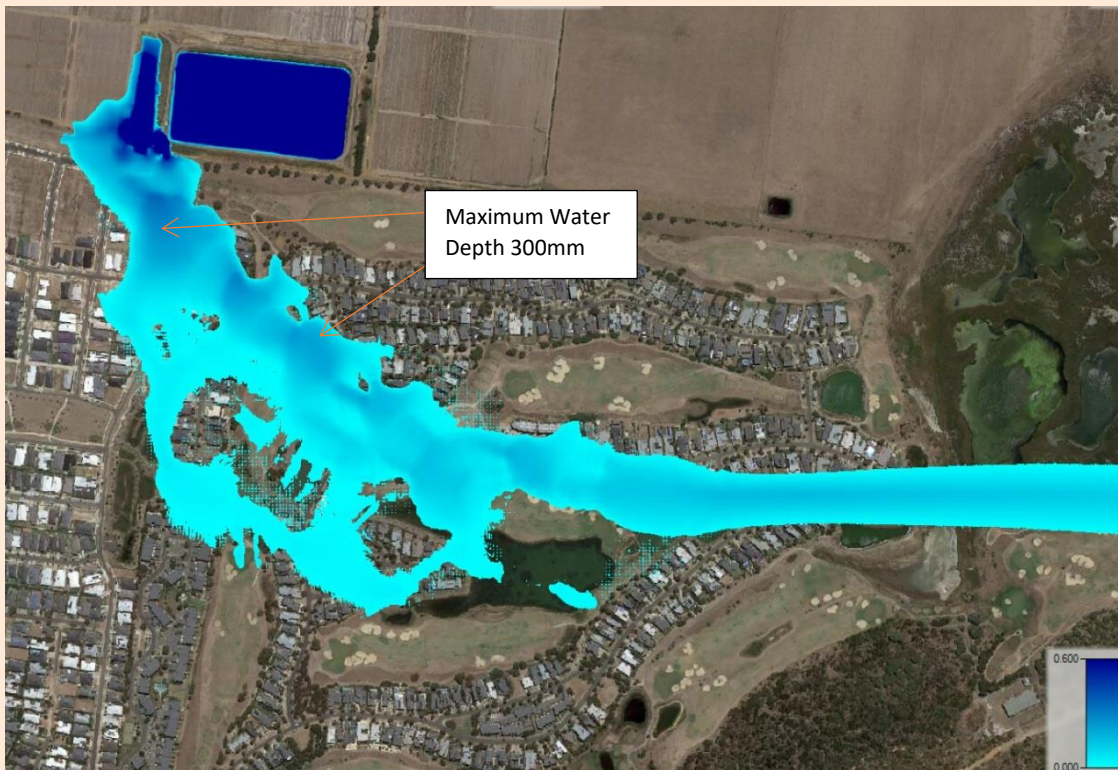




# Dam Safety Emergency Plan

Project: Torquay Farm Dam 1075 Horseshoe Bend Rd  
Report No: AGT20249-2 Rev 2

| Geotechnical Investigation and Design | Pavement Investigation and Design | Residential |  
| Earthworks Specification's, Level 1 Supervision, | Retaining Walls | Slope Stability Assessment |  
Adelaide, Queensland, Melbourne, Warrnambool



Prepared for:

Charlie Santospirito

9 July 2021

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## 1 Use of this plan

This Dam Safety Emergency Plan (DSEP) is prepared to manage foreseeable dam emergency situations that may occur at the dam. This provides recommendations on actions which could be taken by the dam operator in the case of dam emergencies.

### 1.1 Testing the DSEP

Testing is necessary to identify deficiencies and to ensure all participants are familiar with the prescribed procedures and their roles. An exercise, involving the operator and staff from appropriate agencies, should be carried out as soon as possible after the personnel have had time to familiarise themselves with their responsibilities and their particular role in the plan. Given ever-changing circumstances, staff movements and the potential to forget the roles and responsibilities, an exercise should be programmed to be undertaken regularly. The added benefit of regular exercises is the identification of necessary revisions to the document.

### 1.2 Review of the DSEP

This DSEP should be reviewed annually to assess its workability and efficiency. The plan is closely aligned with normal work procedures and therefore should be updated when personnel and responsibilities change or when there are changes in response agencies, telephone numbers or communication methods. The loose-leaf format of this plan has been adopted to allow for changes that will occur as the plan is reviewed and updated.

### 1.3 Debriefing after an incident though an After Action Review (AAR)

After every dam safety incident, an AAR should be undertaken to capture opportunities for improvement in the DSEP and to highlight changes which could be made to the Plan to improve its effectiveness. If necessary, changes to the DSEP should be made as soon as possible. Consider the concept of 'staff rides' for the responders to share with staff their reflections, learnings and human factors.

## 2 Description of this dam

### 2.1 Site access

The dam is located at 1075 Horseshoe Bend Road, Torquay VIC.

Normal access to the Dam is from:

- 1075 Horseshoe Bend Road Torquay VIC and
- It can be also accessed by Pintail Drive Torquay.

Access from Horseshoe Bend Rd is preferred in a dam break scenario as the ground elevation is higher and less likely to be flooded. Also after construction of houses on Pintail Drive the access may be impeded.

During an emergency situation, if there are gates and fences around the dam, access to the dam site beyond the entrance gate should be restricted to essential personnel only. For the safety of the community, Victorian Police should be asked to restrict general public access to the dam embankment.

### 2.2 Summary of previous dam safety issues

An incident was reported in October 2020. Over the weekend 2-4 October 2020, Southern Rural Water (SRW) assisted Emergency Services and Surf Coast Shire in the response to reports of water flowing across backyards of a property on Pintail Drive, Torquay. An emergency incident was declared on Friday evening, 2 October 2020 and the decision was taken to evacuate nearby properties in the early hours of Saturday 3 October. SRW assigned officers, engineers, dam safety specialists and other staff to assist with managing the incident.

## 3 Roles and responsibilities

### 3.1 DELWP strategic control priorities

The DELWP strategic control priorities, also known as the State Controllers intent, were developed to articulate and formalise the focus on primacy of life and issuing community information and community warnings to assist people to make informed decisions about their risks in a dam safety emergency.

These DELWP strategic control priorities provide direction and guidance to the Incident Controller and IMT that will inform their approach and the development of incident response strategies and Incident Action Plan.

1. Protection and preservation of life is paramount - this includes;
  - Safety of emergency services personnel, and
  - Safety of community members including vulnerable community members and visitors/tourist located within the emergency area.
2. Issuing of community information and warnings.
3. Protection of critical infrastructure and essential services that support community resilience.
4. Protection of residential property as a place of primary residence.

5. Protection of assets supporting economic production and individual livelihoods.
6. Protection of environmental and conservation values.
7. Safety and welfare of displaced community members.
8. Effective transition to recovery.

The incident controller may need to vary the strategic control priorities in some circumstance. This shall be done in consultation with the DELWP Regional Controller or State Controller based on sound incident predictions and risk assessments.

### **3.2 Principles of operation**

- the protection of life is the priority
- timely, tailored and relevant warnings and information are communicated to the community
- trained and equipped agencies to respond to the emergency
- the provision of relief and recovery is integrated with response management at an early stage in the emergency
- ongoing assessment and management of the impact and consequences of the emergency
- the immediate needs of affected people and the impacts upon the community.

### **3.3 Victoria State Emergency Service**

The Victoria State Emergency Service (VicSES) is the control agency for flood, earthquake and storm damage and accredited provider of road accident and industrial accident rescue.

### **3.4 Victoria Police**

Under the Emergency Management Manual Victoria, the Victoria Police are responsible for the effective coordination of resources or services in response to emergencies.

### **3.5 CBRN Hazards MFB / Country Fire Authority**

The MFB / Country Fire Authority (CFA) is the control agency for all fires and actual hazardous CBR material spills that may occur in or around a dam.

### **3.6 VicRoads**

VicRoads is the co-ordinating agency for the functional subcommittee entitled Transport, Engineering and Services Support.

### **3.7 Specialist Dam Engineers / Consultants**

Dam safety incidents may require the expert advice of an engineer specialising in dams. The dam specialist would be engaged by the operator to provide recommendations on the severity of the incident and possible courses of action.

### 3.8 Incident Management team roles

| Key Personnel                                   | Responsibility   |
|---|--|
| The operator                                    | Co-ordination of the operator's resources used in responding to emergencies. Responsible for emergency coordination, maintenance and review of emergency plans.  |
| MERC (Municipal Emergency Response Coordinator) | A Member of municipality that provides Co-ordination of personnel and resources who are responding to the emergency.   |
| Site Manager                                    | It is generally recommended to locate a person at site to observe the performance of the dam during the incident. This representative will be responsible for the on-going observation of the dam safety incident during the emergency and provide information to the ICC and council officers.        |
| DELWP State Agency Commander                    | <p>Person responsible for providing strategic advice for the management of the emergency response. For a perceived or imminent significant dams safety event this person should be contacted by Local Government.</p> <p><b>DELWP SCC 1300 13 4444</b><br/> <b>sccvic.reception@scc.vic.gov.au</b></p> |

## 4 Communication

In an emergency situation, the most useful information to be communicated to Specialist Dam Engineers and other agencies will be:

- Reservoir level, and any known flood inflows likely to occur.
- Type of dam, dimensions of dam and spillway, drawings of dam and spillway (this information should be collated in non-emergency times and kept with this DSEP so that it can be accessed if an emergency situation arises).
- Type of defect (ie. cracking, seepage, erosion).
- Location of Defect (orientation with respect to the crest and abutments of the dam).
- Extent of Defect (ie. length and depth of cracks, quantity of seepage and whether the seepage is 'cloudy'), a photographic record should be taken where possible.
- Spillway operation - whether there is flow in the spillway and whether there are any obstructions to the flow (the spillway is the channel for carrying flood flows downstream of the dam embankment, to prevent overtopping).

Where visual inspection reveals a change or fault that threatens the safety of the dam this is to be reported immediately to the dam owner. If the change is not considered to be immediately threatening to the safety of the dam, the Asset Manager will carry out a special inspection as soon as practicable to assess the situation.

#### 4.1 Evacuation types

All Evacuations can be considered under two generic categories;

**Immediate Evacuation : Where people maybe at immediate risk from a dam safety incident and it will be recommended they evacuate immediately. The nature of the dam safety emergency may provide limited or no opportunity for warnings or preparation time.**

**Pre-warned Evacuation:** An evacuation resulting from an event that provides adequate warning and does not unduly limit preparation time.

Evacuation planning should take into consideration the Victoria Police 5 Step Model

- Decision to recommend evacuation
- Warning to evacuate
- Withdrawal
- Shelter
- Return

## 5 Routine surveillance

### 5.1 Routine surveillance of the dam

A copy of the current Visual Inspection Report form which is used for regular inspections of the dam is provided in **Appendix E**.

## 6 Dam failure modes and response actions

Although dam failure maybe relatively rare, preparation for their occurrence is appropriate. Two common scenarios failure modes are:

- Overfilling leading to overtopping , and
- “sunny day” (non-flood) event.

| RESPONSE TO PIPING THROUGH THE EMBANKMENT, FOUNDATION OR ABUTMENTS  |  |
|---|--|
| Plug the flow with whatever material is available (hay bales, bentonite or plastic sheeting if the entrance to the leak is in the reservoir basin). |  |
| Lower the water level until the flow decreases to a non-erosive velocity or until it stops.   |  |
| Place protective sand and gravel filter over the exit area to hold materials in place.  |  |
| Continue lowering the water level until a safe elevation is reached.  |  |
| Continue operating at a reduced level until repairs can be made.  |  |
| Note: this flow may originate alongside an outlet of spillway structure   |  |



| RESPONSE TO SLIDES ON THE UPSTREAM OR DOWNSTREAM SLOPE OF THE EMBANKMENT   |  |
|--|--|
| Lower the water level at a rate and to an elevation considered safe given the slide condition. If the outlet is damaged or blocked, pumping, siphoning or a controlled breach may be required. |  |
| Restore lost freeboard if required by placing sandbags or filling in the top of the slide.   |  |
| Stabilize slides on the downstream slope by weighting the toe area with additional soil, rock or gravel  |  |

| RESPONSE TO OVERTOPPING DUE TO BLOCKED SPILLWAY CHANNEL AND OVERFILLING  |  |
|--|--|
| Open outlet to its maximum safe capacity.  |  |
| If the reservoir does not drop with outlet open then slowly remove debris blocking the spillway channel to allow more water through the spillway. (Note, rapid removal of the spillway blockage may result in extensive flooding downstream. Only if there is an immediate threat to the integrity of the dam should the blockage be removed rapidly.)   |  |
| If debris cannot be removed then follow the response action noted above under 'Overtopping by Floodwater'. (Note: During times of large storm events, high inflow and high reservoir levels, debris resting along the reservoir shoreline can be washed into the reservoir and drawn up to the spillway entrance. This debris should be monitored and removed if it threatens to block the spillway or break the log boom or fish trap.) |  |

## Appendix A – Information on dam

| Item                |  | Description   |
|---------------------|--|---|
| General Information | Name of Dam                              | Torquay Farm Dam  |
|                     | Location (include road name)             | 1075 Horseshoe Bend Rd, Torquay VIC 3228  |
|                     | Map Reference                            | VicRoads Ref 93 G6  |
|                     | Period of Original Construction          | 1987  |
|                     | Water course                             | NA  |
|                     | Hazard Category (ANCOLD)                 | High C  |
|                     | Population at Risk                       | 100 people  |
| Reservoir           | Storage Capacity at FSL                  | Approximately 90 ML at RL12 mAHD (approx..half the volumes is below ground level as the dam was excavated below surface)) |
|                     | Catchment Area                           | 4 Ha (no waterway flows into dam)   |
|                     | Full Supply Level (Spillway Crest Level) | 12.0 mAHD – New proposed  |
| D a m               | Type of Dam (material)                   | Clay / Sandy Clay   |



|                     |  |  |
|---------------------|--|--|
| <b>Embankment</b>   | Embankment Height (max)                  | 6m downstream slope, 9m upstream slope   |
|                     | Embankment Length                        | 315 m  |
|                     | Embankment Crest Elevation               | 16 mAHD  |
|                     | Upstream Slope of Embankment             | 3 Horizontal: 1 Vertical   |
|                     | Downstream Slope of Embankment           | 3 Horizontal: 1 Vertical   |
|                     | Embankment Crest Width                   | 4m   |
| <b>Spillway</b>     | Description of Spillway (material etc)   | Not incorporated.  |
|                     | Location of Spillway                     | To be incorporated   |
|                     | Full Supply Level (Spillway Crest Level) | Previously 14.5 mAHD, reduced to RL12.0 mAHD   |
|                     | Width of Spillway Crest                  | Pipe spillway proposed   |
|                     | Existing Spillway Capacity               | -  |
|                     | Dam Crest Flood                          | na   |
| <b>Outlet Works</b> | Description of Outlet Works              | PVC and HDPE pipes with floating pontoons over embankment aside from one flowing to western sump |
|                     | Location                                 | West embankment  |
|                     | Capacity                                 | 0.1 m <sup>3</sup> /s  |
|                     | Details of Operation                     | For example, operated by pumps from pump house   |

- GENERAL ARRANGEMENT DRAWINGS OF THE DAM
- INUNDATION MAP





**Inundation Map Maximum depth of water level (A maximum Flood Depth of 0.3 metres in surrounding Area/Properties)**



## Appendix B – Emergency contact list

| Emergency Contact   | Telephone numbers         |                           |                           |
|---|---------------------------|---------------------------|---------------------------|
|   | Business                  | After hours               | Mobile                    |
| Dam officer: <b><u>David Santospirito</u></b>                                     | 0417012899                | 0417012899                | 0417012899                |
| Emergency Response Coordinator<br><b><u>David Santospirito/Mark Tomkinson</u></b> | 0417012899<br>0417 552338 | 0417012899<br>0417 552338 | 0417012899<br>0417 552338 |
| <b>Vic SES</b>  |                           | 132 500                   |                           |
| <b>State Control Centre, 24hr Contact</b>   | 1300368722                | 1300368722                |                           |
| <b>DELWP</b> Water Division (Dam<br>Emergency) <b>Siraj Perera</b>                | 03 9637 9125              | 1300 13 4444              | 0408 110 939              |
| DELWP Water Division (Dam Emergency)<br><b>Konrad Gill</b>                        | 03 9637 8775              | 1300 13 4444              | 0431 500 111              |
| <b>DELWP</b> Water Division (Dam Emergency)<br><b>Pradeepa Adihetty</b>           | 03 9637 9526              | 1300 13 4444              | 0438 571 614              |
| <b>Licensing Authorities for Private Dams</b>                                     |                           |                           |                           |
| Southern Rural Water<br>Western Duty Officer                                      | (03) 5139 3113            | 0417 589 183              |                           |

| List of Dams Consultants                              |                         |          |
|---|-------------------------|----------|
| GHD   | 8687 8000; 0403 188 140 |          |
| SMEC  | 9573 8135; 0429 988 900 |          |
| URS   | 8699 7672; 0419 340 148 |          |
| Fisher Stewart  | 8717 9272; 0407 382 885 |          |
| <b>Better suited for smaller dams (eg. farm dams)</b> |                         |          |
| Doug Goad   | 8862 3500; 0414 255 105 | Hawthorn |
| Bob Keleher   | 5441 5422; 0412 459 122 | Bendigo  |
| Trevor Clark  | 5442 9874; 0418 540 874 | Bendigo  |
| Neil Kirby  | 9874 2663; 0418 869 812 | Mitcham  |
| Don Rickerby Consulting                               | 5367 6363 or 0459676363 |          |
| Ron Archibald   | 9707 0039; 0418 145 431 | Berwick  |

## Appendix C – Resource list

|   | Business              | After Hours           | Mobile              |
|---|-----------------------|-----------------------|---------------------|
| <b>Support Agencies</b>   |                       |                       |                     |
| <b>Emergency Services (Police, Fire, Ambulance)</b>   | <b>000</b>            | <b>000</b>            |                     |
| <b>Local Police Station: Torquay</b><br>122 Surf Coast Hwy, Torquay VIC 3228                                    | <b>(03) 5264 3400</b> |                       |                     |
| <b>State Emergency Office: Torquay</b><br>130 Messmate Rd, Torquay VIC 3228                                     | <b>13 25 00</b>       | <b>13 25 00</b>       | <b>13 25 00</b>     |
| <b>Torquay CFA Fire Station</b><br>19 Grossmans Rd, Torquay VIC 3228  | <b>000</b>            | <b>000</b>            |                     |
| <b>Local Electrical Distribution Powercor Geelong</b>   | <b>132206</b>         | <b>132206</b>         |                     |
| <b>Dial before you dig</b>  | <b>1100.com.au</b>    |                       |                     |
| <b>EPA (Environmental Protection Authority) EPA Victoria South West</b><br>33 Mackey St, North Geelong VIC 3215 | <b>1300 372 842</b>   | <b>1300 372 842</b>   |                     |
| <b>Water Corporation – Barwon Water</b>   | <b>1300 656 007</b>   | <b>1300 656 007</b>   |                     |
| <b>VicRoads - Geelong</b>   | <b>13 11 71</b>       | <b>13 11 71</b>       |                     |
| <b>Earth Moving Equipment and Labour</b>  |                       |                       |                     |
| <b>Shire council: Surf Coast Shire Council</b>  | <b>(03) 5261 0600</b> | <b>(03) 5261 0600</b> |                     |
| <b>Company (Excavator, loader, generator) Lake and Land</b>   | <b>5250 3100</b>      | <b>0418545702</b>     |                     |
| <b>Company (Excavator, loader, generator) Lake and Land</b>   | <b>5250 3100</b>      | <b>0418545702</b>     |                     |
| <b>Rock Beaching, crushed rock &amp; sand</b>   |                       |                       |                     |
| <b>Company: Lake and Land</b>   | <b>5250 3100</b>      | <b>0418545702</b>     |                     |
| <b>Sand Bags</b>  |                       |                       |                     |
| <b>Surf Coast Shire Council: 1 Merrijig Dr, Torquay VIC 3228</b>  |                       |                       |                     |
| <b>Company: Newcomb Sand+Soil</b>   | <b>52482632</b>       | <b>52482632</b>       |                     |
| <b>Ready Mix Concrete</b>   |                       |                       |                     |
| <b>Company: Cubic Premix</b>  | <b>5248 7800</b>      |                       | <b>0458 487 801</b> |

|  |                  |                  |                   |
|--|------------------|------------------|-------------------|
|  |                  |                  |                   |
| <b>Electrical</b>                              |                  |                  |                   |
| <b>Electricians Company: Ebuilt Electrics</b>  |                  |                  | <b>0412262747</b> |
| <b>Pump Hire</b>                               |                  |                  |                   |
| <b>Shire council: Location</b>                 | <b>5261 0600</b> | <b>5261 0600</b> |                   |
| <b>Company: Coates Hire Geelong</b>            | <b>5247 2800</b> | <b>5247 2800</b> |                   |
| <b>Generator Hire</b>                          |                  |                  |                   |
| <b>Shire council: Surf Coast Shire Council</b> | <b>5261 0600</b> | <b>5261 0600</b> |                   |
| <b>Company: Coates Hire Geelong</b>            | <b>5247 2800</b> | <b>5247 2800</b> |                   |
| <b>Portable Lights Hire</b>                    |                  |                  |                   |
| <b>Shire council: Surf Coast Shire Council</b> | <b>5261 0600</b> | <b>5261 0600</b> |                   |
| <b>Company: Coates Hire Geelong</b>            | <b>5247 2800</b> | <b>5247 2800</b> |                   |

## Appendix D – Example community alert messages

### Immediate evacuation messaging

For immediate, time critical warning advice, these messages may be used by the operator for the population at risk.

The following are example SMS mobile phone messages for alerting the community at risk in the dam breach area.

#### **Flood Alert SMS Message Example:**

The dam operator issuing a <MAJOR/MODERATE/MINOR> flood warning for downstream of Torquay Farm Dam. River levels expected to peak at <ENTER TIME>. Further information call 0417012899.

#### **Immediate Evacuation Alert Example:**

The dam operator advises that residents downstream of Torquay Farm Dam should evacuate immediately to Horseshoe Bend Road due to potential dam failure. Further information, call 0417012899.

### Pre – Warned evacuation messaging

If there is no imminent threat, warning to evacuate will be arranged by the Vipol Evacuation Manager.





## Appendix E – Incident report form for DELWP

### Incident Report Form for Torquay Farm Dam

**Date / time of report:** Date \_\_ / \_\_ / \_\_\_\_ Time \_\_ : \_\_ hours

**Incident name:** \_\_\_\_\_

**Is the dam about to fail?** Yes / No

If Yes, have the police been notified? Yes / No

**Is there a population at risk or potential loss of life ?** Yes / No

If Yes, have the police been notified? Yes / No

Have the SES been notified Yes No

Have any warnings been issued /evacuations occurred? Yes No

Numbers of Population at risk .....

Potential loss of life numbers .....

#### Details of the person sending the report:

Name \_\_\_\_\_

Contact number \_\_\_\_\_

Organisation \_\_\_\_\_

#### Incident details:

Date of incident \_\_\_\_\_ Time \_\_\_\_\_

Type of incident / description \_\_\_\_\_

Address of incident \_\_\_\_\_

Is it a part of a larger incident (e.g. flood or fire)? Yes / No

#### Incident management details (if known):

Control agency \_\_\_\_\_

Incident Controller name \_\_\_\_\_

Contact number \_\_\_\_\_

**Has there been failure of critical infrastructure?** Yes / No

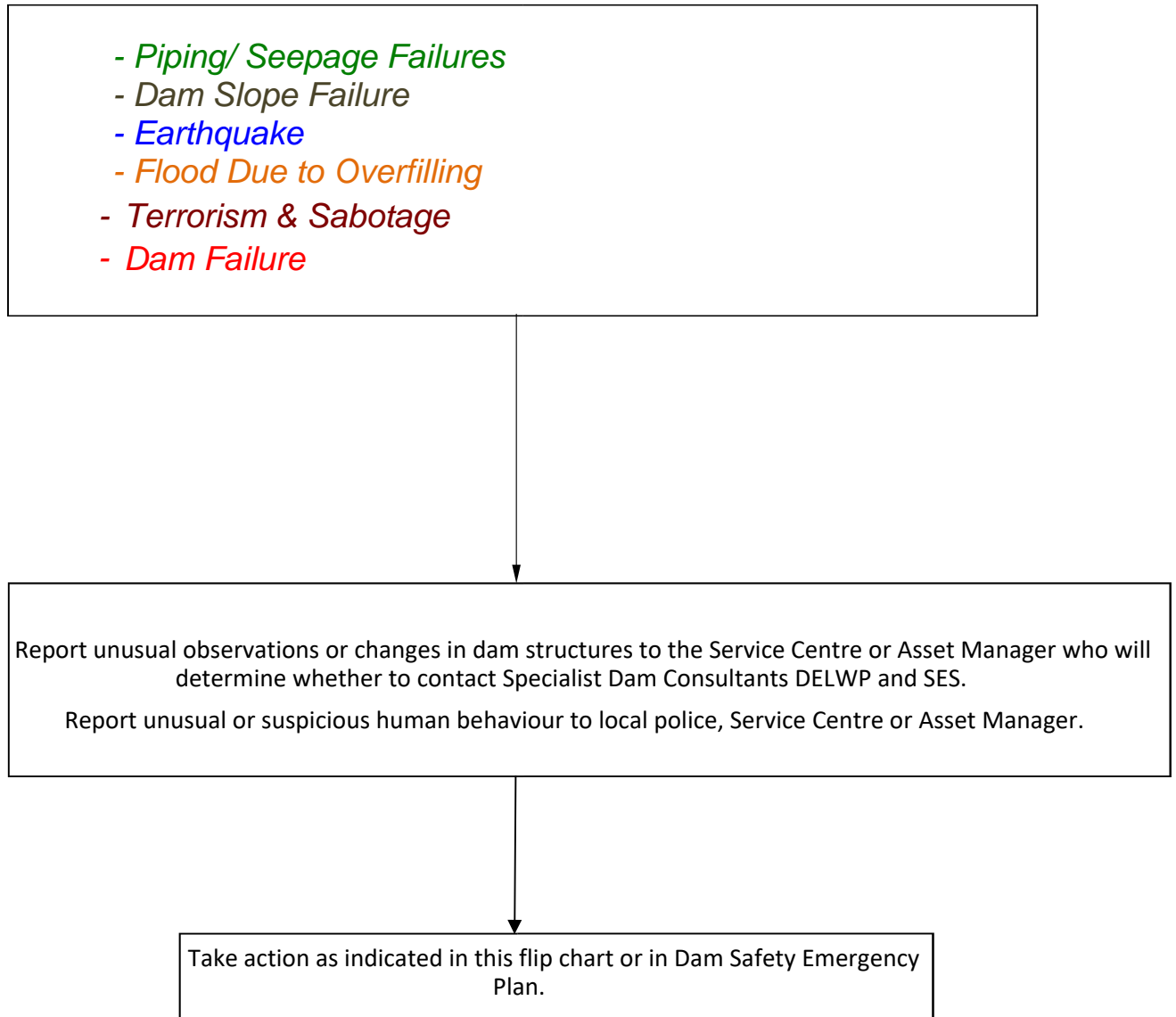
If Yes, describe: \_\_\_\_\_

**Expected resolution?** Date \_\_ / \_\_ / \_\_\_\_ Time \_\_ : \_\_ hours

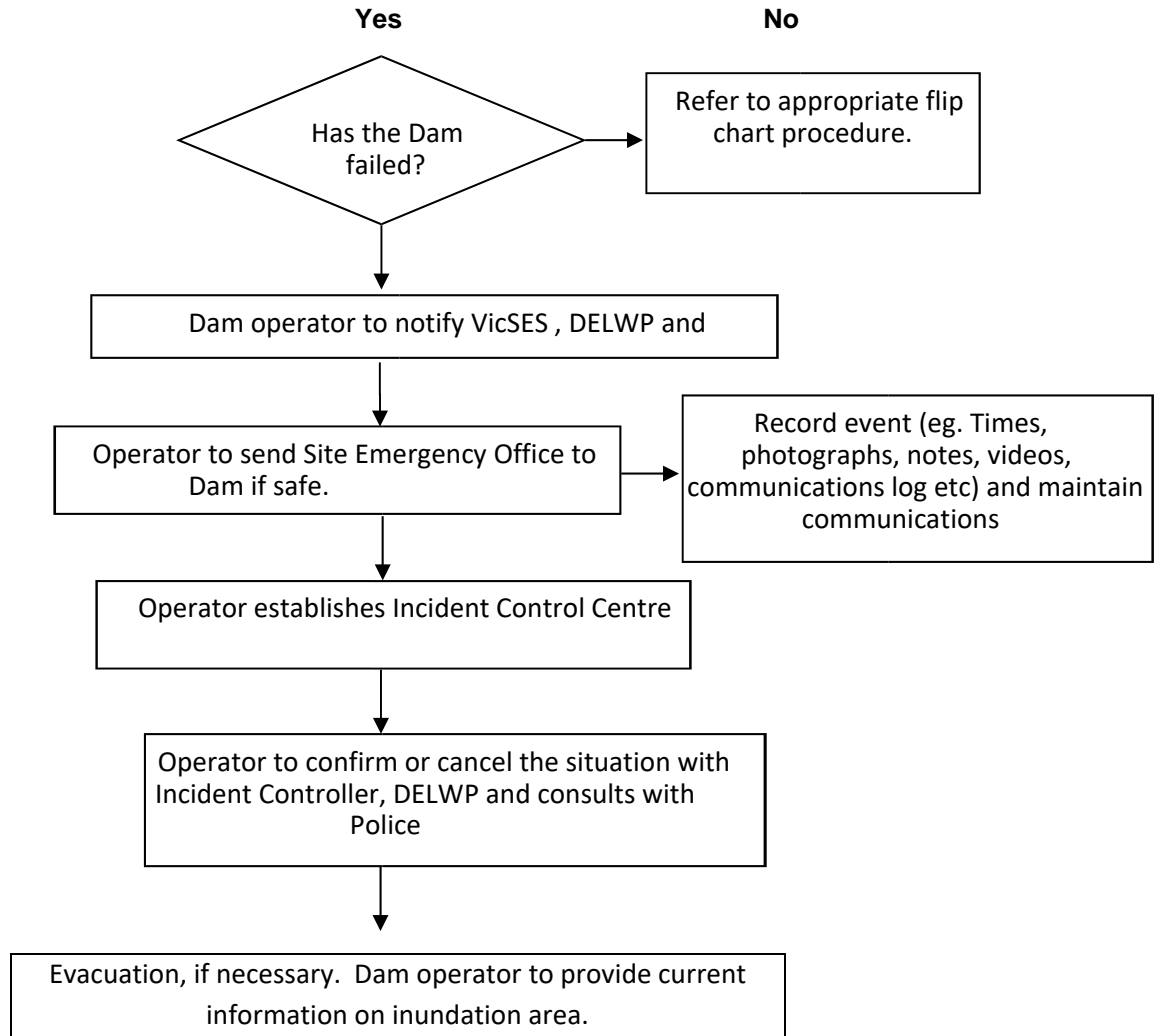
**Time of next report:** Date \_\_ / \_\_ / \_\_\_\_ Time \_\_ : \_\_ hours

|                                     |  |
|-------------------------------------|--|
| <b>DELWP 24hr Emergency Contact</b> | <b>1300 13 4444 AH (State Agency Commander)</b>                                      |
| <b>Email</b>                        | <a href="mailto:sccvic.reception@scc.vic.gov.au">sccvic.reception@scc.vic.gov.au</a> |

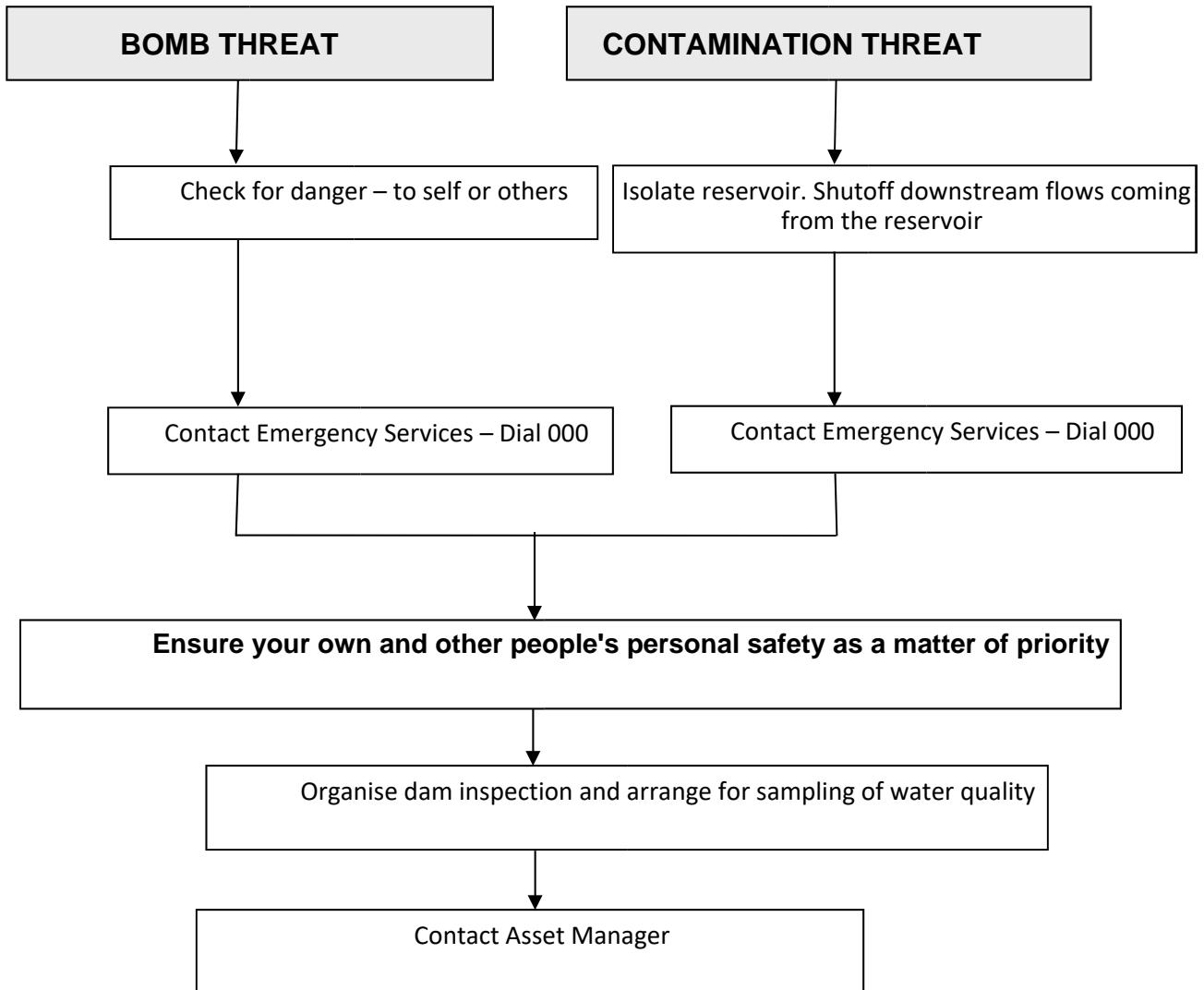
## Appendix F – Emergency scenarios flip charts



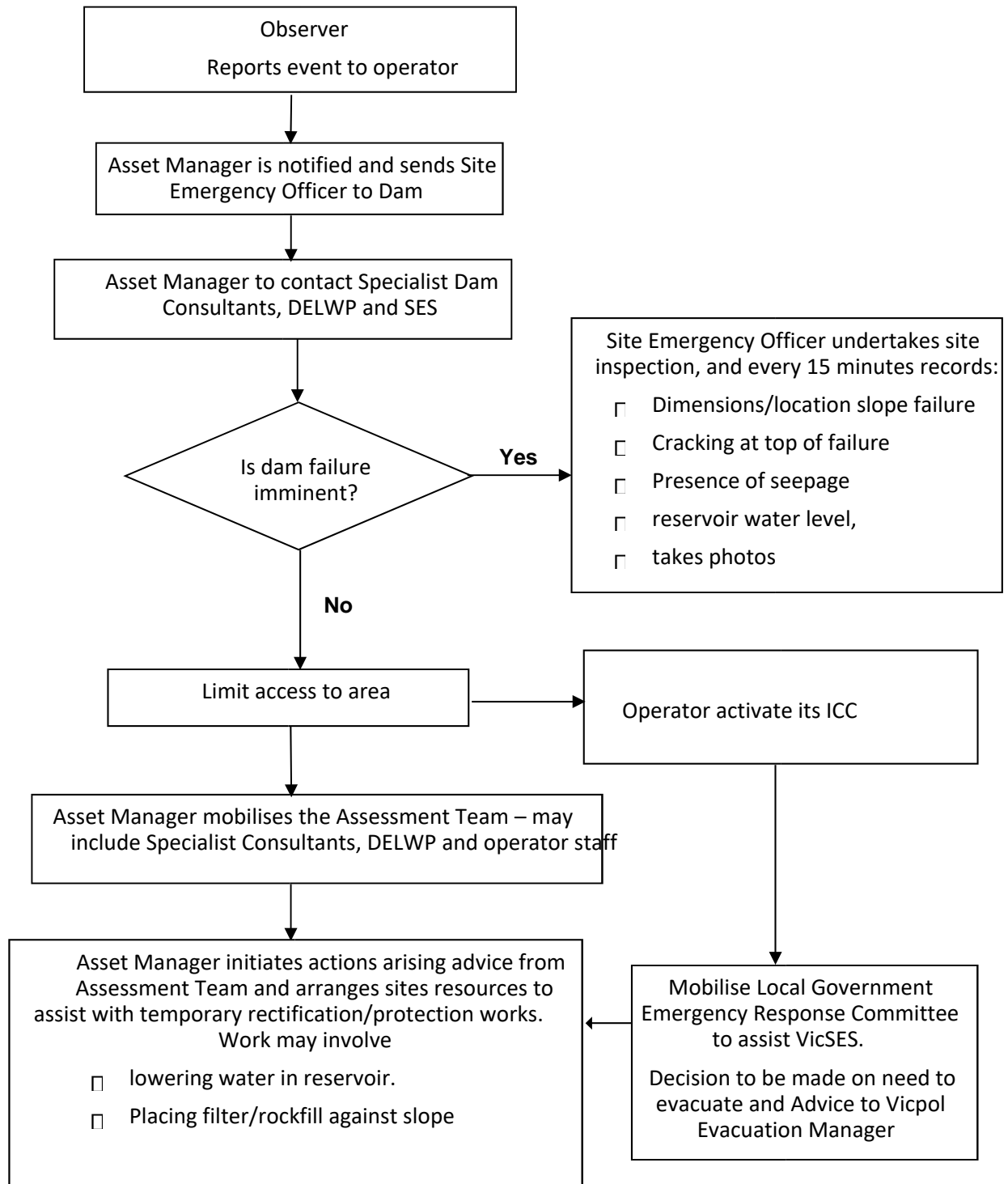
## DAM FAILURE



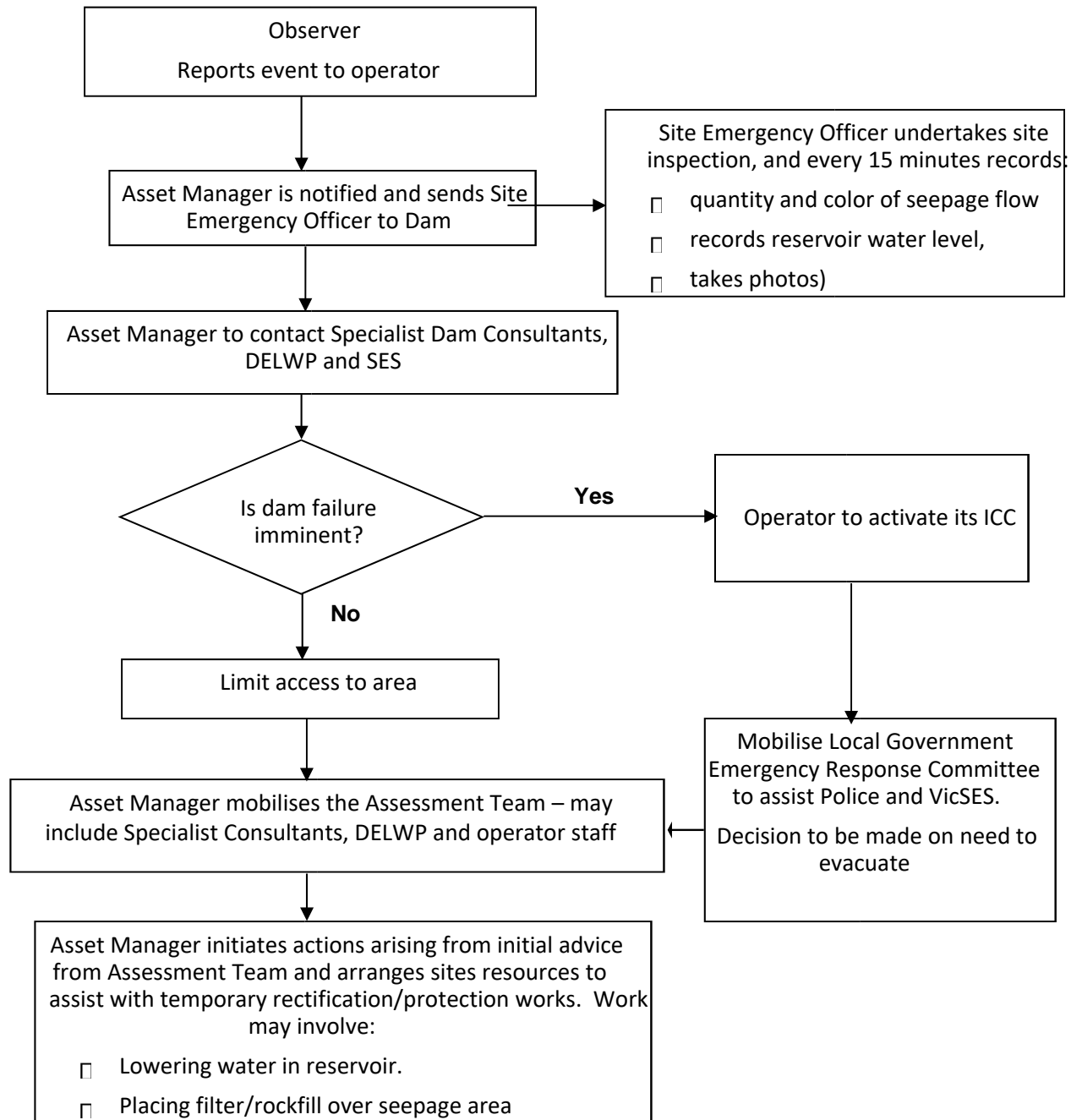
## TERRORISM AND SABOTAGE



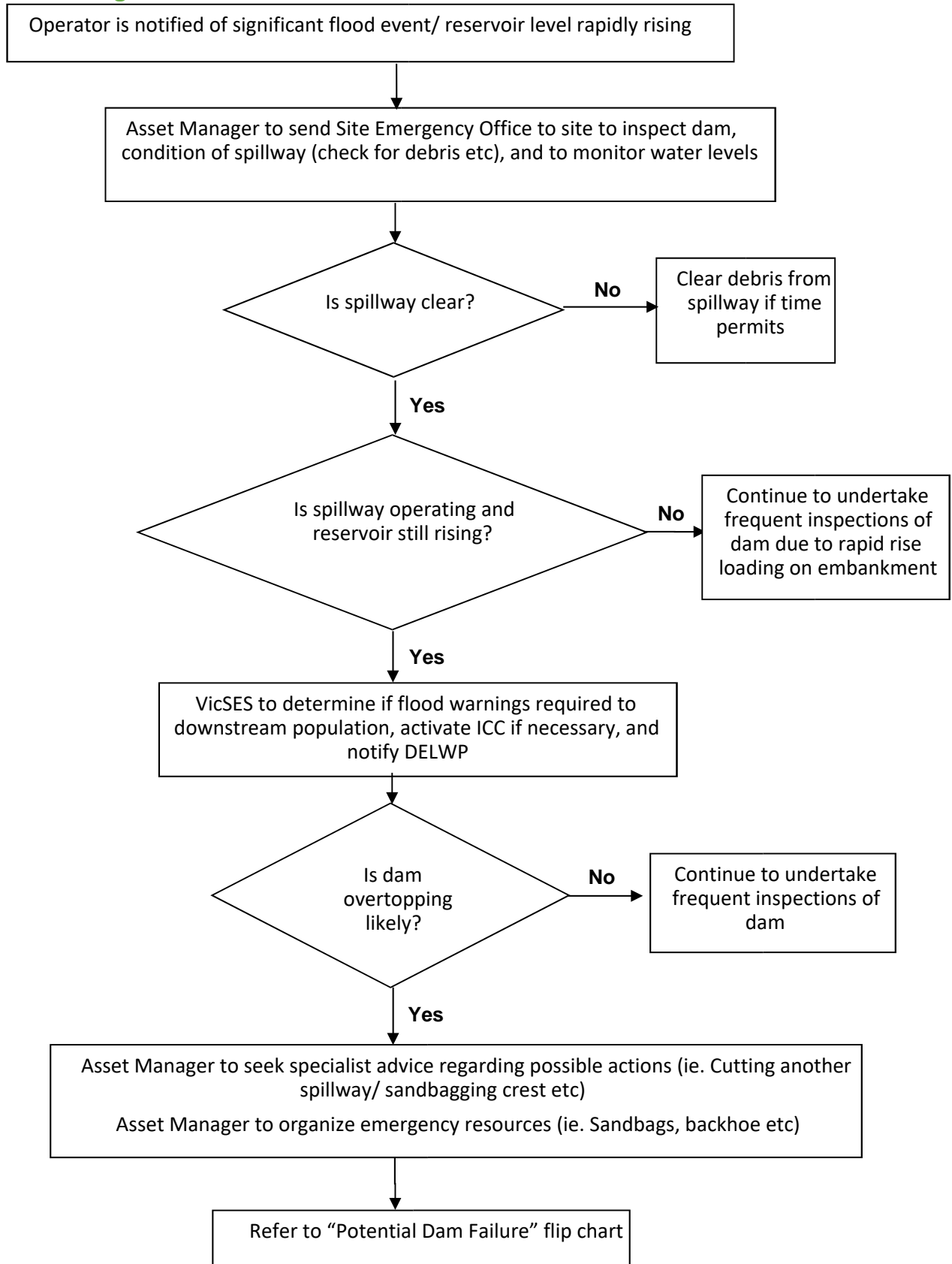
## DAM SLOPE FAILURE



## PIPING/ SEEPAGE FAILURE



## FLOOD / Overfilling





## EARTHQUAKE

