WHS DOCUMENTS & TEMPLATES

DOC-INR-CCV · Inrush Critical Control Verification Pack

Product Overview

For: Underground mines: WHS advisers, mining and geotechnical engineers, hydrogeologists, surveyors, shift supervisors and control owners

Version 1.0 · 15 November 2026

SAMPLE

Field-ready Critical Control Verification forms for inrush: one for each of the 9 critical controls that stop a sudden inrush of water, mud, slurry or gas into the workings, or limit the harm when it happens, with the bowtie, a verification schedule and a short guide.

Most workplaces have controls for inrush: inrush hazard plans, probe drilling, standoff distances, barrier pillars, dewatering pumps and water level monitoring. The question is whether they are working today. A critical control verification (CCV) is the proof: a planned check, in the field, that a control that matters most is in place, in good condition, working as designed, used properly and not bypassed.

This pack gives you one CCV form for each of 9 critical controls (6 preventing, 1 preventing and mitigating, 2 mitigating) for the unwanted event: inrush of water, mud, slurry or gas into underground workings. Each form shows where the control sits on the bowtie, what it must achieve, how it fails, and a checklist scored Pass, Fail or Non-conformance. Physical controls are Pass or Fail only; Non-conformance is kept for administrative items such as records and training dates. A Fail stops the work and is escalated as a high potential incident. The last page of each form has prompts for talking to the operators, workers and supervisors who use the control.

The full bowtie shows every control on one page, the schedule sets who verifies each one and how often, and the guide explains the method. Every form is editable, so you can adapt it to your site. Made by Orana Skills Centre.

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How to Use These CCVs

Inrush Critical Control Verification Pack

What a critical control verification is

The key word here is proof. Not assumption, not guesswork. A critical control verification (CCV) is a planned check, in the field, that one critical control is doing its job. It checks that the control:

- Exist
- Are in place and in good condition
- Are functioning as designed
- Are being used properly
- Are not being bypassed or failing silently

Each CCV form tests one control against its performance requirements, item by item, grouped by those five checks and then the records. It is not a general inspection, an audit, or a maintenance check: keep those, and use the CCVs alongside them for the few controls that matter most.

The bowtie and the critical controls in this pack

Hazard: Water, mud, slurry or gas held in old workings, aquifers, surface water, tailings or wet fill. Unwanted event: Inrush of water, mud, slurry or gas into underground workings. Underground mines, and the shafts, declines and portals that serve them, wherever workings approach old workings, voids, aquifers, faults, surface water, tailings, wet fill or boreholes that could hold water, mud, slurry or gas. Your site's inrush principal hazard management plan and trigger action response plans come first: use these forms to verify the controls they set.

CCV	Critical control	Type	Sits on	At your site
CCV-01	Inrush hazard zones identified, surveyed and marked before mining approaches	Preventing	T1	Use at every site where the threat or consequence is present.
CCV-02	Probe drilling ahead of development in inrush control zones	Preventing	T1, T2	Use while development is in or approaching an inrush control zone.
CCV-03	Standoff distances and barrier pillars kept	Preventing	T2, T3	Use at every site where the threat or consequence is present.
CCV-04	Dewatering and pumping capacity maintained	Preventing	T4, T5	Use at every site where the threat or consequence is present.
CCV-05	Water level and pressure monitoring with trigger action response plans acted on	Preventing and mitigating	T4 (preventing); C1, C2 (mitigating)	Works on both sides: on T4 the trigger response stops the build-up turning into an inrush; on C1 and C2 early withdrawal limits who is in its path. Use the monitoring points and triggers your engineer sets.
CCV-06	Surface water kept out of portals, shafts, boreholes and subsidence	Preventing	T5	Use where portals, shafts, boreholes or subsidence could take in surface water.
CCV-07	Seals, bulkheads and plugs built and maintained to design	Preventing	T6	Use where the mine has seals, bulkheads or plugs holding back water, mud, fill or gas.
CCV-08	Inrush alarm and evacuation by the planned escape routes	Mitigating	C1, C2, C3	Use at every site where the threat or consequence is present.
CCV-09	Refuge chambers and self-rescuers ready for people cut off	Mitigating	C2, C3	Use at every site where the threat or consequence is present.

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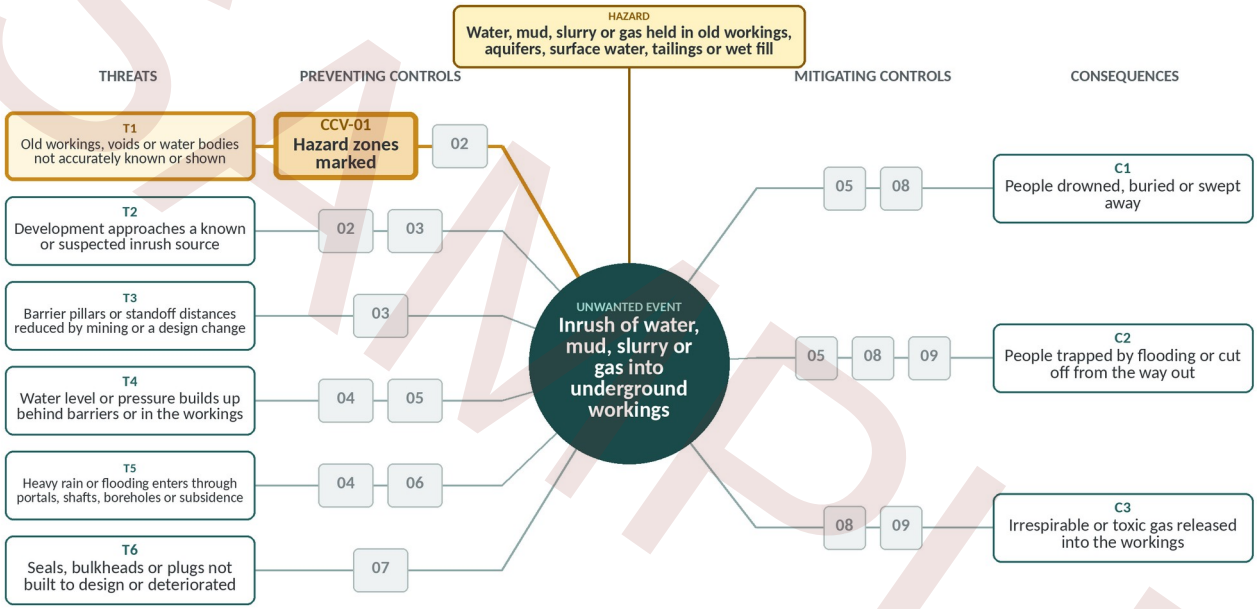
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CCV-01 Inrush hazard zones identified, surveyed and marked before mining approaches

Critical Control Verification · Preventing control · Inrush

Site or location		**Plant or area verified**	
Date and time		**Shift**	
Verified by (name and role)		**Control owner**	

1 Where this control sits on the bowtie



Amber: this control, CCV-01, on threat line T1. Grey numbers: the other critical controls in this pack. Preventing controls sit left of the unwanted event and stop it happening; mitigating controls sit right of it and limit the harm.

2 The control

Control	Inrush hazard zones identified, surveyed and marked before mining approaches
Type	Preventing: it stops the unwanted event happening.
It sits on	Threat T1: Old workings, voids or water bodies not accurately known or shown
Hierarchy of control	Administrative
Objective	Know where every potential inrush source is before mining gets near it: old workings, voids, aquifers, faults, surface water, tailings, wet fill and boreholes are identified, their position confirmed as far as practicable, inrush control zones set around them under **[Inrush control zone rules]**, and the zones shown on the plans and marked in the workings.
Why it is critical	Many inrush disasters happened because old workings or water bodies were closer than the plans showed. The plan is a document; the work of finding, confirming and marking each source, so the crew at the face knows it is there, is the control.

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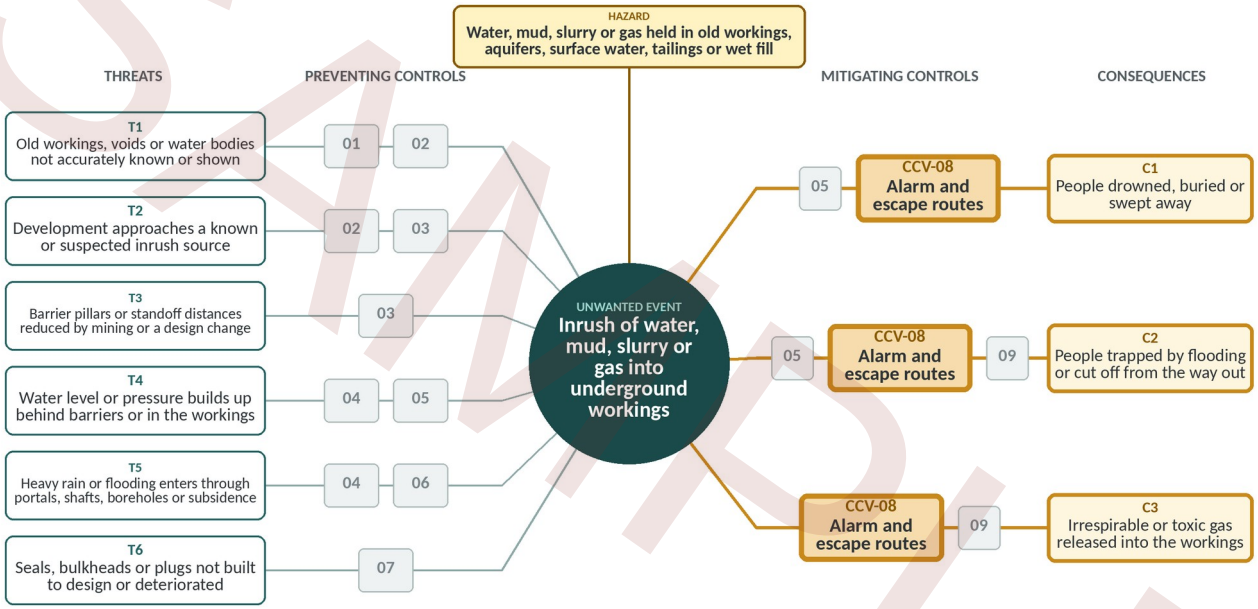
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CCV-08 Inrush alarm and evacuation by the planned escape routes

Critical Control Verification · Mitigating control · Inrush

Site or location		**Plant or area verified**	
Date and time		**Shift**	
Verified by (name and role)		**Control owner**	

1 Where this control sits on the bowtie



Amber: this control, CCV-08, on consequence lines C1 and C2 and C3. Grey numbers: the other critical controls in this pack. Preventing controls sit left of the unwanted event and stop it happening; mitigating controls sit right of it and limit the harm.

2 The control

Control	Inrush alarm and evacuation by the planned escape routes
Type	Mitigating: it limits the harm once the unwanted event has happened.
It sits on	Consequence C1: People drowned, buried or swept away; consequence C2: People trapped by flooding or cut off from the way out; consequence C3: Irrespirable or toxic gas released into the workings
Hierarchy of control	Administrative and Engineering
Objective	If an inrush happens, warn everyone underground at once, and get them out by escape routes that lead up and away from the water, are kept clear, signed and known, with everyone accounted for.
Why it is critical	Water, mud and slurry move fast and collect in low points. People survive an inrush by getting the warning quickly and moving the right way, usually up and away from it, along a route they already know.

3 Performance requirements

What the control must achieve. The checklist in part 5 tests each one.

No.	The control must meet this requirement
R1	An alarm or communication system reaches everyone underground quickly.

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END OF THE FREE SAMPLE

This sample shows a few pages, so you can judge the layout and the quality. Field-ready Critical Control Verification forms for inrush: one for each of the 9 critical controls that stop a sudden inrush of water, mud, slurry or gas into the workings, or limit the harm when it happens, with the bowtie, a verification schedule and a short guide.

What the full product contains

- **9 Critical Control Verification forms, one per critical control (6 preventing, 1 preventing and mitigating, 2 mitigating): each with its bowtie, objective, performance requirements, failure modes, a Pass / Fail / Non-conformance checklist, the overall result, actions, a page of prompts for talking to the people who use the control, and sign-off**
  03_CCV_FORMS/ (Word and PDF)
- **The critical controls: CCV-01 Hazard zones marked (preventing); CCV-02 Probe drilling ahead (preventing); CCV-03 Standoffs and barriers (preventing); CCV-04 Pumping capacity (preventing); CCV-05 Monitoring and TARPs (preventing and mitigating); CCV-06 Surface water kept out (preventing); CCV-07 Seals and bulkheads (preventing); CCV-08 Alarm and escape routes (mitigating); CCV-09 Refuge and self-rescuers (mitigating)**
  03_CCV_FORMS/CCV-01 to CCV-09
- **The full bowtie for inrush on one page: every threat, consequence and critical control**
  02_BOWTIE/Inrush Bowtie.docx and .pdf
- **The CCV schedule: who verifies each control, how often by exposure, the method and the record**
  04_CCV_SCHEDULE/CCV Schedule.docx and .pdf
- **The CCV schedule workbook: suggested frequency by exposure, next due dates and status by formula, dropdowns, no macros**
  04_CCV_SCHEDULE/CCV Schedule.xlsx
- **How to use these CCVs: the method, scoring, the response to a Fail or Non-conformance, frequency, and adapting the set to your site**
  01_START_HERE/How to Use These CCVs.docx and .pdf
- **Read Me First, Product Overview, Permitted Use Terms and Version Information**
  01_START_HERE/ (PDF)

Formats

- Word (.docx), editable, with your logo and business name in the header
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