

Conference Report

Mercury in Our World: Conference on Mercury and Other Hazardous Chemicals in Southeast Asia Schools

April 22-24, 2008

The Imperial Queen's Park Hotel
199 Sukhumvit Soi 22
Bangkok, Thailand



U.S. Environmental
Protection Agency
(USEPA)

Thailand Pollution
Control Department
(PCD)

United Nations
Environment
Program (UNEP)

Merck
Thailand



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1. Conference Outcomes

On April 22-24, 2008, the United States Environmental Protection Agency (USEPA) sponsored the Mercury in Our World Conference in Bangkok, Thailand, together with the Thailand Pollution Control Department (PCD), United Nations Environment Program (UNEP), and Merck, Ltd. The goal of the conference was to promote safer mercury and chemical management in universities and high schools in Thailand, through a train-the-trainer approach, and explore possibilities for duplicating this conference in other Southeast Asian countries. The desired outcome is reduced chemical and mercury student exposure and safer chemical management by school officials in Thailand, and throughout Southeast Asia. Progress towards this outcome is indicated by the following:

64 conference participants were educated on mercury and chemical safety in schools.

This included:

- 28 high school and university teachers and administrators from Thailand, Cambodia, and the Philippines
- 17 university students from Thailand, Cambodia, the Philippines, and the USA
- 8 staff members from the Thailand PCD
- 11 speakers and organizers from USEPA, Merck, UNEP, World Health Organization (WHO), New York Department of Environmental Conservation (NYDEC), and Battelle.

The Thai teachers at the conference, such as Professor Achara Aunsisanun (right) of Traimit Wittayalai School, thanked the conference organizers for reaching out to them, and said they will make changes at their schools.

Many teachers said that they are often excluded from such trainings, and promised to make changes and work with their students to let them know about the danger of mercury. (A survey will be conducted 3-6 months after the conference by USEPA and PCD to confirm the resulting trainings and/or changes made in their schools. See Appendix D.)



Thailand PCD took the initiative to translate conference manuals on mercury and chemical safety into Thai, and PCD talked with local teachers about a mercury clean-out.

PCD has produced a draft Thai version of the conference manuals (highlighting key points), and is in the process of creating a full Thai manual on mercury in schools for distribution to every school in Thailand. Pornpimon Chareonsong, Senior Environmental Scientist at PCD, indicated that she talked at the conference with a group of teachers in Bangkok who were interested in joining together to have a school mercury clean-out program.

Participants from Cambodia and the Philippines expressed a strong interest in duplicating the conference in their respective countries.

Dr. Genandrialine L. Peralta of the University of Philippines, and Mr. Yim Mongtoeun of the Royal University of Phnom Penh, both offered to be the points of contact for USEPA if duplication of the conference by USEPA is possible.

The 28 participants of the Teachers/Administrators Track generated a diverse list of ideas for policies and actions that school administrators and teachers can take to reduce chemical and mercury exposures in schools.

The ideas reported by the teacher/administrator groups included:

- Linking several area high schools together to jointly conduct a mercury collection and disposal program
- Creating an Emergency Action Plan, and joining with the Society of Educators to endorse relevant policies
- Arranging a Chemical Safety Day that would involve student essays, demonstrations, and posters, and a question and answer session
- Creating a network of high schools to collaborate with PCD on chemical emergencies

The 20 participants of the Student Track had a great time exchanging ideas about mercury, and generated VERY creative projects (videos, games, service announcements, and posters) for use in school curriculums.

Many conference participants requested a copy of the student project files (which also will be posted online, and were copied directly onto the flash drives of several participants). Following the conference, students initiated an online (Yahoo) discussion group (“US EPA and UNEP trained environment police who is tasked to clean the world from mercuric contamination.”). Sam Coleman, USEPA Region 6 Superfund Division Director and conference speaker, noted that the student’s “Service Announcement” was so well done that it exceeded his expectations of a professional contractor. See Appendix B for student projects.



Merck, Ltd. staff told conference organizers that they learned a lot from the mercury collection demonstration.

Merck conducts a “Let’s Care Safety Camp” for graduating college seniors every year throughout Thailand, and expressed interest in incorporating mercury clean-up information into their curriculum.

The Royal Thai Army Nursing College said the mercury information was very relevant to their work, and requested a similar conference at their school.

The nursing students told USEPA that they are still using mercury thermometers and sometimes drop them, but just throw the broken thermometers in the trash. The thank-you note (right) from a nursing instructor indicates the knowledge they gained on mercury, and plans they have for dealing with and eliminating mercury in the school and hospital.

Excerpt from Letter from Conference Participant

“...In the conference, we learned a lots about mercury. We gain more awareness for dealing and eliminating the mercury when it spills in the our school and hospital. We have concentrated that it is our responsibilities to know and protect our students and environment. This conference had various sections including workshop, visiting, demonstrating and expaining. As result, it helped us to learn easier and more clearly about mercury topic. Also, in student section, we thought it was really good for them to learn and exchange their knowledge to each other. It was a good way for traning the trainer in school and university...
Thank You Sincerely, Piyaorn”
(Major, Royal Thai Army Nursing College)

USEPA will present the results of this conference at a UNEP Mercury Partnerships Conference in October 2008. In addition to the interest shown in duplicating the student portion of this project by UNEP, representatives from WHO expressed interest in collaborating with USEPA on this topic.

2. Conference Background and Proceedings

Schools around the world contain chemicals of concern for student health, including mercury and mercury-containing devices such as thermometers. These chemicals are used in science and chemistry labs, art studios, vocational classrooms, boiler rooms, maintenance facilities, custodial closets, and other areas, despite the availability of less dangerous alternatives. In 2006, there was a mercury spill at St. Andrew’s School in the Philippines that resulted in mercury poisoning of several students and contamination and closure of the school. In 2003, Ballou High School in Washington, DC also experienced a mercury spill resulting in school and home contamination and school closure. As a result of the U.S. Environmental Protection Agency’s (USEPA) involvement in both cleanups, USEPA is pursuing projects to proactively plan for more effective preparedness, management, response, cleanup, and remediation of chemical and mercury incidents in other schools. Specifically, USEPA is addressing the a need for “how-to” resources to help school districts and individual schools develop effective policies and procedures for proper chemical management, to reduce the health and safety risks to students, teachers, and school personnel, and damage to the environment.

The Thailand PCD agreed to work in partnership with USEPA to develop and implement this conference to help Thai schools better manage mercury and other chemicals on school grounds. Because of the special emphasis on mercury, UNEP also agreed to participate in the conference as part of the UNEP Mercury Partnerships Program. Finally, Merck Ltd. in Thailand agreed to participate as a sponsor and field trip host as part of their chemical safety program.

The conference had parallel Teacher/Administrator and Student Tracks, with the former designed as a train-the-trainer activity, and the latter designed to produce curriculum materials on mercury. The majority of participants were from Thailand. However, participants were also included from Cambodia, the Philippines, and the United States, to foster exchange of experience and explore the possibility for duplicating this conference in other Southeast Asian countries. Table 1 lists the conference participants by country.

Table 1. Conference Participants.

Name/Country	Title/Organization	Category
Cambodia (Total of 2)		
Mr. Yim Mongtoeun	Lecturer and Researcher, Department of Environment, Royal University of Phnom Penh	Faculty
Mr. Yen Sophearith	Royal University of Phnom Penh	Student
Philippines (Total of 5)		
Dr. Genandrialine L. Peralta	Professor and Chair, Department of Chemical Engineering, University of the Philippines	Faculty

Name/Country	Title/Organization	Category
Supt. José S. Embang, Jr.	Fire Marshall, Makati City	Speaker
Dr. Irma Makalinao	Professor of Pharmacology and Toxicology, University of the Philippines	Speaker
Ms. M. Sheila K. Ramos	University of the Philippines	Student
Mr. Ricardo Villavert	University of the Philippines	Student
Thailand (Total of 42)		
Mrs. Acchara Angirasanand	Traimit Wittayalai School	Faculty
Mr. Prasit Boonsong	Foundation For Life-Long Education Committee	Faculty
Ms. Pornpimol Chanchaichaowiwat	Bangmodwittaya School	Faculty
Ms. Jaruwan Chattamanokul	Panyaworakun School	Faculty
Ms. Wanida Chooaksorn	Thammasat University	Faculty
Mr. Surachai Kaewtha	Environmental Officer, Pollution Control Department	Faculty
Mrs. Kaesinee Kengsurakarn	Chanhunbamphen School	Faculty
Mrs. Usa Ketlua	Matayomwatnongkham School	Faculty
Ms. Chariya Kongcharoen	Environmental Officer, Pollution Control Department	Faculty
Ms. Pelaiorn Kwanmaung	Watsuthiwararam School	Faculty
Mr. Vjijt Limpanich	Bodindecha (Sing Singhaseni) 2 School	Faculty
Lt. Colonel Amaraporn Meeparan	Royal Thai Army Nursing College	Faculty
Ms. Charatchom Naco	Thaweetapisek School	Faculty
Mrs. Kanungnath Nakpradit	Vice Director, Rattanakosinsomphot Ladkrabang School	Faculty
Major Kunnatee Nualsuwan	Royal Thai Army Nursing College	Faculty
Ms. Jirawares Peungsujarit	Marketing Manager, Merck Ltd.	Faculty
Mrs. Garuna Pongpibunphol	Bodindecha (Sing Singhaseni) 2 School	Faculty
Mr. Jirawat Rungleritrakoolchai	Thammasat University	Faculty
Mrs. Natthakongka Siritorn	(Unknown)	Faculty
Ms. Pattanan Tarin	Environmental Officer, Pollution Control Department	Faculty
Mr. Sumroeng Teecharoen	Rattanakosinsomphot Ladkrabang School	Faculty
Mrs. Payao Thongkum	Chinorotwittayalai School	Faculty
Mr. Somkiat Vichaiwatana	Watsungwej School	Faculty
Major Piyaon Wajanatinapart	Royal Thai Army Nursing College	Faculty
Mrs. Piracha Wangklang	Thammasat University	Faculty
Ms. Pornpimon Chareonsong	Senior Environmental Scientist, Pollution Control Department	Organizer
Dr. Chayaporn Roengpithya	Technical Solutions Specialist, Merck Ltd.	Speaker
Mrs. Laddawan Siangsung	Chinorotwittayalai School	Speaker
Dr. Supat Wangwongwatana	Director General, Pollution Control Department	Speaker
Ms. Mingquan Wichayarangsarith	Deputy Director General, Pollution Control Department	Speaker
Ms. Chittraporn Chantasorn	Kasetsart University	Student
Ms. Thanit Kanjanawisuth	Mahidol University	Student
Ms. Pantiwa Kehatan	Royal Thai Army Nursing College	Student

Name/Country	Title/Organization	Category
Mr. Chalermpan Ngamsopasiriskun	Kasetsart University	Student
Mr. Nared Petchrak	Kasetsart University	Student
Ms. Anunya Pumkajorn	Assumption University	Student
Ms. Mattama Saipromchae	Royal Thai Army Nursing College	Student
Mr. Weekit Sirisaksoontorn	Kasetsart University	Student
Ms. Nunmongkol Usatago	Pollution Control Department	Student
Mr. Wutikrai Wamsing	Pollution Control Department	Student
Mr. Natthapon Warapo	Kasetsart University	Student
Ms. Suwalak Yaonoon	Pollution Control Department	Student
United States (Total of 13)		
Ambassador Sichan Siv	US Ambassador to UN	Speaker
Mrs. Judy Brubaker	Principal, Matsunaga Elementary School	Faculty
Dr. Amy K. Huff	Environmental Scientist, Battelle Memorial Institute	Organizer
Ms. Piyachat Terrell	National Program Manager, USEPA White House Initiative on Asian Americans and Pacific Islanders	Organizer
Ms. Erica Zell	Environmental Engineer, Battelle Memorial Institute	Organizer
Mr. Sam Coleman	Director of Superfund Division Region 6, USEPA	Speaker
Ms. Deborah J. Knight	Environmental Program Specialist, New York State Department of Environmental Conservation	Speaker
Mr. Eric Nold	On-Scene Coordinator, Region 7, USEPA	Speaker
Ms. Caitlin Brubaker	Pennsylvania State University	Student
Mr. Armando Alcazar Magana	USEPA Intern (Mexico)	Student/ Organizer
Miss Hyun-Jung Lee	Former USEPA Intern (South Korea)	Student/ Organizer
Mr. Seng Peng	USEPA Intern	Student/ Organizer
Mr. Eric Swanson	Berry College	Student
Regional/Global (Total of 2)		
Mr. Alexander von Hildebrand	Regional Advisor of Environmental Health, World Health Organization	Speaker
Mrs. Wei Zhao	Environmental Affairs Officer, United Nations Environment Programme (UNEP)	Speaker
Total Participants (64)		

Plenary Session – Morning of Tuesday, April 22, 2008

This session began with welcomes to the conference from PCD, UNEP, and USEPA, followed by an introduction to mercury and its health effects given by Deborah Knight of the New York State Department of Environmental Conservation. All presentations were given in English, except where noted below.

The introductory sessions were followed immediately by Case Study Sessions, highlighting (1) a mercury spill at a school in the Philippines, (2) observations from multiple mercury cleanups in the U.S., and (3) a discussion of post-Hurricane Katrina chemical collection and cleanup in Louisiana. These sessions provided solid examples and pictures of mercury spills, conveying the hassles and costs of cleanup. Dr. Irma Makalinao of the University of the Philippines told a particularly engaging story about mercury detection equipment with inadequate sensitivity. Dr. Makalinao explained how she held a strong line against other officials who wanted to reopen the school, by emphasizing that a reading of “below detection limit” did not adequately protect student health and could not be relied upon for school reopening.

Participants asked several questions of the case study panel:

- One participant asked about the ultimate disposal of mercury contaminated items.
- Another participant asked about data or videos to demonstrate how dangerous mercury is to health, in order to convince other colleagues.
- Another participant asked how the Jerome meter measures mercury.
- Another participant asked who is responsible for protecting the health of students and teachers after a mercury spill has been cleaned up.
- Another participant asked about the awareness of the dangers of mercury and chemicals by the parents of the children in schools.

Field Trip – Afternoon of Tuesday, April 22, 2008

The afternoon consisted of a tour of Merck Ltd.’s Chemical Distribution Center (CDC) located just outside of Bangkok, in the Bangpoo Industrial Estate. The field trip was designed to give participants a real-world example of proper chemical segregation and storage, appropriate safety measures, and a demonstration of a commercially available mercury spill cleanup kit. Participants were shuttled to and from the CDC on a 1 hour bus trip. Upon arrival, a multitude of Merck staff greeted participants with flower necklaces and arranged for a group photo. Participants were split into two groups, to alternately attend a tour of the warehouse and a facility introduction presentation.



Participants touring the warehouse were provided hardhats. The warehouse manager served as the tour guide, providing detailed explanation on the storage specifications for each type of chemical, and the warehouse design safety elements to prevent or mitigate disasters such as fires or explosions. The facility has been accident-free since 1995. The tour led participants through separate rooms for flammables, toxics, corrosives, oxidizers, and explosives, each with unique temperatures, fire suppression systems, and other safety design

elements. Participants let out a collective gasp when invited to enter the room with a large skull and cross bones indicating toxic chemicals. Participants also viewed a bottle cleanout area where customers can return certain types of chemical bottles, which Merck further cleans and donates for recycling. The tour guide discussed the neutralization of the waste from the returned bottles to a pH of 7 before release to the industrial estate sewage treatment system. Parts of the tour were also provided in Thai. Participants on the tour asked several questions about the chemicals and safety systems, and also took some notes.

The warehouse tour concluded with a demonstration of Merck's Mercury Spill Cleanup Kit. A technician demonstrated the steps of the kit on a hypothetical mercury spill (in this case, water). Participants asked questions about the reagents in the kit and the cost of the kit. Parts of this demonstration were also provided in Thai.

The second half of the visit to the CDC was the presentation given in the facility training room by Dr. Chayaporn Roengpithya. The facility presentation reinforced the information presented in the tour, and provided additional details about the system of chemical segregation and storage.

Social Activity and Dinner Sponsored by PCD- Evening of Tuesday, April 22, 2008

Piyachat Terrell, National Program Manager, USEPA White House Initiative on Asian Americans and Pacific Islanders, led a social activity designed to foster interaction among the students and teachers/administrators at the conference. This activity was well-received and truly seemed to increase the socialization among participants of different ages and from different countries. Sam Coleman, USEPA Region 6 Superfund Division Director, was a particularly good sport as Piyachat continually called on him to recite participants' names. Only about half of the conference participants attended this activity, perhaps because it was scheduled at the end of the day, and also due to some apparent confusion on whether the local Thai teachers (not staying at the hotel) were invited to the evening session and dinner.

Participants received a warm welcome to the PCD dinner from Mingquan Wichayaransaridh, Deputy Director General of PCD. Ambassador Sichan Siv provided an inspirational dinner speech, covering his escape from Cambodia to Thailand, subsequent highlights of his life story, and the importance of protecting the environment and human health in today's world.

Teacher/Administrator Track – Wednesday, April 23, 2008

The teacher/administrator track was presented as a "train-the-trainer" session. At the start of the day, each participant was asked to hold up their Instructor's Manual (which tells how to conduct a training and provide copies of the presentation slides), and their Participant's Manual (which should be duplicated from the CD provided and distributed to other teachers/administrators that attend training). The day was divided into four parts, following the structure of the Participant's Manual, and each part consisted of presentations and a group activity:

- Part 1: Importance of Mercury and Chemical Management for School Administrators and Teachers

- Part 2: Hazardous Chemicals and Equipment and Schools
- Part 3: Policies and Actions for School Administrators and Teachers
- Part 4: Be Smart About Mercury

Participants were asked to introduce themselves to the group. Of the 28 participants, roughly half of them had very limited English skills in such a public speaking environment. Thus, we decided to have PCD (Pornpimon Chareonsong and Pattanan Tarin) provide translation after each slide, and during the activities.

Erica Zell led the Part 1 lecture on the importance of mercury and chemical management in schools, concluding with a presentation of five Case Study examples of recent chemical and mercury accidents in schools. For Activity 1, Interactive Analysis of School Chemical Accident Case Studies, participants were divided into four groups. By design, two groups were entirely Thai so that they could speak in their native language; the other two groups were a mix of Filipinos/as, Cambodians, Americans, and Thais with strong English skills, so that they could speak in English. Each group was assigned a case study and asked to answer four questions about it:

- What could the school administrators and teachers have done to prevent the accident?
- How would you have handled the situation if you were in charge?
- Could the emergency responders and government officials have done anything else to help contain the accident?
- Have you ever experienced a similar chemical accident at your school?

After 10 minutes for analysis, a representative of each group presented their results (in Thai for the Thai groups). The presentations were insightful, and produced the anticipated responses for most questions. One teacher admitted having a mercury spill at their school that they tried to clean up with sand, and then disposed of the spill materials with regular office waste. Another teacher said that their school had switched to alcohol thermometers, and asked why schools in the U.S. have so much mercury.

Dr. Chayaporn Roengpithya, a Technical Solutions Specialist at Merck Ltd., started off the Part 2 lecture on chemical safety. She gave a 30-minute presentation in both English and Thai on “Working Safely in the Laboratory.” Next, Supt. Jose Embang, Jr., Fire Marshal of Makati City, Philippines, presented “Lessons Learned from the San Isidro National High School Chemical Spill.” Participants were shocked at the large volume of chemicals discovered at this school, and asked many questions about the clean-up procedures. For the closing of Part 2, Erica Zell provided a lecture on “Where Chemicals Are Found in Schools.”

For Activity 2, participants again worked in their small groups to review a picture packet of chemicals and identify the hazard signs and appropriate safety measures for each chemical. This was a nice follow-on to the Merck field trip, as the participants had seen all the signs in person the day before. Participants correctly identified the hazards, and freely called out the answers in the large group session. At the conclusion of this activity, all 28 participants seemed pleased to receive an alcohol thermometer (Fisher Scientific Eversafe) courtesy of the USEPA.

Erica Zell presented the Part 3 lecture on “Policies and Actions for School Administrators and Teachers.” This led into Activity 3, Brainstorming on School Policies and Actions, which was slightly modified so that participants could again work in small groups. Each group was asked to pick a representative to present at least three policy and action ideas that they could implement at their schools. This was the most creative exercise and generated very interesting results:

- One group suggested getting involvement from the top down to create an Emergency Action Plan, and then joining with the Society of Educators to endorse relevant policies.
- One group suggested that several high schools could join together and jointly conduct a mercury collection and disposal program.
- One group suggested a Chemical Safety Day that would involve student essays, demonstrations, and posters, and a question and answer session.
- One group suggested having a group of students work with PCD, and creating a network of high schools that could collaborate with PCD to address emergencies.
- One group suggested having training by an expert and establishing a committee for chemical safety.

We had two guest speakers for Part 4, which focused on mercury. Deborah Knight, an Environmental Program Specialist with the New York Department of Environmental Conservation, presented “Getting Mercury Out of Schools” based on her work with schools in the United States. Eric Nold, USEPA Region 7 On-Scene Coordinator, presented “Learning the Basic Properties of Mercury and Why They Are Misunderstood,” based on his experience in cleaning up mercury spills in the United States. Both presentations were interactive and generated discussion with the participants.

Activity 4, a Mercury Spill Role-Play, was also led by Eric Nold. Participants were first instructed to review the mercury spill scenario listed in Activity 4, and the Procedure for Safe Cleanup of a Mercury Spill in Homes and Schools (Appendix J of the Participant’s Manual). Eric noted that no two mercury spill cleanups are alike, and that Appendix J should be thought of as a flexible guideline. Participants gathered around a table and carpeted area on which plastic beads had been spilled to represent mercury. Following this spill scenario, participants from Thailand, Cambodia, and the Philippines each volunteered for roles such as teacher, assistant teacher, emergency responder, and students. With lots of translation, Eric walked participants through isolating the spill, evacuating and cleaning up the children, donning or improvising personal protective equipment, ensuring adequate ventilation, and physically cleaning up the “mercury” beads. The participants asked many questions and took notes, and had a good time with the acting.



Student Track – Wednesday, April 23, 2008

A total of twenty university students and PCD staff from Thailand, Cambodia, the Philippines, South Korea, and the U.S. participated in the Student Track. At the beginning of the session, facilitators Piyachat Terrell and Amy Huff broke the students into five groups of four students each, ensuring that the groups had a uniform distribution of students from different countries. Each group gave themselves a creative and descriptive name to help foster their identity.

The morning of the Student Track was divided into three main sections, each with a lecture and activity component:

- Part 1: Why Should Students Care about Exposure to Hazardous Chemicals?
- Part 2: Chemical Safety
- Part 3: Mercury and Students

Amy Huff led the Part 1 lecture, which involved an overview of why and how chemicals can be hazardous. Five case study examples were presented in order to give students an idea of the types of chemical accidents that can occur in schools. After the case studies were presented, students broke into their groups and analyzed one of the five case studies in depth. Students were asked to analyze the case study from a safety perspective, and they were given a set of questions to help guide their discussions:

- What could the school administrators and teachers have done to prevent the accident?
- What could the student(s) involved have done to prevent their exposure to the chemical?
- Could the emergency responders and government officials have done anything else to help contain the accident?
- How would you feel if you had been a student at the school where the accident occurred?
- Have you ever experienced a chemical accident at your school?

After the student groups finished their analysis, everyone came together again as a large group to discuss the case studies. Piyachat Terrell asked one member of each group to come to the front of the room to share their analysis and insights.

Dr. Chayaporn Roengpithya led the Part 2 lecture with a presentation in English on Working Safely in the Laboratory. The students responded very positively to Dr. Chayaporn's engaging lecture. After her presentation, the students broke into their groups and worked on the second activity, which involved classifying eleven chemicals using United Nation's Globally Harmonized System of Classification and Labeling of Chemicals. Students worked in their groups to classify each chemical and suggest appropriate safety precautions. After they finished their group analysis, the students all came together again as a large group, and they discussed the safety classification and safety measures for each chemical. Piyachat called upon students one by one to come up to the front of the room and present their analysis of each chemical.

Deborah Knight presented the Part 3 lecture on mercury safety. The topics of her presentation on Mercury and Students included:

- Mercury is a “shape-shifter”
- Mercury is a dangerous neurotoxin
- Routes of mercury exposure
- What types of mercury can you find in schools?
- Mercury-containing devices found in schools
- Mercury-free alternatives
- Chemical safety in the laboratory
- Personal protective equipment

At the conclusion of Ms. Knight’s excellent overview of mercury safety, the students broke into their groups and acted out a chemical accident role play. The facilitators provided the students with a hypothetical situation involving two high school students, one of whom had broken a mercury thermometer in her science class in the morning and was feeling ill by the afternoon. The ill student, Mali, doesn’t realize she has acute mercury poisoning, and tells her friend Wonchai that she thinks she has the flu and should go home. The other characters in the role play are Mrs. Aree, the School Principal, and Mr. Bah, Mali’s Science Teacher. The students were asked to act out what they think should happen after Mali tells Wonchai she thinks she should go home.

Once the student groups were ready, they came to the front of the room and acted out their role play for the entire session. The results were terrific! The students had a great time discussing and acting out the consequences of the mercury spill. One group acted out flashbacks of the accident when Mali had broken the mercury thermometer, and another group had a completely silent role play, which was especially relevant at a conference where participants spoke different languages.

During the afternoon of the Student Track session, the student groups created materials on mercury awareness and safety for high school students. Each group prepared a different type of safety material using a combination of arts and craft supplies, photographs, and computers. The completed student projects were distributed to the teachers and administrators at the conference for use in their local schools.



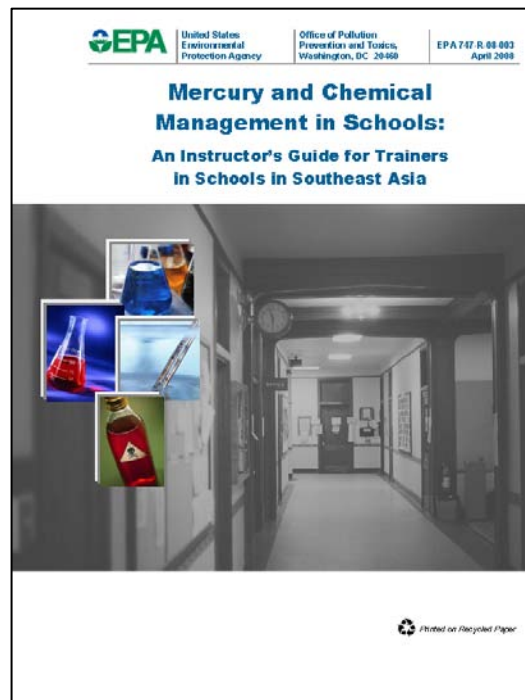
The students were given specific guidelines about the audience, content, and purpose of their safety materials, but beyond that, they were free to develop their projects as creatively as they liked. The results were spectacular. The Quick Silver and Terminator groups created digital videos. The Terminator group also developed a “Jeopardy” style computer game. The Fight group prepared a board game based on a popular Thai “matching” game. The Awesome group created digital voice recordings in Thai and English that school administrators could use to announce a chemical accident. The Better than Awesome group prepared a poster called “Murdering Mercury.”

3. Conference Materials and Design

Conference materials consisted of the following:

Mercury and Chemical Management in Schools: Teachers and School Administrators Participant's Manual in Southeast Asia -

Designed as a "Participant's Manual" to be used as part of a "Chemical and Mercury Management in Schools Training," this document focuses on the policies and programs needed at the school and district level for safe and sustainable chemical and mercury management practices. This document is designed primarily for school administrators (principals and other policymakers), with a focus on issues of relevance in Thailand and throughout Southeast Asia. This document may also be of value for teachers, maintenance personnel, superintendents, school business officials, insurance industry risk managers, and parents.



Mercury and Chemical Management in Schools: An Instructor's Guide for Trainers in Schools in Southeast Asia – This document is a tool to help instructors promote the concepts of safe mercury and chemical management in schools. The guide contains three types of materials: (1) guidance for the instructor/facilitator on conducting the training course, (2) a copy of all presentations with talking points as appropriate, and (3) instructions for participant activities.

Mercury and Hazardous Chemicals in Schools: A Manual for Students in Southeast Asia - Designed as a brief, educational material for university students, this document introduces the hazards of chemicals and mercury in schools and encourages students to be proactive in identifying potential hazards and informing proper authorities.

Appendix A. Conference Agendas

Tuesday, April 22, 2008 – Queen’s Park 2 Room (2nd Floor) Conference Moderators: Ms. Pornpimon Chareonsong, Senior Environmental Scientist, PCD Ms. Piyachat Terrell, National Program Manager, USEPA White House Initiative on Asian Americans and Pacific Islanders	
8:00 – 9:00 am	Registration
9:00 – 9:10 am	Welcome to the Conference from PCD Dr. Supat Wangwongwatana, Director General of PCD
9:10 – 9:20 am	Welcome to Conference from UNEP Mrs. Wei Zhao, Environmental Affairs Officer, UNEP
9:20 – 9:30 am	Welcome to the Conference from USEPA Mr. Sam Coleman, Director of Superfund Division Region 6, USEPA
9:30 – 10:00 am	Mercury in the Environment and Human Health Effects Ms. Deborah Knight, Environmental Program Specialist, New York State Department of Environmental Conservation
10:00 – 11:30 am	CASE STUDY SESSIONS
10:00 – 10:20 am	Case Study: Mercury Spill at St. Andrew’s School in the Philippines Dr. Irma Makalinao, Professor of Pharmacology and Toxicology, University of Philippines
10:20 – 10:40 am	Case Study: USEPA Response to Mercury Spills, and Chemical Clean-Up after Hurricane Katrina Mr. Sam Coleman, Director of Superfund Division Region 6, USEPA
10:40 – 11:00 am	Case Study: Similarities of Mercury Spills at Schools Mr. Eric Nold, On-Scene Coordinator, Region 7, USEPA
11:00 – 11:30 am	Case Study Panel Discussion
11:30 am – 12:15 pm	Lunch (provided at Parkview Restaurant, ground floor)
12:30 pm SHARP	Bus pick-up for travel to Merck Ltd.’s Chemical Distribution Center (Bangpoo Industrial Estate)
1:30 – 3:30 pm	Tour of Merck Ltd.’s Chemical Distribution Center
3:30 pm	Bus pick-up for return to hotel
5:30 – 6:15 pm	Social Hour <i>“Get to Know Each Other” activity</i>
6:15 pm – 7:30 pm	Dinner sponsored by PCD Keynote Address Ambassador Sichan Siv, former Ambassador from United States to the United Nations (2001-2006)

Wednesday, April 23, 2008

	UNIVERSITY STUDENTS TRACK- Imperial China Room (4th Floor)	TEACHERS/ADMINISTRATORS TRACK– Queen’s Park 2 Room
8:00 am – 12:00 pm	<p>Facilitators: Ms. Piyachat Terrell, National Program Manager, USEPA White House Initiative on Asian Americans and Pacific Islanders Dr. Amy Huff, Environmental Scientist, Battelle Memorial Institute</p> <ul style="list-style-type: none"> • Student instruction on chemical safety, with an emphasis on mercury • Brainstorming for preparation of materials on mercury awareness and safety <p>Special Guest Speakers:</p> <ul style="list-style-type: none"> • Dr. Chayaporn Roengpithya, Technical Solutions Specialist, Merck Ltd. • Ms. Deborah Knight, Environmental Program Specialist, New York State Department of Environmental Conservation 	<p>Facilitators: Mr. Eric Nold, On-Scene Coordinator, Region 7, USEPA Ms. Erica Zell, Environmental Engineer, Battelle Memorial Institute Ms. Pornpimon Chareonsong, Senior Environmental Scientist, PCD</p> <ul style="list-style-type: none"> • Part 1: Importance of Mercury and Chemical Management for School Administrators and Teachers • Part 2: Hazardous Chemicals and Equipment in Schools <p>Special Guest Speaker:</p> <ul style="list-style-type: none"> • Dr. Chayaporn Roengpithya, Technical Solutions Specialist, Merck Ltd.
12:00 – 1:00 pm	Lunch (provided at Parkview Restaurant, ground floor)	
	UNIVERSITY STUDENTS TRACK- Imperial China Room (4th Floor) (continued)	TEACHERS/ADMINISTRATORS TRACK– Queen’s Park 2 Room (continued)
1:00 – 5:00 pm	<p>Student Projects:</p> <ul style="list-style-type: none"> • Preparation of materials on mercury awareness and safety 	<ul style="list-style-type: none"> • Part 3: Policies and Actions for School Administrators and Teachers • Part 4: Be Smart About Mercury <p>Special Guest Speakers:</p> <ul style="list-style-type: none"> • Supt. José Embang, Jr., Fire Marshal of Makati City, Philippines • Ms. Deborah Knight, Environmental Program Specialist, New York State Department of Environmental Conservation
5:30 – 6:30 pm	Reception sponsored by Merck Ltd.	
6:30 pm	Dinner (on your own)	

<p>Thursday, April 24, 2008 – Queen’s Park 2 Room (2nd Floor)</p> <p>Conference Moderators:</p> <p>Ms. Pornpimon Chareonsong, Senior Environmental Scientist, PCD</p> <p>Ms. Piyachat Terrell, National Program Manager,</p> <p>USEPA White House Initiative on Asian Americans and Pacific Islanders</p>	
9:00 – 9:15 am	<p>Introduction to Student Presentations</p> <p>Ms. Piyachat Terrell, National Program Manager, USEPA White House Initiative on Asian Americans and Pacific Islanders</p>
9:15 – 10:30 am	<p>Student Presentations of Materials on Mercury Awareness and Safety</p> <ul style="list-style-type: none"> • Visual material (poster and flyer) • Interactive material (game) • Written material (worksheet) • Video material (short film) • Audio material (announcement for school)
10:30 – 10:45 am	<p>Break</p>
10:45 – 10:55 am	<p>Conference Outcomes and Future Directions from PCD</p> <p>Ms. Mingquan Wichayarangsarith, Deputy Director General of PCD (tentative)</p>
10:55 – 11:05 am	<p>Conference Outcomes and Future Directions from USEPA</p> <p>Ms. Piyachat Terrell, National Program Manager, USEPA White House Initiative on Asian Americans and Pacific Islanders</p>
11:05 – 11:30 am	<p>Certificate of Training Presentation to Conference Participants</p> <p>Ms. Mingquan Wichayarangsarith, Deputy Director General of PCD (tentative)</p> <p>Mrs. Wei Zhao, Environmental Affairs Officer, UNEP</p> <p>Ms. Piyachat Terrell, National Program Manager, USEPA White House Initiative on Asian Americans and Pacific Islanders</p>
11:30 am – 12:00 pm	<p>Closing Keynote Address</p> <p>Mr. Alexander von Hildebrand, Regional Advisor of Environmental Health, World Health Organization (WHO)</p>
12:00 – 1:00 pm	<p>Gala Award Lunch (provided at Parkview Restaurant, ground floor)</p>

Teachers/Administrators Track Agenda- Wednesday, April 23

Facilitators:

Ms. Pornpimon Chareonsong, Senior Environmental Scientist, PCD

Mr. Eric Nold, On-Scene Coordinator, USEPA Region 7

Ms. Erica Zell, Environmental Engineer, Battelle Memorial Institute



- 8:00 a.m. Welcome, Overview of Day, Round-the Room Introductions (All)
- 8:30 a.m. **Part 1: Importance of Mercury and Chemical Management for School Administrators and Teachers**
Presentation (Erica Zell, Battelle)
Activity 1: Interactive Analysis of School Chemical Accident Case Studies (Erica Zell, Battelle)
- 9:30 a.m. **Part 2: Hazardous Chemicals and Equipment in Schools Presentation**
Working Safely in Laboratory (Dr. Chayaporn Roengpithya, Technical Solutions Specialist, Merck Ltd.)
- 10:15 a.m. Break
- 10:30 a.m. Where Chemicals Are Found in Schools (Erica Zell, Battelle)
Lessons Learned from the San Isidro National High School Chemical Spill (Supt. José Embang, Jr., Fire Marshal of Makati City, Philippines)
Activity 2: Identifying Chemical Hazards (Erica Zell, Battelle)
- 12:00 p.m. Lunch
- 1:00 p.m. **Part 3: Policies and Actions for School Administrators and Teachers**
Presentation (Erica Zell, Battelle)
Activity 3: Brainstorming on School Policies and Actions (Pornpimon Chareonsong, PCD and Erica Zell, Battelle)
- 2:00 p.m. **Part 4: Be Smart About Mercury**
Getting Mercury Out of Schools (Deborah Knight, Environmental Program Specialist, New York State Department of Environmental Conservation)
- 2:45 p.m. Break
- 3:00 p.m. Learning the Basic Properties of Mercury and Why they are Misunderstood (Eric Nold, On-Scene Coordinator, USEPA)
Activity 4: Mercury Spill Role-Playing (Eric Nold, USEPA)
- 4:00 p.m. **Question and Answer Session, Top 10 Things Learned**
- 5:00 p.m. End of Training

University Students Track Agenda Wednesday, April 23, 2008



Facilitators:

Ms. Piyachat Terrell, National Program Manager, USEPA
White House Initiative on Asian Americans and Pacific Islanders
Dr. Amy Huff, Environmental Scientist, Battelle Memorial Institute

- 8:00 a.m. Welcome, Overview of Day, Round-the Room Introductions (All)
- 8:15 a.m. **Part 1 Lecture: Why Should Students Care About Exposure to Hazardous Chemicals?**
- 8:30 a.m. **Activity 1: Case Study Discussion**
- 9:00 a.m. **Part 2 Lecture: Chemical Safety**
Special Guest Speaker: Dr. Chayaporn Roengpithya, Technical Solutions Specialist, Merck Ltd.
- 9:30 a.m. **Activity 2: Chemical Classifications**
- 10:00 a.m. **Part 3 Lecture: Mercury and Students**
Special Guest Speaker: Ms. Deborah Knight, Environmental Program Specialist, New York State Department of Environmental Conservation
- 10:20 a.m. Break
- 10:35 a.m. **Activity 3: Chemical Spill Role Play**
- 11:00 a.m. **Brainstorming for Student Projects**
Planning for preparation of materials on mercury awareness and safety
- 12:00 p.m. Lunch
- 1:00 p.m. **Begin Student Projects**
Preparation of materials on mercury awareness and safety
- 2:45 p.m. Break
- 3:00 p.m. **Finish Student Projects**
Preparation of materials on mercury awareness and safety
- 5:00 p.m. End of Training

Appendix B. Sample Student Projects

(Note: All game components, and two student videos, will be posted on the conference website).

Laboratory Accident Audio (prepared in English and Thai)

The Awesome Group

Chalermpan Ngamsopasiriskun

Suwalak Yaonoon

Eric Swanson

Mattama Saipromchae

This is a sample public service announcement that can be used in the case of a chemical spill at your school. It can be tailored to fit an individual school's needs by changing the room numbers and the instructions for seeking medical attention. The intent of this action plan is to contain the spill as much as possible while making sure that everyone is safe.

“Attention students and faculty: this is an announcement from the principal. It has just come to my attention that there has been a small mercury spill in room 208 on the second floor. There is no reason to panic. Please listen to the following instructions:

Chemistry teachers involved in the spill should contain the mercury using the mercury cleanup kit. Students in the room during the spill should move to room 210 and wait there for help to arrive. Leave your personal belongings in the room, as they may be contaminated. Please do not leave the area, which could spread the contamination.

Students and teachers not involved in the spill should exit the building in an orderly fashion and wait for further instructions. For your own safety and that of others, please do not go near room 208. We have already contacted professional emergency services, so help is on the way.

If you start experiencing nausea, vomiting, or abdominal pain, go to a hospital immediately to be tested for mercury poisoning.

Again, there is no reason to panic: the situation is under control. Thank you for your cooperation.”

We hope that this is helpful in minimizing the danger of a chemical spill at your school.

Matching Mercury Game (prepared in English)

The Fight Group

Thanit Kanjanawisuth

Nared Phetrak

Seng Peng

Wutikrai Wamsing

How to create the game for your classroom:

Materials Needed:

Poster Board, Index Cards, Scissor, Glue, Markers, Box

The game is a matching/pairing game.

1. Draw/cut pictures in pairs and glue them onto an index card. (3X5)
2. Make sure to label each match/pair by coding them
3. On one card include an explanation of the answer

How to Play the Game:

Game can be played by 14-17+ year olds

1. Game can be played by one or more person
2. Each person takes a picture from the box and try to match it with the pictures that is on the poster
3. For each correct match 10 points is earned
4. A maximum of 70 points can be earned

Note: As each match is made there is an explanation on the back of one card explaining the answer

Appendix C. Sample Blank (English) and Completed (Thai) Pre-Conference Surveys

Mercury in Our World:
Conference on Mercury and Other Hazardous Chemicals in Southeast Asia Schools
Pre-Conference Survey for Teachers and Administrators

Thank you for participating in the “Mercury in Our World” Conference! In order to tailor the conference workshops to match conditions in Thailand and Southeast Asia schools, we would like your help in identifying the major chemicals used by your program. Please fill out the following survey and return it to **(fill in name, email or address, and due date)**.

1. What is your position at your school? (*e.g.*, Science Teacher, Principal)
2. Please list up to 20 of the most common chemicals used in your science class laboratory experiments.
3. Where does your school store the chemicals used in your science experiments? Are they stored in any particular way? (*e.g.*, by type of chemical, by date used)
4. Who is in charge of managing the science chemicals? Is there a list or inventory to keep track of the science chemicals?
5. How often does the person in charge of the science chemicals check for leaking bottles and dispose of expired or outdated chemicals?
6. How does your school dispose of expired or outdated science chemicals? (*e.g.*, in the trash, rinsed down the sink, picked up by a hazardous waste disposal company)
7. From what company or companies do you purchase the chemicals used in your science experiments? Does each purchased chemical come with a Material Safety Data Sheet (MSDS)?
8. Do you use any mercury thermometers or barometers in your schools? If yes, please estimate how many, and describe their uses (*e.g.*, science experiments, nurse’s office).

9. Please list up to 10 of the most common chemical products used to clean your school (*e.g.*, bleach, ammonia).
10. Where does your school store the cleaning chemicals? Are they stored in any particular way? (*e.g.*, by type of chemical, by date used)
11. Who is in charge of managing the cleaning chemicals? Is there a list or inventory to keep track of these chemicals?
12. Please list up to 10 of the most common chemical products used on the lawns and in the building of your school (*e.g.*, pesticides, fungicides, fertilizers).
13. Where does your school store the lawn and building chemicals? Are they stored in any particular way? (*e.g.*, by type of chemical, by date used)
14. Who is in charge of managing the lawn and building chemicals? Is there a list or inventory to keep track of these chemicals?
15. Are there any other departments in your school that use chemicals (*e.g.*, art, trade shops)? If yes, please list the departments and up to 10 of the most commonly used chemicals.
16. What is the largest barrier for safer chemical management at your school? (*e.g.*, available time, resources, knowledge)
17. Please list 2-3 main topics that you would like the conference to address regarding chemical management in Thailand and Southeast Asia schools.

และมีการจำแนกประเภทของการจัดเก็บสารเคมีอย่างไร *STORE BY TYPE OF CHEMICAL*

- จำแนกตามประเภทของสารเคมี (ระบุประเภทของการจัดเก็บ) *050/05/10%*
- จำแนกตามวันที่ที่จะมีการใช้สารเคมี
- อื่นๆ (ระบุ).....

1.3 โปรดระบุชื่อเจ้าหน้าที่ที่ทำหน้าที่ในการควบคุมดูแล และจัดการสารเคมีที่ใช้ในห้องปฏิบัติการ *Name of*
Name ชื่อ - นามสกุล *นางสาว สุภาภา สนิทพร*
Position ตำแหน่ง *asst. doc. (asst.)* *Chemistry teacher*

4 1.4 สถานศึกษาของท่านมีการจัดทำบัญชีรายชื่อสารเคมี/ทำเนียบ เพื่อการควบคุมดูแล และจัดการสารเคมีที่ใช้ในห้องปฏิบัติการหรือไม่ *Has inventory*
 มี ไม่มี

5 1.5 สถานศึกษาของท่านมีการตรวจสอบการรั่วไหลของภาชนะบรรจุสารเคมี รวมถึงการจัดการสารเคมีที่เสื่อมสภาพหรือหมดอายุบ่อยเพียงใด *How often check?*
 ทุกๆ 2 เดือน *every 2 months*
 ทุกๆ 6 เดือน
 ทุกๆ 12 เดือน
 อื่นๆ (ระบุ).....

6 1.6 สถานศึกษาของท่านมีการจัดการกับภาชนะบรรจุสารเคมี และสารเคมีที่เสื่อมสภาพหรือหมดอายุอย่างไร
 ทิ้งปนกับขยะทั่วไป
 เทสารละลายลงในอ่าง (sink) สำหรับทิ้งสารเคมีเฉพาะ
 เทสารละลายทิ้งลงในขวดสำหรับทิ้งสารเคมี
 จัดส่งให้หน่วยงานอื่นนำไปกำจัด (ระบุชื่อหน่วยงาน).....
 อื่นๆ (ระบุ) *ส่งให้หน่วยงานอื่นกำจัด (บริษัท ออแกนิค จำกัด)*

OTHERS
 CK PCO
 #7 1.7 สถานศึกษาของท่านได้สั่งซื้อสารเคมีเพื่อใช้ในห้องปฏิบัติการจากหน่วยงาน/บริษัทใด *COMRANY*
 (ระบุชื่อหน่วยงาน/บริษัท) *ม. 11/6/05/10%* *(NAME: TANMAKO JINLATECH*
 และในการสั่งซื้อสารเคมีแต่ละครั้ง ได้มีเอกสารข้อมูลความปลอดภัยเคมีภัณฑ์กำกับมาด้วยหรือไม่

- มี (ระบุชื่อเอกสาร).....
 - ไม่มี *NO DATA Sheet.*
- 8 1.8 ในสถานศึกษาของท่านมีการใช้เทอร์โมมิเตอร์หรือบารอมิเตอร์ที่มีสารปรอทเป็นส่วนประกอบหรือไม่
 มีการใช้เทอร์โมมิเตอร์ *mercury thermometer*
 ใช้เพื่อวัดอุณหภูมิ (ระบุ).....
 ปริมาณที่มีอยู่ (ระบุ).....
 มีการใช้บารอมิเตอร์
 ใช้เพื่อวัดอุณหภูมิ (ระบุ).....
 ปริมาณที่มีอยู่ (ระบุ).....
 ไม่มี *NO*

2. สารเคมีที่ใช้ในการทำความสะอาดสถานศึกษา

2.1 โปรดระบุรายชื่อสารเคมีทั่วไป 10 ชนิด ที่ใช้ในการทำความสะอาดสถานศึกษา (เช่น สารเคมีที่ใช้ในการทำความสะอาดพื้นห้องเรียน/ห้องน้ำ สารเคมีที่ใช้ในการกำจัดเชื้อโรคในสระน้ำ เป็นต้น)

1.	สบู่ล้างมือ (KROD)	ใช้เพื่อ	ล้างมือ
2.	สบู่ล้างมือ (KROD)	ใช้เพื่อ	ทำความสะอาดพื้น FLOOR CLEANER
3.	สบู่ล้างมือ (KROD)	ใช้เพื่อ	ล้างมือ
4.	สบู่ล้างมือ SOAP	ใช้เพื่อ	ล้างมือ
5.	สบู่ล้างมือ	ใช้เพื่อ	ล้างจาน (DISH) DISH WASHING
6.		ใช้เพื่อ	
7.		ใช้เพื่อ	
8.		ใช้เพื่อ	
9.		ใช้เพื่อ	
10.		ใช้เพื่อ	

10. 2.2 โปรดระบุสถานที่ที่ใช้ในการจัดเก็บสารเคมีที่ใช้ในการทำความสะอาดสถานศึกษาดังกล่าวข้างต้น

- ห้องสำหรับเก็บสารเคมีเฉพาะ → CLEANING CHEMICAL ROOM
 - อื่นๆ (ระบุ)..... → Keep in separate
- และมีการจำแนกประเภทของการจัดเก็บสารเคมีดังกล่าวอย่างไร
- จำแนกตามประเภทของสารเคมี (ระบุประเภทของการจัดเก็บ).....
 - จำแนกตามวันที่จะมีการใช้สารเคมี
 - อื่นๆ (ระบุ).....

2.3 โปรดระบุชื่อเจ้าหน้าที่ที่ทำหน้าที่ในการควบคุมดูแล และจัดการสารเคมีดังกล่าว

NAME - ชื่อ - นามสกุล นางสาว รุ่งโรจน์ จันทวิมล NAME OF STAFF ตำแหน่ง ช่างทำความสะอาด

2.4 สถานศึกษาของท่านมีการจัดทำบัญชีรายชื่อสารเคมี/ทำเนียบ เพื่อการควบคุมดูแล และจัดการสารเคมีดังกล่าว หรือไม่

- มี
- ไม่มี NO LIST

12 3. สารเคมีที่ใช้ในการกำจัดแมลงศัตรูพืชในสนามหญ้า/กำจัดเชื้อโรคบริเวณอาคาร

3.1 โปรดระบุรายชื่อสารเคมีทั่วไป 10 ชนิด ที่ใช้ในการกำจัดแมลงศัตรูพืชในสนามหญ้า สารเคมีที่ใช้ในการกำจัดแมลงหรือเชื้อโรคบริเวณอาคารของสถานศึกษา (เช่น สารกำจัดแมลง สารกำจัดเชื้อรา สารกำจัดปลวก เป็นต้น) รวมทั้งปู

1.		ใช้เพื่อ	
2.		ใช้เพื่อ	
3.		ใช้เพื่อ	
4.		ใช้เพื่อ	
5.		ใช้เพื่อ	

survey your needs

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5. โปรดระบุปัญหาและอุปสรรคสำคัญในการจัดการสารเคมี ภายในสถานศึกษาของท่าน
- ขาดแคลนบุคลากรที่มีความรู้ความสามารถในการจัดการสารเคมี
 - ขาดแคลนอุปกรณ์ป้องกันอันตรายจากความระคายเคืองในการจัดการสารเคมี (ระบุ)
 - อื่นๆ (ระบุ).....
6. ท่านมีความยินดีที่จะเข้าร่วมอบรมในหัวข้อการจัดการสารเคมีในสถานศึกษาในประเทศไทยและในสถานศึกษา
ในเอเชียตะวันออกเฉียงใต้หรือไม่ → *World like to participate*
- ยินดีเข้าร่วม (ส่วน/ชื่อโรงเรียน) ไม่ยินดีเข้าร่วม
7. โปรดระบุหัวข้อ 2 - 3 ประเด็น ที่ท่านต้องการให้มีการบรรจุไว้ในกรอบครั้งนี้
- ประเด็นที่ 1
- ประเด็นที่ 2
- ประเด็นที่ 3

สำนักงานจัดการกากของเสียและสารอันตราย กรมควบคุมมลพิษ

ขอขอบคุณทุกท่านที่กรุณาตอบแบบสอบถาม

หากท่านตอบแบบสอบถามส่วนที่ 1 และส่วนที่ 2 เรียบร้อยแล้ว กรุณาส่งมายังกรมควบคุมมลพิษ ที่หมายเลขโทรสาร

0 2298 2785 หรือ 0 2298 2442

หรือหากมีข้อสงสัยเกี่ยวกับการตอบแบบสอบถาม หรือหากท่านต้องการ soft-file ของแบบสอบถาม

สามารถดาวน์โหลดได้ที่เว็บไซต์ <http://pops.pcd.go.th>

หรือติดต่อ นางสาวจวิศา คงเจริญ โทร 0 2298 2785-6

หรือ นายสุรชัย แก้วทะ โทร 0 2298 2438, 0 2298 2442

Appendix D. Post-conference Survey

Mercury in Our World Conference Follow-Up Survey

This is a copy of a survey that will be sent to you approximately 3-6 months after the conference, in order to help track its success. There is no need to fill it out now, but please keep these questions in mind so you are prepared to answer them when you receive the survey. You are not **REQUIRED** to conduct follow-up activities such as trainings, but you are strongly encouraged to do so.

Name: _____

Title: _____

School/Affiliation: _____

Email Address: _____

Phone Number: _____

1. Since the Mercury in Our World conference, have you trained other **teachers and/or administrators** on the content presented at the conference?

____ Yes, number trained: _____ Additional Comments: _____

____ No _____

____ Planned, approx. date: _____ _____

2. Since the Mercury in Our World conference, have you trained **students** on the content presented at the conference?

____ Yes, number trained: _____ Additional Comments: _____

____ No _____

____ Planned, approx. date: _____ _____

3. Since the Mercury in Our World conference, have you implemented any changes to policies, procedures, or equipment in your school or labs?

____ Yes (please describe below) ____ No ____ Planned, estimated date: _____

Explanation: _____

4. Have you conducted a survey of mercury and mercury-containing equipment (e.g., mercury thermometers) in your school? Have you replaced any of these items with non-mercury alternatives? How did you dispose of the mercury-containing items?

____ Yes (please describe below) ____ No ____ Planned, estimated date: _____

5. Please provide any additional feedback about how the Mercury in Our World conference has improved chemical safety at your school or lab. If applicable, please explain:

Appendix E. Conference Participants With Contact Information

Teachers, Administrators, and Conference Organizers

NAME	COMPANY or UNIVERSITY	COUNTRY of RESIDENCE	CATEGORY	EMAIL	PHONE
Mrs. Acchara Angirasanand	Teacher, Traimit Wittayalai School, Bangkok, Thailand	Thailand	Faculty		662 221 3876 ext.109
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NAME	COMPANY or UNIVERSITY	COUNTRY of RESIDENCE	CATEGORY	EMAIL	PHONE
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