



渠務署

Drainage Services Department

2011

環境報告

Environmental Report







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# Our Vision, Mission and Values

## Vision

To provide world-class wastewater and stormwater drainage services enabling the sustainable development of Hong Kong



## Mission

- Improving drainage services in a cost-effective and environmentally responsible manner
- Enhancing a caring, harmonious, safe and healthy work environment that fosters staff development and a mindset for change
- Strengthening relationships with community, industry and worldwide counterparts

## Values

- Customer Satisfaction
- Quality
- Commitment
- Teamwork







## Director's Statement

Environmental protection has come a long way since the 90's when discussions were generally on the appropriate approaches. Today, the focus is on bio-diversity and eco-awareness; sustainability has undisputedly become the keyword in this global issue.

For Drainage Services Department, whose core duties are to treat sewage and prevent flooding, our eco-awareness has translated into conservation and recycling. In the area of sewage treatment, we not only are reducing the volume of sludge generated from the treatment to save landfill space and help to extend our landfills' life-span, but also are using a greater quantity of water reclaimed from treated effluent for different uses. In flood prevention, we endeavour to maintain if not enhance the ecological features of our engineered channels; thus provide a more natural habitat for plants and living organisms.

The 21<sup>st</sup> century is about productivity and, more importantly, sustainability. To bring home the green message at both corporate and individual levels, our Department runs a Green Management Committee to formulate and review our overall environmental goals and policies. This Committee, comprises members from senior management and chaired by our Deputy Director, monitors the performance of our set environmental targets and promotes green awareness among staff.

In mid-2011, to further strengthen our efforts, we set up a Green Champion Group. Members of this group take up the role of 'green ambassadors'. They spread messages, share tips, give advice and encourage fellow colleagues to stay even 'greener' in their everyday work. Social gatherings are organised and fun events such as 'green' slogan competition are held, much to the delight of staff members.



Our green initiatives are diverse and varied, covering not only big and small projects but also in everyday activities. Years of efforts in promoting green roofing and vertical greening were recognized when our paper “3+1 Approach for Greening Works at Shatin Sewage Treatment Works” was awarded a top prize by the Hong Kong Institution of Engineers in 2011. In brief, this Department completed more than 9 000 square metres of green roofs in 10 drainage and sewerage facilities in the last five years.

At our workplace, we are mindful of the need to run a green office through conserving energy and reducing waste. Office temperature has been set at 25.5°C, lighting been reduced, recycled paper and rechargeable batteries are being used. Other green measures include our paperless meetings—a system that we introduced in mid-2011 and under which meetings are conducted with tablets and notebooks to avoid the printing of documents. In 2011, about 60 such meetings have been held with 400-plus documents circulated via this green method. The Department also promotes the use of renewable energy through the use of solar-wind power lamp poles and combined heat and power generators at our various plants. Electric vehicles are used to transport sewage and sludge samples from the plants to the laboratory and also for project use.

Read more, and in greater details, about our green initiatives in this latest edition of our Environment Report. I hope you enjoy reading the report and will share with us our commitment to a greener environment. Any feedback is welcome and will be studied for possible further improvements.

Director of Drainage Services  
CHAN Chi-chiu





# Environmental Policy / Goals

## Environmental Policy

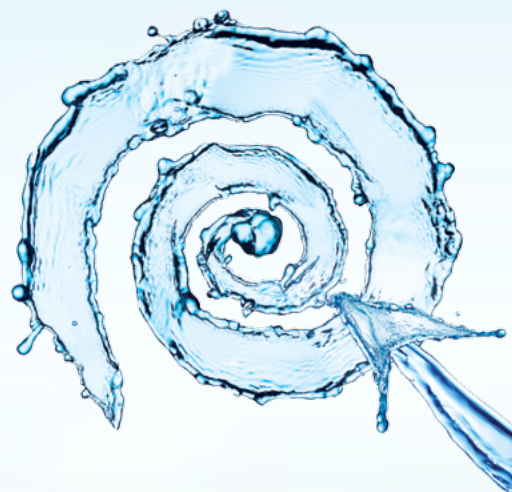
We are committed to being environmentally conscious in all our activities and services and endeavour to serve the Hong Kong community with the best of our expertise in safeguarding human health, protecting and preserving natural ecosystems, thus contributing to the sustainable development of Hong Kong.

We aim to continually improve the quality of our services, and to alleviate as far as practicable the impact that our facilities and sewage and drainage systems impose on the environment of Hong Kong. To meet these objectives, we are committed to:

- Adopting state-of-the-art clean technologies and pollution prevention measures;
- Integrating sustainability considerations into the design, construction and operation of our facilities;
- Minimising and mitigating environmental impacts arising from the construction and operation of our facilities;
- Meeting all statutory and regulatory requirements on environmental performance that are applicable to the activities of the department; and

- Devising and conducting internal operations in an environmentally responsible manner.

We ensure that our Environmental Policy is communicated to all staff, our consultants and contractors, and is open to public scrutiny. Our staff are committed to upholding this departmental policy, obtaining the relevant training and deploying the necessary resources to enable its implementation.



Greening of Shatin Sewage Treatment Works







## Environmental Goals

### Our environmental goals are

- To provide and operate world-class sewerage/drainage systems and sewage treatment/disposal facilities to fulfill the growing needs of the local community and contribute to the sustainable development of Hong Kong.
- To implement sewerage and sewage treatment/disposal programmes in a professional manner, in partnership with other Government establishments including the Environmental Protection Department, and to meet the Water Quality Objectives for Hong Kong waters.
- To implement drainage and flood protection programmes in a professional manner to minimise flooding and to provide protection to local inhabitants, properties and the environment.
- To apply the principles of Reduce, Reuse, Recycle and Recover in the consumption of materials and management of wastes and seek continuous improvement in the efficient use of natural resources and energy in all our operations.







## Our Core Responsibilities

Protecting the general public against flooding and collecting and treating sewage remain our core duties. On flood protection, we focus on planning and implementing the drainage systems under the Drainage Master Plan; the latter involves river channel management in the New Territories and the operation of our city-wide flood protection facilities. On sewage management, the Department designs, constructs, operates, and maintains sewerage system and sewage treatment plants outlined in the Sewerage Master Plans of the Environmental Protection Department.

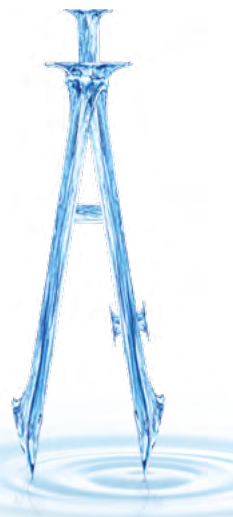
Construction of the Tsuen Wan Drainage Tunnel





## Flood Protection

With an average annual rainfall exceeding 2 300 mm, Hong Kong ranks one of the wettest cities in the Pacific Rim. Flooding is therefore a serious concern especially in the low-lying areas of Northern New Territories and the established urban neighbourhoods. The Department is tasked to reduce flooding risk through the implementation of a massive flood prevention programme. Such a programme covers drainage tunnel development, river training, flood protection schemes in villages, and drainage improvement works in urban areas.



Construction of the \$3.4-billion Hong Kong West Drainage Tunnel, the \$1.7-billion Lai Chi Kok Drainage Tunnel and also the \$1.5-billion Tsuen Wan Drainage Tunnel are progressing well. Upon their completion by mid-2013, the flooding risk of urban areas in Hong Kong and Kowloon will greatly be reduced. To ensure that stormwater finds its way into the sea without causing flooding, the Department carries out regular maintenance works on the 2 654 km of drainage channels and stormwater drains—removing some 17 622 m<sup>3</sup> of sediments. In 2011, we also oversaw a total of 27 village flood protection schemes.



Trained channel of Kwan Tei River

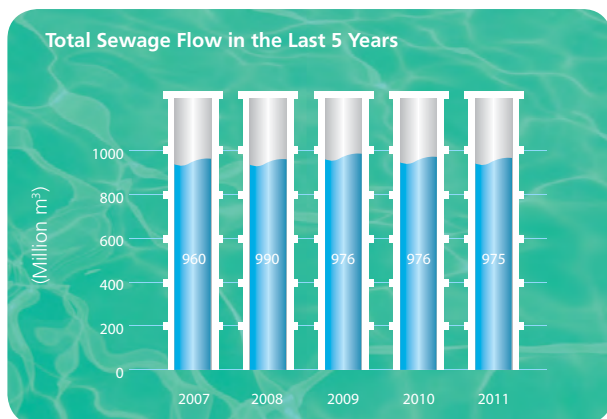




Village sewerage under construction at Pak Kong Au Village, Sai Kung



Interception Facilities at Jordan Valley Box Culvert



## Sewage Collection and Treatment

The Department operates 68 sewage treatment works, 218 sewage pumping stations, 43 submarine outfalls, 3 effluent disposal tunnels, and a total length of 1 645 kilometres of sewers. In 2011, the volume of sewage collected and treated amounted to 975 million cubic metres.

Still, we continue to expand and upgrade our network and facilities. Sewerage now covers some 140 villages, and works are being carried out to extend the coverage to 55 more. To help improve the water quality in the Tsuen Wan beaches, the Department has completed the sewerage that covered the hinterland of the beaches along Castle Peak Road. A disinfection process was also installed in the Stonecutters Island Sewage Treatment Works (STW) under the Harbour Area Treatment Scheme 2A. Such efforts have resulted in the opening of four of the closed seven beaches in Tsuen Wan in 2011 for public recreation.







Beautification and Decking of the Flower Market Road Nullah

## Managing the Environment



To formulate and review the Department's policies and goals on the environment, we have the Green Management Committee, chaired by a Deputy Director. This Committee monitors our green performance and promotes environmental awareness among staff. Members of the Committee include senior representatives from each of our seven Integrated Management Systems. Day-to-day green matters are being overseen by a green manager at the Assistant Director level with assistance from another senior staff member and the departmental administration. The organisational chart of the Green Management Committee is shown on the next page.

In mid-2011, the Department also formed a Green Champion Group to help further promote green initiatives among staff. Every group member, apart from setting a good example on environmental awareness, needs to spread messages and tips with fellow colleagues on greening the environment. Members work in an environmentally responsible manner and encourage and help others to 'get greener' in their daily work.

As a whole, the Department is divided into four main branches: Projects & Development; Operations & Maintenance; Electrical & Mechanical; and Sewage Services. Each branch is headed by an Assistant Director. There are seven Integrated Management Systems under ISO 9001 and ISO 14001 that cover all aspects of the Department work.

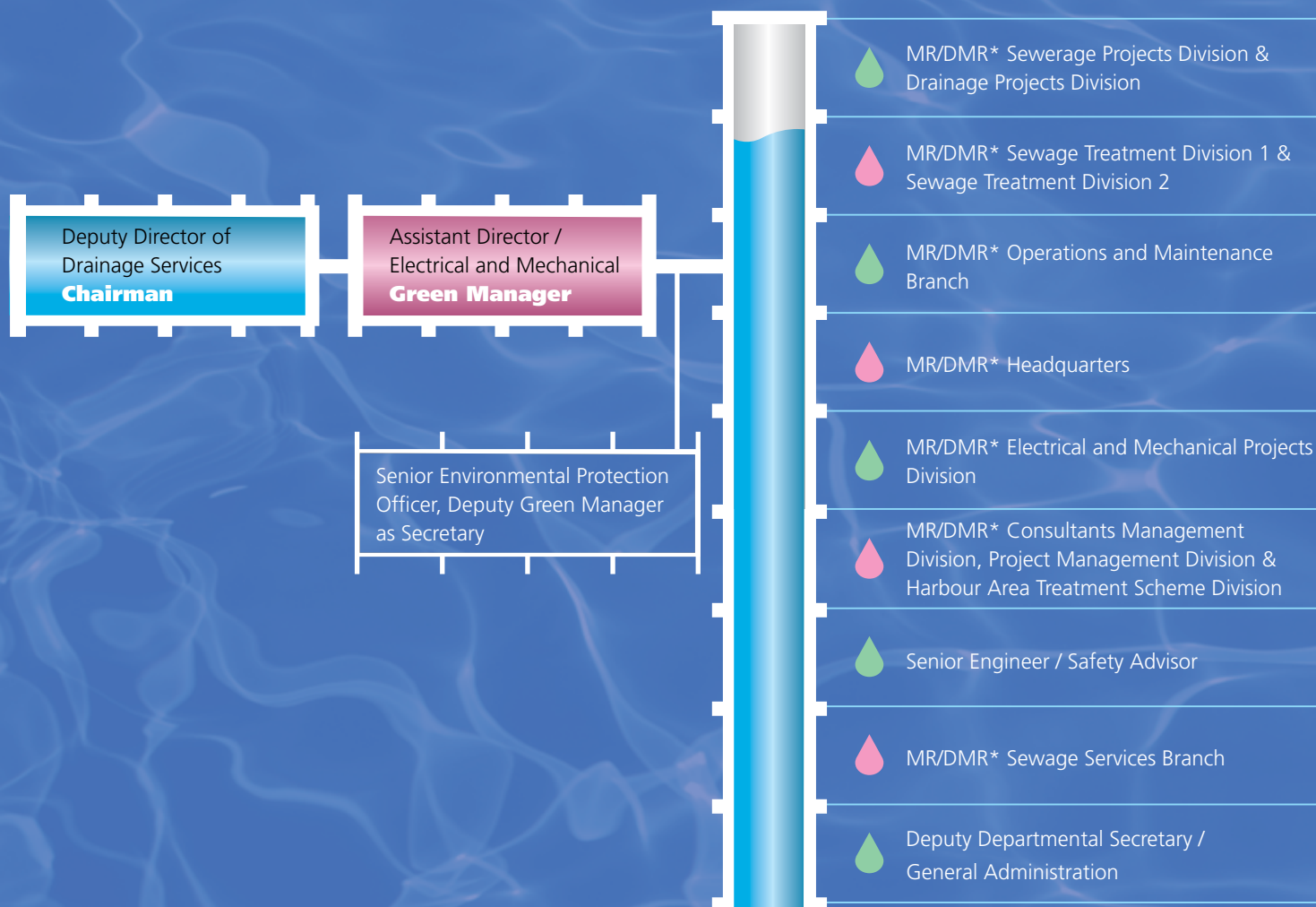
On total workforce, the Department has a staff establishment of about 1 850. Of these, 299 are professional staff, 1 067 technical and general staff, and 483 frontline staff and direct labours.





Beautification and Decking of Jordan Valley Nullah

## The Organisational Chart of Green Management Committee:



\* MR/DMR: Management Representative / Deputy Management Representative of the ISO 9000 and ISO 14001 Integrated Management System





## The Year's Green Performance

Ever-conscious of a green, sustainable development for Hong Kong, our Department has always embarked on works and services that are in harmony with the environment. To best understand and also to assess our overall performances in 2011, we suggest looking into different specific areas—from sewage treatment and odor management to overall compliance; and from different perspectives—including ecology, procurement and renewable energy.







Water Reclamation Plant at Siu Ho Wan STW



Effluent reuse treatment units next to the Water Reclamation Information Centre at Shatin STW

## Sewage Treatment

The commissioning of advanced disinfection facilities in sewage treatment process together with the start of more water reclamation plants in the last two years or so have helped steer us towards a more sustainable development for Hong Kong.

With the full operation of the disinfection facility in Stonecutters Island STW in 2011, the bacteriological water quality in Tsuen Wan has improved significantly. As a result, four beaches in the area, namely, Lido, Casam, Approach and Hoi Mei Wan, were re-opened during the year.

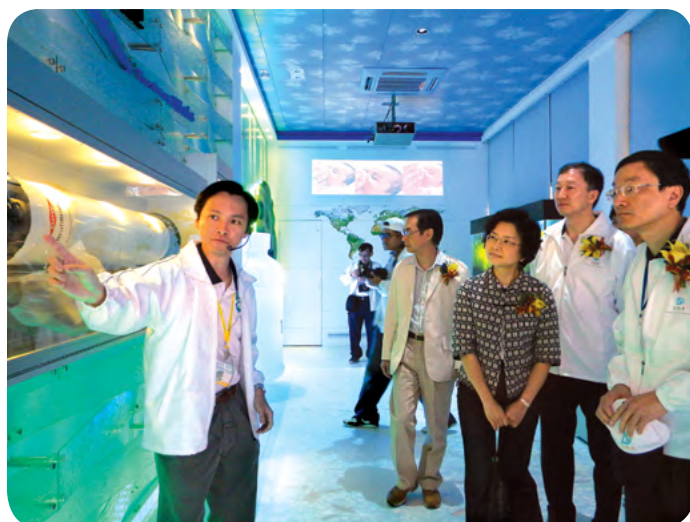
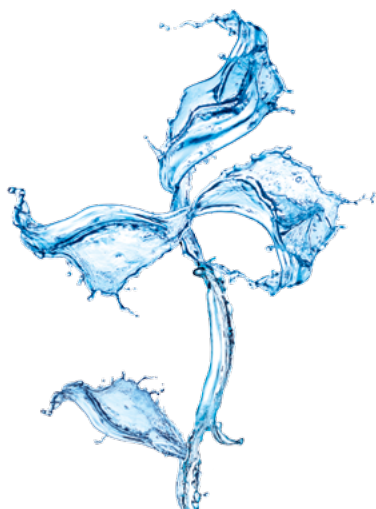
The year also saw a wider use of reclaimed water. Subsequent to the operation of the 11 water reclamation trial plants in 2010, about 850 m<sup>3</sup> per day of reclaimed water was produced for in-house non-potable uses in 2011. This is in addition to the 368 m<sup>3</sup> and 169 m<sup>3</sup> per day of reclaimed water produced and used at the Shatin and Shek Wu Hui STWs respectively. These plants are of different scales, configurations and technologies and include micro-filtration, ultra-filtration, membrane bioreactor and reverse osmosis. Performance of these plants is being closely monitored for up to two years. The reclaimed water is mainly used for toilet flushing, plant washing, chemical scrubbers, landscape irrigation and chemical preparation. We will continue to study the opportunity of using more reclaimed water from treated effluent so as to minimize the use of fresh water within our sewage treatment facilities. Meanwhile, members of the general public are also being educated on the reuse of treated effluent. Through our Water Reclamation Information Centre at the Shatin STW, visitors, numbering some 1 700 last year, learnt about water conservation and energy recovery and witnessed our commitment to sustainability through movies, exhibits and animations shown and on display.

In the year, we operated 68 sewage treatment works with different levels of treatment throughout Hong Kong. The treatment level depends primarily on where the effluent goes as different water bodies in Hong Kong have different waste assimilation capacities and beneficial uses.





Tseung Kwan O Preliminary Sewage Treatment Works



Water Reclamation Information Centre at Shatin STW



Reverse Osmosis Plant at Stanley STW



Membrane Bioreactor and Reverse Osmosis Plant at Siu Ho Wan STW



The major pollutants removed from the sewage in our sewage treatment works are organic materials, often referred to as biochemical oxygen demand (BOD) and suspended solids (SS). In some cases, nutrients such as nitrogen that promote the growth of aquatic plant are removed to prevent algal bloom. In 2011, we removed about 114 000 tonnes of BOD, 170 000 tonnes of SS, and 5 500 tonnes of nitrogen.

From treated sewage comes sludge. In a whole year, about 295 000 tonnes of dewatered sludge, that is some 808 tonnes per day, were produced. The sludge was dewatered to reduce its volume before it was sent to landfills for disposal. This saves landfill space and helps extend the life-span of our landfills. Other than sludge, screenings and grit were also removed from sewage treatment. In 2011, we disposed of about 13 000 tonnes of screenings and 5 700 tonnes of grits.



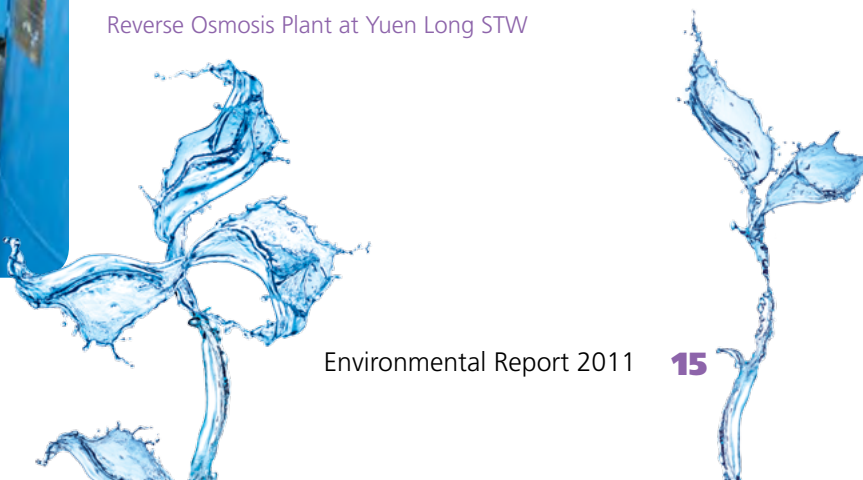
Deodorization unit at Tseung Kwan O Preliminary Sewage Treatment Works



Ultra-filtration Plant at Sai Kung STW



Reverse Osmosis Plant at Yuen Long STW





## Odour Management

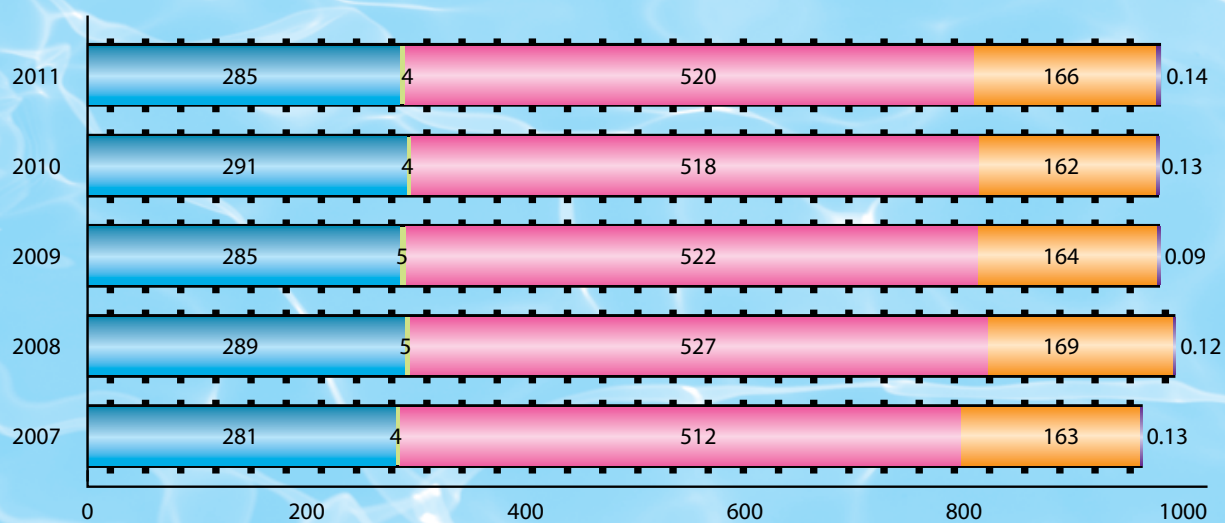
We are committed to reducing the environment impact of our operation as we continue to proactively tackle the odorous problem. New technology is being used and 'Superoxygenation' is a latest methodology whereby we control the problem right at source—by adding chemicals in pumping stations to check hydrogen sulphide production by anaerobic bacteria. When odorous gas is unavoidably been formed, we cover the surface and purify the air by wet chemical scrubber, bio-trickling filter and also activated carbon deodorization, if required. In 2011, we continued installing covers for primary sedimentation tanks in Shatin Sewage Treatment Works with bio-trickling deodorization systems. Odour generated from the tanks will be confined by the covers and polished by the filters before emitting into the air.

The high population density in Hong Kong makes managing odour more complicated. New residential developments are growing in size and are locating ever closer to the sewage treatment facilities. For a city that adopts centralized sewage treatment, this means that the sewage would stay longer in the collection system before being treated. The longer detention time together with the high summer temperature accelerate anaerobic bacteria growth and thus hydrogen sulphide production in the system. Start controlling at the source as mentioned proves more effective.





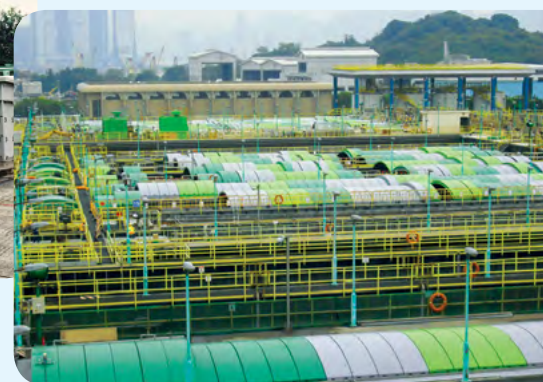
**Distribution of Levels of Sewage Treatment (2007-2011) (in Mm<sup>3</sup>)**



	2007	2008	2009	2010	2011
<span style="color: blue;">■</span> Preliminary Treatment (million m <sup>3</sup> )	281	289	285	291	285
<span style="color: green;">■</span> Primary Treatment (million m <sup>3</sup> )	4	5	5	4	4
<span style="color: pink;">■</span> Chemically Enhanced Primary Treatment (million m <sup>3</sup> )	512	527	522	518	520
<span style="color: orange;">■</span> Secondary Treatment (million m <sup>3</sup> )	163	169	164	162	166
<span style="color: purple;">■</span> Tertiary Treatment (million m <sup>3</sup> )	0.13	0.12	0.09	0.13	0.14



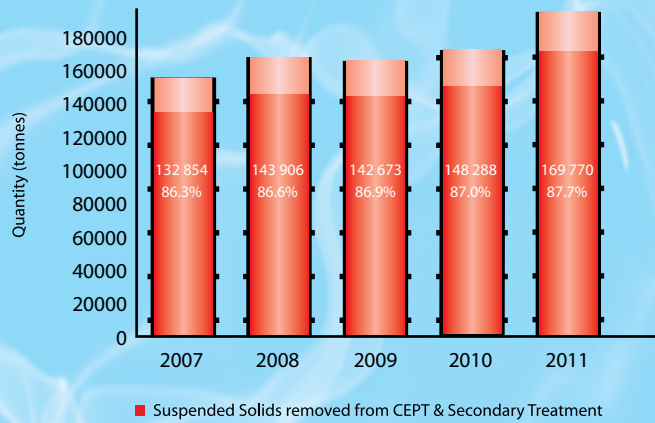
Deodorization unit at Shatin STW



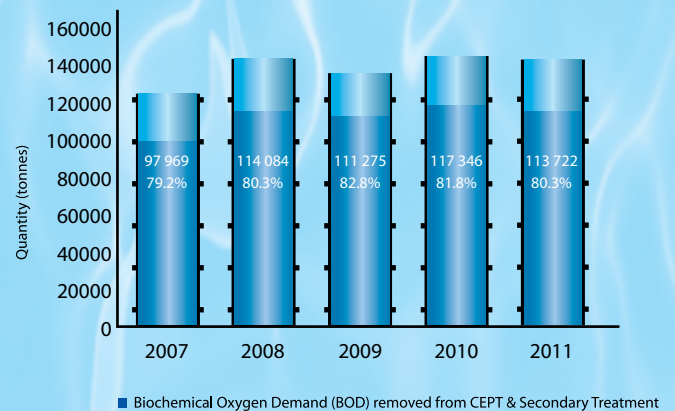
Covers at Stonecutters Island STW



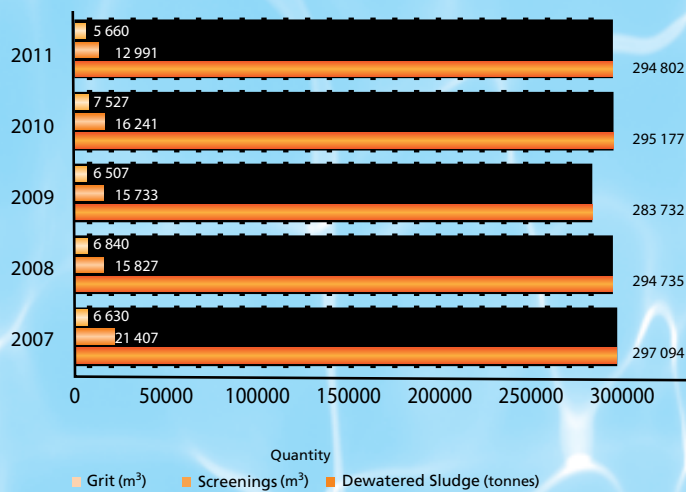
**Removal of Suspended Solids in Sewage Treatment (2007-2011)**



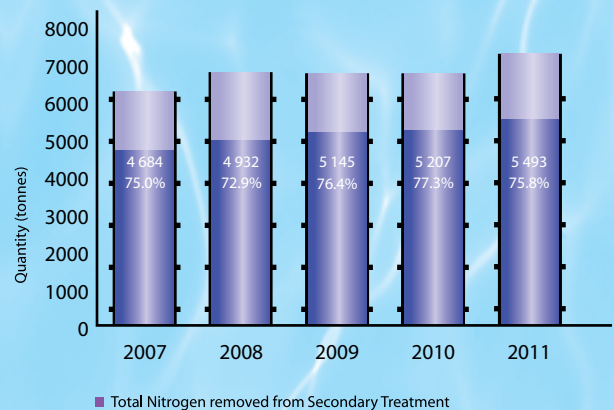
**Removal of Organics in Sewage Treatment (2007-2011)**



**Solids Removal from Sewage Treatment (2007-2011)**



**Removal of Nitrogen in Sewage Treatment (2007-2011)**







Trophies for Construction Sites Housekeeping Award Scheme



Display panels on works contract winning the Award

## Compliance and Monitor

Our sewage treatment works are all licensed under the Water Pollution Control Ordinance, and some have additional control under the Environmental Impact Assessment Ordinance. Each month, self-monitoring results of the performance of the sewage treatment works are provided to the Environmental Protection Department for compliance check. In 2011, except for three isolated incidents outside our control, we achieved full compliance of the licensed conditions.

To promote responsible behaviour at work sites, the Department continues to operate the Construction Sites Housekeeping Award Scheme. In 2011, the scheme covered contracts that had an active construction period of six months or more within the assessment period (from January to October 2011). Visits to construction site, up to four times, were made by senior or chief professional staff for assessment. All work parties involved were encouraged to keep the site clean, tidy, hygienic and environmentally friendly. In 2011, even with 50 active construction contracts, the Department managed to achieve a very good record on environmental protection with no case of conviction under the environmental legislation.







## Enhancing Ecology

Green roofing has been one of our on-going initiatives and is starting to bear fruits. In brief, residents are enjoying more recreational spaces and the Department also won recognition last year for its efforts in the matter.

Our paper titled '3+1 Approach for Greening Works at Shatin Sewage Treatment Works' received the First prize of 'Civil Engineering Paper of the Year Award 2011' organised by the Hong Kong Institution of Engineers. For the community, we have, over the past five years, completed more than 9 000 m<sup>2</sup> of green roofs in 10 drainage and sewerage facilities. Most recent examples were the 3 500 m<sup>2</sup> retro-fitted green roofs, completed in 2011, at our various facilities including Tseung Kwan O Preliminary Treatment Works and Peng Chau Sewage Pumping Station. Green roofing not only creates a pleasant view of our drainage facilities for the neighbours concerned, but also helps alleviate the hot island effect and lowers the building temperature during summer.

Our nullah decking works, coupled with beautification efforts, are creating more green and recreational space for residents. In Mong Kok's Flower Market Road, in Ngau Tau Kok's Jordan Valley and also in Sham Shui Po's Tonkin Street, some 3 500 m<sup>2</sup> of green space was created as we selected suitable plant species and landscaping features to beautify the nullah decks there.

To enhance the ecological value of rivers, our team uses simple and low-cost features such as deflectors, in-stream refugia, rip-rap base, by-pass channels and enhanced fish ladders to upgrade the works at Sai Kung's Ho Chung River and in Mui Wo's streams. In response to public's demand for an ecological channel rather than a decked nullah in Kai Tak, we have commenced drainage revitalization work to

rehabilitate the Kai Tak River in 2011. In the New Territories, we adopt an ecological approach for Stage 4 of the regulation of the Shenzhen River (Liantang Heung Yuen Wai Section). The alignment of the trained river will follow the existing river as much as possible to provide a more natural habitat. The cross section of the river will be in a trapezoidal shape with grasscrete on the side and natural river materials at the bottom.

In a bid to achieve more in enhancing ecology, we have collaborated with a local university to conduct a research to explore the benefits of green roofs in peak runoff mitigation and the impact of strong wind on green roofs. The research is progressing well and is expected to complete in 2013.



Transplant of tree at drainage project



Run-off mitigation study of green roof





Electric vehicle used for projects

## Green Procurement and Green Office

Our Department provides full support to the Government's initiatives on green procurement. The major green products we have purchased included copying machine and printer, toilet paper and stationery, such as recycled paper, correction fluid, marker pen and pencil. Our aim is to achieve, out of our total volume of purchases, a 95% 'green benchmark'.

We also do our best to keep the office green. We reduce waste and conserve resources, set room temperature at 25.5°C, reduce lighting in the corridor, install timer switches in common equipment, use recycled paper and rechargeable batteries, recycle printer cartridges, plastic, metal containers and fluorescent lamps. We have environmental inspection teams to check and remind staff to stay green.

By adopting green measures such as emailing, double-sided printing and avoiding faxes, we met our target on paper conservation. Paper usage in 2011 was about 12 600 reams—an 18 % reduction compared to five year ago. Our target is to further reduce paper consumption by 450 reams come 2012. With the onset of wireless communication technology, the Department introduces a 'paperless meeting' system—using electronic gadgets such as iPads and notebooks for presentations and discussions. About 60 paperless meetings have been conducted in 2011 with 400-plus documents being circulated and viewed through this system.

To highlight our continual commitment to environmental protection and to sharing with the public our greening efforts, we participated in the prestigious Hong Kong Awards for Environmental Excellence (HKAEE) in 2011. The Department was given the 'Certificate of Merit', the fourth time, in recognition of its commitment.

Paper Consumption and Recycling (2007 - 2011)

	2007	2008	2009	2010	2011
Paper consumed (reams)	14046	13512	13558	12983	12596
Waste paper collected (kg)	13143	12270	15290	14974	20373
Paper consumed per staff (ream)	7	6.8	7	6.7	6.8



## Clean Air Charter

The Department has made steady progress in saving energy and reducing emission in its city-wide operation subsequent to the forming of its Energy and Emission Management Team in 2007. The team, headed by a Chief Engineer and with representatives from all branches, came into being shortly after the Chief Executive of HKSAR signed the Clean Air Charter in November 2006.

In actual figures, we managed to save 4.62 million kwh electricity over the last four years and an extra 3.42 million kwh in 2011. This is made possible with measures including the use of combined heat and power (CHP) plant at various sewage treatment works, the replacing of T8 fluorescent lamps and outdoor lights with T5 lamps and LED respectively at various plants, as well as the use of high-efficiency pump motors in our treatment facilities. The largest contributor to energy saving in 2011 was the CHP plant at Tai Po STW while other savings were attributed to the installation of centrifuge's power plates at sludge dewatering facilities of the Stonecutters Island plant and the use of high efficiency pumps and motors at Tsing Yi and Tai Koo Shing Sewage Pumping Stations.

## Renewable Energy

The Department also actively promotes new technology and the use of renewable energy. We have introduced solar-wind power lamp poles at Shatin STW, solar hot water system at Siu Ho Wan STW; we also use electric vehicles to transport sewage/sludge samples from the plants to our central laboratory and for project use. In addition we endeavour to reduce emission through use of hybrid or environmentally friendly vehicles and switch to ultra-low sulphur diesel.

Taking note that biogas from anaerobic digestion of sludge generated from sewage treatment is a renewable energy source, we have in the past decade looked into the better utilization of the biogas produced and planned to install CHP generators in our plants. CHP generation system is to obtain energy from a single fuel (like biogas) by means of combustion, where heat and power are generated simultaneously, thus improving the overall energy usage efficiency; CHP fueled by biogas only is also considered to be a cleaner technology with lower emission level. We are installing new CHP generators (with a combined capacity of 2.03MW) in both Shatin and Tai Po STWs. Together with other recently installed CHP generators at Tai Po STWs (commissioned in 2010 with a 625kW capacity) and at Shek Wu Hui (commissioned in 2011 with a 635kW capacity), we foresee a full utilization of all biogas generated from our sewage treatment works by 2013.

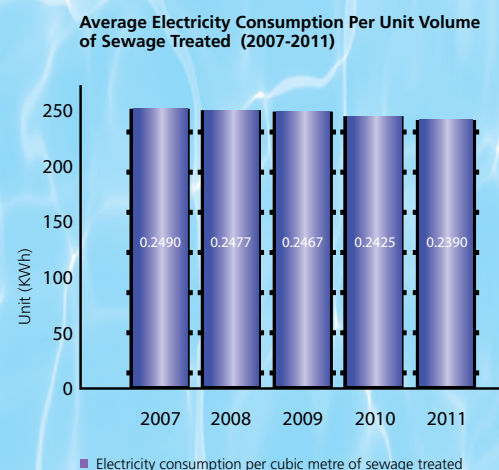
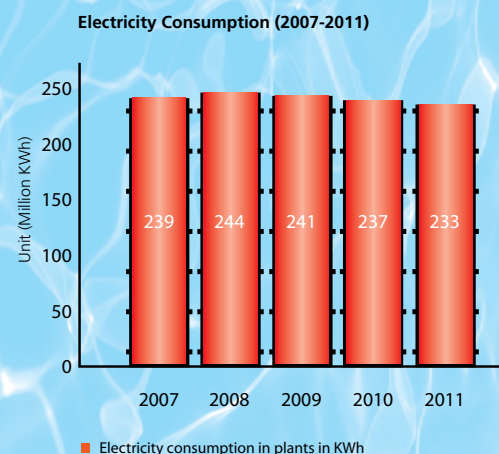
## Carbon Audit

To manage our carbon footprint, we conducted two new carbon audits in 2011 at Shek Wu Hui STW and Ngong Ping STW, and revealed that they emitted about 7 485 and 567 tonnes of CO<sub>2</sub> equivalent in 2010 respectively. This was about 0.25 and 4.32 kg CO<sub>2</sub> equivalent emitted per cubic metre of sewage treated.

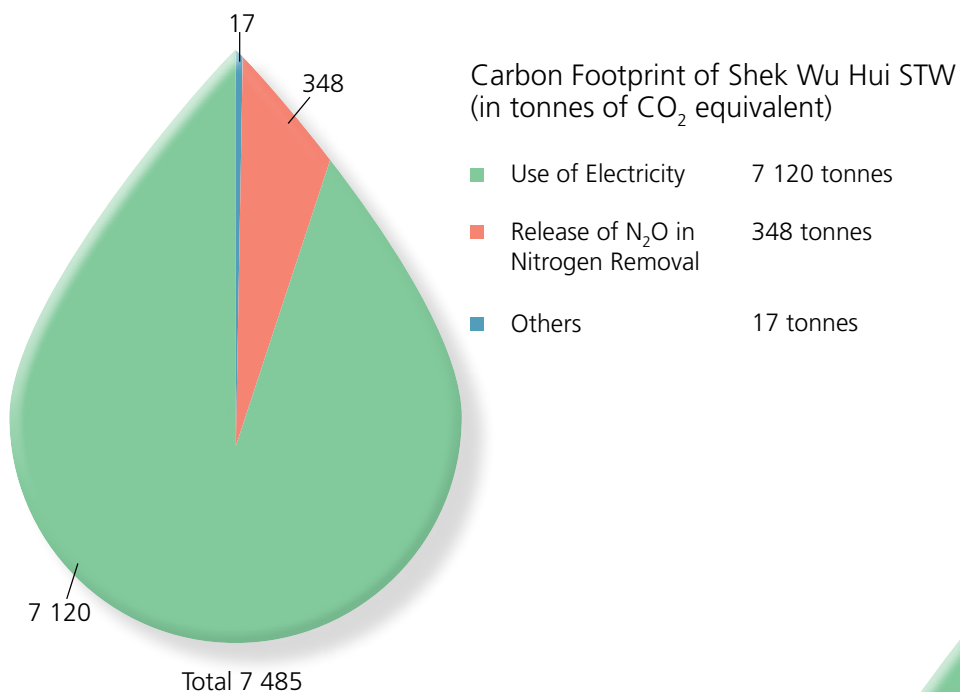
We also continued to conduct the carbon audit for Shatin STW in 2011 which revealed about 23 798 tonnes of CO<sub>2</sub> equivalent were emitted in 2010 representing 0.29 kg CO<sub>2</sub> equivalent emitted per cubic metre of sewage treated.



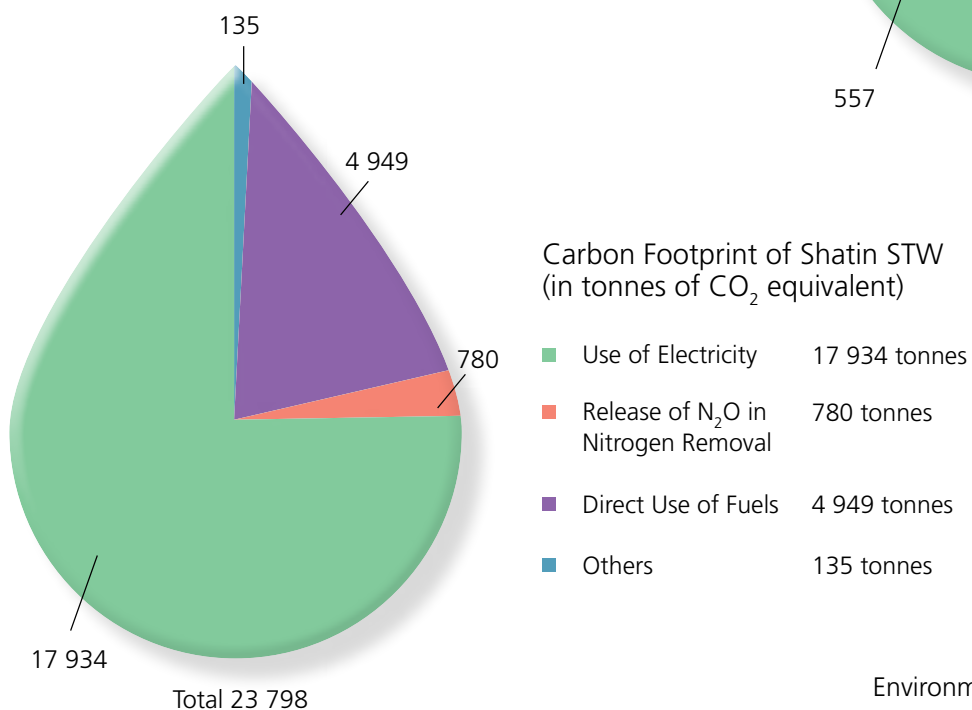
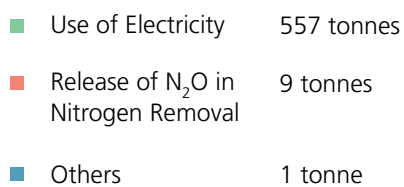
Solar-wind power lamp poles at Shatin STW







**Carbon Footprint of Ngong Ping STW**  
(in tonnes of CO<sub>2</sub> equivalent)





## Engaging the Community

Our Department strives for good and effective communication with all strata of society to ensure a full understanding of our work and services. Internally, we continue to invest in human resources, providing varied training for our staff members.



### Connecting with Schools

In 2011, we visited 41 schools to introduce our Department's work and services and to give talks on flood prevention and sewage treatment. We also received visits from some 140 organisations including delegations from Mainland and overseas countries to our sewage treatments works and information centres.



### Connecting with Interest Groups, Councillors

To broaden our views on our work and services, we meet regularly with interest groups including the green groups, academia, professional organisations, Legislative Council members and District Council members. This two-way communication helps to address the environmental impact of our projects.

To foster collaboration and to share experiences with community groups, we organised both the 'Green Group Forum' and the 'Research and Development Forum' in November 2011.



## Connecting with the Media

In 2011, we invited members of the media to our breakthrough ceremonies for the Lai Chi Kok Drainage Tunnel and the Hong Kong West Tunnel and briefed them on the merits of these projects in preventing floods. We also held the Annual Media Briefing in April 2011 to raise public awareness on flood protection before the start of the rainy season.

## Connecting with Staff

Our Department actively promotes knowledge sharing among staff on various topics such as sustainable drainage services. We kept up our investment in human resources and in 2011 supported 70 staff members for overseas conferences and duty visits; another 183 staff members attended local conferences, seminars and training courses relating to the environment and sustainability. During the year, we also conducted 26 in-house training activities for some 1 380 members.





## Meeting the Set Targets

Every year, the Department sets its 'environmental' targets allowing colleagues to clearly follow the guidelines and work towards reaching the set targets. Areas covered range from energy, water and paper conservation to waste recovery, green procurement and ecological enhancement. The table below shows how we performed under the different set targets in 2011.



DSD Environmental Targets 2011	Performance
<b>A. Energy Conservation</b>	<b>Target met</b>
A1. To reduce energy consumption by another 1.2% of the base level in 06/07.	Energy saving in 2011 was 3.42 million kWh, which was 1.4% of the base level of 06/07.
A2. To conduct two carbon audits in sewage treatment works.	Three carbon audits for STWs were conducted.
<b>B. Water Conservation</b>	<b>Target met</b>
B1. To maintain the use of treated effluent at 1 320 m <sup>3</sup> per day.	The actual use of treated effluent was 1 387 m <sup>3</sup> per day.
<b>C. Paper Conservation</b>	<b>Target met</b>
C1. To reduce annual paper consumption to 14 900 reams.	Only 12 596 reams of paper were consumed.
<b>D. Waste Recovery</b>	<b>Target met</b>
D1. To increase the recycle rate of printer cartridges to 97%.	99.9% printer cartridges were recycled.
D2. To increase the recycle rate of rechargeable batteries used in plants to 97%.	100% of rechargeable batteries used in plants were recycled.
<b>E. Green Procurement</b>	<b>Target met</b>
E1. To use recycled paper up to a level of 97% of DSD's total printing paper consumed.	99.7% of printing paper consumed was recycled paper.
<b>F. Environmental Compliance</b>	
F1. To aim at achieving full compliance with legal environmental requirements at our sewage treatment works, stormwater and sewerage systems.	Full compliance of legal environmental requirements, except three isolated exceedances of licence standards beyond DSD's control, was achieved.
<b>G. Ecological Enhancement</b>	<b>Target met</b>
G1. To plant 2 600 trees and 135 000 shrubs.	2 644 trees and 276 497 shrubs were planted in 2011.
<b>H. Environmental Awareness</b>	<b>Target met</b>
H1. To organise two in-house green campaign to promote staff awareness and active participation in greening activities.	The "Safe, Tidy and Green Office Competition 2011" and 6 classes on potted plants were held in the 4th quarter of 2011.



## Environmental Targets for 2012

<b>DSD Environmental Targets 2012</b>	
<b>A. Energy Conservation</b>	
A1.	To reduce energy consumption by 1.02 Million kWh;
A2.	To conduct two additional carbon audits in sewage treatment works;
A3.	To aim at full utilization of biogas by 2013.
<b>B. Water Conservation</b>	
B1.	To maintain the use of treated effluent at 1 320 m <sup>3</sup> per day.
<b>C. Paper Conservation</b>	
C1.	To reduce annual paper consumption by 3% to 14 450 reams.
<b>D. Waste Recovery</b>	
D1.	To increase the recycle rate of printer cartridges to 98%;
D2.	To increase the recycle rate of rechargeable batteries used in plants to 98%.
<b>E. Green Procurement</b>	
E1.	To use recycled paper up to a level of 98% of the Department's total printing paper consumed.
<b>F. Environmental Compliance</b>	
F1.	To aim for full compliance with legal and environmental requirements for our sewage treatment works, stormwater and sewerage systems.
<b>G. Ecological Enhancement</b>	
G1.	To plant 1 500 trees and 270 000 shrubs.
<b>H. Environmental Awareness</b>	
H1.	To organise two in-house green campaigns to promote awareness and participation among staff members in greening activities.







FUGRO CERTIFICATION SERVICES LIMITED

輝固認證服務有限公司

## Independent Verification Statement

### Scope and Objective

Fugro Certification Services Limited (FCS) was commissioned by Drainage Services Department (DSD) to undertake an independent verification of the Environmental Report 2011. The Report highlighted the past performance of DSD on the environmental aspect for the period of 2011.

The purpose of this verification exercise was to independently review the materiality, completeness, accuracy, consistency and reliability of the information presented in the Report.

### Methodology

The verification procedure included reviewing relevant documentation and verifying selected sample of data and information presented in the Report. Accuracy of the sampled data and the underlying processes were tested through detailed examination of available evidence to support substantive comments and claims made in the Report. The data and information were carefully verified for accuracy and cross-checked with third party information when available.

### Conclusion

After a thorough and detailed examination of the Report, our verification team concludes that the Report provided a structured, balanced and consistent representation of DSD's environmental performance for the reporting period. All selected data examined during our verification were consistent with the supporting information reviewed.

In conclusion, the information provided in the Report is considered to be material, complete, accurate, consistent and reliable in the presentation of DSD environmental performance and achievements for the reporting period, to the best knowledge of our verification team.

Sign for and on behalf of FCS

A handwritten signature in black ink, appearing to be "CY", written over a light grey rectangular background.

Colin Yung  
Verifier

A handwritten signature in black ink, appearing to be "RW", written over a light grey rectangular background.

Tony Wong  
Verifier

July 2012