

Tunnelling

South East Queensland (SEQ) is one of the fastest growing regions in Australia with our population set to increase significantly in the next 25 years. A secure water supply is essential.

The Northern Pipeline Interconnector (NPI) – Stage 2 is a vital piece of infrastructure designed to help secure the water supply for the Sunshine Coast region. It involves the construction of an underground, reverse-flow pipeline from the Noosa water treatment plant to NPI – Stage 1 at Eudlo.

The Northern Network Alliance (NNA) has been engaged to design and construct NPI – Stage 2. The NNA consists of LinkWater Projects, McConnell Dowell, Abigroup and KBR.

Though most of the pipeline will be built using the open cut trenching method (see ‘Constructing a pipeline’ fact sheet) in some instances different techniques will be used, such as tunnelling.

Tunnelling allows an underground path to be created for the pipeline without disturbing the land above. This method is often used in difficult terrain; under major infrastructure (road, rail and buildings), under rivers or lakes, or in densely populated community areas.

The NNA team will tunnel certain sections along the pipeline corridor to minimise impacts on the local environment and the community.

Tunnelling methods

Tunnels along NPI – Stage 2 will be constructed using two different construction methods—micro tunnelling and auger boring.

Micro tunnelling

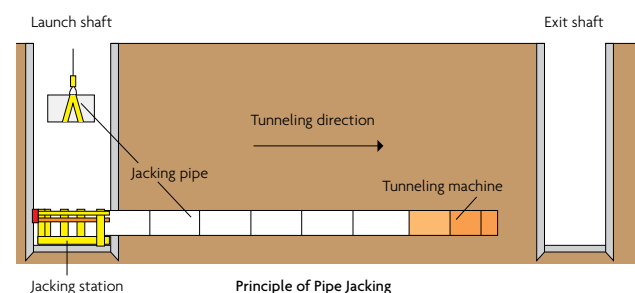
Micro tunnelling creates a lined tunnel between two points using purpose-built machines such as a tunnel boring machine.

How tunnel boring machines work

The tunnel boring machine has a cutting head at the front that digs the tunnel as it is pushed forward. To push the machine forward, hydraulic jacks are used to push specially designed concrete pipes, also known as jacking pipes. These jacking pipes line the tunnel as it is being created. To remove the dirt and rock (or ‘spoil’) from the tunnel, the machine will either have a

conveyor belt or a series of pipes. Once the tunnel is complete and spoil is removed, the water pipe is placed inside the jacking pipes.

For the tunnel boring machine to be able to tunnel, shafts must be created at each end. The shaft where the tunnel starts is known as the launch shaft. This is where the machine and jacking pipes are lowered in position to start the tunnel and where all excavated material is removed. An exit shaft is created at the end of the tunnel so the machine can be removed once the tunnel is completed.

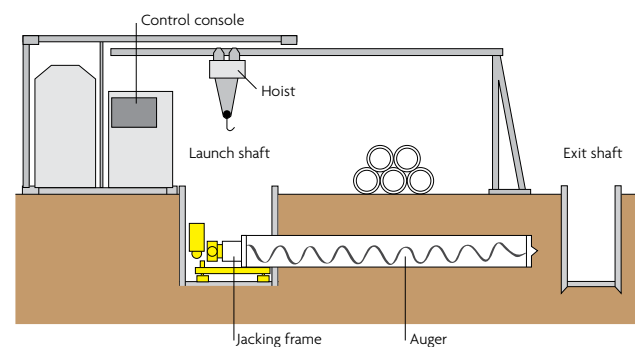


Auger boring

Auger boring creates a tunnel using a large drill-like (Archimedes) screw. This technique is used for shorter distances. The process for auger boring is similar to micro tunnelling.

How auger boring works

Launch and exit shafts are created and hydraulic jacks are used to push the auger bore forward to create the tunnel. A steel enveloper pipe is used to line the tunnel. Once the tunnel is complete, the water pipe is placed inside the tunnel.



Tunnelling locations

The table below lists the tunnel locations and techniques the NNA will use to build the pipeline.

Location	Length (metres)	Technique	Benefit
Suncoast Christian College, Woombye	365	Micro tunnelling	Minimises disruption to school No disruption to Nambour Connection Road, Kiel Mountain Road or Palmwoods Road
Pringle Road, Nambour	28	Auger bore	Minimises disruption to traffic on Pringle Road
Pringle Hill, Nambour	1090	Micro tunnelling	Minimises disruption to residents and the environment
Nambour Connection Road – Bli Bli Road Intersection, Nambour	68	Micro tunnelling	No disruption to Nambour Connection Road and Bli Bli Road
Northern Coast Rail line, Image Flat	37	Auger bore	No disruption to rail services
Steggalls Road and Quandong Court, Yandina	169	Micro tunnelling	Minimises disruption to residents
West Eumundi Road, Eumundi	27	Auger bore	No disruption to West Eumundi Road
West Eumundi Road, Eerwah Vale	24	Auger bore	No disruption to West Eumundi Road
Eumundi-Kenilworth Road, north bound on ramp, Eerwah Vale	137	Micro tunnelling	No disruption to Eumundi-Kenilworth Road
North Coast Rail line, Cooroy	26	Auger bore	No disruption to rail services
Tewantin Road, Cooroy	22	Auger bore	No disruption to traffic on Noosa-Tewantin Road
Pearsons Road, Cooroy	44	Auger bore	No disruption to traffic or services through Pearsons Road area

Managing noise

Noise from construction will be kept to a minimum and remain within Environmental Protection Agency guidelines.

Traffic management at tunnel sites will ensure truck and traffic flows are managed safely and with the least possible inconvenience to motorists, cyclists and pedestrians.

Managing construction traffic

There will be increased traffic in and around sites where tunnels are being created. Trucks will be removing excavated material when creating the launch and exit shafts. Spoil for the launch site will also be removed by truck as the tunnel is being created.

For safety reasons, temporary speed limit changes may be applied around construction areas.

Access for emergency services and community services, such as refuse collection, mail delivery and bus services will be available at all times.