Earthquake event
- Terrorist or high energy impact
- Sunny Day Failure (SDF) events (all other events that may lead to SDF)

Any water quality contamination events at Wild River Dam are managed under Tablelands Regional Council’s Drinking Water Quality Management Plan which includes the Herberton Water Supply Scheme.

Structural failure of the dam can occur when the storage level is at or below FSL, and when the dam is spilling. Structural issues can however become more likely during a flood event due to higher hydrostatic pressures on the structure and foundations.

A “Sunny Day” failure is defined as failure of the dam and the release of water downstream, when there is low or no inflow to the dam from rainfall events. This type of dam failure is unexpected and can occur with little or no warning.

A “Sunny Day” failure may be as a result of any or a combination of the following:
- Embankment stability issues: increased seepage, new visible signs of seepage and particularly evidence of sediment transport (i.e. cloudy flow) as this can be an indication of piping.
- Signs of distress in embankment such as cracking and/or deformation and/or evidence of material having slid off embankment.
- Appearance of sinkholes, soft spots and ‘boggy areas’
- abnormal instrument readings (piezometers indicating higher hydrostatic pressures)
- differential movement or settlement
- increasing rates of seepage or development of new seepage paths
EMERGENCY ACTION PLAN
Wild River Dam

- piping of the embankment
- Earthquakes and Landslides.
- Terrorist or high energy impact (non-natural events), including deliberate, accidental or vandalism actions against the dam structure.

In many of these cases there will be no warning and hence no Alert or Lean Forward level. This has been addressed by the recent installation of remote monitoring equipment at the dam including CCTV camera which allows visual inspection of the dam, spillway and v-notch weir.

7.2 FLOODING

Floodling from significant rainfall has been identified as a dam hazard for Wild River Dam with the potential to cause a dam emergency event. The following sections identify the actions to be undertaken in a flooding event.

The EAP will be activated when the reservoir level reaches EL 1047.1 m AHD (500 mm over the spillway) and heavy rainfall is continuing in the catchment. This corresponds to Alert Level 2. Trigger levels for movement between the different levels are outlined in the Flooding flowchart.

The EAP officer is responsible for monitoring reservoir levels via the SCADA/Telemetry system and CCTV system and identifying when activation of the EAP or escalation of the EAP activation level is required.

Failure Impact Assessment undertaken by SKM and Jacobs identified a maximum number of 31 flood-affected properties in a PMF event with and without dam failure or cascade failure of Old Wild River Dam.

The maximum recorded flood depth flowing over the spillway was 108mm (1046.71 m AHD) on Thursday 24 January 2013. This minor flood event resulted in the access road to the dam becoming inaccessible where the road crosses the river near the old railway bridge. It is noted that anecdotally the dam has often experienced larger overflow events prior to installation of gauging in November 2013.

SunWater identified the critical duration storm for the catchment as 1.5 hours, with peak dam levels occurring approximately 1.3 hours after the start of the storm. This means that with very intense rainfall, the time period from activation of “Alert” status to “Stand-up” could be less than 30 mins.

As access to the dam and nearby properties is cut by the Wild River in even minor flood events, it is noted that:
- Observation of the dam during flood events is wholly reliant on the remote monitoring systems, although there is redundancy built into the system; and
- At least 2 properties comprising PAR are likely to be isolated prior to activation of the EAP.
- There is no public access to the Wild River reach between the Wild River Dam and the Old Wild River Dam and the access road to these dams has locked security gate so it is unlikely to cause hazard to the public when the river outlet of the Wild River Dam is operated.

7.2.1 Preventative actions for Flooding Events:

- Monitor BoM weather radar and storage water level.
- Initial EAP training and continuing refresher training and annual Scenario Event exercises organised by MWW. Details of the training is as follows:
  - EAP Training will be held prior to the start of the wet season.
- EAP Officer, Backup EAP Officers, MWW and LDC are to attend and participate in the training.
- EAP Training exercises to consist of understanding triggers for when EAP is to be enacted, roles and responsibilities of each person, communication / notification protocols and preventative and remediation actions under different EAP events.

**Issue individual Evacuation Plans to PAR affected by a PMF event, and in particular to each house visited explain:**
- What to do.
- Where to go.
- When.

**Ensure that all identified PAR are aware of the implications of large floods with or without dam failure, how they may be affected, where they (as individual groups) are to go and what they have to do at short notice if notified to evacuate.**

- Contact details in the EAP confirmed, and if necessary updated, each year by 1 September for all PAR affected by a PMF event.
- Ensure all identified PAR are signed-up to the Early Warning Network service with TRC which provides voice, SMS and email messaging.
- If updated, the relevant section(s) of the EAP sent to each holder of a controlled copy of this EAP.
- Review Emergency Alert polygon and template, and check that is properly lodged with the SDCC.
Figure 9: Flood Emergency Flowchart
<table>
<thead>
<tr>
<th>Activation Status</th>
<th>Alert 1</th>
<th>Alert 2</th>
<th>Lean Forward</th>
<th>Stand Up 1</th>
<th>Stand Up 2</th>
<th>Stand Up 3</th>
<th>Stand Down</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activation Trigger</td>
<td>Cyclone forecast for the Herberton region with torrential rain and subsequent flooding likely.</td>
<td>Spillway discharging, storage water level at 1047.3 m AHD (700 mm over the spillway), heavy rain falling and storage continuing to rise.</td>
<td>Storage water level at 1048.1 m AHD (1500 mm over the spillway), heavy rain falling and storage continuing to rise.</td>
<td>Storage water level at 1049.1 m AHD (2500 mm over the spillway), heavy rain falling and storage continuing to rise.</td>
<td>Storage water level approaching 1050.15 m AHD (3500 mm over the spillway); imminent risk of failure or overtopping.</td>
<td>Storage water level dropping to below 1046.9 m AHD (300 mm over the spillway).</td>
<td></td>
</tr>
<tr>
<td>Actions: by whom &amp; what</td>
<td>EAP Officer: 1. Notify MWW that EAP has been enacted and maintain communications. 2. Record all instructions (from whom to whom, where, when &amp; what), telephone conversations, etc. including time and date on the record of communication. 3. Monitor and record storage water level and rainfall via SCADA/Telemetry and/or CCTV system as access road will be impassable. 4. Continue to notify MWW at intervals of four (4) hours.</td>
<td>EAP Officer: 1. Notify MWW that EAP has been enacted and maintain communications. 2. Record all instructions (from whom to whom, where, when &amp; what), telephone conversations, etc. including time and date on the record of communication. 3. Monitor and record storage water level and rainfall via SCADA/Telemetry and/or CCTV system as access road will be impassable. 4. Continue to notify MWW at intervals of one (1) hour.</td>
<td>EAP Officer: 1. Notify MWW of change of EAP activation status and maintain communications. 2. Mobilise Backup EAP Officer and Maintenance Officers. 3. Continue monitoring and recording storage water level and rainfall via SCADA/Telemetry and/or CCTV system at intervals of thirty (30) minutes. 4. Provide report to MWW, then at increments of 500 mm or as directed.</td>
<td>EAP Officer: 1. Notify MWW of change of EAP activation status as water storage level has exceeded 1048.1 m AHD (1500 mm over the spillway). 2. Continue monitoring and recording storage water level and rainfall to MWW at intervals of thirty (30) minutes.</td>
<td>EAP Officer: 1. Notify MWW that dam failure may occur at any time. 2. Continue monitoring and recording storage water level and rainfall to MWW at intervals of fifteen (15) minutes or as directed by MWW. 3. Monitor telemetry for signs of failure.</td>
<td>EAP Officer: 1. Providing road to dam is trafficable, request Backup EAP Officers are to inspect dam as soon as possible. 2. Notify MWW water level has dropped below 1046.9 m AHD (300 mm over the spillway) and change of activation status. 3. Prepare report on event for MWW. 4. On the Log of Events / Actions Sheet and the Record of communications Sheet keep a daily running record of all actions / events and telephone calls to and from the MWW, Backup EAP Officers and other personnel. 5. After the event compile an Emergency Event Report and forward unedited copies to the MWW. 6. After the event transfer all data from the event to the Storage Data Book.</td>
<td></td>
</tr>
<tr>
<td>Activation Status</td>
<td>Alert 1</td>
<td>Alert 2</td>
<td>Lean Forward</td>
<td>Stand Up 1</td>
<td>Stand Up 2</td>
<td>Stand Up 3</td>
<td>Stand Down</td>
</tr>
<tr>
<td>-------------------</td>
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<td>Storage water level dropping to below 1046.9 m AHD (300 mm over the spillway).</td>
</tr>
</tbody>
</table>

**Actions: by whom & what**

**MWW:**
1. Notify LDC, GMIS, CEO, Councillor for division, Police Communication Centre Cairns, DDS (DNRM).  
2. Maintain communications with the EAP Officer and LDC.  
3. Obtain rainfall forecast from BoM, track progress and effects of flood and inform the EAP Officer of the flood forecast.  
4. Should loss of radio signal (Telemetry) occur and high risk of increasing level over spillway notify LDC to issue communicate warning notification.

**LDC:**
1. Coordinate the response and implement the disaster management plans as required.  
2. Notify PAR.

**MWW:**
1. Review EAP Officer reports.  
2. Notify LDC, GMIS, CEO, Councillor for division, Police Communication Centre Cairns, DDS (DNRM).  
3. Maintain communications with the EAP Officer and LDC.  
4. Obtain rainfall forecast from BoM, track progress and effects of flood and inform the EAP Officer of the flood forecast.  
5. Should loss of radio signal (Telemetry) occur and high risk of increasing level over spillway notify LDC to issue communicate warning notification.

**LDC:**
1. Coordinate the response and implement the disaster management plans as required.  
2. Notify PAR.

**MWW:**
1. Review EAP Officer reports.  
2. Notify LDC and advise evacuation is required and provide updates at intervals of thirty (30) minutes.  
3. Notify GMIS, CEO, Councillor for division, Police Communication Centre Cairns, DDS (DNRM).  
4. Maintain communications with the EAP Officer and LDC.  
5. Obtain rainfall forecast from BoM, track progress and effects of flood and inform the EAP Officer of the flood forecast.  
6. Should loss of radio signal (Telemetry) occur and high risk of increasing level over spillway notify LDC to issue communicate warning notification.

**LDC:**
1. Coordinate the response and implement the disaster management plans as required.  
2. Notify PAR.

**MWW:**
1. Review EAP Officer reports.  
2. Notify LDC and advise evacuation is required and provide updates at intervals of fifteen (15) minutes.  
3. Notify GMIS, CEO, Councillor for division, Police Communication Centre Cairns, DDS (DNRM).  
4. Maintain communications with the EAP Officer and LDC.  
5. Obtain rainfall forecast from BoM, track progress and effects of flood and inform the EAP Officer of the flood forecast.  
6. Should loss of radio signal (Telemetry) occur and high risk of increasing level over spillway notify LDC to issue communicate warning notification.

**LDC:**
1. Coordinate the response and implement the disaster management plans as required.  
2. Notify PAR.
## Activation Status

<table>
<thead>
<tr>
<th>Cyclone forecast for the Herberton region with torrential rain and subsequent flooding likely.</th>
</tr>
</thead>
</table>

### Activation Trigger

<table>
<thead>
<tr>
<th>Alert 1</th>
<th>Alert 2</th>
<th>Lean Forward</th>
<th>Stand Up 1</th>
<th>Stand Up 2</th>
<th>Stand Up 3</th>
<th>Stand Down</th>
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</thead>
<tbody>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

### Notifications: by whom & to whom

<table>
<thead>
<tr>
<th>EAP Officer:</th>
<th>EAP Officer:</th>
<th>EAP Officer:</th>
<th>EAP Officer:</th>
<th>EAP Officer:</th>
<th>EAP Officer:</th>
<th>EAP Officer:</th>
</tr>
</thead>
<tbody>
<tr>
<td>MWW</td>
<td>MWW</td>
<td>MWW</td>
<td>MWW</td>
<td>MWW</td>
<td>MWW</td>
<td>MWW</td>
</tr>
<tr>
<td>PAR: PAR: PAR: PAR: PAR: PAR: PAR:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Note:
- Actions are numbered in order of priority.
### Table 3: Flood Event – Communication Table

<table>
<thead>
<tr>
<th>Activation Status</th>
<th>Trigger for Communications / Notifications</th>
<th>Contact Groups (in Priority Order)</th>
<th>Method</th>
<th>Message Code</th>
<th>Message Text</th>
</tr>
</thead>
</table>
| **Alert 1**       | Cyclone forecast for the Herberton region with torrential rain and subsequent flooding likely. | Population At Risk (PAR) | Phone (Voice Message) via:  
  • Early Warning Network system subscribed to by TRC;  
  • Direct telephone call | | Tablelands Regional Council wish to inform you that a cyclone is forecast to affect the Herberton region in the coming days. Torrential rain is likely and Tablelands Regional Council advises you to consider evacuating your property to higher ground or risk access to your property being cut off. For more information tune into local radio or call Tablelands Regional Council on 1300 362 242.  
Cyclone forecast to affect Herberton region in coming days. Consider evacuation or risk access to your property being cut off. More info: local radio, TRC 1300 362 242 |
| **Alert 2**       | Loss of remote monitoring communications | PAR (all) | Phone (Voice Message) via:  
  • Early Warning Network system subscribed to by TRC;  
  • Direct telephone call | | This is a Flash Flood Watch and Act message from Tablelands Regional Council. Radio signal to monitoring equipment at the Wild River Dam has been lost. Heavy rainfall may have led to rises in the Wild River Dam. If you experience rapidly rising water levels, collect your evacuation kit and move to a place of safety on higher ground. For more information tune into local radio or call Council on 1300 362 242.  
Heavy rainfall has led to rapid rises in the Wild River Dam. If you experience rapidly rising water levels, collect your evacuation kit and move to a place of safety on higher ground. For more information tune into local radio or call Council on 1300 362 242. |
| Lean Forward      | Not Applicable    | Not Applicable        | Not Applicable | Not Applicable | Not Applicable |
| **Stand Up 1**    | Storage water level above 1048.1 m AHD (1500 mm over the spillway). | PAR (all) | Phone (Voice Message) via:  
  • Early Warning Network system subscribed to by TRC;  
  • State-wide EA system | | Emergency this is an important message from Tablelands Regional Council. Heavy rainfall has led to rapid rises in the Wild River Dam. Water height has now exceeded 1048.1 metres AHD. The critical height for the Wild River Dam is 1050.15 metres AHD (Crest Level). Please prepare for evacuation and await further instruction. For more information tune into local radio or call TRC on 1300 362 242.  
Heavy rain has led to rapid rises in Wild River Dam. Water is now 2m below crest. Be prepared to evacuate. More info: local radio, TRC 1300 362 242. |
| **Stand Up 2**    | Storage water level above 1049.1 m AHD (2500 mm over the spillway). | PAR (all) | Phone (Voice Message) via:  
  • Early Warning Network system subscribed to by TRC;  
  • State-wide EA system | | Emergency this is an important message from Tablelands Regional Council. Heavy rainfall has led to rapid rises in the Wild River Dam. Water height has now exceeded 1049.1 metres AHD. The critical height for the Wild River Dam is 1050.15 metres AHD (Crest level). Please collect your evacuation kit and move to a place of safety on higher ground. For more information tune into local radio or call Tablelands Regional Council on 1300 362 242.  
Heavy rain has led to rapid rises in Wild River Dam. Water is now 1m below crest. Evacuate to higher ground NOW. More info: local radio, TRC 1300 362 242. |
<p>| <strong>Stand Up 3</strong>    | No communications or notifications required at this trigger as evacuation should have already been undertaken. | | | | |
| <strong>Stand Down</strong>    | Storage water level dropping to below 1046.9 m AHD (300 mm over the spillway). | PAR (each of the evacuated groups) | EAP Officer to contact via phone following consultation with MWW and LDC. | | We would like to advise the evacuated groups that the emergency has ended and thank you for your cooperation. |</p>
<table>
<thead>
<tr>
<th>Activation Status</th>
<th>Trigger for Communications / Notifications</th>
<th>Contact Groups (in Priority Order)</th>
<th>Method</th>
<th>Message Code</th>
<th>Message Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of Radio Signal</td>
<td>Loss of communications and high risk of increasing level over spillway.</td>
<td>EAP Officer to contact via phone.</td>
<td>MWW</td>
<td>I am advising you that each of the evacuated group has been contacted and advised that the emergency has ended.</td>
<td></td>
</tr>
</tbody>
</table>
| (Telemetry)               |                                            |                                   |                    |              | Emergency Emergency this is an important message from Tablelands Regional Council. Radio signal to monitoring equipment at the Wild River Dam has been lost. Heavy rainfall has led to rapid rises in the Wild River Dam. Assume worst case scenario as a precaution. Please collect your evacuation kit and move to a place of safety on higher ground. For more information tune into local radio or call Tablelands Regional Council on 1300 362 242.  
Radio signal to monitoring equipment at Wild River Dam lost. Heavy rain has led to rapid rises in Wild River Dam. Assume worst as a precaution. Evacuate to higher ground NOW. More info: local radio, TRC 1300 362 242. |
7.3 EARTHQUAKE

An earthquake may result in damage to the dam including but not limited to:
- deformation of the spillway
- deformation of the embankment
- landslide into the dam.

An earthquake-induced failure of the dam can occur when the storage level is at or below FSL, and when the dam is spilling.

In many cases there will be no warning and hence no Alert or Lean Forward level. The recently installed CCTV camera at the dam allows remote monitoring of the dam and appropriate escalation of the EAP activation.

In the situation where an earth tremor may cause a deformation of the spillway and/or embankment and/or a landslide into the dam there is no automated early warning system. The only immediate method of detection (other than being within the zone of tremor and feeling it) at present would be if the SCADA or CCTV system was being monitored during the event or if personnel were on site at that time.

Travel time of the failure wave from the dam to the first PAR is less than 10 minutes.

Earthquake alerts when received by the LDC and passed on to the EAP Officer. If an earthquake is felt in the region, a visual check of the dam is to be undertaken immediately via the CCTV camera. The dam is to be inspected by the EAP Officer at the earliest possible time. Should this inspection identify any changes to the dam or signs of potential failure, further inspection is to be undertaken by the Manager Water and Waste and/or a Dam Safety Consultant.

7.3.1 Preventative actions for an Earthquake Event:

- Routine inspections of the dam to identify any indications that there is an increased likelihood of failure following an earthquake.
- Public awareness of the evacuation plan.
- Initial EAP training and continuing annual EAP refresher training and annual Scenario Event exercises organised by MWW.
- Issue individual Evacuation Plans to PAR affected by a Sunny Day Failure, and in particular to each house visited explain:
   - What to do.
   - Where to go.
   - When.
- Ensure that all identified PAR are aware of the implications of a Sunny Day Failure event, how they may be affected, where they (as individual groups) are to go and what they have to do at short notice if notified to evacuate.
- If updated, the relevant section(s) of the EAP sent to each holder of a controlled copy of this EAP.
- Contact details in the EAP confirmed, and if necessary updated, each year by 1 September for all PAR affected by a Sunny Day Failure.
- Ensure all identified PAR are signed-up for the Early Warning Network service with TRC which provides voice, SMS and email messaging.
Figure 10: Earthquake Flowchart

Alert
Earthquake reported or felt in the area.
Intensity < SMMI AND No changes detected during surveillance inspection.

EAP Officer:
- Notify MWW
- Visual check of CCTV
- Inspect (dam, spillway and embankment), assess, monitor and inform MWW
- Report to MWW
- Record data and log book entry

MWW:
- Notify LDC

LDC:
- Coordinate the response and implement the disaster management plans as required
- Notify PAR

Has the risk been reduced?
Yes
STAND DOWN
Risk significantly mitigated
No

Lean Forward
Earthquake reported or felt in the area.
Intensity > SMMI OR Changes detected during surveillance inspection.

EAP Officer:
- As per previous activation status
- Notify MWW of change of EAP activation status.
- Inspect, assess, monitor and maintain communication with MWW
- Continue/start remedial action and/or load reduction if directed

MWW:
- Notify LDC and inform evacuation may be required
- Inspect, assess and determine available timeframe for potential/continuing remedial works and/or load reduction, if practical.
- Notify GMIS and CEO that emergency situation has developed.

LDC:
- Coordinate the response and implement the disaster management plans as required
- Notify PAR

Has the risk been reduced?
Yes
No

Stand Up
Earthquake reported or felt in the area AND Failure in progress or likely, increased seepage

EAP Officer:
- As per previous activation status
- Relocate to safe ground, continue observing situation and reporting to MWW

MWW:
- As per previous activation status
- Notify 000 that evacuation is required
- Notify LDC evacuation is required
- Notify GMIS and CEO that emergency situation has further developed.

LDC:
- Coordinate response operations / implement plans and ensure evacuations are conducted as required.
- Notify PAR

Has the risk been reduced?
Yes
No

No
### Table 4: Earthquake Event – Emergency Action Table

<table>
<thead>
<tr>
<th>Activation Status</th>
<th>Alert</th>
<th>Lean Forward</th>
<th>Stand Up</th>
<th>Stand Down</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Activation Trigger</strong></td>
<td>Earthquake reported or felt in area. Intensity less than 5MMI And No changes detected during surveillance inspection</td>
<td>Earthquake reported or felt in area. Intensity greater than or equal to 5MMI And Changes detected during surveillance inspection</td>
<td>Earthquake reported or felt in the area And Failure in progress or likely, increased seepage</td>
<td>Risk assessment has determined that failure risk has reduced</td>
</tr>
<tr>
<td><strong>Actions: by whom &amp; what</strong></td>
<td><strong>EAP Officer:</strong> 1. Notify MWW 2. Visual Check of CCTV 3. Inspect the dam, spillway and embankment, assess, monitor and inform MWW. 4. Report to MWW 5. Record data and log book entry</td>
<td><strong>EAP Officer:</strong> 1. As per previous activation status 2. Notify MWW of change of EAP activation status. 3. Inspect, assess, monitor and maintain communication with MWW. 4. Continue / start remedial action and / or load reduction if directed.</td>
<td><strong>EAP Officer:</strong> 1. As per previous activation status 2. Relocate to safe ground, continue observing situation and relaying information to MWW.</td>
<td><strong>EAP Officer:</strong> 1. Forward event report to MWW 2. Return to scheduled inspection regime 3. After the event transfer all data from the event to the Storage Data Book.</td>
</tr>
<tr>
<td><strong>MWW:</strong> 1. Notify LDC</td>
<td><strong>MWW:</strong> 1. As per previous activation status 2. Inspect, assess and determine available timeframe for potential / continuing remedial works and/or load reduction, if practical. 3. Notify LDC evacuation may be required, and direct to Notify the PAR 4. Notify GMIS and CEO that emergency situation has developed.</td>
<td><strong>MWW:</strong> 1. As per previous activation status 2. Notify 000 that evacuation is required. 3. Notify LDC evacuation is required. 4. Notify GMIS and CEO that emergency situation has further developed.</td>
<td><strong>MWW:</strong> 1. Authorise notification of residents that event is over and deactivate the EAP. 2. Prepare EER. 3. Remedial works undertaken to significantly mitigate risk.</td>
<td></td>
</tr>
<tr>
<td><strong>LDC:</strong> 1. Coordinate the response and implement the disaster management plans as required.</td>
<td><strong>LDC:</strong> 1. Coordinate the response and implement the disaster management plans as required. 2. Notify PAR</td>
<td><strong>LDC:</strong> 1. Coordinate the response and implement the disaster management plans as required. 2. Notify PAR</td>
<td><strong>LDC:</strong> 1. Coordinate the response and implement the disaster management plans as required.</td>
<td></td>
</tr>
<tr>
<td><strong>Notifications: by whom &amp; to whom</strong></td>
<td><strong>EAP Officer:</strong> 1. MWW</td>
<td><strong>EAP Officer:</strong> 1. MWW</td>
<td><strong>EAP Officer:</strong> 1. Emergency services (000) 2. MWW</td>
<td><strong>EAP Officer:</strong> 1. MWW 2. PAR</td>
</tr>
<tr>
<td><strong>LDC:</strong></td>
<td><strong>LDC:</strong> 1. PAR</td>
<td><strong>LDC:</strong> 1. PAR</td>
<td><strong>LDC:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>CEO:</strong></td>
<td><strong>CEO:</strong> 1. Mayor</td>
<td><strong>CEO:</strong> 1. Mayor</td>
<td><strong>CEO:</strong> 1. Mayor</td>
<td></td>
</tr>
</tbody>
</table>

Note: - Actions are numbered in order of priority.
<table>
<thead>
<tr>
<th>Activation Status</th>
<th>Trigger for Communications / Notifications</th>
<th>Contact Groups (in Priority Order)</th>
<th>Method</th>
<th>Message Code</th>
<th>Message Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alert</td>
<td>Earthquake reported or felt in area. Intensity less then 5MMI And No changes detected during surveillance inspection</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Lean Forward</td>
<td>Earthquake reported or felt in area. Intensity greater than or equal to 5MMI OR Changes detected during surveillance inspection</td>
<td>PAR</td>
<td>Phone (Voice Message) via: • Early Warning Network system subscribed to by TRC; • State-wide EA system</td>
<td>Emergency Emergency this is an important message from Tablelands Regional Council. Stability issues have been identified at Wild River Dam which may result in failure and rapid flooding. Please prepare your evacuation kit and identify a place of safety on higher ground. Be prepared to evacuate at short notice. For more information tune into local radio or call TRC on 1300 362 242. Stability issues at Wild River Dam. May lead to dam failure and rapid flooding. Be prepared to evacuate. More info on local radio or TRC on 1300 362 242.</td>
<td></td>
</tr>
<tr>
<td>Stand Up</td>
<td>Earthquake reported or felt in the area And Failure in progress or likely, increased seepage</td>
<td>PAR</td>
<td>Phone (Voice Message) via: • Early Warning Network system subscribed to by TRC; • State-wide EA system</td>
<td>Emergency Emergency this is an important message from Tablelands Regional Council. The Wild River dam has suffered an extreme failure. Rapid flooding is imminent. Please collect your evacuation kit and move to a place of safety on higher ground immediately. This situation poses a significant threat to life and property. Your safety is in jeopardy if you do not act now. For more information tune into local radio or call Tablelands Regional Council on 1300 362 242. Wild River Dam has FAILED. Rapid flooding is imminent. Significant threat to life. EVACUATE to high ground NOW. More info: local radio, TRC 1300 362 242.</td>
<td></td>
</tr>
<tr>
<td>Stand Down</td>
<td>Risk assessment has determined that failure risk has reduced</td>
<td>PAR (each of the evacuated groups)</td>
<td>EAP Officer to contact via phone</td>
<td>We would like to advise the evacuated groups that the emergency has ended and thank you for your cooperation.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>MWV LDC</td>
<td>EAP Officer to contact via phone.</td>
<td>I am advising you that each of the evacuated group has been contacted and advised that the emergency has ended.</td>
<td></td>
</tr>
</tbody>
</table>
7.4 TERRORIST OR HIGH ENERGY IMPACT

A terrorist threat, or activity, could increase the likelihood of dam failure through a high energy impact (non-natural events), or deliberate, accidental or vandalism actions against the dam structure.

The approach of this plan is to monitor any threat or damage remotely until the threat is abated and it is safe to inspect the dam to identify any potential damage.

Travel time of the failure wave from the dam to the first PAR is less than 10 minutes. Therefore, evacuation is advised should any damage be suspected.

The recent installation of remote monitoring equipment at the dam provides a significant improvement in the ability to monitor the dam for potential damage without accessing the dam itself. The available remote monitoring equipment includes a CCTV camera that can be remotely operated to zoom into the dam embankment, spillway, v-notch weir, and dam access. Additionally, dam water levels are now monitored via three separate mechanisms with data transmitted via the SCADA system and via the 3G/4G network.

7.4.1 Preventative actions for Terrorism or High Energy Impact:

- Public awareness of the evacuation plan.
- Initial EAP training and continuing annual EAP refresher training and annual Scenario Event exercises organised by MWW.
- Issue individual Evacuation Plans to PAR affected by a Sunny Day Failure, and in particular to each house visited explain:
  - What to do.
  - Where to go.
  - When.
- Ensure that all identified PAR are aware of the implications of a Sunny Day Failure event, how they may be affected, where they (as individual groups) are to go and what they have to do at short notice if notified to evacuate.
- If updated, the relevant section(s) of the EAP sent to each holder of a controlled copy of this EAP.
- Contact details in the EAP confirmed, and if necessary updated, each year by 1 September for all PAR affected by a Sunny Day Failure.
- Ensure all identified PAR are signed-up for the Early Warning Network service with TRC which provides voice, SMS and email messaging.
Lean Forward
Terrorist threat OR activity observed

EAP Officer:
• Notify Police on 000
• Notify QPS Counter Terrorism Liaison Officer
• Notify National security hotline
• Notify MWW and LDC
• Monitor situation remotely via CCTV
• When deemed safe by Police, inspect dam under Police escort.
• Photo record
• Log book record

MWW:
• Notify GMIS and CEO that emergency situation has developed.

LDC:
• Coordinate the response and implement the disaster management plans as required

Has the risk been reduced?

Stand Up
Explosion, terrorist action or high energy impact observed at dam

EAP Officer:
• As per previous activation level
• Notify Police on 000 that evacuation is required

MWW:
• Notify GMIS and CEO that emergency situation has further developed.

LDC:
• Coordinate the response and implement the disaster management plans as required.
• Notify PAR

Has the risk been reduced?

STAND DOWN
Risk significantly mitigated

Figure 11: Terrorism or High Energy Impact Flowchart
<table>
<thead>
<tr>
<th>Activation Status</th>
<th>Alert</th>
<th>Lean Forward</th>
<th>Stand Up</th>
<th>Stand Down</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activation Trigger</td>
<td>Not Applicable</td>
<td>Possible terrorist activity observed or threat received</td>
<td>Explosion, terrorist action or high energy impact observed at dam</td>
<td>Risk assessment performed and risk deemed to be removed</td>
</tr>
</tbody>
</table>

**Actions: by whom & what**

**EAP Officer:**
1. Notify Police on 000
2. Notify QPS Counter Terrorism Liaison Officer
3. Notify National Security Hotline
4. Notify MWW
5. Monitor situation remotely via CCTV
6. When deemed safe by Police, inspect dam under Police escort.
7. Photo record
8. Log book record

**MWW:**
1. Notify GMIS and CEO that emergency situation has developed.
2. Notify LDC

**LDC:**
1. Coordinate the response and implement the disaster management plans as required.

**Notifications: by whom & to whom**

**EAP Officer:**
1. Emergency services (000)
2. QPS Counter Terrorism Liaison Officer
3. National security hotline on 1800 123 400
4. MWW

**MWW:**
1. Notify GMIS and CEO that emergency situation has further developed.
2. Notify LDC

**LDC:**
1. Coordinate the response and implement the disaster management plans as required.
2. Notify PAR

**CEO:**
1. Mayor

**Notifications: by whom & to whom**

**EAP Officer:**
1. Emergency services (000)
2. QPS Counter Terrorism Liaison Officer
3. National security hotline on 1800 123 400
4. MWW

**MWW:**
1. Police Communication Centre, Cairns
2. LDC
3. GMIS
4. CEO
5. Councillor for division
6. DDS (DNRME)

**LDC:**
1. PAR

**CEO:**
1. Mayor
Table 9: Terrorist or high energy impact - Communication Table

<table>
<thead>
<tr>
<th>Activation Status</th>
<th>Trigger for Communications / Notifications</th>
<th>Contact Groups (in Priority Order)</th>
<th>Method</th>
<th>Message Code</th>
<th>Message Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alert</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Lean Forward</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>
| Stand Up          | Explosion, terrorist action or high energy impact observed at dam | PAR                                | Phone (Voice Message) via:  
  - Early Warning Network system subscribed to by TRC;  
  - State-wide EA system | Not Applicable | Emergency Emergency this is an important message from Tablelands Regional Council. The Wild River Dam has suffered an extreme failure. Rapid flooding is imminent. Please collect your evacuation kit and move to a place of safety on higher ground immediately. This situation poses a significant threat to life and property. Your safety is in jeopardy if you do not act now. For more information tune into local radio or call Tablelands Regional Council on 1300 362 242. Wild River Dam has FAILED. Rapid flooding is imminent. Significant threat to life. EVACUATE to high ground NOW. More info: local radio, TRC 1300 362 242. |
| Stand Down        | Remedial works completed and risk of failure drops significantly. | PAR (each of the evacuated groups) | EAP Officer to contact via phone | We would like to advise the evacuated groups that the emergency has ended and thank you for your cooperation. |
|                   |                                           | MWW LDC                            | EAP Officer to contact via phone | I am advising you that each of the evacuated group has been contacted and advised that the emergency has ended. |
7.5 SUNNY DAY FAILURE

A “Sunny Day” failure is defined as failure of the dam and the release of water downstream, when there is low or no inflow to the dam from rainfall events. This type of dam failure is unexpected and can occur with little or no warning.

A “Sunny Day” failure may be as a result of any or a combination of the following:

- Embankment stability issues: increased seepage, new visible signs of seepage and particularly evidence of sediment transport (i.e. cloudy flow) as this can be an indication of piping.
- Signs of distress in embankment such as cracking and/or deformation and/or evidence of material having slid off embankment.
- Appearance of sinkholes, soft spots and ‘boggy areas’
- abnormal instrument readings (piezometers indicating higher hydrostatic pressures)
- differential movement or settlement
- increasing rates of seepage or development of new seepage paths
- piping of the embankment
- Earthquakes and Landslides.
- Terrorist or high energy impact (non-natural events), including deliberate, accidental or vandalism actions against the dam structure.

Actions for earthquake events and terrorism are outlined in Sections 7.3 and 7.4. This section outlines actions and communications for all other potential Sunny Day Failure events.

The recent installation of remote monitoring equipment at the dam including a CCTV camera allowing remote visual inspection of the condition of the dam and the seepage flow over the v-notch weir seeks to improve the EAP activation and escalation process. However, in many of these cases there will be no warning and hence no Alert or Lean Forward level, with immediate escalation to Stand Up with associated warnings and evacuations. This is particularly important as travel time of the failure wave from the dam to the first PAR is less than 10 minutes.

The dam is inspected weekly for signs of structural defects and increased seepage. The likelihood of this type of failure is lessened with good management practices. However if during an inspection increased seepage/changes in turbidity of seepage was observed and verified then the procedures detailed in the following tables would be followed including inspection by an RPEQ.

7.5.1 Preventative actions for a Sunny Day Failure Event:

- Routine inspections of the dam to identify any indications that there is an increased likelihood of failure.
- Public awareness of the evacuation plan.
- Initial EAP training and continuing annual EAP refresher training and annual Scenario Event exercises organised by MWW.
- Issue individual Evacuation Plans to PAR affected by a Sunny Day Failure, and in particular to each house visited explain:
  - What to do.
  - Where to go.
  - When.
- Ensure that all identified PAR are aware of the implications of a Sunny Day Failure event, how they may be affected, where they (as individual groups) are to go and what they have to do at short notice if notified to evacuate.
• If updated, the relevant section(s) of the EAP sent to each holder of a controlled copy of this EAP.

• Contact details in the EAP confirmed, and if necessary updated, each year by 1 September for all PAR affected by a Sunny Day Failure.

• Ensure all identified PAR are signed-up for the Early Warning Network service with TRC which provides voice, SMS and email messaging.
Figure 12: Sunny Day Failure Flowchart
<table>
<thead>
<tr>
<th>Activation Status</th>
<th>Alert</th>
<th>Lean Forward</th>
<th>Stand Up</th>
<th>Stand Down</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Activation Trigger</strong></td>
<td>Identification during routine inspection of initial signs of embankment distress such as cracks. OR Abnormal seepage increases / changes in turbidity of seepage: around the outlet works and potentially via pathways through dam wall.</td>
<td>Cracking becoming significant to the point where stability may be starting to be impaired. OR Seepage rate begins to further increase / or further increases in turbidity of seepage.</td>
<td>Loads on embankment increasing or cracking deformation or seepage is increasing to a state where the safety of the dam is significantly impaired.</td>
<td>Remedial works completed and risk of failure drops significantly.</td>
</tr>
<tr>
<td><strong>Actions: by whom &amp; what</strong></td>
<td><strong>EAP Officer:</strong> 1. Notify MWW that EAP has been enacted and maintain communications. 2. Inspect, assess, monitor and inform MWW. 3. Undertake or supervise remedial action if directed.</td>
<td><strong>EAP Officer:</strong> 1. Notify MWW of change of EAP activation status and maintain communications. 2. Inspect, assess, monitor and maintain communication with MWW. 3. Continue / start remedial action and / or load reduction if directed.</td>
<td><strong>EAP Officer:</strong> 1. Notify MWW of change of EAP activation status. 2. Relocate to safe ground, continue observing situation and relaying information to MWW.</td>
<td><strong>EAP Officer:</strong> 1. Notify MWW that remedial works have been completed and risk of failure has dropped significantly. 2. On the Lag of Events / Actions Sheet and the Record of communications Sheet keep a daily running record of all actions / events and telephone calls to and from the MWW, Backup EAP Officers and other personnel. 3. After the event compile an Emergency Event Report and forward unedited copies to the MWW. 4. After the event transfer all data from the event to the Storage Data Book.</td>
</tr>
<tr>
<td><strong>EAP Officer:</strong> 1. Notify LDC, GMIS and CEO if deemed necessary</td>
<td><strong>MWW:</strong> 1. Inspect and determine level of risk of failure (storage level, inflow, seepage, etc.) 2. Determine available timeframe for potential remedial works, if practical. 3. Determine if load reduction is required and / or possible. 4. Notify LDC, GMIS and CEO if deemed necessary</td>
<td><strong>MWW:</strong> 1. Inspect, assess and determine available timeframe for potential / continuing remedial works and/or load reduction, if practical. 2. Notify LDC evacuation may be required. 3. Notify GMIS and CEO that emergency situation has developed.</td>
<td><strong>MWW:</strong> 1. Notify 000 that evacuation is required. 2. Notify LDC evacuation is required. 3. Notify GMIS and CEO that emergency situation has further developed.</td>
<td><strong>MWW:</strong> 1. Authorise notification of residents that event is over and deactivate the EAP. 2. Prepare EER. 3. Remedial works undertaken to significantly mitigate risk.</td>
</tr>
<tr>
<td><strong>LDC:</strong> 1. Coordinate the response and implement the disaster management plans as required.</td>
<td><strong>LDC:</strong> 1. Coordinate the response and implement the disaster management plans as required.</td>
<td><strong>LDC:</strong> 1. Coordinate the response and implement the disaster management plans as required.</td>
<td><strong>LDC:</strong> 1. Coordinate the response and implement the disaster management plans as required.</td>
<td></td>
</tr>
<tr>
<td><strong>Notifications: by whom &amp; to whom</strong></td>
<td><strong>EAP Officer:</strong> 1. MWW</td>
<td><strong>EAP Officer:</strong> 1. MWW</td>
<td><strong>EAP Officer:</strong> 1. MWW</td>
<td><strong>EAP Officer:</strong> 1. MWW 2. PAR</td>
</tr>
<tr>
<td><strong>EAP Officer:</strong> 1. MWW 2. PAR</td>
<td><strong>LDC:</strong> 1. PAR</td>
<td><strong>LDC:</strong> 1. PAR</td>
<td><strong>LDC:</strong> 1. PAR</td>
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</tr>
<tr>
<td><strong>LDC:</strong> 1. PAR</td>
<td><strong>EAP Officer:</strong> 1. MWW</td>
<td><strong>EAP Officer:</strong> 1. MWW</td>
<td><strong>EAP Officer:</strong> 1. MWW 2. PAR</td>
<td></td>
</tr>
<tr>
<td><strong>CEO:</strong> 1. Mayor</td>
<td><strong>EAP Officer:</strong> 1. MWW</td>
<td><strong>EAP Officer:</strong> 1. MWW</td>
<td><strong>EAP Officer:</strong> 1. MWW 2. PAR</td>
<td></td>
</tr>
<tr>
<td><strong>CEO:</strong> 1. Mayor</td>
<td><strong>LDC:</strong> 1. PAR</td>
<td><strong>LDC:</strong> 1. PAR</td>
<td><strong>LDC:</strong> 1. PAR</td>
<td></td>
</tr>
<tr>
<td><strong>CEO:</strong> 1. Mayor</td>
<td><strong>EAP Officer:</strong> 1. MWW</td>
<td><strong>EAP Officer:</strong> 1. MWW</td>
<td><strong>EAP Officer:</strong> 1. MWW 2. PAR</td>
<td></td>
</tr>
</tbody>
</table>

**Table 6: Sunny Day Failure Event – Emergency Action Table**

**Note:** Actions are numbered in order of priority.
Table 7: Sunny Day Failure - Communication Table

<table>
<thead>
<tr>
<th>Activation Status</th>
<th>Trigger for Communications / Notifications</th>
<th>Contact Groups (in Priority Order)</th>
<th>Method</th>
<th>Message Code</th>
<th>Message Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alert</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Phone (Voice Message) via:</td>
<td>Not Applicable</td>
<td>Emergency this is an important message from Tablelands Regional Council. Stability issues have been identified at Wild River Dam which may result in failure and rapid flooding. Please prepare your evacuation kit and identify a place of safety on higher ground. Be prepared to evacuate at short notice. For more information tune into local radio or call TRC on 1300 362 242. <strong>Stability issues at Wild River Dam. May lead to dam failure and rapid flooding. Be prepared to evacuate. More info on local radio or TRC on 1300 362 242.</strong></td>
</tr>
<tr>
<td>Lean Forward</td>
<td>Cracking becoming significant to the point where stability may be starting to be impaired. OR Seepage rate begins to further increase or further increases in turbidity of seepage.</td>
<td>PAR</td>
<td>Early Warning Network system subscribed to by TRC; State-wide EA system</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stand Up</td>
<td>Loads on embankment increasing or cracking / deformation or seepage is increasing to a state where the safety of the dam is significantly impaired.</td>
<td>PAR</td>
<td>Early Warning Network system subscribed to by TRC; State-wide EA system</td>
<td></td>
<td>Emergency this is an important message from Tablelands Regional Council. The Wild River dam has suffered an extreme failure. Rapid flooding is imminent. Please collect your evacuation kit and move to a place of safety on higher ground immediately. This situation poses a significant threat to life and property. Your safety is in jeopardy if you do not act now. For more information tune into local radio or call Tablelands Regional Council on 1300 362 242. <strong>Wild River Dam has FAILED. Rapid flooding is imminent. Significant threat to life. EVACUATE to high ground NOW. More info: local radio, TRC 1300 362 242.</strong></td>
</tr>
<tr>
<td>Stand Down</td>
<td>Remedial works completed and risk of failure drops significantly.</td>
<td>PAR (each of the evacuated groups)</td>
<td>EAP Officer to contact via phone</td>
<td></td>
<td>We would like to advise the evacuated groups that the emergency has ended and thank you for your cooperation.</td>
</tr>
</tbody>
</table>

MWW LDC
EAP Officer to contact via phone. I am advising you that each of the evacuated group has been contacted and advised that the emergency has ended.
7.6 RESERVOIR WATER QUALITY (TOXIC SPILL/ ALGAL BLOOM WITHIN CATCHMENT AREA)

Any water quality contamination events are covered under Tablelands Regional Council’s Drinking Water Quality Management Plan which includes the Herberton Water Supply Scheme. As the Dam is not open to the public for recreational use, there is no need to include a water quality contamination event as part of this document.

8. WARNINGS AND NOTIFICATIONS

8.1 WARNING AND NOTIFICATION MECHANISMS

The owner of the dam is responsible for issuing emergency warnings to the Population at Risk (PAR). Locally this is undertaken in collaboration with the Local Disaster Coordinator (LDC) who will issue the notification and warning messages to the affected PAR.

Four (4) key options are available for notification and warning of the PAR:
- An alert via the Early Warning Network system subscribed to by TRC;
- An alert via the State-wide Emergency Alert (EA) system;
- Media releases / public announcements; or
- Direct contact i.e. door-knocking (if possible).

The Early Warning Network (EWN) is an opt-in system. This means that residents can sign up to be included in the system to be added to a Wild River Dam PAR group within TRC’s system. However, as the intended use of contact information is to protect public safety, TRC have opted to include the PAR contacts in an additional distribution system, updated by TRC regardless of whether the individuals have ‘opted in’. Prior to 1 September each year, pre-wet season communications is provided to all affected PAR. A warning using this system can be sent directly by the LDC and generally takes around 20 minutes to set up.

The State-wide EA system alerts all landline and mobiles located within a spatial polygon at a point in time. A warning using this system generally takes around 10 minutes for the LDC to organise and then it has a lead time of approximately 30 minutes before the warning is delivered as the message has to be approved and sent by the State. This has to be factored into the available evacuation time.

Direct contact (i.e. door knocking) may be quicker in some instances, if police or SES are located near the PAR.

However, in utilising these warning systems, it is important to note that these warning mechanisms may not provide effective warning to all PAR as:
- the access to the first 2 properties with PAR will be cut during event minor flood events;
- the travel time for a failure wave from the dam to the first 2 properties with PAR is less than 10 minutes; and
- the travel time for a failure wave from the dam to Herberton and Wondecla is in the order of 1-1.5 hours and 2-2.5 hours, respectively.

8.2 WARNING AND NOTIFICATION PROCESSES

If a notification or warning is required to be sent to affected PAR, the process is to contact the LDC and make the request. Both the Early Warning Network and the State-wide EA system will be used to send out one of the pre-prepared messages in the following sections.
A pre-created EA polygon map and the text of these messages have been pre-lodged with the SDCC watch desk and will be activated by the LDC.

In late 2018, TRC installed a series of remote monitoring equipment at the dam. This allows remote electronic dam water level monitoring, rain gauge monitoring and seepage monitoring. TRC continues to investigate the feasibility of utilising this equipment to trigger an automated alarm at a pre-set sequence of events should the Wild River dam should show signs of a pending failure or overtopping. However, at present an automated warning system is not available for Wild River Dam.

8.3 PRE-PREPARED MESSAGES

Pre-prepared messages have been developed for SDF and Flood Events, and also in the event of loss of radio signal during either event, to advise PAR to “prepare for evacuation” or to “evacuate immediately”. VOICE, TEXT messages have been prepared for the state-wide Emergency Alert system whilst VOICE, TEXT and EMAIL messages have been prepared for the EWN.

8.3.1 Sunny Day Failure – Prepare to Evacuate

Dam Failure Possible – Prepare to Evacuate (VOICE)

Emergency Emergency this is an important message from Tablelands Regional Council. Stability issues have been identified at Wild River Dam which may result in failure and rapid flooding. Please prepare your evacuation kit and identify a place of safety on higher ground. Be prepared to evacuate at short notice. For more information tune into local radio or call TRC on 1300 362 242.

Dam Failure Possible – Prepare to Evacuate (TEXT)

Stability issues at Wild River Dam. May lead to dam failure and rapid flooding. Be prepared to evacuate. More info on local radio or TRC on 1300 362 242.

8.3.2 Sunny Day Failure – Evacuate Now

Dam Failure – Evacuate Now (VOICE)

Emergency Emergency this is an important message from Tablelands Regional Council. The Wild River dam has suffered an extreme failure. Rapid flooding is imminent. Please collect your evacuation kit and move to a place of safety on higher ground immediately. This situation poses a significant threat to life and property. Your safety is in jeopardy if you do not act now. For more information tune into local radio or call Tablelands Regional Council on 1300 362 242.

Dam Failure – Evacuate Now (TEXT)

Wild River Dam has FAILED. Rapid flooding is imminent. Significant threat to life. EVACUATE to high ground NOW. More info: local radio, TRC 1300 362 242.

8.3.3 Flood Events – Prepare to Evacuate

Dam – Rainfall (Cyclone) Events – Prepare to Evacuate (VOICE)

Tablelands Regional Council wish to inform you that a cyclone is forecast to affect the Herberton region in the coming days. Torrential rain is likely and Tablelands Regional Council advise you to consider evacuating your property to higher ground or risk access to your property being cut off.

Dam - Rainfall (Cyclone) Events – Prepare to Evacuate (TEXT)

Cyclone forecast to affect Herberton region in coming days. Consider evacuation or risk access to your property being cut off. More info: local radio, TRC 1300 362 242
EMERGENCY ACTION PLAN
Wild River Dam

Dam - Rainfall Events – Prepare to Evacuate (VOICE)

Emergency Emergency this is an important message from Tablelands Regional Council.
Heavy rainfall has led to rapid rises in the Wild River Dam. Water height has now exceeded 1048.1
metres AHD. The critical height for the Wild River Dam is 1050.15 metres AHD (Crest Level).
Please prepare for evacuation and await further instruction. For more information tune into local
radio or call TRC on 1300 362 242.

Dam - Rainfall Events – Prepare to Evacuate (TEXT)

Heavy rain has led to rapid rises in Wild River Dam. Water is now 2m below crest. Be prepared to

8.3.4  Flood Events – Evacuate Now

Dam - Rainfall Events – Evacuate Now (VOICE)

Emergency Emergency this is an important message from Tablelands Regional Council. Heavy
rainfall has led to rapid rises in the Wild River Dam. Water height has now exceeded 1049.1 metres
AHD. The critical height for the Wild River Dam is 1050.15 metres AHD (Crest level). Please collect
your evacuation kit and move to a place of safety on higher ground. For more information tune into
local radio or call Tablelands Regional Council on 1300 362 242.

Dam - Rainfall Events – Evacuate Now (TEXT)

Heavy rain has led to rapid rises in Wild River Dam. Water is now 1m below crest. Evacuate to
higher ground NOW. More info: local radio, TRC 1300 362 242.

8.3.5  Flood Events – Loss of Radio Signal - Evacuate Now

Dam - Rainfall Events Loss of Radio Signal – Evacuate Now (VOICE)

Emergency Emergency this is an important message from Tablelands Regional Council. Radio
signal to monitoring equipment at the Wild River Dam has been lost. Heavy rainfall has led to rapid
rises in the Wild River Dam. Assume worst case scenario as a precaution. Please collect your
evacuation kit and move to a place of safety on higher ground. For more information tune into local
radio or call Tablelands Regional Council on 1300 362 242.

Dam - Rainfall Events – Evacuate Now (TEXT)

Radio signal to monitoring equipment at Wild River Dam lost. Heavy rain has led to rapid rises in
Wild River Dam. Assume worst as a precaution. Evacuate to higher ground NOW. More info: local
radio, TRC 1300 362 242.

8.4  INDIVIDUAL EVACUATION PLANS

Individual Evacuation Plans (Appendix D) have been prepared and distributed to residents at risk.
They will be advised to implement their Evacuation Plan if they are contacted by the LDC or
become aware of or suspect that an emergency event has occurred.

An annual education program that may include community meetings, door knocking and writing to
the PAR will be undertaken to ensure that residents at risk at kept aware of their risks and their
plan and are updated on any changes to the EAP. As part of this process, residents will be signed
up to Council’s Early Warning Network to receive faster information alerts and warning to evacuate.

8.5  END OF EVENT

The EAP Officer must (after receiving advice from the LDC):
Contact each of the evacuated groups and advise them that the emergency has ended, and thank them for their cooperation.

Advise MWW and LDC that each evacuated group has been contacted and advised that the emergency has ended and await further instructions.

Provide information on support available to affected residents and signposting to recovery services if required.

Debriefing and identifying lessons to improve future response operations.

9. EVENT REPORTING

9.1 STORAGE DATA BOOK

EAP Officer shall ensure that events and appropriate data are recorded in the Storage Data Book. All new entries are to be copied and forwarded to General Manager Infrastructure Services monthly.

Entries shall be a record of water levels, weather observations, inspections, actions that are carried out, telephone conversations that are related to the emergency event, and comments identifying problems and unusual events.

All entries shall be written legibly, unedited and signed by the person making the entry. Errors made shall be struck out and initialled.

The Storage Data Book shall be kept permanently in the EAP Officer work residence. It must be available on request and its location known to, EAP Backup Officers, Manager Water & Waste and General Manager Infrastructure Services.

9.2 EMERGENCY EVENT REPORT

The EAP Officer shall prepare an Emergency Event Report after each emergency event and forward it to the Manager Water and Waste within 15 days of the event.

The report shall contain (at least):

(a) A description of the event summarised from the Storage Data Book.
(b) Description of any observed damage or other consequences.
(c) Photographs.
(d) A summary of data recorded during the event and the times of these recordings such as,
   - rainfall,
   - water level within the storage, and
   - seepage flows and observations (if applicable).
(e) Details of communication which took place during the emergency.
(f) Comment on the adequacy of the Emergency Action Plan.
(g) Any recommendations or suggested changes to the Emergency Action Plan.
(h) Any further comments considered necessary.

The Manager Water and Waste shall provide a report on the event to the Director, Dam Safety within 30 days of the event.
10. **REVISION OF EVACUATION PLANS**

Each year before the end of August the Manager Water and Waste shall contact each property owner at risk of inundation to verify contact details and revise the evacuation plan in consultation with the EAP Officer and LDC. The revised plan shall be forwarded to General Manager Infrastructure Services.

The revised plan shall be forwarded to the CEO of TRC for review and acceptance. If substantive changes have been made, a formal review process in accordance with Section 352H of the Water Supply (Safety and Reliability) Act 2008 is required.

The CEO is to approve the evacuation plans. Once approved, the General Manager Infrastructure Services shall authorise postage of revised plans to each resident, or alternatively the revised plans can be hand delivered as part of the annual consultation process to alert residents.

11. **REFERENCES**

Disaster Management Act 2003

Disaster Management Regulation 2014

Emergency Action Planning for Referable Dams (DNRME, 2013)

Guidelines for Failure Impact Assessment of Water Dams (DNRME, 2012)

Queensland Dam Safety Management Guidelines (DNRM, 2002)

Tablelands Local Disaster Management Plan V5.3 (TRC, 2018)

Water Supply (Safety and Reliability) Act 2008


Wild River Dam Failure Impact Assessment Report (Sinclair Knight Merz, 2013)


Wild River Dam Seismic Hazard Assessment (Seismology Research Centre – August 2018)

Wild River Dam - Standard Operating Procedures

Wild River Dam - Storage Data Book

Workplace Health and Safety Act 2011
APPENDIX A

DATA COLLECTION
REPORT FORMAT

NATURE OF THE EVENT
Describe the event (e.g. spillway discharge, earthquake, chemical spill, etc)

COMMENCED
DATE _____ / _____ / _________
TIME ______________

FINISHED
DATE _____ / _____ / _________
TIME ______________

DESCRIPTION OF THE EVENT
Describe in your own words the lead up to and progress of the event (e.g. a spillway discharge)

Include such information as listed below:
- Weather conditions and rainfall in the catchment
- The rate of rise of the storage
- When the spillway was overtopped
- Date and time of highest level
- Briefly describe any immediate downstream damage caused by the discharge
- Include any other information considered relevant

STATISTICS
Total inflow ___________ Megalitres
Total discharge ___________ Megalitres
Capacity of storage prior to inflow ___________ %
Volume prior to inflow ___________ Megalitres
Maximum inflow ___________ Megalitres per day
Maximum discharge ___________ Megalitres per day

EVENT PROGRESS
Briefly describe the daily rate of storage rise, time to peak level, and weather conditions.

Attach copies of the Spillway Level Versus Time Graph, the Communications Record Sheet, and the Log of Events / Actions Sheet.

GENERAL COMMENTS
Include in this section any observations or comments regarding the event, such as equipment malfunctions, safety issues or any suggestions which may improve monitoring and reporting of the event.

DAMAGE REPORT
Detail any tail water damage to the embankment or stream bank in the immediate area of the dam. Attach photos.

ATTACHMENTS
- Photos / video of the event
- Spillway Level versus Time Graph
- Communications Record Sheet
- Log of Events / Action Sheet

Signed: _____________________________  Designation: _____________________________
Date: _____ / _____ / ________
### Table A - 1  
Record of Rainfall During a Flood

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Rainfall (mm)</th>
<th>Daily Total (mm)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>
Table A - 2  Storage Level Versus Time

<table>
<thead>
<tr>
<th>Time in Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>EL 1046.6 m</td>
</tr>
<tr>
<td>Full Supply Level EL 1046.6 m</td>
</tr>
<tr>
<td>Dam Crest Level EL 1050.15 m</td>
</tr>
<tr>
<td>Date</td>
</tr>
<tr>
<td>------</td>
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</tbody>
</table>
APPENDIX B

CATCHMENT BOUNDARY
EMERGENCY ACTION PLAN
Wild River Dam

Version 8: 10/09/2020
APPENDIX C

POTENTIAL PROBLEM IDENTIFICATION
<table>
<thead>
<tr>
<th>TYPE OF DEFICIENCY</th>
<th>LOOK FOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEEPAGE</td>
<td>A water flow or sand boil on the lower portion of the downstream slope or toe area, especially at the groins. Quantity/quality of drain outflows, seepage and its source(s). Location, type and extent of deteriorated concrete. Extent of moist, wet or saturated areas. Wet areas or areas where the vegetation appears greener or lusher in the toe area. An increase in the amount of water being released from toe drains or through the v-notch weirs. (Remember to take into account changes in the reservoir level.) Turbidity or cloudiness of the seepage. Any change in conditions.</td>
</tr>
<tr>
<td>INSTABILITY</td>
<td>Slides on the upstream or downstream slopes. Bulging, especially at the toe of the dam.</td>
</tr>
<tr>
<td>DEPRESSIONS</td>
<td>Misalignment in the crest and embankment slopes found by sighting along fixed points. Sinkholes found by checking and probing each depression. Remember, sinkholes have steep, bucket like sides while minor depressions have gently sloping, bowl like sides.</td>
</tr>
<tr>
<td>TYPE OF DEFICIENCY</td>
<td>LOOK FOR</td>
</tr>
<tr>
<td>---------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>MAINTENANCE CONCERNS</td>
<td>Inadequate Slope Protection: Check for bald areas or areas where the protection is sparse or damaged.</td>
</tr>
<tr>
<td></td>
<td>Surface Runoff Erosion: Check for gullies or other signs of erosion. Make sure to check the low points along the upstream and downstream shoulders and groins since surface runoff can collect in these areas.</td>
</tr>
<tr>
<td></td>
<td>Inappropriate Vegetative Growth: Check for excessive and deep rooted vegetative growth.</td>
</tr>
<tr>
<td></td>
<td>Debris: Check for debris on and around the dam, especially near outlet works or spillway inlets.</td>
</tr>
<tr>
<td></td>
<td>Animal Burrows: Check for damage caused by burrowing animals.</td>
</tr>
</tbody>
</table>

Note: This tabulation adapted from Queensland Dam Safety Management Guidelines-February 2002.

**WHEN TO GET FURTHER ASSISTANCE**

Several of the deficiencies covered above are very serious. If you observe any of the issues listed below, you should advise the Manager Water and Waste immediately:

- Sand boils or turbid seepage.
- Seepage that has increased since the last inspection (taking the reservoir level into consideration).
- Cracking that extends below the reservoir level or potential reservoir level.
- Transverse and longitudinal cracking.
- Deep seated slides or bulging associated with slides.
- Sinkholes or other large depressions.
- Deep rooted vegetation that might need to be removed.

If you are unsure whether or not a condition poses a threat to the safety of the dam, you should discuss your findings with the Manager Water and Waste.
APPENDIX D

INUNDATION MAPS, EA ALERT (SMS) POLYGON MAP, POPULATION AT RISK CONTACT DETAILS & EVACUATION PLANS
Wild River Dam PAR
SMS Alert Area
Evacuation Plans -

Previous six pages have been redacted
Evacuate away from flood extent upon notification.
Evacuate away from flood extent upon notification.
Evacuate to clearing at intersection of Moomin Rd and Atherton-Herberton Rd.
Evacuate away from flood extent upon notification.
Evacuate away from flood extent upon notification.
Evacuate away from flood extent upon notification.

Evacuate along James Rd and Longlands Gap-Herberton Rd to assemble at the end of No Name Rd.
Evacuate away from flood extent upon notification.
Evacuate away from flood extent upon notification.
Evacuate away from flood extent upon notification.
Evacuate away from flood extent upon notification.
Evacuate away from flood extent upon notification.
Evacuate away from flood extent upon notification.
Evacuate away from flood extent upon notification.
Evacuate away from flood extent upon notification.
Evacuate away from flood extent upon notification.
Wild River Dam Evacuation Advice
Probable Maximum Cascade Failure Flood Extent - Map 25

Evacuate away from flood extent upon notification.

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Evacuate away from flood extent upon notification.
APPENDIX E

WILD RIVER DAM STORAGE CURVE & STORAGE SPILLWAY DISCHARGE CURVE
EMERGENCY ACTION PLAN
Wild River Dam

Wild River Dam Storage Curve.

Wild River Dam Spillway Discharge Rating Curve

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