

Timeline on contamination of soil & ground water inside & outside the abandoned Union Carbide factory premises in Bhopal

S.No	Year	Event / Happening	Document	Remark
1	1969	Union Carbide Corporation sets up pesticide formulation plant in Bhopal. In the absence of any waste management plan or facility hazardous waste routinely dumped inside factory premises.		Beginning of contamination of subsurface soil and groundwater. This is the sole source of contamination in an otherwise near pristine area.
2	10 Oct 1972	Union Carbide signs a 100 year lease with Government of Madhya Pradesh to establish the pesticide manufacturing factory	Land Lease	Lease obliges Union Carbide to return land to GoMP in original condition.
3	1972	Union Carbide's Management Committee approves the waste management plan based on Solar Evaporation Ponds (SEP)* for the Bhopal factory. The plan contains foreknowledge of "danger of polluting subsurface water supplies in the Bhopal area" and directions to build "new ponds will have to be constructed at one to two-year intervals throughout the life of the project".	Union Carbide Waste Disposal Plan letter	Union Carbide had prior knowledge of the possibility of hazardous contamination of subsurface soil and groundwater. In practice no new ponds were constructed.
4	1977	Union Carbide constructed 3 Solar Evaporation Ponds outside the factory premises on 32 acres land where liquid toxic effluent from the factory began to be routinely dumped. Solid hazardous waste continued to be dumped inside the factory premises at 21 locations marked by the factory management.	Map of factory premises with locations of dumping sites and SEPs	SEPs overflowed during the rainy seasons contaminating the surrounding area and damaging crops in farms in the vicinity.
5	1978	Cattle death and loss of agricultural crops in the vicinity due to effluent from the factory.	Letter from MPSPCWPB now Pollution Control Board to	Warning bell regarding the toxicity and severity of contamination.

			UCIL,Manager	
6	1982	<p>Breaching of polymer lining of SEP and consequent contamination of subsurface soil and groundwater.</p> <p>Telex dated March 25, 1982 “Phase II evaporation pond almost emptied. Unfortunately, emergency pond has also shown some signs of leakage.” Telex dated April 10, 1982: “Continued leakage from evaporation pond causing great concern.”</p>	TELEXES between UCC and UCIL	First instance of large scale hazardous contamination of soil and groundwater.
7	1989	<p>Study by Union Carbide’s scientists show severe contamination of soil and groundwater. Samples from land-fill areas were reported to contain poisonous chemicals such as naphthol and naphthalene known to cause damage to lungs, eyes, liver and kidneys and possibly cancer. Union Carbide management suppressed the report.</p>	Bhopal Site Rehabilitation Asset and Recovery Project	Evidence of deliberate suppression of information on hazardous contamination of soil and groundwater by Union Carbide.
8	1990-1992	<p>1990: Study by and Citizen’s Environmental Laboratory, USA and Bhopal Group for Information & Action reports high levels of Dichlorobenzene, Polynuclear aromatic hydrocarbons (PAH), and Phthalates in soil and water.</p> <p>1991: Monitoring by State Research Laboratory of the Public Health Engineering Department of GoMP showed alarmingly high Chemical Oxygen Demand (C.O.D.) values in samples drawn from wells outside the factory indicating irreparable chemical contamination of groundwater.</p> <p>1992 : Study by National Environmental Engineering Research Institute (NEERI) reported presence of Volatiles and Semi-volatiles in soil samples.</p>	Reports	Creation of source of chronic contamination through unsafe disposal of hazardous waste

9.	June 1996	Union Carbide management employed earth movers to dredge massive amount of highly toxic sludge from two SEPs and dump it into the third pond and covering it up with contaminated soil	Washington Post Article	Creation of source of chronic contamination through unsafe disposal of hazardous waste
10.	1997	Study by NEERI reported hazardous contamination of 21 % of the factory premises with poisonous chemicals such as Carbaryl, Lindane and Alpha-naphthol	NEERI Report	NEERI's advice regarding excavation of buried waste to stop spread of contamination remains ignored till date.
11	7 July 1998	UCIL surrenders its lease to the Department of Industries, Govt of Madhya Pradesh. Subsequently GoMP officials write to Union Carbide to clean up the contamination caused due to its operations.	Enquiry Report of UCC	Clear evidence of Union Carbide violating the terms of the 1972 Lease agreement with GoMP
12	1999-2005	<p>1999 : Greenpeace International termed Union Carbide factory and its surroundings a "Global Toxic Hotspot" based on findings of very high levels of hazardous chemicals and heavy metals in soil and groundwater within and outside the factory premises.</p> <p>2001: Peoples' Science Institute, Dehradun reported high levels of mercury inside the factory and in ground water samples taken from neighbourhood communities upto 1.5 kms.</p> <p>2001-PSI, Dehradun found high levels of mercury inside the factory and in ground water samples taken from nearby communities</p> <p>2002 : Greenpeace International reported presence of Carbaryl, Hexachlorocyclohexane, Hexachlorobenzene and other toxic chemicals in samples taken from the factory premises and the SEPs.</p> <p>2002: New Delhi based Fact Finding Mission on Bhopal reported heavy concentration of toxic chemicals and heavy metals in soil, groundwater and breast milk based on analysis</p>	Reports	<p>Levels of mercury reported by Greenpeace were several million times higher than safe levels.</p> <p>PSI study corroborated findings of Greenpeace regarding mercury.</p> <p>An estimated 500 newborn children were exposed to highly toxic breast milk every year.</p> <p>MPPCB made no recommendations for protection of residents from exposure to hazardous and carcinogenic chemicals.</p>

		<p>in IIT, Kanpur laboratory.</p> <p>2005: Madhya Pradesh Pollution Control Board reported high levels of carcinogenic chemicals like Lindane, Aldrin and b-bhc in soil and groundwater samples outside the factory.</p>		
13	May 2004	<p>In a separate matter concerning sites with contaminated ground water due to industrial waste was heard by the SC. In WP 657/97 SC directed Govt of MP to provide clean drinking water supply in areas affected by contamination caused due to dumping of hazardous waste by Union Carbide in Bhopal.</p>	SC order	
14	August 2004	<p>In July 2004, a resident of Bhopal (Alok Pratap Singh) filed a Writ Petition No. 2802/2004 in the Madhya Pradesh High Court seeking removal of toxic wastes and remediation of contaminated environment. The petitioner prayed for holding Dow Chemical Company, the new owner of Union Carbide, accountable for the clean up & remediated of the area and compensation for health damages caused as a result of ground water contamination to the residents living in the affected areas.</p>	MP High Court	See Timeline on Disposal of Hazardous Waste

15.	2009	Central Pollution Control Board, New Delhi and Center for Science & Environment New Delhi studied groundwater and soil samples from inside the factory, SEP and from communities as far as 3 kms from the factory.	CPCB & CSE Reports	Evidence of spread of contamination up to 3 km From the factory. Similar findings with respect to severity and spread of contamination in studies carried out by government and non-government agencies.
16	2010	NEERI, NGRI & IICT were asked to carry out an assessment of the depth and spread of contamination in and around the Union Carbide factory	Reports	
17	May 2011	The Oversight Committee of Ministry of Environment & Forest appointed a Peer Review Committee. The PRC studied the NEERI/NGRI reports, and the comments on the same from 31 technical experts from around the world, and concluded that the findings of the Rs 2.5 crore study by NEERI and NGRI on the depth and spread of contamination was not to be relied upon. The competence of these and other scientific agencies are also evident in their earlier reports	PRC Report	
18	2011-2012	Bhopal Groups sought directions from Supreme Court in WP 657/95 to further assess the spread of ground water contamination. SC ordered India Indian Institute of Toxicology Research, Lucknow analyzed 30 samples of groundwater and identified 22 additional communities that were affected by groundwater contamination.	SC order	Number of communities affected by contaminated groundwater up from 14, in 2004 to 22 in 2012. Clear evidence of spread of contamination of groundwater.
19	2014	Completion of project for supplying piped drinking water to about 10,000 families in 22 communities in the vicinity of the factory.		GoMP took more than 10 years to implement the Supreme Court's decision on supply of piped water to affected communities.

20	2014	United Nations Environment Program (UNEP) offered to undertake a comprehensive scientific assessment of the depth and spread of the contamination in & around the Union Carbide factory.	UNEP offer letter	Assessment would have helped in chalking out the remediation strategy and for claiming damages from Dow Chemical
21	2015	Ministry of Environment, Forests & Climate Change (MOEF), Govt of India rejected UNEP's offer citing that Indian CSIR institutions were capable in doing such study.	Rejection Letter	Ministry responded "No new studies are needed at this time. 347MT will be disposed off under the order of Apex Court"
22	2015	Groundwater samples analyzed at the State Research Laboratory, Public Health Engineering Department, GoMP shows unusually high values of Chemical Oxygen Demand (COD) in groundwater samples in 20 communities	Reports of State Research Laboratory, Public Health Engineering Department, GoMP	Groundwater contamination has spread at least 1.5 Kms. beyond the boundary marked by IITR, Lucknow.
23	2016	Groundwater samples collected by Sambhavna Trust Clinic and analyzed at the State Research Laboratory, Public Health Engineering Department, GoMP shows unusually high values of Chemical Oxygen Demand (COD) in groundwater samples in 20 communities	Reports of State Research Laboratory, Public Health Engineering Department, GoMP	Evidence of continued spreading of the groundwater contaminations.
24	November 2017	Supreme Court orders that clean water should be supplied in these 20 additional communities identified by the Intervenor & also ordered IITR to analyse samples of ground water in these communities.	SC order	Number of communities affected by contaminated groundwater up from 14, in 2004 to 22 in 2012 & 42 in 2017. Clear evidence of spread of contamination of groundwater

25	2018	Indian Institute of Toxicology Research, Lucknow analyzed 22 samples of groundwater and identified 20 additional communities that were affected by groundwater contamination. Thus taking the toll of the communities affected by ground water contamination to 42	IITR study	Water found not fit for drinking in 42 communities.
26	May 2019	Groundwater samples collected by Sambhavna Trust Clinic and analyzed Madhya Pradesh Pollution Control Board, GoMP shows unusually high values of Chemical Oxygen Demand (COD) in groundwater samples in 6 additional communities.		
	3 December 2020	The Chief Minister of MP announces building of memorial on contaminated site of the abandoned Union Carbide factory	Newspaper Clipping	
27	April 2021	Govt of Madhya Pradesh invites bids for Disposal of 337MT of UCIL Waste by Incineration at Common Hazardous Waste Treatment Storage and Disposal Facility.	Tender Document	Bids is only for disposal of 337MT of hazardous waste, currently sitting in one room causing no damage to anyone. There is no comprehensive assessment of the depth and nature of the waste buried inside the factory and outside in Solar Evaporation Ponds
28	June 2021	Two Gujarat based companies responded to the bid. The technical and financial bids of both of these companies is under consideration of the technical committee designed to oversee the bidding process		
29	July 2021	Both Gujarat based transporter companies did not pass the technical criteria. Hence bids were		

		rejected. New tender for disposal of 337 MT to be called again		
30	Nov 2021	TSDf facility of Ramky Enviro Engineers, situated in Pithampur, Indore applied for Disposal of 337 MT of UCIL Waste in its facility. Bid was approved and granted to Ramky. Govt of MP has sought funds from Dept of Chemicals & Fertilizers for incineration of 337MT of Union Carbide waste.	Tender Documents	In December 2021, CM of Madhya Pradesh again announced building of the memorial on factory premises
31	Aug 2022	Monitoring Committee set up on clean drinking water by the SC instructed Madhya Pradesh Pollution Control Board and Public Health Engineering Dept to carry out testing of 5 additional communities surrounded on the boundary of 42 communities. Report of test results of these 5 communities is yet to be made public	Newspaper Clippings & Letters	While a study carried out by Sambhavna Trust clinic in May 2022 found strong evidence of the presence of organo-chlorines in ground water samples from 29 additional colonies situated around the Union Carbide factory, groundwater of only 5 of these communities was tested and results of this have not been made public.