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UCIL contamination remains a threat for Bhopal

Three decades after it was shut down after the infamous gas leak that killed thousands and maimed people for generations, the Union Carbide factory in Bhopal continues to be a real danger to the people of Bhopal, according to a leading environmental group.

Almost every study done to measure the impact of the waste dumped within and outside the site by UCIL has come up with one conclusion - there is large-scale contamination in the soil and water of the area where the factory is located.

In the first initiative of its kind, New Delhi-based research and advocacy body **Centre for Science and Environment (CSE)** has analysed all the studies and their conclusions.

CSE released the key findings of its analysis here Thursday at a media briefing. It also released a comprehensive action plan for ridding the site of this contamination.

Between 1969 and 1984, Union Carbide India Limited (UCIL) had produced carbamate pesticides and organochlorine formulations. All these years, the toxic wastes and products were being dumped at several locations inside the plant and in the solar evaporation pond (SEP) outside. After the plant was shut down in 1984, this highly toxic waste was left lying on the plant premises and SEP.

Says Chandra Bhushan, CSE's deputy director general and the head of the Centre's lab which conducted one of the studies: "Over the years, this waste has been a continuous source of soil and groundwater contamination and therefore, a cause of serious public health concern for residents in the surrounding areas."

CSE has analysed about 15 studies conducted over the last 20 years to assess soil and groundwater contamination in and around the UCIL site. These studies were conducted by several non-government organisations, Madhya Pradesh state agencies, the Central Pollution Control Board (CPCB), and Council of Scientific & Industrial Research (CSIR) institutes such as the National Environmental Engineering Research Institute (NEERI), the National Geophysical Research Institute (NGRI), the Indian Institute of Chemical Technology (IICT) and the Indian Institute of Toxicology Research (IITR).

Says Amit Khurana, programme manager, food safety and toxins programme of CSE: "Most of these studies confirm contamination and have more convergence than divergence. The nature of contaminants found in the soil and the place from where they were found are similar in several studies. Contamination of groundwater has also been reported in most studies."

In April 25-26, CSE had organised a stakeholders' round table on this subject in New Delhi that focused on developing a road map on remediation of soil and groundwater, disposal of toxic chemical waste, remediation of plant machinery and the fate of the site. Says Chandra Bhushan: "For the first time, such a discussion was held in which all the stakeholders sat amicably across the table and participated actively."

Deliberations lasting two days, involved expert representatives from scientific institutions such as NEERI, IITR, IICT, NGRI, IIT-Bombay, IIT-Kharagpur, IIT-Madras and IIT-Roorkee; regulatory bodies such as CPCB; industry including those with expertise in remediation of contaminated sites; and organisations from Bhopal.

The expert group concluded that 350 tonnes of stored waste is a small part of the total waste that is still dumped at the site and the SEP area. The bigger challenge is to decontaminate the soil and groundwater.

Action plan

The expert group came to a consensus and has suggested a range of measures for remediation and waste disposal. Based on the criticality and required time-frame for implementation, the measures have been divided into two sections - immediate and medium/long-term.

Under immediate measures, it suggests:

Securing the site and SEP area by fencing and guarding to prevent access of people, especially children, hence their exposure to toxic chemicals; stopping construction in the SEP area; and protecting annual surface water runoff from the site during monsoon

Excavation and recovery of all the waste from the site; Characterisation and inventorisation of the collected waste for proper treatment and disposal

Characterisation of the 350 tonne wastes that is stored at the site and the results to be shared in the public domain. Under the supervision of the CPCB and affected community, incinerable waste is to be incinerated after the stabilisation of the trial results at Pithampur

Medium and long-term measures include

Groundwater contamination assessment through detailed field investigation and lab analysis to develop a remediation plan. Possibility of hydraulic containment is to be explored as an interim containment measure

Characterisation and remediation of the waste dumped in SEP area, particularly the landfill to prevent continued contamination of the groundwater in the local area

Detoxification, dismantling and decommissioning of the plant after preserving structures such as MIC plant including the vent, vent scrubber, storage tanks and control room

Remediation of the UCIL site that involves building a memorial and centre of excellence for industrial disaster management after decontaminating the site

Says Chandra Bhushan: "The action plan is implementable and is developed out of the consensus within the expert group. It was widely agreed that this is high time to break the existing institutional logjam and the government of Madhya Pradesh should swiftly act and solve this public health concern of huge significance."