

EXAMINATION PANEL REPORT

Summary of results and general comments

Written examination results

Date:	25 February 2015
Number of candidates:	56 (78 approved to sit)
Number who passed:	36 (64% success rate) (30 candidates passed from 43 candidates on 1st attempt = 70%)
Average overall mark:	61% (minimum pass mark 60%)
Highest mark obtained:	79/100

Question 1

Highest mark:	19.5/20
Average mark:	13/20

Question 1 a)

15 Inspection program

The inspection program for a coal operation must make provision for the following:

- a) the division of the coal operation into inspection areas,
- b) the identification of certain inspection areas as production areas, being:
 - i. in the case of an open cut mine - each area where mining operations are being conducted, or
 - ii. in the case of an underground mine - each area in the mine within which there is a place where coal or stone is mined (other than places at which coal or stone is mined for repairing or enlarging roadways), being areas:
 - (a) that include all places within 100 metres of a place where mining occurs that are in the same ventilation split as that place, and
 - (b) that do not start within a hazardous zone, and
 - (c) whose sizes are determined by taking into account the ability of people to effectively carry out inspections required by the inspection program,
- c) the identification of any place in an underground mine (other than places at which coal or stone is mined for repairing or enlarging roadways) that would otherwise be a production area and that is to be treated as not being within a production area during any period of not less than one shift when coal or stone is not intended to be mined,
- d) the clear and durable marking of the start of a production area in a roadway through which people normally travel,
- e) the assignment of a competent person to each inspection area to carry out inspections in that area, including:
 - i. in the case of an inspection area that is a production area in an open cut mine - a person who is competent to exercise the function of a mining supervisor for an open cut mine, or

- ii. in the case of an inspection area that is a production area in an underground mine - a person who is competent to exercise the function of a mining supervisor for an underground mine,
- f) in the case of an underground mine - a competent person within a production area remaining within that area while production is taking place unless replaced by another competent person (who
- g) must be qualified for assignment to carry out inspections in the area,
- h) the conduct of regular inspections of all safely accessible parts of the coal operation with the frequency of inspections being dependent on the risks present,
- i) the durable recording of results of inspections,
 - i. the means by which any concerns raised around the size of production areas, and the ability of those responsible to adequately perform required inspections, are to be resolved,
 - ii. the bringing of concerns arising from an inspection to the attention of:
 - iii. those whose health or safety may be affected by the subject matter of the concern, and
 - iv. those within the management structure of the coal operation whose area of responsibility and accountability includes the subject matter of the concern,
- j) the reporting of any remedial action taken as a result of an inspection to a person more senior in the management structure of the coal operation than the person whose area of responsibility and accountability includes the subject matter of the concern,
- k) the bringing of concerns arising from any remedial action taken as a result of an inspection to a person more senior in the management structure of the coal operation than the person whose area of responsibility and accountability includes the subject matter of the concern,
- l) the regular and timely review of reports of inspections, or other information from those who carry out inspections, by those in the management structure whose area of responsibility and accountability includes the subject matter of the report or information,
- m) if a regular routine of inspections for a production area is interrupted, for the area to be inspected by a competent person before any other person enters the area,
- n) for employees to examine their place of work for risks prior to commencing work and during the course of their work,

Note. Section 59 (3) of the Act requires an employee who works at a coal operation to immediately report to his or her immediate supervisor any situation that the employee believes could present a risk to health and safety and that is not within the employee's competence to control.

Section 62 of the Act applies that section to an employee of a contractor who works at a coal operation.

- o) in the case of an open cut mine, the carrying out of at least one inspection each shift,

for the inspection of the roof and sides of roadways underground by a person who is competent to exercise the function of a mining supervisor for an underground mine (or a person with equivalent competence in the inspection of roofs and sides of roadways underground),
- p) in the case of an underground mine:
 - i. the inspection of places, including, but not limited to, all safely accessible roadways, goaf edges, shafts and drifts, and
 - ii. the inspection of production areas, including, but not limited to:
 - (a) inspection for the presence of inflammable and toxic gases before connecting power to any plant, and
 - (b) inspection, at intervals not exceeding 2 hours, of each face area where coal or stone is mined, and
 - (c) inspection, at intervals not exceeding 5 hours, of all other places where people work, and
 - (d) inspection, at least once each shift, of all safely accessible places in the production area, and
 - iii. inspection of belt conveyors, including but not limited to:
 - (a) inspection of each operating belt conveyor at least once each shift, and
 - (b) inspection of any belt conveyor that has been shut down to detect the presence of any overheating, smouldering or other condition likely to cause a fire, and
 - iv. inspection of places other than production areas, including, but not limited to:

- (a) inspection at least once each shift of all places where people work, and
- (b) inspection at least once every 24 hours of all roadways where people regularly travel, and
- (c) inspection at least once every 7 days of all safely accessible places, and
- v. inspection for the presence of inflammable gas prior to the supply of electric power to any underground part of the coal operation.

Overall comment: Some candidates answered this very well, while other candidates were obviously guessing at the requirements for an inspection program.

Question 1 b)

- i. Clause 55 incidents
 1. immediately by the quickest means available to the inspector and industry check inspector.
 2. Site preservation – 24 hours except:
 - to help or remove a trapped or injured person or to remove a body, or
 - to avoid injury to a person or damage to property, or
 - for the purposes of any police investigation, or
 - in accordance with a direction of an inspector or with the permission of both an inspector and an industry check inspector, or
 - in any other circumstances that may be prescribed by the Regulations.
- ii. Clause 56 incidents
 3. Section 110 of the CMHSA
 4. No requirement for scene preservation
 5. Clause 56 - 24 hours (d, e, f, g, h, i, j, k, n, o, q) and as soon as practicable or not later than 7 days for everything else – to inspector and safety and health representative.

Overall comment: Many candidates did not mention the requirements for scene preservation, or the need to contact the safety and health representative.

Question 1 c)

- i. Clause 55 incidents

The following incidents are prescribed for the purposes of section 110 (1) (b) of the Act:

- a) an injury to a person that results (at any time after the injury) in any of the following:
 - i. the amputation of one or more fingers or toes or any other part of a hand or foot,
 - ii. any fracture other than a fracture of a finger, toe, hand or foot,
 - iii. loss of sight of an eye,
 - iv. an internal haemorrhage receiving hospital treatment,
 - v. the injection of fluid (including hydraulic fluid, oil, air or water) under pressure,
 - vi. asphyxia,
 - vii. the loss of consciousness of the person caused by impact of physical force, exposure to hazardous substances, electric shock or lack of oxygen,
- b) an event that results (at any time after the event) in the admission of a person to hospital as an in-patient,
- c) any of the following events or circumstances that present an immediate threat to life or of permanent incapacitating injury:
 - i. damage to any plant, building or structure,
 - ii. imminent risk of explosion or fire,
 - iii. entrapment of a person,
 - iv. failure of strata, or of slope stability control measures,
 - v. serious burns to a person,

- vi. the unintended activation or movement of vehicles or machinery,
- d) any incident involving electricity:
 - i. as a consequence of which a person suffers injury, receives treatment from a health care professional or is unable (on medical advice) to attend work for any period of time, or
 - ii. where a vehicle, machinery or other plant makes contact with an energised high voltage source involving a risk to any person,
- e) an uncontrolled explosion or fire or a misfire of explosives in the underground parts of a coal operation,
- f) an uncontrolled outburst of gas,
- g) an abnormal inrush of fluid,
- h) a collision on the surface part of the coal operation involving a vehicle or mobile plant with a gross weight of more than 2 tonnes,
- i) the loss of control of a heavy vehicle or other large plant on the surface part of the coal operation,
- j) the overturning of a heavy vehicle or other large plant on the surface part of the coal operation,
- k) ejection of fly rock so that it falls outside a blast exclusion zone (that is an area from which people are excluded during blasting) or near people,
- l) failure of any part of a powered winding system or damage to a shaft or shaft equipment.
- ii. Clause 56 incidents
 - 1. The following are declared to be incidents or matters that are required to be notified for the purposes of section 110 (1) (c) of the Act:
 - a) an injury to a person that results in the person being unfit, for a continuous period of at least 7 days, to attend the person's usual place of work, to perform his or her usual duties at his or her place of work or, in the case of a non-employee, to carry out his or her usual work activities (where that unfitness is supported by a medical certificate),
 - b) an illness of a person that is related to work processes and results in the person being unfit, for a continuous period of at least 7 days, to attend the person's usual place of work or to perform his or her usual duties at that place of work (where that unfitness is supported by a medical certificate),
 - c) any incidence of violence at a place of work that results in an employee being unfit, for a continuous period of at least 7 days, to attend the employee's usual place of work or to perform his or her usual duties at that place of work (where that unfitness is supported by a medical certificate),
 - d) a spill or incident resulting in exposure or potential exposure of a person to a notifiable carcinogenic substance or a prohibited carcinogenic substance,
 - e) contact of a person with an energised electrical item that is supplied at above extra low voltage,
 - f) initial self-heating of coal or other material, or any heating of coal in the underground parts of a coal operation that results in withdrawal of people,
 - g) an accumulation of gas that requires the withdrawal of people or results in the tripping off of electric power,
 - h) an unplanned fall of a roof or sides that impedes passage or disrupts mine ventilation or extends outside the bolted zone,
 - i) a windblast that results in injuries requiring treatment by a medical practitioner,
 - j) the burial of machinery such that it cannot be recovered under its own tractive effort,
 - k) a creep or progressive pillar collapse,
 - l) an event that occurs in a hazardous zone in the underground parts of the coal operation and from which an electric arc is observed or that leaves visible evidence on an electric cable of arcing having occurred,
 - m) the in-service failure of the explosion-protection characteristics of explosion-protected plant,
 - n) an uncontrolled explosion or fire or a misfire of explosives in the surface parts of a coal operation,
 - o) an escape of fluid under pressure that could place any person at risk,

- p) an unintended activation or movement of vehicles or machinery that does not present an immediate threat to life or of permanent incapacitating injury,
- q) a sudden pillar collapse.
2. For the purposes of section 110 (5) of the Act, the time in which notice of an incident referred to in subclause (1) (d), (e), (f), (g), (h), (i), (j), (k), (n), (o) or (q) must be given is as soon as practicable, and in any case within 24 hours, after the operator becomes aware of the notifiable incident.
3. In this clause:
- ***bolted zone*** means the area around an underground roadway that has been penetrated by roof, rib or cable bolts.
 - ***notifiable carcinogenic substance*** has the same meaning as in the regulations under the *Occupational Health and Safety Act 2000*.
 - ***prohibited carcinogenic substance*** has the same meaning as in the Regulations under the *Occupational Health and Safety Act 2000*.

Overall comment: Generally well answered.

Question 2

Highest mark: 20/20

Average mark: 11.5/20

Question 2 a)

There was sufficient information in the question to indicate the issue was the main fan – the pre-shift is after a weekend shutdown and the fact it affected two panels.

A drop in fan pressure is indicating a reduction in mine resistance potentially caused by:

- a stopping has fallen over between intake and return
- machine doors have been left open
- the short circuit means that less ventilation is reaching the last line of cutthroughs explaining the increase in gas reading in panel returns

The cause would not be a blockage in the return – this would lead to higher pressures.

The expected location would be main intake to main return and most likely near pit bottom due to the significant decrease in fan pressure.

Alternate causes are a fault on the main fan collar pressure monitor (however that would not account for the increase in gas levels) or a problem with the fan (which could be checked on surface).

Overall comment: Many candidates did not identify that this was a pre-shift from the surface. Many candidates indicated that the probable cause was a fall in the return which would not result in the drop in pressure.

Question 2 b)

Based on the above figures what may you expect to find in the face areas of the affected panels?

Due to the reduced ventilation reaching the last line of cut throughs and the fact that weekend ventilation would be setup (no auxiliary fans operating), the loss of ventilation would make the weekend ventilation ineffective. Thus it would be expected that little or no air in ventilating the faces inbye of the last line of cut throughs resulting in increased gas concentrations.

The air ventilating the faces would be lower but the weekend ventilation would still be circulating (assuming there are no other issues). The expectation would be that as long as the weekend ventilation pushes all the air to the faces then the return levels would be representative of the faces – ie there would be concentrations of 0.3% methane at the face area.

Overall comment: Most candidates did not consider how the panel would have been set up for a weekend shutdown. The auxiliary fan would be off and weekend ventilation would be in place. There would be no source of dust in the panel.

Question 2 c)

- Barometer
- Previous inspection reports
- Daily Inspection of Equipment (i.e. SMV) prior to operating
- Competent person on the surface
- Bump test gas monitor
- Discussion with electrician with respect to sequence of re-powering (assuming re-powering is occurring)

Overall comment: Generally well answered.

Question 3

Highest mark: 18/20

Average mark: 12.5/20

Question 3 a)

- Earth leakage fault
 - If the power has tripped on earth leakage fault only an electrician can reset power to the cable (reset is locked with an electricians lock). This will only be done after fully investigating the problem, including testing the cable with a megger.
 - A "Damaged Cable Report" should be filled out for every cable failure. This is to be forwarded to the Shift Supervisor for his comments and then passed on to the Manager of Electrical Engineering.
- Earth continuity fault
 - Isolate cable and check along entire length for damage. If no apparent damage, one attempt may be made to re-power. If it does not re-power, the cable must be tagged "Out of Service" and an electrician must investigate the problem.
 - If damage is detected, the cable must be tagged "Out of Service" and the cable damage procedure followed.

Overall comment: Many candidates could not identify the difference between an earth leakage trip and an earth continuity trip.

Question 3 b)

- Check pillar length (breakaway position) on the ATM
- Check that the roadway has been driven on centre from the last survey point
- Run out tape measure from the last survey pin (normally have 100m tape in the panel) and mark the centre of the cut through on roof.
- Mark up (measure up) 3, 4, 5 triangle (or 1.5, 2, 2.5m) with longest side along roadway centre. Measure 5m back from planned cut through centre along the centre of the roadway. Swing 4m arc (off outbye end) and 3m arc (off inbye end), cross over point will indicate centre line of the cut through. Or check distance and centre and set up the 90 degree prism.
- Hang laser droppers (tied to roof mesh) off the cut through centre position, and cross over position above
- Using spray paint mark inbye rib line 2.5m inbye of cut through centre (5.0m roadway)
- Measure back 8m from cut through centre and mark start of breakaway position on rib to guide miner driver (distance will depend on the type of continuous miner being used)
- Commence breakaway, when miner is around corner install laser

Overall comment: Several candidates ignored the key component of setting out the 90 degree turn.

Question 3 c)

Most mines purging procedures have a threshold at which purging is required. This is generally when equipment has been in an unknown concentration of methane or in a general body of 2% for 2 hours.

There are variations to the enclosures to be purged – may be the largest panel (the assumption is that this will draw in the most external atmosphere) or all enclosures with sparking components. Compressed air is not to be used to purge the enclosure.

Overall comment: Several candidates confused purging procedures with degassing procedures.

Question 3 d)

- Ensure the LHD operator is safe and uninjured.
- Immediately attend scene of the incident and take steps to repair the ventilation short circuit. If unable to repair fully, takes steps to reduce the airflow until further works can be undertaken (i.e. brattice over, place villa board over hole, etc)
- Contact inbye production districts and notify them of the reduced ventilation and potential for recirculation / increase in gas levels.
- Notify Undermanager of the incident and whether additional work is required to complete the repair
- Notify control to monitor for changes in return gas levels
- Notify panels when work is complete
- Complete statutory report
- Complete Incident report with respect to why the LHD damaged the stopping and any actions to prevent a similar occurrence in the future.

Overall comment: Generally well answered.

Question 4

Highest mark: 17/20

Average mark: 11.5/20

Question 4 a)

1. There is smoke and elevated CO – this is an emergency requiring immediate action.
2. Safety of men – collect men in preparation for egress from single entry
 - Discuss strategy to exit single entry
 - Collect escape equipment
 - You will notify them to don escape equipment (either self-rescuer or CABA depending on what is available at the location)
 - Take available firefighting equipment (fire extinguishers as a minimum), more equipment will be available at the fire depots stations along the single entry. If the fire is in the single entry you may have to fight the fire to escape the area.
3. At communication point (phone, radio or DAC) make contact with control and notify of smoke entering single entry
 - Ask if control can identify the origin of the smoke on underground monitoring system.
 - Report location, personnel with you and intention to exit the single entry
 - Indicate that assistance is to be sent to outbye side of fire (assuming fire is in the single entry)
 - Collect firefighting equipment and attend start of single entry
 - Maintain ventilation in the single entry
 - Will call from next phone in single entry (assuming CABA is available)

Overall comment: Many candidates did not seem to take into account that they were working in a single entry and evacuation was a priority.

Question 4 b)

You are a deputy carrying out a belt inspection on a longwall belt. Approximately 1000m along the 2000m gate road you notice the bottom belt tracking off and see a small pile of glowing material under a point where the belt is rubbing the structure. What are your priorities in this situation?

- Immediately run out a water hose to cool the affected area and dulse the hot embers

- Stop the belt to prevent additional embers
- Collect firefighting equipment and maintain a fire watch
- Report incident to the shift under manager (either directly or via control) and if additional resources are required.
- Check areas immediately inbye for any hot material carried inbye by the belt
- Check other areas where the belt has tracked off for any sign of fire/heat
- As the event is notifiable (combustion emitting light and heat) there is a requirement for non-disturbance, complete a report of what was witnessed prior to extinguishing the fire
- Have a belt shut-down carried out
- Ensure firefighting equipment is replaced
- Complete statutory report

Overall comment: Many candidates failed to understand when to turn the belt off – for this question the belt could be turned off immediately (no open fire and the belt continuing to run would just generate more heat and embers). Many candidates failed to identify this event as a reportable occurrence – a fire underground requiring scene preservation. Many candidates also failed to identify the need for a belt shut down.

Question 5 (marked up plan on page 9)

Highest mark: 19/20

Average mark: 12.5/20

Question 5 a)

i. Sequence

It is normal for the CM to cut from left to right. There were several acceptable answers but consideration had to be given to a logical sequence taking into consideration ventilation, wheeling and cable management.

Overall comment: Generally well answered – though some candidates had the CM flitting all over the place, creating difficulties in ventilating stubs and requiring strange tube runs.

ii. Ventilation devices

It was expected to show all stoppings. The return would normally be either the left hand side or flanking returns.

Overall comment: Generally well answered.

iii. Position of equipment

There were several acceptable variations.

Overall comment: Some candidates struggled with DCB position and CM cable route. These candidates only considered the first sequence and had given no thought to latter sequences.

iv. Ventilation pressure

Show the approximate points with the highest absolute ventilation pressure and the lowest absolute ventilation pressure

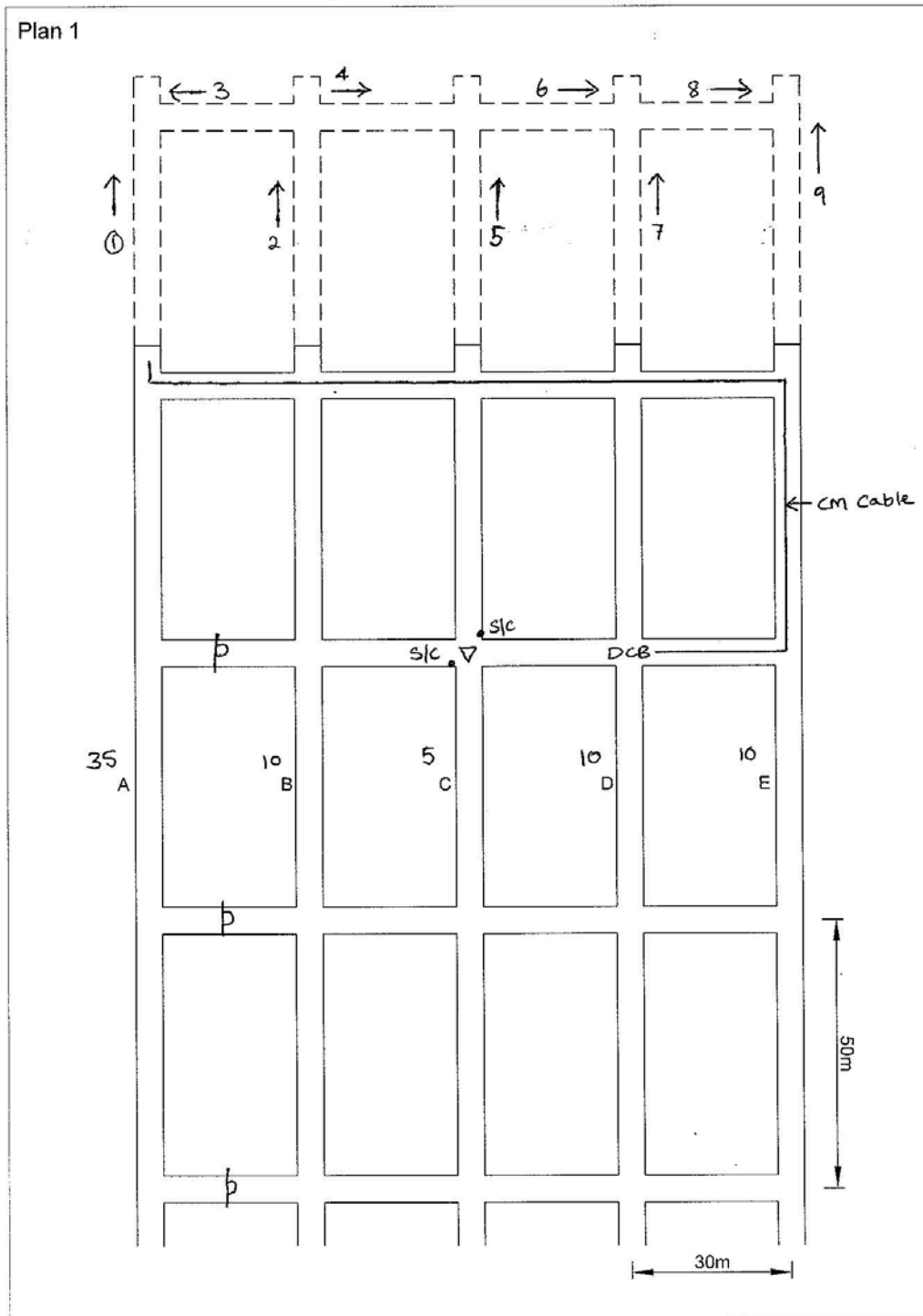
Ventilation flows from high pressure to low pressure. The highest pressure in the panel is the outbye end of the intake and the lowest pressure is the outbye end of the return.

Overall comment: Very poorly answered by most candidates.

Question 5 b)

The total quantity for the panel would be in the range of 25 to 40 cubic metres per second. The total intake quantity should equal the total return quantity.

Overall comment: Generally well answered.



Oral examination results

Date: 19, 20 and 21 May 2015
Number of candidates: 65 (98 approved to sit)
Number who passed: 21 (32% success rate)

Comments

A very poor pass rate for this round of oral exams. The major areas where candidates were found to be “not yet competent” were again ventilation and emergency management. These are two of the most basic areas for a candidate to demonstrate competence to be eligible for the awarding of a certificate of competence to be a deputy.

43 of the 44 candidates deemed not yet competent were unable to demonstrate competence in one or more elements of ventilation. This included 16 candidates with less than adequate understanding of degassing and 10 candidates with less than adequate understanding of brattice ventilation. 21 candidates were deemed to be not yet competent in emergency management. 7 to 10 candidates were found to be not yet competent in each of the areas of sequencing, inspections, pillar extraction and associated non-technical skills (generally leadership and decision making).

28 of the candidates were found to be not yet competent in 3 or more areas.

Candidates need to spend more time on grasping the fundamentals of ventilation and being able to demonstrate their knowledge. They should have an excellent knowledge of the system at their mine and a good understanding of common systems used in other mines with differing conditions and hazards in NSW.

More information

Business Processes & Authorisations

Phone: 4931 6625

Acknowledgments

Deputy Examination Panel

© State of New South Wales through the Department of Trade and Investment, Regional Infrastructure and Services 2015. You may copy, distribute and otherwise freely deal with this publication for any purpose, provided that you attribute the NSW Department of Trade and Investment, Regional Infrastructure and Services as the owner.

Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (July 2015). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of the NSW Department of Trade and Investment, Regional Infrastructure and Services or the user's independent advisor.