

CAVERN MASTER PLAN

EXPLANATORY STATEMENT

INTRODUCTION

- (1) This Explanatory Statement is intended to provide the key information on the Cavern Master Plan prepared under the “Long-term Strategy for Cavern Development – Feasibility Study” (Strategic Cavern Study).
- (2) The Cavern Master Plan is a planning tool providing a broad strategic planning framework to guide and facilitate territory-wide cavern development in Hong Kong. Areas that are considered strategic for accommodating multiple cavern facilities (referred to as Strategic Cavern Areas) to support future development need are delineated on the Cavern Master Plan. The Cavern Master Plan aims to make known these areas and their essential information to project proponents such that they can identify suitable cavern sites for their development projects. The Cavern Master Plan is non-statutory, only serving as user guidelines for cavern development and is not a blueprint for systematic development of caverns in all the identified Strategic Cavern Areas. Cavern development in Strategic Cavern Areas, including sizes and locations, would be subject to the need of individual development projects and detailed technical feasibility studies, and would be assessed on individual merits.
- (3) Attached to the Cavern Master Plan is a set of Information Notes with reference drawings which show the spatial context of each Strategic Cavern Area. The Information Notes indicate the broad potential land uses suitable for cavern development within the area and denote the extent of potential portal locations. The rationale of boundary delineation of each Strategic Cavern Area is also set out along with the key development opportunities and constraints.
- (4) The broad potential land uses set out in the Information Notes have made reference to the Hong Kong Planning Standards and Guidelines (HKPSG) on identification of land uses with potential for development in rock caverns.

BACKGROUND

- (5) Land is a scarce resource and there is a pressing need to increase land supply to sustain social and economic development. The hilly terrain and underlying geology of Hong Kong pose challenges as well as offer opportunities for development of the city. This setting has resulted in scarce supply of sizable developable flat land and has caused the built-up areas largely concentrating within the gently sloping foothills extending towards the shoreline and reclaimed land. Conversely, the hilly terrain underlain by massive hard igneous rocks (i.e. granitic and volcanic rocks), particularly in the urban fringe is suitable for developing rock caverns. Cavern development could be an alternative source of land supply in addition to the traditional land development approaches (e.g. large-scale reclamation and open-cut site formation), especially for the continued growth of the city and the increasing call to preserve the landscape, ecological and geological attributes of the territory.
- (6) Around the mid-1990s, a number of Government facilities in Hong Kong were purpose-built in rock caverns to meet the needs of the community while overcoming the lack of suitable surface sites at the locality, namely the Island West Transfer Station, Stanley Sewage Treatment Works and Kau Shat Wan Government Explosives Depot. In 2009, the University of Hong Kong constructed rock caverns to re-house the Western Salt Water Service Reservoirs in order to release land for the Centennial Campus development. These projects have demonstrated that rock caverns can be a cost-effective alternative, while yielding additional safety, environmental and security benefits. The Cavern Master Plan shows the location of these existing cavern facilities.
- (7) In March 2010, the Civil Engineering and Development Department (CEDD) commenced the “Enhanced Use of Underground Space in Hong Kong – Feasibility Study” (Cavern Feasibility Study) to take forward the initiative proposed by the Development Bureau in the 2009-10 Policy Agenda of launching strategic planning and technical studies to promote the enhanced use of rock caverns as part of Hong Kong’s pursuit of sustainable development.
- (8) An important outcome of the Cavern Feasibility Study was the development of a territory-wide cavern suitability map, which shows areas which are considered broadly suitable for cavern development from the geological perspective. Such areas account for about 64% of the total land area in Hong Kong. This map provides the basis for delineation of the Strategic Cavern Areas in the Strategic Cavern Study. An overlay of the Strategic Cavern

Areas on the cavern suitability map is included in **Plan A** of this Explanatory Statement. Reference should be made to the section on Geological Suitability in paragraphs (23) to (25) below.

- (9) The Cavern Feasibility Study was completed in March 2011 and recommended that policy steer be provided through the issue of technical circulars to lay down administrative requirements for Government departments to consider cavern option in early project planning stage, a framework be developed to encourage private sector participation in cavern development, and a strategy be formulated to relocate existing Government facilities to caverns to gradually release occupied surface land for other beneficial uses.
- (10) In the Chief Executive's 2011-12 Policy Address under "Policy on Land Development and Accumulation", the potential of re-provisioning the existing Government facilities in rock caverns was highlighted as one of the main innovative measures to expand Hong Kong's land resources. In the 2013 Policy Address, the Chief Executive further highlighted that rock cavern is a viable source of long-term land supply and stressed the need to conduct a study on the long-term strategy for cavern development with a view to preparing a rock cavern master plan. The scope of the Strategic Cavern Study, which commenced in late 2012, includes development of a long-term strategy for the planning and implementation of the cavern initiative.

BENEFITS OF CAVERN DEVELOPMENT

- (11) There are distinct benefits of the planned use of rock caverns towards Hong Kong's sustainable land development strategy. The land so created, particularly in the vicinity of urban areas, is a valuable resource and would assist in resolving some of the land incompatibility issues. These could include:
 - a. Relocating suitable existing Government facilities to caverns thereby releasing the surface land;
 - b. Placing new facilities in caverns thereby reducing surface land take;
 - c. Reserving valuable cavern space for future developments and future expansion of cavern facilities;

- d. Housing “Not-In-My-Backyard” (NIMBY) type of facilities in caverns for minimising their nuisance to the community; and
- e. Providing other intangible benefits such as removing incompatible land uses in the community.

PURPOSE OF THE CAVERN MASTER PLAN

- (12) The long-term strategy for cavern development, and in particular the development of a Cavern Master Plan, would provide a holistic approach in releasing the potential of cavern development, facilitating the establishment of a sustainable means of enhancing land supply and increasing land reserve for future development, as well as playing a strategic role and providing systematic guidelines for implementation of cavern development in the territory. Private sector participation should also be an integral part of cavern development because many private sector facilities, such as warehousing/logistics and data centres, can benefit from the stable and secure setting offered by caverns. The Cavern Master Plan will give the basic information needed to consider the option of caverns for accommodating their facilities.
- (13) The objectives of the Cavern Master Plan include:
 - a. Facilitation of territory-wide cavern development – to delineate Strategic Cavern Areas that could facilitate wider application of cavern development in the territory. Reference should be made to the sections on Strategic Cavern Areas in paragraphs (14) to (18) and Criteria for Delineation of Strategic Cavern Areas in paragraphs (19) to (48) below for further details;
 - b. Promulgation of information – to disseminate and publicise information on Strategic Cavern Areas that could enable both Government departments and private sector organisations to identify suitable cavern sites for their developments. Reference should be made to the section on Information Notes in paragraphs (49) to (51) below for further details; and
 - c. Optimal utilisation of Strategic Cavern Areas – to enhance the use of land resources through a pragmatic mechanism for managing cavern and other subsurface developments in Strategic Cavern Areas, without compromising beneficial surface land use and developments. Reference should be made to the section on Implementation in paragraphs (52) to (61).

STRATEGIC CAVERN AREAS

- (14) A Strategic Cavern Area is defined as an area that is easy to access and can accommodate multiple facilities in rock caverns to meet the need of development. The area should be sufficiently large and located at the urban fringe with supporting infrastructure network. The following key selection criteria have been considered in identifying Strategic Cavern Areas:
- a. Suitable settings – the area should have favourable topography and geology for developing caverns;
 - b. Easy access – the area should be located at urban fringe and could be easily connected to the surrounding infrastructure network, either existing or committed, by constructing minor access roads;
 - c. Accommodating multiple facilities – the area should be suitably large with sufficient number of portal locations that could enable multiple cavern facilities to be developed; and
 - d. Meeting development needs – the area should be located in a region with demand for caverns to meet the needs of development, such as relocation of existing Government facilities, urban development (e.g. provision of new facilities to serve new development areas or to support the expansion/upgrading of existing urban areas/new towns) or private sector demand.

The criteria for delineation of Strategic Cavern Areas are further elaborated in paragraphs (19) to (48) below.

- (15) The 48 Strategic Cavern Areas as delineated on the Cavern Master Plan cover a total area of approximately 4 600 hectares. There are 11 on Hong Kong Island, 5 in Kowloon, 25 in the New Territories and 7 on Lantau Island. The size of individual Strategic Cavern Areas range from approximately 30 to 200 hectares. Strategic Cavern Areas with size over 30 hectares are considered large enough for accommodating multiple facilities in caverns. The maximum size of Strategic Cavern Areas is to a certain extent confined by the prescriptive fire safety requirements (see paragraphs (47) and (48)). Some Strategic Cavern Areas are in close proximity to each other. They are not combined into larger Strategic Cavern Areas due to the presence of some topographic features (e.g. deep valley), geological features (e.g. major fault) or existing infrastructures (e.g. road tunnel) between them.

- (16) The total area of Strategic Cavern Areas does not represent the actual developable cavern space because provisions have to be made for features like buffer zones between individual facilities, intervening rock pillars for support and adits for portal access and inter-connection. Making an allowance for such provisions, the maximum usable footprint area is estimated to be in the range of about 1 200 to 1 800 hectares. Notwithstanding the reduction (i.e. in range of about 60% to 75%), the usable area may be increased by constructing caverns at different elevations or by forming multiple-floor facility within a single cavern (e.g. National Archives of Norway and National Library of Sweden).
- (17) Strategic Cavern Areas identified so far only represent areas that are found strategic for cavern development in terms of geological considerations and the current planning perspectives. They are not meant to be exhaustive because there may be other areas that could be suitable for cavern development but do not meet the selection criteria of Strategic Cavern Areas as given in paragraph (14) above, e.g. relatively small hillsides that can merely accommodate a single facility or remote areas that are not easy to access.
- (18) There are various locations being explored under other studies for housing new infrastructures in caverns to support development areas such as New Territories North. Since those areas do not meet the selection criteria of Strategic Cavern Area, they have been denoted as “Caverns under planning” on the Cavern Master Plan for reference. For those Government cavern projects under study, such as relocation of the Sha Tin Sewage Treatment Works, they have been denoted as “Caverns under investigation” on the Cavern Master Plan.

CRITERIA FOR DELINEATION OF STRATEGIC CAVERN AREAS

- (19) A number of factors have been considered to determine the locality, boundary, extent of potential portal locations and potential land uses of Strategic Cavern Areas shown on the Cavern Master Plan. These factors include terrain, geological suitability, land status, land use planning, infrastructural support, environmental constraints and fire safety requirements.

Terrain

- (20) Strategic Cavern Areas are to be located in hilly terrain with steep hillsides and shallow rock head, which offers a favourable site setting for cavern

development. Steep hillsides could minimise the length of access tunnels required and hence reduce the extent of portal formation works. Shallow rock head could also provide adequate rock cover to support the development of sizable caverns. For example, terrain at Braemar Hill above North Point is considered to have suitable topography for cavern development. Similar topography could be found in quarry sites, e.g. Anderson Road Quarry, where rock is exposed and the quarry face provides convenient access for portal formation.

- (21) The preference for the potential portal locations is to be close to steep hillsides and/or have sufficient surrounding space for providing a staging area for cavern construction and for the siting of above ground structures if needed to support cavern development. Typical above ground structures include ventilation and administration buildings.
- (22) The terrain conditions must be considered together with the geological suitability for the delineation of Strategic Cavern Areas. An overlay of the Strategic Cavern Areas on the terrain of Hong Kong is shown in **Plan B** where it can be seen that all Strategic Cavern Areas fall generally within hilly terrain.

Geological Suitability

- (23) The abundance of strong igneous rocks (i.e. granitic and volcanic rocks) in Hong Kong, which covers some 80% of the land area, offers an opportunity for placing facilities in rock caverns. The hilly areas at the urban fringes are particularly suitable for cavern development as they allow easy access into the ground to construct the caverns.
- (24) The cavern suitability map, which was prepared as part of the Cavern Feasibility Study, has been used to assist in delineating the boundary for each Strategic Cavern Area (see **Plan A**). As a whole, about 64% of the total land area in Hong Kong is potentially suitable for cavern development, i.e. caverns are considered to be more easily developed in these areas. Strategic Cavern Areas possess geological and spatial characteristics appropriate for cavern development, such as hilly terrain comprising strong rock.
- (25) Strategic Cavern Areas are not included in areas below landfill sites and Scheduled Areas under the Buildings Ordinance where geotechnical difficulty of cavern development is high. Strategic Cavern Areas also avoid geological features which may adversely affect the constructability of caverns, such as

major faults, and areas underlain by sedimentary and metamorphic rocks where the rock mass properties are considered less suitable for cavern development.

Land Status

- (26) In general, development zones (e.g. residential zone, village type development zone), private lots and burial ground are excised from Strategic Cavern Areas at the time of formulating the Cavern Master Plan. Boundaries are defined to cover Government land and prevent extension into private land for ease of implementation. Nevertheless, some of this Government land may be rezoned and disposed of in the future for private development. Suitable provisions would be incorporated in the lease conditions to safeguard the integrity of the Strategic Cavern Areas (see paragraphs (52) to (61) on Implementation).
- (27) Due to the small scale of the Cavern Master Plan, there are small individual private lots located midway on the hillsides within some Strategic Cavern Areas. These small private lots are also excised from the Strategic Cavern Areas on the reference drawings and they would not physically pose constraints on the development potential of Strategic Cavern Areas, and vice versa.

Land Use Planning

- (28) The spatial context of the surrounding land uses with the individual Strategic Cavern Areas has been considered in the identification of potential land uses.
- (29) Some Strategic Cavern Areas are identified to serve the adjacent urban areas and new towns which have limited available surface land for expansion. These Strategic Cavern Areas will provide solution space for relocating existing and/or accommodating additional Government, Institution or Community facilities like service reservoirs in rock caverns in order to support the increasing demand of local residential communities. In areas with a concentration of commercial/industrial developments, land uses in rock caverns that support adjacent existing and planned economic activities have been considered, such as storage/warehousing facilities and data centres. Strategic Cavern Areas located in relatively remote and/or isolated locations are suitable for housing facilities considered to be of high safety risk or NIMBY in nature.
- (30) Proximity to Key Development Areas has also been considered in determining Strategic Cavern Area locations. This provides the opportunity for a more comprehensive approach of increasing available land for these development

areas. Key Development Areas are identified on the Cavern Master Plan, including areas delineated for planning and development such as those covered under the studies for housing sites in Yuen Long South, Hung Shui Kiu New Development Area and Tung Chung New Town Extension.

- (31) Strategic Cavern Areas are not included in areas of impounding reservoirs or military land even though they might be highly suitable for cavern development from the geological perspective.
- (32) Demand for cavern development has also been established through consultation with the private sector. Consultations have been undertaken to identify spatially the demand trends for cavern development under different land uses, including warehousing/logistics facility, data centre, columbarium, vehicle parking, bus depot, retail/shopping arcade, oil storage, wine storage, electric substation, research/material testing laboratories and underground quarrying. This information has been considered in identifying Strategic Cavern Areas and their potential land uses.
- (33) Reference has also been made to the HKPSG in identifying the potential land uses for Strategic Cavern Areas. The HKPSG sets out the broad land uses with the potential for development in rock caverns. A list of land uses with the potential for development in rock caverns is given in **Appendix I**.

Infrastructural Support

- (34) Connectivity to the existing and planned major infrastructure is one of the key factors in the determination of the location and the potential land uses for Strategic Cavern Areas. The proximity to and capacity of existing as well as planned infrastructure, such as highways and railways, has supported the potential of certain land uses to be accommodated within Strategic Cavern Areas and has also been considered in the delineation of their boundaries.
- (35) The adjacent road network has also been reviewed in terms of forecast capacity to assist in the identification of potential land uses with regards to the surrounding infrastructure. Land uses which would typically generate larger traffic volumes, such as warehousing, have only been considered for recommendation where the surrounding infrastructure has reasonable residual capacity. The need for any upgrading of the existing infrastructures to support particular types of land use is highlighted in the respective Information Notes as appropriate.

- (36) In addition to considering proximity to the existing road network, the proximity to MTR stations and other modes of public transport has also been taken into account in the identification of potential land uses which will require easy access by staff and/or the general public.
- (37) The location of existing and planned underground infrastructure, including tunnels, has also been considered in the delineation of Strategic Cavern Area boundaries. The boundaries of Strategic Cavern Areas would be at a reasonable distance away from existing and planned underground infrastructure on similar elevations in order to provide a buffer zone to reduce potential impact to these infrastructures. Those tunnels that are located at different elevations with sufficient buffer would not be avoided since they would unlikely pose any insurmountable constraint on future cavern developments in the Strategic Cavern Areas. The respective Information Notes of each Strategic Cavern Area has also highlighted the interface issues with the existing and planned underground infrastructure, should there be any within the Strategic Cavern Area.

Environmental Constraints

- (38) Environmental issues have been an important consideration in the formulation of the Cavern Master Plan. A range of environmental factors have been considered when determining the boundary of each Strategic Cavern Area. Major conservation areas have been used as the basis for consideration of environmental and heritage related factors. These include, but are not limited to, constraints such as Conservation Areas, Coastal Protection Areas, Sites of Cultural Heritage and Sites of Special Scientific Interest. The identification of potential portal locations has avoided encroaching onto Country Parks and Special Areas (hereafter referred to as Country Parks), conservation areas, valuable woodland, watercourses and other ecologically significant areas and sensitive parts of the natural environment as far as practicable to avoid possible adverse environmental, ecological and landscape impacts on these areas.
- (39) Based on the cavern suitability map, about 64% of the total area in Hong Kong is considered suitable for cavern development. Some 55% of this land is located within the statutory protected Country Parks, development below which would require the consent from the Country and Marine Parks Authority who may request for further consultation with the Country and Marine Parks Board or its Country Parks Committee where appropriate. Given this high proportion, it is inevitable that most Strategic Cavern Areas identified encroach

onto Country Parks in varying degrees (see **Plan A**). As a whole, about 40% (i.e. 1,800 hectares) of the total area of Strategic Cavern Areas are within Country Parks, accounting for about 4% of the total Country Parks area.

- (40) Cavern construction, including rock excavation, rock support and waterproofing works, and implementation of environmental mitigation measures, is an established technology. Numerous underground infrastructures have been built below Country Parks, for example, road tunnels such as Lion Rock Tunnel, Tate's Cairn Tunnel and Tai Lam Tunnel, as well as numerous railway, water, drainage and cable tunnels. There are over 160 km of underground infrastructure within Country Parks. Given the similar engineering practice in construction of tunnels and caverns, these examples provide reference that cavern developments underneath Country Parks could be acceptable provided that they are in compliance with the statutory requirements and appropriate engineering measures are implemented to mitigate the potential adverse environmental impacts.
- (41) The Cavern Master Plan does not exempt any cavern development projects, either within or outside Strategic Cavern Areas, from the statutory requirements, including applications for approval of environmental impact assessment (EIA) report and environmental permit under the Environmental Impact Assessment Ordinance (EIAO). For developing caverns within Country Parks, project proponents must seek the views and obtain consent of Country and Marine Parks Authority, who may request for further consultation with the Country and Marine Parks Board or its Country Parks Committee where appropriate. All projects must be justified on their own merits of developing caverns within Country Parks.
- (42) Rock cavern development is a Designated Project under the EIAO. The environmental acceptability of a cavern development project, its potential environmental impacts, including cumulative environmental impacts, arising from the construction and operation of a cavern development and its associated facilities, and environmental mitigation or compensation measures required shall be determined on an individual project basis in the EIA under the EIAO requirements.
- (43) Environmental constraints relevant to each Strategic Cavern Area are included in the corresponding Information Notes (reference should be made to the section on Information Notes in paragraphs (49) to (51) below for further details). For example, noise, air, ecologically and visually sensitive

receivers/areas should be considered in the selection of potential portal locations where there may be adverse impacts on these areas during construction and/or operation of the cavern project. Project proponents should also endeavour to locate surface supporting infrastructures of the cavern projects, such as ventilation shafts and administration buildings, outside major conservation areas and Country Parks as far as practicable. If such encroachment cannot be avoided, project proponents should justify the need, seek approvals from the relevant authorities and incorporate suitable environmental mitigation measures in the cavern scheme.

- (44) Graded historic buildings and declared monuments located within or close to Strategic Cavern Areas, which may pose constraints on cavern development, are highlighted in the respective Information Notes. Project proponents must comply with the statutory requirements on heritage conservation for cavern development works where appropriate and consult the Antiquities and Monuments Office of the Leisure and Cultural Services Department if necessary.
- (45) A Strategic Environmental Assessment (SEA) was carried out as part of the Strategic Cavern Study and provided environmental information on the Cavern Master Plan. The SEA Report of the Strategic Cavern Study strategically addresses the environmental aspects of cavern development, including potential environmental impacts that may be induced by cavern development, recommendations of environmental design and mitigation measures, for cavern development proposals to make reference. The SEA Report also contains a set of environmental guidelines on cavern development for individual project's reference when conducting EIA in future.
- (46) The detail of site and facility specific environmental protection measures to be incorporated in the design and any other further environmental implications will be subject to EIA study under the EIAO. Project proponents will normally be required to set up and carry out an environmental monitoring and audit (EM&A) programme to ensure compliance with the conditions stipulated in the environmental permits, assess the effectiveness of the recommended mitigation measures and identify any further need for additional mitigation measures or remedial action. Where appropriate, post-construction monitoring including ecological, landscape and groundwater monitoring may need to be implemented for cavern development projects in sensitive areas (e.g. Country Parks) to allow comparison with baseline data before works commencement. The build-up of experience and monitoring data would help

to establish a scientific basis to address potential knowledge gap regarding the long-term ecohydrological impact of cavern development. Furthermore, ecological compensation and enhancement programme could be implemented as part of the cavern projects where appropriate.

Fire Safety Requirements

- (47) In accordance with the Guide to Fire Safety Design for Caverns jointly published by the Building Authority and Fire Services Department in 1994, the total horizontal distance of escape route inside caverns should not be excessive. For certain uses of caverns as described in the above Guide, a maximum distance of 750m may be permitted under the prescriptive fire safety requirements of the Guide. For other proposed uses not covered by the Guide or proposals with maximum travel distance exceeding 750m, the fire safety design should comply with the performance requirements specified in Section 2 of Part A of the Code of Practice for Fire Safety in Buildings 2011.
- (48) In the case where the boundary of Strategic Cavern Area is not constrained by other restrictions such as terrain, geological suitability, land status and environmental constraints, it is considered reasonable to confine its extent to a maximum distance of 800 m (i.e. 750 m plus 50 m buffer zone) from the potential portal locations. Such confinement could provide a rational size of cavern development area where conventional fire engineering and evacuation strategy design could be generally adopted. It is still possible to develop caverns beyond this limit but it would require specific fire safety design and installations using fire engineering approach as specified in Part G of the Code of Practice for Fire Safety in Buildings 2011.

INFORMATION NOTES

- (49) Information Notes set out the characteristics of and constraints on each Strategic Cavern Area. This includes details of the geological, planning, environmental and traffic characteristics and other key issues/constraints on cavern development. It also outlines the potential land uses and the extent of potential portal locations. Brief descriptions are provided for the geographical context of the Strategic Cavern Area and its delineation rationale.
- (50) Appended to the Information Notes is a reference drawing which provides the spatial context of each Strategic Cavern Area.

- (51) The potential land uses are identified through a review of the issues noted in the section on Land Use Planning in paragraphs (28) to (33) above.

IMPLEMENTATION

- (52) Strategic Cavern Areas are valuable land resources. This alternative source of long-term land supply should be managed in a judicious manner. Synergy effect on cavern development in Strategic Cavern Areas including the optimal utilisation of cavern space and economies of scale should be pursued through better integration with other surface (e.g. site formation works) and subsurface (e.g. tunnels) developments within the Strategic Cavern Areas.
- (53) The Cavern Master Plan provides a strategic planning framework to guide and facilitate territory-wide cavern development in Hong Kong. The Cavern Master Plan should be referenced to alongside the HKPSG in the course of planning and engineering studies, preparation/revision of town plans and development control for surface, subsurface and cavern developments in the territory. Due consideration should also be given to relocating existing facilities and/or placing new facilities in rock caverns when opportunity arises in order to release surface sites for other beneficial uses, reduce surface land take and remove incompatible land uses.
- (54) The Sub-committee on Cavern Development under the Committee on Planning and Land Development is responsible for vetting proposals of new developments that wholly or partly fall within Strategic Cavern Areas. This provision, which is intended to strive for the best use of Strategic Cavern Areas for the overall benefits of Hong Kong, should be applied in a pragmatic manner when dealing with projects that would have an impact on the cavern development potential of Strategic Cavern Areas. The following general principles should be adopted:
- a. It should optimise the utilisation of Strategic Cavern Areas.
 - b. It should enable beneficial surface and subsurface developments in Strategic Cavern Areas while safeguarding the cavern development potential of the Strategic Cavern Areas.
 - c. It should facilitate integrating cavern development with other surface and subsurface developments in Strategic Cavern Areas to bring about synergy

effect whenever possible.

- (55) The vetting mechanism is stipulated in the Development Bureau Technical Circular (Works) No. 8/2017 on Rock Cavern Development. The Sub-committee on Cavern Development will vet development proposals involving either Government projects or land disposal/alienation proposals (including lease modification and land exchange) that wholly or partly fall within Strategic Cavern Areas, including surface, subsurface and cavern development proposals, and recommend suitable provisions for optimising the use of the Strategic Cavern Areas.
- (56) The Information Notes as described in paragraphs (49) to (51) above should be used to facilitate the early stage development of proposals for cavern development and provide a summary of information on the characteristics of Strategic Cavern Areas including reference drawings which show potential development opportunities for and constraints on each Strategic Cavern Area.
- (57) The Cavern Master Plan is intended to provide systematic guidelines for cavern development and the Strategic Cavern Areas identified are not exhaustive to possible cavern development in Hong Kong. Detailed planning and engineering feasibility studies and assessments, such as environmental impact assessment and traffic impact assessment, should be conducted for development proposals in rock caverns on a case-by-case basis whether these are within or outside of Strategic Cavern Areas. It also does not exclude the possibility of private land owners from exploring cavern development potential within land under their ownership and land not delineated in the Cavern Master Plan.
- (58) Proponents for cavern development projects should follow the relevant statutory and administrative procedures/requirements at the implementation stage. Planning applications or amendments to Outline Zoning Plans submitted to the Town Planning Board will be assessed on individual merits. Other relevant statutory requirements, such as applications for approval of EIA report and environmental permit under the EIAO, consent from the Country and Marine Parks Authority and any specific land lease conditions will need to be fulfilled as required.
- (59) The Cavern Master Plan will be reviewed and updated periodically taking account of changing circumstances and development needs.

- (60) The Cavern Master Plan, Explanatory Statement and the accompanying Information Notes are available on the websites of the Civil Engineering and Development Department (<http://www.cedd.gov.hk/eng/cavern/index.html>) and Planning Department (http://www.pland.gov.hk/pland_en/info_serv/cmp/index.html).
- (61) For public enquiry, please contact the Geotechnical Engineering Office of the Civil Engineering and Development Department and the Planning Department:

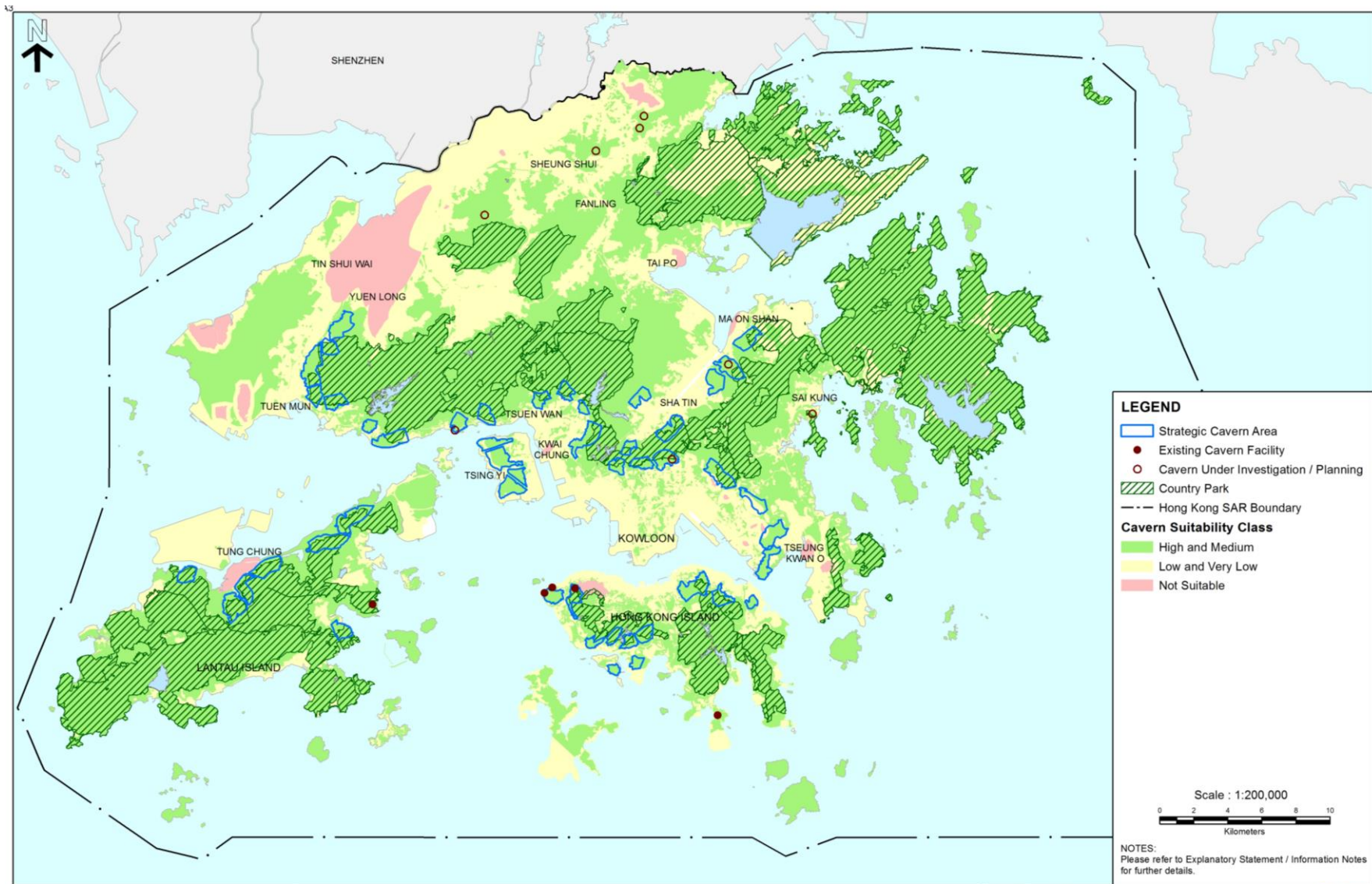
Planning Division
Geotechnical Engineering Office
Civil Engineering and Development Department
11/F, Civil Engineering and Development Building
101 Princess Margaret Road
Homantin, Kowloon
Hong Kong

Technical Services Section
Planning Department
17/F, North Point Government Offices
333 Java Road,
Hong Kong

LAND USES WITH POTENTIAL FOR DEVELOPMENT IN ROCK CAVERNS

Types of Land Uses	
1.	Commercial Uses -Food and beverage -Food/Wine storage -Retail
2.	Industrial Uses -Container storage -Data centre -Industry -LPG bulk storage -Oil bulk storage -Research/Testing laboratories -Storage/Warehousing
3.	Government/Institution/Community and Other Specified Uses -Archives -Civic centre -Columbarium/Mausoleum/Mortuary -Cultural/Performance venue -Explosives depot/magazine -Incinerator -Indoor games/Sports hall -Indoor swimming pool/complex -Maintenance depot -Recreational complex -Refuse transfer facility -Service reservoir -Sewage/Water treatment plant -Slaughterhouse -Transport connections & networks -Underground quarrying -Vehicle parking -Vehicle (including bus) depot -Wholesale market
4.	Public Utilities -Power station -Public utility installation

Note: Potential land uses should be assessed on a case-by-case basis on their suitability for cavern development in consultation with the relevant bureau/departments having regard to, amongst others, safety, operational, environmental, technical and financial considerations.

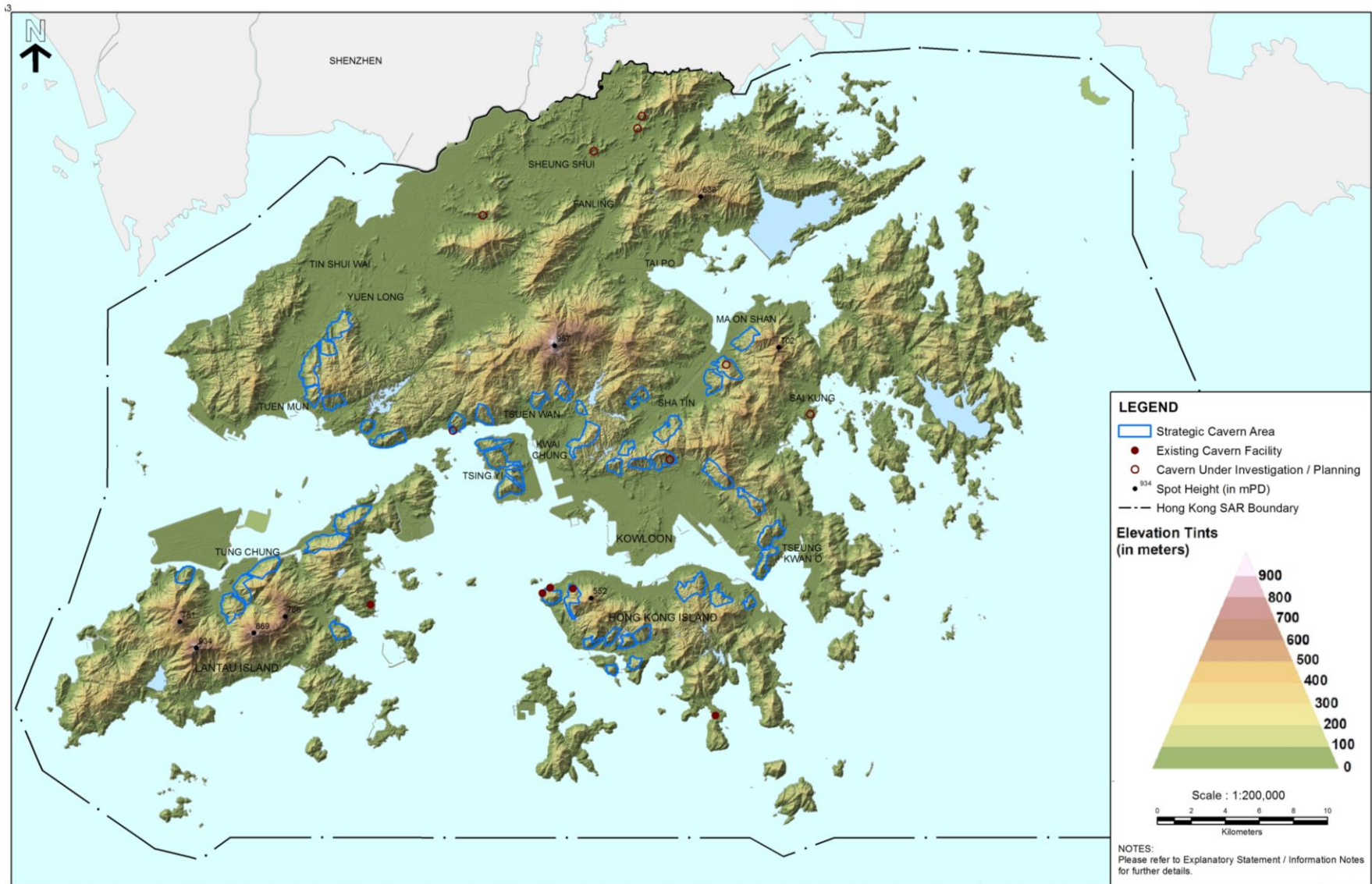


Plan A - Cavern Suitability Map

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
PLANNING DEPARTMENT



Plan A



Plan B - Relief Map

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
PLANNING DEPARTMENT



Plan B