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In this edition, the *Quarterly* focuses on Hong Kong's serious air pollution, which probably ranks as our most pressing environmental issue. We briefly consider the background to Hong Kong's worsening air quality, and report on several fast-track remedial measures which have been put forward by one of Hong Kong's most prominent campaigners for improved environmental protection, Christine Loh.

The Editors

CONTENTS

Page

AIR POLLUTION – AN URGENT ENVIRONMENTAL PROBLEM

Hong Kong's air pollution

Hong Kong's well documented poor air quality is probably the most serious individual environmental problem which we face today, and one which requires short term, urgent action as well as long-term remedial planning.

Numerous articles and comments in the popular press over recent years, especially during the last year or so, have made everyone aware of how serious and acute the problem of air pollution is. There is no doubt the quality of our air has deteriorated over the years despite the best efforts of government regulators, in particular the Environmental Protection Department (EPD), and a sophisticated regulatory control system designed to minimise or prevent polluting activities. Of the numerous statistics available and often quoted, we need only consider the EPD's annual report, *Environment Hong Kong 1999* (the most recent *Environment Hong Kong* report) which admits that air pollution "is having a growing impact on our lives" (p.32).

The principal causes of our air pollution are broadly identified by the report as:

- vehicle diesel emissions
- cross-border pollution from southern China
- general industrial pollution, such as land-fill emissions and smoke-stack discharges.

The government has introduced various measures over the years in an effort to curb the level of air pollution. One such measure was the introduction in mid-1999 of a regulation requiring all smoky vehicles up to 5.5 tonnes to be tested on a treadmill to measure the level of smoke emissions to ensure emissions are within regulatory levels. The same test will be required of heavier vehicles from the year 2000 (the date is yet to be announced). Earlier steps taken by the government to reduce the level of air pollution included legal requirements for lower sulfur emissions by factories and the use of cleaner petrol.

The government also has improved the monitoring system employed to

measure ambient and road-side air pollution levels. The original monitoring network was set up in the early 1980's when ten air monitoring stations were established throughout Hong Kong. However, none of these was at road-side level. Following protracted public criticism, the government introduced four more monitoring stations in 1998, two of which were located at street level in busy urban locations, such as Causeway Bay. [However, whether these monitoring stations are providing adequate technical data remains an issue, as referred to further below].

Hong Kong's daily Air Pollution Level (APL) is now widely published in newspapers and on television, so community awareness of the fact of air pollution and the risks to health it represents has increased greatly over recent years. According to *Environment Hong Kong 1999*, an APL reading between 51 and 100 represents a "high" level of air pollution. A reading between 101 and 200 is a "very high" level of pollution when people with heart or lung illnesses are advised to avoid areas with even, higher localised pollution, such as heavy traffic streets. Taking a line through that broad scale, it is clear that Hong Kong's usual APL is either high or very high.

"Air Pollution was officially recognised by the government as a significant environmental problem as long ago as 1959 when the *Clean Air Ordinance* was enacted"

Legislative controls

Air pollution was officially recognised by the government as a significant environmental problem as long ago as 1959 when the *Clean Air Ordinance* was enacted. In 1983 this was replaced by the *Air Pollution Control Ordinance* under which Hong Kong was subsequently (1987) divided into air quality zones for each of which *Air Quality Objectives* (AQOs) were legislated. The AQOs set maximum levels, which differ from zone to zone, for seven common air pollutants. Other legislation also has been enacted since 1983 concerning aspects or air quality, the most significant of which is the *Ozone Layer Protection Ordinance and* the various regulations (such as regulations controlling release of refrigerants) thereunder.

Broadly speaking, the EPD is the monitoring and enforcing authority under air pollution control legislation. However, other government agencies also play a role: eg. Customs and Excise Department monitors and controls the use or importation of ozone depleting substances, and motor vehicle emissions are controlled/enforced by several different agencies, including the Transport Department and the Hong Kong Police Force.

Urgent remedial steps are needed

Notwithstanding the relatively comprehensive nature of Hong Kong's air pollution control legislation, the level and incidence of air pollution have worsened, as already stated. This unfortunate situation, which is now so serious as to represent a factor influencing investors and businesses to locate elsewhere, has prompted a renewed call by one of Hong Kong's prominent politicians (and one genuinely concerned with improving Hong Kong's level of environmental protection) Ms Christine Loh. In her capacity both as a Legco member and as Chairperson of Legco's *Panel on Environmental Affairs*, Ms Loh recently put forward the following proposals to bring about lower air pollution in the short term:

1. *Encourage use of ultra low sulfur diesel (ULSD)*
   ULSD has a sulfur content 1/10th of that regular diesel fuel now used in Hong Kong, and certain brands of diesel have an even lower sulfur content (eg City Diesel has a content 1/100th that of regular diesel). The government should encourage importation of ULSD, and should use its influence to persuade oil companies to supply ULSD in Hong Kong. In fact one transport operator, First Bus is now trialling ULSD in its diesel vehicles.

2. *Facilitate local production of liquid nitrogen gas (LNG)*
   The Black Point Power Plant operated by China Light and Power Ltd. is capable of producing in the short-term LNG for use in vehicles. However, production has not occurred because the Economic Services Bureau, which is responsible for controlling power generation within Hong Kong, has been unable to work out the necessary financial incentives.

3. *Adopt a zero tolerance policy towards smoky vehicles*
   Enforcement of regulations prohibiting smoky vehicles from using our roads must be increased (as, indeed, could be said of enforcement of all our environ-mental protection legislation). In 1999 on-the-spot fines handed out to smoky vehicles owners/drivers numbered 5,816. By comparison, Hong Kong police will issue approximately one million on-the-spot fines in the year 2000 for illegal parking!

4. *Increase smoky vehicle emissions fines immediately*
   The on-the-spot fines for black smoke emissions from vehicles is $450.00. This should be increased to $5,000.00.

Ms. Loh also argues that the government's undertaking to reduce ambient levels of air pollution significantly by the year 2005 does not go far enough, and that a general reduction of 10% p.a. of all pollutant levels should be the government's objective.

It has also been proposed by Ms. Loh and her political party that longer term financial incentives should be put in place to encourage activities which are less-air polluting. An obvious example of this is to introduce air pollutant taxes which would penalise severely the use of known air pollutant substances and would provide incentives to consumers to use more environmentally friendly substances, such as ULSD.

Vehicle emissions are a major pollutant

Ms. Loh's suggested measures focus on vehicle polluting emissions, which is unsurprising when we consider that

Hong Kong's approximate 146,000 diesel vehicles cause in excess of 50% of air pollution levels (although figures differ depending on which medium of air pollution you measure). For the record, Hong Kong's diesel vehicles comprise:

18,000	taxis
6,400	mini-buses/vans
70,000	light vehicles (up to 5.5 tonnes)
12,000	franchised buses
40,000	medium/heavy trucks and lorries

The majority of these vehicles have old engines which do not comply with modern emission standards. In general, the vehicles are poorly maintained which increase the likelihood they will emit polluting substances. Only last year did the Transport Department import equipment to test old engines for polluting emissions.

The single significant contribution that vehicle emissions make to the level of air pollution requires the government's specialist transport agencies, such as the Transport Bureau, radically to address the issue of motor vehicle traffic growth in Hong Kong.
[Sources: *Newsletter (30/3/200); Press Release (29/3/2000); The 2000-2001 Budget: New Fiscal Structure for a World Class City (22/2/2000)*]

Other air quality issues

Even if all of the above remedial measures were adopted, they are only a partial solution. The sources of Hong Kong's air pollution extend beyond vehicle emissions, and include those over which Hong Kong apparently has little control, such as emissions originating from factories and other processes in southern China.

Measures technically to improve the way manufacturers and vehicles operate so as to reduce polluting emissions, and to enforce controlling legislation already in place, would lead to a measurable improvement in Hong Kong's air quality. Even if the government could achieve this there remain two further factors which illustrate the complexity of the task of maintaining a healthy air quality in a developed, urbanised society such as Hong Kong.

1. **Importance of sophisticated monitoring**
   We are unaware of the degree to which Hong Kong's air quality monitoring stations record and analyse air pollutants. Generally, our air pollution levels are measured in terms of Respirable Suspended Particulants (RSPs). RSPs may cause or exacerbate human illnesses, such as heart and lung diseases.

   However, a recent report compiled by the United States General Accounting Office (August 1999), *Air Pollution – EPA's actions to resolve concerns with the fine particulate monitoring programme*, analyses the level of the scientific sophistication of data provided by the 1,500 monitoring stations established throughout the United States. GAO found that almost all these stations were inadequate in realistically addressing the air pollution problem because they measured only mass standards. That is, their data helped in showing the levels of ambient pollution but were unhelpful in providing a database for comprehensive assessment of the sources contributing to fine particle pollution.

   It was also noted by GAO that weather conditions, such as humidity, produced inaccurate readings often, which presumably is a problem in Hong Kong too.

   Many other technical analyses and comparisons are made in the GAO report which we do not have the time or space to deal with here. However, the report prompts the question: are Hong Kong's air-quality monitoring stations sophisticated enough to provide us with meaningful data, not only to measure a mass pollution level but also to plan more effective pollution control measures?

2. **Indoor air pollution**
   Our discussion above has concerned external air pollution only. However, another comprehensive report by GAO in August 1999, *Indoor pollution: status of federal research activities*, strongly recommends that government authorities research and address the causes of indoor air (or *surface*) pollution. In 1987, US regulatory authorities ranked radon and other sources of indoor air pollution as among the top 5 of 31 listed environmental risks. In 1991 the EPA and its *Science Advisory Board* identified indoor air pollution as a comparatively high health risk. EPA officials (and other experts in the US) have in modern times consistently labelled indoor pollution "as one of the most serious environmental risks to public health", exceeding the concentration of outdoor air pollutants by a factor of 2 to 5 (and sometimes much more than that) (p.4).

   Despite these statistics, GAO concluded that the US was devoting far too little of its resources to combating and researching indoor air pollution, and was concentrating primarily on outdoor pollution.

   In terms of 1999 dollars, federal funds for indoor pollution research totaled $1.1billion for fiscal years 1987-1999.

   GAO concluded that in the USA there are gaps in "the scientific understanding of the degree to which indoor sources and concentrations of bioaerosols are influenced by such factors as indoor humidity levels; heading, ventilation and air-conditioning system design features and maintenance; etc" (p.57)

   For a predominantly "indoors" society such as Hong Kong, these "gaps" in our understanding of health risks of indoor pollution are even more alarming than might be the case in the USA. Which prompts the further question: to what extent (if at all) does the government encourage/fund indoor pollution research?

Conclusion

Since Hong Kong's first air pollution legislation was introduced we have

made significant advancements in legislating for better air quality. The *Air Pollution Control Ordinance* of 1983 and the subsequent *Air Quality Zones* (1987) illustrate this. Nevertheless, it is undeniable and well recognised that our outdoor air quality continues to decline. In the short term, it is logical that far more vigorous enforcement of existing legislation, combined with the kind of fast-track measures suggested by Christine Loh, would greatly improve our air quality. The government also should legislate to prevent known polluting activities not covered by present legislation, such as use of China-sourced diesel fuel (see *Hong Kong Briefing*).

But as well as our concern with outdoor air pollution, we suggest that increased emphasis should now be given to researching and controlling the causes of indoor pollution, which represent perhaps an even greater threat to the health of Hong Kong's people, if we accept GAO's report as relevant or applicable to Hong Kong.

Digest of LEGISLATION

AIR POLLUTION CONTROL (MOTOR VEHICLE FUEL) (AMENDMENT) (NO. 2 REGULATION 2000)

1. Commencement

This regulation shall come into operation on l January 2001.

2. Schedules substituted

Schedules 1 and 2 to the Air Pollution Control (Motor Vehicle Fuel) Regulation (Cap. 311 sub. leg.) are repealed and the following substituted-

Schedule 1
Specifications of Motor Vehicle Diesel
Any motor vehicle diesel shall –

(a) contain not more than 0.035% by weight of sulphur as determined by ISO l4596;
(b) have a certain number of not less than 5l.0 as determined by ISO 5l65;
(c) contain not more than 11% by mass of polycyclic aromatic hydrocarbons as determined by IP 39l;
(d) have a 95% distillation temperature of not more than 360 Degree C as determined by ISO 3405; and
(e) have a density at l5 Degree C of not more than 0.845 kg/L as determined by ISO 3675.

Schedule 2
Specifications of Unleaded Petrol
Any unleaded petrol shall –

(a) contain not more than 0.005 gram of lead per litre as determined by EN237;
(b) contain not more than 0.0l5% by weight of sulphur as determined by ISO l4596;
(c) have a motor octane number of not less than 85 as determined by EN 25l63;
(d) have a research octane number of not less than 95 as determined by EN 25l64;
(e) contain not more than l.0% by volume of benzene as determined by EN l2l77;
(f) have a Reid vapour pressure of not more than 60.0 kPa as determined by EN l2;
(g) contain not more than 42.0% by volume of aromatic hydro-carbons as determined by ASTM Dl3l9;
(h) contain not more than l8.0% by volume of olefins as determined by ASTM Dl3l9;
(i) (i) contain stabilizing agent if it contains methanol; and
(ii) in any event, contain not more than 3% by volume of methanol as determined by EN l60l;
(j) contain not more than 5% by volume of ethanol as determined by EN l60l;
(k) contain not more than l0% by volume of iso-propyl alcohol as determined by EN l60l;
(l) contain not more than 7% by volume of tertiary butyl alcohol as determined by EN l60l;
(m) contain not more than l0% by volume of iso-butyl alcohol as determined by EN l60l;
(n) contain not more than l5% by volume of ethers (containing 5 or more carbon atoms per molecule) as determined by EN l60l;
(o) contain not more than l0% by volume of other oxygenates as determined by EN l60l;
(p) contain not more than 2.7% by mass of oxygen content as determined by EN l60l;
(q) have not less than 46.0% by volume evaporated at l00 Degree C as determined by ISO 3405; and
(r) have not less than 75.0% by volume evaporated at l50 Degree C as determined by ISO 3405.

Note: "ISO" followed by a numerical symbol ("ISO number") means the test procedures of the International Standards Organisation commonly known by that ISO number;
"IP" followed by a numerical symbol ("IP number") means the test procedures of the Institute of Petroleum commonly known by that IP number.
"ASTM D" followed by a numerical symbol ("ASTM number") means the test procedures of the American Society for Testing and Materials commonly known by that ASTM number;
"EN" followed by a numerical symbol ("EN number") means the test procedures of the European Standards commonly known by that EN number.

Explanatory Note (16 May 2000)
This Regulation repeals and replaces Schedules l and 2 to the Air Pollution Control (Motor Vehicle Fuel) Regulation (Cap. 3ll sub. leg.) in order to provide for more stringent standards on the specifications to be compiled with by motor vehicle diesel and unleaded petrol.

HONG KONG Briefing

CE seeks Canadian expertise in HK's environmental sector

Canadian expertise in environmental technology and clean transport systems could be put to good use in Hong Kong, the Chief Executive, Mr. Tung Chee Hwa, said today (April 5, HK time) in Toronto.

Mr. Tung said Hong Kong needed to improve its quality of life if it was to achieve the goal of becoming a World City in Asia. He said Hong Kong had a lot to learn about environmental protection and environmentally-friendly technology.

Mr. Tung was briefed by Toronto city and Ontario provincial officials on environmental measures, in particular their 'Drive Clean' programme which requires cars older than 3 years to pass an annual exhaust emission test before being registered. It is expected to reduce carbon dioxide emissions by 23,000 tonnes annually.

Toronto's solid waste management system emphasises the 3Rs approach – reduce, reuse and recycle. Toronto city officials explained several initiatives, including a successful and profitable newspaper recycling operation, waste separation schemes, the use of organic waste to generate electricity, and promoting the use of bicycles as a clean transport alternative.

Mr. Tung also took a ride on a Canadian environmentally-friendly hybrid electric bus, which runs on a combination of diesel and electric power and significantly reduces harmful emissions.
(http://www.info.gov.hk/gia/general/200004/05/0405049.htm; 5 April 2000)

Dirty diesel from China

Drivers returning from Shenzhen get their fill of dirtier diesel banned from sale in HKSAR

Each day tens of thousands of Hong Kong vehicles are filling their tanks with high sulphur content diesel at a Shell station on the mainland side of the Lo Wu border. Mainland diesel cannot be bought legally in the SAR because of Hong Kong's air pollution controls. Under SAR law, purchasing mainland diesel, which has a significantly higher sulphur content and is half the price of Hong Kong diesel, is still legal.
Angela Spaxman, director of lobby group *Clear the Air*, said: "It's not illegal and that's the problem. The [cost] incentive is there, but it's so unnecessary." She suggested an immediate solution would be for Hong Kong to model itself on Singapore, where the Government limits the amount of fuel drivers can bring across borders to a fraction of the tank – and tests fuel levels before vehicles enter the city-state.

Green groups pinned the blame for the diesel problems on government policy-makers, rather than corporations.

Hong Kong has introduced proposals to shift to using cleaner fuels, but cross-border cooperation on pollution issues in the Pearl River Delta is still weak.

The Environmental Protection Departments says it has had talks with its mainland counterparts on pollution, but a department spokeswoman said it could not comment on cross-border traffic issues that fell under Customs' watch. Customs said its job was enforcement, not environmental issues.

Until Hong Kong's laws change to prevent the use of mainland diesel, drivers are likely to continue to opt for cheaper, dirtier fuel.
(*SCMP* 26/June/00)

Artificial reefs deployed off CLK

Artificial reefs to be deployed in waters off north Lantau will help to protect the habitat of Chinese white dolphins. Six underwater reef complexes will be created in an area of l3.8 hectares to the west of Sha Chau. Each reef complex will comprise four ferro-cement vessels and seven container units, which will be sunk at Sha Chau in the waters north of the airport, where white dolphins are frequently seen. Other reefs will be created in the Chek Lap Kok Marine Exclusion Zone.

The HK$8.2 million project is being undertaken by the Agriculture, Fisheries and Conservation Department (AFCD) with funding support from the Airport Authority (AA) and Hong Kong Jockey Club.

Before HKIA was built at Chek Lap Kok, knowledge of the Chinese white dolphins (Sousa chinensis) and their habitat was limited. An environmental impact assessment, commissioned by the then Provisional Airport Authority, identified the waters off north Lantau island as having a significant population of these rare mammals. As a result of these findings, the AA formulated an environmental plan in consultation with Hong Kong University, the AFCD and the Environmental Protection Department to try to ensure that any impact on the dolphins and their environment was kept to a minimum.

Contractors engaged in marine works, such as piling, came to regard the dolphins as their special responsibility and introduced their own mitigation measures. One of the most successful of these was an innovative "bubble curtain" which significantly reduced the underwater noise of the pile driving.

One of the initiatives that arose from Hong Kong's heightened interest in white dolphins was that measures should be implemented to enhance their habitat. The suggestion was made that certain areas off Chek Lap Kok be designated marine parks and white dolphin protection zones, an idea that was readily endorsed by the AA which also provided funding support. It was further proposed that artificial reefs be established in these areas to attract fish and other marine life.

In the Check Lap Kok Marine Exclusion Zone, five deployment sites covering 6,l25 sq. m. have been selected and nine medium-to-large ferro-cement vessels will be sunk to form artificial reefs. The deployment project commenced at the beginning of March and will take about one month to complete.
(*Sing Tao Jih Pao*, 25 June, 2000)

HONG KONG DISNEYLAND UPDATE

Complaint to the Ombudsman on the Disney Project

On 23rd March 2000 Friends of the Earth (Hong Kong) (FoE) lodged a complaint with the Ombudsman concerning alleged mal-administration by the government in handling the Hong Kong Disney Theme Park Project.
FoE said it wanted to raise legitimate concerns about the government's lack

of transparency and the necessity of conducting a proper risk evaluation in the use of tax payers money, and protecting Hong Kong's environment.

FoE has complained also that the government's bias in favour of a private company has led to conflicts of interest, misleading behaviour and irresponsible decisions by government officials.

Conflict of interest

The government could be abusing its administrative resources to facilitate the Disney Joint Venture Company to fast-track normal procedures of the approval process for obtaining an environmental permit under the *Environmental Impact Assessment Ordinance*. The government is keen to meet the hand-over deadline set under a secret deal between the government and Disney Corporation. One example of abuse of administrative resources alleged by FoE was the government's high profile press conference on the 13th March for which the government spent public money to create a more favorable atmosphere for Disney to pass the subsequent scrutiny by the Advisory Council on the Environment and the Legislature. FoE complains that it is inappropriate and entirely unnecessary to hold such a function and to make a misleading announcement that the Disney project has already passed the environmental requirements when in fact, later on the same day, the Environmental Protection Department issued a press release to say that an environmental permit had not yet been issued.

Misleading the legislature

FoE urged the Ombudsman to investigate whether the government misled Legco to secure approval of the $26.4 billion funding and to make it a category A, or urgent project. They also challenge the government's definition of the Disney theme park as an infrastructure project, given the fact that there will be no adverse impact on the livelihood of the general public should the project not proceed.

Environmental liabilities

Government presented the Hong Kong Disney project to Legco without showing adequate grounds for evaluating the environmental risks and liabilities which may arise from the contaminated shipyard. The cost-benefit analysis so far presented to the Legislative Council (the government refused to disclose the details of the Disney deal to the public or Legco) did not reveal anything about potential risks of pollution compensation or of environmental liability issues.

Given the fact that the Hong Kong Disney Theme Park will co-locate with a contaminated shipyard, FoE is concerned that the green light is likely to be given for site reclamation without a proper EIA being conducted to assess the shipyard pollution, since experience worldwide suggests that shipyard operations generate contaminants such as toxic metals, persistent organic pollutants and other hazardous substances.

FoE has requested that the following three points be addressed prior to the commencement of work to reclaim Penny's Bay for the building of the Theme Park.

Conflict of interest

Senior government officials are Directors of the Disney Joint Venture and are using administration funds to promote Disney's fast-track approval.

- What are the personal declarations of interest by the concerned officials?
- What operating guidelines does government have on the use of public funds for the promotion of private companies, and how are these being adhered to with Disney?

Unreasonableness

The Disney project was classified by senior government officials as a Category A infrastructure project, although there is no justification for this.

- Who is accountable for the funding classification of the Disney project?
- What is government's definition of an infrastructure project?
- How does the Disney project fit the definition of an infrastructure project?

Risk assessment

A risk estimate of clean-up costs of the shipyards adjacent to the proposed Disney project has not been included in the cost-benefit study presented to the Legislative Council, which is unacceptable in view of the unknown contamination levels, the undefined standards of clean-up for the Disney project, the undisclosed responsibility of government in the clean-up, and the unknown litigation costs should any problems arise from the management of contamination at the shipyard.

- How can the government justify the financial risks to public funds from the co-location of the Disney project with a potentially contaminated shipyard on which no detailed studies have been done, considering the large costs of cleaning up similar sites elsewhere?
- Why are other brown-field sites, such as Kai Tak Airport, required to implement decontamination that complies with the Environmental Impact Assessment Ordinance prior to re-use, but the government has announced a start date for the Disney project construction without even investigating the contamination of a co-located brown-field site?
- What are the government's obligations to Disney Corporation regarding the clean-up or disclosure of contaminated land adjacent to or underneath the Disney project?
- What legal recourse does Disney Corporation have against the government (and therefore taxpayers) in the event that contamination is not adequately managed, or in the event that there is third party litigation?

(http://www.hk.super.net/~foehk)

Competition for the construction contract of Hong Kong Disney Theme Park

Hong Kong Disneyland is such a big project that its construction contract becomes the apple of every one's eyes. A lot of Hong Kong surveyors and architects worry that the contract will be awarded to foreign companies. They wrote to Mr. Donald Tsang Yam Kuen, the Financial Secretary, demanding the government be fair and

open and award the contract by way of tender. The government, being a big shareholder in the project, is responsible for providing more job opportunities to Hong Kong people. Apart from some specialised work, Hong Kong architects and engineers can contribute to the construction of the hotels, administrative buildings, support centres and carparks which comprise the project.
(*Industry News, Construction & Contract News 2000 No. 2*)

ADVISORY COUNCIL ON THE ENVIRONMENT (ACE)

West Rail Phase 1, Public Transport Interchanges (ACE Paper 05/2000)

The Kowloon-Canton Railway Corporation reported that the project involves the design of Public Transport Interchanges (PTIs) for the Kowloon-Canton Railway Corporation (KCRC) West Rail, which provides mass transportation by rail from Tuen Mun to West Kowloon through nine stations. Except at West Rail Mei Foo Station, all other stations will be linked to a public transport interchange (PTI) to enable passengers to connect conveniently with various feeder services including buses, mini-buses and taxis. In addition, PTIs provide parking spaces for private cars and bicycles, together with drop-off points. Since Mei Foo Station will mainly be used as a KCR/MTR interchange, a PTI for other transport modes is not planned for the Station.

In order to function safely and efficiently, PTIs tend to occupy large areas of flat land which are, necessarily, immediately adjacent to each station. PTIs comprise roads for access and egress, run-ins and parking bays for the various types of vehicles, and pavements for waiting passengers. Queuing lines are normally provided with canopies for weather protection (unless a podium-style development is located above). Disabled and emergency vehicular accesses are also provided.

The PTIs are presented in the visuals as they will appear at the opening of West Rail at the end of 2003. They are planned to be integrated into future property developments. All PTIs except the one at Siu Hong (SIH) will be covered by podiums and enclosed to some extent by the walls of the development above. These developments will be subject to the Building Department's approval.

The PTIs are not designated projects under the Environmental Impact Assessment Ordinance and environmental impact assessment studies are therefore not required. However, the PTIs associated with the West Rail stations will still be designed in accordance with other relevant requirements, such as the Hong Kong Planning Standards and Guidelines and the Environmental Protection Department's environmental guidelines. For those PTIs which will be covered by podium structures for the property developments, adequate ventilation will be provided. They should not result in adverse noise or air quality impacts to the surrounding environment.

Remaining Development in Tung Chung and Tai Ho, Comprehensive Feasibility Study (CFS) (ACE Paper 06/2000)

The Tung Chung New Town, consisting of two districts viz. Tung Chung and Tai Ho, has been identified as the Territory's ninth New Town. The North Lantau Development Study (NLDS) completed in 1992 recommended an ultimate population of 260,000 beyond 2011 for the New Town. This population target was subsequently reviewed and revised to 320,000 by 2011 under the Territorial Development Strategic Review (TDSR) in 1996. The objective of the Comprehensive Feasibility Study (CFS) is to investigate the feasibility of intensifying the New Town for achieving a target population level of 320,000 by 2011. The CFS is a designated project under the Schedule 3 of the EIA Ordinance.

Phase 1 development, located in Tung Chung Central, has been completed. Phase 2 development in Tung Chung West is underway. The remaining developments of the New Town are planned to be implemented as Phases 3 and 4.

The CFS recommends a total population of 320,000 by 2011 for the New Town, comprising a population of 240,000 in Tung Chung and 80,000 in Tai Ho. Phases 1 and 2 are planned to accommodate a population capacity of 88,000 while Phases 3 and 4 are planned to accommodate a population capacity of 232,000. About 42,000 local service jobs will be provided within the New Town. The population increase is achieved by increasing the intensity of residential developments around the MTR stations, the addition of a new district at Tung Chung East and the rezoning of the land earmarked for industry at Siu Ho Wan under the NLDS to residential.

The New Town is planned as a rail-based development with high density development located above and around the MTR stations and the transport nodes, medium density development located near the waterfront, and low density development located in the valleys. To maximize the sea view, air movement and penetration of natural light, a stepped down building height concept has been adopted and enhanced three dimensionally throughout the New Town.

To maximize the preservation of ecological resources, the reclamation of Pak Sha Tusk Island and Tai Ho Bay considered under the NLDS have been deleted. In Tai Ho Valley, no new development is proposed except the expansion of the few existing recognized villages. The village zones in Tai Ho Valley are so planned as to avoid village type development being close to the Tai Ho Stream Site of Special Scientific Interests (SSSI), habitats of high ecological values and the archaeological site at Pak Mon. A stream buffer zone is also provided along Tai Ho Bay and the Stream.

The development of the New Town is restricted by existing transport infrastructure including the North Lantau Highway, the airport railway and the distributors which are considered as major air pollutant and noise sources. To reduce road traffic

and to minimize air and noise impacts, the New Town has been designed as a rail-based development with high density development being located above and around the MTR stations.

In order that the planned developments comply with the established traffic noise standard, mitigation measures, including setbacks, low noise road surfacing, vertical barriers, cantilever barriers and site-specific building orientations, have been recommended. Trackside barriers have also been proposed along the airport railway. Only a few percent of dwellings will need insulation to deal with the residual traffic noise impact.

Air quality of the New Town will be improved by breezeways in Tung Chung and Tai Ho. Amenity strips are provided as buffers along the roads to minimize the effect of vehicular emissions. Cumulative impacts of aircraft operation and road traffic have been assessed and the results indicate that the planned developments will comply with established air quality standards.

Review of the Strategic Sewage Disposal Scheme (ACE Paper 07/2000)

Environment and Food Bureau (EFB) has proposed plans for the process and expected timetable for conducting the review of the Strategic Sewage Disposal Scheme (SSDS). The process is to be open and participatory and the review panel will be drawn from experts of high professional standing in sewage treatment, tunneling, economics and environmental assessment so that it can take a comprehensive view of the current scheme and alternative proposals.

The background of SSDS is as follows:-

The Strategic Sewage Disposal Scheme was conceived in the 1980's as a means of replacing the present unacceptable discharges of sewage from the main urban area into the central harbor after receiving preliminary treatment.

As originally projected, the scheme was to consist of two treatment plants, providing primary treatment supplemented with lime dosing. Several means for conveying the sewage from the catchment areas to the treatment plants and to the outfall were considered. Deep tunnels were selected because increased geotechnical problems in construction were considered to be offset by reduced engineering complexity, operational risks and interference with other urban infrastructure.

Following a review in 1995, the scheme was revised. Stage I of SSDS comprises a treatment plant at Stonecutter's Island, pumping and screening stations and seven deep tunnels with a total length of 25.3 km. The 1.7 km interim outfall tunnel has already been completed and is now in operation. The Stonecutters Island Sewage Treatment Works (SCISTW) is also in operation and is currently treating about 320,000 cubic metres of sewage daily. This represents 25% of the total design flow from the whole SSDS Stage I catchment. Since the SCISTW was put into operation in May 1997, the performance of the chemical treatment process using ferric chloride is satisfactory. Over 80% suspended solids and 70% biochemical oxygen demand on average are removed from the raw sewage against the respective target removal rate of 75% and 35%.

The EIA study for Stage II has been completed. It has recommended that the outfall be located to the southeast of Lamma Island, and that the treatment process should be further upgraded. A disinfection process should be added at the time of constructing the Stage II tunnels, and land will have to be reserved should biological nutrient removal processes need to be added in future.

Progress Report of the Interdepartmental Working Group on Flytipping Control (ACE Paper 08/2000)

The Task Force (Black Spots) of Lands Department reported that following the winding up of a special inter-departmental task force set up under the auspices of Environmental Protection Department (EPD) to deal with a number of serious cases of indiscriminate and unregulated dumping of waste in the north-west New Territories, the then Secretary for Planning, Environment and Lands directed that Task Force (Black Spots) of Lands Department (Lands D) should be responsible for co-ordinating government efforts towards quicker and more effective responses to such problems.

The Terms of Reference for the Inter-departmental Working Group on Flytipping Control (IWG) are: - (i) to co-ordinate the efforts of relevant government departments towards the cleaning-up of illegal dumping of waste and to determine responsibility, where necessary, for specific clean-up operations; (ii) to monitor and co-ordinate the progress of the enforcement actions of relevant government departments against cases of illegal dumping and provide support when necessary; and (iii) to consider initiatives, including legislative measures, aimed at preventing and controlling illegal dumping activities, and to recommend implementation measures where appropriate.

A total of thirteen meetings have been held since August 1998.

Main achievements of the IWG during 1999/2000 are as follows:-

(a) Data relating to flytipping sites identified by EPD, FEHD, Plan Department and Lands Department has been input and the database is now being utilised to monitor and ensure efficient clearance of the sites. Problem locations where repeated dumping or non-clearance are identified for special action.

(b) According to the database, a total of 461 dumping sites have been cleared by the relevant departments since January 1998 with action currently being taken at another 120 dumping sites. Another 73 dumping sites are under investigation and appropriate enforcement/cleaning up action will be initiated soon.

(c) The IWG at its meeting on 6.8.99 urged the relevant departments to consider increasing the maximum penalties of the offences.

(d) Task Force (Black Spots) has undertaken preventative landscaping on 31 illegal dumping black spot sites in the Tuen Mun and Yuen Long Districts. Subject to availability of funds further sites will be given similar treatment in 2000/2001. In addition to preventing illegal occupation and opportunistic illegal dumping, local residents will be able to enjoy an improved environment.

The work of the IWG is ongoing and it continues to look for new locations where it can make improvements.

TOWN PLANNING

Railway construction projects

During the next 5 years the Hong Kong Government will spend approximately HK$230 billion on a huge transport development project in the New Territories, which will include 6 new railways and 2 major bridges for motor vehicles. The Transportation Department ("TD") recently revealed that it is developing the new railway networks to assist orderly extension of urban areas and for better communications between Hong Kong and southern China.

The government will invest more than HK$100 billion to construct 6 new rail-routes, one of which will connect with the railway which links Shenzhen with inland China. It is expected that construction will be completed in 2004, and that the additional rail networks will have sufficient capacity to cope with estimated traffic until 2016.

The government has also reserved HK$80 billion for the second stage of the railway construction project, which will be completed in 2016. It is estimated that the proportion of the public using rail transport will increase from 38% to 45%.

(*Construction & Contract News*, 2nd Issue of 2000, Hong Kong Construction Association)

Kwun Lung Lau re-construction project

The contract to construct Kwun Lung Lau Re-Construction Project ("the Project") has been awarded to a local construction company, Ma Leung & Associates (HK) Co. Ltd,. through a tender process. The Project, which has already commenced, comprises 2 stages: (1) to demolish 7 connected Kwun Lung Lau buildings and (2) to construct 7 multi-storey and in their place. After the re-construction, the total service area will be 2,000,000 sq. ft. The height of each building will be 40 stories approximately.

Mr. Ma of the construction company said that they are going to face many difficulties with the Project. Most importantly, they have to adhere to a strict time schedule. For example, in the first stage, they have to deal with the following time/activity sequence:

- residents in 2 out of 7 Kwun Lung Lau buildings are required to move out
- the 2 vacant buildings will be demolished
- construct new buildings on the same piece of land
- choose the qualified residents to occupy Kwun Lung Lau
- arrange a flat in the new buildings for each qualified family.

The second stage of construction will follow the same arrangement for the remaining buildings. The advantage of this two-stage arrangement is that resources and time can be saved, provided the Project runs smoothly and within good time management. The company is aiming to complete the Project quickly.

Mr. Ma further added that the company will have to pay special attention to several technical points: (1) inspection of the slope near the buildings to ensure the safety of the residents; (2) maintain the existing passage ways within the area of Kwun Lung Lau so that any inconvenience caused by the construction work is reduced to a minimum. He estimated that the newly constructed Kwun Lung Lau buildings would have a much better view, due to their geographical location.

The Project will provide 3000 residential units, with 800 units in the 1st stage and 2000 or more units in the 2nd stage. The developer, Hong Kong's Housing Authority, plans to lease out the units in the 1st stage and sell the units in the 2nd stage.

(*Building Review*, 4th Issue of 2000, Hong Kong)

Ten-year plan for land supply

Under a Ten-Year Plan for Land Supply Programme, the government plans to release approximately 4000 hectares of land between 1999 to 2009, a quarter of which will be for residential use. Together with the government's urban planning and renewal initiatives, the supply of land programme is estimated to provide during the next ten years approximately 85,000 new residential units per year. The main source of new land will be the New Territories. An example is the housing development near the West-North Railway and the Ma On Shan Road, which will supply 57,000 units.

The Government proposes the following allocation of uses for the programme's land supply:

Land use	Area (hectares)
Government, institution or social use	1,402
Residential use	1,005
Other designated use	575
Road or other use	542
Industrial use	240
Commercial use	108
Total	3,872

(*Construction & Contract News*, 2nd Issue of 2000, Hong Kong Construction Association)

REGIONAL & INTERNATIONAL

Australia

A 1974 discovery of a new animal species by Michael Tyler of the University of Adelaide could have helped chemists develop a new drug to relieve human stomach ailments, but unfortunately the frog species was extinct by 1980.

What Tyler discovered was a frog with bizarre reproductive behaviour. The female swallowed her own eggs, incubated them in her stomach and gave birth through her mouth. The amphibian, called the Australian gastric-brooding frog, carried the eggs

inside her stomach without her stomach being digested by stomach acid because the mother frog had the ability to turn off her stomach acids while hatching her eggs. Excess stomach acid causes great misery in millions of human beings. The potential was that the frog secretes a compound that could offer new medicines for stomach ailments.

Technology has evolved to enable laboratory scientists to find, analyze and manipulate molecules offered by Mother Nature, and to develop chemicals unimaginable and uninventable by chemists. For example, the anti-cancer compound, taxol, taken from the Pacific yew tree, is one of those natural wonder drugs that is, according to natural-products chemist Gordon Cragg of the U.S. National Cancer Institute, too fiendishly complex a chemical structure for researchers to invent.

Yet despite innovative technology which enables us to take advantage of natural compounds, we continue to threaten the world's species and the habitats on which they depend. For example, the European leech, source of a new blood thinner, and the poison dart frogs, producers of many intriguing chemicals, have been almost wiped out by overzealous collectors. Tropical cone snails and sponges, respectively known to harbour analgesic and anti-cancer compounds, live on one of the most endangered of marine ecosystems, coral reefs.

The unlearned lesson from the folly of destroying species that could benefit humanity is not new, however. John Riddle, a classics scholar at North Carolina State University, has written about a female contraceptive reputed to be safe and effective, known as silphion to the Greeks and silphium to the Romans. Riddle and his colleagues have reported that experiments on laboratory rats with the common fennel plant, a close relative of silphium's, did show contraceptive capabilities. Unfortunately, they were unable to test the silphium itself because it became extinct 1,500 years ago.
(*Time, Earth Day 2000 Special Edition*, April-May 2000)

Built in Australia, Solar Sailor, the first ferry in the world that uses only solar energy, made her maiden voyage on 25th June 2000 on Sydney Harbour. Australian authorities plan to promote this environmental-friendly ferry in September during the Olympics.
It took four years to design and build the 21.5m long Solar Sailor at a cost of A$2,000,000. She can be driven by solar energy, wind velocity, batteries or reserved liquid gasoline, or any combination of them, without discharging pollutants into the air. She travels at a maximum speed of 15 nautical miles an hour with a carrying capacity of 110 passengers.
(*Apple Daily, 26* June 2000)

Palau

Palau is famous for its marine life. Divers and scientists fly from around the world to this Pacific archipelago, 500 miles east of the Philippines, to view its parrot fish, gobies, damselfish, sharks, turtles, butterfly fish and the stately Napoleon wrasse. The Blue Corner, on Palau's western reef, is rated one of the world's top dive sites for its abundance of big fish. With 1,387 species at last count, Palau has more fish varieties than any other area of the North Pacific.

However, all this is now threatened by overfishing (and destructive fishing practices, such as cyanide and dynamite blasting fishing). Palauans have always lived from the sea, but it was not until the mid-1980s that overfishing became a problem. After its independence from the U.S. in 1994, Palau passed the Marine Protection Act which bans the export of certain species and regulates fishing of others. Enforcement of this legislation is weak, however.

Palauans' promotion of marine life preservation is winning over other Pacific islands. The Federated States of Micronesia is planning to follow what Palau has done.

Palau's ecosystem is still severely under threat, as the government plans to build roads, golf courses and more hotels in an attempt to boost tourism.
(*Time, Earth Day 2000 Special Edition*, April-May 2000)

Asia/USA

A new strain of genetically modified rice, developed by Washington State University and agriculture researchers in Japan, has been tested in China, Korea and Chile. It was created by infusing rice with genetic material from maize to boost photosynthesis so that the plant is able to produce more sugar and increase grain yields.

First results gave increases in yields of 35 per cent, but researchers urged caution because the findings were still very preliminary. They also said the new rice would require more tests, not only in the field but also involving infusion with additional traits to further improve the strain.

The tests used a rice plant developed in Japan. Researchers believe that this cultivar might not be suitable for other areas, and to transfer this trait they would need to do traditional breeding to introduce the genes to the elite commercial rice varieties. This means that it will be three to five years before the new rice strain would be ready to be released to farmers.

The International Rice Research Institute, near Manila, said rapid population growth has caught up with advances in cereal yields. Farmers must consistently produce an extra 6.7 millions tonnes of rice a year, using less land and water, just to maintain current nutrition levels. GM technology may help farmers to achieve these targets.
(*The Age*, 1 April 2000)

Japan

In Yokkaichi, Japan, a town near Kyoto, a massive waste dump is poisoning the nearby fields with calcium and other heavy metals. Tetsuo Sekiguchi, one of Japan's leading experts in toxic chemistry and practically a one-man environmentalist movement, teaches local farmers how to gather specimens for toxin testing and monitoring.

The farmers are organizing to oppose continued operation of the leaking dump, and are marking maps with their own pollution readings. Sekiguchi advises them to trust their senses in

detecting toxins: "When you go to a dump, look at the trees, listen to your body," he says. "Are your eyes sore? Do you smell something strange? Do you feel sick?"

A former high school science teacher and truck driver, Sekiguchi began his mission almost by accident. When he was brought by a neighbour to see industrial waste being dumped into a river, he was shocked into action and began investigating the landfills surrounding his home. Since then he has found over 2,000 illegal dumps in his prefecture alone.

But he is making enemies. His young daughter was once whisked off the street and interrogated about her father's work, and he himself has been roughed up and forced off dumpsites he was investigating. However, he is not deterred. "He's a crusader." says C.W. Nicol, a writer and a naturalist. He'll need to be a crusader; there's the whole of Japan to clean up.

(*Time*, 29 May 2000)

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Comparative Table of Environmental Convictions:
Apr – Jun 2000

	Number	1st Offence	2nd Offence	3rd + Offence	Highest Fine
APCO	46	19	9	18	HK$25,000
	52	22	9	21	HK$20,000
	41	16	13	12	HK$15,000
WPCO	29	20	7	2	HK$60,000
	23	19	1	3	HK$60,000
	22	12	5	5	HK$50,000
NCO	26	12	1	13	HK$60,000
	30	9	5	16	HK$60,000
	55	14	8	33	HK$100,000
OLPO	-	-	-	-	-
	-	-	-	-	-
	-	-	-	-	-
DASO	-	-	-	-	-
	-	-	-	-	-
	-	-	-	-	-
WDO	26	21	3	2	HK$25,000
	37	26	5	6	HK$20,000
	46	38	6	2	HK$20,000
Total	127	72	20	35	
	142	76	20	46	
	164	80	32	52	

April figures appear on the first line, May figures on the second and June figures on the third of each item. Source: EPD, Anti-Pollution Prosecution Figures.

ABBREVIATIONS

AFD	Agriculture & Fisheries Department
APCO	Air Pollution Control Ordinance
CFCs	Chlorofluorocarbons
DASO	Dumping At Sea Ordinance
EC	European Community
EE	Estern Express
EPCOM	Environmental Pollution Advisory Committee
EPD	Environmental Protection Department
EXCO	Executive Council
FEER	Far Eastern Economic Review
HKS	Hong Kong Standard
HKU	University of Hong Kong
JLG	Joint Liaise Group
LDC	Land Development Corporation
LEGCO	Legislative Council
LS	Legal Supplement
NCO	Noise Control Ordinance
NT	New Territories
OLPO	Ozone Layer Pollution Ordinance
PAA	Provisional Airport Authority
PADS	Port and Airport Development Strategy
SCMP	South China Morning Post
SMP	Sunday Morning Post
WDO	Waste Disposal Ordinance
WPCO	Water Pollution Control Ordinance

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