

ReSAGPAC WG Newsletter

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The Working Group on Remediation for Soil and Groundwater Pollution of Asian Countries

Member Countries:



India



Indonesia



Japan



Korea



Malaysia



Philippines



R.O.C.(Taiwan)



Thailand



Vietnam

Embracing the Regional Sustainable Contaminated Land Development in the Asian Region

by Hung-Teh Tsai, Technical Superintendent and Executive Secretary, Soil and Groundwater Remediation Fund Management Board, Taiwan EPA

ABSTRACT

Working Group on Remediation for Soil and Groundwater Pollution of Asian Countries (ReSGPACWG) was established in 2010 and Taiwan Environmental Protection Agency (TWEPA) has the honor to sponsor the working group for next 4 years. With the honor, TWEPA also recognizes its responsibility in meet the expectations and realizes the vision of the working group. Thus, layout of the roadmap and developing a strategy to achieve the common objectives are important.



We believe that the foundation for the working group to be successful is mindset. There are two core elements worth mentioned: collaboration and sustainability. By embracing the collective knowledge and effort, the member countries can make leap in various aspects regarding the contaminated land management. Also, transform contaminated assets to economical marvels can only be achieved by thinking sustainably and has been proven in developed countries. At this stage, the working group is going to accomplish this concept in our regions. We will need multidiscipline to solve the complex environmental problems in hands. The revitalization of contaminated lands is one of the answers to remediation of polluted soil and groundwater. The roadmap of the working group then can be plotted out based on the rebirth cycle of contaminated land.

With the concept, this presentation will propose a strategic roadmap for the development of the working group. An action plan then is discussed to define the future directions for the working group to develop. Additionally, the general benefits to the economic, social, and environmental issues expected will be introduced. TWEPA looks forward to the consensus being discussed and formed among the member countries. Consequently, the missions of the working group can be accomplished for the years to come.

Introduction

With the tightness of world economy, the world is no more divided but united as one globe. The evolution of technologies has made sharing knowledge and experiences easier and is the best practice for making collective efforts to move forward. As a result, regional collaboration becomes a critical element for countries to be competitive in the globe. It also leads to accelerated progresses in technologies.

The soil and groundwater contamination are more than an environmental issue. The contamination is relatively immobile and the soil usually plays as the role of the final resting place for contaminants in environmental matrices, its characteristics distinguish the contaminated site management from water and air pollution management. Since soil is also the basis of agricultural production, industrial development, and life. Potential impacts to agriculture, economic development, and ecological system do exist. There is no doubt that the soil contamination is a serious global issue to people living on the earth.

Working Group on Remediation for Soil and Groundwater Pollution of Asian Countries (ReSGPACWG) was established with bringing collectively efforts and solutions to regional soil contamination problems in mind. Knowledge sharing is the core of the operation. The working group shall embrace the spirit and take on the challenge from different aspects. TWEPA and Taiwan Association of Soil and Groundwater Environment Protection (TASGEP) have the honor to be in charge of the operation of the working group

Embracing the Regional Sustainable Contaminated Land Development in the Asian Region Continued

for next four years. The success of the working group will rely on the consensus among the members, building the trust and confidence is the most important task for the growth of the working group.

Area of Concern and Goals

The working group has been founded with good motives and it is a necessity to define the ultimate goal for the operation of the working group. TWEPA would like to first propose the areas which we shall focus for the coming years. Considering most of the delegates are from public sectors of the member countries, the concerned areas should be more comprehensive and resolution based. Thus, three areas are defined as the guiding targets (Figure 1.). The targets are defined under the concept described as – policy and regulation development leading the way to elevate the technology evolution and to realize the sustainable land use with the integration of sustainability.

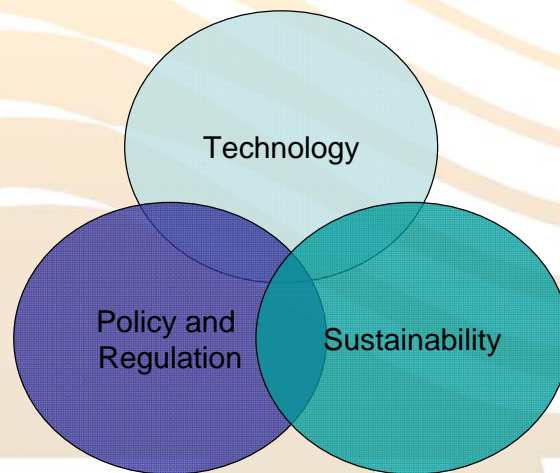


Figure 1. Areas of Concerned for Future Working Group Operation

Based on the three areas proposed, the goals might be considered in the next 4 years include:

- **Technology:** completing general reference guidelines for site investigation, remediation engineering design, and environmental risk assessment to a base of technical information exchange.
- **Policy and Regulation:** establish a sustainable contaminated land management framework to serve as a beacon for the interest of member countries.
- **Sustainability:** plan out the general strategies to integrate the contaminated land management and sustainable design such as renewable energy, green transportation, and green building.

Approaches

The objective of the operation is to have the working group create impacts and values to member countries to deal with the contaminated site management. At its new birth phase, the planning for the initial operation approaches would emphasize the construction of basic functions and common objectives. The main approaches could be considered include:

- Movement with a feasible roadmap
- Smoothing communication
- Expanding network

(1) movement with a feasible roadmap

With the goals defined, pathways to achieve the results shall be planned and followed so that the

Embracing the Regional Sustainable Contaminated Land Development in the Asian Region Continued

common interest could be realized in a prompt manner. A general strategic roadmap based on the areas of concern is illustrated in Figure 2. Each element in the map connects to certain purposes which lead to stable development and operation of the working group. Also, the tasks in the roadmap exhibit their characteristics which support the targeted areas. For instance, the policy and regulation is expected to provide influence that can assist member countries to build up or improve the regulatory framework. To emphasize the collective efforts, the information exchange is also listed as the objective within the area. It was particularly important for the policy side due to the necessity of localization for a framework to fit into a country’s unique regulatory concept and enforcement. At the same time, some common concept created from the working group can be integrated and practice.

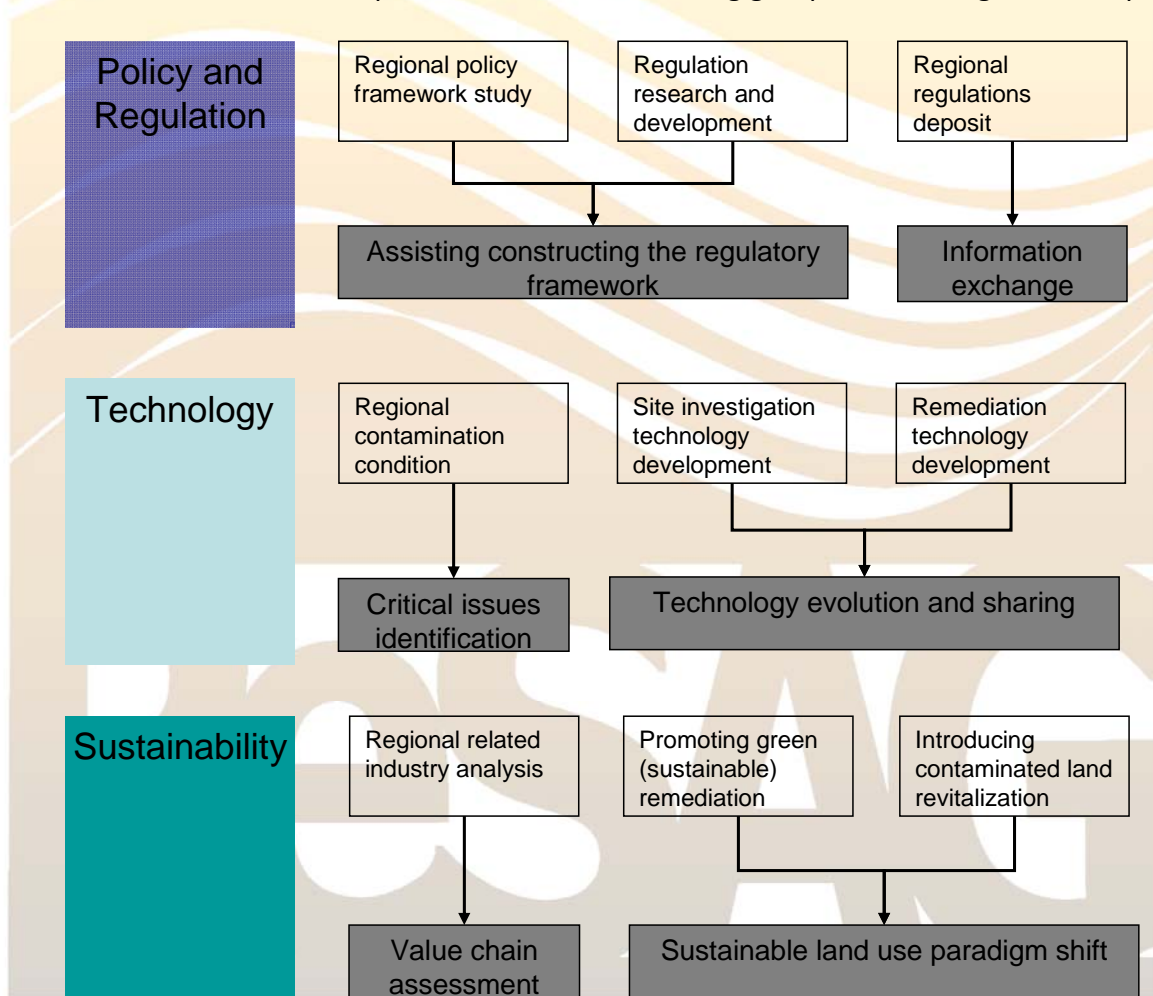


Figure 2. General Strategic Road Map for ReSGPACWG

(2) smoothing communication

Due to the geographical limitation, the regional operation needs a good way to have members to communicate and dialog. To facilitate the information flow, a platform in cyber space has created and goes on-line recently (Figure 3). This platform is still at its early stage and might not be able to meet all the needs. It should serve as a starting point and provide a regular channel for members to discuss issues. In the future, more functions, such as webinar, could be add-in so that the communication channel would be transformed into an information exchange platform. A better communication can attain for the working group operation.

Embracing the Regional Sustainable Contaminated Land Development in the Asian Region Continued



Figure 3. ReSGPACWG Web Site as a Communication Platform

(3) expanding network

Currently, there are regular meetings held by the host country annually. While these meetings are held at regular basis, more functional meetings should be considered in the future. For example, the combination of workshop with special purpose or theme can further tighten the relationship among member countries. Also, the networking should go beyond the region. The expertise and experience can be brought in from developed countries. The members can learn and practice with the global knowledge.

Conclusions

As the host of the ReSGPACWG, TWEPA is honored to have the opportunity to play an important role at the start-up. The proposed strategic map and tasks are the corner stone for the future development of the working group. TWEPA shall make its best effort to work with all member countries collectively to promote and excel the sustainable land use in the region.



Program

2nd Business Meeting of

Working Group on Remediation for Soil and Groundwater Pollution of Asian Countries (ReSAGPAC WG)

Date: November 28, 2011

Venue: Alexandria Chamber, GIS Convention Center, National Taiwan University, Taipei, Taiwan

Time	Topic	Speaker
08:00-09:00	Registration	
09:00-09:20	Opening Ceremony	Dr. Zueng-Sang Chen Chairman of WG
09:20-10:00	Keynote Speech: Embracing the Regional Sustainable Contaminated Land Development in the Asian Region	Mr. Hung-Teh Tsai (represented by Dr. Hao-Chun Hung) Taiwan EPA
10:00-10:20	Break	
10:20-11:30	Keynote Speech: An Overview of the Development of Key U.S. Pollution Control Laws and Their Shared Framework Elements (11:10-11:30 for Question and Discussion of other issues)	Dr. Jessica Kao USEPA
11:30-12:20	Keynote Speech: Soil and Groundwater Related Policy Framework in the European Union	Mr. Phillip Crowcroft CL:AIRE/ERM, UK
12:20-13:50	Lunch	
14:00-14:50	Business Meeting Part 1 – Confirmation of General Rules, LOGO of WG, Website Demonstration	Prof. Zueng-Sang Chen Chairman of WG
14:50-15:10	Break	
15:10-16:00	Business Meeting Part 2 – Topics of workshop and training courses of WG in 2012-2014 and Communication types of WG (eg. Facebook)	Prof. Zueng-Sang Chen Chairman of WG
16:00-16:20	Break	
16:20-17:10	Business Meeting Part 3 – Visiting Programs Organized by WG	Prof. Zueng-Sang Chen Chairman of WG
17:10-17:20	Closing Ceremony	Prof. Zueng-Sang Chen Chairman of WG

Program Continued

International Workshop on Regulatory Standards of Pollutants and Management Systems for Soil and Groundwater Pollution (1st Day)

Date: November 29, 2011

Venue: Socrates Chamber, GIS Convention Center, National Taiwan University, Taipei, Taiwan

Time	Topic	Speaker
09:00-09:30	Registration	
09:30-09:40	Group photo (Foreign Participants only)	
09:40-09:50	Opening Ceremony	Prof. Zueng-Sang Chen Chairman of WG
09:50-10:00	Guest Open Address	Mr. Tzi-Chin Chang Taiwan EPA
10:00-10:40	Keynote Speech: Future Projects in Next Four Years of Soil and Groundwater Management of Taiwan EPA	Mr. Hung-Teh Tsai Taiwan EPA
10:40-11:00	Break	
11:00-11:50	Keynote Speech: Introduction of the major U.S. Hazardous Waste Management and Cleanup Laws (I)	Ms. Nancy Marvel USEPA
11:50-12:40	Keynote Speech: The Contaminated Land Management Framework and Regulations in UK	Mr. Phillip Crowcroft CL:AIRE/ERM, UK
12:40-14:00	Lunch	
14:00-14:30	Legal and Legislative Approaches to Find Soil Contamination Sites in Korea	Dr. Yong-Ha Park Korea
14:30-15:00	Development of Soil Control Standards for Organic Pollutants in Taiwan	Prof. Dr. Shian-Chee Wu Taiwan
15:00-15:30	Recent Contamination Cases and Development of Countermeasure Regulations in Thailand	Dr. Chayawee Wangcharoenrung Thailand
15:30-15:50	Break	
15:50-16:40	Tainan Low Carbon City - Green Remediation Project: Case of An-Shun Site	Dr. Hwang Jen Chang (represented by Prof. Chih-Cheng Chao) Taiwan
16:40-17:10	Monitoring of Agent Orange Pollution and a Potential Management Strategy in the Military Base	Mr. Wan Jun Korea
17:10-18:20	General Discussion	Prof. Zueng-Sang Chen Chairman of WG

Program Continued

International Workshop on Regulatory Standards of Pollutants and Management Systems for Soil and Groundwater Pollution (2nd Day)

Date: November 30, 2011

Venue: Socrates Chamber, GIS Convention Center, National Taiwan University, Taipei, Taiwan

Time	Topic	Speaker
09:00-09:30	Registration	
09:30-10:00	Regulatory Standards of Heavy Metal Pollutants in Soil and Groundwater in Taiwan	Prof. Dar-Yuan Lee Taiwan
10:00-10:30	Ecological Risk Assessment of Heavy Metal Pollution in Watershed nearby Abandoned Metal Mine	Dr. Jae E. Yang Korea
10:30-10:50	Break	
10:50-11:40	Keynote Speech: Introduction of the major U.S. Hazardous Waste Management and Cleanup Laws (II)	Ms. Nancy Marvel USEPA
11:40-12:30	Keynote Speech: The Practice of Contaminated Land Management in UK and Case Studies	Mr. Phillip Crowcroft CL:AIRE/ERM, UK
12:30-14:00	Lunch	
14:00-14:30	The Conceptual Approach for Control Standard Setting Based on Human Health Risk	Dr. Chih Huang Taiwan
14:30-15:00	Indonesian Regulations Related to the Prevention of Soil and Groundwater Pollutions	Prof. Wisjnuprpto Indonesia
15:00-15:30	Vietnam's Regulation on Management of the Soil and Underground Water Pollution	Ms. Nguyen Hoang Anh Vietnam
15:30-15:50	Break	
15:50-16:20	Prevention and Control of Soil Pollution: An Indian Perspective	Dr. Rashid Hasan India
16:20-18:10	General Discussion and Closing Remarks	Prof. Zueng-Sang Chen Chairman of WG
18:10-18:20	Closing Ceremony	Prof. Zueng-Sang Chen Chairman of WG

Seminar Report - Guest Open Address

**International Workshop on
Regulatory Standards of Pollutants and Management Systems for Soil and Groundwater Pollution**

09:50~10:00am, November 29, 2011

Socrates Chamber, GIS Convention Center, National Taiwan University, Taipei, Taiwan



Mr. Tzi-Chin Chang (張子敬)

Deputy Minister of Taiwan Environmental Protection Administration

- M.S., Institute of Environmental Engineering, National Chiao Tung University
- B.S., Department of Environmental Engineering, National Cheng Kung University
- Senior Professional and Technical Examinations for the category of civil engineering in 1980
- Senior Examination for Civil Service Personnel in the category of Environmental Engineering in 1980



Seminar Report - Guest Open Address Continued

各位關心土壤及地下水環境保護議題的女士及先生們，大家好：

本人謹代表台灣環保署為各位貴賓及先進撥空參加這次「土壤及地下水污染物法規標準及管理制度研討會」表達最誠摯之謝意，並特別感謝美國環保署及英國 CL:AIRE 協會代表，分別透過與我國的合作計畫及合作備忘錄等合作模式，與我們分享他們在土壤及地下水相關法規標準及管理制度的建立及實施之經驗。

我國「土壤及地下水污染整治法」施行已超過 10 個年頭，並於去年進行大幅度之修正，在未來土壤及地下水污染整治研發策略總體規劃上，為因應國際趨勢之演變，環保署已進行整體性之規劃並逐步實施，其中與本次會議主題有關，也是未來執行重點的項目，便是全面修正及更新「土壤及地下水污染監測標準」及「土壤及地下水污染管制標準」。

我國自 2001 年發布實施「土壤污染監測基準」與「土壤污染管制標準」，在當時的時空背景之下，其整體架構除部分重金屬管制項目外，均採單一管制標準的作法。時至今日，綜觀目前世界各先進國家，在「土壤污染管制標準」的制定理念，多依據土地用途類別及對人體健康與環境之風險訂定不同的管制標準，與我國現行許多管制項目及其管制值訂定之趨勢已有分歧，考量現階段國內情況及參考國際管制方式，我國開始辦理全面檢討及修定，預定在明年完成「土壤污染監測標準」及「土壤污染管制標準」修正草案，修正之方向將朝各污染項目物質特性，加以分類為重金屬類、油品類、含氮有機化合物類及火炸藥類等四類別，並配合健康風險及褐地再開發政策，以合適之土地用途別及人體健康風險評估等方式進行，並透過召開專家會議及舉辦研討會等方式廣羅各方意見。在接下來兩天的會議中，將會對我國現行及未來修正的管制標準，為各位進行詳盡的介紹。

在此，我要特別感謝陳尊賢教授的熱心協助，及「亞洲土壤及地下水污染整治工作小組」來自各國的貴賓的參與，本署很榮幸能有機會支持並協助發展這樣一個有意義的工作組織，未來希望能持續透過交流，共同與國際接軌，並為亞洲地區土壤及地下水環境保護工作一同努力。

最後，再一次謝謝諸位關心我國土壤及地下水保護的女士及先生們的參與，祝大家平安健康，謝謝。



Minutes

2nd Business Meeting of

Working Group on Remediation for Soil and Groundwater Pollution of Asian Countries (ReSAGPAC WG)

09:00am~05:20pm, November 30, 2011

Alexandria Chamber, GIS Convention Center, National Taiwan University, Taipei, Taiwan

Present:

Dr. Zueng-Sang CHEN (Chairman, Taiwan), Mr. Jeng-Ren HO (Taiwan),
Dr. Hao-Chun Hung (on behalf of Mr. Hung-Teh TSAI, Taiwan), Dr. Rashid HASAN (India),
Prof. Wisjuprpto (Indonesia), Mr. Wan JUN (Korea), Dr. Jae E. YANG (Korea),
Dr. Yong-Ha Park (Korea), Dr. Azimuddin BAHARI (Malaysia), Dr. Zaharah Bt. YAHYA KHAN (Malaysia),
Mr. Anukoon SUTHAPAN (Thailand), Dr. Chayawee WANGCHAROENRUNG (Thailand),
Dr. Orathai Sukreeyapongse (Thailand), Ms. Pham Thi Thuy HANH (Vietname),
Dr. Le Thi Hai LE (Vietname), Ms. Nguyen Hoang Anh (Vietname)

In Attendance:

Dr. Jessica Kao (USEPA, 9:00am~12:20pm only),
Dr. Phillip Crowcroft (UK CL:AIRE, 9:00am~12:20pm only), Mr. Zih-Sin Wang (Taiwan EPA),
Dr. Shian-Chee Wu (Taiwan, 9:00am~12:20pm only), Dr. Chih Huang (Taiwan, 9:00am~12:20pm only),
Prof. Dar-Yuan Lee (Taiwan, 10:20am~17:20pm only),
Mr. Yuan-Wu Chen (Taiwan, 14:00~17:20pm only)

Absent:

Mr. Aep Purnama (Indonesia), Dr. Atty. Ernesto D. Adobo, Jr. (Philippines),
Dr. Tomoyuki MAKINO (Japan)



Minutes Continued

Opening Address at 09:00~09:20am

The Chairman, Dr. Zueng-Sang Chen, welcomed Mr. Jeng Ren Ho, who is the the Division Chief of Soil and Groundwater Remediation Fund Management Board of Taiwan, and Dr. Hao-Chun Hung, who is the senior environmental technology specialist of Soil and Groundwater Remediation Fund Management Board of Taiwan EPA.

2. The Chairman welcomed all Members to the business meeting:

Distinguished invited government officers and experts from Asian countries, USEPA, CL:AIRE, Ladies and Gentlemen:

It is a great pleasure for me at the opening ceremony of the business meeting of the Working Group on Remediation for Soil and Groundwater Pollution of Asian Countries (WG ReSAGPAC). On behalf of the working group and Taiwan EPA, I should like to extend my sincerely welcome all of you, including 22 foreign participants from government officers and scientists from 9 countries members of this working group and also include 2 experts from USEPA, Ms. Nancy Marvel and Ms. Jessica Kao, and one expert from CL:AIRE of United Kingdom, Mr. Philip Crowcroft. Your participations are very welcome, and will contribute a great deal to the success future of our working group to maintain our good environmental quality and human health in this region.

In the last business meeting of the working group held on June 13, 2011, at Taipei, we have approved the general rules on the objectives, membership, officers, structures, function of steering committee, function of scientific committee, function of service and communication committee, activities, official business meeting and finance. Based on this rules, the WG shall aim on



promoting the activities to share the management strategies, remediation technologies for soil and groundwater-contaminated sites and also on disseminating the knowledge and experience for the benefit of the member of the working group in the Asian region.

We have 3 items to be discussed during this business meeting. The first item to be discussed is to confirm the general rules, logo and website demonstration of the WG. We can find some information of the country members of WG in the website. I thank for your strongly supporting to provide the information. The second item to be discussed is the topics of

Minutes Continued

workshop and training course and communication types of the WG in 2012-2014. The third item to be discussed is to propose the visiting program organized by the WG in 2012-2014. I hope we can get good conclusion to be followed in the next 3 years.



Finally, I would like to express my grateful thanks to Mr. Hung-Teh Tsai, who is the technical superintendent and executive secretary of the Soil and Groundwater Remediation Fund Management Board of Taiwan EPA and the government officer of the Fund management Board for their strong support for this business meeting and workshops in the first two terms of our WG. I also thank all of you to here to promote our activities of the WG

for good environmental quality and health life in the Asian countries. I also hope you have a very good time in Taipei and Taoyuan during field study tour on Dec 1.

Thank you.

****Bio*****
Dr. Zueng-Sang Chen is the Chairman of the Working Group on Remediation for Soil and Groundwater Pollution of Asian Countries (WG ReSAGPAC) (2011-2014). He is a Distinguished Professor of Department of Agriculture Chemistry, National Taiwan University. He received his Ph.D. degree from Department of Agriculture Chemistry, National Taiwan University. His specialties are pedology, soil classification and taxonomy, forest ecology, and soil pollution remediation. He has many experiences on planning, design, construction, and operation of soil remediation work.

3. Mr. Jeng Ren Ho extended welcome to invited speakers and all Members.



****Bio*****
Mr. Chien-Jen Ho is the chief of technology evaluation section of Soil and Groundwater Fund Management Board, Taiwan EPA. He received his bachelor degree from Department of Civil Engineering, National Central University, Taiwan, and now he is studying at National Taiwan University for his Ph.D. degree in Environmental Engineering. His specialties are Environmental Planning and Management, Soil Pollution Remediation and Management, and the building and operation management of an incinerator.

Minutes Continued

Keynote Speech at 09:20am~12:20pm



4. On behalf of Mr. Hung-Teh Tsai, Dr. Hao-Chun Hung made a presentation on Embracing the Regional Sustainable Contaminated Land Development in the Asian Region.

*****Bio*****

Dr. Hao-Chun Hung is a senior Environmental Technology Specialist of the Soil and Groundwater Remediation Fund Management Board of Taiwan EPA. He received his Ph.D. degree from Department of Civil and Environmental Engineering, University of Wisconsin-Madison, USA.

5. Ms. Jessica Kao shared the experience in USEPA on An Overview of the Development of Key U.S. Pollution Control Laws and Their Shared Framework Elements.



*****Bio*****

Ms. Jessica Kao has been an attorney with the U.S. Environmental Protection Agency, Pacific Southwest Region (Region 9) since 1987, which covers Arizona, California, Hawaii, Nevada, the Pacific Islands, and 147 tribes. She has extensive experience implementing U.S. environmental laws, including handling precedent-setting civil matters under various permitting, standards and enforcement programs and serving as the Region’s Criminal Enforcement Counsel from 1995 to 2000. She has a Juris Doctorate from the University of California, Hastings College of the Law, an MA in cultural anthropology from the University of California, Los Angeles.

6. Mr. Phillip Crowcroft gave a speech on Soil and Groundwater Related Policy Framework in the European Union.



*****Bio*****

Mr. Phillip Crowcroft has been a member of several Environment Agency and CIRIA research contract steering groups and the Land Condition Record Steering Group. He is a Partner in the Contaminated Site Management team based in the Leeds and Manchester offices. He has over 30 years experience in dealing with land contamination and brownfield regeneration. He has specialised in regulatory issues, keeping abreast of both UK and European legislation and providing advice on liability for land-owners and users.

Minutes Continued

Business Meeting at 02:00~05:20pm

Part 1 – Confirmation of General Rules, LOGO of WG, Website Demonstration

7. The general rules of the Working Group of ReSAGPAC were confirmed without amendment. (Remark: The general rules had been discussed at the 1st business meeting on June 13, 2011, at Taipei, Taiwan.)

8. The proposed design of the logo of the Working Group was discussed and concluded with green color.

9. The Chairman demonstrated the website of the Working Group.

10. Members reviewed the contents of the website and the Chairman proposed to continue providing the basic information of the country members of the Working Group.

Left: Dr. Zaharah bt. Yahya Khan (Malaysia) /

Right: Dr. Azimuddin Bahari (Malaysia)



Part 2 – Topics of workshop and training courses of WG in 2012-2014 and Communication types of WG

11. Proposal and discussion (1) - November, 2011: Workshop on **Regulatory standard and management of pollutants** of the contamination sites, including inviting 2 experts from USEPA, 1 expert from European Union, 22 persons from 9 country members of WG ReSAGPAC.

Left: Dr. Orathai Sukreeyapongse (Thailand) /

Mid: Dr. Rashid Hasan (India) / Right: Prof. Wisjnuaprpto (Indonesia)



12. Proposal and discussion (2) - June, 2012: Workshop on **phytoremediation techniques** for the heavy metals or organic pollutants of the contaminated sites (meeting the Taiwan EPA and USEPA activities). WG will invite 3 experts from USEPA, 1 expert from European Union and 15 persons from 9 country members of WG ReSAGPAC.

13. Proposal and discussion (3) – September, 2012: **International conference** on the remediation

and management and environmental exhibition on the remediation technique. WG will invite around 20 experts from the world and 20 persons from 9 country members of WG ReSAGPAC.

Minutes Continued

14. Proposal and discussion (4) - June, 2013: Workshop on **permeable reactive barrier (PRB)** techniques for the heavy metals or organic pollutants (e.g. DNAPL compounds) of the contaminated sites (meeting the Taiwan EPA and USEPA activities).
15. Proposal and discussion (5) - October, 2013: **Training courses on sampling techniques and geostatistics** for mapping the distribution of pollutants in the contamination sites.
16. Proposal and discussion (6) - June, 2014: Workshop on **remediation techniques on the dioxin and polychloride benzene (PCB)** (meeting the Taiwan EPA and USEPA activities).
17. Proposal and discussion (7) - **Facebook system** can be involved in the website of WG ReSAGPAC.

Mr. Wan Jun (Korea)



Dr. Jae E. Yang (Korea)



Part 3 – Visiting Programs Organized by WG

18. Team Visiting Program (TVP) to Korea in 2012: WG proposed to organize a Taiwan team visiting program to Korea.

- The proposed visiting agency is the Soil and Groundwater Management Division, Water Environment Management Bureau, Ministry of Environment, Korea.
- The purposes of visiting are to communicate the possibility to sign the Memory of Agreement to promote the cooperative activities, share the experience on the development of the regulatory standard and management of pollutants, and also to visit the governmental agencies related to soil and groundwater pollution.
- The possibility to organize the international workshop to be held at Korea and some speakers are invited from members of WG.
- The possibility to understanding the future cooperative activities on the contaminated sites of soil and groundwater sites.

19. Team Visiting Program (TVP) to Thailand in 2012: WG propose to organize a Taiwan team visiting program to Thailand.

- The proposed visiting agency is the Industrial Wastewater Division, Water Quality Management Bureau, Pollution Control Department, Ministry of Natural Resources and Environment, Thailand.

Minutes Continued

- The purposes of visiting are to communicate the possibility to sign the Memory of Agreement to promote the cooperative activities, share the experience on the development of the regulatory standard and management of pollutants, and also to visit the governmental agencies related to soil and groundwater pollution.
- The possibility to understanding the future cooperative activities on the contaminated sites of soil and groundwater sites.

Left: Mr. Anukoon Suthapan (Thailand) /

Rihgt: Dr. Chayawee Wangcharoenrung (Thailand)



20. Team Visiting Program (TVP) to Vietnam in 2012: WG propose to organize a Taiwan team visiting program to Vietnam.

- The proposed visiting agency is Department of International Cooperation and Science and Technology, General Department of Land Administration, Ministry of Natural Resources and Environment, Vietnam.

Left: Ms. Pham Thi Thuy Hanh (Vietname) /

Mid: Ms. Nguyen Hoang Anh (Vietname) Rihgt: Dr. Le Thi Hai Le (Vietname)



- The purposes of visiting are to communicate the possibility to sign the Memory of Agreement to promote the cooperative activities, share the experience on the development of the regulatory standard and management of pollutants, and also to visit the governmental agencies related to soil and groundwater pollution.
- The possibility to understanding the future cooperative activities on the contaminated sites of soil and groundwater sites.

21. There being no other business, the Chairman declared the meeting closed.

The Working Group on Remediation for Soil and Groundwater Pollution of Asian Countries

Interesting sidelights at 2nd Business Meeting of ReSAGPAC WG



Seminar Report - Opening Address

International Workshop on Regulatory Standards of Pollutants and Management Systems for Soil and Groundwater Pollution

09:40~09:50am, November 29, 2011

Socrates Chamber, GIS Convention Center, National Taiwan University, Taipei, Taiwan



Dr. Zueng-Sang Chen (陳尊賢)

**Distinguished Professor of Department of Agriculture Chemistry,
National Taiwan University**

- Ph.D. in Agriculture Chemistry, 1984, National Taiwan University
- M.S. in Agriculture Chemistry, 1978, National Taiwan University
- Specialties: pedology, soil classification and taxonomy, forest ecology, soil pollution remediation.
- Experienced on planning, design, construction, and operation of soil remediation work.

Distinguished invited government officers and experts from Asian countries, USEPA, CL:AIRE, Ladies and Gentlemen:

It is a great pleasure for me at the opening ceremony of the 2011 International Workshop on Regulatory Standards of Pollutants and management Systems for Soil and Groundwater Pollution. On behalf of the Taiwan EPA and Working Group on Remediation for Soil and Groundwater Pollution of Asian Countries (WG ReSAGPAC), I should like to extend my sincerely welcome all of you, including 22 foreign participants from government officers and scientists from 9 countries members of this working group and also include 2 experts from USEPA, Ms. Nancy Marvel and Ms. Jessica Kao, and one expert from CL:AIRE of United Kingdom, Mr. Philip Crowcroft. Your participations are very welcome, and will contribute a great deal to the success future of our working group to maintain our good environmental quality and human health in this region.

As we know, there are only few countries have the regulatory standard of pollutants and management systems for soil and groundwater Pollution in Asian countries. The regulations of the pollutants are still discussed for different purposes-based evaluation although they have, especially for environmental quality, food safety, human health and risk assessment. Based on the general rules of the working group of ReSAGPAC, the main purposes of this workshop are to promote the country members of WG to develop their regulatory standard of pollutants and management systems for soil and groundwater Pollution sites in the near future.



In the morning session of the

Seminar Report - Opening Address Continued

workshop of two days, the WG invited three keynote speakers, Mr. Hung-Teh Tsai from Taiwan EPA, Ms. Nancy Marvel from USEPA, and Mr. Philip Crowcroft from CL:AIRE of United Kingdom, to share their experience. The main contents of three keynote speeches include the next 4 years (2012-2015) on soil and groundwater pollution in Taiwan, the hazardous waste management and cleanup Law of USEPA, and the contaminated land management framework and regulations of pollutants in UK.

In the afternoon session of the workshop of two days, the WG invite the experts from India, Indonesia, Japan, Korea, Thailand, Vietnam, Philippines and Taiwan, to present their experience and Acts on the development of regulatory standard of pollutants and management systems based on different consideration and risk assessment. Some of them are very serious contamination sites in the Asian countries.

We understand the important of the education and communication of the human health risk assessment for the people community exposure in a contamination site. We know that the risk-based approach remediation techniques should be a very important direction to be followed to develop different remediation techniques for soil and groundwater contaminated sites in the world, especially in the Asian countries.

Finally, I would like to express my grateful thanks to Mr. Hung-Teh Tsai, who is the technical superintendent and executive secretary of the Soil and Groundwater Remediation Fund Management Board of Taiwan EPA and the government officer of the Fund management Board for their strong support for this workshop. I also thank all of you to here to promote our activities of the WG for good environmental quality and health life in the Asian countries. I also hope you have a very good time during the workshop.

Thank you.



Seminar Report - Invited Speakers

**International Workshop on
Regulatory Standards of Pollutants and Management Systems for Soil and Groundwater Pollution**
10:00~10:40am, November 29, 2011

Keynote Speech: Future Projects in Next Four Years of Soil and Groundwater Management of Taiwan EPA

Website for downloading the paper and ppt files:

http://140.115.123.119/1001129-30/Nov_29-30_Proceedings_Full_V3_for%20web.pdf (page 18/309~41/309 of the pdf file) or ReSAGPAC WG website (<http://www.resagpac.org/>)



Mr. Hung-Teh Tsai (蔡鴻德)

**Technical Superintendant and Executive Secretary of
Soil and Groundwater Remediation Fund Management Board,
Taiwan Environmental Protection Administration**

- M.S. in Environmental Engineering, National Taiwan University
- B.S. in Public Health, National Taiwan University
- Experienced in Administration, Site Supervision and Management.



for Soil and
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Seminar Report - Invited Speakers Continued

**International Workshop on
Regulatory Standards of Pollutants and Management Systems for Soil and Groundwater Pollution**
11:00~11:50am, November 29, 2011 & 10:50~11:40am, November 30, 2011

Keynote Speech: Introduction of the major U.S. Hazardous Waste Management and Cleanup Laws



Ms. Nancy Marvel
Regional Counsel of the U.S. Environmental Protection Agency, Pacific Southwest Region (Region 9)

- A graduate of Princeton University
- Law degree from Georgetown University Law Center
- A member of the bar in California and a recipient of the Senior Executive Service Meritorious Executive Presidential Rank Award for her achievements over the course of her EPA career.



The Working Group
Groundwater Pollution

Seminar Report - Invited Speakers Continued

**International Workshop on
Regulatory Standards of Pollutants and Management Systems for Soil and Groundwater Pollution**
11:50am~12:40pm, November 29, 2011 & 11:40am~12:30pm, November 30, 2011

**Keynote Speech: (1)The Contaminated Land Management Framework and Regulations in UK;
(2)The Practice of Contaminated Land Management in UK and Case Studies**

Website for downloading the paper and ppt files:

http://140.115.123.119/1001129-30/Nov_29-30_Proceedings_Full_V3_for%20web.pdf (page 42/309~57/309 and 158/309~179/309 of the pdf file) or ReSAGPAC WG website (<http://www.resagpac.org/>)



Dr. Phillip Crowcroft

**CL:AIRE (Contaminated Land: Applications In Real Environments)
Partner – Contaminated Site Management,
Environmental Resources Management Ltd. (ERM), UK**

- MSc Geotechnical Engineering, University of Surrey, 1982
- BSc (Eng) Civil and Structural Engineering, University of Sheffield, 1975
- Fields of Competence: Contaminated land and landfill investigation and remediation, Risk assessment, Design and implementation of remediation schemes, UK policy and regulation on land contamination, Expert witness



Seminar Report - Invited Speakers Continued

**International Workshop on
Regulatory Standards of Pollutants and Management Systems for Soil and Groundwater Pollution**
02:00~02:30pm, November 29, 2011

Topic: Legal and Legislative Approaches to Find Soil Contamination Sites in Korea

Website for downloading the paper and ppt files:

http://140.115.123.119/1001129-30/Nov_29-30_Proceedings_Full_V3_for%20web.pdf (page 58/309~67/309 of the pdf file) or ReSAGPAC WG website (<http://www.resagpac.org/>)



Dr. Yong-Ha Park

Chief Senior Research Fellow, Korea Environment Institute

- Ph.D Plant Pathology and Microbiology, Texas A&M University, 1991
- M.s. Plant Pathology and Weed Sciences, Colorado State University, 1987
- M.S Plant Protection, Korea University, 1984
- B.S Agricultural Science, Korea University, 1982
- Areas of expertise: Natural Resource Management



Seminar Report - Invited Speakers Continued

International Workshop on

Regulatory Standards of Pollutants and Management Systems for Soil and Groundwater Pollution

03:00~03:30pm, November 29, 2011

Topic: Recent Contamination Cases and Development of Countermeasure Regulations in Thailand

Website for downloading the paper and ppt files:

http://140.115.123.119/1001129-30/Nov_29-30_Proceedings_Full_V3_for%20web.pdf (page 92/309~97/309 of the pdf file) or ReSAGPAC WG website (<http://www.resagpac.org/>)



Dr. Chayawee Wangcharoenrung

**Environmental Professional Level, Industrial Wastewater Division,
Water Quality Management Bureau, Pollution Control Department,
Ministry of Natural Resources and Environment, Thailand**

- Doctor of Philosophy, Mechanical Engineering - Biomechanics, 2005, The University of Texas at Austin, USA
- Master of Science, Mechanical Engineering - Dynamic Systems and Control, 1999, The University of Texas at Austin, USA
- Bachelor of Engineering, Mechanical Engineering – Automotive Engineering, 1994, Kasetsart University, Bangkok, Thailand
- First Class Mechanical Engineering Licensee, Thailand, 1994-present



Seminar Report - Invited Speakers Continued

International Workshop on

Regulatory Standards of Pollutants and Management Systems for Soil and Groundwater Pollution

03:50~04:40pm, November 29, 2011

Topic: Tainan Low Carbon City - Green Remediation Project: Case of An-Shun Site

Website for downloading the paper and ppt files:

http://140.115.123.119/1001129-30/Nov_29-30_Proceedings_Full_V3_for%20web.pdf (page 98/309~123/309 of the pdf file) or ReSAGPAC WG website (<http://www.resagpac.org/>)



Prof. Chih-Cheng Chao (巢志成)

**Sustainable Environmental Research Center
National Cheng Kung University, Taiwan**

(on behalf of Dr. Hwang Jen Chang (張皇珍), Director General of
Environmental Protection Bureau of Tainan City Government)

- Ph.D., Environmental Engineering (1979), University of Montreal, Canada
- M. Sc., Chemical Engineering (1971), University of Nebraska, USA
- B. Sc., Chemical Engineering (1967), Tunghai University, Taiwan
- Specialties: Sustainable Material Management, Eco-Industrial System, Value-Added Recycling, Cleaner Production, Site Remediation and Redevelopment, HazWaste Treatment.



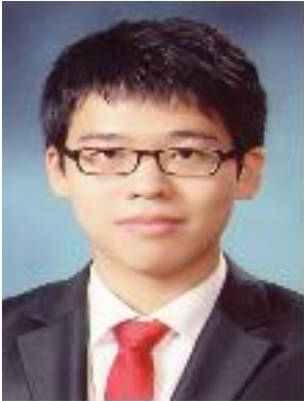
Seminar Report - Invited Speakers Continued

**International Workshop on
Regulatory Standards of Pollutants and Management Systems for Soil and Groundwater Pollution**
04:40~05:10pm, November 29, 2011

Topic: Monitoring of Agent Orange Pollution and a Potential Management Strategy in the Military Base

Website for downloading the paper and ppt files:

http://140.115.123.119/1001129-30/Nov_29-30_Proceedings_Full_V3_for%20web.pdf (page 124/309~127/309 of the pdf file) or ReSAGPAC WG website (<http://www.resagpac.org/>)



Mr. Wan Jun
Deputy Director of Soil & Groundwater Management Division,
Water Environment Management Bureau,
Ministry of Environment,
Republic of Korea



Seminar Report - Invited Speakers Continued

**International Workshop on
Regulatory Standards of Pollutants and Management Systems for Soil and Groundwater Pollution**
09:30~10:00am, November 30, 2011

Topic: Regulatory Standards of Heavy Metal Pollutants in Soil and Groundwater in Taiwan

Website for downloading the paper and ppt files:

http://140.115.123.119/1001129-30/Nov_29-30_Proceedings_Full_V3_for%20web.pdf (page 128/309~149/309 of the pdf file) or ReSAGPAC WG website (<http://www.resagpac.org/>)



Dr. Dar-Yuan Lee (李達源)
Professor of Department of Agricultural Chemistry,
National Taiwan University

- Ph.D. in Soil and Environmental Sciences, 1988, University of California, Riverside, USA
- M.S. in Agriculture Chemistry, 1983, National Taiwan University
- B.S., in Agriculture Chemistry, 1979, National Taiwan University
- Specialties: Soil Chemistry, Soil Physics, Soil & environmental sciences.



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Seminar Report - Invited Speakers Continued

**International Workshop on
Regulatory Standards of Pollutants and Management Systems for Soil and Groundwater Pollution**
10:00~10:30am, November 30, 2011

Topic: Ecological Risk Assessment of Heavy Metal Pollution in Watershed nearby Abandoned Metal Mine

Website for downloading the paper and ppt files:

http://140.115.123.119/1001129-30/Nov_29-30_Proceedings_Full_V3_for%20web.pdf (page 150/309~157/309 of the pdf file) or ReSAGPAC WG website (<http://www.resagpac.org/>)



Dr. Jae Eui Yang
President of International Union of Soil Science (IUSS)
Dean of College of Agriculture and Life Sciences
Professor of Soil Environmental Chemistry,
Department of Biological Environment, Kangwon National University, Korea

- Ph.D. in Montana State University, US
- Experienced in environmental site assessment, remediation planning construction, and operation of soil remediation work.



The Working
Groundwater

Seminar Report - Invited Speakers Continued

**International Workshop on
Regulatory Standards of Pollutants and Management Systems for Soil and Groundwater Pollution**
02:00~02:30pm, November 30, 2011

Topic: The Conceptual Approach for Control Standard Setting Based on Human Health Risk

Website for downloading the paper and ppt files:

http://140.115.123.119/1001129-30/Nov_29-30_Proceedings_Full_V3_for%20web.pdf (page 180/309~197/309 of the pdf file) or ReSAGPAC WG website (<http://www.resagpac.org/>)

Dr. Chih Huang (黃智)

**Senior Research and Deputy Manager of Environmental Engineering Research Center,
Sinotech Engineering Consultants, Inc., Taiwan**

- Experienced in in Ground Water Science, Environmental Site Assessment, and Remediation Planning, Design, Construction, and Operation of Remediation Work.



Seminar Report - Invited Speakers Continued

International Workshop on

Regulatory Standards of Pollutants and Management Systems for Soil and Groundwater Pollution

02:30~03:00pm, November 30, 2011

Topic: Indonesian Regulations Related to the Prevention of Soil and Groundwater Pollutions

Website for downloading the paper and ppt files:

http://140.115.123.119/1001129-30/Nov_29-30_Proceedings_Full_V3_for%20web.pdf (page 198/309~221/309 of the pdf file) or ReSAGPAC WG website (<http://www.resagpac.org/>)

Prof. Wisjnuaprpto

Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung, Indonesia

- 1981, Doctor of Engineering in Biological Wastewater Treatment Process, INSA Toulouse, France
- 1976, Diplome in Sanitary Engineering, International Institute in Hydraulic and Environmental Engineering (IHE), Delft, the Netherlands
- 1971, Undergraduate degree (Engineer) in Environmental Engineering, Institut Teknologi Bandung, Indonesia
- Specialties: Water and wastewater treatment, environmental biotechnology development.



The Working
Groundwater

Seminar Report - Invited Speakers Continued

**International Workshop on
Regulatory Standards of Pollutants and Management Systems for Soil and Groundwater Pollution**
03:00~03:30pm, November 30, 2011

Topic: Vietnam's Regulation on Management of the Soil and Underground Water Pollution

Website for downloading the paper and ppt files:

http://140.115.123.119/1001129-30/Nov_29-30_Proceedings_Full_V3_for%20web.pdf (page 222/309~253/309 of the pdf file) or ReSAGPAC WG website (<http://www.resagpac.org/>)



Ms. Nguyen Hoang Anh
Head of Water and Soil Pollution Control Division
Pollution Control Department
Vietnam Environment Administration
Ministry of Natural Resources and Environment



The Working Group on
Groundwater Pollution

Seminar Report - Invited Speakers Continued

**International Workshop on
Regulatory Standards of Pollutants and Management Systems for Soil and Groundwater Pollution**
03:50~04:20pm, November 30, 2011

Topic: Prevention and Control of Soil Pollution: An Indian Perspective

Website for downloading the paper and ppt files:

http://140.115.123.119/1001129-30/Nov_29-30_Proceedings_Full_V3_for%20web.pdf (page 254/309~259/309 of the pdf file) or ReSAGPAC WG website (<http://www.resagpac.org/>)



Dr. Rashid Hasan
Director, CP Division
Ministry of Environment and Forests, Government of India

- Ph.D., Aligarh Muslim University (AMU), 1984
- M.S., Aligarh Muslim University (AMU), 1978
- Experienced in pollution control, environmental policy, planning, law, ecodevelopment, rural livelihood improvement & management.



Seminar Report - Question and Discussion

**Mr. Kuo-Chung Liu (劉國忠) –
Senior Engineering Expert,
China Steel Corporation, Taiwan**



Mr. Phillip Crowcroft (CL:AIRE/ERM, UK)



Dr. Rashid Hasan (India)



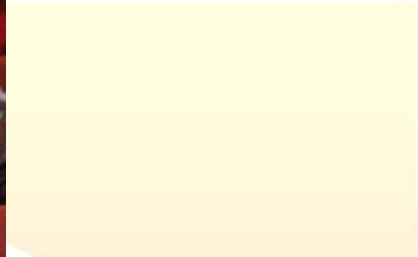
Dr. Jae E. Yang (Korea)



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Countries

Seminar Report - Question and Discussion Continued

Dr. Orathai Sukreeyapongse (Thailand)



Prof. Wisjnuaprpto (Indonesia)



Dr. Hao-Chun Hung (洪豪駿) - Taiwan EPA



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Groundwater P

Seminar Report - Question and Discussion Continued

Dr. Azimuddin Bahari (Malaysia)



*Dr. Satnam Singh (辛士南) –
Post Doctoral Researcher
National Chung Hsing University,
Taiwan*



*Dr. Zueng-Sang Chen (陳尊賢) –
Professor, National Taiwan University*



*Dr. Chih Huang (黃智) –
Senior Research and Deputy Manager,
Sinotech Engineering Consultants, Inc., Taiwan*

Seminar Report - Interesting sidelights



Registration, November 29, 2011

Registration, November 29, 2011



VIP Room, November 29, 2011



VIP Room, November 29, 2011



for Soil and
Countries

Seminar Report - Interesting sidelights Continued

Group Photo, November 29, 2011



Groundwater Pollution

Seminar Report - Interesting sidelights Continued



Break Time, November 29, 2011



Seminar Report - Interesting sidelights Continued



Lunch Time, November 29, 2011



Dinner Party, November 29, 2011



tion for Soil and
Countries

Seminar Report - Interesting sidelights Continued



Break Time, November 30,, 2011



November 30, 2011



Study Tour to Environmental Analysis Laboratory of Taiwan EPA and Contaminated Site in North Taiwan

Date: December 1, 2011

Time	Content of Schedule		Explanation Staff
08:00	Get on the bus at Leader Hotel		
08:15	Get on the bus at Howard Taipei international House Hotel		
08:30-10:00	Bound to the Environmental Analysis Laboratory (EAL, Taiwan EPA) located at Hsing-Wu, Taoyuan (40 km from Taipei)		
10:00-10:30	Environmental Analysis Laboratory	<i>The Brief introduction</i> for the Latest Status of the Environmental Analysis Laboratories Management	Dr. Yuan-Wu Chen
10:30-12:00		Visit the <i>Lab of heavy metals analysis</i>	Associate Researcher Dr. Ming-Nee Chen
		Visit the <i>Lab of Dioxin analysis</i>	Dr. Yuan-Wu Chen
		Visit the <i>Lab of sampling equipments on soil and groundwater</i>	Dr. Shee-Nan Yang
12:00-13:30	<i>Lunch</i> at Restaurant located at Chung-Lee city		
13:30-14:00	Bound to the Business Center of Tao-Yuan, Hsing-Chu and Miao-Lee region, China Petroleum Company, Taiwan		
14:00-15:00	<i>Brief introduction</i> of the oil-contamination site located at Sin-Wu, Tao-Yuan, No. 15 Provincial Road +53.5K of Taiwan		Dr. Shang-Lin Ho
15:00-15:40	Bound to the oil-contamination site		
15:40-16:40	<i>Field study</i> at the oil-contamination site		Dr. Shang-Lin Ho
17:00-19:00	<i>Dinner</i> at the restaurant located at Yuan-An Harbor		
19:00-20:00	Bound to the Taipei by bus		

Study Tour to Environmental Analysis Laboratory of Taiwan EPA and Contaminated Site in North Taiwan Continued

Visit the Environmental Analysis Laboratory (EAL) of Taiwan EPA



Welcome address

Mr. Gwo-Dong Roam(阮國棟)- the Director of EAL



Briefing

Dr. Yuan-Wu Chen(陳元武)



The Working Group
Groundwater Panel

Study Tour to Environmental Analysis Laboratory of Taiwan EPA and Contaminated Site in North Taiwan Continued

Visit the Environmental Analysis Laboratory (EAL) of Taiwan EPA



Groundwater Polluti

Study Tour to Environmental Analysis Laboratory of Taiwan EPA and Contaminated Site in North Taiwan Continued

Visit the Environmental Analysis Laboratory (EAL) of Taiwan EPA



Study Tour to Environmental Analysis Laboratory of Taiwan EPA and Contaminated Site in North Taiwan Continued

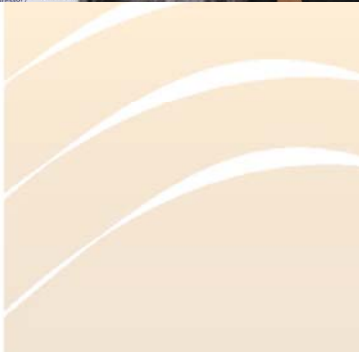
Briefing in the Business Center of Tao-Yuan, Hsing-Chu and Miao-Lee, CPC Corporation, Taiwan



ion for Soil and
ountries

Study Tour to Contaminated Site and Taroko National Park in East Taiwan Continued

Field study at the oil-contamination site located at No. 15 Provincial Road +53.5Km



The working Group of
Groundwater Pollution

