

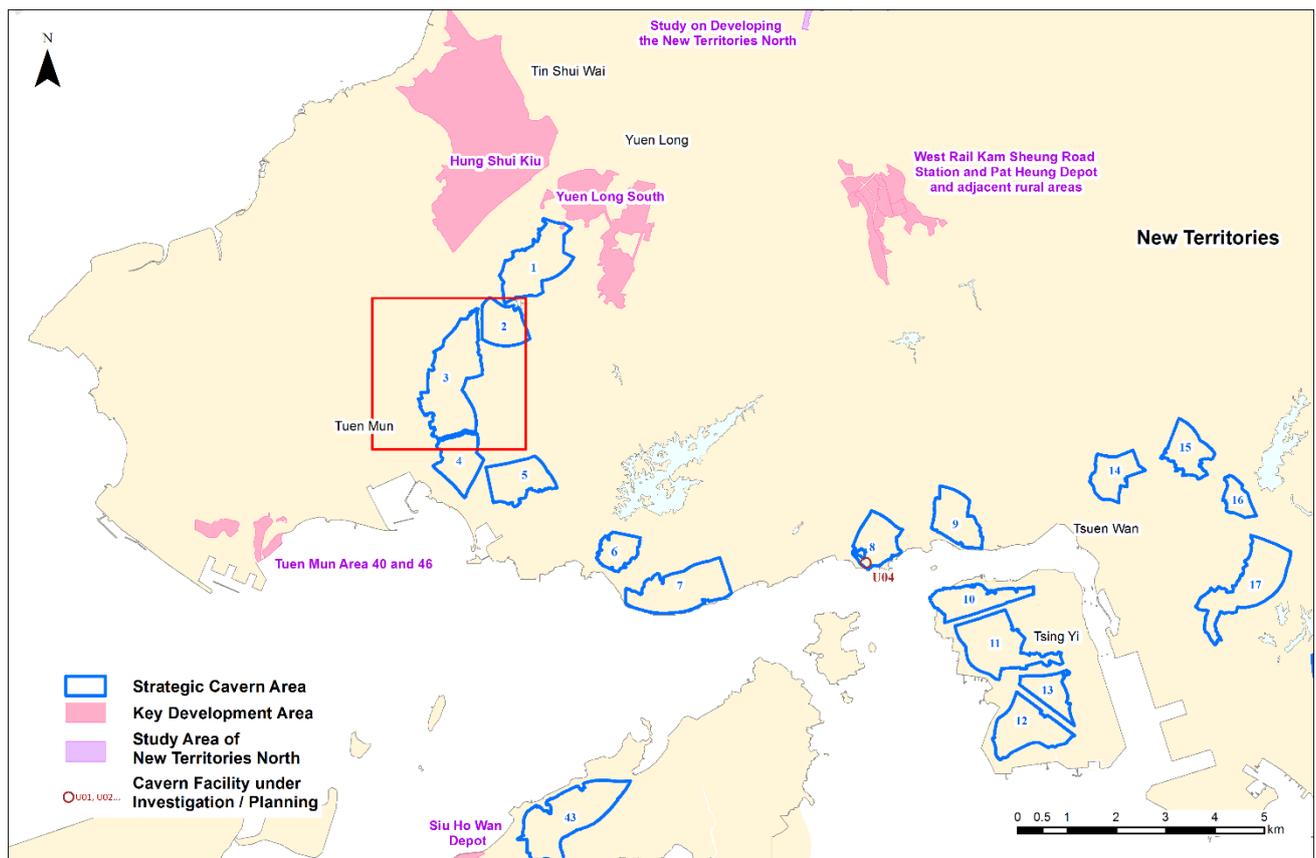
CAVERN MASTER PLAN – INFORMATION NOTE

STRATEGIC CAVERN AREA NO. 03 – TUEN MUN

This Information Note describes the characteristics, key development opportunities and constraints of Strategic Cavern Area No. 03 - Tuen Mun (the SCVA). It indicates the potential land uses suitable for cavern development within the area, but would not pre-empt other possible land uses put forward by the project proponents with justifications. It also denotes the extent of potential portal locations. The spatial context of the SCVA is illustrated in the Reference Drawing appended to this Information Note.

Reference should be made to the Explanatory Statement of the Cavern Master Plan for its background and purposes, as well as the definition and delineation criteria of SCVAs.

1. Location Plan



2. Strategic Cavern Area Details

Outline Zoning Plans (OZPs):	Draft Tuen Mun OZP No. S/TM/34 Draft Lam Tei and Yick Yuen OZP No. S/TM-LTY Y/9
Area:	196.3 ha
Maximum elevation in the SCVA:	+395 mPD
Minimum elevation in the SCVA:	+4 mPD

3. District Context

Location

The SCVA is located in the western portion of the New Territories. Tin Shui Wai and Hung Shui Kiu New Development Area (HSKNDA) are to the north of the SCVA, Yuen Long and Yuen Long South Development Area (YLSDA) are to the northeast, Tuen Mun New Town is to the west and Tai Lam Country Park is to the east and south.

The SCVA is generally hilly with a maximum elevation of about +395 mPD. It partially encroaches onto Tai Lam Country Park at the northeastern and southeastern sides. Within the SCVA, there are local village settlements of Fu Tei Sheung Tsuen, Tseng Tau Ha Tsuen and Chung Wong Toi as well as the Tuen Mun Fresh Water Primary Service Reservoir in its northern part. The western part of the SCVA covers Tseng Tau Chung Tsuen, Castle Peak Christian Cemetery and RTC Gaia School. Tseng Tau Sheung Tsuen, Tuen Mun East Fresh Water Service Reservoir and Tuen Mun East No. 2 Fresh Water Service Reservoir are located in its southwestern part. These villages and the school scatter near the toes of hillsides of the northern, western and southwestern parts of the SCVA, and all are on Government land.

To the west of the SCVA, Tuen Mun New Town is a local hub of high-density residential developments as well as local villages. These include Tuen Mun Town Plaza (about 60 m to the southwest of the SCVA), Prime View Garden (about 120 m to the northwest of the SCVA) and San Hui Village (about 100 m to the west of the SCVA). In the proximity of the SCVA, there are a number of key Government, Institution and Community (GIC) facilities supporting the development of Tuen Mun New Town and the territory, including Tuen Mun Water Treatment Works (about 50 m to the northwest of the SCVA), Lingnan University (about 200 m to the northwest of the SCVA) and Tuen Mun Hospital (about 200 m to the northwest of the SCVA).

To the north of the SCVA, Tin Shui Wai and Yuen Long are another two new towns with high-density residential developments in the Northwest New Territories. Their population is expected to grow further with the HSKNDA¹ and the YLSDA². To the northeast of the SCVA, Lam Tei Quarry is scheduled to cease operation in 2022. The Preliminary Land Use Study for Lam Tei Quarry and the Adjoining Areas commenced in June 2016.

Access

The SCVA is accessed from its northern, western and southwestern edges via Fu Tei Road, King San Path and Castle Peak Road (Castle Peak Bay) respectively. Regional connections could be routed through the nearby Tuen Mun Road, Yuen Long Highway and Castle Peak Road.

The MTR Light Rail Transit (LRT) serves the northwestern New Territories and several stations are close to the SCVA. These include On Ting Station (about 400 m to the southwest of the SCVA), Town Centre Station (about 300 m to the southwest of the SCVA), Pui To Station (about 150 m to the west of the SCVA), Hoh Fuk Tong Station (about 200 m to the west of the SCVA), Prime View Station (about 150 m to the west of the SCVA) and Fung Tei Station (about 300 m to the northwest of the SCVA). Tuen Mun Station and Siu Hong Station of the MTR West Rail Line are located about 400 m to the west and about 500 m to the northwest of the SCVA respectively, providing connection to Kowloon.

Land Use Zoning

Under the Draft Tuen Mun OZP No. S/TM/34 and the Draft Lam Tei and Yick Yuen OZP No. S/TM-LTY/9, the majority of the SCVA is zoned “Green Belt”, while the areas in the northeastern and southeastern parts are not covered by any Statutory Plan and are designated as country park. The zonings of the surrounding areas, mainly to the northwest, west and southwest of the SCVA, include “Green Belt”, “Government, Institution or Community”, “Residential (Group A)”, “Residential (Group B)”, “Village Type Development”, “Other Specified Uses” annotated “Quarry” and “Other Specified Uses” annotated “Electricity Substation”, with the rest being Tai Lam Country Park.

¹ The HSKNDA is a proposed new development area with about 218,000 population. It is positioned as a “Regional Economic and Civic Hub” for the Northwest New Territories providing about 150,000 jobs. First population intake is expected by 2024 and full development is targeted by 2037/38. [Source: Information Digest and Revised Recommended Outline Development Plan (RRODP), Hung Shui Kiu New Development Area Planning and Engineering Study, Planning Department and Civil Engineering and Development Department, September 2016]

² The YLSDA is a proposed extension of the Yuen Long New Town housing a total population of about 88,000 with provisions of supporting facilities. It will create about 10,500 jobs and first population intake is expected by 2027. [Source: Information Digest, Planning and Engineering Study for Housing Sites in Yuen Long South – Investigation, Planning Department and Civil Engineering and Development Department, August 2017]

For details of the latest land use zonings on the OZPs, please refer to the Town Planning Board website (<http://www.tpb.gov.hk>).

There is no existing or planned cavern facility within the SCVA.

4. Summary of Characteristics of Strategic Cavern Area

4.1. Boundary

The northern and northwestern boundaries of the SCVA are defined by burial grounds, the Lingnan University, Tuen Mun Water Treatment Works and some residential developments including Elegance Garden. The southern boundary of the SCVA is defined by the valley topography. The eastern boundary of the SCVA is defined by Lam Tei Irrigation Reservoir, the valley topography, and an extent at 800 m from the potential portal locations. The western boundary of the SCVA is defined by local villages including San Hui Village, Castle Peak Road (Castle Peak Bay), residential developments including Villa Tiara and Tuen Mun Substation.

4.2. Geology

The solid geology of the SCVA is primarily fine-grained granite with local fine- to medium-grained granite at the southeastern portion, which belongs to Tai Lam Granite; and medium-grained and coarse-grained granite within the southwestern portion, which belongs to Lantau Granite. The SCVA is with the rock types that are suitable for cavern development. A number of geological features, such as faults, photolineaments and isolated dykes, are identified within and in the areas surrounding the SCVA. The excavated fine-grained granite, fine- to medium-grained granite and medium-grained granite within the SCVA are suitable for reuse as construction aggregate. Other excavated rocks can be used as road base materials, asphalt production, etc.

Further geological information of the SCVA can be found in the 1:20,000-scale Geological Map Sheet 6 (Yuen Long) published by the Geotechnical Engineering Office, Civil Engineering and Development Department.

4.3. Planning

The SCVA is close to existing urban developments (e.g. Tuen Mun New Town), the proposed key development areas (i.e. HSKNDA and YLSDA) and Lam Tei Quarry and the adjoining area. Given the SCVA is easily accessible by several highways and railways, there is potential for the SCVA to support the development of these areas.

Located to the west of the SCVA, Tuen Mun New Town is a local hub of residential developments (e.g. Tai Hing Estate) which is supported by various GIC facilities (e.g. hospital, service reservoir, school, sports centre, etc.). Should there be any need for providing additional land for residential use, the SCVA may provide the solution space by, for example, relocating some of the suitable infrastructural facilities into caverns (e.g. service reservoirs located close to existing residential developments). By doing so, surface land could be released for other beneficial uses (e.g. residential developments and/or community facilities), and it could also enable more effective utilisation of land resources in Tuen Mun New Town while preserving the natural landscape adjacent to Tai Lam Country Park.

Given that the SCVA is located close to a large population catchment in Tuen Mun New Town and in close proximity to various existing residential developments (e.g. Tuen Mun Town Plaza and Prime View Garden) as well as LRT stations (e.g. Pui To Station and Town Centre Station) and West Rail Tuen Mun Station, there is potential for the SCVA to support these residential communities by providing additional community facilities (e.g. leisure centre/sports centre) as well as warehousing (e.g. mini storage).

The SCVA is adjacent to Lam Tei Quarry, which has been scheduled to cease operation in 2022. Project proponents should take into account the findings of the Preliminary Land Use Study for Lam Tei Quarry and the Adjoining Areas for opportunities of development.

4.4. Environmental

Environmental sensitive receivers to cavern development in the SCVA include the nearby schools (e.g. S K H Mung Yan Primary School, RTC Gaia School, Hoh Fuk Tong College) and residential developments (e.g. Prime View Garden, Fu Tei Sheung Tsuen, Tseng Tau Ha Tsuen, Tseng Tau Chung Tsuen, Tseng Tau Sheung Tsuen, San Hui Village, Villa Tiara, Handsome Court). A Potentially Hazardous Installation (PHI), the Tuen Mun Water Treatment Works, is located to the northwestern portion of the SCVA. If the proposed layout of cavern facilities falls into the consultation zone of the PHI, Quantitative Risk Assessment would be required at the planning stage of the projects. The northeastern and southeastern portions of the SCVA are within Tai Lam Country Park and both portions encroach onto the streams and water courses located within the Water Gathering Grounds. Wooded areas are located close to the extent of potential portal locations. In addition, a Declared Monument (the Morrison Building in Hoh Fuk Tong Centre), a traditional burial ground, a Grade 3 historic building (the Ceramic Kiln in Hin Fat Lane), and the Fu Tei Ha Site of Archaeological Interest, are located in close proximity to the SCVA.

All potential environmental constraints, which may impose restrictions on the cavern development, should be identified and taken into account under the Environmental Impact Assessment Ordinance (EIAO) and other relevant ordinances, such as the Country Parks Ordinance. Project proponents are required to take into account the potential environmental constraints when planning each cavern development project and undertaking the environmental impact assessment under the EIAO to determine its environmental acceptability, potential environmental impacts and environmental mitigation measures required.

4.5. Traffic

The SCVA can be accessed from its northern, western and southwestern edges via Fu Tei Road, King San Path and Castle Peak Road (Castle Peak Bay) respectively. The SCVA is also connected to the nearby Tuen Mun Road, Yuen Long Highway and Castle Peak Road, which allows for road network connection to different parts of Hong Kong. Connection to Shenzhen can be made through Kong Sham Western Highway, and in future, to Lantau via the Tuen Mun – Chek Lap Kok Link.

4.6. Other Key Issues / Constraints on Cavern Development

There are pylons and overhead power lines running above the northeastern and southern portions of the SCVA. A Water Supplies Department's tunnel, the Tai Lam Chung Supply Tunnel to Tuen Mun Water Treatment Works, passes through the northeastern portion of the SCVA. Due to the difference in elevations, the pylons and overhead lines and the water tunnel would unlikely pose any insurmountable constraints to cavern development within the SCVA.

There are village settlements including Fu Tei Sheung Tsuen, Tseng Tau Chung Tsuen, Tseng Tau Sheung Tsuen, etc and RTC Gaia School scattered on the hillsides of the northern, western and southwestern parts of the SCVA. They are not excluded from the SCVA boundary as they are all located on Government land on hillsides, and unlikely affect or be affected by cavern development given their scattered nature. Project proponents should take due account on these villages and the school in the SCVA in their cavern development project in order to avoid/minimize potential impacts on them.

Some potential portal locations are close to the existing nearby village houses, private lots, etc. Project proponent shall take it into account when planning cavern development proposals in order to minimise potential interface issues and adverse impacts arising from the construction and operation of cavern facilities.

Given the proximity of the SCVA and Lam Tei Quarry, the future development of the SCVA should be compatible with the future land uses of Lam Tei Quarry, and any potential interface issues should be minimised. Project proponents should take into account the latest available information on the future development and proposed land uses of Lam Tei Quarry under the Preliminary Land Use Study for Lam Tei Quarry and the Adjoining Areas.

5. Potential Land Uses

The potential land uses for the SCVA are as follows:

Land use	Description
Leisure Centre/ Sports Centre	<p>The SCVA is located close to a large population catchment and it is adjacent to various existing major residential communities such as Tuen Mun Town Plaza. There is potential for the SCVA to support the potential expansion of these areas by providing additional supporting community facilities, such as leisure centre/sports centre to meet the rising demand from the increasing population.</p> <p>The potential portal locations are in close proximity to the existing residential developments (e.g. Prime View Garden) and various LRT Stations in Tuen Mun (e.g. Pui To Station which is about 150 m from the SCVA). The close and easy access for the local residents further enhances the potential for housing such facilities in the SCVA.</p>
Service Reservoir	<p>Tuen Mun New Town is home of various high-density residential developments (e.g. Tuen Mun Town Plaza) and a number of local villages (e.g. San Hui Village) are also found near the New Town. The nearby HSKNDA and YLSDA are also proposed for residential developments as a new community in the district and an extension of Yuen Long New Town respectively. There is thus opportunity to develop suitable land use to support the development of these residential areas, by relocating and/or expanding some of the suitable infrastructure facilities, such as service reservoir, to caverns.</p> <p>Existing service reservoirs are found within the boundary of the SCVA. Relocation of the facilities to caverns may be considered, thereby releasing the surface land for other beneficial uses and for integration with the future development.</p>

Land use	Description
Warehousing	The SCVA is adjacent to the existing major residential developments in Tuen Mun New Town as well as the various LRT stations in Tuen Mun (e.g. Pui To Station which is about 150 m from the SCVA), having good connectivity and easily accessible by the locals and the general public. There is thus potential to develop warehousing (including mini storage) to support the residential development in these areas and to meet the demand from local communities as well as from the territory.

Note: Zoning amendment/planning application may be required to facilitate the pursuit of the above potential land uses.

6. Extent of Potential Portal Locations

The extent of the potential portal locations is shown on the Reference Drawing.

Accessing the potential portal location behind the Tuen Mun Substation would likely require the construction of a new access road from either Tuen Hing Road or Hin Fat Lane. The extent of potential portal locations on Castle Peak Road (Castle Peak Bay) and King San Path are located at the toe of the slopes alongside the carriageways. There is potential to extend the King San Path to the southwest to reach an open area which may be suitable to form a potential portal. These accesses can support low to medium-traffic generated land uses. Road widening may be required for high-traffic generated land use. The extent of potential portal location on King San Path is in close proximity to existing residential developments. Project proponents should take this into account to minimise potential impacts arising from the cavern development. The access to the SCVA from potential portal locations located off Fu Tei Road, which is a single-lane carriageway, would require widening and upgrading in order to facilitate cavern development.

The potential portal locations are at the toe of cut slopes with natural terrain in the above. There may be potential natural terrain hazards in the vicinity of the potential portal locations, which may require further study by project proponents. Any proposed slope works associated with the provision of the portal and any other above-ground structures should avoid encroaching onto Tai Lam Country Park as far as practicable.

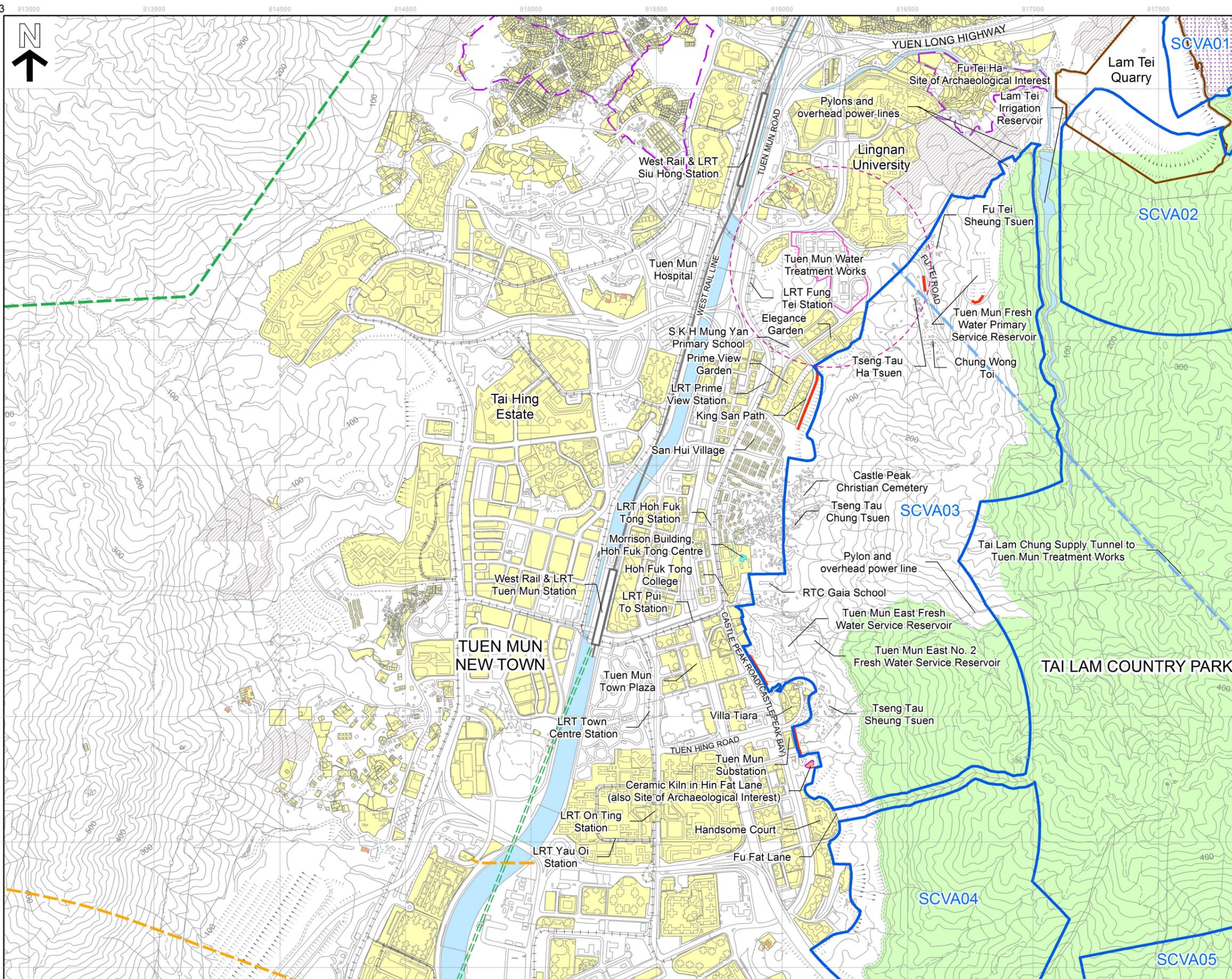
Project proponents should carry out further studies on identifying specific locations of portals for the proposed cavern development.

7. Concluding Remarks

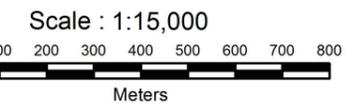
This SCVA presents an opportunity for locating suitable land uses in rock caverns to serve the neighbouring communities in Tuen Mun New Town (e.g. by housing service reservoirs, leisure centre/sports centre and warehouses). Project proponents for cavern development should take due consideration of the existing and proposed residential developments, environmental sensitive receivers, accessibility for cavern development, and findings of the Preliminary Land Use Study for Lam Tei Quarry and the Adjoining Areas, to minimise the interfacing issues and bring about greater synergy and opportunities.

8. Notes

The Cavern Master Plan and all supporting documents do not exempt project proponents for cavern development from following the relevant statutory and planning procedures. Information including the potential land uses and the extent of potential portal locations indicated in this Information Note should serve as reference materials only. In formulation of development proposals, project proponents should conduct the necessary studies and assessments relevant to each project stage. Reference should be made to the “Implementation” section of the Explanatory Statement of the Cavern Master Plan for further details.



- Legend**
- Strategic Cavern Area
 - Extent of Potential Portal Locations
 - Quarry
 - Existing Railway Line
 - Proposed Railway Line
 - Existing Light Rail
 - Cable Tunnel / Gas Tunnel
 - Drainage Services Department Tunnel
 - Water Supplies Department Tunnel
 - Reservoir / River / Nullah
 - Site of Archaeological Interest
 - Graded Historic Building
 - Declared Monument (Historic Building)
 - Private Lot
 - Burial Ground
 - Potentially Hazardous Installation
 - Consultation Zone of Potentially Hazardous Installation
 - Major Conservation Area
 - Country Park



REFERENCE DRAWING OF STRATEGIC CAVERN AREA NO. 03 - TUEN MUN