

IMPACT OF CONTAMINATED LAND ADJOINING THE NEW DISNEY THEME PARK IN HONG KONG

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ABSTRACT

As a measure to boost the economy, the Hong Kong Special Administration Region government (HKSAR government) reached an agreement in November 1999 with Walt Disney to build a 126-hectare theme park on Lantau Island in the former British Colony. In connection with the construction of roads and other infrastructure for the future park, a shipyard was compulsorily acquired by the government. It was later found that the demolition of the shipyard would involve the removal of around 87,000 cubic metres of dioxin laden contaminated soil.

The presence of the highly toxic soil required extra finance for the remediation. It not only caused a budget blowout but also an embarrassment to the HKSAR government. This paper finds that the problems were mainly caused by the fragmented nature of the current contaminated land management approach adopted by the government and the lack of adequate power for the acquiring authority to enter the land for site investigation prior to the land acquisition. Unless appropriate changes are made to the current land contamination management and land acquisition practice, similar land contamination incidents may occur in the future and may have a long-term impact on the Hong Kong property market.

Key words: Disney theme park, dioxin, remediation, environmental protection

INTRODUCTION

Contaminated land is one of the most serious environmental problems that has caused alarm among people. Apart from being dangerous to flora and fauna, it also threatens human health and safety, and may lead to legal and financial liabilities. The problems of contaminated land do not go away, even if the pollution activities are discontinued.

There have been several contaminated land incidents that have caused major public concerns. The most notable one was the Love Canal incident in 1977 in the USA that eventually led to the enactment of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) by the US federal

government (Chan, Jefferies & Simons, 1998). Besides the USA, there were also similar incidents in other countries. For example, the Lekkerkerk incident in the Netherlands was a serious land contamination incident in the 1980s. Eight hundred residents had to evacuate their homes that were built on a former refuse tip at Lekkerkerk near Rotterdam (Pearce, 1992). In Australia, there was a similar incident in the late 1980s. Residents of Kingston, a Brisbane suburb, had to abandon their homes after black sludge began oozing into their backyard. Investigation revealed that the suburb was built on a hazardous waste dump used by an old gold mine (Egerton, 1990). Critics view the serious problems associated with contaminated land as a toxic time bomb in land (Pearce, 1992).

The Hong Kong economy has been declining since the Asian Financial Crisis in 1997. As a measure to boost the economy, the Hong Kong Special Administration Region Government (HKSAR government) signed an agreement in November 1999 with the Walt Disney Company to develop a 126 ha theme park on Lantau Island, the largest outlying island in Hong Kong. In connection with the construction of roads and other infrastructure linking to the future park, a shipyard was compulsory acquired by the government. It was later found that the demolition of the shipyard would involve the removal of around 87,000 cubic metre of dioxin laden contaminated soil. This paper aims at reporting this toxic time bomb and its impact, highlight the lessons to be learnt and analyse the likely impact on the Hong Kong property market.

HONG KONG DISNEY THEME PARK

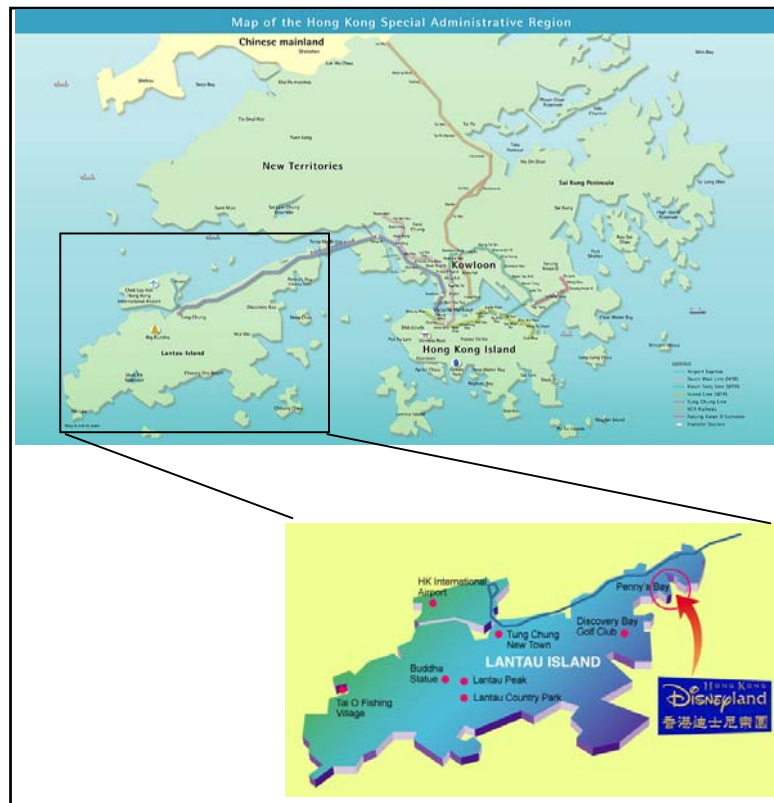
In order to boost the economy and attract foreign investment, the HKSAR government has put forward a number of measures; including signing an agreement in November 1999 with the entertainment giant Walt Disney Company to develop a 126 ha theme park in Penny's Bay on Lantau Island; see location plan in Figure 1.

The theme park site, due to open by early 2006, will be accessible by rail, highway and ferry. Connected by a new rail link to the existing Tung Chung line, the park is about 10 minutes from the Hong Kong International Airport and is about 30 minutes from downtown Hong Kong (ISD HKSARG, 2000; Hong Kong Disneyland, 2002).

The estimated development cost of the theme park is HK\$14.1 billion (US\$1.8 billion). The investment is split 57%:43% between HKSAR government and Disney (Forest Conservation Portal, 2002). The HKSAR government claims that the project will generate an estimated HK\$148 billion [US\$19 billion] boost to the economy over a 40-year period in terms of value added, such as employment

income and profits for small and large companies in Hong Kong (ISD HKSARG, 2002).

Figure 1: Location of Hong Kong Disneyland



Source: Based on ISD HKSARG, 2002

The toxic time bomb

In connection with the Disney theme park development, the government needs to provide the necessary infrastructure to support the theme park. One of the infrastructure projects is to build a highway linking the theme park to the existing highway system on Lantau Island. The construction of the new highway and other infrastructure requires the compulsory acquisition of the land occupied by the Cheoy Lee Shipyard (CLS).

The land concerned has an area of 19 ha and is situated on the critical path to the theme park. CLS started its ship building business on the site in 1964. The shipyard had since built, maintained and repaired sea-going vessels ranging from

small boats to passenger ferries for several decades. The ship building materials used included fibreglass, plastics and metal (Mingpao News, 2002).

Before the land acquisition by the government, the shipyard business had already been suspended for many years, because the owner had relocated the business to Mainland China. The proposed compulsory land acquisition required the authority to follow the procedures prescribed in the Roads (Works, Use and Compensation) Ordinance (Chapter 370), the Railways Ordinance (Chapter 519) and the Lands Resumption Ordinance (Chapter 124). The first two laws have specific provision to empower the acquiring authority to enter private land for site investigation prior to compulsory acquisition; however, the power is not available in the third law. Since it would take a long time to go through all statutory procedures and might delay the Disney project, the government decided to acquire the land by agreement with the shipyard owner. CLS initially asked for a compensation of HK\$10 billion (US\$1.3 billion). The compensation amount was finally agreed at HK\$1.5 billion (US\$200 million) (Mingpao News, 2002).

During the negotiation for land acquisition, the shipyard owner refused to permit the government to enter the premises to carry out site investigation on the grounds that the land was private property. In this circumstance, the government could only carry out site investigation outside the boundaries of the shipyard. Evidence of minor pollution was found from the investigation and the government reserved HK\$30 million (about US\$3.8 million) for site remediation.

After physically taking over the site, detailed site investigation was carried out and an environment impact assessment report was prepared. It was found that the site was polluted by the contaminants shown in Table 1.

Table 1: Contaminants found on CLS site

Contaminant Type(s)	Estimated Volume (m ³)
Metals only	48,000
TPH/SVOCs	700
Metals and TPH/SVOCs	8,300
Dioxins and Metals/TPH/SVOCs	30,000
Total Estimated Volume	87,000
Source: MCAL 2002	
Note: TPH = Total Petroleum Hydrocarbon	
SVOCs = Semi-volatile Organic Compounds	

Among the listed contaminants, dioxin causes the biggest concern because of its extreme toxicity. It is “one of the most toxic chemicals known” (Dioxin Homepage, 1998). Dioxin is a general term for a group of hundreds of toxic chemicals, such as PCB, that will stay in the environment for a long time. This

group of toxic chemicals is formed by burning chlorine-based chemical compounds with hydrocarbons. Dioxin affects human health in the following manner:

- Reducing sperm count;
- Inducing testicular cancer;
- Causing endometriosis (a painful growth outside the uterus);
- Increasing the chance of getting breast cancer
- Causing damages to foetus.

(Dioxin Homepage, 1998)

In general, dioxin affects human health through the food chain. However, human health can also be seriously affected through breathing or contact with dioxin-laden air. Dioxin has a persistent characteristic and is difficult to break down. Soil samples from the CLS site show that the content of dioxins in the soil is 109 times higher than the safety standard of 1 part per billion TEQ (i.e. dioxin Toxic Equivalent) (Mingpao News, 2002). If the shipyard is not decommissioned, it will pose long-term risks to the health of workers and visitors to the theme park (Reuters, 2002).

In the Environmental Impact Assessment Final Report, the environmental consultant recommended excavation of all contaminated soil. The 30,000 m³ of dioxin contaminated soil will then be remediated by a thermal desorption process at a new treatment plant to be built in To Kau Wan, north of the Disney site.

The dioxin contaminated soil will be transported to the thermal desorption treatment plant by sealed container trucks. It is estimated that there will be about 50 shipments per day and it will take 6 months to complete the consignment. The 600 m³ of residual generated will finally be transported by trucks to the Chemical Waste Treatment Centre on Tsing Yi Island for destruction by incineration.

The recommended remediation proposal has caused deep concern among the people and Green groups. They query why the government does not choose insitu remediation and worry about the safety of transporting contaminated soil by road to the treatment plants. Besides the criticisms, the cost of remediation is huge. Based on findings from the preliminary site investigation outside the shipyard boundaries, the government only reserved HK\$30 million (about US\$3.8 million) for the remediation. Now the full extent of land contamination is known and the government faces a remediation bill of about HK\$400 million (about US\$51 million) (Agence France-Press, 2002). It not only increases the cost of providing infrastructure for the theme park, but also causes embarrassment to the government.

According to the remediation proposal, it will take more than one year to treat all contaminated soil. The whole process is expected to complete by March 2006. If the first stage of the theme park development is completed on time in early 2006, it is possible that the operation of the theme park will co-exist with the remediation process. While there may be no real threat to workers and visitors to the theme park, it nevertheless will tarnish the image of the park.

PROBLEMS WITH CURRENT LAND CONTAMINATION MANAGEMENT PRACTICE

Before the development of the shipyard in 1964, the land was ordinary farmland. Apparently, contamination of the CLS site was caused by the shipbuilding activities. Subsequent investigations found that the dioxins on the site might have been caused by burning of plastic materials on site. However, there is little action that the government can take against the previous shipyard owner.

In Hong Kong, the power to control and prevent land contamination is fairly fragmented. A number of government departments may be involved in regulating land contamination under different laws. For example, the Agriculture, Fisheries and Conservation Department (AFCD), Environmental Protection Department (EPD), Food and Environmental Hygiene Department (FEHD), Lands Department (LD), and Planning Department (PD) all have powers within their jurisdiction to deal with certain aspects of land contamination issues. However, none of them is the ultimate authority in this matter. In the subject case, the AFCD and FEHD are clearly not relevant, because the shipyard has nothing to do with agriculture, fisheries, country parks; and food hygiene. The roles of the EPD, LD and PD in this incident are examined below.

At present, there are 7 environmental protection laws enforced by the EPD in Hong Kong:

1. Air Pollution Control Ordinance (Chapter 311)
2. Dumping at Sea Ordinance (Chapter 466)
3. Environmental Impact Assessment Ordinance (Chapter 499)
4. Noise Control Ordinance (Chapter 400)
5. Ozone Layer Protection Ordinance (Chapter 403)
6. Waste Disposal Ordinance (Chapter 354)
7. Water Pollution Control Ordinance (Chapter 358).

There is no specific laws regulating land contamination (Mak, 2002). Among the laws listed above, the Waste Disposal Ordinance and Environmental Impact Assessment Ordinance are most relevant to the subject case. The Waste Disposal Ordinance was passed in 1980. In essence, it prohibits dumping waste in public

places or on government land, or on private premises without the consent of the owner or occupier (EPD HKSAR, 2002). However, it does not have retrospective power to punish polluters for illegal waste disposal. As mentioned above, the business activities of the shipyard had been suspended for a long time and it was difficult to tell whether the pollution was made before or after the enactment of the law. On the other hand, the HKSAR government is now the landowner and may have inherited the legal liabilities from the previous landowner. It is therefore unlikely for the EPD to bring a test case against the HKSAR government.

The Environmental Impact Assessment Ordinance (Cap. 499) was passed in 1997 and came into operation in 1998. It only applies to designated projects through the application of the environmental impact assessment process and the environmental permit system. As mentioned above, in order to build the infrastructure for the Disney theme park, it is necessary to decommission the shipyard. Decommissioning a shipyard is a designated project under the Ordinance.

In Schedule I of the Ordinance, "decommissioning" means "ceasing production and demolishing an existing plant for the development or redevelopment of the site". The previous landowner only suspended the shipyard operation and there was no evidence to show that they intended to decommission the shipyard. Accordingly, it is difficult for the government to take legal action against the polluter for failing to comply with provisions of this law. After all, it is the current owner, i.e. the HKSAR government, that wants to decommission the shipyard. It thus has the legal responsibility to prepare an environmental impact assessment report of the site for the approval of the EPD.

The Lands Department (LD) may also take action against polluters under conditions of land grant documents. Hong Kong adopts a leasehold land tenure system (Chan, 1999). Every plot of land in the territory is subject to a land grant document issued by the government (Cruden, 1986). In the early days, environmental issues were not a concern of the government or the public. When the Hong Kong government and community became more concerned about environmental issues in the 1960s, the government started to incorporate environmental protection clauses into land grant documents. The grantee (i.e. land title holder) may be required to rectify any breach of the land grant conditions or reimburse the government which makes good the problems on the grantee's behalf. However, these clauses are fairly vague and do not specifically cover land contamination issues. The land grant document of the CLS site contains the following environmental protection clause:

"The grantee shall not permit sewage or refuse water to flow from the lot on to any adjoining land or allow any decaying, noisome, noxious, excrementitious, or other refuse matter to be deposited on

any portion of the lot and shall see that all such matter is removed daily from the premises in a proper manner.”

Land grant documents generally contain a clause to allow the government to enter the land for inspection. However, it does not authorise the inspector to carry out site investigation. This is why the government could not enter the site to carry out site investigation prior to acquiring the subject land. The HKSAR government is now seeking legal advice to see if the former owner had breached any environmental protection provisions in the land grant document and whether it can ask the previous owner to pay compensation (Mak, 2002).

Land contamination in Hong Kong may also be regulated through conditions attached to town planning approval. Urban areas in Hong Kong are covered by the respective statutory plan called the “outline-zoning plan (OZP)”. In general, developments or redevelopments that comply with land uses permitted by the OZP need not have separate approval from the Planning Department (PD). Planning permission is required only when rezoning is necessary. When granting rezoning approval, the PD may attach environmental protection clauses to the conditions of the approval document. For areas not covered by an OZP, a planning permission is required only if the development or redevelopment falls within a Development Permission Area (DPA) (Ng, 2002). In the subject case, the shipyard is not within an OZP area or a DPA. Also, the previous landowner did not have any development or redevelopment proposal. The PD thus does not have any power to deal with land contamination issues on the site.

Given the fragmented nature of the current contaminated land management practice, the legal loopholes and the unique characteristics of the subject land acquisition, no legal action has been taken against the former shipyard owner.

DISNEY’S LIABILITIES

In the USA, land contamination is strictly regulated under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). Apart from the polluters, landowners, including financiers, who are involved in the direct management of the polluters’ business, may be held liable for land contamination (Chan, Jefferies & Simons, 1998). In the subject land contamination incident, while Disney is an American company, and a partner of the theme park development, they are not liable under CERCLA because they are not the polluters or landowners of CLS, and that Hong Kong is outside the jurisdiction of CERCLA.

The company is also not liable under Hong Kong laws for remediation of the site, even though it is a partner of the joint venture theme park scheme. Under the joint

venture agreement, the HKSAR government is responsible for providing land and infrastructure for the theme park development. Similar to other compulsory land acquisitions for public purpose in the territory, the CLS site becomes government after acquisition and does not form part of the theme park asset. Accordingly Disney has no legal obligation to remediate the site.

LESSONS TO BE LEARNT

Hong Kong has never been a heavy industrial base; the public and the government generally do not consider land contamination a serious threat (Tsing, 2002). Against this background, the government does not treat it as an important issue and the regulation of land contamination is very fragmented. Although serious environmental problems are rare and the overall environment is acceptable, the CLS incident is a wake up call for the HKSAR government, as more environmental problems similar to the CLS incident may be unearthed in the future.

The land contamination issues on the CLS site has cost the HKSAR government dearly. The remediation cost is now more than 10 times the original budget. The government has to fund the remediation works. Besides money matters, there are criticisms on the government's performance in handling the issues. The incident not only causes an embarrassment to the government, but also tarnishes the international image of Hong Kong.

In the CLS incident, the HKSAR government's hasty decision to acquire the site is to blame. The biggest issue is that the government had no power to enter the premises to investigate potential environmental problems prior to the land acquisition. As a result, the reserved funding for the remediation works is far less than the real cost required. Apparently, the current power of the government is inadequate and needs to be reviewed.

The subject land contamination incident could be seen as partly due to the ignorance of the shipyard operator regarding the impact of on-site disposal of industrial wastes, and partly due to the remote location of the shipyard and that unlawful waste disposal would be difficult to detect by the authority. After all, none of the relevant government departments is charged with the exclusive responsibility to detect and regulate land contamination activities. They also do not have the necessary power to pursue the perpetrators. The fragmented approach to land contamination management creates loopholes for offenders to escape liabilities.

The CLS land contamination incident clearly shows that there needs to be an ultimate authority to deal with land contamination issues. On the other hand, the

environmental laws need to be reviewed and tightened up. Experience from developed countries such as Australia, the Netherlands, the UK and the USA shows that there needs to be specific legislation and a single enforcing authority to deal with land contamination issues (Chan, 1997). While land contamination issues are relatively minor in Hong Kong and it may not be necessary to enact draconian environmental laws like those found in certain developed countries, at least the relevant authority should be given adequate power to take the initiative to investigate suspected land contamination activities and prosecute the polluters.

IMPACTS ON THE PROPERTY MARKET

The subject contaminated land incident may have a long-term impact on the property market. Although Hong Kong is a big city, its area is actually very small, a total of 1100 sq. km only. In contrast to the small area, it has a big population. The census in 2001 showed that Hong Kong has a population of about 6.75 million (ISD HKSARG, 2003). The interaction of these two factors makes land a precious commodity in the territory. While developers may get land from the government via public auction, redevelopment of former industrial sites is a common means to obtain land for development.

In the past few decades, a number of former industrial sites were redeveloped. The more notable ones are shown in Table 2.

Table 2: Redevelopment of former industrial sites

Project	Former land use	Current land use
Harbour City in Tsim Sha Tsui	Godown	Commercial/residential
Mei Foo Sun Chuen in Lai Chi Kok	Oil depot	Commercial/residential
Tai Koo Shing in Quarry Bay	Dockyard	Commercial/residential
Kwun Yick Building Phase I - III in Sai Wan	Godown	Commercial/residential
Whampoa Garden in Hung Hom	Dockyard	Commercial/residential
South Horizons in Ap Lei Chau	Power Station	Commercial/residential

In the past, developers did not seriously consider land contamination issues because of the absence of statutory liabilities. Nevertheless, they knew that land contamination might affect property values and often tried to keep secret any finding of contaminated soil on their building sites (Leung, 2002). Remediation works were often carried out without due care or consultation with the Environmental Protection Department (EPD). However, this practice has changed

after the operation of the Environmental Impact Assessment Ordinance in 1998. By virtue of the ordinance, if a development or redevelopment is a designated project, the developer needs to submit an environmental impact assessment report to the EPD for approval.

In recent years, environmental awareness of the Hong Kong people has been increasing. The CLS incident has undoubtedly raised the public's concern for health risks from contaminated land. Given the statutory requirements and public concerns, developers can no longer ignore land contamination issues. There are two likely impacts on the property market arising from this issue.

The first one is the likely impact on the supply of property. In Hong Kong, the normal property development period is about 3 years from land acquisition to completion (Fung, 2001). As the redevelopment of contaminated or potentially contaminated sites requires site investigation, approval of remediation program by the authority and implementation of remediation program, the overall development period will be longer. It lengthens the time to supply property and adds uncertainty to the project, because the market may change from good to bad by the time the project is completed.

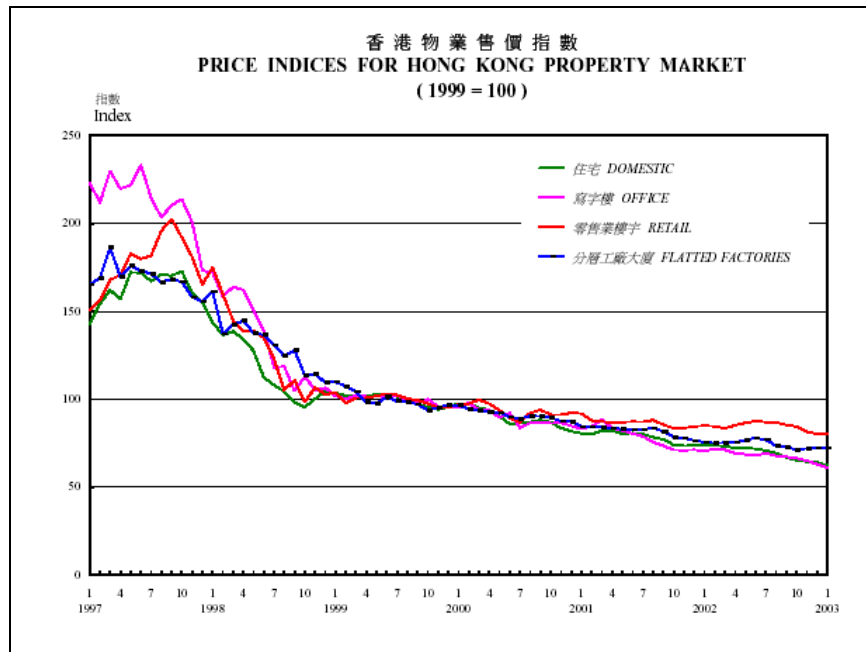
The second likely impact is on development costs and subsequent sale prices. The cost to carry out site investigation, preparation of an environmental impact assessment report and implementation of a remediation program can be very high. On top of this, there is the associated holding cost during this period. The overall development cost will no doubt be higher. Nevertheless, developers will certainly take the likely cost into consideration when making an offer to acquire the land. Unless the remediation cost exceeds the original estimate, it is unlikely that the cost will be passed on to the consumers, given the highly competitive market condition in Hong Kong.

Regarding sale prices, there may be pressure from stigma factors. Stigma arises out of health risk perception, even after the land has been remediated. It is regarded as "the detrimental impact on property value due to the presence of a risk perception-driven market resistance" (Chan, 2001). It has been well documented that stigma does have an impact on property prices (Patchin, 1991; Mundy, 1992; Roddewig, 1996; Syms, 1997; Neustein and Bell, 1998; Bond, 2000; Chan 2001, 2002). Accordingly, properties built on a former contaminated site may experience pressure on volume of transactions and prices.

At present, the Hong Kong property market is experiencing the most difficult period since the territory was returned to China in 1997. In addition to oversupply, property prices has dropped significantly to a record level; see Figure 2. Given the current unsatisfactory market conditions, it is unlikely that land contamination

issues will have immediate impacts on the property market. The impacts may surface when the market is back to normal.

Figure 2: Price indices for Hong Kong property market



Source: R&VD HKSAR, 2003

CONCLUSION

The Disney theme park project is one of the measures to revitalise the Hong Kong economy. Its success is hinged on a number of factors, including environmental issues. The discovery of a large amount of dioxins on the CLS site has caused a lot of concerns among the Hong Kong people and potential visitors to the theme park. The government needs to address the issues promptly and carefully.

Hong Kong is a dynamic city and redevelopment of former industrial sites for alternative uses is inevitable. It has never been a heavy industrial base, and the chance of having large scale land contamination may be remote. Nevertheless, land contamination similar to the CLS incident may be unearthed in the future when more former industrial sites are redeveloped.

At present, the CLS site is being decommissioned and remediated accordingly to the recommendations in the environmental impact assessment report. Nevertheless, the incident highlights that the current practice of land contamination management in Hong Kong is far from satisfactory. There needs to be a more effective approach for the government to detect and monitor land contamination activities and to take legal actions against the polluters/landowners. Also, the government needs to have adequate power to enter premises for site investigation prior to compulsory land acquisition, including land acquisition by agreement. Experience from developed countries shows that there needs to be specific regulation and a single authority to deal with land contamination issues. The HKSAR government should borrow the experience from its overseas counterparts and formulate a suitable approach to tackle land contamination problems in Hong Kong.

The subject incident may have impacts on the Hong Kong property market in the long run. The supply and prices of property may be under pressure, given that developers have to comply with the relevant environmental protection laws, and there may be detrimental impacts from stigma factors. However, the real impacts can only be seen after the current ailing property market recovers.

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