

To:
The Chairman
Public Hearing Committee
Cuddalore

07 June 2002

Sir:

Sub: Public Hearing for setting up of Chemplast's PVC plant in Semmankuppam, in SIPCOT Phase II, Cuddalore Taluk, Cuddalore District

The undersigned organisations hereby convey the grounds for our objections to the setting up of a 170,000 tonnes per year VCM to PVC factory by M/s Chemplast Sanmar Ltd in Semmankuppam village, of SIPCOT Phase II of Cuddalore Taluk. The elaboration and technical evidence deriving from a review of Chemplast Sanmar's Environmental Impact Statements for the PVC plant and the Marine Terminal are attached below. **(See Annex 1: "Critique of the Environmental Impact Statements for PVC plant and Marine Terminal Proposed by Chemplast Sanmar Ltd in Semmankuppam Panchayat, SIPCOT Phase II, Cuddalore Taluk")**

The SIPCOT Industrial estate

1. It is an established fact that the industries in the SIPCOT industrial estates in Cuddalore have already polluted the air, groundwater, rivers and land in and around the estates. Numerous residents in Kudikadu, Sonnanchavadi and nearby areas suffer serious health effects because of exposure to industrial poisons. These facts are affirmed in various reports by the National Environmental Engineering Research Institute and the State Human Rights Commission. **(See Annex 2: SHRC report)** Any steps to increase the pollution load by allowing new industries to set up or existing industries to expand would constitute a willful act that places private profits over community health and environmental well-being.
2. Mining of groundwater for use by the industries in the estates has already depleted critical coastal aquifers and has caused the salinisation of valuable groundwater. This privatisation of common groundwater resources has robbed villagers near the industrial estate of their most fundamental need – safe freshwater. This is attested by the fact that the TWAD Board has instructed local cooperative banks to refuse loans for installation of submersible pumps in the area in light of the depleting water table. **(See Point 3 of Annex 3: Letter from President, Semmankuppam Panchayat dt/15/3/2002)**
3. Discharge of effluents by industry into the River Uppanar has laid waste entire stretches of the river, and afflicted long-term pollution damage to the river bed sediments, and estuarine flora and fauna. The damage to the river has had a pronounced and negative effect on the quality of lives of estuarine fisherfolk in several villages around Uppanar.
4. Local villagers, their elected representatives and even the Panchayat Union have officially called for an end to the setting up or expansion of polluting or water

intensive industries in the area. The EIS does not even allude to existing pollution problems, the hardships faced by the local communities and the struggles by the communities against the industries and their pollution. (See **Annex 4 – 1997 Resolution from Semmankuppam Panchayat**)

The Factory

5. Poly Vinyl Chloride (PVC) is also known as the “Poison Plastic” because of the toxic emissions and related health effects associated with the manufacture, use, recycling and disposal of this material. PVC production and combustion (during disposal or in accidental or landfill fires) are significant contributors to the global load of dioxins. The United Nations-led Stockholm Convention on Persistent Organic Pollutants (POPs) identifies PVC combustion as a significant source of dioxins, and separately requires signatories (India included) to reduce, with the aim of elimination, all sources of POPs, including dioxins.
6. The factory proposes to introduce 170,000 tonnes of PVC into the environment every year. The EIS lacks a “life cycle assessment of PVC impacts to the environment.”
7. Vinyl Chloride Monomer (VCM), the primary raw material proposed to be used in the factory, is a chemical which causes cancer in both humans and animals, according to the United States Environmental Protection Agency (USEPA) and the International Agency for Research on Cancer (IARC). Scientific studies among VCM factory workers confirm a link between occupational exposure to VCM and the development of angiosarcoma of the liver. (See **Annex 5 – DHSS and IARC Classification of Vinyl Chloride**)
8. The EIS clearly shows that emissions of VCM from the factory far exceed internationally permissible levels. (See “Evaluation of EIS” by Mark Chernaik, Staff Scientist, Environmental Law Alliance Worldwide, U.S. March 2002” attached.)
9. Chemplast is currently a manufacturer of PVC elsewhere in the state and therefore knowledgeable in the plant’s operations, associated pollution and its sources from within the factory. Despite this, the company fails to list significant sources of VCM, other than the dryer exhaust and fugitive emissions from the reactor. The company’s EIS vastly underreports the sources and quantum of fugitive emissions of carcinogenic VCM.
10. The EIA lacks a health impact assessment of predicted ground-level concentrations of VCM. VCM is a carcinogen for which no safe level of exposure can be anticipated. The EIS does not predict the increased incidence of cancer that would be caused among the population living in and around the factory.
11. A fatal flaw in the EIS is the fact that the Assessment for the PVC plant lacks an assessment of potential dioxin formations. VCM incineration is likely to release “**substantial** amounts of PCBs and dioxins because of the strong tendency of VCM combustion products to form these potently toxic substances.” (See **Annex 1**)

The Factory and the CRZ

12. The proposed site for the PVC plant lies alongside the Uppanar River falling clearly within the Coastal Regulation Zone. Clause 2 of the CRZ Notification namely S.O.

114 (E) dt/19.2.91 issued by the Ministry of Environment & Forests prohibits the setting up of any industry not requiring foreshore or water-front facilities in the CRZ.

We wish to reiterate to the Public Hearing Committee that the local communities, their elected representatives and the constitutionally mandated local government bodies have called for an end to the setting up and expansion of polluting and water-intensive units. Under the circumstances, allowing for such proposals to advance to the stage of a public hearing is contrary to common sense, wasteful of public money and the time of community members, most of whom survive on daily wages.

Sincerely,

M. Nizamudeen
General Secretary, FEDCOT - Cuddalore
No. 9, Easwaran Koil Street
Manjakuppam, Cuddalore

Nityanand Jayaraman
CorpWatch India
218, 6th Cross, 6th Main
Rajarajeshwari Nagar, Bangalore 560 098

Navroz Mody
Toxics Campaigner
Greenpeace India
J15 Saket, New Delhi

Arul Rathinam
Pasumai Thayagam
Chennai

Rajesh Rangarajan
Toxics Link
No. 8, Fourth Street
Venkateswara Nagar
Adyar, Chennai 20

Copy to: Chairperson,
Tamilnadu Pollution Control Board
Anna Salai, Guindy
Chennai

ANNEX 1

Critique of the Environmental Impact Statements for PVC plant and Marine Terminal Proposed by Chemplast Sanmar Ltd in Semmankuppam Panchayat, SIPCOT Phase II, Cuddalore Taluk

We present herewith grounds for our objections to the setting up of a 170,000 tons per annum PVC plant at the SIPCOT Industrial Estate, in Cuddalore. For the purpose of evaluating the integrity of the Environmental Impact Assessment and Impact Statements prepared by Chemplast Sanmar, we had sought and obtained comments from Dr. Mark Chernaik, Staff Scientist, Environmental Lawyers Association Worldwide, Oregon, U.S.A.

1. At the outset, the proposal to establish a PVC plant at a site adjoining the Uppanar River and falling clearly within the Coastal Regulation Zone cannot be countenanced because the establishment of any industry not requiring foreshore or water-front facilities is prohibited under Clause 2 (i) of the CRZ Notification namely S.O 114 (E) dt/19.2.91 issued by the Ministry of Environment & Forests. The proposal has to be rejected on this score alone.

2. It must be emphasized that Vinyl Chloride Monomer (VCM) is one of the most potent carcinogens viz., cancer causing substances, known to human health experts. The International Agency for Research on Cancer (IARC) lists Vinyl Chloride in Group 1 of its carcinogen classification scheme. The US EPA lists vinyl chloride in Group A of its carcinogen classification scheme. The IARC and the US Department of Health and Human Services, (DHHS) have designated vinyl chloride a chemical for which there is sufficient evidence of carcinogenicity in both humans and experimental animals. (See below Appendix 1, IARC Supplement 7, (1987) (p. 373), and Append. 2, DHHS CAS No. 75-01-4).

Moreover, the effects of VCM in the workplace are now better understood. Epidemiological studies of occupationally exposed workers and nearby residents have linked vinyl chloride exposure to the development of a rare cancer, liver angiosarcoma, and have suggested a relationship between exposure and cancers of the lung and brain. (See Annex 6: Health impacts).

3. Willful suppression of relevant facts

As will be noted below, the company's lack of appreciation of the potential health and environmental impacts of the project is reflected in several serious lacunae, falsehoods, suppression of material information and misrepresentations especially in its planning for emission control, monitoring, health impact assessments, disaster management plan etc.

The Company is currently a manufacturer of PVC elsewhere in the State – in Mettur. It has as consultants parties who operate PVC plants where they have to be conversant with standards and procedures required to be maintained in the US and EU. The Company seriously misrepresents sources, quantum and quality of emissions. Failure on the part of the company to reveal the sources and potential *inter alia* for formation of dioxin, PCBs, furans and hexachlorobenzene (HCB) is a fatal omission of the EIS. Dioxins, furans, PCBs and HCB are all chemicals listed for elimination under the Stockholm POPs Convention. India has been an active participant in the drafting of the Convention. The failure to disclose the possible releases of these POPs has led to serious shortcomings in the design and projection of safety measures, control and monitoring in the EIS.

This omission could not have been inadvertent as the Company operates an existing PVC facility in Mettur and could not be unaware of its release of these dangerous chemicals including chlorobutadienes and chlorobenzenes, into the environment.

We demand that the company place on record its emissions from its current operations and call on the Impact Assessment Agency to inspect the facility with a view to assessing the quantum and sources of POPs emissions, monitor EDC/VCM releases, and assess the impact on the health of workers and the surrounding environment and community.

Furthermore, these omissions by the company seriously undermine the credibility of the project as it represents an externalization of costs which are passed on to society through health impacts on people, and onto an environment extending far beyond the boundaries of the factory.

1 Carrying Capacity at SIPCOT

The EIS makes it clear that there are no figures available for emissions from the units currently operating in the Industrial estate. Therefore, **the EIS is woefully inadequate in predicting the incremental, cumulative and synergetic effects of the proposed emissions into an already overburdened environment.**

The EIS fails to record the struggles of local communities against existing industries and their call for a moratorium on polluting/water intensive industries. The EIS also does not recognise the legislative efforts of the neighbouring Union Territory of Pondicherry (less than 20 kilometres from the proposed site) which has imposed a ban on the setting up of chemical and/water intensive industry within 6 kilometres of the coast.

The EIS also fails to take into account that in response to these concerns and demands, the State Human Rights Commission under its Chairman, Hon. Justice Nainar Sundaram, a retired Chief Justice of the Madras High Court and Andhra Pradesh High Court, inspected the area, conducted hearings and submitted a report in 1998, and whose findings and recommendations on the already overburdened environment of the Industrial estate are unambiguous.

Through his observations, the State Human Rights Commission notes:

“There should be a survey of the entire SIPCOT complex with the objective of finding out the effectiveness of the effluent treatment plants or system installed in every industrial concern.” The Commission goes on to note that “ I have a word of caution for establishing any more Chemical Industries in the Cuddalore region proper. I am convinced that public health cannot take more burden than that which has ensued by the existing Chemical Industries.”

(Appendix 4, Report of the TN HRC)

The National Environmental Engineering Research Institute (NEERI) in a study undertaken in 1999 confirmed the extent of **groundwater contamination** and noted that releases into the Uppanar river and sewer lines was responsible for the contamination of the ground water. There was no assessment made of emissions to the air from existing units.

Elected local bodies, which are critical units of self governance under the 73rd and 74th Constitutional Amendments, have passed resolutions demanding that the State Government and

the State Pollution Control Board should not permit any further chemical industries in or in the neighbourhood of the SIPCOT complex.

We therefore submit that further burdening the local population and environment with a chemical unit as proposed would be a serious violation of their rights to clean water, air and indeed life.

2 The EIA: Emissions and monitoring

The EIA for the proposed plant (p 6-31) Table 6.8) shows that the plant would emit 0.283 grams of VCM per second from a major process source, dryer exhaust. This is equivalent to a VCM emission rate of more than 1000 grams, (one kg) of VCM per hour. This rate of emissions would greatly exceed that permitted by international standards.

For example, under standards promulgated by the State of California South Coast Air Quality Control District: “The owner or operator of the air pollution control equipment specified in this rule shall at all times operate such equipment at an efficiency sufficient to limit the total amount of vinyl chloride in the discharge of all such control equipment at less than 50 grams per hour for polyvinyl chloride plants and less than 50 grams per hour for both ethylene dichloride and vinyl chloride plants. Such 50 grams per hour limit shall apply to the discharge of control equipment serving all polyvinyl chloride plants on a premise.” South Coast Air Quality Control District, Regulation XI, Rule 1163 - Control of Vinyl Chloride Emissions (Adopted June 7, 1985).
<http://www.aqmd.gov/rules/html/r1163.html>

VCM emission rates from dryer exhaust at the proposed PVC plant would exceed this standard by a factor of 20!

2.1 In the EIA for the PVC Plant, Modeling of Ground-Level Concentrations of VCM omits major sources of VCM Emissions

Chemplast used a computer model to predict ground-level concentrations of VCM that would result from operation of its plant (EIA for the PVC Plant, Section 1.9.4). This model incorrectly assumed only two sources of VCM emissions: 1) Vent 1 Dryer Exhaust; and 2) Reactor Fugitive Emissions. See: EIA for PVC Plant, page 6-31.

This fails to include numerous other major sources of VCM emissions. Therefore, **predicted ground-level concentrations of VCM will be far more than that stated in the EIA.** What follows is a discussion of other major sources of VCM emissions that Chemplast omitted.

2.1.a Other fugitive sources

Chemplast assumes that all of its fugitive emissions from its PVC plant will stem from the PVC reactor. See EIA for PVC plant, page 6-31.

To assess the validity of this assumption, Dr. Mark Chernaik of ELAW-US solicited input from Mr. Warren Johnson of the U.S. Environmental Protection Agency.

Mr. Warren Johnson
U.S. Environmental Protection Agency

Organic Chemicals Group
Emission Standards Division
Research Triangle Park, NC 27711
Tel: 1-919-541-5124
E-mail: Johnson.Warren@epa.gov

Mr. Johnson is the U.S. EPA's foremost expert on PVC plant emissions and headed U.S. EPA efforts to draft new hazardous air pollutant emission standards for PVC plants. According to Mr. Johnson, it is incorrect to assume that the fugitive emissions from the PVC reactor will be the only source of VCM emissions from a PVC plant. Operation of a PVC plant would **also** generate fugitive emissions of VCM from **pumps, compressors, pressure relief devices, connector and valves**.

For example, although fugitive emissions of VCM from PVC plants in the U.S. are strictly regulated, a U.S. PVC plant (Oxy Vinyls PVC plant in Louisville, Kentucky) reported more than 3018 kilograms of fugitive emissions of VCM in 1992, and 2740 kilograms of fugitive emissions of VCM in 1999. This plant produced 153,000 tons of PVC in 1992 and 260,000 tons of PVC in 1999. Therefore, the rate of fugitive emissions of VCM improved from 0.02 kg per ton in 1992 to 0.01 kg per ton in 1999. Chemplast will produce PVC at a rate of 21.25 tons per hour. See EIA for PVC plant, page 1-1.

Generously, assuming that fugitive emissions of VCM from Chemplast's proposed PVC plant will be at the midpoint of these two values (0.015 kg per ton), fugitive emissions of VCM from Chemplast's proposed PVC plant will be more than 300 grams per hour. **Even conservative estimates indicate the fugitive emissions would exceed the Californian standard by six times.** The absence of a Leak Detection and Repair Program means that fugitive emissions will be far higher than 300 grams per hour.

2.2. Evaporative emissions of VCM from the discharge of treated effluent

As Chemplast points out: "VCM entering aquatic systems is rapidly lost to the atmosphere through volatilization. The volatilization half-time of VCM from surface waters ranges from several minutes to a few hours ..." See EIA for PVC plant, page 6-20. Therefore, Chemplast must take into account evaporative emissions of VCM from the discharge of treated effluent.

Chemplast predicts that it will discharge 1,980,000 liters per day of treated effluent that will contain up to 1.0 milligrams of VCM per liter. See EIA for PVC plant, page 4-23 and 6-70.

Therefore, discharge of treated effluent will result in up to 82.5 grams of additional VCM emissions per hour. The company has failed to disclose this.

3. The EIA for the PVC Plant Lacks a Health Impact Assessment of Predicted Ground-Level Concentrations of VCM

Correctly predicting ground-level concentrations of VCM is only half of the analysis. An EIA for a proposed PVC plant must then assess how these predicted ground-level concentrations will impact human health. The proposed PVC factory imposes a significant and heightened risk of various forms of cancer to the community living nearby. Chemplast has neither acknowledged this nor has it provided an assessment of the cancer risk that the community will have to face.

It should be noted that lifetime exposure to as little as 1 ppb of VCM would cause an additional case of cancer for each 5,000 exposed individuals!! More than 25,000 persons live within 3,000 meters of the plant. See EIA for PVC plant, page 5-9.

It is not sufficient to merely observe that predicted ground-level concentrations of VCM will be below applicable ambient air quality standards. See EIA for PVC plant, page 6-57.

VCM is a carcinogen **“having no threshold exposure level below which no significant adverse health impacts are anticipated.”** California Air Resources Board Staff Report (March 1991) **“Proposed Identification of Vinyl Chloride as a Toxic Air Contaminant,”** <http://www.arb.ca.gov/toxics/summary/vinyl.htm> Therefore, additional cases of cancer would still occur with VCM ground-level concentrations that are below applicable ambient air quality standards.

Toxic Exposure Among Workers and surrounding Community:

Vinyl chloride (VCM) is associated with cancers at several sites in both humans and animals, but is best known for causing causing angiosarcoma of the liver in PVC industry workers. **(See Annex 6: Compilation of health impacts on vinyl workers)**

In a recent study of a PVC plant in the Slovak Republic, angiosarcoma of the liver has been diagnosed in workers having between nine and twenty-five years of exposure. Death occurred between two weeks and thirteen months after diagnosis, either through liver failure or internal bleeding from ruptured tumours. (Batora, J., Schmidt, Kubik, J. & Jakubis, P. (1998). **“Angiosarcoma of the liver in workers professionally exposed to vinyl chloride (in Slovakia).”** Central European Journal of Occupational and Environmental Medicine 4(3): 252-264).

Other toxic effects of vinyl chloride include narcosis, nervous system damage, weight loss, increased cardiovascular disease, and impacts on the immune systems, liver, spleen, thyroid, eyes and skin. Raynaud's phenomenon, in which blood circulation and bones in the fingers are damaged, is also particularly associated with vinyl chloride (see eg Stringer, R. & Johnston, P. (2001) Chlorine and the Environment, Kluwer Academic Publishers. Workplace exposure to VCM is mostly via inhalation. Consequently, the concentrations in the air is regulated.

The US Occupational Safety and Health Organisation (OSHA) has set a permissible exposure limit (PEL) of 1 part per million (ppm) as a time-weighted average, with a maximum of 5ppm for shorter exposures of 15 minutes (US DHHS 2000). This 8-hour limit is far lower than the 3ppm proposed by Chemplast. Moreover, the OSHA limits may not even be enough to protect workers' health. The US Agency for Toxic Substances and Disease Registry (ATSDR) has set minimal risk levels (MRLs), designed to reflect the concentrations which would not have any appreciable health risk.

For developmental effects, this was set at 0.5ppm; for effects on the liver, it was set at 0.03ppm (ATSDR 2000).

The EIS remains silent on these studies.

4. The EIA for the PVC Plant lacks an Assessment of Potential Dioxin Emissions

Although incineration of VCM serves to control atmospheric emissions of this potent toxic, it would also serve to form and release into the atmosphere other chemical substances that are

equally toxic yet far more persistent: polychlorinated biphenyls (PCBs) and polychlorinated benzo-p-dioxins and polychlorinated benzofurans (dioxins).

To assess the potential of a VCM incinerator to form and release PCBs and dioxins, Dr. Mark Chernaik of E-LAW US sought input from Dr. Brian Higgins, a leading expert on the formation of chlorinated toxins that result from incineration of chlorinated organic compounds such as VCM.

Dr. Brian S. Higgins, Assistant Professor Mechanical Engineering Department
California Polytechnic State University
San Luis Obispo, CA 93407
Tel: 1-805-756-1387
E-mail: bshiggin@calpoly.edu
Web: <http://www.calpoly.edu/~bshiggin>

According to Dr. Higgins, incineration of VCM would result in the formation of PCBs and dioxins in the post-combustion zone of the incinerator. He reports that it would be possible to estimate the amount of PCBs and dioxin formed in the combustion zone using chemical kinetic modeling software that calculates PCBs and dioxin formation based on the design features of the VCM incinerator.

Dr. Chernaik of ELAW US says “It is my opinion that the VCM incinerator would release **substantial** amounts of PCBs and dioxins because of the strong tendency of VCM combustion products to form these potentially toxic substances.”

In a recent study, scientists with the US Environmental Protection Agency evaluated the correlation between levels of numerous low-molecular-weight chemical compounds and the levels of PCBs and dioxins that form post-combustion of a variety of waste fuels. (Lemieux, P.M., et al. (2000) “Prediction of Dioxin/Furan Incinerator Emissions Using Low-Molecular-Weight Volatile Products of Incomplete Combustion,” Journal of the Air & Waste Management Association, Vol. 50, pp. 2129-2137.)

This study found that levels of Vinyl Chloride in exhaust gas were the **strongest surrogate indicators** of the levels of dioxins in the exhaust gas. According to the authors of this paper: “It is not surprising that vinyl chloride would yield some of the best regression fits, considering the overall importance of the vinyl chloride radical in chlorocarbon combustion reactions. Vinyl Chloride was present fairly consistently in all of the samples. Studies conducted on detailed chemical structure of chlorinated hydrocarbon flames indicated that vinyl chloride is the predominant intermediate species produced during the early stage of the combustion, which leads to the formation of chlorinated aromatics during the latter stage of combustion.” (Lemieux et al., pp. 2134-2135.)

Even if the VCM incinerator operates at a destruction efficiency beyond the expectations of the project proponents, ample amounts of vinyl chloride and vinyl chloride radical will exist in the post-combustion zone to give rise to formation of substantial levels of PCBs and dioxins.

The EIS study does not include any proposal to monitor dioxin emissions from various potential sources, most importantly the incinerator. India lacks the facilities to analyse dioxins and furans in various media. Also, the cost of analyses is more than \$600 per sample. The number of samples and the frequency with which it would need to be taken to meaningfully address environmental and health issues associated with dioxin emissions would make such a monitoring

exercise prohibitively expensive. However, if the monitoring is not done meaningfully, no measures can be taken to prevent the pollution of the environment and related health impacts.

An investigation of emissions from Chemplast's existing plant would give a good indication of the formation of PCBs, hexachlorobenzenes, furans and dioxins in the conversion of VCM to PVC.

The Company proposes to dispose of PVC waste ("off-spec and non-prime material") to plastic units such as those in the SIPCOT industrial area. However there is no evaluation the secondary impact on the operating health and environment conditions of units that will use this off-spec PVC, adding to the total generation of dioxins and other toxics. The present conditions of operation of these units must be evaluated to understand the extent of the secondary impact generated from PVC waste generated at the plant.

5. The EIA Lacks a "Life-Cycle Assessment" of PVC Impacts to the Environment

The EIA for the PVC plant limits its focus geographically (impacts on the environment in the vicinity of the proposed plant) and temporally (impacts during construction and operation phases). This ignores the totality of environmental impacts resulting from the manufacture and use of PVC by society. Most notably, the combustion of PVC (for example, accidental fires in building or vehicles containing PVC) is one of the most significant sources of dioxin emissions. Lemieux, P.M. et al (2000) "Emissions of Polychlorinated Dibenzo-p-dioxins and polychlorinated Dibenzofurans from the Open Burning of Household Waste in Barrels," ENVIRONMENTAL SCIENCE AND TECHNOLOGY, http://pubs.acs.org/hotartcl/est/2000/research/es990465t_rev.html.

Recognizing these impacts, the European Union has called for a detailed life cycle analysis of PVC manufacture and use in Europe. <http://europa.eu.int/comm/environment/pvc/>

It is common knowledge that the production of Ethylene Di Chloride (EDC) and VCM generate significant quantities of dioxins among other deadly pollutants. Greenpeace analysis of wastes from a PVC plant in the UK belonging to EVC (the parent company of Chemplast's technology provider INOVYL) revealed dioxins at 16.53 parts per billion. [Source: Stringer, R. and Temuge, T. (1998) "PVC: The Dark Side of Petkim." Greenpeace Mediterranean, 31 pp.]

The production of the company's raw material, VCM, is itself pollution intensive, contributing significantly to the global problem of Persistent Organic Pollutants. According to Stringer and Johnston (2001), 2.9 tonnes of "light ends" and 2.3 tonnes of heavy ends are produced for every 1000 tonnes (1 kilotonne). This figure was calculated based on the unit ratios of by-products generated in an integrated VCM plant. [Source: Rossberg M. et al (1986) Chlorinated hydrocarbons In: W. Gerhartz (Ed.) Ullmann's Encyclopedia of Industrial Chemistry 5th Edn. Publ. VCH Publishers, NY. Vol. A6 pp. 233 – 398.]

Both, the Stockholm Convention on POPs and **the High Powered Committee (HPC) of the Supreme Court on Hazardous Wastes**, have recommended that projects that generate POP emissions or manufacture products that release POPs in their lifecycle ought to be discouraged.

The HPC was empowered by the Supreme Court in the writ petition No. 657/95 (Research Foundation for Science, Technology and Natural Resource Policy v. Union of India and ors).

The HPC recommends that:

“(v) It is imperative that Government declare and take steps to ensure that expansion of existing hazardous waste industries and new industries of this nature follow the basic parameters of Clean Production. . . They must not be permitted to employ technologies or processes that intentionally or unintentionally generate endocrine disrupting chemicals or persistent organic pollutants. Nor should they be permitted to generate products whose final disposal would poison the environment with such chemicals or pollutants; in such cases, they must have a cradle to grave responsibility. . .”

[Source: “Report of the High Powered Committee on Management of Hazardous Wastes – Volume I” p. 245, 2001]

The project, in itself, and through the 170,000 tonnes/year of PVC manufactured represents an additional load of Persistent Organic Pollutants into the global environment. The Stockholm Convention’s Article 5 (c) requires states to “Promote the development and, where it deems appropriate, require the use of substitute or modified materials, products and processes to prevent the formation and release of the chemicals listed in Annex C. . .”

Part V of Annex C of the Stockholm Convention on “General Guidance on Best Available Techniques and Best Environmental Practices” reads: “. . . Priority should be given to the consideration of approaches to prevent the formation and release of the chemicals listed in Part I. Useful measures could include. . . (d) Replacement of feed materials which are persistent organic pollutants or where there is a direct link between the materials and releases of persistent organic pollutants from the source.”

The proposed PVC plant will be the source of 170,000 tons per year of additional PVC to the environment of India.

6. The Environmental Action Plan for the PVC Plant Lacks a Leak Detection and Repair (LDAR) Program

Page 6-23 of the EIA contains a list of design standards that Chemplast would use to minimize fugitive emissions of VCM. Conspicuously absent from this list and the Environmental Action Plan for the PVC plant is implementation of a Leak Detection and Repair (LDAR) Program.

The U.S. EPA recognizes that, while proper design of equipment is essential for the control of vinyl chloride, even properly designed equipment will eventually leak. Therefore, the U.S. EPA requires operators of PVC plants to employ a rigorous program to detect and repair leaks of VCM, including weekly or monthly visual and physical inspections of valves and other equipment that may leak.

40 CFR Part 61, Subpart V – National Emission Standard for Equipment Leaks (Fugitive Sources).

<http://www.tnrcc.state.tx.us/air/opd/61/V/vhp.htm>

7. The Environmental Action Plan for the PVC Plant Lacks a Plan for Monitoring Actual VCM Emissions and Actual VCM Ground-Level Concentrations

While the Environmental Action Plan provides for the monitoring of emissions and ground-level concentrations of conventional pollutants (e.g., particulate matter, sulfur dioxide, nitrogen dioxide, etc.), inexplicably this plan does not require monitoring of emissions and ground-level concentrations of VCM, the single most hazardous air pollutant that the proposed PVC plant will emit. See EIA for PVC plant, page 7-10.

This is contrary to international monitoring requirements for PVC plants. For example, the U.S. Environmental Protection Agency requires PVC plants to conduct continuous emission monitoring of VCM emissions.

40 CFR Part 61, Subpart F – National Emission Standard for Vinyl Chloride, Section 61.68.
<http://www.tnrcc.state.tx.us/air/opd/61/F/68.pdf>

Other jurisdictions require continuous monitoring of ground-level concentrations of VCM in the vicinity of PVC plants. For example, under standards promulgated by the State of California South Coast Air Quality Control District, operators of PVC plants must:

“1) Provide and operate up to four air monitoring stations to continuously measure and record ambient concentrations of vinyl chloride in the vicinity of such plants. The exact number and location of such monitoring stations shall be approved by the Executive Officer; and 2) Provide and operate up to four additional air monitoring stations to continuously measure and record ambient concentrations of vinyl chloride in populated areas near such plants. The exact number and location of such monitoring stations shall be approved by the Executive Officer.”

South Coast Air Quality Control District, Regulation XI, Rule 1163 - Control of Vinyl Chloride Emissions (Adopted June 7, 1985).

<http://www.aqmd.gov/rules/html/r1163.html>

8. The Environmental Action Plan for the PVC Plant Lacks a Contingency Plan for Responding to a Major Release of VCM

The purpose of an EIA is to provide essential information to government officials and communities about proposed projects, enabling them to decide whether the potential benefits of a proposed project outweigh its potential risks; and whether a proposed project could be implemented in a manner that minimizes its impact to the environment.

To fulfill this important purpose, an EIA must include a contingency plan that describes the measures the project proponent and relevant authorities would take in the event of an emergency situation.

In recognition of this principle, the Government of India’s Ministry of Environment and Forests (MoEF) requires environmental management plans to include contingency plans for emergency situations.

According to the MoEF:

“Preparation of environmental management plan is required for formulation, implementation and monitoring of environmental protection measures during and after commissioning of projects. The plans should indicate the details as to how various measures have been or are proposed to be taken including cost components as may be required. ... 12. Disaster Planning. Proper disaster planning should be done to meet any emergency situation arising due to fire, explosion, sudden leakage of gas etc. Fire fighting equipment and other safety appliances should be kept ready for use during disaster/emergency situation including natural calamities like earthquake/flood.”

<http://envfor.nic.in/citizen/specinfo/emp.html>

A Disaster Management Plan is also a mandatory requirement under the Tamilnadu Factories Rules.

The EIA for the proposed PVC plant alludes to, but does not contain a disaster management plan.

See EIA for PVC plant, page 6-6.

Such a faulty and defective EIS has to be rejected as it cannot form the basis for any rational decision on establishment of the PVC plant.

9. The EIA for the Marine Terminal Facility Lacks an Oil Spill Assessment

Accidental petroleum spills from ship traffic causes significant impacts to the environment. The risk of a petroleum spill is not limited to oil tankers or other vessels that specialize in the transportation of oil or fuel. The frequency of accidental releases of oil from cargo vessels is as great as from oil tankers. Talley, W.K. (2000) "Vessel Accident Oil Spillage: Post OPA-90," <http://www.oduport.org/Talley2.htm>.

Every marine cargo vessel carries large amounts of fuel oil. Typically, marine cargo vessels use bunker fuel, a type of fuel oil that is especially dense and viscous and that can cause especially severe and long-lasting environmental impacts. Chemplast proposes to construct a marine terminal facility to import 170,000 tons of VCM per year. As a consequence, numerous large ships will enter and leave the Cuddalore coast carrying many thousands of liters of transportation fuel and metric tons of chemicals. An accident involving any of these ships has the potential to release significant amounts of petroleum into the Cuddalore coast, spoiling productive fishing grounds.

The EIA for the Marine Terminal Facility contains no analysis of what would happen to the marine environment of Cuddalore if there were an accidental petroleum spill resulting from ship traffic to and from the proposed port facility. This is a significant omission considering that fishing is a common form of employment in the area.

The World Bank requires that proposed port facility projects evaluate the potential environmental impacts of such accidental spills. For example, the World Bank is assisting the Government of Mauritius to conduct an EIA for a port development extension project located in the port of Port-Louis. The terms of reference for the EIA require consultants to evaluate the environmental impacts of accidental petroleum and chemical spills from ship traffic.

Environmental Impact Assessment in Port Louis (Mauritius), http://www.worldbank.org/html/fpd/transport/ports/_tor/env-bas2.pdf

10. The Environmental Action Plan for the Marine Terminal Facility Fails to Require VCM Vapor Recovery During Unloading

The proposed PVC plant will receive all of its VCM through the unloading of VCM from vessels to a pipeline. According to Warren Johnson of the U.S. EPA (see above), emissions of VCM during the unloading of a single vessel can vastly exceed VCM emissions from a PVC plant that processes the VCM if the vessel is not equipped with an adequate vapor recovery system.

In the U.S., vapor recovery systems are mandatory for vessels unloading bulk quantities of hazardous volatile liquids such as VCM.

40 CFR Part 63, Subpart Y – National Emission Standards for Marine Tank Vessel Loading Operations. <http://www.tnrcc.state.tx.us/air/opd/63/Y/yhp.htm>

Conspicuously absent from the Environmental Action Plan for the Marine Terminal Facility is a requirement that all vessels unloading VCM employ an adequate vapor recovery system.

Annex 1

Critique of the Environmental Impact Statements for PVC plant and Marine Terminal Proposed by Chemplast Sanmar Ltd in Semmanakuppam Panchayat, SIPCOT Phase II, Cuddalore Taluk

Annex 2
SHRC report

Annex 3
Letter from President, Semmankuppam Panchayat dt/15/3/2002

Annex 4
1997 Resolution from Semmankuppam Panchayat)

Annex 5
DHSS and IARC Classification of Vinyl Chloride

Annex 6
Compilation of health impacts on vinyl workers