POP's and Obsolete Pesticides Newsletter

No 3
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Prepared on behalf of International HCH and Pesticides Association (IHPA)

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Aim

The aim of this newsletter is to disseminate information in a cost-effective way on the developments taking place in bioremediation technology moving the frontiers of technology for commercial exploitation both in developed and developing countries. Special emphasis will be given to bio-removal of pollutants in soil, water matrices and will cover mainly Persistent Organic Pollutants (POPs) as designated by the Stockholm Convention on POPs and also other persistent toxic pollutants not covered under the POPs conventions. It will also highlight cleaner and environment friendly technologies, which show good promise in this area. The newsletter will not go into technical details of selected scientific publications but only highlight salient features for the benefit of the readers.

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Note from the Editor

Since the last Newsletter in August, the most important global event was the World Summit on Sustainable Development (WSSD) in Johannesburg. More than 65,000 delegates and non -delegates from hundreds of countries/ organizations converged on Johannesburg expecting different results all with the same goal of poverty elimination and safeguarding of the environment. It was ten years down the road from Rio summit and the Agenda 21 and for those working on POPs it was almost 40 years down the road since Carlson wrote the book 'Silent Spring'. Whichever way one looks at, WSSD was a great success for the Government of South Africa for hosting such a big conference in a most efficient way. The Summit echoed the sentiment that good governance within each country and at the international level is essential for sustainable development. At the domestic level, sound environment, social and economic policies, democratic institutions responsive to the needs of the people, the rule of law, anti corruption measures, gender equality and an enabling environment for investment are basis for sustainable development. Mr. Kofi Annan emphasized the reality that business is vital to solve the world's poverty and health issues. So it was clear that economic growth is the key to make sustainable development (SD) work its way into poorer nations. The J'burg WSSD came out with a 59 page dossier covering various aspects of SD with emphasis on Africa. For those inside the meeting it was considered a grand success and for those outside the meeting it was just a repeat of previous rhetoric with neither any financial commitment nor the will to help the poor nations. For those involved in cleaner production, hazardous waste management, elimination of POPs it was gratifying that the dossier did provide a number of statements related to these topics.

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WSSD and POPs.

The WSSD Summit declaration specifies providing incentives to cleaner production and eco-efficiency in all countries such as state-financed loans, venture capital, technical assistance and training programmes for small and medium sized companies. It specially wants promotion of the ratification and implementation of relevant international instruments on chemicals and hazardous waste, including the Rotterdam Convention on Prior Informed Consent (PIC) in international trade pesticides of concern, so that it can enter into force by 2003 and the Stockholm Convention on Persistent Organic Pollutants (POPs) so that it can enter into force by 2004. This would encourage and improve coordination as well as supporting developing countries in their implementation. This declaration is definitely a positive step in the elimination of POPs and will help the Obsolete Pesticides Stockpiles Project for Africa and the proposed establishment of a similar set up for Central and Eastern European Countries in the 7th International HCH and pesticides Forum at Kiev, Ukraine in June 2003 (see website: www.hchforum.com)

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GEF commits to its global environment programme.

The 20th Council of GEF held in Beijing in October confirmed replenishment of~$3 billion for its environment facility program. This includes almost $250 million allotted for POPs over the next 4 years. These will mainly cover enabling activities for National implementing plans (NIP), demonstration and capacity building. UNIDO has got 28 Enabling Activities projects approved and work already started in 15 countries.

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When there is a will there is a way

Ten hot spots cleaned in Poland

Poland is well known for its so called chemical tombs inherited from the cold war days. Since the opening up of the iron curtain it is taking all measures to clean up many of the hot spots which was evident from its role in organizing the last Poznan Forum on POPs .(See Newsletter April 2002.) These chemical tombs contain among others many hazardous chemicals including POPs and cleaning up of them is a Himalayan task. Recently Poland declared ten hot spots as cleaned up. This clearly indicates the Government's will to act to make Poland to reach West European standards. With the admission to the EU almost imminebt, Poland does not want to leave any stone unturned to facilitate its well deserved grand entry into the EU.

Name of the hot spot - Type - Place
1.Gdynia - Debogorze - Municipal Baltic coast wastewater treatment plant.
2.Frantschach - Swiecie - pulp and paper Vistula Industry.
3. Bydgoszcz - Fordon - municipal and Vistula wastewater treatment industrial plant.
4. Bydgoszcz - Kapusciska - Chem. Ind. Vistula
5. Zgierz -Boruta Dyestuffs - Chem. Ind. Vistula
6. Oswiecim - Dwory Plant - Chem. Ind. Vistula
7. Bukowno - Boleslaw Works - MetalI nd. Vistula
8. Vistula Upper Basin (7) - Salt Ind. Vistula
9. Poznan - Central wastewater Municpal Odera - treatment plant

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Code of practice: Investigations of potentially Contaminated Sites.

Referring to the above clean-up of sites in Poland, it is worth mentioning that in the UK, the Society for Chemical Industries (SCI) and the Royal Society of Chemistry (RSC) organized a meeting in October, 2002 at Runcorn, UK, to discuss the new (British Standard Institute(BSI)- 10175:2001 that replaced DDI 175:1998. The new standard (83 pages) provides guidance on the process of investigation to characterize the contamination status of a site. The meeting covered:
- Rationale and implications of the standard
- A practitioner's view of the standard
- Quality Assurance
- Site investigations and risk assessment
- Laboratory analysis and interpretation of results

The meeting was organized by the Environment and Water Group of the SCI and the Water Chemistry Forum of the RSC. According to the organizers, the meeting was a

re-run due to popular demand of the topic. If anyone wants further information on the meeting's report contact Dr. G. Fowler at g.fowler@ic.ac.uk

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Arsenic poisoning:

In the last report we mentioned about arsenic poisoning of underground drinking water in Bangladesh. Studies transpire that in Bangladesh underground water irrigation promoted by the government and some AID agencies might have been responsible for the seepage of Arsenic in drinking water. The same fear is now expressed in Kerala, India where advanced warning is being given for Arsenic poisoning of well waters.

A CARE investigator in Bangladesh has developed an efficient, low- cost method of treating arsenic-contaminated drinking water with a system that combines unglazed clay pots and low-tech filtration materials.

Dr. Ma of The University of Florida and her colleagues have shown that the fern has a near-insatiable appetite for arsenic. It could thus be used to help clean up spoil heaps contaminated with this unpleasant element.

Dr Ma's interest increased when she found that brake fern plants growing near an old wood-preservation site in central Florida. The site was contaminated with copper arsenate, a fairly noxious substance, but the fern was apparently thriving. Analysing fronds(leaves) from the site showed that they had accumulated as much as five grams of arsenic for each kilogram of the fern's foliage. And when, prompted by this discovery, the researchers started growing brake fern in laboratory conditions, they were able to quadruple this figure.

In theory, a contaminated site could have much of its arsenic sucked out of it over the course of a few years by planting it with Chinese brake. And, since brake is one of the few ferns that prefer sunny conditions to dark and moist ones, it could be planted on a wide variety of such sites.

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Efficient Soil Decontamination of Obsolete Dense Pesticides with Thermal Desorption Technology

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The problem

Pesticide contamination in soil prevents proper utilisation of valuable land, decreases agricultural production, polluting groundwater and exerts direct impact on the humans and animals. The owners of contaminated land are deeply concerned about:
- the exact predictable time frame of the decontamination procedure (desirable 1-2 years),
- financial, business, legal and technical risks taken,
- the guaranteed end result of the decontamination procedure with comprehensive solution, for both risk based or limit value based approach of Authority permitting,
- the "all included" total cost efficiency of the decontamination procedure,
- the legal responsibility and legal acceptance, including for the trans boarder real estate transfer and migration of contamination stream.

In this paper a short summary of a descriptive method of Thermal Desorption Technology is given. For efficient decontamination of obsolete and dense pesticides with rapidly achieved predictable end result, indirectly heated low temperature thermal decomposition method is used. The treated substance is not oxidised, whereas inorganic components are not changed. Gas vapours are burned out in high temperature with a minimum of 2 seconds residence time, the off-gas is cleansed, while the solid phase is denaturalised by TDT-3R integrated biological revitalisation by determined microbiological species for comprehensive post processing. A mobile unit is designed and prepared for field and full scale demonstration with continuous throughput capacity of approximately 2 t/h, (15k-tpa) or 5 t/h, (36k-tpa). Applied patent: US 5,707,592, Jan. 13, 1998.

The main component of the Thermal Desorption Technology Recycle-Reduce-Reuse Terra Humana "TDT - 3R" is a specially designed, indirectly fired in a horizontally arranged rotary kiln reactor. In the reactor, the contaminated soil in a reductive environment is gassed-out under low vacuum (0-50 Pascal) and a material core temperature range of approximately 300°C - 350°C. Due to the design characteristics, the technology allows controlled introduction of contaminated soil and flow of obsolete pesticide compounds.

Gas vapour from the thermal desorption process is directly combusted at a minimum temperature of 1,250 °C with a minimum of 2 seconds residence time. The flue gas is cooled with recovery of heat. In the case of halogenated contamination, it is generally experienced that dioxin and furan gases are not created/recreated in a reductive environment and the pyrolysis gas-vapour phase does not contain dioxin-furan gasses. The remaining gas is cleansed in an efficient high capture wet gas multi venturi scrubber prior to discharge. Scrubber process water is cleansed prior to discharge and the neutralised precipitate with the water from treatment is disposed off to a permitted landfill The cleansed soil is cooled and discharged, which may contain porous carbon residues, which during the recultivation phase will keep the moisture content and provide protected sites for implanted micro-organisms.

Process technical aspects
- high efficient heat transfer to the basic material, such as the horizontally arranged kiln,
- revolutionary technical solution for the rotary kiln sealings between the moving and stationary parts,
- advanced technical solution for the continuous throughput of the feed stock,
- advantageous and safe application for high concentrated (any concentration over 10,000 mg/kg) contaminated soil treatment, mobile version is available,
- flexible operations: operates in a range of 25 % to 125 % of nominal capacity,
- closed continuous input - output system,
- simple - safe vacuum system, easy start up - shut down, total heat recovery,
- the TDT-3R rotary reactor system is of a simple technical - mechanical construction, containing no exotic technical construction and exotic materials,
- throughput capacities of: 2 t/h, (15k-tpa) or 5 t/h, (36k-tpa), larger capacities available.

The TDT-3R meets the U.S. RCRA Misc. Units 40 CFR 264 Subpart X for Thermal Desorbers and compatible E.U. Norms for thermolysis. It has the following main characteristics:
- Thermal Desorption Chamber: indirect-fired heat source used for primary desorption chamber with relatively low operating temperature,
- Air Pollution Control Devices "APCD": non-destructive APCD is used.
- Waste Residual Management: treatment of residuals is separated from the desorber.

Economics: The economic analysis of the TDT-3R technology revealed that operating costs are mostly affected by the feed rate and residence time. Soil moisture content, soil treatment temperature (which is determined by contaminant type and concentration) and the cost of fuel are site-specific factors that effect costs. The soil moisture content determines the feed rate and residence time needed to proper treatment of the soil. Estimated thermal desorption treatment cost for 5,000 tons: € 115 - 175 / ton.

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The results

- Short decontamination time
- Safe treatment at any concentration/composition levels for complex soil pollutions.
- Cost efficient with fix cost structure.
- Legal acceptance.

The status of the TDT-3R technology:
The TDT-3R technology has successfully passed the scientifically research and pilot scale tests, whereas concept, method and apparatus have been worked out. The status of the TDT-3R technology is a post innovative phase and a prior Full Scale Demonstration phase.
(Note: The author should be contacted for any detailed information. The newsletter is not responsible for any statements in this report)

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UK Takes Serious look at the three 'R' s.
(source : Chem.& Ind.,15, p.17, 2002.9

Fridge mountains are dotted around the UK. The country is lagging behind in the safe disposal of outdated fridges which contain the ODS-, chloroflurocarbons. Approximately one million fridges are awaiting legally safe method of disposal . It is estimated that 75 million pounds would be needed and non.government sources feel that it will take end of 2003 before getting rid of these mountains of fridges. In Europe's recycling league, UK is far behind and the three 'R' s -reduce, reuse and recycle- . UK recycles 11% of its municipal waste while Switzerland does 52%, and Germany stands at 46%. While land fills are becoming a scarcity, incineration being violently opposed, the shift is towards sustainable waste management. The Prime Minister advocates doorstep recycling. One publication on "zero wastes" forecasts elimination of landfills and incineration by 2020. Many well known companies have already gone into partnership with local council to reach 'zero waste'.

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Events:

Next the major meeting on POPS is the 7th International Forum in Kiev. Details can be obtained from www.hchforum.com

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Search for Co-editors IHPA Newsletter:

For the continuation of this newsletter, we are looking for 4 or 5 co-editors to keep updates, 3-4 times per year, on the various pesticides related subjects. If you are interested, please contact me at: bsugavanam@yahoo.co.uk

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Season's Greetings

The Newsletter wishes its readers Happy Christmas and a Prosperous NEW YEAR.

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