REPORT ON HEAVY METALS AND PERSTICIDES IN BEVERAGES INDUSTRIES

November 2003

CENTRAL POLLUTION CONTROL BOARD
DELHI

1.0 BACKGROUND

Pursuant to the reports received from West Bengal Pollution Control Board and press reports regarding hazardous waste generated by beverage units, the Central Pollution Control Board (CPCB) deputed two teams: one to West Bengal and the other to Kerala to assess the effluent quality generated and discharged, treatment provided and characteristics of solid waste with respect to metal content for proper disposal:

The composition of the teams is as follows:

Team A (for West Bengal)

i. Shri. P.M. Ansari, Additional Director
ii. Dr. D.D Basu, Senior Scientist
iii. Dr. D.P Mukhopadhyay, ZO, CPCB, Kolkata
iv. Representatives of SPCB

Team B (for Kerala)

i. Shri. N.K Verma, Additional Director
ii. Dr.D.C Sharma, Sr. Env. Engineer
iii. Representatives of SPCB

The team 'A' carried out inspection of the following three beverage units in West Bengal during 9 to 11 September, 2003:

i. M/s Diamond Beverages Pvt. Ltd, Taratola
ii. M/s Bengal Beverages Pvt. Ltd., Dankunj
iii. M/s Pepsico Holdings Pvt. Ltd., Sonarpur

The team 'B' inspected M/s Hindustan Coca Cola Beverages Pvt. Ltd., Palaghat on 12th September 2003.

During the inspection, samples of raw water, treated water, inlet and outlet of Effluent Treatment Plant (ETP) and sludge generated from ETP were collected. The samples collected by Team A were analysed at Central laboratory of Central Pollution Control Board (CPCB), Delhi while samples collected by Team B were analysed at CPCB Zonal Office at Bangalore.

2.0 RESULTS AND OBSERVATION

The results of analysis are enclosed.

It may be seen from the enclosed tables that concentration of heavy metals in effluent of ETP of M/s Hindustan Coca Cola Beverages Pvt. Ltd., Kerala is well within the prescribed limit for discharge of effluent into surface water, the concentration of Pb in treated effluent of M/s Diamond Beverages Pvt. Ltd and M/s Bengal Beverages Pvt. Ltd. is exceeding the limit of 0.1 mg/l while concentration of Cd are well within the limit of 2.0 mg/l. In case of M/s Pepsico Holding Pvt. Ltd., Pb and Cd in treated effluent are not traceable. Concentration of Cd in ETP sludge is more than 50 mg/kg in the case of M/s Bengal Beverages Pvt. Ltd., M/s Diamond Beverages Pvt. Ltd. As well as M/S Hindustan Coca Cola Beverages Pvt. Ltd. And as such qualifies as hazardous waste. The ETP sludge from all the four plants fail to meet the standards for compost in respect of heavy metals. The lime sludge from water treatment plant, spent carbon and hyflo do not qualify as hazardous waste but the concentration of heavy metals are more than the limit for compost. In case of M/s Pepsico Holdings Pvt. Ltd., West Bengal, the Cd and Pb concentrations in ETP sludge are such that they do not qualify as hazardous waste.

The team A also collected samples for analysis of Pesticides in raw water, sludge and wastewater. The concentration of individual Pesticides was found to be less than 0.1 µg/l and Total Pesticides was found to be less than 0.5 µg/l in raw water of all the three units of West Bengal.

3.0 ACTION PROPOSED

The ETP sludge of M/s Hindustan Coca Cola Pvt. Ltd., Kerala, M/s Bengal Beverages Pvt. Ltd., Dankuni and M/s Diamond Beverages Pvt. Ltd., Taratola were found to be hazardous waste as concentration of Cd was more than 50 mg/kg. These units are required to dispose of the ETP sludge in a secured landfill as per procedure laid down in Hazardous Waste (Management and Handling) Rules, 1989 as amended.

The Pb concentration in effluents of M/s Bengal Beverages Pvt. Ltd and M/s Diamond Beverages Pvt. Ltd were found to exceed the prescribed limit. These units are required to upgrade their ETP so as to treat the effluent to meet the prescribed standard.

The ETP sludge generated from M/s Pepsico Holdings Pvt. Ltd. as well as spent carbon & hyflo and lime sludge from water treatment plant of M/s Hindustan Coca Cola Pvt. Ltd contain concentration of heavy metals more than the limit prescribed for compost and as such these wastes should not be utilised as manure in agricultural field and shall be properly disposed as industrial solid waste.

State Pollution Control Boards are required to direct the concerned units to take measures as state above.

Table I : ANALYSIS REPORT OF HIDNUSTAN COCA COLA BEVERAGES PVT. LTD., PALGHAT, KERALA

Sl No.	Sample Identification	Metal Concentration				
		Pb	**Cd**	**Cr**	**Ni**	**Zn**
	Water Sample					
1	Raw Water (mg/l)	0.020	NT	NT	0.160	0.190
2	Treated Water (mg/l)	0.012	0.002	NT	0.006	0.268
	Liquid Effluent					
1	Influent to ETP (mg/l)	0.248	0.004	0.008	0.096	0.074
2	Effluent from ETP (mg/l)	0.034	0.002	NT	0.122	0.746
	Sludge					
1	Sludge from ETP (mg/l)	3471	338.8	759.6	69.6	3810
2	Spent carbon & Hy-flow (mg/l)	2.9	5.2	42.0	196.7	199
3	Lime Sludge from ETP (mg/l)	NT	0.0	17.1	138.2	58.1
4	Recovered sludge from fields (kept in industrial premises) (mg/kg)	696.8	73.8	457.8	92.4	935

Table : 2 Analysis results of M/S Bengal Beverages Pvt. Limited, Dankuni, West Bengal

S. No	Source	Heavy metals concentrations	
		Cd	Pb
1.	Raw water (mg/l)	NT	NT
2.	Treated water (mg/l)	NT	NT
3.	Effluent of ETP (mg/l)	0.02	0.11
4.	ETP sludges (mg/kg)	56	1043

Table: 3 Analysis results of M/s Diamond Beverages, Taratola West Bengal

S. No	Source	Heavy metals concentrations	
		Cd	Pb
1.	Raw water (mg/l)	NT	NT
2.	Treated water (mg/l)	NT	NT
3.	Effluent of ETP (mg/l)	0.02	0.38
4.	ETP sludges (mg/kg)	69	805

Table: 3 Analysis of M/s PEPSICO, Sonarpur, West Bengal

S. No	Source	Heavy metals concentrations	
		Cd	Pb
1.	Raw water (mg/l)	NT	NT
2.	Treated water (mg/l)	NT	NT
3.	Effluent of ETP (mg/l)	NT	NT
4.	ETP sludges (mg/kg)	32	695

ANNEXURE - I

ANALYSIS RESULTS OF ORGANOCHLORINE PESTICIDES BY GC-ECD

SAMPLES COLLECTED FROM VARIOUS BEVERAGES PLANTS IN KOLKATTA BY ESS DIVISION, CPCB

Sl. No.	Sample Details	Organochlorine Pesticides Concentration										
		α-BHC	β-BHC	γ-BHC Lindane)	Aldrine	α-Endosulphan	Dieldrin	p.p'-DDE	β-Endosulphan	o.p-DDT	p.p-DDT	Total
	Method Detection Limit (MDL) in pg	6.88	15.6	22.81	8.47	8.42	10.35	22.5	11.71	40.63	12.72	
	Fresh Water	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
1.	Bengal Beverages Raw Water (Dankuni)	0.013	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.013
2.	Bengal Beverages Treated Water	BDL	0.039	0.090	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.125
3.	Pepsico Borewell Water	BDL	0.019	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.019
4.	Pepsico Sonar R.O Water	0.005	0.056	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.061
5.	Taratola Raw Water	0.010	0.022	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.032
6.	Taratola Treated Water	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	Waste Water	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
7.	Bengal Beverages Treated Effluent	0.009	BDL	0.027	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.036
8.	Pepsico Treated Effluent (ETP Outlet)	0.016	0.012	BDL	BDL	BDL	BDL	BDL	BDL	0.026	BDL	0.054
9.	Taratola Treated Effluent (Final Outlet)	0.011	0.026	0.044	BDL	BDL	BDL	BDL	BDL	0.015	0.067	0.162
	Sludge	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
10.	Bengal Beverages Sludge	0.007	0.019	BDL	BDL	BDL	0.001	BDL	BDL	BDL	BDL	0.027
11.	Pepsico Sludge	0.009	0.045	BDL	0.004	BDL	0.008	BDL	BDL	BDL	BDL	0.086
12.	Taratola Sludge	0.006	0.21	BDL	BDL	BDL	0.005	BDL	0.004	0.002	BDL	0.037

BDL means, values were less than Method Detection Limit (MDL) as well as Method Blank

ANNEXURE – II

ANALYSIS RESULTS OF ORGANPHOSPHORUS PESTICIDES BY GC-MS

SAMPLES COLLECTED FROM VARIOUS BEVERAGES PLANTS IN KOLKATA BY ESS DIVISION, CPCB

SL. No.	Sample Details	Organophosphorus Pesticides Concentration		
		Malathion	Chlorpyrifos	Total Organanophosphorus pesticides
	Method Detection Limit (MDL) in pg	21.14	16.2	
	Fresh Water	(µg/L)	(µg/L)	(µg/L)
1.	Bengal Beverages Raw Water (Dankuni)	BDL	BDL	BDL
2.	Bengal Beverages Treated Water	BDL	BDL	BDL
3.	Pepsico Borewell Water	BDL	BDL	BDL
4.	Pepsico Sonar R.O Water	BDL	BDL	BDL
5.	Treated Raw Water	BDL	BDL	BDL
6.	Taratola Treated Water	BDL	BDL	BDL
	Waste Water	(µg/L)	(µg/L)	(µg/L)
7.	Bengal Beverages Treated Effluent	BDL	BDL	BDL
8.	Pepsico Treated Effluent (ETP Outlet)	BDL	BDL	BDL
9.	Taratola Treated Effluent (Final Outlet0	BDL	BDL	BDL
	Sludge	(µg/L)	(µg/L)	(µg/L)
10.	Bengal Beverages Sludge	BDL	BDL	BDL
11.	Pepsico Sludge	BDL	BDL	BDL
12.	Taratola Sludge	BDL	BDL	BDL

BDL means, values having poor Qvalue (relative ion ratio match quality)
Values than Method Detection Limit (MDL) as well as Method Blank as well as
Values less than Method Blank

ANNEXURE III

STANDARDS FOR COMPOST

Parameters	Concentration not to exceed (mg/kg dry basis, except all value and C/N ratio)
Cadmium	5.00
Chromium	50.00
Lead	100.00
Nickel	50.00
Zinc	1000.00