

# Environmental Policy Monthly

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## Feature Article

### ***The Results and Status of Taiwan's Incinerator Promotion Efforts***

To further the construction of incinerators in Taiwan, the EPA approved the *Taiwan Area Refuse Resource Recycling (Incineration) Plant Construction Plan* in September, 1991. According to this plan, 21 incinerator facilities throughout the island will ultimately be completed. These facilities will have a total treatment capacity of 21,900 tons. Nine facilities have been completed and the incineration treatment rate has hit 34%. Of the twelve facilities currently under construction, six should be finished by the end of the year, at which time Taiwan's incineration treatment rate will jump to 60%. When all incinerator facilities come on line, the treatment rate will likely exceed 70%.

Due to government financial pressure, it will be necessary to utilize private sector resources. In response, the Executive Yuan approved the *Plan to Encourage the Construction and Operation of Public and Private Refuse Incinerators* in 1996. This plan established the road map for the construction of 15 incinerators with a total capacity of 8,500 tons per day. A contract on one of these facilities has already been awarded, the bidding for another five was recently announced, and the bids for the remaining nine are under preparation. It is estimated that in 2003, upon completion of all facilities, Taiwan's refuse incineration rate will exceed 90%.

## A Look Inside the EPA

### ***The Bureau of Incinerator Engineering***

In order to plan and construct refuse resource recycling (incineration) plants, and to promote the transfer and localization of related technical capabilities, the establishment of the EPA's Bureau of Incinerator Engineering was approved by the Executive Yuan in March, 1992. This Bureau exclusively handles matters related to the various phases of incinerator construction, including:

1. Planning -- the Bureau performs activities such as drafting and promotion plans, allocating budgets, managing engineering activities, tracking and reviewing project implementation, and providing supervisory guidance.
2. Contractor selection and site preparation -- the Bureau manages activities related to selecting and overseeing contracted construction firms, designing plans, overseeing environmental impact assessments, acquiring land, inspecting sites, delineating site boundaries, performing soil analysis, testing, overseeing technology transfer, and planning operations.
3. Construction -- the Bureau reviews design changes, oversees implementation of contract and construction quality and schedule, oversees relevant permit

applications requirements, monitors test-runs, performs final check, and handles complaints and disputes.

4. The Bureau also handles other related planning and construction activities.

## *EPA to Strengthen Industrial Waste Management*

**In response to recent incidents involving the illegal disposal of solid waste, the EPA will list for priority control substances such as compacted ash/dust, oil sludge, volatile organic solvents, and medical waste. If necessary, the EPA will station inspectors on-site to ensure the proper handling of these four types of hazardous waste. As for the extremely urgent need to clear away waste from two sites in Pingtung and Changhwa Counties, the EPA is considering temporarily tapping the Recycling Fund for this purpose. Internally, the EPA has added staff and adjusted waste management departments. In the future, Division 4 of the Bureau of Solid Waste Management will be responsible for the management of commercial organizations. Division 5 will handle management of waste clearance firms and the transboundary movement of waste. This section will also promote development of sites for final waste disposal.**

As cases of illegal waste dumping have continually occurred, and in light of the difficulty encountered in proper handling of waste, the EPA announced on March 18 a string of action plans. The EPA has decided to comprehensively review policy, set priority listings, and even modify its organizational structure in order to solve case-after-case of illegal waste dumping incidents.

First, to demonstrate the government's resolve to strengthen management of industrial waste, the EPA has enacted priority controls on dust/ash collected from air pollution control devices, oil sludge, volatile organic solvents, and medical waste. Discussions with relevant manufacturers have been initiated, and they have been requested to properly handle all solid waste problems.

Most of these priority listed substances have the special characteristic of being produced in large quantities by a small number of firms. As a result, a large degree of control can be achieved with minimal effort. The EPA will use a dual approach to controlling the treatment and disposal of these substances. On the one hand, the EPA will trace waste that has been illegally dumped back to its original source. Waste producers will be made to feel that they can no longer shirk responsibility for proper waste treatment. On the other hand, inspections will be stepped up. The EPA does not rule out stationing inspectors within relevant sites to supervise clearance, treatment, and disposal activities.

The EPA will also perform comprehensive investigations of 160 illegal dumps containing unknown waste substances. Academic and research institutions have

already been contracted to perform site investigations and hazard risk analyses.

The principles for handling future situations will be as follows: if the waste in question is general (non-hazardous) industrial waste, it must be stored in orderly facilities and prevented from collapsing. Prior to properly clearing away the waste, the owner of the land may not change the zoning (land-use) of the relevant parcel. As for hazardous industrial waste, experts will be entrusted to help local authorities properly handle the waste, thereby preventing the occurrence of secondary damage from the hazardous materials.

The EPA will also be performing sample analyses of well water within a 500 meter radius of polluted dumpsites. To identify priority areas for emergency remediation, fifty dumpsites will be initially selected for investigation, testing, and analysis. To date, comprehensive site investigations and sampling activities have been completed. Analysis and assessment work should be completed by mid-May.

Sites slated for priority cleanup and remediation will be chosen as follows:

1. Sites near wells where pollution concentrations exceed drinking water standards.
2. Sites where the surrounding air contains hazardous volatile organic gaseous compounds.

Two sites in urgent need of waste removal [clearance] are in Ping-tung and Chang-hwa Counties, respectively. Buried wastes need to be dug up and hauled away. Unfortunately, local government funding for this activity is insufficient. To enact cleanup measures in a timely manner, the EPA is seeking permission from the Executive Yuan to look into the feasibility of using monies from Taiwan's Recycling Fund. In this case, local governments would be required to sue responsibility parties for waste clearance and handling costs. If the funds cannot be reclaimed, the EPA will petition the Executive Yuan to allocate money from the Second Reserve Fund.

To handle similar future cases, the EPA is studying whether to include articles regarding the establishment of a "fund for clearance and handling of waste of unknown origin" in future amendments to the *Waste Disposal Act*.

Further measures being undertaken by the EPA include the restructuring of waste management departments and reassigning personnel to bolster crucial units. Responsibility for soil pollution control issues has been move from Division 5 of the Bureau of Solid Waste Management to Division 6. From now on, Division 5 will integrate and manage the permitting, operational licensing, and supervision of public and private waste clearance organizations. This Division will also handle transboundary waste movement issues and promote the establishment of final waste disposal sites.

## ***EPA to Integrate Zone-based Responsibility into Recycling System***

**The amount of material recycled in Taiwan has steadily risen since the transfer of recycling duties to the public sector. Taiwan's resource recycling rate was 5.68% in 1998 and is expected to reach 10% by 2001. To address areas with poor or non-existent recycling practices, the EPA has devised a plan to boost container recycling by distributing responsibility by zones. The government will delineate receptacle recycling zones, set recycling prices and subsidize recyclers. The EPA will do a trial run of the program in Taipei and Ilan Counties in June. All counties and municipalities will begin participation in July.**

Since the EPA took over the management of resource recycling last July, the performance of Taiwan's overall recycling system has improved and recycling rates have steadily risen. Waste container recycling has risen from an average monthly rate of 24% to 48%, unwanted motor vehicle recycling rates have gone from a monthly average of 18% to 22.3%, waste home appliances from 1% to 26.8%, and waste computer components from 2% to 77%.

A public opinion survey revealed that 67% of the island's residents recycle. Statistics show that in 1998, over 9 million tons of waste was cleared and transported; 554,000 tons of this was recycled. The resource recycling rate of 5.78% for 1998 surpassed original estimates for the year of 5.68%. Japan's recycling rate for 1998 was 10%, which Taiwan aims to reach in 2001.

The EPA is encouraging the public to recycle by setting up recycling points in the island's scenic areas, city districts, schools and public places. In June, it will test run a recycling zone-based responsibility program focused on container recycling.

The responsibility zone program will not affect the current recycling system. The program will focus on areas with current recycling channel bottlenecks, and use government subsidies to encourage recycling firms to provide recycling services. Areas that are likely to experience recycling problems will be targeted first. Recyclers are reluctant to enter areas that are isolated or where recycling amounts are low. They also prefer to recycle high-value waste containers such as PET, and often refuse to recycle lower-value containers or those made of materials which are harder to recycle, such as polystyrene (styrofoam) and paper.

After recycling zones are delineated, recyclers will be able to bid for the contract to handle recycling within each area. The EPA will consider the bids and set the lowest recycling prices according to the type of container. Subsidies will also be provided to recyclers for vehicle, personnel and transport costs. Prices set for recyclers will not necessarily exceed those already in place for the public and price raises will be limited.

Recyclers will be required to adhere to the set prices and must recycle all types of containers within their zone.

In fact, the responsibility zone program is very similar to the previous system whereby recyclers were contracted to handle all recycling activities in remote areas. The special characteristic of the responsibility zone program is that the government will survey recycling points to determine the probable amount of material recycled, frequency of collection, and minimum recycling payments. A free hotline will also be set up and public responses will be monitored to ensure the quality and frequency of recycling services.

The EPA is sending out 4,000 questionnaires to communities and schools to determine their recycling needs and decide how to map out the recycling zones. Considering the distribution of recycling points, recycling quantity status, and operational status to delineate recycling zones. In most cases, county and municipality boundaries will act as zone boundaries; when necessary, however, zones may span existing jurisdictional boundaries. After the program has been perfected, government subsidies can slowly be withdrawn. Contracts will be rewarded on a yearly basis, leaving room for healthy competition in the bidding process.

Taipei City and I-lan County have already been selected for test runs of the program in June. Other counties and cities will begin implementation in July.

Average Monthly Resource Recycling Amounts								
Time span	containers	Automobiles	Motor-bikes	Tires	Lubricating oil	Lead batteries	Home appliances	Computer components
7/97-6/98	6,672 (tons)	4,443 (units)	15,076	5,738 tons	298,620 liters	1,997 tons	2,000 *	3,795 *
7/98-12/98	12,229 tons	6,079	19,276	5,130 tons	694,661 liters	2,418 tons	68,869	21,013

\* statistics from 3/98-6/98

## ***Hazardous Waste Solvent Treatment Controls to be Strengthened***

**The EPA will strengthen regulatory controls on hazardous waste solvents. Through the process of reverse tracking, the EPA has learned which treatment companies have exceeded allowable treatment capacity. Personnel are currently stationed at factories 24 hours to supervise operations. Approximately 58,000 tons of waste solvents are produced each year, but there is only capacity to properly treat about 40,000 tons. In the future, research will be performed on ways to promote more re-use of waste solvents.**

The classification of solvents is complex and many substances, because they are toxic or inflammable, are very hazardous. Solvents are produced and used in large quantities in Taiwan, and unfortunately, many spent or waste solvents end up being illegal dumped. Current well-known instances of illegal dumping have been found in Taipei County at San-yin Bridge and in Kaohsiung near the Lao-nong River.

Because of the severe hazards posed by illegal dumping, and as part of the new wave of industrial waste control measures, the EPA is focusing on placing priority controls on solvents. On March 26, the EPA assembled representatives from industries, trade groups, and local environmental agencies to discuss response measures. The EPA has also requested manufacturers to conduct inventories of waste solvents stored on-site and report this and waste solvent destinations to proper authorities.

Waste solvents originate from two general sources -- manufacturers and users. Generally speaking, solvent manufacturers (other than foreign importers) are mostly producers of raw materials used in the chemical industry. Users, on the other hand, are firms that employ solvents for cleaning, surface treatment, or as additives. Major solvent users include the semiconductor industry, electric machinery manufacturers, automobile producers, as well as synthetic leather and paint manufacturers.

According to information provided by the EPA's Industrial Waste Management Center, Taiwan produces about 136,000 tons of waste solvent per year -- 58,000 tons of which are considered hazardous. This amounts to about 4% of all hazardous waste produced in Taiwan. Around 95% of waste solvents are generated in Kaohsiung County, Taipei County, and Hsin-chu County and City.

Taiwan currently has four organizations that can treat waste solvents. According to data from these companies, total domestic capacity for treating waste solvents is approximately 40,000 tons per year. Moreover, treatment data reported to the Control Center indicates an annual reported treatment amount of 14,000 tons. Whether one considers total treatment capacity or actual amounts legally being treated, there is a significant gap between solvent quantities being produced and those being treatment.

By back-tracking from the data provided by industry to the Industrial Waste Control Center, it is clear that certain firms are accepting more waste solvents than they have the capacity to properly handle. In response, the EPA has stationed personnel in suspect facilities on a 24-hour basis to monitor treatment status. Manufacturing firms (solvent producers and users) have also been requested to inventory and report solvent quantities stored on-site and report quantities contracted out for hauling.

During the March 26 meeting, manufacturers also expressed their views. Waste solvents generated by some manufacturers (such as IPA in the semiconductor industry and methanol from packing tape manufacturers) maintain high purity, and would thereby be good for re-use as raw material. Industry representatives expressed,

however, that waste re-use application procedures are very lengthy and that the EPA should help streamline the process.

Waste treatment organizations voiced their feelings that reuse policies unfairly disadvantage their services. They indicated that only through numerous inspections and heavy investment can Class A treatment organizations obtain operating licenses. Also, some treatment organizations complain that some firms claim solvent re-use in order to evade stringent inspection processes. What's more, there is no effective monitoring of the secondary pollution created by solvent reuse as it is currently implemented in Taiwan. Because manufacturers that reuse solvents can avoid high pollution control costs, the services offered by legal Class A treatment organizations are put an extreme price disadvantage.

As soon as possible, the EPA will perform detailed research of these issues; i.e. the request by manufacturers to allow the reuse of waste solvents as incinerator fuel, the complaints that the solvent reuse application process is too slow, and the claims that solvent reuse unfairly disadvantages treatment organizations. The EPA will further demand that prior to legal treatment of waste solvents manufacturers take responsibility for proper solvent storage. For special cases, the EPA will audit and inspect the status of storage and treatment and may implement 24-hour on-site monitoring.

#### Status of Waste Solvent Treatment in Taiwan

	Reported quantity of hazardous waste solvents	Reported quantity of general waste solvents	Total (in tons)
Total amount treated by treatment firms	8319.3 (100%)	55797.6 (82%)	641169.9 (84%)
Total amount of off-site treatment	8319.3	68210.2	76529.5
Total amount of on-site treatment	5918.6	1620.9	7521.5
Totals	14237.9	69813.1	84051.0

### *Water Pollution Control to be Improved through In-depth Auditing*

**In the future, auditing/inspection of water pollution will no longer be primarily based on sampling at effluent outfall points. A deeper approach to auditing will be taken. Future comprehensive auditing procedures will involve such steps as reviewing of pre-inspection background data and comprehensive site records, writing of detailed reports, initiating the penalization process, and construction and organization of computer database files.**



In Taiwan, the major approach to inspecting effluent water quality is to perform sampling at discharge points. According to EPA analyses, from July, 1994 to the end of June, 1998, the number of audits resulting in fines totaled more than 14,000 cases. Of these, the number of fines issued for violation of effluent standards was 11,000 -- 78.5% of total cases.

In the past, control focused on end-of-pipe wastewater sampling due to its simplicity, definitiveness, and efficiency. Unfortunately, firms can easily take advantage of the lack of local-level auditing personnel by secretly discharging effluent, diluting wastewater, or burying discharge pipes. Moreover, once firms have been fined they often find reasons to question auditing procedures and use uncertainties in the audit records to petition higher government authorities to commute penalties. This process creates excessive administrative inefficiency and heavily wastes auditing efforts and administrative resources.

In response to these problems and to raise the efficiency of auditing and inspection activities, the EPA has been planning reforms to the system for some time. Draft guidelines for wastewater auditing and inspection were recently completed. Auditing will no longer be focused primarily on sampling effluent at discharge points. Sludge inspection and permit compliance review will be integrated into the auditing process.

The draft guidelines mentioned above will require that the auditing process six major parts: pre-inspection background information review, site audit, detailed report writing, initiation of penalization process, and construction and organization of computer databases.

The first step is to review pre-inspection background information. Through inspecting permitting and approval of industrial pollution characteristics and past pollution audit records, it will be possible to identify the key areas of focus for a site auditing/inspection. Next comes an in-depth audit/inspection of the site. In addition to sampling wastewater quality according to actual needs, inspectors must also make detailed records of the functioning of wastewater treatment equipment, operating procedures, and sludge analyses.

The next step is to write audit/inspection conclusions based on pre-auditing records, site inspection reports, and sample analyses. If violations are found, penalties can then be issued to firms accordingly. Finally, for the benefit of follow-on tracking and to establish a comprehensive file of pollution inspection/auditing at industrial organizations, the creation of computerized inspection databases will be emphasized.

To establish long-term tracking and auditing systems, the EPA had established a set procedures concerning major pollution source control. Through inspection sludge, determinations as to a firm's degree of pollution reduction can be made. After long-term tracking has revealed that improvements have been made, the procedures

mentioned above can be dismantled. In this way, the effectiveness of water pollution source auditing can be raised, and the normal operation of all water pollution control equipment can be assured.

Sludge inspection will become a complementary auditing skill and a key point for wastewater inspection. Under the traditional approach to inspection, wastewater judged to be “in compliance” was equated with pollution reduction or proper operation of treatment equipment. In other words, the traditional system left much room for doubt. After extensive research, the EPA adopted the concept that properly operated wastewater treatment equipment produces sludge and has therefore integrated sludge inspection into the standard approach to wastewater inspection. This change should prevent deceptive behavior such as substituting tap water or groundwater for effluent or secretly discharging wastewater. And, it should motivate firms to ensure that effluent treatment equipment is properly operated.

Future reforms of Taiwan’s audit system, in terms of the legal system, will aim at comprehensive and in-depth auditing. In terms of implementation, according to an internal timeline set by the EPA’s Bureau of Water Pollution Control, in order to support the maturation of audit personnel resources, the first stage will set the auditing of sludge from wastewater treatment equipment as first priority.

### ***NO<sub>x</sub> Emission Standards to be Significantly Tightened***

**The EPA plans to tighten up the currently loose nitrogen oxide (NO<sub>x</sub>) emission standards and set limits on per-unit caloric values. In response, industry has indicated that due to cost considerations, old boilers should be separately regulated. In addition, industry’s response to the EPA suggestion that ammonia be used to remove NO<sub>x</sub> revealed lack of understanding. Nonetheless, the EPA will take into full consideration the suggestions of industry.**

Compared to nitrogen oxide (NO<sub>x</sub>) emission standards in the developed countries of Europe and North America, Taiwan’s standards are relatively loose. And, through reviewing data submitted along with air pollution fees, most of the largest 50 stationary pollution sources in each of Taiwan’s three geographic regions have NO<sub>x</sub> emissions lower than current limits.

Statistics indicate that of the more than 1,000 stacks at the 150 aforementioned factories, 66.1% have monthly emission averages lower than set NO<sub>x</sub> limits. In addition, 82.6% of pollution sources have reduced NO<sub>x</sub> emission concentrations to below 180 ppm through installing air pollution control equipment or improving production processes.

Because domestic pollution control technology has already matured, the EPA plans to further tighten NO<sub>x</sub> emission standards. Draft standards have already been developed

and interested parties have been invited for discussions.

For newly installed NO<sub>x</sub> emissions from steam-energy cogeneration boilers, a standard of 100 ppm will be set. However, in terms of per-unit caloric emission values, the limit for boilers using gaseous fuel will be 0.27 (kgNO<sub>x</sub>/MKcal), limits for liquid fuel use will be 0.29, and those for solid fuel use will be 0.30.

For steam-energy cogeneration boilers at existing facilities, the draft standards require that from January 1, 2002, boilers using gaseous fuel, regardless of scale, meet a NO<sub>x</sub> emission limit of 120 ppm and 0.32 per-unit caloric value. Boilers using liquid fuel must meet a limit of 150 ppm and 0.43 per-unit caloric value, and those using solid fuel must meet a standard of 200 ppm and 0.60 per-unit caloric value. However, between the months of October and March, existing pollution sources in the counties of I-Lan, Hua-lien, Tai-tung, or Chang-hua, or in Fujian province using solid fuel will be required to meet standard 1. Sources in other areas will be required to meet standard 2 (see accompanying table).

As for industrial boiler NO<sub>x</sub> emissions, new facilities will all be required to meet a 150 ppm limit. The limits for existing facilities that use gaseous fuel will also be tightened to 150 ppm, while limits for boilers using liquid and solid fuels will be set at 180 ppm (see table 1).

Some firms have reacted to these stricter draft standards by stating that older boilers have yet reached replacement age, yet there is no room to add additional pollution control equipment. The expressed hope that the EPA would use a separate approach to regulating emissions from older boilers. Firms also expressed doubt regarding the effectiveness of the EPA suggestion to use SNCR technology whereby ammonia is used to remove NO<sub>x</sub> emissions. These firms felt that this approach has the potential to create secondary pollution.

The EPA's plans to tighten NO<sub>x</sub> standards have not been put on an implementation timeline yet. As the process moves forward, the EPA will take into full consideration the concerns and opinions of industry.

*Table 1: Proposed standards for NO<sub>x</sub> emissions from steam-energy cogeneration boilers*

Pollution Source		Original emission concentration standards	Planned emission concentration standards	
			emitted concentration	per-unit caloric value
existing facilities	gaseous fuel	120 ~ 300	(1) 120; (1) 120	(1) 0.32; (2) 0.32
	liquid fuel	200 ~ 400	(1) 150; (1) 150	(1) 0.43; (2) 0.43
	solid fuel	280 ~ 500	(1) 200; (2) 150	(1) 0.60; (2) 0.45
new facilities	gaseous fuel	120 ~ 150	100	0.27
	liquid fuel	200 ~ 400	100	0.29
	solid fuel	250 ~ 500	100	0.30
units for emission concentrations: ppm				
units for per-unit caloric value: kgNO <sub>x</sub> /NKcal				

*Table 2: Proposed standards for NO<sub>x</sub> emissions from industrial boilers*

Fuel type		Original emission concentration standards	Planned emission concentration standards
existing facilities	gaseous fuel	300 ~ 150	150
	liquid fuel	250 ~ 400	180
	solid fuel	350 ~ 500	180
new facilities	gaseous fuel	150	150
	liquid fuel	250	150
	solid fuel	350	150
units for emission concentrations: ppm			

## ***Industrial Waste Final Disposal Sites to be Moved Forward on a Case-by-Case Basis***

Existing final disposal sites for industrial waste in Taiwan have a total capacity of only about 1.08 million tons and shall likely reach capacity in the next 12 months. Predictions show that by 2006, a land area of 532 hectares will be needed to handle final disposal of waste. To facilitate the development of final waste disposal sites, the EPA has formed a special task force that will promote disposal sites on a case-by-case basis. The EPA hopes that within the next two years enough final waste disposal capacity will be established to handle domestic waste production volumes. Currently, several private firms have expressed interest in developing a total of 574 hectares of disposal sites. Of these, BES Engineering Corporation has won a bid to develop a disposal site on 300 hectares of land at Tainan's Long-chi Factory.

The capacity of Taiwan's final disposal sites for industrial waste is inadequate for the long-term. Current privately operated disposal sites are close to saturation. There is urgent need for the development of new sites. To promote the establishment of new sites, the EPA recently restructured the Bureau of Solid Waste Management. The

Bureau's Fifth Section will now be solely responsible for issues concerning the import, export, and final treatment/disposal of industrial waste.

To promote development of final disposal sites, the EPA will continue to encourage private investment as a major policy direction. Administrative and technical assistance will be provided by the government, as will several economic incentive packages. By raising private sector interest in investing in industrial waste landfills, the EPA hopes to expand final disposal capacity to meet domestic needs within the next two years.

According to recent surveys, Taiwan has an urgent need to develop new disposal sites. Current privately operated final disposal sites exist in six areas in Kaohsiung County. These facilities have a total of annual capacity of one million tons, but only have about 1.08 million tons of capacity remaining. These sites will likely reach saturation within the next 12 months.

Initial estimates reveal that by the year 2001, 183 hectares of final disposal site land area will be needed to meet requirements. By 2006, required land area will surge to 532 hectares. Information compiled by the EPA suggests that the private firms have an interest in developing final disposal sites on a total of 574 hectares of land. Of these, the Long-chi Factory in Tainan has 300 hectares, and Taiwan's Waste Clearance and Treatment Industry Association has committed nine facilities with a total of 170 hectares. In addition, the Rong-Hua Group has 80 hectares in Kaohsiung available for treatment and disposal facilities.

Future final disposal sites will be established in line with the following principles: sites will be integrated into regional comprehensive waste treatment plans; land-use plans for final disposal facilities (including site rehabilitation plans) will be required; measures to compensate surrounding communities will be developed; and, to enhance administrative efficiency and transparency, special task forces will be established.

Although the details of economic incentives have not been set yet, it is hoped that they will include subsidies for planning, design and EIA-related fees, as well as financial assistance for facility construction, operation subsidies, and community compensation subsidies.

Of the EPA's current cases, the biggest case recently made a smooth transition beyond the first stage. On April 3, BES Engineering Corporation made a successful bid to develop an industrial waste final disposal site on 300 hectares of Long-chi Factory land. Now that the bid has been won, it is hoped that BES Engineering will proceed quickly with development. This good news bodes well for the EPA, now closer to achieving its goal of meeting domestic demand for industrial waste final disposal within two years.

## *Stationary Pollution Source Fine Criteria Drawn Up*

The EPA has set the terms for the *Criteria for Levying Fines against Stationary Air Pollution Sources*. The criteria cover various types of pollution and clarify factors used in determining the fines, such as scale and amount of emissions and pollutant toxicity. Concurrently, the draft criteria further combines factors to create a uniform measuring standard and simplify punishment procedures. In cases where school zones are involved, where there is a high frequency of pollution, or where pollution is severe, punishment will be heavier. However, according to the new criteria, local authorities will still have discretion over the actual fine levied, within 30% of the fine prescribed by the criteria.

The EPA has drawn up criteria to determine stationary pollution source fines and punishment. Private and public sites now pay a fine of between NT\$10,000 and NT\$1,000,000 for violations of air pollution laws. The EPA decided to standardize the fine and punishment criteria because local variations when meting out fines have been too great.

In the draft criteria, the maximum and minimum fine amounts will not change, however, the amount of the fine will be determined by the pollution type. Factors to be considered when determining the amount of the fine include: emission scale and quantity and pollutant toxicity. The draft criteria also combines different factors to formulate a uniform measuring standard and simplify the punishment procedures.

The code aims to clarify the overly-complicated and indeterminate disciplinary measures of original criteria by listing all possible violation clauses, fine non-compliance clauses, the scope of the fines, and punishments in the appendix.

The currently enacted *Air Pollution Control Act* requires that the amount of fine levied be based on amount and characteristic of pollution and degree of potential hazard. The Act does not contain stipulations for doubling fines if fine payment time limits are exceeded, however. There is cause for concern that, if the criteria are rashly applied, the authority of the Act may be exceeded.

In addition to following the set terms for punishment, the draft states that local environmental authorities can resort to stricter methods of punishment in cases where the pollution occurs in a specified area, or if the pollution occurs frequently or is of a serious degree. In these cases, the draft specifies the following:

1. A single violation of a provision within the Act may be met with the lowest fine (calculated according to the draft criteria's guidelines); if, however, a second violation of the same provision occurs within one year, the fine shall be doubled; when three or more violations of the same provision occur within the same year, each violation will be fined at double the previous fine amount.
2. If the violation affects a school, the fine will be doubled.
3. As provided for in Article 75 of the *Air Pollution Control Act*, serious offenders in

circumstances outlined within the articles will be fined the highest possible amount.

In respect of local authority, and to maintain flexibility, local authorities will have discretion to levy fines in light the circumstances of each case. In determining fine amounts, local authorities shall consider the degree of violation and calculate the fine using an established formula and within a range of plus or minus 30%.

The EPA plans to hold a discussion on the contents of the code with local units at the end of May.

### ***Environmental Group Raises First Environmental Civic Lawsuit***

**Following the addition of an article to the *Air Pollution Control Act* concerning civil lawsuits, an environmental group recently provided written notification to five counties and cities requesting prompt enforcement. Even though environmental agencies have already begun enforcement activities for the indicated cases, the EPA still agrees with the principle of having the public participate in the regulatory oversight process.**

The most recent round of amendments to Taiwan's Air Pollution Control Act was passed by the Legislative Yuan late last year. One amendment provides a legal basis for the public to bring civil lawsuits against environmental authorities that neglect their regulatory enforcement duty. These stipulations were added to enhance the effectiveness of implementation and enforcement of pollution control laws. Adopting this relatively new regulatory concept from developed countries is a pioneering endeavor for the EPA and demonstrates its commitment to raising the quality of regulatory enforcement.

The first case putting these new provisions to the test was initiated on April 22 by the Taiwan Environmental Observation Center (an organization established by the Environmental Quality Protection Foundation, a local public interest group). The Center sent a formal notification to environmental authorities in five counties and cities claiming that for specific cases they were neglecting their duty to implement and enforce environmental regulations. Governments notified included those of Taipei County, Hsin-chu County, Taichung City, Taichung County and Yun-lin County. If within 60 days after receipt of notification, these authorities have still not begun enforcement activities, a civil suit can be brought against them. If the suit is successful, these agencies can be ordered by the courts to enforce relevant regulations.

The EPA noted, however, that these environmental agencies have actually begun enforcement activities at each of the sites listed on the aforementioned notification. Some have been listed as targets for auditing and inspection and others have already been fined. Two sites which the Taiwan Environmental Observation Center claims

have not been subject to enforcement include publicly operated incinerators in Taipei County and Taichung City. The Center claims that dioxin emission standards are not being enforced at these facilities; however, they have already initiated emissions improvement projects and should be in compliance with current dioxin emission standards before 2001.

Following the addition of the civil lawsuit provisions to the *Air Pollution Control Act*, all sectors have been watching development of this policy with great interest. For environmental public interest groups and individuals that have frequently complained of weak air pollution control enforcement, this new policy is another mechanism to impel comprehensive enforcement of pollution control regulations. The EPA further indicated that because air pollution inspection, auditing and control is the responsibility of environmental authorities, the civil lawsuit provisions will significantly pressure these authorities to perform their duty. As such, the provisions will be beneficial to improving Taiwan's overall air quality.

### ***New Version of Environmental GIS CD-ROM Published***

**The EPA recently completed the second edit of its Environmental Geographic Information System (GIS) Public Database CD-ROM and began issuing it at the end of April. The new version of the CD-ROM provides information for use by government agencies and the general public.**

The EPA recently announced the publication of a new edit of its informational CD-ROM of Environmental Geographic Information System (GIS) Public Database. In addition to retaining the same cataloging and database design concepts, the EPA now offers both a professional and a standard version. The professional version contains data obtained from other government agencies, as well as map-based data from GIS-related projects implemented by the EPA in recent years. This version provides a valuable tool to environmental agencies at all levels of government.

Due to information property rights, the standard version only includes records of map-based data from EPA GIS-related projects. This version is helpful for uses by academic and research institutes, as well as by the general public. Moreover, the current edit of the CD-ROM is the first to utilize the newest version of free map viewing software. It offers complete map layer overlap previews and due to faster map file review and retrieval, it provides helpful support to environmental protection and analysis activities.

The new edit of the environmental GIS CD-ROM includes several different types of map files and data related to environmental status and protection activities. Files related to noise, solid waste and ultraviolet light include maps showing the island-wide distribution of noise pollution records, general waste treatment facilities, municipal



waste incineration plants, and ultraviolet monitoring stations. The CD-ROM also includes maps and information regarding environmental sanitation, toxic chemical substances, complaints and environmental disputes, and pollution control. Map-based data on firms that manufacture and use environmental sanitation agents and toxic chemicals is also provided, as is data on areas that witnessed environmental disputes and factories in pollution control regions. All this information can be very helpful for activities such as pollution control, regulatory listing, and auditing/inspection.

The EPA further noted that in order to reduce waste and for the convenience of collecting previous edits, the second edit of the CD-ROM will also be specially issued in tandem with the first edit of the standard version. Persons interested in obtaining a copy of the CD-ROM can purchase one at stores that sell government issued products, or at the EPA's consumer cooperative store. The standard version of the second edit sells for NT\$300 per set, and the combined first and second edit standard version can be obtained for NT\$600.

## ***News Briefs***

### ***EPA Developing Plans for Large-Scale Groundwater Survey***

The EPA is pressing for the development of plans to conduct a large-scale subsurface survey to assess the severity of illegal toxic waste dumping. The survey will study groundwater quality in Kaohsiung, Pingtung, and Changhua Counties. In line with the *Plan for Establishing a Network of Groundwater Monitoring Stations in Taiwan Province*, 132 monitoring stations are planned for the three counties. Stations, dug at the site of public wells, will monitor the degree of electric conductivity and pH reading. The groundwater will also be monitored for amounts of lead, cadmium, chromium, nickel, copper, zinc, arsenic, mercury, and other minerals, as well as volatile substances. The monitoring is expected to be completed in the near future.

### ***SO<sub>x</sub> Controls to be Intensified***

From July 1, limits on sulfur oxides in Nantou and Changhua Counties will be stricter; fuel must have a sulfur content below 0.5%. The EPA determined the new standards after consulting with industry members on March 16. In addition, the concentration of sulfur oxide emissions of fuel must be maintained at 500ppm. Emissions standards of gaseous fuel will be set at different rates. For the time being, the emissions standards are not applicable for flue gas in the oil refinery industry because their equipment cannot easily be upgraded. Intermediary standards for solid and gaseous fuel will be maintained for two years. Beginning in 2001, all fuel must conform to emission standards of 300ppm.

### ***Toxic Chemical Accident Dispersion Model Put On-line***

After two years of collaboration with the US, the ROC EPA announced on April 23 that toxic disaster dispersion modelling software has been completed and gone on-line. Using

synchronized maps and models, the software, which is in Chinese, can simulate the dispersion of gases with a specific gravity near that of air. The program contains a variety of information on toxic chemical substances and information on other toxic substances can be added as needed. Maps of different scales can also be supported in performing the simulations. Results of changes can be received within a matter of seconds, making the program useful for education and training in the development of emergency response plans. The program also delineates guidelines for marking hazardous or evacuation areas for toxic disaster response personnel.

### ***Guidelines for Applying to Handle and Use Bituminous Coal and Petroleum Coke to be Announced***

The EPA has completed the draft guideline for obtaining handling and use permits for bituminous coal and petroleum coke in their efforts to control air pollutant emissions after discussions with industry on March 30. According to the draft regulations, all companies handling or using the aforementioned materials must apply for handling or use permits. Furthermore, users must either install de-sulfurizing equipment, or have combustion and production methods that already incorporate de-sulfurization. The draft also clarifies the criteria regarding review deadlines. The review must be completed within 30 days after local authorities accept the permit application and supplemental documentation must be received in 90 days. The draft guidelines will be announced within the next few weeks.

### ***Mobile source air pollution fees to be collected from fuel suppliers***

Existing air pollution fee collection regulations have been revised so that air pollution fees for mobile pollution sources and petroleum coke will be collected from fuel suppliers (i.e. sellers and importers) rather than users, the EPA announced on April 1. As for stationary pollution sources, high-grade diesel is already included in the scope of the preceding fee collection standards. And, in the future, rates regarding sulfur oxide and nitrogen oxide will be set at zero for stationary pollution sources that use high-grade diesel. The announcement also stipulated qualifying conditions for low-polluting gaseous fuel.

### ***Complete Remediation Necessary for Granting Building Permit at Former RCA Site***

The Ministry of the Interior (MOI) reviewed the former RCA site land-use rezoning case on April 7. The EPA suggested that the MOI list the following two EIA conclusions: (1) No structures can be built on the contaminated soil; and (2) no building permit will be granted unless the contaminated soil is completely treated.

### ***Draft Standards for Waste Computer Component Treatment Facilities Completed***

The new draft requires that all waste computer component treatment facilities obtain Category 1 Type A waste treatment installation and operation permits. The area of the facility must be at least 3,300 sq. m. and land use must be consistent with environmental or industrial land use criteria and restrictions. In addition, the draft requires that operations be conducted in sealed rooms within the facility. Waste treatment facilities must be able to handle PCs, computer

surveillance equipment, and IC boards. Their treatment methods must be in accordance with resource recycling and reprocessing, i.e. directly using landfills or incinerators does not qualify.

***ROC-Canada Environmental Cooperation Projects Confirmed***

The 4<sup>th</sup> Steering Committee of the ROC-Canada Memorandum of Understanding on Environmental Cooperation convened on April 7 at Taipei's Howard Plaza Hotel, where the two sides mapped out four primary directions for cooperation: climactic change, resource recycling systems and reuse technology, eco-label organizations, and environmental firm strategy alliances. For FY 1999, the two sides established six areas of cooperation: 1) organize seminars on resource recycling strategies, 2) engage in environmental firm strategy alliances, 3) set ultraviolet monitoring forecast technology and use, 4) eco-label organization collaboration, 5) Year 2000 global environmental protection exhibition ("GLOBE 2000"), and 6) ROC-Canada catalogue of environmental manufacturers.