

全年回顧 Year in Review

投資基建 Investing in Infrastructure

教導孩子節約用水，
珍惜點滴。

Help children
understand the
importance of
conservation and
the value of water.





投資基建 Investing in Infrastructure

一如以往，本署配合人口增加所需要的水資源，未雨綢繆，做好規劃的工作。我們優化集水區的設施，並引入更新計劃，提升或更換水管、濾水廠和輸送設施。

提升供水網絡

於二零零零年開展的水管更換及修復計劃，施工期長達15年，範圍遍及全港3 000公里的水管，現時已進入最後階段。第四期計劃將於二零一一年開始。截至二零一零年六月三十日，我們已完成了1 313公里的水管更換及修復工作，確保市民獲得更加可靠的供水。

香港許多現有的水管已使用超過30年，運作情況未如理想。因水管爆裂、水壓驟降及其他因供水網絡老化而產生的事故，會對供水造成干擾，並且影響交通網絡的運作和市民的日常生活。水管更換及修復計劃完成後，可確保供水繼續安全、可靠及有效。

本署引進了最新方法和技術去更換及修復水管。我們盡可能使用非開挖的施工方法，包括內喉緊貼法、原位內搪喉管法、水管推頂法及定向鑽挖法，以減少路面工程，從而降低對公眾的干擾。

The Department is continuing to plan ahead for the provision of water supplies to areas of population growth. This includes working on water catchment facilities and instituting a programme to upgrade or replace existing water mains, treatment and transfer facilities.

Improving the Supply Network

Our 15-year phased programme of replacing and rehabilitating 3 000 kilometres of water mains across Hong Kong which began in 2000 is now in its final stages. Construction work on the fourth stage will begin in 2011. As at 30 June 2010, we have completed work on 1 313 kilometres, ensuring greater supply reliability for residents.

Many of the existing mains are more than 30 years old and are in unsatisfactory service conditions. Water mains bursts, sudden drops in pressure and other incidents in our aging supply network can cause disruptions to our water supply. Bursts and leakage incidents often affect traffic and transportation as well. The replacement and rehabilitation programme, once completed, will ensure the efficient provision of safe and reliable water, with minimum disruption to daily life.

New construction methods and technologies are adopted in our replacement and rehabilitation programme. Where necessary, we use trenchless construction methods including close fit lining of existing mains, cure-in-place pipes, pipe jacking and horizontal directional drilling. These technologies lessen the above ground inconvenience caused to the public.

位於動植物公園的進口井，用以進行水管推頂工程。
A launching pit at Hong Kong Zoological and Botanical Gardens for pipe jacking.





非開挖的施工方法能減低對路面交通造成影響。
Trenchless construction methods can reduce the impact on road traffic.

減少水管滲漏

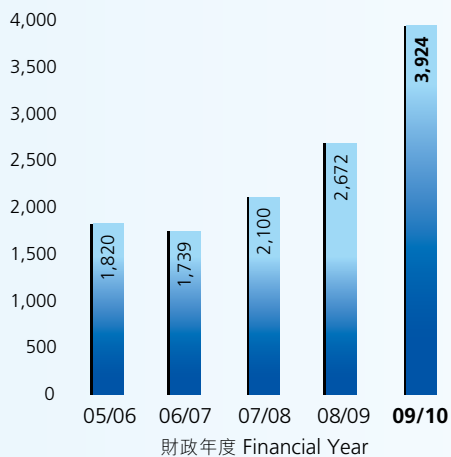
應用水壓管理技術適度調控水管壓力，大大加強我們對水管滲漏的控制。這些技術試驗，已由小規模的先導計劃推廣至主要供水區的層面。我們在各檢測區域安裝了電磁流量計和電子數據記錄器，並透過移動電話網絡將水流量和水壓數據傳送至控制中心，盡早發出早期滲漏預警，以便更迅速地展開補救行動。

Reducing Water Loss from Leakage

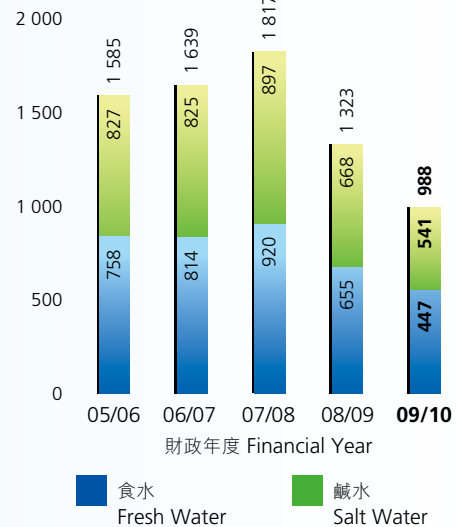
Controls over water loss from mains have been strengthened through wider application of pressure management technology that optimises water mains pressure. Small scale pilot schemes using the technology have been extended into major supply zones across Hong Kong. Electromagnetic flow meters and electronic data loggers are used across district metering areas with flow and pressure data transmitted via mobile phone networks to control centres providing early alerts of leakages and enabling faster remedial action.

資本投資 Capital Investment

百萬元 \$million



水管爆裂修理個案統計數字 Statistics on Mains Bursts Repaired





建造沙田海傍二號海水抽水站，提升沙田和馬鞍山地區的鹹水供應能力。
Construction of Sha Tin Seafront No.2 Salt Water Pumping Station will increase the capacity of salt water supply in the Sha Tin and Ma On Shan areas.

擴建供水系統

節約用水的其中一個重要策略，是擴建或提升作為沖廁用的海水供應系統。現時，本港約八成人口使用海水沖廁。我們已開展的海水供應系統工程，預計於數年內令此服務覆蓋八成半的人口。

目前，薄扶林區並未有海水供應作沖廁用途。為減輕食水供應系統的負荷和節省食水資源，該區正興建全新海水供應系統。新系統會於鋼線灣設置海傍海水抽水站，及相連的海水進水涵洞；兩個分別位於華富和薄扶林的海水配水庫；位於華富的海水抽水站，及相連的鹹水水管。預計可應付整個薄扶林區八萬五千人口平均每日15 100立方米的鹹水需求。

在沙田地區方面，正在建造中的新建海傍抽水站及相連的水管系統，以及在馬鞍山及多石興建的兩個新配水庫，將使該區的海水系統供應能力大大提升。在新界西北區，本署在樂安排與元朗及天水圍之間的青山公路沿線正鋪設67公里的鹹水水管。與此同時，樂安排海水抽水站以及位於丹桂村的配水庫已在建造中。

Extending the Supply System

As a part of our initiative to conserve fresh water, we are extending or upgrading the sea water supply system used for toilet flushing. Currently 80 per cent of consumers use sea water for toilet flushing. Construction of sea water systems is in progress to extend this service to cover 85 per cent of the population in a few years' time.

There is at present no sea water flushing supply system in the Pok Fu Lam area. To relieve the burden on the fresh water supply systems and to save fresh water resources, a new sea water supply system is being built. The new system comprises a seafront salt water pumping station at Telegraph Bay and the associated sea water intake culvert, two salt water service reservoirs at Wah Fu and Pok Fu Lam, a salt water pumping station at Wah Fu and the associated salt water mains. It will be able to meet the salt water mean daily demand of 15 100 cubic metres per day or about 85 000 people for the whole Pok Fu Lam area.

In Sha Tin, the sea water supply system is being upgraded with the addition of a new seafront pumping station and two service reservoirs at Ma On Shan and To Shek, with an associated water mains system. In the Northwest New Territories, 67 kilometres of salt water mains are being laid along Castle Peak Road from Lok On Pai to Yuen Long and Tin Shui Wai. A salt water pumping station at Lok On Pai and a service reservoir at Tan Kwai Tsuen are also being built.

灣仔、中環和半山地區的沖廁用水需求不斷增加。灣仔發展計劃第二期把這個關注納入其中，將進行灣仔海傍海水抽水站產能提升工程。馬己仙峽道的新置配水庫、寶雲徑的附加抽水站和7公里長的新設鹹水水管，將支援這項供水計劃。

To cope with the increasing demand for flushing water in Wan Chai, Central and Mid-level areas, the seafront salt water pumping station at Wan Chai will be uprated in capacity while it is reprovisioned in connection with the Wan Chai Development Plan II. The supply scheme will be supported by a new service reservoir at Magazine Gap Road, an additional pumping station at Bowen Drive and 7 kilometres of new salt water mains.

本署在香港大學校園內的新西區配水庫重置工程順利完成。是項工程重置食水和海水配水庫，是港大百周年校園工程的一部分。工程採用嶄新而又環保的方法，重置兩個海水配水庫於石洞之中，有效利用土地。除此之外，更採用環保施工方案，減少了大量的斜坡工程。兩個食水配水庫上蓋日後將變身為種植百多棵樹木的花園。配水庫已經全部落成啟用，為中西區及山頂12萬居民提供服務。所有施工的設計元素和用材都符合本署對環境保護和可持續發展的要求。

On the campus of the University of Hong Kong (HKU), the new Western service reservoirs were handed over to the Department. As part of the development of the University's Centennial Campus, HKU undertook the reprovisioning of the affected fresh water and salt water storage facilities. Innovative and environmentally friendly methods were used to develop two salt water service reservoirs inside a rock cavern. This has optimised land use and provided an environmentally friendly engineering solution by avoiding massive slope works. The roof of the two fresh water service reservoirs will become a landscaped garden with more than 100 trees. The salt and fresh water service reservoirs are now in operation helping meet the needs of 120 000 people in the Central, Western and the Peak areas of Hong Kong Island. All the new works feature design elements and materials that meet our environmental and sustainability objectives.



善用土地資源，把西區海水配水庫重置於石洞中。
Salt water service reservoirs are constructed inside a rock cavern to optimise land use.





透過水塘間轉運計劃，九龍副水塘的溢流得以輸送到沙田濾水廠。
The flood water from Kowloon Byewash Reservoir is carried to Sha Tin Water Treatment Works through an Inter-reservoirs Transfer Scheme.

保護水資源

在渠務署制訂西九龍防洪策略時，我們已探討在防洪工程下兼收節約水資源之效的可行性。我們因此而制訂了水塘間轉運計劃，利用排洪隧道把九龍水塘群與下城門水塘連接起來，並把九龍水塘群的溢流經下城門水塘和現有輸送系統輸送到沙田濾水廠處理，而非直接排放到維多利亞港。工程計劃完成後，每年平均會新增約250萬立方米的原水量。此外，為安全和有效地收集地表水，我們現正計劃展開另一項基本工程計劃，以改善城門、筆架山、金山和大欖涌現有共長約26公里的引水道系統。

Protecting Water Resources

In conjunction with Drainage Services Department's flood control strategy for West Kowloon, we explored the feasibility of achieving water conservation as part of flood control. The result is the formulation of the proposal for the Inter-reservoirs Transfer Scheme in which the Kowloon group of reservoirs is to be connected with Lower Shing Mun Reservoir by a raw water transfer tunnel. The flood water, instead of being discharged into Victoria Harbour, will be carried through a tunnel and along an existing transfer system to Sha Tin Water Treatment Works where it will be treated to become fresh water. Once this project is completed, it is expected to generate an additional 2.5 million cubic metres of raw water per annum. We are also planning improvements to catchwaters that will provide for the safe and efficient collection of surface water. The first of these projects will involve improvements to 26 kilometres of catchwaters in the Shing Mun, Beacon Hill, Golden Hill and Tai Lam Chung catchwater systems.

確保食水處理能力

確保食水處理能力，把原水處理，以符合特定水質標準，對維持有效的供水系統至為重要。兩個負責處理由東江輸入原水的濾水廠——沙田濾水廠和大埔濾水廠，正分別進行原地重置和擴建工程。兩個工程的進展規劃和處理能力將互為補足，相輔相成，以應付全港日趨增加的需求。

大埔濾水廠的擴建工程分兩期進行，每日處理能力將由現時的25萬立方米增至80萬立方米，估計總成本為47億元。第一期工程於今年展開，並計劃於二零一二年年底竣工，令該廠房的處理能力提升至40萬立方米。沙田濾水廠的重置工程將隨即展開。

Securing Treatment Capacities

Ensuring that we have the capacity to treat raw water to prescribed standards is critical to maintaining an effective supply system. Two major treatment facilities that handle the raw water piped in from the Dongjiang, the Sha Tin Water Treatment Works and the Tai Po Water Treatment Works, are currently undergoing major reprovisioning and extension programmes. The programmes of the two projects have been phased such that at all stages of the construction works, the treatment capacities of the two treatment works will complement each other to produce an overall output which can meet the increasing demand of the territory.

The capacity of the Tai Po Water Treatment Works will be increased from 250 000 cubic metres per day to 800 000 cubic metres per day in two parts at a cost of \$4.7 billion. Part 1 of the work began this year and will be completed by the end of 2012, taking the capacity to 400 000 cubic metres per day. When this part at Tai Po is completed, reprovisioning work will be phased in at the Sha Tin Water Treatment Works.

沙田濾水廠的重置計劃是本署的重點工程。
Sha Tin Water Treatment Works' in-situ reprovisioning is a key project of WSD.



資產管理

作為一個擁有龐大資產的部門，效能優越的資產管理對本港提供優質供水極為重要。正如去年報告中提及，本署參與了資產管理參照計劃，把資產管理效能與全球41家水務機構作一比較。其後，我們制定了全盤的資產管理架構，以期在可接受風險的框架內，善用資產，令運作效能達至合理水平。

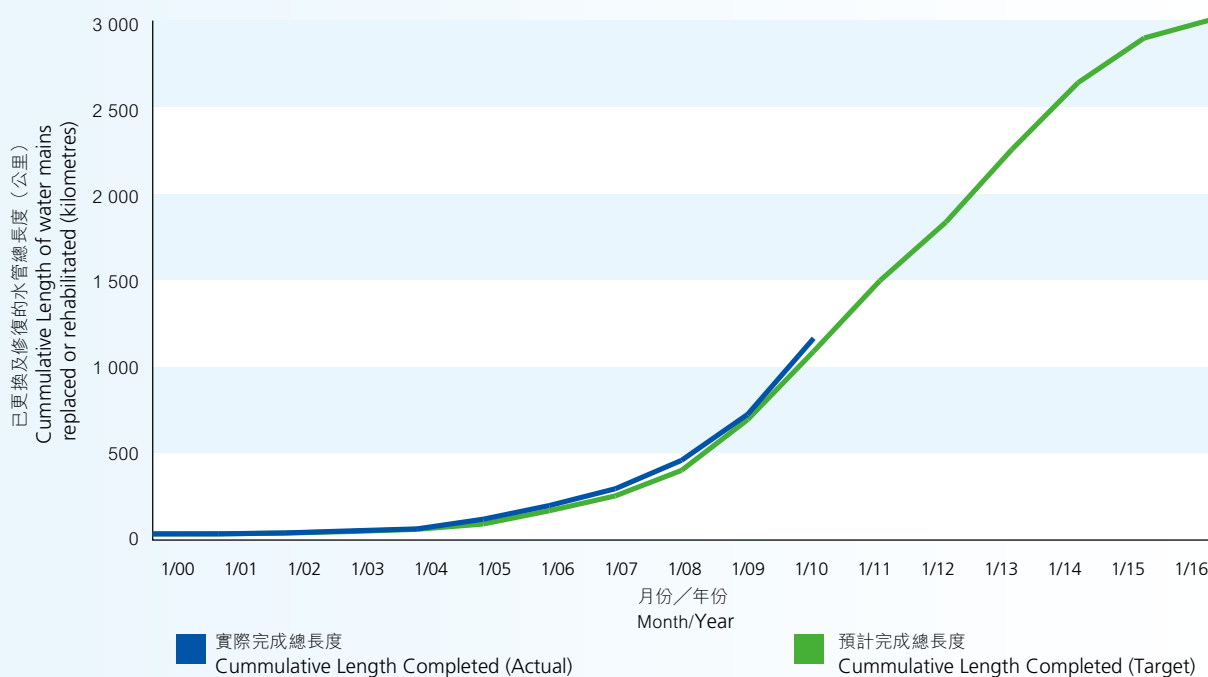
與此同時，我們又建立起全面的風險管理框架，以幫助我們驗證、分析、評估及處理有可能影響我們運作和供水服務的風險。我們正同步制訂總資產管理計劃，並探索資訊科技系統如何更有效融入或聯繫到資產管理系統之內，以發揮輔助的作用。

Managing Assets

As an asset intensive organisation, it is important that our assets are managed cost-effectively for the delivery of quality water to the community. As reported last year, we participated in an Asset Management Process Benchmarking Project. This enabled us to measure our effectiveness in asset management practices against 41 water sector utilities from around the world. After this exercise, we have developed a holistic asset management framework. Our goal is to manage the life cycle of our assets to achieve a desired level of service within an acceptable risk framework.

At the same time, we have developed a framework for risk management. This process helps us identify, analyse, evaluate and treat risks that can affect our business and the delivery of services. In tandem, we are also working on a Master Asset Management Plan and will explore how existing IT systems can be better integrated or interfaced to support asset management.

更換及修復水管計劃下的工程進度
Progress of Works under Replacement and Rehabilitation Project





為香港2009東亞運動會制定的緊急應變方案，成功減低停水風險。
 Contingency plans prepared for Hong Kong 2009 East Asian Games successfully minimised the risk of supply disruption.

應變計劃管理

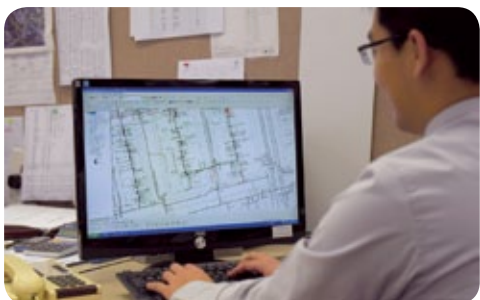
本署恆常地辨識和管理整個供水系統的潛在風險。危機處理及在不尋常事故出現時維持無間斷供水的能力乃持續的挑戰。

香港於二零零九年十二月舉辦東亞運動會。本署與其他政府部門緊密合作，以確保比賽場地和參賽團隊住宿的酒店有穩定的供水。本署亦加強了分配網絡，並密切監察滲漏水管或水管爆裂的風險。另外，本署又設定了應變措施，以應對可能影響供水的緊急事故。所有措施均證實有效，而東亞運動會亦順利舉行，期間並無出現供水中斷的情況。

Contingency Management

The Department is constantly identifying and managing risks across the entire supply system. Crisis management and the ability to maintain an uninterrupted water supply should any extraordinary event occur remain an ongoing challenge.

Hong Kong hosted the East Asian Games in December 2009. We worked closely with other government departments to ensure maintaining continuous water supplies throughout the event to all venues and the hotels providing accommodation to the teams and their supporters. The distribution network was strengthened and monitored closely for water leaks or risks of mains bursts. Contingency plans were prepared for emergencies that may affect water supplies. All measures proved effective and the Games ran smoothly without supply disruptions.



數碼繪圖系統為部門提供有效及準確的供水網絡、運作及保養資訊。

Digital Mapping System facilitates the Department with fast and accurate updating of mains records, enhancing the efficiency of operational and maintenance activities.

資訊科技

本署著力確保轄下斜坡的安全。現行的斜坡管理系統由土木工程拓展署加入全新的格式和更多斜坡數據，有助識別需要額外安全設施或行動的斜坡。

我們採用一套專門為部門設計而嶄新的資訊系統，保存和管理所有維修工程的進度。

馬鞍山、荃灣、北港和上水濾水廠的監控系統正進行設備提升工程。新系統把濾水設施的重要運作參數收集，再利用內聯網傳輸給員工。油柑頭和屯門濾水廠的監控系統提升工程不久亦將展開。

我們在地區運作上不斷擴大數碼繪圖系統的應用，且為該系統添置更多新功能。去年發展的閘門隔離電腦程式，是地理資訊系統的一個應用程式，現已連接到前線員工的手提電腦。我們會積極加強這個程式的功能，使其能進一步完善網絡查詢和數據更新功能，並匯入員工使用的個人數碼助理 (PDA)，令員工能快速回應運作上的變更。

過去一年，我們成功把專門為水管更換及修復計劃設計的數碼繪圖系統，落實到工地辦事處，供員工應用。這些更新資料加強了記錄的完整性，並帶來更有效及更準確的供水網絡、運作及保養資訊。

Information Technology

We are constantly aware of the need to ensure the slope areas under our jurisdiction remain safe. Our current Slope Management System is being enhanced by the Civil Engineering Development Department with new slope data and format. This will help us identify slopes that may require additional safety features or action.

We have also adopted a new information system, specially designed for the Department, to manage and track the progress of all maintenance works.

Control systems are being upgraded at four water treatment works – Ma On Shan, Tsuen Wan, Pak Kong and Sheung Shui. The new systems will collect and transmit essential operational data from the treatment facilities and transmit the data to intranet users. Control systems for the Yau Kom Tau and Tuen Mun Water Treatment Works will also be upgraded soon.

The applications of our Digital Mapping System in our regional operations are being extended with various new functions being developed. The innovative valve isolation computer programme (a GIS application) developed last year has been transferred to electronic notebooks for use by our frontline staff. We are continuing to add further enquiry and information update functions in this programme to our web environment and on to PDAs that are held by staff. This ensures a rapid reaction to any operational changes.

During the year, we successfully launched an out-stationed Digital Mapping System, specifically devised for the water mains replacement and rehabilitation project. This has resulted in faster and more accurate updating of mains records, enhancing the efficiency of operational and maintenance activities.

本署已制定了全面的保養策略，涵蓋安裝和系統的主要流程，從而強化抽水站可靠而有效率的運作。

New maintenance programme templates are being distributed to all major pumping stations to enhance reliability, cost effectiveness and performance. The templates cover all key processes in installations and systems.

研究和發展

Research and Development

為提升轄下基建設施和運作效能，本署不斷展開海內外的研究。過去一年，我們籌備試驗計劃，以先進技術檢測運作中帶壓水管的滲漏情況。有關技術將閉路電視鏡頭或聲音感應器置入水管內，利用水流帶動鏡頭以檢查水管內部狀況及檢測滲漏點。試驗計劃預計在二零一零年年底展開。

To be able to upgrade infrastructure and improve operational efficiency, we undertake research and development studies both in Hong Kong and overseas. Over the past year, we have begun preparatory work on a pilot scheme using a new technology that can detect leakage in in-service pressurised water mains. The technology can use either a CCTV camera or an acoustic sensor which is inserted into water mains and carried by water along the water mains to undertake internal detections and inspections. The pilot scheme will be launched in late 2010.

過去四年，本署更換了超過一百萬個水錶，加強水錶讀數準確度。根據水務設施條例的規定，水錶的誤差若不高於或不低於正確數字的百分之三，須當作記錄正確。使用超過12年的水錶，讀數準確度一般較低，需要更換。

Over the past four years, we have replaced over one million water meters to enhance the accuracy of meter readings. Under the Waterworks Regulations, a meter shall be deemed to register correctly if its inaccuracy does not exceed ± 3 per cent of the correct amount. Meters that are 12 years old or older are more susceptible to inaccurate readings and need to be replaced.



引入先進技術檢測運作中帶壓水管的滲漏情況。
A new technology is introduced to detect leakage in in-service pressurised water mains.