National Waste Minimization Partnership Program

GENERAL INFORMATION

Company Name: The Dow Chemical Company, Texas Operations
Facility Location: Freeport, TX 77541

GOAL DEVELOPMENT - Our initial voluntary goals for reducing and/or recycling chemicals found in our hazardous wastes are shown below. Since these goals are estimates, we may choose to revise these goals as our projects proceed. If/when we find the need to revise our goals, we will notify EPA.

Chemical #1: Dioxins/Furans **CASRN:**

Narrative description of proposed project: Work with EPA to have a promulgated gasification rule that contains reasonable regulatory treatment of gasification of secondary materials in chemical facilities. Thereafter, build a gasification unit at our Freeport, Texas site that will consume at least 100,000,000 pounds per year (a design capacity of 150,000,000 pounds per year) of heavily chlorinated secondary materials that are currently being fed to several RCRA permitted burners. The gasification of these materials will convert them to commercial hydrochloric acid and synthesis gas, for further use in the nation's production process, most likely on-site. This may allow several of the RCRA permitted burners to go through RCRA closure.

The environmental benefits from the gasification of these materials can be collected into three areas. The first is a savings in the consumption of virgin raw materials. The 100,000,000 pounds per year of heavily chlorinated secondary materials will produce approximately 88,000,000 pounds per year of synthesis gas (4,700,000 pounds per year of hydrogen and 83,000,000 pounds per year of carbon monoxide) and 57,000,000 pounds per year of anhydrous hydrogen chloride or 160,000,000 pounds per year of 36% hydrochloric acid or a mixture of the two hydrochloric acid products. The energy required for the production and transportation of hydrochloric acid is also saved, as the hydrochloric acid will most likely be consumed on site. The same is true for the energy consumption associated with the production and transportation of natural gas, as the synthesis gas most likely will be consumed on site. This project will also completely remove any others adverse environmental impact that the production of these virgin materials would produce.

> Note that except for less than 0.1% of chlorine feed that currently becomes air emissions of hydrochloric acid and chlorine, most of the chlorine is already captured as dilute hydrochloric acid through use of halogen acid furnaces. What the gasifier will allow is the capture of this as a more concentrated, up to anhydrous, hydrochloric acid. A more concentrated hydrochloric acid is more useful and more valuable.

The second area of environmental benefit is the elimination of the generation of significant quantities of Persistent Bioaccumulative Toxics (PBTs) and other chemicals that would be of regulatory concern if mismanaged. Gasification keeps these chemicals in the manufacturing process, where the inherent protections against loss of containment and the like are such that the hazardous waste rules do not need to apply. This is also the highest form of recycling in EPA's and Dow's waste hierarchy – elimination of the generation of the waste. (www.epa.gov/epaoswer/non-hw/muncpl/reduce.htm and Dow Operating Discipline Management System (ODMS) 6.07.A.2, "1. Source reduction, 2. Recycle, 3. Recover, 4. Convert, 5. Treatment, 6. Containment") While particular concentrations of particular PBTs are determined by the rate at which feed production processes are running and the particular mix of production processes which are generating feeds to

the gasifier. However, one calculation of potential feeds (at design capacity of 150,000,000 pounds per year) will remove from the waste universe approximately 1,000,000 pounds per year of Pentachloroethane; 5,000,000 pounds per year of 1,1,1,2 Tetrachloroethane; 8,100,000 pounds per year of Tetrachloroethene; 1,500,000 pounds per year of Carbon Tetrachloride; 7,000,000 pounds per year of 1,1,2,2 Tetrachloroethane; 2,000,000 pounds per year of Trichloroethylene; 10,000,000 pounds per year of Hexachloroethane; 8,000,000 pounds per year of 1,2, Dichloropropane; 39,700,000 pounds per year of 1,2,3 Trichloropropane; 1,500,000 pounds per year of Dichloropropanol; 6,000,000 pounds per year of Dichlorobutane; 100,000 pounds per year of Vinyl Chloride; 4,000,000 pounds per year of 2-chloropropene and 3-Chloropropene; 1,500,000 pounds per year of Dichloropropanol; 4,000,000 pounds per year of Dichloropropene; 4,000,000 pounds per year of (3-chloro-1,2-epoxypropane); 6,000,000 pounds per year of Dichloroisopropyl Ether and less than 1,000,000 pounds per year of numerous other chemicals. While these chemicals would have continued to be safely managed in Dow's RCRA permitted incineration devices, absent the gasifier; the gasifier enables these chemicals never to leave the integrated production process.

The third area of environmental benefit is the reduction of air emissions. Since the alternative to gasification is the combustion and emission of generated carbon dioxide, we expect to reduce emissions of carbon dioxide by at least 204,000,000 lbs per year. There is a good possibility that several RCRA burners (HAFs) will be taken out of RCRA service once they are no longer needed to manage these heavily chlorinated feeds. These units currently consume approximately half of the expected gasifier feeds on a carbon basis. These units have air permit allowable emissions of 150,000 pounds (75 tons) per year of NO_x, 144,000 pounds (72 tons) per year of CO, 30,000 pounds (15 tons) per year of THC/VOC, 22,000 pounds (15 tons) per year of HCl 140,000 pounds (68 tons) per year of particulate matter, 48,000 pounds (24 tons) per year of chlorine, 28,000 pounds (14 tons) per year of SO_x, 0.137 I-TEQ grams (15 TM17 grams, as used in the Toxic Release Inventory annual report EPA requires) per year of dioxins and furans (1998). There is a small increase in several parameters from the required gasification flare. This flare's CO permit limit is 60,000 pounds (28 tons) per year. The actual 1998 emissions of these air pollutants is much less than the permit limits. Since the synthesis gas will be initially used as a replacement for existing methane in existing steam/power generation, there is no claim of further emission reduction in air emissions from the use of synthesis gas. This analysis also does not consider secondary savings, such as the reduction in emissions from the avoided production and transportation of the replaced methane.

1. Our voluntary source reduction goal is to reduce the amount of this chemical generated in hazardous waste from a baseline of Dioxins and Furans and other chemicals associated with the actual feeds, typified in the second and third paragraphs of the preceding answer associated with burning 100,000,000 pounds per year of heavily chlorinated secondary materials to a reduced amount of -0- pounds, between May 2002 and May 2006.

2. To accomplish this goal, we will explore the following source reduction : (Check all that apply)

   __X__ Equipment or technology modifications
   _____ Reformulation or redesign of products
   _____ Improvements in inventory control
   _____ Process or procedure modifications
   _____ Substitution of less toxic raw material
   _____ Improvements in maintenance/housekeeping practices

3. Our (optional) voluntary recycling goal for this chemical is to increase the pounds of this chemical recycled from _____ (X lbs/year) to _____(X lbs/year), for a total recycled quantity of _____(X lbs/year) between _____ (month/year) and _____(month/year).

4. To accomplish this recycling goal, we will explore: (check all that apply)
   _____ Direct use/reuse in a process to make a product
   _____ Process the waste to recover or regenerate a usable product
   _____ Use/reuse as a substitute for a commercial product
   _____ Other (explain):