



Suburban Rail Loop East

Environment Effects Statement

Soil and groundwater



Suburban Rail Loop is a city and state-shaping project that will transform Victoria's public transport system, enhance Melbourne's middle suburbs and create a long pipeline of jobs.

Suburban Rail Loop East from Cheltenham to Box Hill (SRL East) will connect Melbourne's growing health, education, retail and employment precincts in Melbourne's east and south east.

The 26-kilometre SRL East tunnel will be built as a standalone line that is integrated with the existing public transport network.

A high-tech fleet of energy efficient trains will run on the line, stopping at the six new underground stations at Cheltenham, Clayton, Monash, Glen Waverley, Burwood and Box Hill.

Planning processes

After two years of detailed planning and development work, SRL East's Environment Effects Statement (EES) has been released.

The SRL East EES identifies benefits and potential impacts during construction and operation and proposes ways to avoid, minimise, offset or manage any effects.

The EES for SRL East includes 19 different studies and technical reports on topics such as noise, vibration, traffic, ecology and social impacts.

Also released is a draft Planning Scheme Amendment (PSA) showing proposed changes to local planning schemes so land can be used to build rail infrastructure for SRL East.

The SRL East EES and draft PSA can be viewed in full on the Suburban Rail Loop website at suburbanrailloop.vic.gov.au/EES

What we've heard so far about soil and groundwater

Since mid-2019, we've engaged with over 20,000 people via online and face to face consultation.

Key feedback relating to **soil and groundwater** included:

- Requests for a plan for the safe removal and disposal of spoil from work sites and to ensure any contaminated soil is quickly moved away from sites near residential areas
- Suggestions to look at sustainable spoil removal methods and re-use locally where possible.
- Queries about the assessments being undertaken to understand ground conditions.
- Questions about health impacts from dust and pollution during construction.

MORE INFORMATION ABOUT COMMUNITY ENGAGEMENT CAN BE FOUND IN ATTACHMENT E OF THE SRL EAST EES - COMMUNITY ENGAGEMENT REPORT.

This factsheet

We've developed a suite of fact sheets to help you navigate the SRL East EES and connect you with the information that's relevant to you.

This fact sheet provides information about how potential impacts on **soil and groundwater** have been considered and explains where you can find more detail in the SRL East EES.

EES study topics covered in this fact sheet:



Ground movement



Contaminated land



Groundwater



Surface water



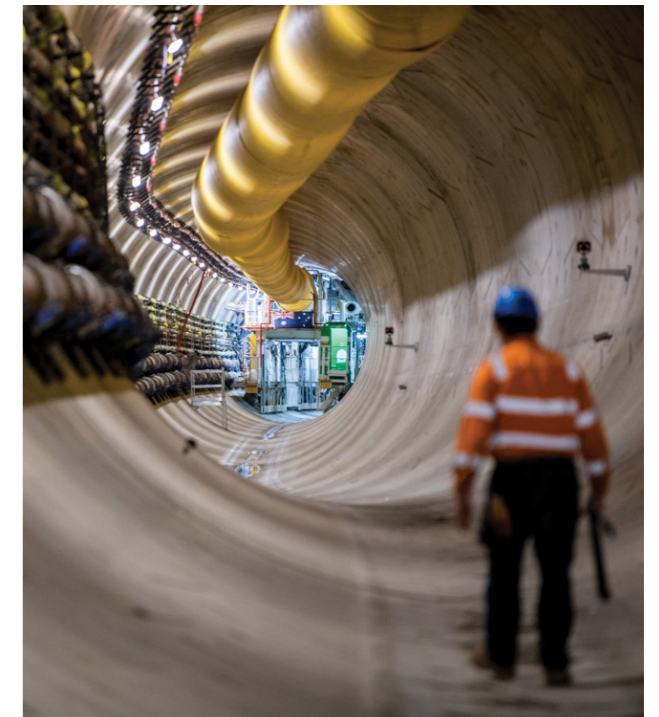
SRL East site investigations at Monash

Digging deep underneath Melbourne's south eastern suburbs

Site investigations and studies have been performed to understand the ground conditions across the 26-kilometre alignment, including drilling more than **500** boreholes. From this information, a geological model of the ground conditions has been used to determine appropriate construction techniques.

Tunnel boring machines (TBMs) would be used to build the 26-kilometre twin tunnels. TBMs have been used to build many underground rail projects around the world, including Melbourne's Metro Tunnel, and are tried and tested under a range of conditions.

MORE INFORMATION ABOUT CONSTRUCTION TECHNIQUES CAN BE FOUND IN THE BUILDING SRL EAST FACT SHEET.



Inside Melbourne's Metro Tunnel

Managing soil and groundwater impacts

Suburban Rail Loop Authority is committed to minimising impacts on soil and groundwater during the construction and operation of SRL East.

A number of mitigation measures have been developed to avoid or minimise impact to the environment and human health. These form the basis of Environmental Performance Requirements (EPRs) recommended by specialists through the EES process.

The recommended EPRs for soil and groundwater include:

- Designing the tunnels and underground structures to limit ground movement during construction and operation
- Assessing potential ground movement from excavation and identifying trigger levels for additional mitigation measures
- Property condition surveys before construction begins to record the existing condition of all potentially impacted buildings, including older/heritage homes, hospitals and major institutions
- Plans for managing contamination encountered during construction, including acid sulfate soil and rock and industrial waste
- Strict measures to reduce the risk to human health and the environment from hazardous materials
- Protections for the community and workers in line with Environment Protection Authority (EPA) Victoria for the excavation, storage and management of soil.
- Designing underground structures to minimise groundwater changes and the design and implementation of a monitoring program to verify that no significant impacts occur
- Plans to manage surface water and implement measures to minimise risks from changes to flood levels, flow and velocity.



SRL East site investigations at Burwood



Inside Melbourne's Metro Tunnel

MORE INFORMATION ABOUT ENVIRONMENTAL PERFORMANCE REQUIREMENTS CAN BE FOUND IN ATTACHMENT A OF THE SRL EAST EES - ENVIRONMENTAL MANAGEMENT FRAMEWORK.

Assessing ground conditions

With the majority of SRL East's works underground, a range of specialist studies have provided a detailed understanding of ground conditions beneath Melbourne's east and south east suburbs, including potential for ground movement and contamination.

The soil and rock (technically known as 'spoil') excavated during construction of the tunnels and stations would be managed under a detailed re-use or disposal plan.

Ground movement

Assessing ground movement

During or after excavation of an underground tunnel and construction of the cross passages, there is potential for ground movement or settlement. Natural ground movement occurs seasonally as temperature and soil moisture changes. As part of the SRL East EES, specialists assessed buildings, utilities and infrastructure which could be susceptible to ground movement and proposed measures to mitigate any adverse impacts.

Limited ground movement is expected from excavation works to build SRL East. Modelling identified that a small number of roads may be affected by ground movement over time from excavation and settlement around the tunnels, which would be managed by additional mitigation measures and remedial works.

Detailed condition surveys of nearby buildings and other structures would be completed by our contractors before and during construction and extensive monitoring undertaken. Survey monitoring points would be set up on buildings, including heritage properties, structures, pavements and roads across the SRL East alignment.

Condition surveys would be offered to property owners near the tunnel alignment and construction sites to give peace of mind before construction gets underway. These surveys would document current conditions and identify if other mitigation measures would be needed to reduce potential impacts.

With appropriate techniques and monitoring, SRL East would be built and operated with minimal ground movement and no undue effects to buildings or the natural environment.



SRL East site investigations at Glen Waverley

Contaminated land

Site specific investigations for the SRL East EES included 3,400 soil, groundwater and vapour samples. These investigations showed that contaminate levels did not pose a significant risk for human health, the environment and buildings or structures.

Most of the rock and soil removed during construction would be what is known as fill material – material that can potentially be reused or recycled. However, the urban and industrial history of some parts of the alignment increase the likelihood of encountering some hazardous materials.

Assessing contaminated land

Land contamination is a common environmental issue in Australian cities. Melbourne’s industrial and manufacturing heritage, combined with poor environmental management and waste disposal practices in the past, has left many potentially contaminated sites across the city.

Through a combination of site history assessments, ground investigations and sampling, specialists identified SRL East areas where there is potential contaminated land and proposed measures to minimise or avoid any impacts to people and the environment.

Additional mitigation measures would be put in place at the Cheltenham site, due to its proximity to the former Highett Gasworks. Specific measures would also be required for works at the train stabling facility site in Heatherton, due to its history as a clean fill landfill site.

Specific management plans and measures would manage the extraction of acid sulphate soils, gases and vapours, contaminated groundwater or any other hazardous materials.

The majority of spoil would be reused and managed in accordance with the project’s **Spoil Management Strategy**. In total, less than 5 per cent of spoil would likely be contaminated and need to be disposed of in line with Environment Protection Authority (EPA) Victoria and WorkSafe Victoria guidelines at appropriately licenced facilities.

Construction of SRL East would generate an estimated 3.5 million cubic metres of excavated rock and soil.

In most cases, rock and soil would be removed from construction sites as quickly as possible. However short-term stockpile areas would be created at TBM launch sites and other major excavation sites in order to temporarily store materials that cannot be removed immediately.

These stockpile areas would be carefully managed in line with EPA Victoria guidelines.

Figure 1 Volume of excavated (in situ) material (m³)

Activity	Approximate volume of excavated (in situ) material (m ³)
Tunnelling	2,055,000
Station excavation	1,469,000
Total volume of excavated material (m³)	3,524,000

Groundwater

Construction of SRL East would likely cause localised drawdown on the groundwater table around the station locations. However, drawdown is expected to be minimal, with no anticipated impacts on aquatic or terrestrial groundwater dependent ecosystems after mitigation.

Assessing groundwater impacts

Groundwater is water that exists below the ground surface, where it saturates soil and fills spaces. It is a valuable water source for people and the environment and can be used for drinking, irrigation, stock watering, industrial or commercial purposes. Groundwater also supports ecosystems such as aquatic environments, terrestrial vegetation, wetlands and waterways and is important to Traditional Owners.

Specialists identified and assessed groundwater conditions and how they may be effected during the construction and operation of SRL East. Specialists have proposed approaches to minimising and managing potential impacts as part of SRL East’s EPRs.

While some sites including Cheltenham and the train stabling facility sites contain some localised potential contamination sources, there would be low risk to the broader environment.

Interactions with groundwater, in terms of drawdown, inflows and water quality, are expected to be controlled or reduced by design features, carefully selected construction methods, and groundwater monitoring.



Gardiners Creek, Burwood



Surface water and flooding

Assessing surface water impacts

Surface water refers to any body of water above ground, including streams, rivers, lakes, wetlands, reservoirs and creeks. Specialist investigations identified surface water which intersects with SRL East and proposed approaches to minimise and manage any potential impacts during construction and operation.

During construction of SRL East, there would be exposed surface areas at construction work sites. During high volume rainfall events, runoff from the sites could affect nearby waterways, either directly or via stormwater drainage systems.

An **Integrated Water Management Strategy** would include mitigation for flooding and surface water run-off, including stormwater and wastewater during construction. Water sensitive urban design measures would seek to capture and reuse run-off for irrigation of parks and gardens as part of the project's delivery.

Commonly used stormwater management techniques, such as minimising the area of exposed ground and isolating site run-off from the existing drainage system, would be used to minimise the risk of run-off entering the stormwater system and waterways during construction.

Suburban Rail Loop Authority proposes naturalising a section of Gardiners Creek in Burwood. Specific management measures would be in place during these works to minimise disturbance to the bed and banks and manage potential impacts on water quality and flooding.

Design solutions for the tunnels, stations and surrounding areas would provide protection against heavy rainfall and rare flood events during construction and operation.



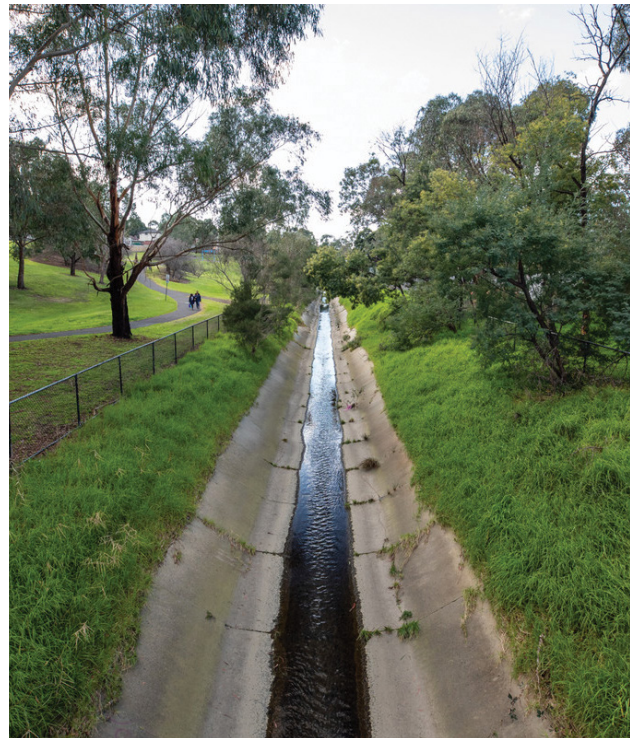
Make a submission

Submissions on the SRL East EES and draft Planning Scheme Amendment (PSA) are invited during the public exhibition period.

Submissions must be made in writing to **Planning Panels Victoria** and received by **11:59pm on Thursday 16 December 2021**.

For questions relating to submissions contact the Department of Environment Land Water and Planning **Customer Service Centre on 136 186**.

To make a submission visit **engage.vic.gov.au/srl-east-iac**



Gardiners Creek Reserve, Burwood

More information

To find out more about Suburban Rail Loop:

- 🏠 suburbanrailloop.vic.gov.au
- ✉ contact@srla.vic.gov.au
- 📞 1800 105 105 (24 hours a day, 7 days a week)

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It should be noted that this information is current at the time of printing, however changes may occur. Please visit suburbanrailloop.vic.gov.au for the latest updates.