July 31, 2012

Environmental Policy Monthly

Environmental Protection Administration, R.O.C. (Taiwan)

ISSN: 1811-4008 GPN: 2008600068

The EPM is available at http://www.epa.gov.tw/environmentalpolicymonthly

Feature Article

Soil and Groundwater Pollution Emergency Response

The Taiwan government has established principles and methods for handling all types of accidents to ensure implementation of emergency response measures and to prevent the worsening of soil and groundwater pollution. Building on past experience with different aspects of emergency response procedures and technologies, the goal of emergency response is to appropriately protect victims and prevent pollution from spreading at the onset of an accident.

In any operation involving the handling of petroleum products or other chemical accidents, unforeseeable events such as human error, natural disasters or other external factors could result in contamination of soil and groundwater. In past accidents, soil and groundwater contamination was commonly neglected after wrapping up onsite emergency response work. In recent years the legislation of the 'Soil and Groundwater Pollution Remediation Act' and the incidents of high-profile pollution have highlighted soil and groundwater pollution as the focus of environmental protection efforts. This helps create a more complete picture that takes into consideration all the implications of pollution events, thus providing a better understanding of effective and swift methods that can prevent the spread of pollution and protect those in danger – two foremost tasks during an emergency pollution event.

Establishing a Support Team to Carry Out Emergency Response Measures

Some of the more common causes of pollution accidents include wastewater discharge, dumping of waste, tanker accidents, storage tank leaks, and breakage of oil pipelines. There is a vast difference in the pollution characteristics of each of these types of accidents. Even accidents of a similar nature can vary widely depending on the amount of pollutants released, geographical and geological factors, as well

In This Issue

as daily habits of affected residents. These variables lead to differences in degree of contamination, degree of urgency and the types of emergency response measures required for each accident.

For example, in 1996 and 1998 there were accidents along the provincial roadway near Houlong River Bridge and at the 322.5 K mark of the national highway. Both accidents involved leaks in a long-distance oil pipeline. In one of the accidents, the leaked substance spread after contaminating surface water and had an immediate impact on the local fisheries in the watershed. In the other accident, the pollution spread through groundwater and through air spaces in the soil, affecting nearby residents many days after the leak occurred. As can be expected, there were major differences in the substance and costs of follow-up remediation work in each of these two cases.

As mentioned above, there are wide variations between different soil and groundwater pollution accidents, making it difficult to apply a one-fits-all set of emergency response procedures or mechanisms. Nonetheless, any response to an emergency pollution event should be able to immediately implement relevant emergency response measures to control the spread of pollution. The initial response is critical in that it works to protect people, decrease the area of contamination and reduce follow-up remediation costs.

Some of the indispensible elements for achieving this goal are a fast and proficient emergency response team, experience of personnel, technology, and the creation of an operations manual. Thus in recent years the EPA has actively launched initiatives regarding the handling of emergency pollution events, including the establishment of professional emergency response support teams. These teams conduct pollution inspections and verification work at the outset of soil and groundwater pollution events to ensure a full understanding of the status of the

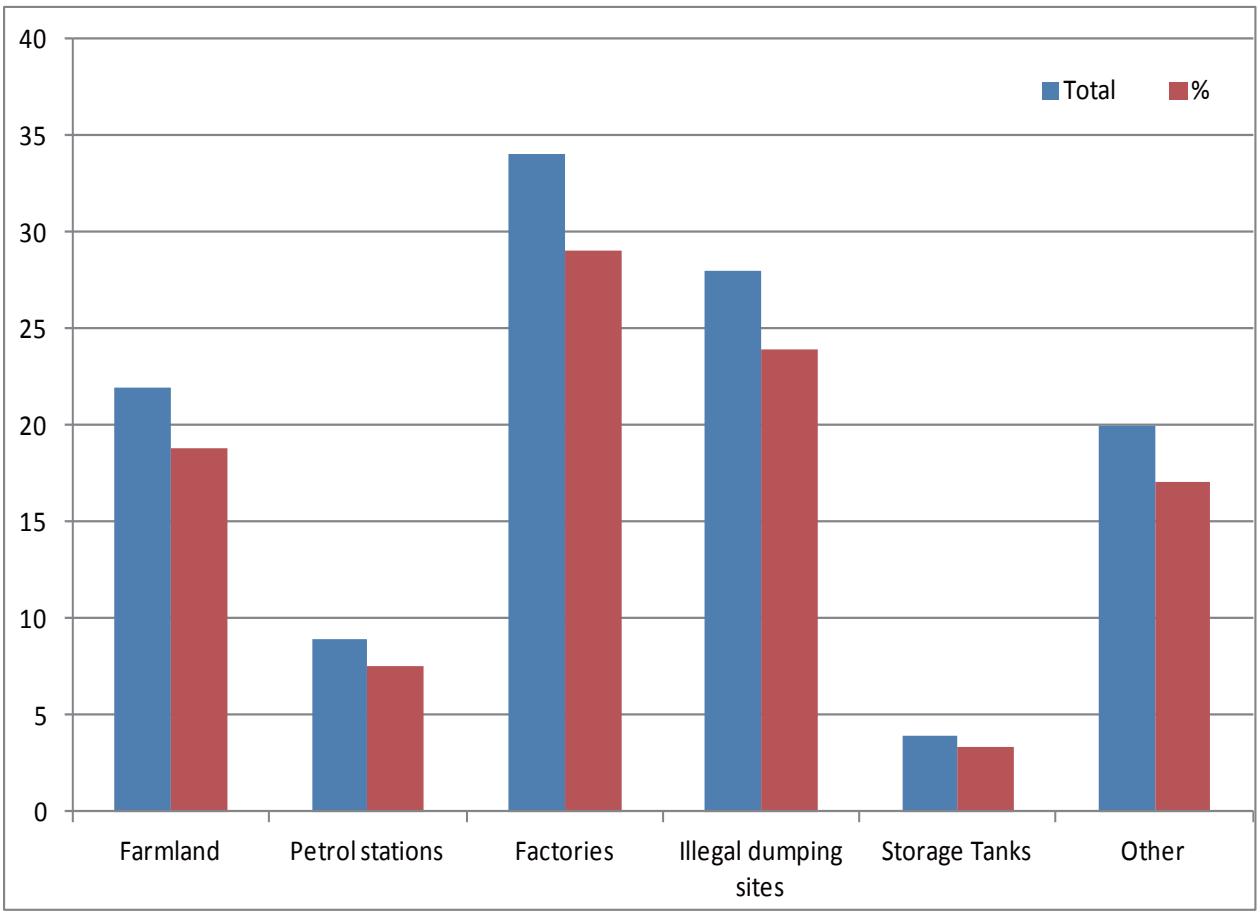

Figure: Accumulated Total of different type of pollution sites between 2001 and 2010

pollution. The EPA has also published the Soil and Groundwater Pollution Event Emergency Response and Handling Reference Manual, which sets handling principles and methods for each kind of case. The manual draws on accumulated experience in emergency response procedures and techniques gained during actual implementation. It is hoped that in the handling of future pollution events, response organization can be more complete, response actions can be more rapid, and related response measures can be more appropriate so as to attain the goal of protecting people and preventing the spread of pollution.

Central and Local Cooperation to Maintain Command over Pollution Situations and to Provide Immediate Response

In February 2000, the 'Soil and Groundwater Pollution Remediation Act' provided the legal basis for implementing related work. In the face of increasing numbers and complexity of investigations into soil and groundwater pollution, assessments of improvement work, and emergency response work, county governments are being hindered by budget restrictions and administrative procedures. This makes it impossible to immediately attend to the response needs of pollution events and also makes it difficult to gain command over the actual status of pollution events. Thus there is still a need for the EPA to provide assistance during complex events, or when otherwise necessary.

From 2001, the EPA began to commission professional organizations in special projects to provide emergency response and technical support for soil and groundwater pollution events. By the end of 2011, this mechanism saw to the implementation of nine special plans in which emergency response and technical support was provided at 140 sites. The general objectives of emergency response and verification are to verify pollution and improvement efforts, and investigate the causes and sources of pollution. Between 2001 and 2004, most pollution emergency response work was in the area of pollution verification. Work began to diversify from 2005 to 2011, which in addition to pollution verification, saw an increase in pollution source tracking, as well as investigation of pollution sources and environmental media.

Thirty Percent of Pollution Sites Due to Factory Pollution

Most pollution sites are factories, illegal dumping sites, and farmland. The most frequent soil pollutants are total petroleum hydrocarbons (TPHs), benzene, nickel, chromium, copper and zinc, while the most common groundwater pollutants are benzene, toluene and vinyl chloride. Factories are the most common type of pollution site, comprising 29% of all cases, attesting to factory pollution as the main source of soil and groundwater pollution. The next most common type of pollution sites are illegal dumping sites, which account for 24% of all cases, showing that illegal disposal of waste is still a problem. The third most common type of pollution sites are farmland and other cases including oil pipeline leaks, accidents and pollution with unclear sources. Contaminated petrol station sites are relatively fewer in number, mainly due to the EPA's implementation of widespread inspections at petrol stations in recent years.

Based on investigation results, pollutant concentrations in soil and groundwater exceed control standards at nearly half of all pollution sites. Among the sites that have already completed emergency response work, over 20 sites have been announced as control sites in the following jurisdictions: Taichung City, Taoyuan County, Changhua County, Kaohsiung City, Taipei City, New Taipei City, Chiayi County, Tainan City, Hualien County, Hsinchu County, Pingtung County and Penghu County. Another six sites have been announced as remediation sites: Tainan Rende Jiaren Petrol Station Oil Pollution Incident Site, Tainan City China Petroleum and Chemical Corporation Anshun Site, Kaohsiung City CPC Kaohsiung Refinery P37 Tanker Area, Miaoli County Vinyl Chloride Pollution Site, Pingtung County Sinyuan Township Sinyang Section 432-6 Land Verification and Inspection, and the Kaohsiung Formosa Plastics Corporation Renwu Plant. As the pollution source was not clear in the Miaoli Toufen Zhunan Area Groundwater Pollution Investigation, groundwater use restriction zones were delineated and other restrictions were announced.

Recognizing the importance of emergency response to soil and groundwater pollution incidents, the government has established management principles and methods for various types of accidents, drawing on years of experience in all aspects of emergency

response procedures and technology. Measures taken at the outset of a pollution accident can ensure appropriate protection of people and prevent pollution from spreading. The EPA has already established emergency support teams to assist in handling emergency pollution incidents and ensure speedy command over site pollution conditions. It will help ensure that necessary and effective emergency responses can be adopted with the required measures to prevent pollution from spreading or damaging human health and environmental quality. Once pollution has been confirmed, regulatory procedures are followed according to the law to ensure that polluters receive due punishment.

Water Quality

Continuous Automatic Wastewater Monitoring to Allow Immediate Control of Effluent Discharge

The EPA has drawn up regulations to cover maximum limits for wastewater volumes, automatic water quality monitoring systems, and video monitoring equipment for the exclusive sewer systems of industrial parks and large-scale enterprises over a designated size. Once installed, this equipment transmits real-time data on pollution discharges to local environmental protection bureaus. Preliminary estimates suggest that 114 operators, accounting for approximately 50% of Taiwan's industrial wastewater, will be required to adopt the new measures.

The 'Water Pollution Control Measures and Test Reporting Management Regulations' originally stipulated that only the dedicated sewer systems of industrial parks had to have automatic water quality monitoring facilities installed in them. In order to gain better control over wastewater of large-scale enterprises, the EPA recently preannounced revisions to the management regulations so that enterprises with daily wastewater volumes exceeding 15,000 cubic meters, as well as power plants that produce cooling water or use wet air pollution control systems, will be subjected to automatic water quality monitoring regulations in the future. Operators will be required to monitor both influent and effluent for volumes, temperature, hydrogen ion concentration index, electrical conductivity, chemical oxygen demand, suspended solids, ammonia nitrogen and any other values set by the central competent authority. Discharge outlets or affected shorelines must also be monitored and relevant data and images must be sent to local competent authorities via transmission modules and the Internet.

Promoting the uptake of automatic monitoring and continuous data transmission for sewer systems will allow operators to fine tune their wastewater treatment facilities and improve functionality, and thus take another step on the road to full self-management. In the event of abnormal wastewater quality readings or emergencies, the automatic monitoring systems will also be able to sound alarms so that emergency response and improvement measures can be immediately launched. The automatic monitoring systems are thus also an improvement to factory pollution prevention management, and also provide environmental agencies with comprehensive, real-time effluent data to help control wastewater pollution and remediate Taiwan's rivers.

The EPA will be giving industrial parks and large-scale enterprises plenty of time to make the necessary adjustments. Industrial parks will have one year from the date informed by the EPA to complete the installation of automatic water quality monitoring facilities and video monitoring equipment on their sewer systems. Enterprises are also required to abide by the promulgated revisions of the 'Water Pollution Control Measures and Test Reporting Management Regulations.' It is estimated that they will have to install the monitoring equipment no sooner than the end of 2013. The new measures will certainly lead to fewer abnormal wastewater discharges by operators, which will obviously be positive for environmental protection efforts. The EPA is urging all parties concerned to fulfill their responsibility to the environment by abiding by the new regulations.

Water Quality

Revisions to Water Pollution Control Measures and Test Reporting Management Regulations Preannounced

On 28 June 2012, the EPA preannounced revisions to the 'Water Pollution Control Measures and Test Reporting Management Regulations' (水污染防治措施及檢測申報管理辦法). The revisions are designed to strengthen the management of discharged wastewater, ensure the proper functioning of facilities, enhance pollution prevention, and increase the scope of Internet-based monitoring. The revisions will encompass a number of new management methods that will enhance the effectiveness of current pollution prevention measures.

The 'Water Pollution Control Measures and Test Reporting Management Regulations' were first promulgated on 16 October 2006. When they were amended on 7 July 2010 to strengthen the management of industrial park sewer systems, the unique characteristics of industrial park sewer systems were taken into account before adding regulations governing pollution management and continuous water quality monitoring. Also taken into consideration was the fact that wastewater from large-scale enterprises is usually of complex content and large volume. Wastewater from power plants has the additional problem of being warm, and has a noticeable impact on coastal ecosystems that causes concern in many circles. The EPA has thus decided to try out the same methodology as used for industrial parks in requiring power plants to abide by the new continuous water quality monitoring regulations. As for enterprises that seriously violate the regulations – such as by installing bypass discharge pipes or operating inadequate wastewater treatment facilities – the regulations now require them to have their monitoring equipment connected through the Internet to the local environmental protection bureau. The bureaus will also be required to carry out management-enhancing measures such as wastewater treatment facility function testing and certification to ensure that the operators have made the necessary improvements.

The EPA acknowledges that the management of industrial wastewater in general – and of enterprises that have high potential to pollute in particular – is in need of additional review and strengthening. To this end, the EPA added a revision requiring enterprises to adopt the best possible measures for reducing pollution in discharged wastewater. The revisions also cover special category enterprises, adding management methods and mechanisms for preventing spillages from polluting groundwater, restricting the areas where pickling wastewater can be discharged, and controlling substances of acute biological toxicity.

Air Quality

Revisions to Steel Industry Smelting Plant Emission Standards Promulgated

Steel smelting plants are major sources of air pollution. The EPA recently amended the Steel Industry Smelting Plant Air Pollutant Emissions Standards in order to strengthen controls over this category of air pollution source.

Although steel smelting plant emissions standards have been tightened in various nations over the last few years, this has been accompanied by technological advancements in emission treatment. Taiwan's steel smelting plants have also been able to keep actual emissions within the currently enforced maximums. The EPA thus decided to amend the standards after taking into account overseas standards, the status of domestic emissions, the feasibility of emissions control technology, and cost-

benefit analyses. Since emission improvements in steel smelting plants involve considerable engineering work and expense, the EPA will enforce the new standards in stages to give operators a suitable grace period to adjust to the new regime.

The main purpose of the revisions is to tighten emissions standards for particulate pollutants, sulfur oxides, and nitrous oxides. The EPA also took into account the special nature of the steel manufacturing process and the possibility of emission reductions elsewhere in smelting plants when deciding to adopt the total emissions control method. A new revision was added that sets smelter emission standards for the first three hours after the smelter is fired up, and for when pollution prevention equipment is being repaired. The EPA estimates that steel smelter operators will have to invest NT$6 billion in upgrading their pollution prevention facilities in order to comply with the new regulations.

The promulgation of revisions to the Air Quality Standards (空氣品質標準) on 14 May 2012, will lead to tighter restrictions on fine suspended particulate matter, and the EPA is currently formulating a comprehensive strategy to implement the necessary controls. The EPA will be looking closely at how to tighten air pollutant emission standards for stationary sources such as power plants and steel smelting plants. The EPA took into account local air pollution characteristics and announced the 'Kaoshiung City Steel Smelting Plants Dioxin Controls and Emission Standards', the 'Taichung City Steel Industry Air Pollutant Emission Standards', and the 'Taichung City Stationary Source Hexavalent Chromium Emission Standards'. Standard legal procedures will be employed for determining the 'Taichung City Power Generation Facilities Air Pollutant Emission Standards' and the 'Kaohsiung City Power Generation Facilities Air Pollutant Emission Standards.'

Soil and Groundwater

Preliminary Assessment and Treatment Level Evaluation Regulations for Soil and Groundwater Contaminated Sites Preannounced

On 2 July 2012, the EPA preannounced a draft of the 'Preliminary Assessment and Treatment Level Evaluation Regulations for Soil and Groundwater Contaminated Sites' (土壤及地下水污染場址初步評估暨處理等級評定辦法) in accordance with Article 12 Paragraph 11 and Article 14 Paragraph 5 of the 'Soil and Groundwater Pollution Remediation Act.'

In order to strengthen controls over sites contaminated with soil and groundwater pollution, the EPA has drawn up a complete set of contaminated site hazard assessment methods. Over the last few years, the EPA has also conducted a review of the effectiveness of implementing the 'Regulations Governing the Preliminary Assessment of Soil and Groundwater Pollution Control Sites' and the 'Remediation Site Scope of Pollution Survey, Environmental Impact Assessment, and Cleanup Priority Ranking Regulations.' The latest draft accords with the assessment demands laid out in the articles in the 'Soil and Groundwater Pollution Remediation Act,' and aims to enhance risk assessments of contaminated sites. Since the assessment objectives in the two articles are very similar, the EPA combined the requirements into one draft. The main areas covered in the draft include:.

- Pollution impact potential assessment methods and assessment content.
- Regulations regarding when a control site will be announced as a remediation site.
- Evaluation criteria for determination of remediation level.
- Modifications to the funding priorities of the Soil and Groundwater Pollution Remediation Fund.

Designation of a pollution site is based on how sites

with different degrees of pollution are undergoing appropriate control and treatment. The method for determining level of treatment has an influence on the application of the Soil and Groundwater Pollution Remediation Fund. The preliminary assessment currently employed is solely for determining concentrations of pollutants present in soil and groundwater. With the promulgation of the new draft, preliminary assessment factors will be revised to include risk assessment, part of a general trend toward promoting risk assessment. The management of contaminated sites is also expected to be improved by designating sites for remediation and using the Soil and Groundwater Pollution Remediation Fund as required by site-specific circumstances.

Noise Control

Revisions to Noise Control Standards Preannounced

The EPA recently preannounced draft revisions to the 'Noise Control Standards' (噪音管制標準). The revisions mainly involve increasing the scope of noise control areas for each category of premises, facility, or construction project, and tightening the standards in terms of decibels and time periods. Noise control standards for wind turbines and relevant retesting regulations have also been added. The EPA invites interested stakeholders to send in their opinions or suggestions for improvements, and will give due consideration to all correspondence.

The EPA has noted that the citizens of Taiwan are becoming increasingly demanding about the quality of their environment. Noise pollution has consistently been number one on the list of public nuisance complaints in recent years, with the total number of complaints received remaining high. In fact, over 90% of the cases investigated by the EPA involve noise that is within stated limits or cannot be measured on time, and the actual rate of penalty imposition is only about 8%. It is clear that implementation of the current 'Noise Control Standards' is not satisfying the public's demand for a quieter living environment.

In addition, the number of repeated noise complaints has increased rapidly, going from 1,831 in 2008 to 3,103 in 2011, an increase of about 70%. This shows that despite passing repeated noise inspections, some noise pollution sources still disturb the peace of nearby residents. These are the primary cause of the increase in noise complaints that has necessitated revisions to noise control values, area and time restrictions, and assessment methods. Clearer regulations governing follow-up inspections have also been added to address the problem of noise sources at some sites (e.g., construction sites) changing after the initial inspection. The clarifications will give inspectors regulatory support in the case of disputes during follow-up inspections and are hoped to lead to a reduction in the number of noise complaints received.

The main points of the revisions are as follows:

- Low-frequency noise control standards will be lowered by 3 decibels for all time periods for factories, places of entertainment, business premises, and construction sites in noise control area categories 1-3.
- Full-frequency noise control standards will be lowered by 3 decibels for all time periods for factories, places of entertainment, business premises, and construction sites in noise control area categories 1-3.
- Noise control standards will be lowered by 3 decibels for amplified sound except for night time periods in category 1 noise control areas.
- Full frequency noise control standards for wind turbine facilities will henceforth be applied incrementally.
- Noise control standards have been added for open facilities.
- Regulations governing compulsory retesting have been clarified.

- For sources of regular and intermittent noise of varying volumes (such as freezers) restrictions will be applied based on an average of the ten loudest noise levels measured. It is hoped that this measure will solve the problem of members of the public being disturbed by this particular type of machinery.

The EPA estimates that enforcement of the latest revisions will lead to an increase of around 15% of inspections finding noise levels to exceed limits, which will lead to the parties responsible for the noise pollution to make improvements.

Air Quality

App Service for Taiwan UV Index Now Available

The EPA has finished developing a free, downloadable mobile phone app for the Taiwan UV Index. The app allows users to connect to the EPA's UV radiation monitoring information database and access real-time information on UV indices, highest daily values, forecasts and other information for various locations around the nation. The app also provides practical advice on how to protect against UV radiation. Members of the public are invited to take advantage of the facility.

This app will initially be only available for Android-enabled mobile phones and can be downloaded for free from Google Play online store. Other mobile phone versions, such as Apple iOS and Windows Phone, will be released in due course to accommodate the growing number of smartphone users. The EPA would like to point out that UV monitoring data is available through a number of channels. For example, real-time information on UV indices and UV forecasts can be accessed by adding the EPA service account epa-uv as a "friend" in Facebook and other social networking sites.

The App Service for the Taiwan UV Index now available for Android-enabled mobile phones

The EPA is planning to add two new UV monitoring stations – in Taipei and Chiayi – to expand the scope of UV monitoring. This will increase the total number of stations from 19 to 21. To give the public data that is even more up-to-date, the EPA also plans to increase UV forecasts from once a day to twice a day, at 10:30 am and 5:00 pm. The information will be particularly useful for members of the public who wish to travel or undertake outdoor activities during the hot summer months.

The EPA is also currently applying the Open Data method to disseminate various types of environmental monitoring data. The recent upgrade of the UV radiation monitoring index Web services function is a part of this, as is providing app source codes free of charge to software developers so that they can develop value-added applications. It is hoped that bringing the private sector on board will lead to the development of even more interesting and practical apps and services for the purpose of environmental protection. More information on this type of interface service and its functions is on the EPA's air quality monitoring Web site: http://taqm.epa.gov.tw.

Air Quality

Monitoring of $PM_{2.5}$ to be Launched Nationwide in August 2012

The EPA has been stepping up the task of controlling fine suspended particulate matter ($PM_{2.5}$) by drawing up plans for monitoring $PM_{2.5}$ concentrations in the air at 30 air quality monitoring stations around Taiwan. $PM_{2.5}$ monitoring technology has been developed and disseminated by the EPA's Environmental Analysis Laboratory, and the maturation in the technology and capacity building has led to $PM_{2.5}$ monitoring being scheduled to begin in August 2012.

Fine suspended particulate matter refers to particles suspended in the atmosphere that have an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$). Particles of such a small size are easily absorbed through the lungs into the body and can thus have a negative impact on human health. In order to improve the quality of the environment and protect the health of Taiwan's citizens, on 14 May 2012, the EPA announced revisions to the 'Air Quality Standards' with the addition of $PM_{2.5}$ air quality standards. The 24 hour maximum value for $PM_{2.5}$ has been set at 35 $\mu g/m^3$, and the annual average has been set at 15 $\mu g/m^3$.

Before the $PM_{2.5}$ air quality standards were announced, the EPA's Environmental Analysis Laboratory had previously, on 19 June 2006, announced its method for quantifying $PM_{2.5}$ based upon the US EPA's Federal Reference Method. A later revision, announced on 30 April 2012, saw this method become the standard sampling and testing method – the technological foundation on which Taiwan's nationwide system of $PM_{2.5}$ air quality monitoring is being built.

The EPA's Environmental Analysis Laboratory is the first organization in Taiwan to possess $PM_{2.5}$ testing technology and field equipment. The testing technology has been developed to adhere to the US national standards. Since $PM_{2.5}$ particulate matter is extremely light it is easily affected by temperature and humidity, and hence testing for $PM_{2.5}$ must be done using a microbalance in a sanitized environment in which temperature and humidity are strictly controlled. As part of a pilot plan conducted between 2011 and 2012, the lab analyzed over 1,000 manually taken samples for $PM_{2.5}$ content and concentrations. Very high quality data that has become the foundation of Taiwan's $PM_{2.5}$ testing program was obtained.

The Environmental Analysis Laboratory has also been actively building Taiwan's $PM_{2.5}$ testing capacity by promoting the uptake of the technology among private-sector testing organizations and by offering guidance, assessments, and evaluations. The lab did its part to protect public health by assisting in the establishment of the 30 $PM_{2.5}$ air quality monitoring stations. To date, sample testing technology developed by two private-sector environmental organizations has been evaluated and approved by the EPA and is now being used by local governments to conduct $PM_{2.5}$ sample testing. There are another 5 or 6 private-sector environmental organizations that are expected to apply to the EPA for evaluation of their testing technology. On receiving EPA approval they will be able to participate in $PM_{2.5}$ sampling and testing, thus helping to accelerate the building of Taiwan's testing capacity and greater control over air quality.

Air Quality

Air Quality in 2011 Best in Years

The unstinting efforts of local government environmental protection bureaus resulted in 2011 being the best year recently in terms of average nationwide air quality and improvement in quality over the previous year.

The EPA pointed out that statistics for 2011 showed the number of days when air quality was poor (PSI＞100) at only 1.38%, an improvement of 4.2% over the figure of 1.44% for 2010. Among the

1.38%, PM_{10} contributed 0.42%, the same as 2010, while ozone contributed the rest 0.96%, showing a 5.9% improvement over the 2010 figure of 1.02%.

Of the seven major emission control zones, the Yilan and Hualian/Taitung zones generally have much better air quality, recording far lower numbers of poor air quality days than the other zones. In the five western zones, the number of PSI＞100 days in 2011 was fewer than in 2010. The Hsinchu/Miaoli zone showed the greatest improvement (at least 31.3%), followed by the Yunlin/Chiayi/Tainan and Kaohsiung/Pingtung zones. The local government environmental protection bureaus are to be applauded for their hard work in reducing pollution and improving air quality.

The EPA points out that although the air quality figures for 2011 showed considerable improvement, other negative factors such as the slow increase in the overall burden on the environment, changes to global climate patterns, and the dramatic increase in long-range aerial transportation of pollutants to Taiwan are still present. Further improvement of air quality will therefore require continuous effort by central and local government environmental protection agencies. The EPA will continue interdepartmental cooperation to improve air quality and protect public health – as is expected of it by Taiwan's citizens – by working with local governments to review and improve existing systems and regulations.

Soil and Groundwater

Taiwan and USA Join Forces to Promote Soil and Groundwater Phytoremediation

The EPA is always looking for ways to enhance expertise in soil and groundwater pollution survey and remediation, and thus regularly brings cutting edge surveying and remediation technology to Taiwan from overseas. One of the more recent international environmental trends that the EPA has responded to is phytoremediation. With the cooperation of the US EPA, two American experts recently visited Taiwan to talk about the latest developments in this technology.

Phytoremediation takes advantage of some of the natural characteristics of plants: Plants can absorb, stabilize, capture, metabolize, and break down pollutants found in soil, groundwater, or sediment. The costs of phytoremediation are lower than those for employing traditional remediation technologies. It also has the advantage of covering polluted sites with pleasant greenery, which makes it a very attractive alternative to traditional remediation methods as we move toward building a more eco-friendly, low-carbon, sustainable society. Phytoremediation has already evolved into mainstream remediation technology in Europe and North America, another reason why the EPA is keen to promote it in Taiwan. The two American experts recently invited to Taiwan to participate in the phytoremediation workshop were Steve Rock and James Landmeyer, authors of the US EPA phytoremediation handbook and more than 70 journal articles. By sharing their rich experience in the field they have contributed greatly to cultivating Taiwan's homegrown expertise.

The phytoremediation workshop was held in Kaohsiung City from 26-27 June and was attended by enthusiastic participants from both the public and private sectors. In order to promote the dissemination of phytoremediation technology, the EPA has collected relevant information from the workshop and published it on the EPA Soil and Groundwater Pollution Remediation Web site.

Environmental problems are never purely regional, or even purely national, by nature, as shown by the increasing international attention that many local environmental issues have started to attract. In order to keep abreast of international trends, the EPA spends much time and effort on promoting international environmental exchanges. As well as holding this recent workshop, the EPA will also host the "2012 International Soil and Groundwater Symposium and Environmental Exhibition" from 30-31 October 2012. A number of renowned experts from various nations have been invited to give

presentations. Local and overseas consultants in the soil and groundwater field have also been invited, as have equipment suppliers, who will be displaying their wares at the exhibition. News updates will be posted on the EPA's Web site.

Recycling

New Measures for Resource Recycling Enterprise Registration to Commence in September 2012

In order to improve the working conditions of community and village recycling workers, and to integrate the management of resource recycling channels, the EPA is currently drawing up plans for a resource recycling enterprise registration management mechanism. The establishment of a registration management system will act as an integrated registration management platform for all resource recycling channels. The EPA expects the new system to provide fuller information regarding recycling channels and enhance the overall effectiveness of resource recycling. The new measures are expected to go into effect in September 2012.

Recycling Recycling operations in local communities are conducted by low-key but diligent charity groups, recycling companies, and individuals who work closely with local residents to provide convenient recycling stations for them. There are over 10,000 such recycling stations in communities and villages around Taiwan. Though seemingly miniscule, these stations are the real backstage heroes of community environmental protection and provide an indispensable service. The establishment of a recycling station registration management system will allow environmental agencies to keep on top of information regarding types and scales of all recycling channels. It will also allow inspectors to spot poorly managed stations and offer guidance so that recycling workers can maximize their contribution to environmental protection.

Since 2005, the EPA has been working with local environmental protection bureaus to promote the Resource Recycling Image Improvement Plan in order to improve the environs near resource recycling stations. The main purpose of the plan is to provide training and education in environmental protection, health and safety. Results to date have been very positive. The establishment of the recycling station registration management system will mean that after recyclers register with their local environmental protection bureaus, they will be offered guidance on how to set up a proper recycling station, improve their station's immediate environment, run operations that are in harmony with residential environments, and abide by environmental regulations.

Ecolabelling

EPBs Commended for Promoting Green Consumption

The EPA issued awards to the 15 local government environmental protection bureaus (EPBs) that performed well in promoting the Implementation of Green Procurement among Corporations and Citizen Groups Plan.

The EPA is interested in promoting green consumption, and in 2007 rolled out the Implementation of Green Procurement among Corporations and Citizen Groups Plan. The EPA has been working effectively with local government EPBs to reinforce three approaches to green consumption: building a distribution network and purchasing information systems for green products; encouraging private-sector corporations and citizen groups to buy more green products; and promoting education and

guidance regarding green consumption. At the same time the EPA has also been assessing the results achieved by each EPB.

The 15 counties and cities that received the awards were: Yilan County, Chiayi City; Taoyuan County; Kaohsiung City; Taipei City; New Taipei City; Tainan City; Pingtung County; Miaoli County; Keelung City; Hsinchu County; Taichung City; Taitung County; Chiayi County; and Nantou County. They were commended for advising vendors within their jurisdictional areas on how to set up green stores, for encouraging private corporations and citizen groups to buy more green products, and for holding events to promote education and guidance regarding green consumption.

The administrative effectiveness of all of the above 15 counties and cities was of a very high standard, but particularly worth mentioning are: Taipei City's encouragement of private-sector green procurement to the tune of NT$1.6 billion; Tainan City's green consumption promotion events that drew over 160,000 participants; and Yilan County's outstanding performance in administering the Green Coin Action Plan for hotels.

News Briefs

Handbook for Auditing and Certification of Non-plastic Containers Revised

The latest revisions to the 'Regulated Recyclable Waste Recycling, Clearance and Treatment Subsidy Rates' came into effect on 1 July 2012. On the same day the EPA announced revisions to the 'Auditing and Certification Handbook for Regulated Recyclable Waste Clearance (Non-Plastic Containers).' The revisions are intended to raise the quality of the recyclable waste reaching treatment plants, and to enhance the management of disposal and recycling operators who receive government subsidies.

There are three main reasons for the latest revisions. One is to add management regulations to cover managing subsidies for different colors of recyclable waste glass containers, conducting recycling plant inspections, and for implementing measures to ensure a smooth transition from the old system to the new one. Another is to class waste containers of over 17 L in volume – a category which is not designated as recyclable and which can easily be distinguished from most other glass containers – as general waste when calculating subsidies. This revision is expected to lead to an improvement in the quality of glass containers being recycled. The third reason for the revisions is to have clear regulations for the certification of weight reduction calculations so that organizations receiving subsidies cannot use unsanctioned methods of calculation. The EPA is determined to ensure that all organizations receiving subsidies respect the regulations laid out in the auditing and certification handbook. The latest revisions to the handbook are intended to make the auditing and certification of non-plastic container recyclers more thorough and comprehensive. Details of the revisions can be viewed and downloaded from the EPA's recycling Web site (http://recycle.epa.gov.tw/Recycle/index2.aspx).

Annual Output Value of Recycled Plastic Containers Reaches NT$4.8 billion

Last year, the total plastic containers recycled nationwide was approximately 193,000 tonnes. The proper recycling of these containers is estimated to have saved NT$760 million in refuse disposal costs, and the 169,000 tonnes of renewable material produced had a value of NT$4.83 billion. Of this, NT$2.7 billion derived from renewable PET bottles made from waste polyethylene terephthalate (PET) bottle shards. There are currently about 290 container recyclers around Taiwan, of which 17 are treatment plants qualified to receive EPA waste container recycling and disposal subsidies. The types of plastic that are being recycled include PET, polyethylene (PE), polypropylene (PP), polyvinylchloride (PVC), and polystyrene (PS).

Environmental Policy Monthly
R.O.C. (Taiwan)

Publisher
Stephen Shu-hung Shen, Minister

Editor-in-Chief
Tsung Yung Liu

Executive Editors
Y. F. Liang; Yu-ling Yang; Li-kuo Hsiao; Shao-wen Chang; Jason Hoy

Translator
Peter Morehead

Editorial and translation support provided by:
Hui-kuo Consulting, Ltd.

For inquiries or subscriptions to the printed version, please contact:
Environmental Policy Monthly
Environmental Protection Administration
Office of Sustainable Development

83, Sec. 1, Jhonghua Rd.,
Taipei 100, R.O.C. (Taiwan)
tel: 886-2-2311-7722, ext. 2211
fax: 886-2-2311-5486
e-mail: umail@epa.gov.tw

Printed with soy ink on recycled paper.

行政院新聞局出版登記證局版北市誌字第1611號
中華郵政北台字第6128號執照登記為雜誌交寄