

Contamination of Community Water Sources in Bhopal, India

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Executive Summary

For more than a decade, a chain of evidence has accumulated that demonstrates that thousands of people living around the now-abandoned Union Carbide factory site in Bhopal, India, are suffering direct exposure to toxic substances from their water supplies.

A number of the contaminants, described by a range of studies, are environmentally persistent, remaining in harmful concentrations for decades and readily moving between environmental media. Properties of the observed contaminants include not just carcinogenicity but also neurotoxicity and potential damage to organs, with most being especially harmful to children and foetuses. Some contamination studies indicate human exposure has already occurred at concentrations that could result in adverse and irreversible health effects.

Social workers operating among the affected communities report that consumption of contaminated water has resulted in persistent problems such as abdominal pain, headache, giddiness and joint pain. Community health workers report abnormally high rates of anemia among the exposed population. Local newspapers report incidences of cancer.

Though the evidence points to a long-standing and still developing humanitarian crisis, no agency, state or otherwise, has yet taken sufficient responsibility for ending the ongoing cycle of community exposure to carcinogenic and mutagenic toxins.

In order to obviate the long-standing reliance upon contaminated sources, it is critical that all contamination-affected communities living around the former Union Carbide factory site are immediately given continuous supplies of fresh water. This self-evident necessity has been recognized by the empowered Supreme Court Hazardous Wastes Monitoring Committee. However, a May 7th, 2004 order of the Supreme Court of India (**annexure 1**), requiring that the government of Madhya Pradesh (M.P.) make adequate clean water supply available to communities, has not, at the time of writing, been implemented.

In the medium and long-term, it is crucial that contamination is stopped at source and local aquifers thoroughly de-contaminated. Thousands of tones of chemical waste remain in and around the factory site, both above and under the ground. The problem of aquifer contamination grows steadily worse the longer waste is allowed to lie as the pollution plume spreads farther, affecting as-yet-unaffected communities.

The nature and extent of the contamination necessitates a highly thorough programme of remediation of the factory site and its environs, based upon complex scientific assessments and conducted to the best international standards. Evidently, the potential cost of any full and proper remediation of the factory site is a highly important factor in

how adequately the work is addressed. Independent environmental scientists estimate the cost of an acceptable remediation programme to be upwards of tens of millions of US dollars.

No agency has yet committed to spending this level of money. In a lawsuit brought by survivor plaintiffs in the Southern District court of New York (SDNY), Union Carbide is contesting its liability for the contamination. Despite its adherence to the internationally accepted 'polluter pays' principle, India has made no active attempt to fix liability for the cost of clean-up upon Union Carbide, the polluter.

Recently, a Public Interest Litigation (PIL) brought in the M.P. High Court led to the setting up of a 'Task Force' to plan and supervise a programme of remediation at the factory, comprised of Central and M.P. State Government departments and Indian scientific agencies. A small amount of pre-remediation work was begun in June 2005. Local groups monitoring this operation attest that it is patently illegal, violative of India's Hazardous Waste (Management & Handling) Rules, 1989, as well as international standards. On the first day of the operation a woman with a broom lacking protective clothing and accompanied by a 7-year old child collected pesticide floor sweepings from a dilapidated storage shed. Subsequent work has exposed workers and gas-affected populations already hypersensitive to chemicals to toxic pesticide dust. (**Annexure 2**)

The following briefing, which draws upon a host of source material from Indian government agencies, NGO's and court materials, examines some of the key issues affecting the present and future health of people living around the former Union Carbide factory site. The briefing:

- outlines a history of the contamination of water supplies around the former Union Carbide factory site;
- describes the wholly inadequate efforts to end the ongoing community exposure to hazardous substances via local water sources;
- discusses attempts to make the Indian Central Government, M.P. State government and Union Carbide and its new owner, The Dow Chemical Company Ltd, take responsibility for addressing the serious health and environmental consequences of the contamination.

The briefing begins with a short history of Union Carbide's involvement in the Bhopal factory site and a description of the dumping of waste in and around the factory that led to the current contamination problems. The first section ends with a brief description of the populous communities established in contamination-affected areas surrounding the factory.

Section 2 outlines both public and confidential studies concerning contamination at the factory site, which together serve to demonstrate that telling evidence of water pollution and comprehension of its likely deleterious effects upon local people's health is long standing:

- A research laboratory of the M.P. government conducted ground water tests in 1991 and 1996, finding high levels of organic chemical contaminants in wells around the Carbide factory.
- A 1999 report by Greenpeace International detailed extensive contamination of water supplies. The carcinogen carbon tetrachloride was found at levels nearly six hundred times US EPA limits in one community tube well, amongst other high levels of mutagenic and carcinogenic toxins including heavy metals.
- A 2002 report by the Delhi-based scientific organisation Shristi found traces of mercury in the breast milk of nursing mothers resident in affected communities.
- Further ground water tests by the M.P. government in 2003 and 2004 found high levels of pesticides Lindane, Endosulfan and others.

The section ends with a description of some of the observed health effects upon people living around the factory site.

Section 3 details the wholly inadequate progress made by the M.P. State Government in meeting its obligations to ensure the necessary supply of clean water to contamination-affected areas in the nine years since the Bhopal Municipal Corporation declared 100 tube wells unfit for drinking. More recent events described are the so far unsuccessful efforts of the Supreme Court Hazardous Wastes Monitoring Committee to force the M.P. authorities to meet basic clean water needs of all of the impacted communities. Of particular concern is that on May 17th, 2005 a protest staged by at the offices of the Director, Bhopal Gas Tragedy Relief & Rehabilitation, demanding compliance with the Supreme Court order, was subject to use of police force resulting in the hospitalization of four men and one woman protestor. Police also filed numerous and trumped up charges against seven participants.

Section 4 examines the question of liability for remediation of the factory site through opinions expressed by Indian agencies, US Congresspersons and Amnesty International. Legal initiatives before the M.P. High Court and the SDNY are discussed.

Section 5 sets out site remediation efforts since the factory site was abandoned by EIIL in 1998, detailing recent moves by an appointed 'Task Force' to begin the process of site remediation that have violated Indian law and generated serious concerns for the health of local residents and workers.

The briefing ends with conclusions and recommendations.

Section 1: Background to contamination of water supplies in Bhopal

Union Carbide in Bhopal

The Union Carbide factory, Bhopal began manufacturing pesticides in 1969. The factory was positioned close to established working class settlements and one and a half miles

from the centre of the heavily populated old city. Despite the sizeable communities living around its periphery, between 1977 and 1984 the Carbide factory was licensed by the Madhya Pradesh Government to manufacture the extremely hazardous chemicals phosgene, monomethylamine, methyl isocyanate (MIC) and the pesticide Carbaryl, also known as Sevin.

Following the gas disaster of December 3rd, 1984, the plant ceased normal operations. However, until 9th July 1998, Union Carbide Corporation (UCC), Union Carbide India Ltd. (UCIL) and its successor Eveready Industries India Ltd. (EIIL) had around 40 operators on the site involved in management, disassembling, waste disposal and contamination assessment. Documents obtained by plaintiffs via “*Bano v. Union Carbide Corp.*” demonstrate that UCC - through its Indian subsidiary and hired consultants, Arthur D Little (ADL) - was involved in these ‘site rehabilitation’ efforts from 1989 until approximately 1997, in cooperation with the Indian authorities and those of Madhya Pradesh.

EIIL inherited the UCIL site lease and site rehabilitation proposals in September 1994, when UCC sold its shares in UCIL and the existing company was renamed. UCC trained site manager C.K. Hayaran, and the consultants ADL were retained by EIIL for continuing rehabilitation efforts. However, only cosmetic rehabilitation had been completed by UCC, UCIL and EIIL when, in July 1998, EIIL abruptly surrendered the 99 year site lease to the District Industries Centre – essentially a clerical office of the M.P. state - and abandoned the plant in an ‘as is’ condition. At the time, EIIL were beginning a more urgent and comprehensive remediation programme supervised by the Madhya Pradesh Pollution Control Board (MPPCB).

To this day the site contains warehouses, management buildings, chemical units and thousands of metric tonnes of chemical wastes, and contaminated machinery.

Hazardous Waste Dumping

According to former workers of the factory, from December 1969 to December 1984 a massive amount of chemical substances formulated in the plant - including pesticides, solvents used in production, catalysts, and other substances as well as by-products - were routinely dumped in and around the factory grounds. These caused pollution of the soil, water and air (**annexure 3**).

Between 1969 and 1977, byproducts and wastes were dumped into pits situated in the north, east and southeast of the factory premises. A 1997 environmental assessment by the Indian scientific organisation NEERI (**annexure 4**) described the span of the below-ground dumping areas within the factory as at least 6.4 hectares, or 21% of the total site area. The NEERI report concluded that some 17 areas within the factory had been heavily contaminated. In addition to the disposal areas, storage tanks and their transfer points, spill and target areas and underground wastewater drains and pipelines were and continue to be sites of contamination.

In 1977, Union Carbide constructed Solar Evaporation Ponds (SEPs) - covering an area of 14 hectares - 400 metres north of its factory. Several thousand tonnes of toxic wastes and by-products were henceforth dumped at these sites. The wastes were separated from the soil beneath by just a thin plastic liner. Every year during the rainy season the ponds overflowed and contaminated large areas of farmland surrounding them. In 1996 site management attempted to cover up environmental damage caused by the SEPs: the toxic sludge was all dumped into one pond and covered over with farm soil, layers of polythene, and finally a concrete cover. The two other ponds were levelled (during which their black polythene liners were ruptured). Soil has eroded around the concrete covers allowing surrounding water to become contaminated with toxic material. Populous settlements have since sprung up around this area.

Though huge amounts of waste were simply buried, Union Carbide failed to take even the measures described above for the disposal of numerous materials generated on site for use in pesticide production. Consequently, residues and waste materials weighing hundreds of metric tonnes were contained in five storage areas upon the surface of the site, including an open cycle shed, a soapstone shed, a formulation building and two godowns. Many of the wastes have lain exposed to weather conditions, resulting in further contamination spread. These wastes are today the subject of a temporary containment operation sponsored by government agencies and taking place as this brief is written.

Growth of Local Settlements

Land situated north, north-east and north-west of the Union Carbide factory has seen a prodigious amount of housing development over the past seventeen years. Two of the communities -- Atul Ayub Nagar and New Arif Nagar -- situated closest to the factory's perimeter fencing and proximate to some of the most severely contaminated water sources grew up in 1988. Characterised by make-shift, single story slum dwellings, the two settlements sit between the factory and the Bhopal-Ujjain rail line. A further twelve colonies that have developed around the area since 1988 are also known to have access primarily to contaminated water.

Despite their recent residency in these areas, many of the residents are registered voters. Data taken from voters lists indicates that 16,230 people reside in these water-polluted communities. Community estimates place the population figure well above 20,000. A high proportion of the population of these communities are survivors of the 1984 gas disaster, already suffering chronic effects of chemical exposure.

Section 2: Evidence of Contamination

Confidential reports

As early as July 21, 1972, Union Carbide officials recognised problems with the SEP proposals for the site, asserting they brought a "*danger of polluting subsurface water supplies in the Bhopal area*". To avoid this, "*new ponds will have to be constructed at one to two-year intervals throughout the life of the project*" (**annexure 5**). This prescription was never implemented.

On March 25, 1982, Union Carbide officials learned of a major failure of the SEPs. By April 10, 1982, officials were informed that toxic materials were spreading into the subsurface water reservoirs of Bhopal: "*Continued leakage from evaporation pond causing great concern.*" (**Annexure 6**)

In 1989, Union Carbide management began the "Site Rehabilitation Project –Bhopal Plant", which was shortly to become the "Bhopal Site Rehabilitation and Assets Recovery Project". Internal documents regarding the project demonstrate that Union Carbide directed its appointed consultant, ADL, to find the cheapest possible method of site rehabilitation. Though the record shows that the Indian government and the Madhya Pradesh state government cooperated fully with UCIL and UCC throughout their site remediation activities, further documents reveal that Union Carbide and UCIL attempted to actively conceal the existence, nature and scale of the developing problem of environmental contamination at the Bhopal site.

In 1990, UCIL retained NEERI to conduct an investigation of contamination at the site. The report by NEERI seemed to find little significant contamination, but, knowing NEERI's results to be unreliable, Union Carbide authorized a confidential 'in-house' investigation, the results of which were not shared with local authorities or made public at the time, only coming to light as a result of discovery in the New York lawsuit (see **pps. 13-14 below**) in 2002. Entitled "Presence of Toxic Ingredients In Soil/Water Samples Inside Plant Premises", the report found high levels of contamination within the site. Involving "*nine soil/solid samples and eight liquid samples*" drawn in June-July 1989 from the factory, the investigation found chemicals such as naphthol and Sevin. "*All samples caused 100% mortality to fish in toxicity assessment studies and were to be diluted several fold to render them suitable for survival of fish.*" (**Annexure 7**)

On 28th October 1996 the State Research Laboratory of the Madhya Pradesh Public Health and Engineering department completed its own confidential report. The report, leaked sometime in 1999, took eleven samples from tube wells located in communities situated around the periphery of the plant. The results showed that "*there is a heavy presence of chemicals. Normally the C O D (Chemical Oxygen Demand) value in ground water is zero but the samples tested here had C O D values between 45 mg/l and 98 mg/l whereas, the WHO has fixed the standard value of C O D for natural water at 6 mg/l. The high values of C O D found in the ground water establishes that large amounts of chemicals are dissolved in it.*" The report mentions that the results reflect those obtained in a similar 1991 investigation by the same agency, and that "*it is established*

that this pollution is due to chemicals used in the Union Carbide factory that have proven to be extremely harmful for health.” (Annexure 8)

In 1997, an extensive report by NEERI, commissioned by ADL, found high concentrations of temik, sevin and lindane in two of the main site disposal areas. It found that the concentration of semivolatiles, including sevin, temik and alpha naphthol, was very high at seven sites and moderately high at ten others. Tellingly, *“the concentration of semivolatiles was observed to be higher at 60cm samples than 30cms in a few locations indicating the possibility of contamination even at higher depths.” (Annexure 4)* In spite of these significant findings, NEERI suggested that groundwater would be safe from contamination in the interim as it would take around twenty three years for contaminants to leach through the clay soil type. NEERI also asserted the groundwater to be potable: *“The water meets the drinking water quality criteria. This indicates that the contaminants have not reached the water table till now.”*

However, the draft NEERI report was reviewed by the consultants ADL. The criticisms in their private report to Carbide's directors ran to seventeen pages, finding flaws right across the report's spectrum. Most critically, ADL clearly advised against giving the water a clean bill of health: *“While we agree that the ground water samples do not contain contamination, the sentence 'The ground water appears to be suitable for drinking purposes' is too strong given the limits of the data for the following reasons. First, there is only one round of ground water samples from these wells. Second, it is not known if contaminant migration will impact ground water in the near future. Finally, there is little information regarding the hydrogeology in the area.” (Annexure 9)* None of the criticisms were heeded in the final NEERI report, which became oft cited by both Indian agencies and Union Carbide in their repeated denial of contamination problems at the Bhopal site.

Public Reports

By 1981 and 1982, several cattle had died through exposure to poisonous water in the SEPs, prompting a formal police complaint. By 1982-83 farmers in the vicinity of the SEPs were experiencing drastic reduction in the fertility of their soil due to the overflowing water. Two tube wells dug in the neighbourhood of the SEPs had to be abandoned because of the obnoxious smell and taste of the water. A lawsuit brought by farmers resulted in an out-of-court settlement with UCIL.

In April 1990, the Citizen's Environmental Laboratory (CEL), Boston tested sediment from the SEPs, soil samples taken from near the ponds and community well water. Numerous toxic materials were found in the sediment sample. Dichlorobenzenes and Trichlorobenzenes were found in the soil and water samples. The issue of this contamination was raised at the 1990 Union Carbide AGM by Marco Kalofthen of CEL.

On November 15, 1999, Greenpeace International published a report entitled “The Bhopal Legacy“, conducted with the help of the laboratories and technical experts at the

University of Exeter in the United Kingdom. This Report provided the first public and scientifically reliable evidence of massive and spreading groundwater contamination emanating from the Bhopal plant. (**Annexure 10**)

Greenpeace collected 33 samples of soil and 22 samples of groundwater from in and around the factory site. After analysis of the samples, the site was declared a “*global toxic hotspot*.” It found heavy concentrations of carcinogenic chemicals and heavy metals like mercury. Mercury was found at between 20,000 to 6 million times the expected levels, and elemental mercury was discovered to be widely distributed across the plant premises. Twelve volatile organic compounds, most greatly exceeding WHO and EPA standard limits, were found to have seeped into local tube wells (**annexure 11**).

The investigation demonstrated “*extensive and, in some cases, severe chemical contamination of the environment surrounding the former Union Carbide plant. As a result of the ubiquitous presence of contaminants, the exposure of the communities surrounding the plants to complex mixtures of hazardous chemicals continues on a daily basis... long-term chronic exposure to mixtures of toxic synthetic chemicals and heavy metals is also likely to have serious consequences for the health and survival of the local population.*”

Further water tests conducted by Greenpeace in 2001 reaffirmed the presence of chlorinated benzenes (1,2-dichlorobenzene, 1,3, dichlorobenzene and 1,4-dichlorobenzene), chloroform, trichloroethene and carbon tetrachloride (tetra chloromethane) in the water well being used by the communities.

In September 2002, a report by The People’s Science Institute, Dehra Dun, found mercury in groundwater sources near the plant. Mercury levels were found to be twice as high as the one microgram per litre permitted by the WHO.

In December 2002, a report for the Factfinding Mission on Bhopal by Delhi-based environmental organization Shristi found that “*the groundwater, vegetables and even breast milk is contaminated to various degrees by heavy metals like nickel, chromium, mercury and lead, volatile organic compounds (VOCs) like dichlorobenzene and halo-organics like dichloromethane and chloroform.*” (**Annexure 12**)

The report highlighted that the found chemicals can have a long-term impact on the reproductive, immune and nervous system through bio-accumulation, with potential effects including carcinogenicity, mutagenicity and chromosomal aberrations. Human breast milk samples showed maximum concentrations of Volatile Organic Chemicals and a higher concentration of pesticide in breast milk, allowing the shortest route of exposure to infants who are most vulnerable to these kinds of carcinogens.

Between April 2003 and January 2004 the MPPCB conducted four separate groundwater tests at ten community locations. With some consistency, “*The pesticides Lindane, Endosulfan i- ii, Heptachlor, Aldrin, Dieldrin, BHC, Endrin and 4,4 DDT were detected in some of the samples*” along with the halogenated hydrocarbon Trichlorobenzene.

(Annexure 13) The reports came to light through submissions made in the Supreme Court of India.

Noted Effects Upon the Health of Contaminated Communities

No systematic study of the health of these communities has yet been undertaken. However, reports by local health workers and journalists, and individual testimonies, describe a consistent pattern of symptoms.

Health symptoms associated with the consumption of contaminated water include abdominal pain, skin lesions, dizziness, vomiting, constipation, indigestion, and burning sensations in the chest and stomach. Health workers have noted that the majority of children in the most severely affected community, Atul Ayub Nagar, are born seriously underweight, weak, with discolored skin, as well as suffering from other multi-systemic health problems. Women complain of reduced lactation; in some instances, lactation has stopped within a month of child-birth. Anecdotal reports refer to higher instances of cancer, growth retardation and even birth defects.

Section 3: Supply of Water in Affected Communities

Shortly after the State Research Laboratory report of October 1996 (**pps. 6-7 above**), the Bhopal Municipal Corporation (BMC) placed warning signs upon over 100 tube wells, declaring the water 'unfit for drinking', but none of the wells were capped and continue to be used till today in the absence of sufficient alternatives.

The same year, the Department of Gas Relief and Rehabilitation requested Rs 8.50 crores from the Central government for drinking water supplies to communities adjacent to the Union Carbide factory. An amount of Rs 2.53 Crores eventually came from the Central Government in 1999. The budget was specified for the supply of piped water to severely affected communities. No immediate action was taken by local authorities.

On August 11, 2000, community health workers from the Sambhavna Clinic began an intensive health education campaign in Atal Ayub Nagar. After a few weeks elders in the community took the initiative in organising people to pressure the local elected public official on an almost daily basis. As a result of this community initiative, on September 9, 2000, six tanks of 10,000 litres capacity each were provided by the Municipal Corporation. In the months following, six to eight tankers brought water every day, filling tanks that had been installed in the community. However, due to insufficient quantity, 20 % of the community was left without access to tanker water. The other thirteen affected communities were entirely without alternative supplies.

In 2001, pipelines were partially laid in two communities, Atal Ayub Nagar and New Arif Nagar, but no water was or has been supplied through them. In the following years an intermittent supply of water was given to some of the affected communities by means of tankers, and in six of the communities Syntex tanks were built for storage of water. However, the response by local authorities, piecemeal and grossly insufficient, was only meeting a fraction of the overall need.

In 1995, the Research Foundation for Science Technology and Natural Resource Policy filed a petition with the Supreme Court of India, "*Writ Petition (c) No. 657 of 1995*", the unregulated hazardous waste imports in India. Subsequently, the Supreme Court extended the scope of the case to cover issues of indigenous hazardous wastes generation and management. In October 2003, frustrated by the repeated failure by regulatory agencies to implement Supreme Court directives to enforce the law, the apex court appointed a specially empowered Committee – the Supreme Court Monitoring Committee (SCMC) – to oversee the implementation of its orders.

In February 2004, the SCMC visited Bhopal and began its investigation. The SCMC recommended intervention by the Supreme Court: "*in view of the dangerous contamination of the water from the chemicals within the UC Bhopal plant, this Court should direct the closure of all the open wells in the area and simultaneously issue directions to the State Government to provide water in tankers for drinking, cooking and personal hygiene and by pipelines by end of the year to all the affected persons in the immediate vicinity of the Union Carbide plant.*" (**Annexure 14**)

On May 7th 2004, the Supreme Court issued an order in the matter of "*Writ Petition (c) No. 657 of 1995*" requiring the M.P. government to "*take steps to supply fresh drinking water in tanks or pipes particularly, taking into consideration, the fact that summer season has already set in. It shall be done expeditiously.*" (**Annexure 15**)

An affidavit submitted in the same matter in May 2004 (**annexure 16**) attested that 800 water tankers would be needed to supply sufficient water to all the affected communities. As the BMC only has around 40 tankers, a piped water supply is the only feasible option.

On July 22nd 2004, the BMC submitted an affidavit to the Supreme Court regarding the same matter. The affidavit asserted that steps were being taken to lay pipelines in the affected communities and that the water supply, around 360,000 litres per month, was adequate. However, an affidavit filed in response by petitioners paints a wholly different picture: "*water being supplied to all the 14 communities is not only grossly inadequate, but the MP government is taking no steps to lay the pipelines in contaminated communities. Residents of these communities have no choice but to drink the contaminated water on a daily basis.*" (**Annexure 17**)

The affidavit notes that in August 2004 alone, actual water supply was around 5% of the amount needed, as per UNESCO guidelines (50 litres per day per person), at 42,000 litres for the month (**annexure 18**). Finally, piped water supplies described in the BMC

affidavit were actually delivered from the same groundwater sources as the contaminated tube wells.

On October 14, 2004, 350 women from the contaminated communities took over the offices of the Director of the Bhopal Gas Tragedy Relief and Rehabilitation (BGTRR) department, Bhupal Singh. The action resulted in an agreement between the BMC and affected communities: for a specific amount of tanker deliveries per day; for community oversight regarding delivery and water quality; for installation of additional Syntex tanks; and for further weekly meetings to discuss supply.

On March 9-10, 2005, SCMC member Claude Alvares visited Bhopal. A report of the visit was issued on April 2nd, 2005, describing a meeting with the Principal Secretary of the BMC and the Chairperson of the MPPCB (**annexure 19**) at which it was agreed that:

- Communities with no access to good water would receive supplies;
- To increase the water supply from 40,000 to 400,000 litres per day;
- To involve the Local Area Environment Committee (LAEC) closely in supply operations;
- That permanent water supply would be arranged within two years;
- That plans for permanent supply would be submitted within four weeks of the Alvares report.

A letter from the Chairman of the Supreme Court Hazardous Wastes Monitoring Committee formalising these commitments was sent on to the Chief Secretary of M.P. on April 22nd, 2005. We are not aware that any of the agreements have yet been actioned.

Impatient of receiving the requisite supply of clean water, on May 17th, 2005 representatives of contamination affected communities staged a protest at the offices of the Director, Bhopal Gas Tragedy Relief & Rehabilitation, Mr. Manish Rastogi, demanding implementation of the Supreme Court's May 7th, 2004 order. Reports state (**annexure 20**) that local police attacked the demonstration - which included small children - pushing some protestors downstairs, kicking some women in the chest and stomach and beating others with *lathis* (sticks). Five protestors, including two women, had to be treated in hospital. Five serious charges were then filed against seven participants. On May 19th Amnesty International issued a statement expressing concern at the excessive and unnecessary use of force by Bhopali police. Amnesty also called for a proper investigation into the incident to examine whether the use of force by police was consistent with national law and international standards, including the Basic Principles on the Use of Force and Firearms, and the Code of Conduct for Law Enforcement Officials.

Section 4: Liability for the Contamination

Opinion of Indian authorities:

Subsequent to its abandonment by EIL, the factory site reverted to the Madhya Pradesh State government. State authorities have suggested that the lack of a formal hand over of the lease means that UCIL/EIL remain, technically, occupants (**annexure 21**). State authorities have also since stated that the site lease's terms and conditions were breached as the lease required the land to be returned in the condition under which it was leased – an opinion reflected in documents written by Union Carbide officials and obtained by plaintiffs through the US suit (**annexure 22**).

The MPPCB, general supervisor of site remediation efforts during the tenancy of UCIL and EIL, has remained consistent in requiring UCIL and its successor EIL to remediate the site, citing the Hazardous Waste (Management & Handling) Rules, 1989 (**annexure 23**).

In June 2004, both the M.P. government and the Government of India submitted a ‘no objection’ letter to the Southern District Court of New York (SDNY) in the matter of “*Bano v. Union Carbide Corp.*”:

Government of India wrote to the SDNY that: “*Pursuant to the ‘polluter pays’ principle recognized by both the United States and India, Union Carbide should bear all of the financial burden and cost for the purpose of environmental clean-up and remediation. The Union of India and the State Government of Madhya Pradesh shall not bear any financial burden for this purpose.*” (**Annexure 24**)

Recent statements by Indian officials have highlighted their intention to pursue The Dow Chemical Company, Union Carbide’s 100% owner, for remediation costs. On June 20, 2005, The Union of India submitted an affidavit to the M.P. High Court (**see p.14 below**) stating that the court may direct the Dow Chemical Company and others deposit an amount of Rs.100 crores in advance of future remediation costs, to be adjusted in accordance with the final orders of the court. (**Annexure 25**)

International opinions:

On October 17, 2003, nine members of the US Congress submitted an ‘amicus curiae’ in the matter of “*Bano v. Union Carbide Corp.*”: “*The ‘polluter pays’ principle has been affirmed by both international law and American common law as well as Congressional enactments as the appropriate means for addressing such pollution or environmental harm regardless of where it occurs. That principle cannot and should not be ignored or disregarded simply because the polluter has abandoned its facility, sold its shares in a subsidiary or otherwise effected a change of ownership.*” (**Annexure 26**)

On September 29, 2004, US Congressman Frank Pallone introduced bill #503 to the US House of Representatives. The resolution called for Congress to express commitment to work with the Government of India and others to ensure that, amongst other things, Union Carbide provides environmental rehabilitation in Bhopal. “*International trade and*

ethical practices compel Dow Chemical to treat this matter very seriously and ensure that equitable treatment be afforded to the victims and their progeny.” (Annexure 27)

On November 29, 2004, Amnesty International released a report entitled “Clouds of Injustice: Bhopal Disaster 20 Years On”. Drawing attention to the ongoing violation of human rights in Bhopal, the report (page 32) quotes Judge Weeramantry, sitting in the International Court of Justice in The Hague: “*The protection of the environment is... a vital part of contemporary human rights doctrine, for it is a sine qua non for numerous human rights such as the right to health and the right to life itself. It is scarcely necessary to elaborate on this, as damage to the environment can impair and undermine all the human rights spoken of in the Universal Declaration and other human rights instruments.*” (Annexure 28)

Amnesty notes that (pages 35-6), “*it is now a recurrent theme in environmental law that liability for environmental harm is channelled towards the private originator or polluter, sometimes on the basis of fault and in other cases on the basis of strict liability. Operators of hazardous facilities are held liable, in some cases by treaties imposing strict liability.*” Amnesty concludes by calling on the Dow Chemical Company to promptly provide full reparations, restitution, compensation and rehabilitation for the continuing damage done to people’s health and the environment by the ongoing contamination of the site.

Attempts to gain legal redress

On November 15, 1999, a class action lawsuit containing claims under fifteen counts, “*Bano v. Union Carbide Corp.*”, based on legal provisions under Alien Torts Claims Act [ATCA] – a US law -- and citing supporting legislation such as the Declaration of the United Nations Conference on The Human Environment, was filed in the Southern District Court of New York on behalf of seven individual Bhopal survivors and five organizations representing survivors.

Following appeal of an August 28, 2000, summary dismissal, claims under seven counts regarding contamination of ground water and soil in and around the factory and consequent health damages were directed to Judge Keenan for re-consideration. On March 18, 2003, the suit was dismissed once more and appealed the following month (annexure 29).

On March 17, 2004, the US Second Circuit Court of Appeals reversed Judge Keenan's dismissal in part (annexure 30). The Court held that Union Carbide could be ordered to clean up individual victims’ property, and could also be ordered to clean up the plant site itself, if the Indian authorities, owners of the land on which the plant sits, were to intervene and request such a clean-up. The appeal decision also allows for certain personal injury claims within the statute of limitations period; property claims for monetary damages; and claims for medical monitoring by plaintiffs.

On June 28, 2004, the Government of India issued a no objection certificate (**annexure 23**) to the New York District court regarding the clean up and decontamination of the UCIL plant site. The certificate was issued only after six days of a waterless fast by two survivors and one Bhopal campaigner.

The lawsuit is currently awaiting a decision on class certification and request for discovery has been made upon Union Carbide.

On August 3, 2004, the division bench of the Madhya Pradesh High Court admitted a Public Interest Litigation by Alok Pratap Singh of 'Jahrili Gas Peedit Morcha', filed against UCIL with regard to the contamination at the Bhopal plant site. The High Court later served notices upon the Union Government of India, the Madhya Pradesh government, Union Carbide, EIL and The Dow Chemical Company in the matter.

On March 30, 2005 a two judge panel of the High Court produced an interim order (**annexure 31**) directing the Union Government of India to constitute a five member expert committee headed by the Secretary of the Ministry of Chemicals and Fertilisers, New Delhi to prepare a scheme and action plan for removal of toxic wastes at the plant site by April 27, 2005. The judges took the opinion that local authorities should be asked immediately to start containing the toxic material, irrespective of liability.

On May 10, 2005, an advocate for The Dow Chemical Company, Mr. Abhishek Sanghvi attended proceedings and made a statement to the effect that Dow Chemical is an American company, having no property or assets in India. In fact, Dow has four registered subsidiaries operating in India.

Section 5: Remediation Efforts to Date

Following EIL's abandonment of the former Union Carbide factory site, M.P. government agencies' response to the problem of site contamination has been typified by vacillation and departmental buck passing in the face of the magnitude, complexity and cost of the problem. A series of fires within the factory ground between 1999 and 2001, one stopping just short of a volatile stockpiles of chemicals, highlighted a different kind of urgency in the matter.

On October 25, 2002, technical guidelines for the clean-up of the factory site, drawn up by Greenpeace International scientists, were presented to Madhya Pradesh Chief Minister Digvijay Singh and simultaneously handed over at Dow Chemical Company offices in India, Europe and the U.S. The guidelines assert that future cleanup operations be transparent, involving various stakeholders, ensure the safety of local residents, use appropriate disposal equipment and be carried out to the highest possible standards. (**Annexure 32**)

On November 25, 2002 members of the International Campaign for Justice in Bhopal (ICJB) and local community members attempted to safely contain some of the hazardous surface wastes at the site. Greenpeace activists trained in hazardous material handling lent their expertise. However, Bhopal police interrupted the operation, shoving and beating survivors including women. Seventy people were arrested and later charged with criminal trespass.

On November 4, 2004, Greenpeace International organised a symposium at which an international team of experts estimated the clean-up cost to be approximately \$30 million. A number of provisos were added to this estimate: that the cost could increase upon further evaluation of the site and when factors such as the amount of soil, wastes and groundwater to be treated, the time needed for groundwater remediation and the technologies to be adopted were considered.

Following the orders given in the M.P. High Court (**p.14 above**), an operation aimed at basic containment of above-ground wastes that were lying exposed to the elements began on June 1st, 2005. The operation - which was begun without any intimation to local people - employed crude homegrown technology: a woman with a broom, without any protection and with a seven year old child in tow, swept up pesticide dust from the floor of a storage shed.

For three days, migrant labourers were brought in for similar work. The names and addresses of the workers were intentionally not recorded; none of them are traceable now. Subsequently, Hyderabad-based M/S Ramky Pharma City, a contractor hired by the State Government, began pre-remediation work in earnest. The work stirred up clouds of toxic dust that drifted into nearby communities. This work too was carried out by unprotected workers – with no gloves, no masks, and in some instances, no footwear.

Reports describe how the operation impacted upon the health of both hired labourers and local residents by exposing them to airborne pesticides. Workers complained of breathing difficulties and at least one resident, Noorjahan, 35, was rushed to hospital with acute respiratory distress. A six month old baby was also among those needing medical attention, amongst as many as thirty six people affected. (**Annexure 2**)

Ramky's operation, local groups aver and even Ramky concurs, is not as per best international practice, and violative of India's Hazardous Waste (Management & Handling) Rules, 1989.

At the time of writing a local advocacy group, the Bhopal Group for Information and Action, has intervened in the M.P. High Court case in order to make the judicial panel cognisant of these serious concerns, gaining a temporary stay on the work. (**Annexure 25**) On August 12, the M.P. High Court issued an order allowing NGO advocates to provide a detailed plan for removal and containment of hazardous waste, in a safe and scientific manner, by September 15 2005.

Conclusions and Recommendations

Till date, the M.P. State government has demonstrated a lack of competence and integrity in relation to the clean water needs of contamination-impacted communities in Bhopal. More than a year since the intervention of the Supreme Court of India in the issue, people are still forced to drink and wash with water believed to be seriously injurious to their health. Only the M.P. authorities have it in their power to end this entirely unnecessary exposure.

Only a complete rehabilitation of the former Union Carbide factory site will safeguard the water supplies of as-yet-unaffected communities in Bhopal from hazardous contamination. However, as a consequence of its approach to the site contamination thus far, we are convinced that the M.P. State Government and the associated agencies lack the intent, political will, scientific know-how and the culture of safety required to conduct the remediation work in a safe manner in line with international best practices.

Additionally, it is evident that reckless waste dumping by former tenants of the factory site, Union Carbide, a lack of transparency over contamination findings and a resistance to meeting its responsibilities has led directly to the ongoing humanitarian crisis in Bhopal.

There is, therefore, a question of whether the State should, through undertaking a cleanup operation, allow the polluter, Union Carbide, to evade its responsibility. The Union of India has requested that Union Carbide, its owner The Dow Chemical Company and others be made to deposit an amount of R100 crores in advance of future remediation costs. However, an adjudication of liability has not been decided by the M.P. High Court, and there are fundamental doubts about the possibility of the polluter being made to pay for remediation via this forum. There are further questions about the sufficiency of the aforementioned sum.

Meanwhile, the lawsuit initiated by Bhopal residents in the SDNY, which has progressed to a critical stage, and which allows claims for both clean up and personal injury, has received no active support from the Indian government. Yet this lawsuit affords the best opportunity of forcing a resistant Union Carbide to pay for a full and proper remediation of the factory site and its surrounding areas.