

**USIBWC CRP Rio Grande Organic Chemical Study
2007 – 2010**

The International Boundary and Water Commission, U.S. Section, Texas Clean Rivers Program (USIBWC CRP) for the Rio Grande Basin has analyzed 23 organic chemicals in the Rio Grande from 2007 through 2010. Many of the chemicals which are being analyzed are listed on the United National Environmental Program's "Dirty Dozen" List, a list of 12 chemicals which are being banned or phased out by international agreement, the Stockholm Treaty. Below is a brief description of the parameter and its environmental impacts as justification for why it was chosen for analysis.

Results of the study are posted in an Excel sheet at http://www.ibwc.gov/CRP/segment_data/Organics_in_Sediment_2007-2010.xls.

<i>Parameter</i>	<i>Description</i>
DDD	Similar to DDT, which results from environmental degradation of DDT. Toxicity to insects are similar. DDD bioaccumulates and is no longer sold as an insecticide.
DDE	Bioaccumulates in birds and reduces their ability to reproduce. Very difficult to biodegrade and it is very fat-soluble, thereby remaining in bodies for a long time. Since restrictions and bans in the 1970s, birds affected by DDE, such as bald eagles and falcons, have made a comeback
DDT	A persistent insecticide with high acute toxicity and potential to cause chronic effects in humans such as cancer, although not traditionally considered to be a human carcinogen. In 1973 the EPA banned all uses of DDT, although DDT is still being used in developing countries to control disease or combat agricultural insects. Hailed as miraculous by Sir Winston Churchill in 1945 because of its effectiveness against disease-causing mosquitoes and other insects. Rachel Carson's <i>Silent Spring</i> showed its role in decreasing bird populations
Aldrin	Cyclodiene pesticide that arrived on the market in about 1950. Persistent, have potential toxicity, and a tendency to accumulate in fatty tissues. Used for termites.
Chlordane	Soil pesticide, restricted in the U.S; maximum water contaminant level is 2 ppb. Listed by UN as a Persistent Organic Pollutant
Endrin	Used to kill rodents. Listed by UN as a Persistent Organic Pollutant
Heptachlor	Used to kill soil insects, is restricted in the U.S. Maximum water contaminant level in the U.S. is 1 ppb. Listed by UN as a Persistent Organic Pollutant.
Methoxychlor	An insecticide still used both domestically and agriculturally to control flies and mosquitoes. Is water-soluble and degrades in the environment. It is excreted by organisms rather than bioaccumulating.
Mirex	Insecticide, particularly effective against the fire ant found in the southeastern US. Also sold under the name dechlorane as flame retardant additive for synthetic and natural materials. Mostly used in the

	1960s and banned in the 70s. Classified as a Persistent Organic Pollutant by the United Nations.
Toxaphene	The most heavily used insecticide during the period from 1966 to 1976 in the US before restrictions were placed on its use in 1982 and a total ban was imposed in 1990. Mostly used in southeastern cotton-growing states, as well as peanuts and soybeans. Has since spread across North America by air transport after evaporation. Listed by UN as a Persistent Organic Pollutant
Dieldrin	Suspected to cause excess mortality of adult bald eagles. Use is banned. Agricultural uses to combat soil insects and to control termites were prohibited in the mid-1980s.
Hexachlorobenzene	Also called HCB, an organochlorine pesticide that is stable and easy to prepare from chlorine and benzene, used as agricultural fungicide for cereal crops. Extremely persistent and remains in the environment. Causes liver cancer in laboratory rats. Listed by the United Nations as a Persistent Organic Pollutant
PCBs	Listed by UN as a Persistent Organic Pollutant. Have many uses.
Endosulfan 1	Endosulfan is still used extensively throughout the world as an insecticide for both domestic and agricultural applications. Environmental persistence is lower than other cyclodiene pesticide since it is more reactive.
Demeton	
Diazinon	Common pesticide for soil and trees
Dursban/chlorpyrifos	Household domestic pesticide/insecticide. Commonly detected in streams and shallow groundwater in both urban and agricultural areas due to its domestic usage.
Guthion/ Azinphos-methyl	Organophosphate insecticide; neurotoxin derived from WWII nerve agents. EPA is currently phasing this chemical out of use in the US.
Malathion	Domestic pesticide; Type C Organophosphate
Parathion	Insecticide highly toxic to non-target organisms; banned in many countries
2,4-D	(2,4-dichlorophenoxyacetic acid) Herbicide used to kill broad-leaf weeds in lawns, golf course fairways and greens, and agricultural fields. Huge quantities are used in developed countries for the control of weeds in both agricultural and domestic settings. Farmers who mix and apply large quantities of 2,4-D to their crops have been found to have increased incidences of non-Hodgkin's lymphoma cancer.
2,4,5-T	(2,4,5-trichlorophenoxyacetic acid) Herbicide introduced in 1944 that is effective in clearing brush, and used on roadsides and powerline corridors.
Silvex	A phenoxy herbicide based on propionic acid.

Sources:

- Baird, Colin and Cann, Michael. *Environmental Chemistry*, Third Edition. Part II – Toxic Organic Chemicals. W.H. Freeman and Company, 2005.
- Wikipedia