

GOVERNMENT OF PAKISTAN  
MINISTRY OF ENVIRONMENT

# MANAGEMENT OF MERCURY AND MERCURY CONTAINING WASTE IN PAKISTAN

BY

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Final Workshop of Mercury Waste Project,  
21 – 23 June, 2010, University of Aberdeen, Scotland, UK

# Presentation Sequence

- Project Brief
- Objectives
- Expected Results
- Summary Table for Activities
- Summary of Activities
- Future Plan/Proposals

# Project Brief

|                      |  |
|----------------------|--|
| Project Title:       | Management of Mercury and Mercury Containing Waste in Pakistan                     |
| Sponsoring agency:   | Norway   |
| Executing Agency:    | United Nations Environment Programme (UNEP),<br>Chemicals Branch                   |
| Implementing agency: | International Cooperation Wing, Ministry of<br>Environment, Government of Pakistan |
| Duration:            | December, 2008-June, 2010  |

# Main objectives of the project

- Review and analysis of the national mercury inventory data
- Exchange of information with national stakeholders to prioritize mercury waste sources and sectors
- Development of a national mercury waste management plan
- Identification of possibilities for Environmental Sound Management (ESM) application in selected sources / sectors
- Sampling and analysis of relevant environmental and human samples

# Expected results/outputs of the project

- Enhancement of Draft Technical Guidelines on the ESM of Mercury Waste
- Prioritization of sector/source-specific mercury waste
- Development of national and source/sector-specific mercury waste management plans
- Implementation of training and capacity-building programs
- Awareness-raising of policymakers, regulators and stakeholders
- Mapping of existing capacity :
  - sampling of relevant matrices
  - mercury analysis at national level.



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**SUMMARY TABLE FOR ACTIVITIES WITHIN THE  
PROJECT ON "MANAGEMENT OF MERCURY AND  
MERCURY CONTAINING WASTE IN PAKISTAN**



**UNEP Chemicals Branch,  
Geneva**

| S # | Activity   | Country / Actors  | Date       | Objective   | Remarks |
|-----|--|---|------------|---|---------|
| 1   | Set-up national project management structure and identification of relevant national stakeholders  | International Cooperation Wing, Ministry of Environment | March 2009 | <ul style="list-style-type: none"> <li>i. Creation of national project team</li> <li>ii. Identification of national stakeholders</li> <li>iii. The draft national stakeholders workshop agenda indicating priority sectors to be communicated to International Consultant by end of March 2009</li> </ul>                                       |         |
| 2   | a. National stakeholders' meeting and orientation on the Draft Technical Guidelines on Environmental Sound Management (ESM) of Mercury Waste, criteria for prioritization and drafting of a national mercury waste management plan | IC Wing, M/o Environment and International Consultant   | April 2009 | Questionnaire of mercury issues to be distributed to Workshop participants in advance of the workshop   |         |
|     | b. Sector-specific and awareness-raising activities on the Technical Guidelines (TG) application   |   | May 2009   | <ul style="list-style-type: none"> <li>i. National inception workshop of stakeholders</li> <li>ii. Site visits of International Consultant to hot spots i.e. Chlor-alkali industry (Ittehad Chemicals), hospital waste incinerator</li> <li>iii. Proceeding/report of inception workshop to be communicated to UNEP Chemicals Branch</li> </ul> |         |



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**SUMMARY TABLE FOR ACTIVITIES WITHIN THE  
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MERCURY CONTAINING WASTE IN PAKISTAN"**



**UNEP Chemicals Branch,  
Geneva**

| S# | Activity  | Country / Actors                                      | Date                 | Objective  | Remarks |
|----|---|---|----------------------|--|---------|
| 3  | Collection of samples and shipment to UK              | IC Wing, M/o Environment and Mercury Lab, UK          | June 2009            |  |         |
| 4  | Development of national mercury waste management plan | IC Wing, M/o Environment and International Consultant | June 2009 – May 2010 | Application of Basel Convention Technical Guideline on Mercury Waste on the following sectors;<br><br>a) Chlor-alkali industry<br>b) Dental amalgams sector<br>c) Medical waste incinerators |         |
| 5  | Sharing of results national with local stakeholders   | Mercury Lab, UK                                       | July 2009            |  |         |



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**UNEP Chemicals Branch,  
Geneva**

| S # | Activity   | Country / Actors  | Date                    | Objective   | Remarks |
|-----|--|---|-------------------------|---|---------|
| 6   | Global final project results workshop  | Burkina Faso, Cambodia, Chili, Pakistan, Philippines, International Consultant, Mercury Lab, UK and UNEP Chemicals Branch | March/<br>April<br>2010 | i. Evaluation of project activities<br>ii. Lessons learned<br>iii. Discussion on draft final report |         |
| 7   | 2 <sup>nd</sup> national stakeholder meeting to finalize management plan and communication of results to UNEP Chemicals Branch | IC Wing, M/o Environment and International Consultant   | May<br>2010             | Finalization of mercury waste management plan with recommendations of all the national stakeholders |         |
| 8   | Submission of final technical and financial national reports to UNEP, Chemicals Branch   | IC Wing, M/o Environment and International Consultant   | June<br>2010            | Final report will be submitted to UNEP Chemicals Branch by email                                    |         |
| 9   | Publication of project final report  | UNEP Chemicals Branch   |                         |   |         |



# Summary of Activities

- Set-up national project management structure
- Identification of National Stakeholders
- Site Visit of UNEP Chemicals Expert Dr Mario Yarto to Chlor Alkali Industries
- Inception Workshop of National Stakeholders
- Human hair samples & shipment to UK
- Products for Mercury analysis
- Draft Mercury Waste Management Plan
- Final Workshop of National Stakeholders

# National Project Management Structure

- Joint Secretary (IC)/SAICM- NFP
- Technical Officer (Chemical)/NPC-MWP
- Programme Officer
- Administrative and Finance Assistant
- Office Attendant
- Messenger

# Identification of National Stakeholders

- Ministry of Environment
- Federal & Provincial EPA's
- Ministry of Commerce
- Ministry of Industries and Production
- Federal Board of Revenue
- Ministry of Health
- Ministry of Science and Technology
- Ministry of Food and Agriculture.
- Ministry of Petroleum and Natural Resources.
- City District Governments
- Chamber of Commerce and Industry
- Research institutes
- Academia
- NGOs
- Electronic and print media

# Site Visit of UNEP Chemical Expert to Chlor-Alkali Industries

1. Ittehad Chemicals Limited  
(40% Production on Mercury Cell Technology)
2. Sittara Chemicals Industries  
(100% Production on Membrane Cell Technology)





# Inception Workshop of National Stakeholders

|                    |   |
|--------------------|---|
| Date               | 30 <sup>th</sup> July, 2009   |
| Venue              | Avari Hotel, Lahore   |
| No of Participants | 168   |
| Group I            | Criteria for prioritization   |
| Group II           | Drafting of a national mercury waste management plan  |
| Group III          | Sector specific and awareness raising activities on the Technical Guidelines (TG) application |

# Inception Workshop of National Stakeholders

## Recommendations

### Group I: Criteria for prioritization

## Policies

- Phase-out programme in existing appliances, Equipment and Industries
- Best Technical options for setting up industries /Import of new products
- Capacity building for utilization of local R&D potential.

## Rules and regulations on Hg Import

- Handling, Transportation, Labeling, Storage and safe disposal
- National data base for Hg -Inventory with releases on
  - Air
  - Water
  - Soil
- Monitoring of existing potential Hg sources



# Inception Workshop of National Stakeholders

## Group II: Drafting of a national mercury waste management plan

- Identification and categorization of mercury waste
- Segregation of mercury waste at source
- Specific legislative guidelines for safe handling, storage transportation and disposal of mercury waste including fresh and existing legislations (Including Basel Convention and National instruments)
- Reuse , recycle and recovery of mercury waste
- Only certified and skilled personnel should handle the mercury waste
- Technical training of consumers of mercury products should be undertaken
- Academia and regulating bodies should include the subject "Hazardous Waste Management" in their curricula

# Inception Workshop of National Stakeholders

- Capacity building of governmental and nongovernmental organizations/departments
- Rigorous implementation through EPAs/Ministry of Environment
- Monitoring and evaluation by independent monitoring agencies
- Encourage development of alternative equipment and materials
- Establish R&D centers at provincial level
- Exchange of knowledge and expertise at international level
- Encouraging mercury free interventions at national level

# Inception Workshop of National Stakeholders

**Group III: Sector specific and awareness raising activities on the Technical Guidelines (TG) application**

## Vision Statement

- Awareness leads to personal protection, personal protection leads to community safety, community safety leads to proper and effective implementation of the National Mercury Waste Management Plan

## Goal and Objective

- Development of a national mercury waste management plan
- Incorporation of the Basel Convention
- Use multiple points if necessary

# Inception Workshop of National Stakeholders

## Main Sectors

- Chlor-Alkali Plants
- Health Care and Dentistry
- Landfill (municipal waste)
- Ship Breaking
- Secondary ferrous and non-ferrous metal production
- Energy sources
- Waste burning(industrial, medical)
- Cell batteries
- Lime production

# Inception Workshop of National Stakeholders

## Key Players per Sector

### HEALTH CARE

- Doctors
- Nurses
- Orderlies
- Medical students
- Paramedical staff
- Hospital administrative staff
- Sanitary workers

### INDUSTRY

- Ministry of Industries
- Chambers of commerce and industry
- Labor department
- Customs department
- Small and Medium Enterprises Development Authority (SMEDA)
- Local governments
- Ministry of Environment
- Industrial and Manufacturing units heads
- Labor Union

# Inception Workshop of National Stakeholders

## LANDFILL (Municipal Waste)

- Project Director Solid Waste Management
- Chief Corporation Officer Municipal Corporation – Local Governments
- Solid Waste Management Office
- EPAs and EPDs
- Sanitary Workers
- Garbage Collectors
- NGOs

## Possible Awareness Activities and Practices

### PRACTICES

- Waste minimization
- Segregation at source
- Handling
- Collection
- Storage
- Transportation
- Disposal

# Inception Workshop of National Stakeholders

## Awareness Tools

- Campaigns
- Leaflets
- Brochures
- Workshops
- Banners

## Coordination Mechanism

- National coordination committee
- Development of sectoral specific guidelines
- Legislative and Regulatory Guidelines
- Ground level stakeholders
- Monitoring and evaluation

## RECOMMENDATION

- Remediation of sites contaminated with mercury
- Introduce programs for public awareness and participation
- Involvement of civil society

# Pictorial Glimpses of Inception Workshop of National Stakeholders









# Human hair samples & shipment to UK

## Groups of Hair Samples

- Group No (1): Ittihad Chemicals Limited  
Number of samples 22
- Group No (2): Sittara Chemicals Industries  
Number of samples 10
- Group No (3): Punjab Dental Collage & Hospital  
Number of samples 22
- Group No (4): Control Group Samples  
Number of samples 18

## Results of Hair Samples

Group No (1):

Ittihad Chemicals Limited  
Number of samples 22

| Sample ID | Total mercury concentration $\mu\text{g/g}$<br>(mean $\pm$ SD), n = 12 |       |
|-----------|--|-------|
|           | Dry hair sample  | % RSD |
| 1 ICL PK  | 275 $\pm$ 3.6  | 1.30  |
| 2 ICL PK  | 143 $\pm$ 1.7  | 1.20  |
| 3 ICL PK  | 1057 $\pm$ 17.4  | 1.65  |
| 4 ICL PK  | 1124 $\pm$ 32.26   | 2.87  |
| 5 ICL PK  | 199 $\pm$ 2.46   | 1.24  |
| 6 ICL PK  | 125 $\pm$ 2.0  | 1.40  |
| 7 ICL PK  | 3261 $\pm$ 39  | 1.20  |
| 8 ICL PK  | 9341 $\pm$ 76  | 0.81  |
| 9 ICL PK  | 143 $\pm$ 2.0  | 1.30  |
| 10 ICL PK | 272 $\pm$ 3.0  | 0.99  |
| 11 ICL PK | 470 $\pm$ 7.0  | 1.39  |
| 12 ICL PK | 10.6 $\pm$ 0.3   | 2.80  |
| 13 ICL PK | 14.7 $\pm$ 0.3   | 1.93  |
| 14 ICL PK | 517 $\pm$ 4.0  | 0.87  |
| 15 ICL PK | 725 $\pm$ 7.0  | 0.99  |
| 16 ICL PK | 87.7 $\pm$ 1.6   | 1.89  |
| 17 ICL PK | 34.5 $\pm$ 1.4   | 6.48  |
| 18 ICL PK | 12.2 $\pm$ 0.8   | 6.52  |
| 19 ICL PK | 10.5 $\pm$ 0.5   | 5.10  |
| 20 ICL PK | 177 $\pm$ 3.0  | 1.59  |
| 21 ICL PK | 768 $\pm$ 7.0  | 0.91  |
| 22 ICL PK | 45.1 $\pm$ 0.3   | 0.74  |

## Results of Hair Samples

Group No (2):

Sittara Chemicals Industries  
Number of samples 10

| Sample ID | Total mercury concentration $\mu\text{g/g}$<br>(mean $\pm$ SD), n = 12 |       |
|-----------|--|-------|
|           | Dry hair sample  | % RSD |
| 23 SCL PK | 3.32 $\pm$ 0.18  | 5.45  |
| 24 SCL PK | 2.00 $\pm$ 0.08  | 4.04  |
| 25 SCL PK | 3.86 $\pm$ 0.14  | 3.75  |
| 26 SCL PK | 2.57 $\pm$ 0.13  | 5.04  |
| 27 SCL PK | 20.2 $\pm$ 0.4   | 1.95  |
| 28 SCL PK | 2.89 $\pm$ 0.17  | 6.13  |
| 29 SCL PK | 2.36 $\pm$ 0.09  | 4.17  |
| 30 SCL PK | 2.01 $\pm$ 0.12  | 6.26  |
| 31 SCL PK | 1.69 $\pm$ 0.11  | 6.56  |
| 32 SCL PK | 1.71 $\pm$ 0.06  | 4.03  |

## Results of Hair Samples

Group No (3):

Punjab Dental Collage & Hospital  
Number of samples 22

| Sample ID | Total mercury concentration $\mu\text{g/g}$<br>(mean $\pm$ SD), n = 12 |       |
|-----------|--|-------|
|           | Dry hair sample  | % RSD |
| 33 DCD PK | 1.93 $\pm$ 0.12  | 6.56  |
| 34 DCD PK | 2.47 $\pm$ 0.09  | 3.71  |
| 35 DCD PK | 2.20 $\pm$ 0.13  | 7.25  |
| 36 DCDPK  | 1.94 $\pm$ 0.09  | 5.05  |
| 37 DCD PK | 4.68 $\pm$ 0.45  | 9.60  |
| 38 DCD PK | 3.70 $\pm$ 0.22  | 6.08  |
| 39 DCDPK  | 3.19 $\pm$ 0.18  | 5.75  |
| 40 DCD PK | 3.00 $\pm$ 0.21  | 7.27  |
| 41 DCD PK | 3.89 $\pm$ 0.22  | 5.86  |
| 42 DCDPK  | 3.07 $\pm$ 0.32  | 10.50 |
| 43 DCD PK | 2.31 $\pm$ 0.09  | 5.18  |
| 44 DCD PK | 1.44 $\pm$ 0.11  | 7.75  |
| 45 DCDPK  | 3.36 $\pm$ 0.11  | 3.52  |
| 46 DCD PK | 2.20 $\pm$ 0.15  | 7.01  |
| 47 DCD PK | 4.86 $\pm$ 0.36  | 7.46  |
| 48 DCD PK | 0.45 $\pm$ 0.02  | 6.20  |
| 49 DCD PK | 3.60 $\pm$ 0.18  | 5.23  |
| 50 DCDPK  | 2.10 $\pm$ 0.12  | 6.09  |
| 51 DCD PK | 1.29 $\pm$ 0.07  | 7.40  |
| 52 DCD PK | 2.15 $\pm$ 0.17  | 8.04  |
| 53 DCD PK | 1.63 $\pm$ 0.05  | 3.63  |
| 72 DCD PK | 1.41 $\pm$ 0.10  | 7.62  |

## Results of Hair Samples

Group No (4):

**Control Group Samples**  
**Number of samples 18**

| Sample ID | Total mercury concentration $\mu\text{g/g}$<br>(mean $\pm$ SD), n = 12 |       |
|-----------|--|-------|
|           | Dry hair sample  | % RSD |
| 54 CGS PK | 1.29 $\pm$ 0.07  | 5.85  |
| 55 GCS PK | 0.71 $\pm$ 0.05  | 8.35  |
| 56 CGSPK  | 0.37 $\pm$ 0.03  | 10.4  |
| 57 CGS PK | 0.41 $\pm$ 0.05  | 13.1  |
| 58 CGS PK | 0.23 $\pm$ 0.01  | 8.26  |
| 59 CGSPK  | 0.13 $\pm$ 0.01  | 8.99  |
| 60 CGS PK | 1.25 $\pm$ 0.10  | 8.35  |
| 61 CGS PK | 0.15 $\pm$ 0.01  | 7.93  |
| 62 CGS PK | 0.12 $\pm$ 0.01  | 9.30  |
| 63 CGS PK | < 0.03   |       |
| 64 CGS PK | < 0.03   |       |
| 65 CGS PK | < 0.03   |       |
| 66 CGS PK | 0.52 $\pm$ 0.05  | 10.89 |
| 67 CGS PK | 0.87 $\pm$ 0.05  | 6.01  |
| 68 CGS PK | < 0.03   |       |
| 69 CGS PK | 1.91 $\pm$ 0.10  | 5.51  |
| 70 CGS PK | 4.73 $\pm$ 0.11  | 2.34  |
| 71 CGS PK | 0.89 $\pm$ 0.05  | 5.75  |



THE ONLY WAY

SAFETY  
EQUIPMENT



# HOUSE SURGEONS ON DUTY

Sr. No

From 10-08-09 IMPORTANT NOTE MONDAY.  
Filling Patients will be Treated in this  
Department from 8:15 AM TO 10:30 AM.  
ALL H/O and Doctors Please  
Instruction.





# HOUSE SURG

| Sr. No |                  |
|--------|------------------|
|        | From 10-08-09 M  |
|        | Filling Patients |
|        | Department from  |
|        | 10 and Doc       |
|        | hon.             |



## Comparison of T-Hg concentrations from this study with other different studies of different exposed populations worldwide

| Location                      | n    | Mean $\pm$ SD<br>( $\mu\text{g/g}$ ) | Range<br>( $\mu\text{g/g}$ ) | Comments  | References  |
|-------------------------------|------|--------------------------------------|------------------------------|---|---|
| Tucuruí, Para,<br>Brazil      | 125  | 35.0                                 | 0.9-240                      | Fishermen   | Leino and Lodenius<br>(1995) <sup>(2)</sup>       |
| Palawan<br>Philippines        | 130  | 3.7                                  | 0.1 – 18.5                   | Hg mining impacted area   | Williams et al. (2000)<br><sup>(3)</sup>          |
| Kuwait                        | 100  | 4.181                                | -                            | Fishermen   | Al-Majed and Preston<br>(2000) <sup>(4)</sup>     |
| Diwalwal,<br>Philippines      | 316  | 4.14                                 | 0.03-37.76                   | Gold amalgamation area  | Drasch et al. (2001) <sup>(5)</sup>               |
| Rio Branco,<br>Brazil         | 2318 | 2.418 $\pm$ 0.850                    | -                            | Urban population  | De Oliveira Santos et<br>al (2002) <sup>(6)</sup> |
| Jacareacanga,<br>Para, Brazil | 205  | 8.6                                  | 0.3-83.2                     | Brazilian Amazon<br>riverine community  | Crompton et al. (2002)<br><sup>(7)</sup>          |
| Ten cities in<br>Japan        | 8665 | 1.82 (GM*)                           | 0.02 – 29.37                 |   | Yasutake et al. (2004)<br><sup>(8)</sup>          |
| Cambodia                      | 94   | 3.1 (GM)<br>7.3 (GM)                 | 0.54-190                     | A source other than fish<br>may be responsible<br>for high Hg in some<br>Cambodians | Tetsuro, A. et al<br>.(2005) <sup>(9)</sup>       |

# Comparison of T-Hg concentrations from this study with other different studies of different exposed populations worldwide

| Location                             | n   | Mean $\pm$ SD ( $\mu\text{g/g}$ ) | Range ( $\mu\text{g/g}$ ) | Comments   | References                            |
|--------------------------------------|-----|-----------------------------------|---------------------------|--|---------------------------------------|
| Madeira River B., Amazon , Brazil    | 713 | 15.22 $\pm$ 9.60                  | 5.99-150                  | Riverside population   | Bastos et al. (2006) <sup>(10)</sup>  |
| Wujiazhan town, northeast China      | 108 | 3.44 (AM**)<br>0.648 (GM*)        | 0.16-199                  | The river was polluted with Me-Hg by industrial wastewater discharge | Zhang and Wang (2006) <sup>(11)</sup> |
| DSX, Wanshan                         | 49  | 5.5 $\pm$ 2.7                     | 1.5-16                    | Mercury mining area  | Ping Li (2009) <sup>(12)</sup>        |
| XCX, Wanshan                         | 36  | 3.3 $\pm$ 1.4                     | 1.6-9.4                   | Mercury mining area  | Ping Li (2009) <sup>(12)</sup>        |
| Chlor-Alkali / Pakistan (SCL)        | 9   | Mean 4.36<br>Median 2.30          | 1.69 – 20.2               | Pakistani Chlor-Alkali factory                                       | This study                            |
| Chlor-Alkali / Pakistan (JCL)        | 23  | Mean 818<br>Median 177            | 3.3 - 9341                | Pakistani Chlor-Alkali factory (Lahore)                              | This study                            |
| Pakistani Health worker/ Pakistan    | 22  | Mean 2.59<br>Median 2.26          | 0.45- 4.86                | Dental Hospital ( Pakistan /Lahore)                                  | This study                            |
| Punjab University (Lahore /Pakistan) | 18  | Mean 0.76*<br>Median 0.39*        | <0.03-4.73                | Pakistani Control group (student population)                         | This study                            |

# Products for Mercury analysis

## Detail of Mercury Products Samples

| Category "A" Light sources |                  |            |                                      |          |
|----------------------------|------------------|------------|--------------------------------------|----------|
| S.NO                       | Description      | Brand Name | Origin                               | Quantity |
| 1                          | Energy saver     | Osaka      | China                                | 1        |
| 2                          | Energy saver     | Philips    | China                                | 1        |
| 3                          | Tube light       | Sailboat   | China                                | 1        |
| 4                          | Bulb             | Osaka      | China                                | 1        |
| <b>Total</b>               |                  |            |                                      | <b>4</b> |
| Category "B" Paints        |                  |            |                                      |          |
| S.NO                       | Description      | Brand Name | Origin                               | Quantity |
| 1                          | Synthetic enamel | Hi-delux   | Khurram shahzad & company Pakistan   | 1        |
| 2                          | Synthetic enamel | Fouji      | Harris paint factory lahore Pakistan | 1        |
| <b>Total #</b>             |                  |            |                                      | <b>2</b> |

Cont'

# Products for Mercury analysis

| Category "C" Cosmetics<br>Sub category Skin Cream |                  |                 |                                       |          |
|---|------------------|-----------------|---------------------------------------|----------|
| S.NO  | Description      | Brand Name      | Origin                                | Quantity |
| 1   | Skin cream       | Vince           | King world<br>laboratories Australia  | 1        |
| 2   | Skin cream       | Due             | Creative Cosmetic<br>Karachi Pakistan | 1        |
| <b>Total #</b>                                    |                  |                 |                                       | <b>2</b> |
| Sub category Sun screen Cream                     |                  |                 |                                       |          |
| S.NO  | Description      | Brand Name      | Origin                                | Quantity |
| 1   | Sun screen cream | Sun block cream | Stiefel consumer USA                  | 1        |
| 2   | Sun screen cream | Banana boat     | Canada                                | 1        |
| <b>Total #</b>                                    |                  |                 |                                       | <b>2</b> |

# Products for Mercury analysis

| Sub category Pimplac medicated cream |             |              |  |          |
|--------------------------------------|-------------|--------------|--|----------|
| S.NO                                 | Description | Brand Name   | Origin   | Quantity |
| 1                                    | Pimplex     | Pimpal cream | Brookes<br>pharmaceutical<br>laboratories (Pakistan) | 1        |
| 2                                    | Pimplex     | Adapco       | ATCO Laboratories<br>Karachi Pakistan                | 1        |
| <b>Total #</b>                       |             |              |  | <b>2</b> |
| Sub category Soap                    |             |              |  |          |
| S.NO                                 | Description | Brand Name   | Origin   | Quantity |
| 1                                    | Soap        | Dove         | Unilever Germany                                     | 1        |
| 2                                    | Soap        | Skin white   | Skincare Company<br>Pakistan                         | 1        |
| <b>Total #</b>                       |             |              |  | <b>2</b> |



# Products for Mercury analysis

| Sub category Mascara                                      |                |                               |  |             |
|---|----------------|-------------------------------|--|-------------|
| S.NO  | Description    | Brand Name                    | Origin                                   | Quantity    |
| 1   | Mascara        | Lancom                        | Paris                                    | 1           |
| 2   | Mascara        | Etude                         | Korea                                    | 1           |
| <b>Total #</b>  |                |                               |  | <b>2</b>    |
| Category "D" Pharmaceutical                               |                |                               |  |             |
| S.NO  | Description    | Brand Name                    | Origin                                   | Quantity    |
| 1   | Lotion         | Mercurochrome<br>lotion B.P.C | Spectrum Laboratories<br>Lahore Pakistan | 1           |
| 2   | Lotion         | Mercurochrome<br>lotion B.P.C | Sapient Pharma Kot<br>Lakhpat Lahore     | 1           |
| <b>Total #</b>  |                |                               |  | <b>2</b>    |
| Category "E" Miscellaneous<br>Sub category Dental amalgam |                |                               |  |             |
| S.NO  | Description    | Brand Name                    | Origin                                   | Quantity    |
| 1   | Dental amalgam | local                         | Pakistan                                 | (6 samples) |
| <b>Total #</b>  |                |                               |  | <b>6</b>    |

Cont'

# Products for Mercury analysis

| Sub-Category Battery             |                     |                       |           |          |
|----------------------------------|---------------------|-----------------------|-----------|----------|
| Button cell battery (12 samples) |                     |                       |           |          |
| S.NO                             | Description         | Brand Name            | Origin    | Quantity |
| 1                                | Button cell battery | Vinic                 | Japan     | 1        |
| 2                                | Button cell battery | Lithium battery       | China     | 1        |
| 3                                | Button cell battery | Fante Lithium battery |           | 1        |
| 4                                | Button cell battery | Sony                  | Japan     | 1        |
| 5                                | Button cell battery | Panasonic             | Japan     | 1        |
| 6                                | Button cell battery | Maxell                | Japan     | 1        |
| 7                                | Button cell battery | Maxell                | Japan     | 1        |
| 8                                | Button cell battery | Energizer             | USA       | 1        |
| 9                                | Button cell battery | Lithium cell          | Nil       | 1        |
| 10                               | Button cell battery | Tianqiu               | Nil       | 1        |
| 11                               | Button cell battery | LR 1130               | Nil       | 1        |
| 12                               | Button cell battery | L 1154                | Nil       | 1        |
| <b>Total #</b>                   |                     |                       | <b>12</b> |          |

Cont'

# Products for Mercury analysis

| Cylindrical battery (12 samples) |                     |                |           |          |
|----------------------------------|---------------------|----------------|-----------|----------|
| S.NO                             | Description         | Brand Name     | Origin    | Quantity |
| 1                                | Cylindrical battery | Energizer      | China     | 1        |
| 2                                | Cylindrical battery | Energizer      | Singapore | 1        |
| 3                                | Cylindrical battery | Super alkaline | China     | 1        |
| 4                                | Cylindrical battery | Silver         | Nil       | 1        |
| 5                                | Cylindrical battery | Vimie          | Nil       | 1        |
| 6                                | Cylindrical battery | Alkaline       | Nil       | 1        |
| 7                                | Cylindrical battery | Eastar         | Nil       | 1        |
| 8                                | Cylindrical battery | Toyashiba      | Nil       | 1        |
| 9                                | Cylindrical battery | Rocket         | Nil       | 1        |
| 10                               | Cylindrical battery | 3-circles      | Japan     | 1        |
| 11                               | Cylindrical battery | Nokeea         | Nil       | 1        |
| 12                               | Cylindrical battery | Power flesh    | Nil       | 1        |
| <b>Total #</b>                   |                     |                | <b>12</b> |          |

Cont'

# Products for Mercury analysis

| Sub category Cement     |             |            |  |          |
|-------------------------|-------------|------------|--|----------|
| S.NO                    | Description | Brand Name | Origin                                 | Quantity |
| 1                       | Lime        | local      | Pakistan                               | 1        |
| <b>Total #</b>          |             |            |  | <b>1</b> |
| Sub category LPG        |             |            |  |          |
| S.NO                    | Description | Brand Name | Origin                                 |          |
| 1                       | Diesel      | local      | Pakistan                               | 1        |
| 2                       | Coal tar    | local      | Pakistan                               | 1        |
| <b>Total #</b>          |             |            |  | <b>2</b> |
| Category "F" Pesticides |             |            |  |          |
| S.NO                    | Description | Brand Name | Origin                                 | Quantity |
| 1                       | Pesticide   | Tenekil    | PCSIR laboratories<br>Karachi Pakistan | 1        |
| 2                       | Pesticide   | Rapids     | Pakistan                               | 1        |
| <b>Total #</b>          |             |            |  | <b>2</b> |

Cont'

# Products for Mercury analysis

| <u>Muzaffarabad, Azad Jammu and Kashmir</u> |                           |  |           |          |
|---|---------------------------|--|-----------|----------|
| S.NO  | Description               | Location                                   | Origin    | Quantity |
| 1   | Municipal effluent        | Domail                                     | Pakistan  | 1        |
| 2   | Municipal effluent        | Near Neelam bridge                         | Pakistan  | 1        |
| 3   | Hospital waste            | Abbas Institute of medical Sciences (AIMS) | Pakistan  | 2        |
| 4   | Solid waste landfill site | Shahdra                                    | Pakistan  | 4        |
| <b>Total #</b>                              |                           |  | <b>8</b>  |          |
| <b>Grant Total #</b>                        |                           |  | <b>61</b> |          |

# Draft National Mercury Waste Management Plan

1. Chlor Alkali Sector
2. Health Sector
3. Light Products Sector

# Final Workshop of National Stakeholders

|                    |                            |
|--------------------|----------------------------|
| Date               | 19 <sup>th</sup> May, 2010 |
| Venue              | Islamabad Hotel, Islamabad |
| No of Participants | 130                        |
| Group I            | Chlor-Alkali Sector        |
| Group II           | Health Sector              |
| Group II           | Light Products Sector      |

# Final Workshop of National Stakeholders

## Recommendations

### Group I: Chlor-alkali- sector

- Phase out Plan
  - a) Total shut down of 30 MT of mercury cell within 2 months
  - b) Remaining 65MT by 2015
  
- Demolition plan
  - a) Hg disposal
  - b) Rest of equipment scrap
  
- To replace Mercury plant with Ionized Exchange Membrane plant, technical and financial assistance is required.



# Final Workshop of National Stakeholders

## Group II: Health Sector

- Replacement of mercuric amalgam with composite (white material)
- Baseline data on existence and use of mercury in public and private health sectors
- Proper handling of mercury waste in health sector (e.g. laboratories and equipments)
- Awareness messages regarding hazards of mercury and general public through posters, lectures in educational institutions, print and electronic media
- Dental clinics should have amalgam mixer/ separator through law /legislation
- The cosmetic manufacturers should be made mandatory through legislation to cite mercury warning on cosmetics in Urdu and English both
- Mercury containing waste should not be mixed with other hazardous waste
- Hospitals should develop guidelines to store, handle mercury equipment
- EPA should develop data and produce mercury containing rules for concerned agencies (imports, PSQCA , medicines, fungicides etc)
- Future industries must not use mercury in products (ISO 9001)

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## Group III: Light Sources/Products

- Light energy savers should not be encouraged as these contain mercury.
- Lighting is a diffused activity taking place at every house and commercial center and it is difficult to apply a control on diffused activities. So first preference should be given to reduction of mercury use in manufacturing.
- Take back services may work more efficiently with the responsibility of the distributors to effectively convey this concept through electronic and print media.
- Apply Management / Treatment Practices for Curbing Mercury Release into Environment
- Develop Electrical & Electronics Manufacturing with Minimum or No Use of Mercury
- Undertake R&D programmes with Cooperation of Chambers of Commerce & Industries and Academia for Developing Environment Friendly Technologies Regarding Mercury Manufacturing and Mercury Waste Management

# Pictorial Glimpses of Final Workshop of National Stakeholders





"MANAGEMENT OF MERCURY  
AND MERCURY CONTAINING WASTE  
IN PAKISTAN"  
17-19 April 2010, Islamabad Hotel, Islamabad  
United Nations  
Environment Programme (UNEP)  
Chemicals Branch

RECOMMENDATIONS  
HEALTH EXPERTS  
○ REPLACEMENT OF MERCURY  
DIALYSIS WITH SILVER OAE  
(SAFE MATERIAL)



# Future Plan/Proposals

1. Phasing out of Mercury and Mercury Containing Products in the Country
2. Capacity Building of Institutions regarding the management of Mercury
3. Awareness Raising Activities on Health Impacts of Mercury

**Thanks**