

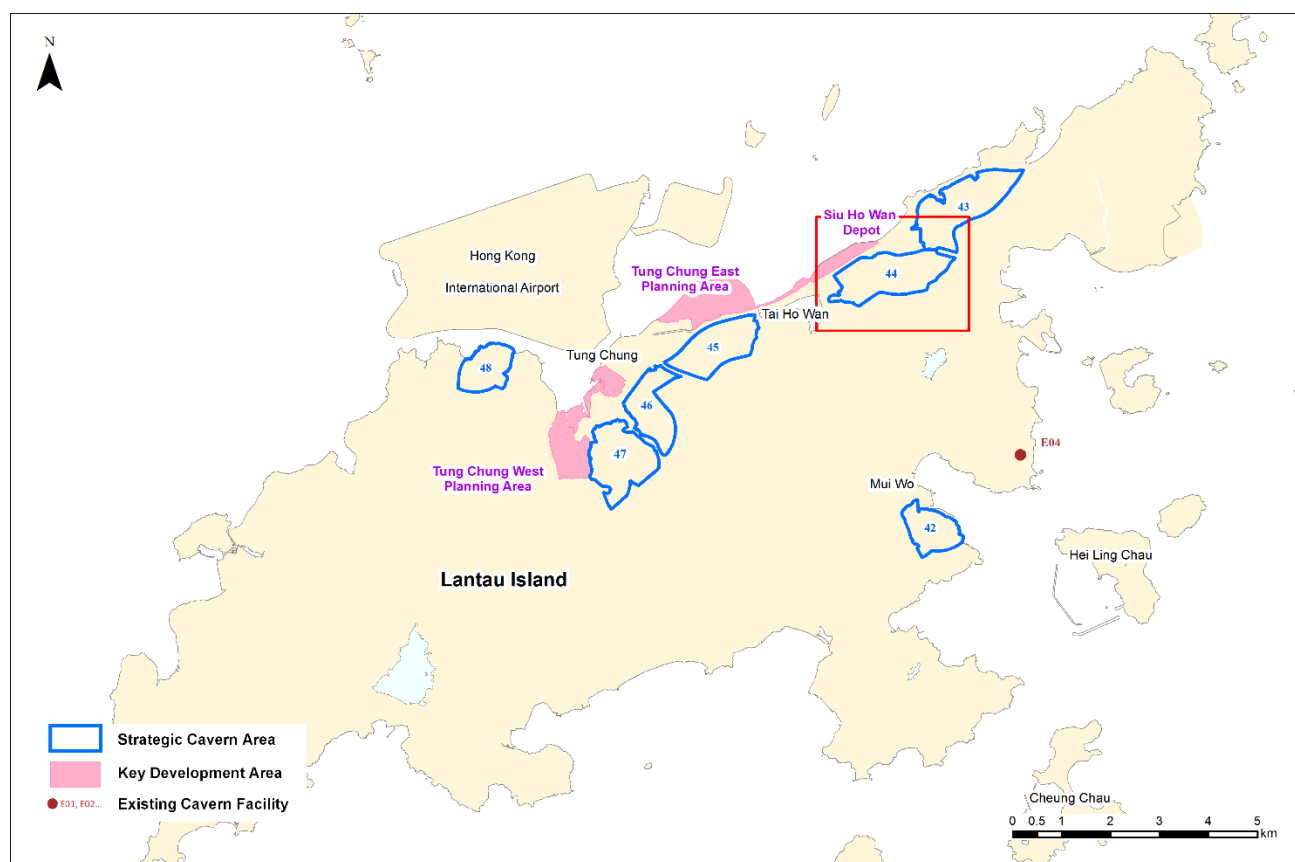
## CAVERN MASTER PLAN – INFORMATION NOTE

### STRATEGIC CAVERN AREA NO. 44 – SIU HO WAN

*This Information Note describes the characteristics, key development opportunities and constraints of Strategic Cavern Area No. 44 - Siu Ho Wan (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 Plan (OZP):	N/A
Area:	172.6 ha
Maximum elevation in the SCVA:	+378 mPD
Minimum elevation in the SCVA:	+6 mPD

## 3. District Context

### Location

The SCVA is located in the northern part of Lantau Island. It covers the hillside area of Siu Ho Wan. Sham Shui Kok is located to the northeast of the SCVA, Lo Fu Tau and Lantau North (Extension) Country Park are to the south, Tai Ho Wan is to the west and southwest, and Tung Chung New Town, Hong Kong International Airport (HKIA), Hong Kong-Zhuhai-Macao Bridge (HZMB) and Hong Kong Boundary Crossing Facilities (HKBCF) (both under construction) are to the further west.

The SCVA is generally hilly with a maximum elevation of about +378 mPD. A majority of the SCVA encroaches onto the Lantau North (Extension) Country Park. The vicinity of the SCVA has not yet been developed but there are a number of key Government, Institution and Community (GIC) facilities. These include the North Lantau Transfer Station (about 1,050 m to the north of the SCVA), Siu Ho Wan Sewage Treatment Works (about 200 m to the north of the SCVA), Siu Ho Wan Water Treatment Works (about 350 m to the north of the SCVA), Siu Ho Wan Vehicle Pound Vehicle Examination Centre and Weigh Station (about 500 m to the north of the SCVA), Siu Ho Wan Organic Waste Treatment Facilities (currently under construction for commissioning in 2017; about 500 m to the north of the SCVA), and some maintenance depots (including Siu Ho Wan Government Maintenance Depot and New Lantao Bus Co. Siu Ho Wan Depot at the northern boundary of the SCVA).

Apart from the existing GIC uses, Siu Ho Wan was identified to have potential for near shore reclamation under the study of “Enhancing Land Supply Strategy – Reclamation Outside Victoria Harbour and Rock Cavern Development” in 2013. The in progress “Technical Study on Developments at Siu Ho Wan and the Associated Transport Infrastructures – Feasibility Study” will assess the technical feasibility of the proposed reclamation and propose broad land use themes with related transport infrastructures for developments at Siu Ho Wan. The MTRCL is also studying the feasibility of residential development atop the MTR Siu Ho Wan Depot (about 150 m from to the northwest of the SCVA). In addition, the replacement and rehabilitation of rising mains to Siu Ho Wan Sewage Treatment Works will be developed within the area at Siu Ho Wan

The area to the southwest of the SCVA consists of the major conservation area in Tai Ho Wan and some local villages, including Tin Liu and Pak Mong (both about 1,100 m to the southwest of the SCVA).

#### Access

The SCVA is accessed from its northern edges via Cheung Tung Road and Discovery Bay Tunnel Link which is a restricted access road. Regional and cross-boundary connections could be routed through the adjacent North Lantau Highway, Tuen Mun-Chek Lap Kok Link and HZMB (both under construction).

The MTR Airport Express and Tung Chung Line run alongside the North Lantau Highway to the north of the SCVA. There is currently no railway station close to the SCVA.

#### Land Use Zoning

The entire SCVA is not covered by any Statutory Plan. The area to the immediate east of the SCVA is zoned “Conservation Area” under the Approved Discovery Bay OZP No. S/I-DB/4.

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

## **4. Summary of Characteristics of Strategic Cavern Area**

### **4.1. Boundary**

The northern boundary of the SCVA is defined by Discovery Bay Tunnel Link, Discovery Bay Tunnel and Siu Ho Wan Government Maintenance Depot. The eastern boundary of the SCVA is defined by the Conservation Area. The northwestern boundary of the SCVA is defined by Cheung Tung Road. The western boundary of the SCVA is defined by the Tai Ho Priority Site for Enhanced Conservation. The southern boundary is defined by an extent of 800 m from the potential portal locations.

### **4.2. Geology**

The solid geology of the SCVA is feldsparphyric rhyodacite and feldsparphyric rhyolite, which belong to East Lantau Rhyodacite and East Lantau Rhyolite respectively. 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 rocks may be suitable for reuse as construction aggregate, subject to further confirmation by relevant testing on the potential alkali-silica reaction. Nevertheless, the excavated rocks can be used as road base materials and for asphalt production, etc.

Further geological information of the SCVA can be found on the 1:20,000-scale Geological Map Sheet 10 (Silver Mine Bay) published by the Geotechnical Engineering Office, Civil Engineering and Development Department.

### 4.3. Planning

Currently the area in Siu Ho Wan is mainly used for housing various GIC facilities. There are, however, various proposals to develop Siu Ho Wan (including the abovementioned studies for developments at Siu Ho Wan and atop MTR Siu Ho Wan Depot) and the adjacent areas (including Tung Chung New Town, HKBCF and HKIA). In the 2015 and 2016 Policy Addresses, it was mentioned that there would be potential for development along the existing and future railway lines near Siu Ho Wan. As such, there is potential for the SCVA to support the developments in North Lantau so as to release more surface land for other beneficial uses.

The Sustainable Lantau Blueprint<sup>1</sup> unveiled by the Development Bureau on 3 June 2017 includes the strategic economic and housing development at the North Lantau Corridor and the cavern development at the hillside near Siu Ho Wan and Mui Wo to increase usable space for housing Government facilities so as to release land for residential, recreational or other uses, etc. The key projects at the North Lantau Corridor include the planned Three Runway System of the HKIA, North Commercial District on the airport island, topside development at the HKBCF Island of HZMB, Tung Chung New Town Extension and Siu Ho Wan Development. A new railway station at Siu Ho Wan is proposed to tie in with the development in Siu Ho Wan area.

The development of the SCVA could be integrated with the proposed developments in Siu Ho Wan and atop MTR Siu Ho Wan Depot to bring about greater synergy and opportunities. The SCVA could be used to house infrastructure facilities that are required to support the future developments, e.g. housing new or relocating some of the existing GIC facilities in the adjacent areas (e.g. sewage treatment works, refuse transfer facility and maintenance depot), thereby releasing surface land for other beneficial uses. In particular, housing ‘Not-In-My-Backyard’ (NIMBY) type of facilities in caverns could greatly minimise the nuisance to the future community. Furthermore, these would help to reorganise the current land use pattern in Siu Ho Wan so as to enhance the overall development potential of the area. Project proponents should take into account the findings of the abovementioned studies and proposals.

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<sup>1</sup> More information can be obtained from the Sustainable Lantau Blueprint available on the website of the Sustainable Lantau Blueprint, [www.lantau.gov.hk](http://www.lantau.gov.hk).

The SCVA is situated at a strategic location near the HKIA, HKBCF and Tung Chung New Town and served with major trunk roads including North Lantau Highway, Tuen Mun-Chek Lap Kok Link and HZMB (both under construction) enabling regional and cross-boundary connections. The Sustainable Lantau Blueprint also suggests to strengthen the connectivity of trunk roads along the northern shore of Lantau. This favourable transport infrastructure could be well utilised, for example by housing warehousing, research/testing laboratories and/or data centres in support of the high value-added business and logistics developments in HKBCF, and to facilitate the development of North Lantau as a whole.

#### **4.4. Environmental**

Key environmental constraints on cavern development in the SCVA are the Lantau North (Extension) Country Park within and to the south of the SCVA, comprising the natural greenery and lowland forest. The various industrial/NIMBY type of facilities (e.g. Siu Ho Wan Sewage Treatment Works, Siu Ho Wan Government Maintenance Depot, Siu Ho Wan Vehicle Pound Vehicle Examination Centre and Weight Station and several bus depots) in the close proximity to the SCVA may also pose environmental constraints on cavern development. There may be potential land contamination associated with those facilities and require further investigation by the project proponents if necessary. Tai Ho Priority Site for Enhanced Conservation, Tai Ho Stream Site of Special Scientific Interest, Tai Ho Site of Archaeological Interest and several burial grounds are located to the southwest of the SCVA. Conservation Area is also located to the southeast of the SCVA. The northern part of the SCVA encroaches onto the Consultation Zone of the Potentially Hazardous Installation (PHI) of the Siu Ho Wan Water Treatment Works. Quantitative Risk Assessment will be required during the planning stage before commencement of construction works. There are also natural or modified surface water courses within the SCVA.

All potential environmental constraints, which may impose restrictions on 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 edges via Cheung Tung Road, the slopes behind Siu Ho Wan Sewage Treatment Works and Discovery Bay Tunnel Link which is a restricted access road. Regional and cross-boundary connections can be made through the adjacent North Lantau Highway via other nearby roads/highways. The connectivity of the SCVA is enhanced by the nearby major transport infrastructure, including the HKIA, HZMB and Tuen Mun-Chek Lap Kok Link (both under construction), and the proposed new railway station at Siu Ho Wan.

Access to the North Lantau Highway from the SCVA can be routed through Sunny Bay Road and Penny's Bay Highway to the east of the SCVA, or Tung Chung Eastern Interchange to the west.

Discovery Bay Tunnel Link is a toll road with restricted access. Cheung Tung Road is a single carriageway for two-way traffic connecting MTR Sunny Bay Station at the east and Tung Chung at the west. The capacity of Cheung Tung Road should be suitable for various traffic generating activities. Nevertheless, the project proponents would be required to assess the traffic impact on a case by case basis.

#### **4.6. Other Key Issues / Constraints on Cavern Development**

Siu Ho Wan/Silver Mine Bay Aqueduct passes through the SCVA from northeast to southeast. A proposed fresh water tunnel between Siu Ho Wan and Silver Mine Bay Water Treatment Works will be located in the northeastern portion of the SCVA. Discovery Bay Tunnel is about 50 m to the northeast of the SCVA. Considering the horizontal extent and topography of the SCVA, these tunnels in general would not pose insurmountable constraint on cavern development within the SCVA. Project proponents should take into account the existing and proposed underground infrastructure when pursuing cavern development projects.

The SCVA falls within an area that is covered by the Deed of Restrictive Covenant (retrievable at the Lands Registry under Memorial No. 278911) in relation to the Hong Kong Disneyland, which sets height restrictions in the vicinity of the theme park to avoid visual intrusions. Lands Department should be consulted regarding any proposals that may encroach onto the area covered by the deed.

Project proponents need to consult the Coordinating Committee on Land-use Planning and Control relating to Potentially Hazardous Installations (CCPHI) as the SCVA encroaches onto the PHI Consultation Zone of Siu Ho Wan Water Treatment Works.

Project proponents should also take into account the latest progress of the proposed developments at Siu Ho Wan and other developments under the Sustainable Lantau Blueprint.

## 5. Potential Land Uses

The potential land uses for the SCVA are as follows:

<b>Land use</b>	<b>Description</b>
Data Centre	<p>The SCVA is at a strategic location in North Lantau Corridor where strategic economic and housing development has been suggested under the Sustainable Lantau Blueprint, alongside the HKIA, HKBCF and Tung Chung New Town. The SCVA is supported by major transport infrastructure enabling regional and cross-boundary connections. There is thus potential for the SCVA to house data centres and related facilities, to support the high value-added business and logistics development in North Lantau. This would also be in line with the Government's policy to promote Hong Kong as a data centre hub.</p>
Refuse Transfer Facility	<p>With the potential population intake associated with the proposed developments at Siu Ho Wan and atop MTR Siu Ho Wan Depot, there is potential for the SCVA to support such development by housing suitable NIMBY type of facilities in caverns, such as refuse transfer facility, to minimise the nuisance to the future community.</p> <p>Existing refuse transfer facility is found in the vicinity of the SCVA. Relocation of the facility to caverns may be considered, thereby releasing the surface land for other beneficial uses and for integration with future development.</p>

<b>Land use</b>	<b>Description</b>
Research/ Testing Laboratories	<p>For the same reasons given for “Data Centre” land use, there is potential for the SCVA to house research/testing laboratories, to support the high value-added business and logistics development in North Lantau.</p> <p>The development of research/ testing laboratories is in line with the six strategic industries where Hong Kong enjoys clear advantages, as outlined in the 2010/11 Policy Address (i.e. education facilities, medical services, testing and certification services, innovation and technology, environmental industries, cultural and creative industries).</p>
Maintenance Depot	<p>The SCVA is supported by good road network and is easily accessible by major highways (e.g. North Lantau Highway and the future Tuen Mun-Chek Lap Kok Link). There is thus potential to develop suitable land uses that require convenient transport infrastructure for serving a large catchment area, such as maintenance depot.</p> <p>There are existing maintenance depots and related facilities located in the vicinity of the SCVA. Relocation of these facilities to caverns may be considered, thereby releasing the surface land for other beneficial uses and for integration with future development.</p>



<b>Land use</b>	<b>Description</b>
Sewage Treatment Plant	<p>Given the potential population intake associated with the proposed developments at Siu Ho Wan and atop MTR Siu Ho Wan Depot, there is opportunity for the SCVA to support the development by housing suitable NIMBY type of facilities in caverns, such as sewage treatment plant, to minimise the nuisance to the future community.</p> <p>An existing sewage treatment plant is found in the vicinity of the SCVA. Relocation of the facility to caverns may be considered, thereby releasing the surface land for other beneficial uses and for integration with the future development.</p>
Warehousing	<p>Given the potential population intake associated with the proposed developments at Siu Ho Wan and atop MTR Siu Ho Wan Depot and the good connectivity of the SCVA supported by road network and major highways, there is also potential for the SCVA to house warehousing to support the residential development in the area as well as to serve the high value-added business and logistics development in North Lantau.</p>

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.

The SCVA is accessed from the slopes behind Siu Ho Wan Sewage Treatment Works and Discovery Bay Tunnel Link to the north, and Cheung Tung Road to the northwest.

The potential portal locations are general on slopes alongside the roads in which multiple portal locations can be formed if required. The potential portals are generally unrestricted by the existing configurations and capacity of the roads, allowing the SCVA being suitable for developing various land uses. However, accessing the potential portals behind Siu Ho Wan Sewage Treatment Works and on Discovery Bay Tunnel Link is under restrictions. The project proponents would have to sort out the land status and right of access issues when planning cavern project.

There are natural slopes above the potential portal locations. There may be potential natural terrain hazards in the vicinity which may require further study by the project proponents.

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

## **7. Concluding Remarks**




















The SCVA presents an opportunity for placing suitable land uses in rock caverns to serve the future developments in Siu Ho Wan (e.g. refuse transfer facility, sewage treatment works and/or maintenance depot). It also has the potential for housing land uses that could make use of its strategic location and good connectivity to support the development of North Lantau (e.g. research/testing laboratories, data centres and/or warehousing). Project proponents for cavern development should take due consideration of the proposed residential developments, environmental sensitive receivers and the Consultation Zone of the PHI that are in close proximity of the SCVA, accessibility for cavern development and the latest findings of the studies on various developments in North Lantau, to minimise the interfacing issues and bring about greater synergy and opportunities.

## **8. Notes**

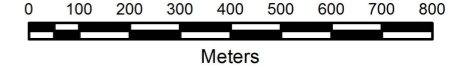
The Cavern Master Plan and all supporting documents do not exempt project proponents for cavern development from following the relevant statutory and planning procedures. Information including the potential land uses and the extent of potential portal locations indicated in this Information Note should 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
-  Committed Major Road
-  Existing Railway Line
-  Proposed Major Road
-  Vehicle Tunnel
-  Water Supplies Department Tunnel
-  Reservoir / River / Nullah / Sea
-  Ecologically Important Stream (EIS)
-  Site of Archaeological Interest
-  Graded Historic Building
-  Private Lot
-  Burial Ground
-  Potentially Hazardous Installation
-  Consultation Zone of Potentially Hazardous Installation
-  Major Conservation Area
-  Priority Site for Enhanced Conservation
-  Country Park
-  Site of Special Scientific Interest

Scale : 1:15,000



REFERENCE DRAWING OF STRATEGIC CAVERN AREA NO. 44 - SIU HO WAN

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT  
PLANNING DEPARTMENT



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