



土木工程拓展署  
Civil Engineering and  
Development Department

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Agreement No. CE 57/2018 (GE)

# Pilot Planning and Engineering Study on Development of Selected Strategic Cavern Areas – Feasibility Study

Executive Summary of the Study (ES)

September 2025







# 1. INTRODUCTION

Under the “Hong Kong 2030+ - Towards a Planning Vision and Strategy Transcending 2030”, the exploration of cavern development and underground space development to release surface land is identified as an alternative source of long-term land supply for meeting future needs.

The Civil Engineering and Development Department (CEDD) and Planning Department (PlanD) have jointly promulgated a territory-wide Cavern Master Plan (CMP) to provide a broad strategic planning framework to guide and facilitate planning on the

# 2. POTENTIAL USES AND SELECTION OF SUITABLE STRATEGIC CAVERN AREAS

A baseline review, focusing on the potential uses that are considered suitable for cavern development, was carried out to identify the development needs. For public facilities, the territorial development needs of different types of facilities and the locational needs of upgrading existing government facilities were already broadly identified under the “Long-term Strategy for Cavern Development – Feasibility Study” completed in 2017. With respect to the private facilities reviewed, underground quarry (UQ), data centres and logistics centres are considered to have the highest demand and potential for cavern development.

A market survey was also carried out by interviewing a range of stakeholders from the private sectors and industry stakeholders to establish the market demand of potential uses of rock caverns.

Among the 48 Strategic Cavern Areas (SCVAs) in the CMP, broad technical assessments have been conducted for selected SCVAs, including SCVA No. 10 and SCVA No. 43 (**Figure 1**), with relatively higher development potentials.

# 3. SCVA NO. 10 AT TSING YI NORTH

## Potential Uses

SCVA No. 10 at Tsing Yi North (**Figure 2a**) situates at a strategic location with an extensive road network and marine access. As the baseline review and market survey have indicated a strong land demand for storage/warehouse/logistics in the medium- and long-term, these are adopted as the preferred potential uses for SCVA No. 10 to help alleviate such demand.

uses of caverns in Hong Kong.

The subject pilot planning and engineering study (the P&E Study) is one of the follow-on initiatives after the promulgation of the CMP in order to provide a step forward to facilitate project proponents in the identification of suitable sites and potential uses in rock caverns for development projects considering cavern options as and when needed.

The broad technical assessments carried out ascertained the technical feasibility of undertaking UQ and the preferred potential uses, subject to the availability of suitable infrastructure and implementation of necessary enabling measures.

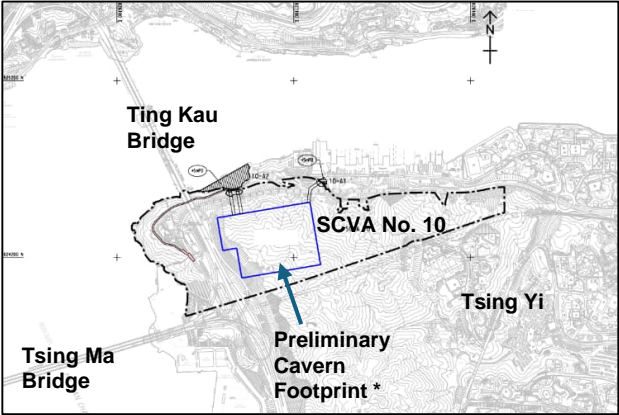


**Figure 1 – SCVA No. 10 and SCVA No. 43 with Broad Technical Assessments Completed**

Storage/warehouse/logistics uses can also capitalise on the stable and secure environment for proper storage of valuable goods inside caverns. Taking advantage of its close proximity to major import/export port and transport infrastructure and their service areas, the proposed uses can create synergy effect by providing additional port backup facilities to support import and export trading.



Delivery to other parts of Hong Kong such as Yuen Long, North-western New Territories and Lantau will also be convenient via Tsing Long Highway, the proposed Route 11 and the Tsing Yi-Lantau Link respectively.



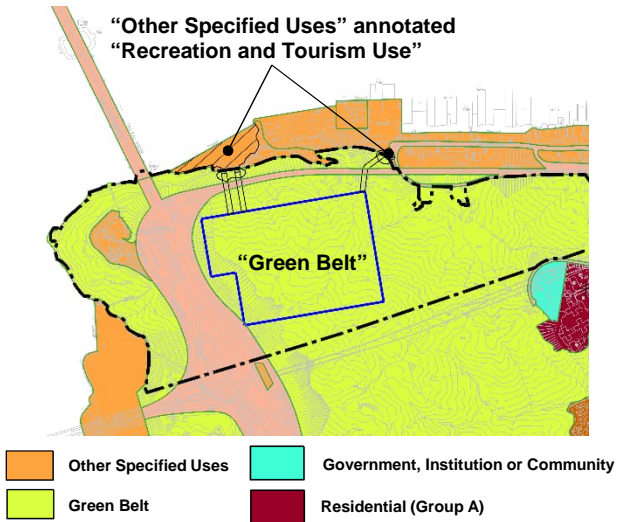
*\*The cavern footprint is subject to change under the Investigation and Design Study commissioned by CEDD.*

**Figure 2a – Proposed Land Use Development at SCVA No. 10 (Storage/Warehouse/Logistics)**

There is a surface land of about 2 ha along the northern coast of Tsing Yi immediately to the north of the SCVA No. 10 which can make UQ a viable option for forming cavern space and attractive to quarrying operators. Connected with convenient land transport access, the surface land also has a 300m-long marine frontage for marine access. The land and marine access allows rock materials extracted from the cavern formation be delivered to receiving sites and allows patronage of the operations on the surface land.

### Zoning Mechanism

The Preliminary Cavern Footprint mainly falls within the area zoned “Green Belt” on the approved Tsing Yi Outline Zoning Plan No. S/TY/32 (**Figure 2b**). Details of the development is subject to further investigation and design at later stage.



**Figure 2b – Outline Zoning Plan at SCVA No. 10**

### Preliminary Implementation Strategy

In SCVA No. 10, the use of underground quarrying-cum-cavern development approach to allow 15 years to form the cavern space, with the packaging of a surface land to support the UQ and ancillary operations, is more cost-effective than using public works projects approach by saving the project-specific cavern construction cost.

Upon completion of the UQ contract, a cavern space of about 11 ha can be formed as cavern land bank to accommodate storage/warehouse/logistics uses to meet the demand in medium- to long-term. By then, the surface land at the portal area can also be released for other uses.

A future engineering feasibility study (EFS) including financial assessment will be conducted to further ascertain and support the preferred potential uses of the surface land and cavern space and relevant statutory procedures, if any.



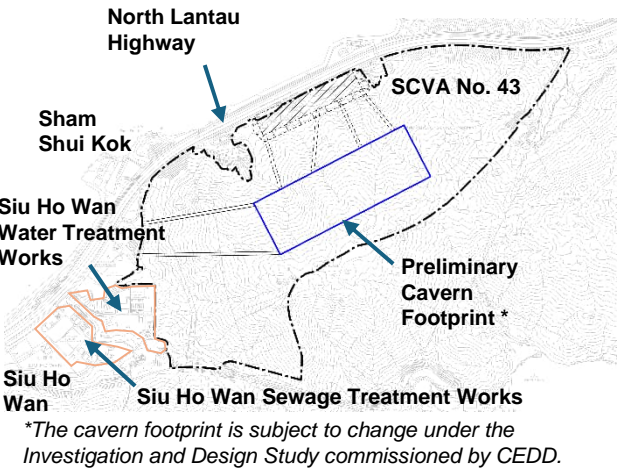


# 4. SCVA NO. 43 AT SHAM SHUI KOK

## Potential Uses

SCVA No. 43 (**Figure 3a**) is situated at Sham Shui Kok, a strategic location with good connectivity near the critical infrastructures in North Lantau, as well as future development such as topside developments at Siu Ho Wan and Sunny Bay along the North Lantau Corridor.

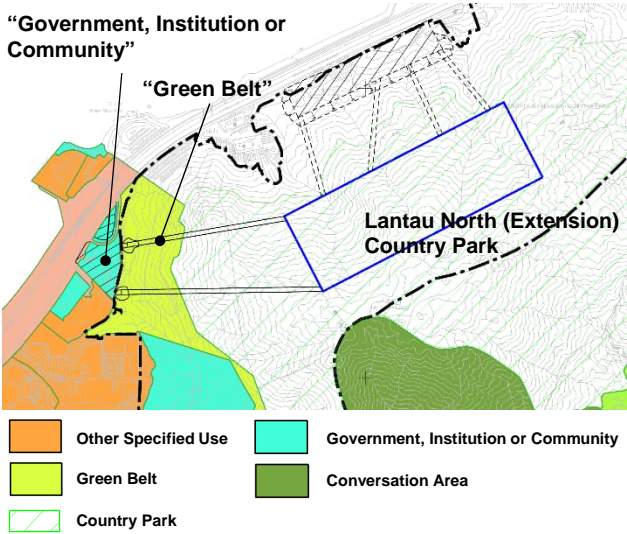
In the Sustainable Lantau Blueprint (DEVB, 2017), the SCVAs at North Lantau is recognised for accommodating new or relocated existing government facilities and infrastructures, thereby releasing their original surface sites for other more beneficial uses to achieve a synergy effect with the proposed residential development atop the Siu Ho Wan Depot of the MTR Corporation Limited.



**Figure 3a – Proposed Land Use Development at SCVA No. 43 (Government Facilities)**

## Zoning Mechanism

The Preliminary Cavern Footprint mainly falls within the boundaries of the Lantau North (Extension) Country Park and is not covered by any statutory plan (**Figure 3b**), details of the development is subject to further investigation and design at later stage.



**Figure 3b – Outline Zoning Plan at SCVA No. 43**

## Preliminary Implementation Strategy

To explore the potential for forming cavern spaces by way of quarry operation, face-to-face interview sessions with the stakeholders and practitioners in construction industry was held under this P&E Study in 2021. Underground quarrying-cum-cavern development approach is considered very suitable for long-term planning of relocation of the existing government facilities and infrastructures at SCVA No. 43 from a cost-effectiveness perspective. It is tentatively proposed to implement UQ by two contracts, the first one lasting for 20 years followed by another 15-year contract.

Upon completion of the UQ, the potential land uses of SCVA No. 43 and the after-use of the released site will be further ascertained around 5 years before the completion of the second UQ contract based on the development need/potential in the area by the time.

A future EFS including financial assessment will be conducted to further ascertain and support the preferred potential uses of the surface land and cavern space and relevant statutory procedure, if any.





## 5. POTENTIAL DEVELOPMENT OF CAVERN DATA CENTRE

According to the Innovation, Technology and Industry Bureau (ITIB), Hong Kong is one of the leading data centre hubs in the world, and there is a very keen demand for data centre facilities, which is also revealed in the market sounding exercises. The Hong Kong Innovation and Technology Development Blueprint promulgated by ITIB in December 2022 stated that the Government will consider increasing new land supply, including cavern development among others, to address the land use demand for new data centres in medium- to long-term.

The development of the cavern data centre can utilise the secure and stable operating environment inside caverns for higher energy efficiency, and achieve more effective use of the land resources.

In Hong Kong, large surface data centres tend to cluster around Tsuen Wan, Kwai Chung, Sha Tin, Kwun Tong, Kowloon Bay, San Po Kong, Chai Wan and Tseung Kwan O.

With due consideration of the availability of existing supporting infrastructure requiring for data centres, terrain characteristics and geological suitability, there are potential cavern sites with relatively high potential for cavern data centre development which warrant further technical investigation and studies.

## 6. THE STAKEHOLDER CONSULTATION EXERCISE

### Interview Sessions on UQ Development, 2021

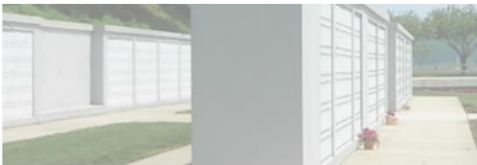
To confirm the demand of underground quarry for development of rock caverns, face-to-face interview sessions with the stakeholders and practitioners in construction industry were arranged in July to September 2021 in the presence of representatives from CEDD, AECOM and Knight Frank. The interview was held targeting industry stakeholders. Specialists involved in the production of aggregate and associated products such as concrete and asphalt were invited. Professional institutions in the construction industry was also invited.

The interviewees agreed a long contract period is attractive in terms of business. Comments and views received on various aspects, including site setting, land use, technical issues, financial issues, were duly considered for the refinement of schemes under the P&E Study.

### Stakeholder Forum on Cavern Data Centres, 2022

A half-day stakeholder forum was jointly organised by CEDD and the then Office of the Government Chief Information Officer (OGCIO) on 16 September 2022. The invited stakeholders include Legislative Council (LegCo) Members, industry practitioners, cloud service providers, power supply and telecommunication companies and professional institutions.

Majority of the stakeholders agreed the data centre business opportunity is growing fast and supported the idea of developing data centres in cavern. But most responded that they do not have experience in developing underground data centres. Careful consideration on the scale of the future project site is also recommended to ensure financial viability. Majority of the stakeholders suggested the lease terms to be in a long period of time. The Government will further explore the potential development of cavern data centre in Hong Kong.





## 7. REVIEW AND UPDATING OF CMP

The review of Cavern Master Plan is carried out on a territory-wide scale with identification of

- (1) major development constraints;
- (2) current and future supporting infrastructure of SCVAs; and
- (3) existing cavern and planned cavern.

To accompany the Cavern Master Plan, an Explanatory Statement, the Information Note and Reference Drawing of each Strategic Cavern Area are reviewed and updated. The Explanatory Statement also include an updated list of examples of potential uses in rock caverns.

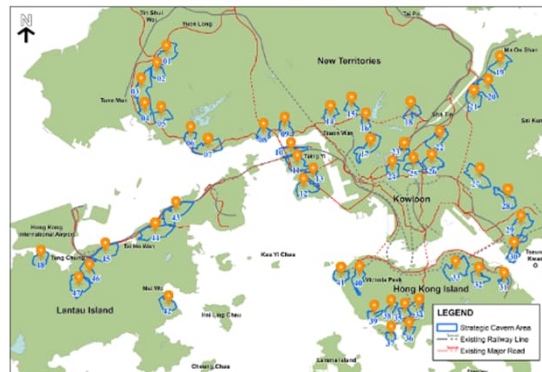
The revised CMP will be promulgated through the website of CEDD. The CMP will be reviewed and updated in the future as necessary taking account of changing circumstances and development needs.

## 8. CONCLUSION AND WAY FORWARD

A baseline review was conducted to identify the suitable potential uses in rock caverns. Stakeholder consultations were conducted by interviewing a range of stakeholders from the private sectors and industry stakeholders to establish the market demand of potential uses of rock caverns.

Broad technical assessments of selected SCVAs ascertained the technical feasibility of undertaking UQ and the preferred potential uses in the long-term for each selected SCVA, subject to the availability of suitable infrastructure and implementation of necessary enabling measures.

SCVA No. 10 is proposed to be implemented by an underground quarrying-cum-cavern development approach. The cavern space formed will serve as a land bank for potential uses of storage/warehouse/logistics.



Topics in Focus –  
Cavern Master Plan

SCVA No. 43 is proposed to be implemented by an underground quarrying-cum-cavern development approach. The potential land uses of SCVA No. 43 and the after-use of the released site will be further ascertained before the completion of the UQ contract based on the development need/potential in the area by the time.

It is recommended to take forward the investigation and design of UQ at SCVA No. 10 and SCVA No. 43 to enhance long-term land supply as well as to provide a local source of rock material supply.

It is also recommended to explore the potential development of cavern data centres for effective use of land resources and utilization of the edge of cavern space to support Innovation and Technology development in Hong Kong.

The suitability and feasibility of specific use in rock caverns should be assessed on their individual merits in consultation with the relevant bureaux/departments giving due consideration to, amongst others, safety, operational, environmental, technical and financial considerations.



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