Understand the electricity network

Powerlines have many different configurations ranging from multiple high voltage cables supported on large towers to a Single Wire Earth Return (SWER) system. SWER system spans can be of up to 400 metres and are particularly hazardous to pilots as cables and poles can be difficult to see.

Buildings such as houses and sheds are likely to have power connected through overhead structures. Roads may also provide a convenient path for powerlines. By identifying at least two poles, a pilot can gauge the path of the cable. Insulators on poles generally run in the same direction as the cable and may assist in identifying the number of cables and their direction. Understanding how to read powerline hardware on utility structures is a core skill for low-level flying crews.

To identify powerline locations, visit **lookupandlive.com.au** and make a plan to stay safe when working near powerlines.

Scan with smartphone

Call for safety advice

Powerlink Queensland — **1800 635 369**

Queensland Government

Ergon Energy Network — **13 74 66**

energex — **13 12 53**

Part of the Energy Queensland Group

1800 353 031	Emergency numbers	**13 16 70**	**13 19 62**

ergon.com.au | **energex.com.au**

EGE180508

Working safely around electricity when **Low-Level Flying**

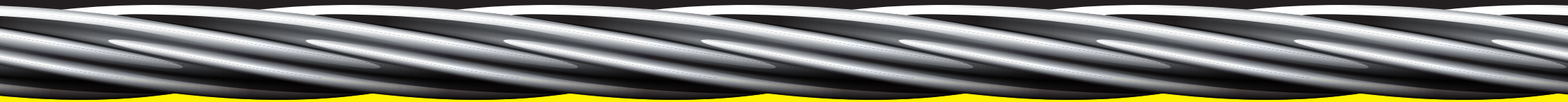
Powerlink Queensland

Queensland Government

Ergon Energy Network | energex

Part of the Energy Queensland Group

There are electrical overhead powerlines criss-crossing the country.
Often unnoticed, they are essential to provide electricity to our towns and communities.
Contact with overhead powerlines can cause serious injury or death.



Practice safe work habits

- Before starting work, take the time to plan. Visit **lookupandlive.com.au** - our powerline planning map to identify powerline locations and make a plan to work safe.
- Conduct a pre-flight briefing and do a pre-flight reconnaissance.
- Apply appropriate flying techniques.
- Maintain situational awareness for co-pilot and crew.
- Read the physical structure indicators, eg poles and insulators and identify verbally all structures if flying with others.
- Know the location of powerlines on and around the property or the area you are flying in.
- Consider weather conditions.
- Guard against deviating from low-flying routes and areas that have been previously checked for powerlines and other cables.
- Cross over powerlines at poles or structures rather than mid–span where possible.
- Be aware of reduced powerline heights resulting from damage, often indicated by uneven cables, excessive sag or slack stays.
- Stay well clear of damaged powerlines and report damage immediately by calling triple zero (000).
- Request Installation of rotamarkers on overhead powerlines and stay wires where low-level flying operations occur regularly.
- Request permission to paint poles to highlight structures.
- Provide ground barriers to warn crew of the presence of powerlines and electrical infrastructure, where appropriate.
- Ensure all new members of the crew are inducted on the risks so they understand potential electrical hazards with powerlines.

What to do if contact with powerlines occurs

- Follow your pilot's training if contact with powerlines occurs. Be aware that there is an elevated risk of fire from fuel in an electrical accident.
- Assume that powerlines or cables are 'live', even if they are not sparking.
- Don't touch overhead powerline cables.
- Call triple zero (000) immediately to report powerlines down and a life threatening situation.
- Stay inside the cabin, unless it is unsafe to do so. Occupants should not leave their aircraft until the power is switched off and they have been given the all clear by an authorised electricity distribution employee.
- Keep bystanders at least 10 metres away from the aircraft and anything else in contact with the powerlines. A potentially dangerous electrical field will be created around anything in contact with the powerline.

If immediate evacuation of aircraft is necessary:

- Access your escape route and check for fallen powerlines.
- Jump well clear ensuring you land with your feet together. Be careful not to stumble or fall and don't touch the aircraft and the ground at the same time.
- Jump or shuffle away with your feet together until you are at least 10 metres clear of the aircraft, powerlines or anything else in contact with them.
- Once clear DO NOT go back to the aircraft for any reason.
- Don't try to be a hero. Never approach, attempt to rescue or allow others to approach an aircraft in contact with powerlines.

Marking powerlines

Aircraft warning markers

Powerline warning markers should be installed where regular low-level flying operations take place. Refer to AS 3891. The marker's colour should be chosen for visibility and contrast with the surrounding background.

Red and white rotamarkers are the standard powerline markers used by Energex and Ergon Energy. Markers of different colours may be requested to provide contrast when viewed in different directions or conditions (eg. white and orange alternated).

More information on powerline markers can be found in our Marking overhead powerlines and electrical assets brochure.

Pole marking

Painting the lower section of the pole up to 2.4 metres above ground with white and red alternating 600mm bands of paint can also provide a visual indication of structures.

Contact us for safety advice about marking powerlines and poles on your property.

Responsibilities

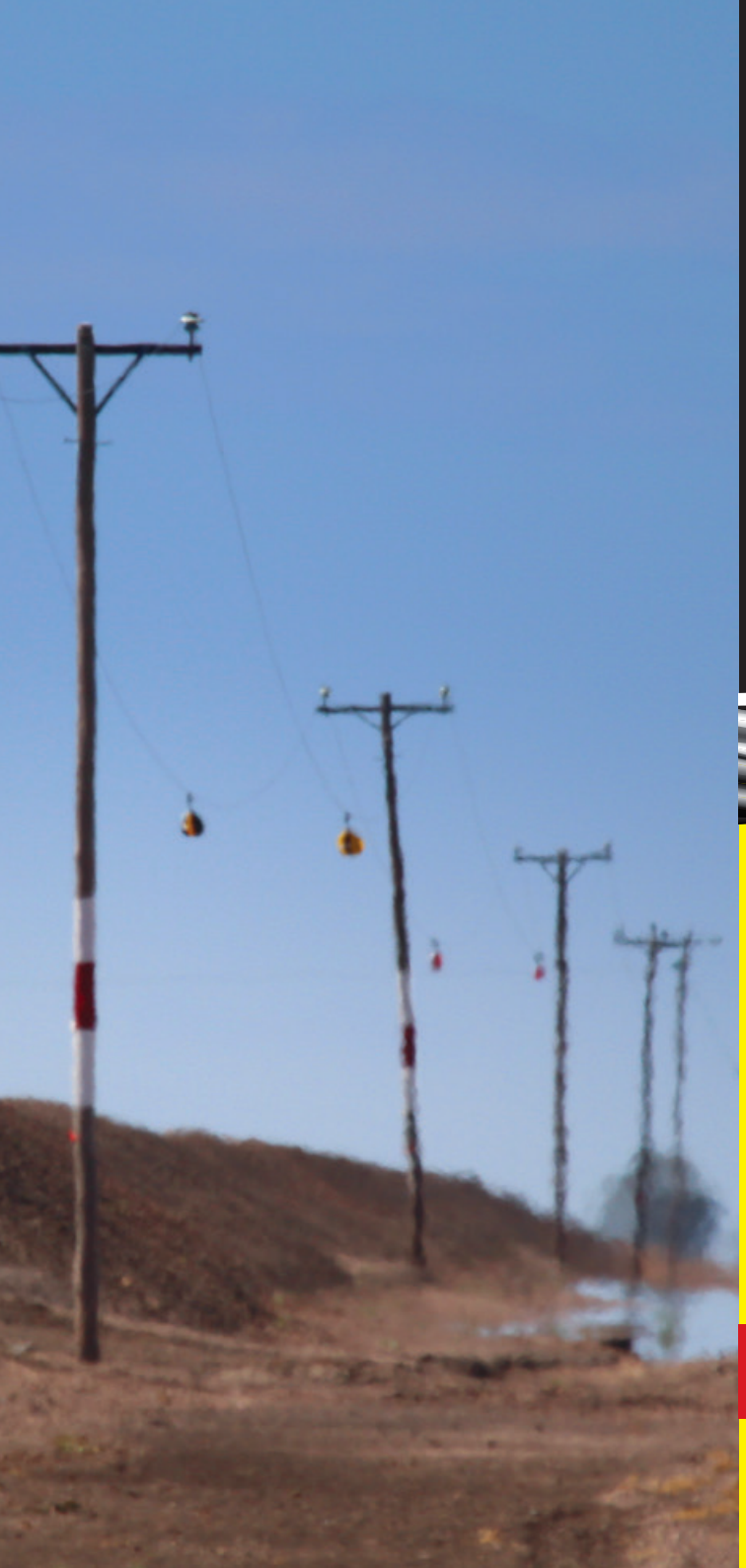
The responsibility for marking overhead powerlines, cables and structures should be as follows:

(a) The person requesting planned low-level flying operations (eg the land owner) is responsible for requesting installation of markers.

(b) The pilot or pilot's delegate should be satisfied as to the need for and effectiveness of markers prior to commencing low-level operations.

(c) Aerial markers should only be installed, maintained or removed by Ergon Energy or Energex.

More information on avoiding contact with powerlines can be found at www.atsb.gov.au, www.casa.gov.au and aerialag.com.au



To identify powerline locations, visit **lookupandlive.com.au** and make a plan to stay safe when working near powerlines.

Scan with smartphone

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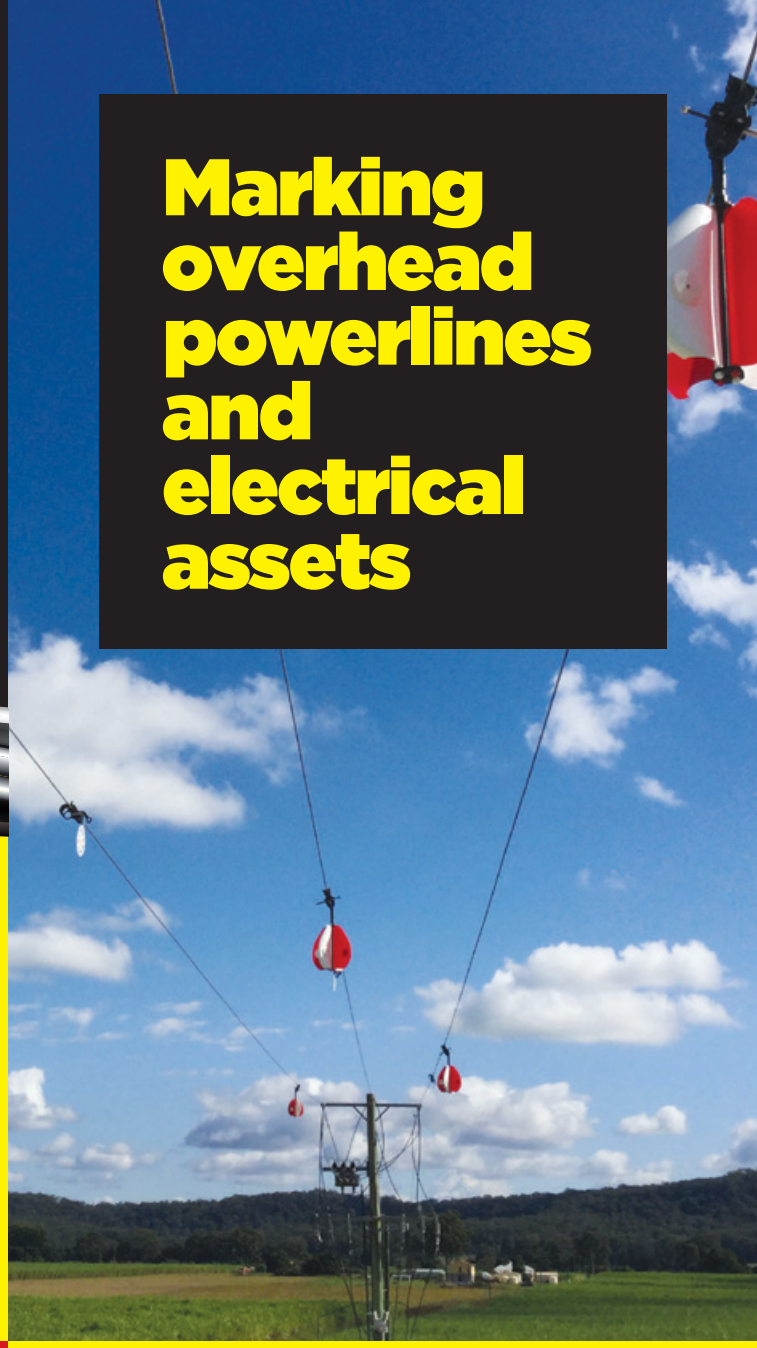
ergon.com.au | **energex.com.au**

EGE180508

Marking overhead powerlines and electrical assets



Powerlink Queensland

Queensland Government

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Before starting work, every person working near powerlines should be aware of their safety obligations under the *Electrical Safety Act 2002*, *Electrical Safety Regulations 2013*, and adopt safe work practices in accordance with the *Electricity Entity Requirements: Working Near Overhead and Underground Electric Lines*. If you are contemplating working or operating plant near overhead or underground powerlines, you can obtain a copy of these documents from our website.

Overhead warning markers

We have a range of overhead warning markers that can be installed to help identify overhead powerlines in areas where machinery is frequently operated.

Painting poles

Painting the lower section of the pole up to 3 metres above ground can also provide a visual indication of structures to help avoid accidental contact.

Aircraft warning markers

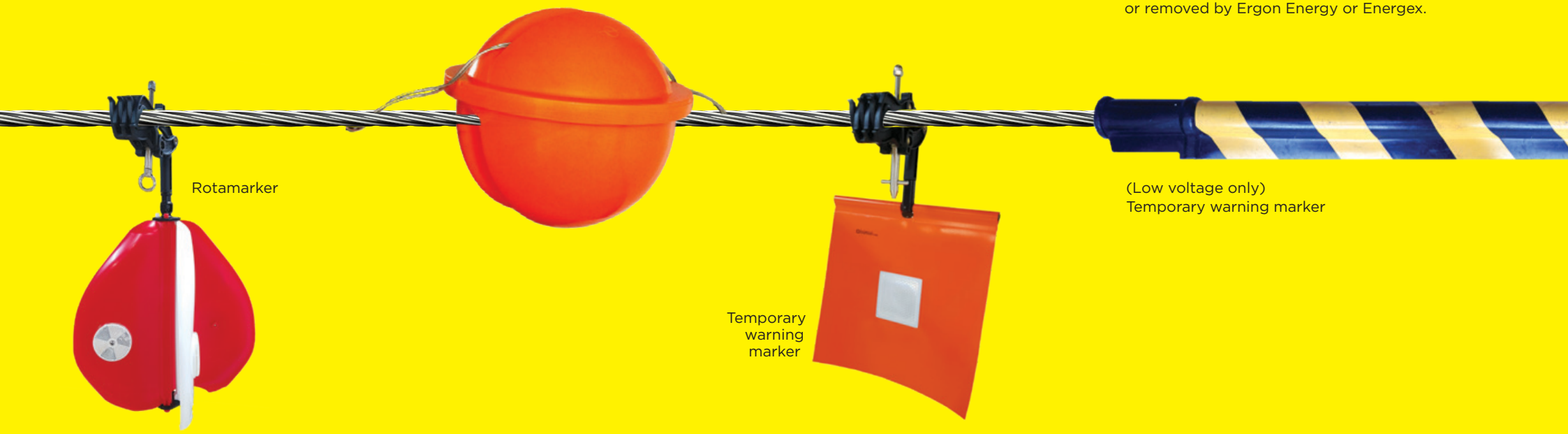
Cable markers should be installed where regular low-level flying operations take place. Refer AS 3891 – 2008 Air navigation - Cables and their supporting structures - Marking and safety requirements.

The red and white rotamarker is the standard powerline marker. Markers of different colours may be used to provide contrasts when viewed in different directions or conditions e.g. white and orange alternated.

Responsibilities

The responsibility for marking overhead powerlines, cables and structures should be as follows:

- The person requesting planned low-level flying operations e.g. the land owner, is responsible for requesting installation of markers.
- The pilot or pilot's delegate should be satisfied as to the need for and effectiveness of markers prior to commencing low-level operations.
- Aerial markers should only be installed, maintained or removed by Ergon Energy or Energex.



Rotamarker

Temporary warning marker

(Low voltage only)
Temporary warning marker

Place these handy stickers in key locations

More industry specific information

All machinery operators and other workers working near powerlines should

be aware of their safety duties under the Electrical Safety Act 2002 and The Electrical Safety Regulation 2013 and adopt safe work practices in accordance with the Code of Practice 'Working Near Overhead and Underground Electric lines'.

If you are contemplating working or operating plant near overhead or underground powerlines, you should obtain a copy of the 'Electricity Entity requirements: Working Near Overhead and Underground Electric Lines' which is available at **ergon.com.au/lookupandlive** or **energex.com.au/lookupandlive**

Call for safety advice

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13 74 66 **13 12 53**

Look up and Live

Always take care when operating around overhead powerlines.

Working in close proximity to powerlines, above or below the ground, has its hazards. Every year, workers die or suffer serious injuries, mostly because safe work practices around electricity have not been applied. Not only could contact with powerlines cause injury or death but costs to repair the damage could be expensive.

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This guide contains valuable information about some of the potential dangers of and how to work safely around, both overhead and underground powerlines, for operators of machinery including excavators, tip trucks, trucks, crop sprayers, harvesters or aircraft and users of scaffolding equipment, irrigators or ladders.

Exclusion zone

An exclusion zone is a safety envelope around an overhead powerline. Exclusion zones keep people, operating plant and vehicles a safe distance from energised overhead powerlines. No part of a worker, operating plant or a vehicle should enter an exclusion zone while the overhead powerline is energised (live).

Exclusion zone measurements depend on the voltage of the powerline, type of work being performed and qualifications of people involved.

Generally, workers and their equipment must maintain exclusion zones around powerlines as follows:

- 3 metres for voltages up to 132kV

- 6 metres for voltages up to 330kV

If the work that you and your staff are planning has the potential to encroach into powerline exclusion zones or if you are unsure, contact us for safety advice before starting the job.

These exclusion zones can be reduced if the worker has been trained and approved as an Authorised Person. Contact us for information on how to become an Authorised Person.

Safety Observer Zone

A Safety Observer Zone is the area where machinery or equipment is operating where any part of the machinery or equipment COULD enter the exclusion zone. A trained safety observer MUST be used if the equipment can reach the exclusion zone. Encroachment into the exclusion zone is strictly forbidden.

To ensure the equipment does not come within an unsafe distance, we recommend that a Safety Observer Area of 10 metres be delineated either side of overhead powerlines as per the diagram below. A Safety Observer SHOULD be used when machinery or equipment is operating in the Safety Observer Area.

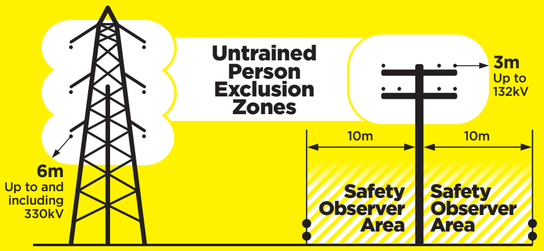
Safety Observer

A Safety Observer or spotter is a person who:

a. observes the operating plant; and

b. advises the plant operator if it is likely that the operating plant will enter the exclusion zone for an overhead powerline.

Safety Observers undergo specific training and must be competent to perform the role in observing, warning and communicating effectively with the plant operator. Contact us for information on how to become a qualified Safety Observer.



What to do if contact with powerlines occurs

What happens if overhead or underground powerlines are contacted

1. The machinery or vehicle will become 'live' at the same voltage as the powerlines contacted and electricity will attempt to pass through the vehicle to the ground.
2. Anything in contact with the powerlines will also become 'live', such as fences and trees.
3. A potentially dangerous electrical field will be created around anything in contact with the powerline. This field extends for approximately 10 metres around these items.

What should you do if contact occurs

1. Try not to panic, remain calm and stay in the vehicle until the power has been isolated and the powerlines removed. Don't risk being electrocuted by attempting to leave the vehicle before power is disconnected.
2. Advise anyone near the incident site to stay a minimum of 10 metres from the vehicle and anything else in contact with the powerlines.
3. Treat all powerlines as if they are 'live'.
4. Call 000 immediately to report powerlines down and a life threatening situation.

We recommend that operators of machinery practise this jump / shuffle technique on a regular basis.

What if the person in the vehicle needs to be evacuated

An emergency evacuation is extremely dangerous and should only be attempted as a last resort, such as if the vehicle is on fire. Remember never approach the vehicle to assist in an evacuation and always treat all powerlines as if they are 'live'.

Tyres can explode

When a vehicle contacts overhead powerlines a massive electrical current flows through the vehicle and its tyres to earth. This can cause the tyres to explode on contact or to start burning on the inside.

Tyres burning on the inside creates a potential hazard where the build up of gases and heat can cause the tyre to explode at a later time, even 24 hours after the incident. Flying debris from the tyres exploding could potentially injure any persons in close proximity to the vehicle.

Ensure that the vehicle is isolated with a 300m exclusion zone for a minimum of 24 hours. After this, have the vehicle thoroughly inspected for tyre and mechanical damage.

All machinery operators and other workers working near powerlines should also be aware of their safety duties under the Electrical Safety Act 2002 and The Electrical Safety Regulation 2013 adopting safe work practices in accordance with the Code of Practice 'Working Near Overhead and Underground Electric lines'. If you are contemplating working or operating plant near overhead or underground powerlines, you should obtain a copy of the 'Electricity Entity requirements: Working Near Overhead and Underground Electric Lines' which is available at **ergon.com.au/lookupandlive** or **energex.com.au/lookupandlive**