

DOW CHEMICAL MIDLAND, MICHIGAN FACILITY

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BACKGROUND

The Dow facility is a 1,900 acre chemical manufacturing plant located in Midland, Michigan. Dioxins and Furans (D/Fs) were byproducts formed during the manufacture of chlorine-based products. Past waste disposal practices, fugitive emissions, and incineration at Dow have resulted in on and off-site D/F contamination. In 2003, MDEQ issued an Operating License to Dow which includes corrective action requirements for the City of Midland, the Tittabawassee River (TR) and Saginaw River, their floodplains, and Saginaw Bay. At Dow's request, on-site and off-site corrective action activities are proceeding as separate processes.

D/F contamination of the Saginaw Bay Watershed (SBW) extends over 50 miles, into Saginaw Bay. The highest dioxin concentration detected to date is 87,000 ppt TEQ (total concentrations are significantly higher). Other hazardous constituents may be identified when sampling beyond D/Fs takes place.

Elevated dioxin concentrations could potentially pose unacceptable risks to public health and the environment in the SBW. This issue has attracted a high level of interest by Federal and State legislators, citizens, environmental groups and the media.

EPA OVERSIGHT ROLE

Region 5 is overseeing Michigan's implementation of RCRA corrective action at the Dow Midland site for the following reasons:

- Requested by MDEQ, Saginaw Chippewa tribe, environmental groups, and citizens.
- Significant levels of contamination and potential risk.
- Large area of contamination (50 miles of river sediments, floodplains, and Saginaw Bay).
- Large potentially exposed population (140,000).
- Public health concerns due to consumption of contaminated fish & game (fish & game advisories in watershed).

EPA is providing oversight in the following manner:

- Review of major elements of significant documents (e.g. Remedial Investigation Workplans (RIWPs)).
- Detailed review of key documents (e.g. human health risk assessments, site-specific cleanup numbers, etc.) when requested by MDEQ.
- Provide comments in draft form prior to submittal to MDEQ. MDEQ may use the comments as they wish.
- Provide technical expertise/support to MDEQ when requested.

CURRENT CONDITIONS

Dow

- On 11/27/06, MDEQ notified EPA that a recent sampling event identified a sediment sample containing 87,000 ppt TEQ of dioxin in the first six miles of the Tittabawassee River downstream of Dow's facility. MDEQ has stated that Dow will be conducting additional sampling in the vicinity of the 83,000 ppt sample location this week to further identify the significance of the problem. MDEQ has stated that they intend to require Dow to actively address this hot spot prior to the river freezing over this year.
- In a parallel corrective action process occurring for on-site contamination at the Dow Midland facility, recent sampling has identified a dioxin result of 296,469 ppt TEQ. Dow has taken additional samples and has identified the area as a fourth Locally Elevated Location (LEL) of dioxin contamination at the facility. Dow will be submitting a Remedial Action Plan to MDEQ which will include paving of the area, and restriction of access.
- On 12/1/06, Dow submitted revised RIWPs for the city of Midland, and the Tittabawassee and Upper Saginaw Rivers in response to two Notices of Deficiency (NOD) issued by MDEQ. The two RIWPs exceed 3,000 pages in length, and contain numerous "placeholders" where Dow wishes to resolve certain disagreements with MDEQ's NOD comments through a process of ongoing work sessions with MDEQ. EPA plans to provide high level (major issues only) comments on the RIWPs to MDEQ in January.
- Dow's recently submitted RIWPs proposes a more aggressive timetable for completing most investigations and having sufficient information to enter into a comprehensive agreement for a final remedy by 2010.
- MDEQ and EPA are cautiously optimistic of Dow's recent proposed timeline. However, optimism is tempered by the lack of any details and Dow's poor performance history with respect to corrective action.
- Dow's first significant characterization event (~2,500 soil and sediment samples) is underway along the upper 6 miles of the TR downstream of Dow.
- Dow is required to submit revised RIWPs for the City of Midland and the TR by 12/1/06 (6 month extension to original due date) in response to MDEQ's 2/2/06 Notice of Deficiency (NOD).
- Dow has proposed timelines that delay final remedies until at least 2011 for the TR and 2017 for Midland. The proposed time lines were submitted on 5/1/06 in partial response to MDEQ's 2/2/06 NOD.
- MDEQ sent Dow an NOD on 2/2/06 identifying numerous critical deficiencies in their RIWPs for the TR and Midland RIWPs which were submitted to MDEQ on 12/29/05.

MDEQ

- MDEQ and Dow are currently working to develop a Target Analyte List (TAL) for constituents other than D/F. MDEQ and Dow expect the TAL to be completed soon. Samples currently being collected on the Tittabawassee River are being archived for analysis when the TAL is completed.

EPA

- EPA has concerns with Dow's past failures to provide timely corrective action information to MDEQ. Recently, MDEQ cited Dow for its failure to provide MDEQ information as required by Dow's RCRA License. EPA continues to have concerns that Dow may not have produced all relevant information it possesses concerning the historic releases of hazardous constituents from its facility. EPA is working with MDEQ to obtain this additional information.

City of Midland

Soil sampling is taking place in the City of Midland this fall. The City had objected to soil sampling within Midland arguing that sampling data could reduce property values. A compromise was reached between MDEQ and Midland where a 3rd party will confidentially hold the sampling data, and MDEQ will only be allowed to look at the data at the office of the 3rd party (no copying or notes). EPA believes the constraints being placed on MDEQ by the City of Midland for soil sampling are unreasonable.

Public Participation

- EPA has recently received 5 broad FOIAs on Dow.
- MDEQ and Dow are holding joint quarterly public meetings to keep citizens informed of corrective action activities. The next public meeting is scheduled for 11/8/06.

HUMAN HEALTH RISK ISSUES

Dow's Proposed Human Health Risk Assessment

As part of the RIWPs, Dow proposes to conduct site-specific human health risk assessments (HHRAs) using a Probabilistic Risk Assessment (PRA) methodology which includes:

- Replacing single point/deterministic estimates for exposure parameters/factors (e.g., body weight, soil ingestion rate, food and water intake rate, exposure duration) with statistically-derived Probability Distribution Functions (PDFs).
- Replacing single point estimates of chemical-specific dose-response factors (i.e., Cancer Slope Factors, Reference Doses, Toxic Equivalence Factors) with PDFs. These PDFs would be developed by reviewing all available scientific literature on the toxicology of each contaminant and mathematically combining them.
- EPA has concerns with numerous PRA studies Dow has proposed as part of its 12/29/05 RIWPs. EPA believes these studies are unnecessary and will result in substantial delays of the final remedies.
- Development of PDFs for dose-responses of contaminants is not in accordance with EPA guidelines. EPA only recognizes toxicity factors developed by HQ through a peer-reviewed, national consensus process.
- Dow has not provided the methodology for mathematically combining the results of numerous toxicological studies to

create PDFs. Establishing and performing such a methodology will delay completion of risk assessments.

- The MDEQ and EPA are in substantial agreement on Dow's proposed HHRA. EPA HQ is reviewing the issues of concern.

Fish & Game Consumption

- The Michigan Department of Community Health released findings in 6/06 from a fish consumption survey identifying potentially at risk segments of the Saginaw Bay watershed population which consume significant amounts of highly contaminated fish.
- There is fish consumption advisory for the TR, Saginaw River and Saginaw Bay and a game consumption advisory for the TR floodplain (advisories due to D/F contamination).