

## Consolidated report

# Slope stability – stage 2 surface METEX mines

April 2023 to January 2025



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## Executive summary

A crucial part of the Resources Regulator’s incident prevention strategy for mines and petroleum sites involves:

- targeted assessments and planned inspection programs – focusing on assessing an operation’s control of critical risks by evaluating the effectiveness of control measures in the mine’s safety management system
- priority programs – proactively assessing a topic that is an emerging risk throughout the industry, which is determined primarily from incident data as well as evolving industry trends.

A planned inspection program at surface METEX mines for the principal hazard management plan – ground or strata failure was conducted between April 2023 and January 2025.

The 33 METEX mines assessed consisted of 24 extractive mines (21 construction material mines and 3 industrial mineral mines), 6 metalliferous metal mines (1 surface mine, 1 processing site and 4 surface areas at underground metal mine sites) and 3 mineral sands mines (2 dredging operations and 1 surface mine).

The Regulator identified 11 threats and 5 consequences for the stage 2 assessment program. Four critical control criteria for assessment of the material unwanted event (MUE) of unplanned ground or strata failure were also identified.

As part of the planned assessment activities, Regulator inspectors attended 33 surface METEX mines with a focus on assessing the identified critical control criteria and control supports.

This planned inspection program was part of an ongoing effort by the Regulator to reduce the potential risks associated with human exposure to unplanned ground or strata failure.

This report provides information on assessment findings and recommendations for surface METEX mine operators.

Of the 33 surface METEX mines assessed, a total of 71 compliance notices were issued to the 33 mine sites assessed.

Fifty compliance notices of the 71 notices issued related specifically to the topic of human exposure to unplanned ground or strata failure.

Explanatory notes on the assessment system are in Appendix A.

## Assessment criteria for all assessments

The Regulator identified 11 threats and 5 potential fatal outcome consequences, and 4 critical control criteria and control supports to assess how surface METEX mine operators managed the MUE of human exposure to unplanned ground or strata failure.

A tabulation of the threat/consequence and critical controls assessed for the MUE is in Table 1.

Table 1: Threat/consequence and critical controls for the MUE of human exposure to unplanned ground or strata failure

Threat/consequence		Critical control
Threat	Ground conditions	Excavate to design (PC1.5)
	Unconsolidated material	
	Natural or induced seismic event	
Threat	Ground conditions	Water management (PC1.6)
	Unconsolidated material	
	Water	
Threat	Ground conditions	Separate people from ground or strata hazards (PC1.7)
	Void or other workings beneath wall	
	Unconsolidated material	
	Water	
Consequence	Natural or induced seismic event	ROPS/FOPS (MC1.1) Roll over protection system (ROPS) Falling object protection system (FOPS)
	Struck by falling material	
	Crushed by falling material	
	Engulfed by falling material	
	Fall with failed bench or ramp	
	Drown – fall into waterbody	

A tabulation of the critical controls and control supports assessed for the MUE is provided in Table 2.

Table 2: Critical controls and control supports assessed for the MUE of human exposure to unplanned ground or strata failure

Critical control	Control support	
Excavate to design (PC 1.5)	01	Verify that supervisors can explain the dig limits for the excavation block.
	02	Confirm with the supervisor that dig limit guidance is provided to the equipment operators. Examples may be GPS guidance or survey pegs.
	03	Confirm that excavations are surveyed to verify they conform to design or standard.
	04	Verify that shift inspection reports include checks for wall integrity.
	05	Confirm that potentially unstable or overhanging rocks are not visible.
	06	Confirm that potentially unstable or overhanging rocks that are not able to be removed have been identified as a hazard.

	07	Verify that the equipment can excavate to the wall angle and clean back to hard.
	08	Confirm the equipment is allocated to the task of cleaning the walls back to hard.
<b>Water management (PC1.6)</b>	01	Confirm that those with water management responsibilities can explain the water management controls related to ground or strata failure.
	02	Confirm the nominated water management controls are implemented to the specified design.
	03	Confirm the nominated inspection and monitoring arrangements are in place.
	04	Confirm supervisors can explain TARP trigger levels and the required controls.
<b>Separate people from ground or strata hazards (PC 1.7)</b>	01	Confirm that the selected controls designed to protect people from ground or strata failure hazards are implemented to the documented standard in the safety management system.
	02	Confirm that supervisors and workers can explain the ground or strata failure hazards and the required controls that apply to their workplace.
<b>ROPS or FOPS (MC1.1)</b>	01	Vehicle compliance plate identifies appropriate ROPS/FOPS installed
	02	Verify a procedure to maintain and repair protective devices to standards has been documented and implemented.

## Assessment findings for surface METEX mines

Overall, the assessment findings for surface METEX mines were:

- 33 surface METEX mines were assessed between April 2023 and January 2025
- 528 individual findings for the assessed criteria
- 111 assessment findings with enforcement action recorded
- 71 compliance notices in total were issued to 33 surface METEX mines assessed.

## Assessment overall ratings for surface METEX mines

In summary the overall assessment findings for surface METEX mines were:

- 89% assessment overall finding for the four critical controls assessed.

Figure 1 provides a summary assessment of the overall findings by critical control for surface METEX mines.

Figure 1: Overall assessment findings by critical control for surface METEX mines

Threat			Consequence	Grand Total
1. Ground conditions 3. Unconsolidated material 5. Natural or induced seismic event	1. Ground conditions 3. Unconsolidated material 4. Water	1. Ground conditions 2. Void or other workings beneath wall 3. Unconsolidated material 4. Water 5. Natural or induced seismic event	1. Struck by falling material 2. Crushed by falling material 3. Engulfed by falling material 4. Fall with failed bench or ramp 5. Drown - fall into waterbody	
PC1.5	PC1.6	PC1.7	MC1.1	
Excavate to design	Water management	Separate people from ground or strata hazards	ROPS/FOPS	

- Green (=100%)
- Yellow (>= 80% and <100%)
- Orange (>= 65% and <80%)
- Red (<65%)
- Not applicable

In summary the overall assessment ratings were 77% documented and implemented, 12% implemented but not documented, 4% documented but not implemented, 1% not documented and not implemented and 6% were not applicable.

Figure 2 provides an overall assessment findings ratings for surface METEX mines.

Figure 2: Overall assessment findings ratings for surface METEX mines

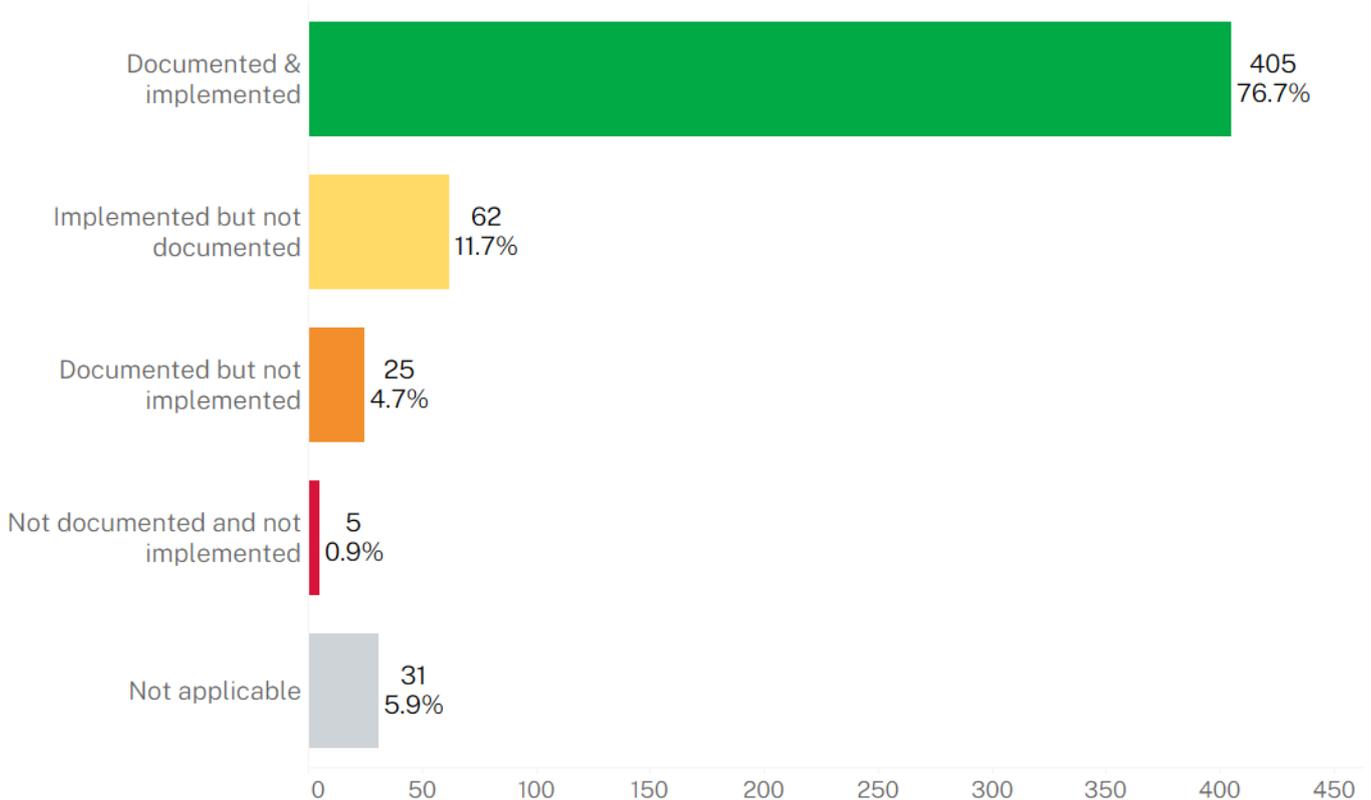


Figure 3 provides an overall assessment of the overall finding ratings by critical control for surface METEX mines.

Figure 3: Overall assessment findings ratings by critical control for surface METEX mines

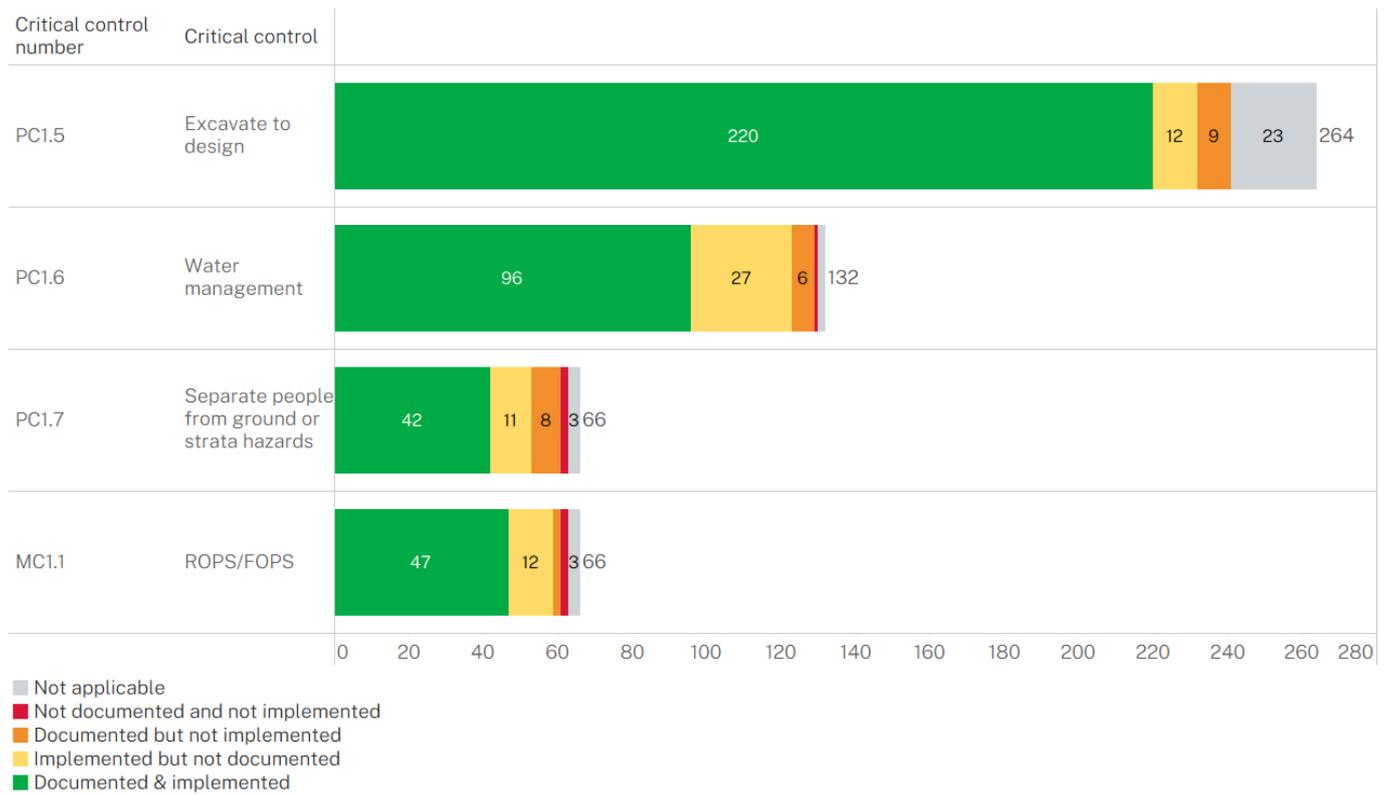
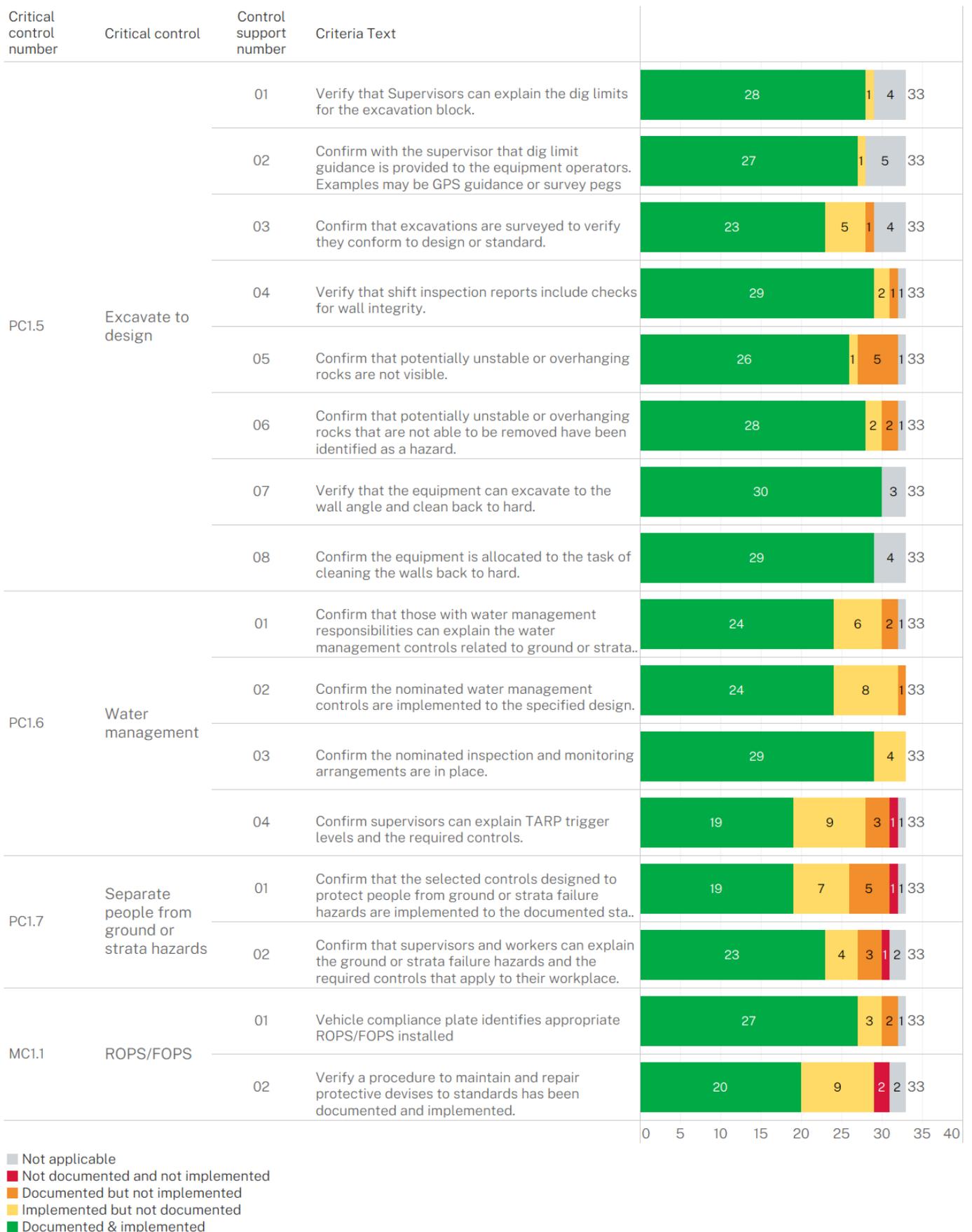


Figure 4 provides an overall assessment of the overall finding ratings by critical control and control support for surface METEX mines.

Figure 4: Overall assessment findings ratings by critical control and control support for surface METEX mines



# Notices issued to surface METEX mines

In total, 33 assessments were conducted at surface METEX mines.

In summary, there were 71 compliance notices in total issued to the mines assessed comprising:

- 1 x section 195 prohibition notice issued to a surface mine
- 38 x section 191 improvement notices (1 notice issued related to surface areas at an underground mine site)
- 32 x section 23 cause for concern notices. (4 notices issued related to surface areas at an underground mine site)

Note: The single WHSA s195 prohibition notice issued related specifically to human exposure to unplanned ground or strata failure.

23 of the 38 WHSA s191 improvement notices issued related specifically to human exposure to unplanned ground or strata failure.

26 of the 32 WHSA s23 notice of concern issued related specifically to human exposure to unplanned ground or strata failure.

Table 3 lists the compliance notices issued by type and number.

Table 3: Notices issued for surface METEX mines

Category	Surface	Surface	Underground	Grand Total
WHS(MPS)A s23 notice of concerns	1	27	4	32
WHS s191 improvement notice		37	1	38
WHS s195 prohibition notice		1		1
Grand Total	1	65	5	71

# Recommendations for surface METEX mines

Based on the findings outlined in this report, and in relation to the numbers and types of compliance notices issued during the assessment of human exposure to unplanned ground or strata failure at surface METEX mines, it is recommended that the following topics should be reviewed by operators of surface METEX mines:

Review the site principal hazard management plan (PHMP) – ground or strata failure, in particular the critical controls associated with:

- **excavate to design** – ensure workers and supervisors monitor and maintain PHMP specified slope batter angles, face heights, edge protection, catch benches and protective bund walls to prevent or reduce ongoing risks to persons associated with ground and slope failures
- **water management and slope failures** – investigation of slope failures by appropriately qualified persons, analysis of strata failure mechanisms/causes and documenting of controls to prevent or reduce ongoing risks to persons associated with ground and slope failures
- **separation of persons from ground or strata hazards** – implement appropriate training and awareness information of the site PHMP ground or strata failure system to ensure workers and

supervisors are aware of, and implement, all PHMP controls to prevent or reduce ongoing risks to persons associated with ground and slope failures

- **mobile plant vehicle compliance with ROPS and FOPS protective devices** – ensure all mobile plant ROPS and FOPS protective device components are fitted, maintained and inspected for ‘fit for purpose’

For more information on safety assessment programs, the findings outlined in this report, or other mine safety information, please contact the Regulator.

Contact	Contact details
Email	<a href="mailto:cau@regional.nsw.gov.au">cau@regional.nsw.gov.au</a>
Incident reporting	To report an incident or injury call 1300 814 609 or log in to the <a href="#">Regulator Portal</a>
Website	<a href="http://www.resources.nsw.gov.au">www.resources.nsw.gov.au</a>
Address	Resources Regulator 516 High Street Maitland NSW 2320

## Appendix A – Assessment criteria rating

Each assessed criteria is rated from one to 4 based on evidence supporting the expected control supports identified at the mine site.

Evidence supporting expected control supports

Expected control supports	Rating	Evidence supporting rating / comments				
	<table border="1"> <tr> <td>4</td> <td>3</td> </tr> <tr> <td>2</td> <td>1</td> </tr> </table>	4	3	2	1	
4	3					
2	1					

Assessment findings results are calculated based on the total points allocated to the assessed ratings as a percentage of the maximum possible points for each criteria group, and any findings rated as ‘Not applicable’ were excluded from the calculation.

Criteria assessed ratings and points

Assessed as	Rating	Points
Documented & implemented <b>Compliant</b>	4	4
Implemented but not documented <b>Improvement needed</b>	3	2
Documented but not implemented <b>Significant improvement needed</b>	2	1
Not documented and not implemented <b>Non compliant</b>	1	0
Not applicable (N/A)		

Findings results (points) with colours assigned as follows:

- Green (=100%)
- Yellow (>= 80% and <100%)
- Orange (>= 65% and <80%)
- Red (<65%)
- Not applicable