

**March 2, 20007**

**To: DNREC  
Site Investigation & Restoration Branch  
391 Luken Dr.  
New Castle, DE 19720**

**From:  
Glenn R. Evers, Chemical Engineer  
(Former DuPont Titanium Dioxide Employee, Whistle Blower and Good Samaritan)  
Hockessin, DE**

**Title: Public Comment to Hay Road Sludge Drying Site (AKA Iron Rich™ Dioxin Pile). Cherry Island Study**

**Schnabel Engineering Study Reference: 06150049 For DNREC  
dated 12-26-2006**

### **Summary**

Based on Schnabel's Iron Rich™ Dioxin Pile report, I have concluded that DuPont did not conduct a thorough site analysis and does not currently have a secure landfill to protect the City of Wilmington and Delaware public. The dioxin pile contains toxic radioactive chemicals, arsenic, heavy metals, dioxin, dioxin like chemicals, PCB's and benzene chemicals like Hexachlorobenzene (HCB) benzene that will leach out under current conditions and harm the public.

Schnabel indicates it that would be helpful for DuPont to list ALL contamination in grams/pounds contained the 500,000 ton Iron Rich™ Dioxin Pile located on Hay Road product launch area. Schnabel did not have access to critical raw material feed (SCD, Coke & Ore dust and black foam) analytical data from that shows toxic dioxin and dioxin –like concentrations at 1000 times higher concentration. There no explanation of where the most toxic chemical ever made by man, 2,3,7,8 TCDD and furans disappeared to because Schnabel only evaluated limited data provided by DuPont.

The Iron Rich™ Material (IRM) should be removed immediately to a secure landfill or incinerated, especially in light of DuPont's recent employee communication regarding the discovery of 2,3,7,8 TCDD on the Edge Moor site. Edge Moor has international standing as one of the largest toxic dioxin producers.

Assuming that it takes five years to clean out the dioxin pile, DuPont saves \$7-\$70 million/yr by delaying clean-up. DuPont cemented the same waste material and stored it on their production site, yet they insist on keeping IRM, a non-cemented waste in dust form near the City of Wilmington.

The scathing truth is that at least three other DuPont researchers warned Edge Moor that the Iron Rich™ was too contaminated to be sold as a product. The economic advantage of reclassifying a waste as a product so that it could be stored on ordinary land provided tremendous economic and competitive benefit to DuPont. The time has now come remove the dioxin pile.

### **Technical Aspects**

Schnabel was not shown nor did they evaluate the raw material components that go into producing Iron Rich™ using Spray Condenser Discharge (SCD). Based on the ratio of SCD to lime they would have been able to get a more accurate picture of the total dioxin & dioxin-like compounds, and other toxic chemicals that are located the Iron Rich Staging Area.

Other areas that needed to be addressed:

1. Toxic Dioxin/ Dioxin like compounds, PCBs, arsenic and heavy metals, and radioactive chemical analysis of spray condenser discharge (SCD) used to feed the Iron Rich process. Action item: I support Schnabel's recommendation for simple tables showing the public how many pounds of Dioxin/ Dioxin like compounds, PCBs, arsenic and heavy metals that is in 500,000 tons of Iron Rich Material (IRM).

2. Heavy metals and dioxin released from Edge Moor's hot cyclone discharge on was not shown. This feeds into Iron Rich™.

I recommend that you subpoena all Edge Moor analytical results for process streams that directly or indirectly feed the SCD used to make Iron Rich™

3. Schnabel did not list critical 2001 Correspondence between DuPont and EPA Office of Solid Waste (OSW) management concerning EPA's doubts about ferric chloride filter solids (used to make Iron Rich™) and blending waste vanadium soap waste into SCD. DuPont purposely did not reveal that non-bevill amendment vanadium soap waste came from a separate part of the plant that was blended off into the ferric chloride "co-product" and Iron Rich™ "product" through SCD. This practice continued for many years until Edge Moor's waste streams came under scrutiny by EPA.

4. DuPont fails to identify the true chemical nature of the radioactive materials prior to neutralization that was used to make Iron Rich™. They characterized radioactive materials as a solid (i.e. found in granite or fertilizer). In fact, the radioactive material started out quite soluble and actually penetrates plastics such as solid fiber glass storage tank linings and penetrates rubber. The lining of Edge Moor's ocean dumping barge was saturated with radioactivity.

5. Black foam (my terminology). This toxic foam was discovered and analyzed by a young Edge Moor mechanical engineer in the early 1990's and it was found again recently at the DeLisle, MS TiO<sub>2</sub> plant. This light weight material floats to the top of ferric and ferrous chloride carrying PCB's, dioxins and dioxin like chemicals. The black polymeric foam can be easily dried and exposed dioxin piles can be blown towards peoples homes.

6. Schnabel may be confused between "ferric chloride co-product" and "Iron Rich™". Both come from a reddish iron waste stream contaminated with toxic materials. Both come from same raw material called SCD. Iron Rich Material (IRM) is ferric chloride product with a *high* level of sediment that has been neutralized with lime. In contrast, "ferric chloride co-product" has a *low* level of sediment that is diluted and eventually neutralized with lime or caustic at your local drinking water or sewage sludge treatment.

7. High concentrations of carcinogenic hexachlorobenzene (HCB) found in Iron Rich™ is not surprising. Data on HCB in ferric chloride reached an astounding 0.1 wt% range in the late '80's. DuPont excluded correspondence with EPA and the City of Philadelphia. Canada severely restricts HCB contamination by several orders of magnitude.

8. DuPont failed to provide Schnabel a chemical analysis of the neutralized and cemented ponds located on the Edge Moor site. Neutralized pond dredging is chemically the SAME as Iron Rich™. DuPont's own environmental coordinator admitted that there was no difference between neutralized pond dredging and Iron Rich™. Important data on pond material was excluded from the study even though it fed the Iron Rich process™.

9. Typical ore roaster dust and blower analytical data was not presented to Schnabel. Based on recent 2006 coke & ore dust analysis, there seems to be correlation between HCB and the most toxic form of dioxin.

## **Conclusion**

The Iron Rich™ waste was quite simply diluted by lime making dioxin waste detection difficult but not impossible. The DuPont company suspected contamination in ferric chloride processing even before Iron Rich™ started production. Edge Moor recently admitted to their employees and DNREC that the number 1 most toxic chemical ever made by man, **2,3,7,8 TCDD Dioxin**, is in their ferric chloride process.

We know that the Edge Moor plant produces 1 ppm in the SCD. Where did it exit the plant? If it was not found in the Iron Rich Material, then simple accounting dictates that it was dumped the ferric chloride drinking water chemical sold to the public!

DNREC must require a mass balance around each process step that leads to Iron Rich™ to be able to accurately assess where the waste chemicals are going to.

## Appendix A Raw Material Feed into Iron Rich™

### **Edge Moor TiO<sub>2</sub> Process Toxic Waste Flow Diagram**

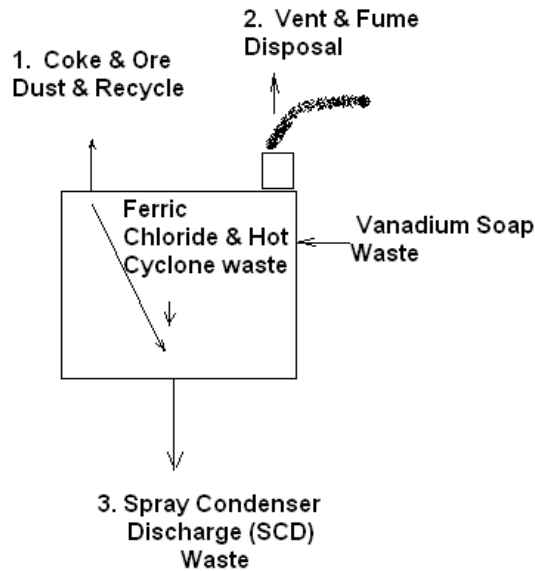
Attached is a very simplified diagram showing where three major waste outlets are at DuPont's Wilmington, DE, Edge Moor titanium dioxide plant. The most significant waste, outlet #3, called SCD waste is shown in Figure 1. It is very significant because DuPont will have to give an accounting of all waste constituents originating in SCD before it was processed into Iron Rich™, and Ferric Chloride co-product.

It is apparent from Schnabel's report that DuPont has failed to present enough analytical data to determine the total amount of toxic chemicals located in the Iron Rich Material (IRM) and as such, has NOT answered public concerns. DuPont has not presented the 100 or more analytical test results they have conducted on the process that leads up to IRM production, most notably the SCD feed. No independent analytical testing has been done in the presence of knowledgeable scientists who know how and where to sample process streams.

In Schnabel's report, **Section 6.3.1 Dioxin** states "It should be noted that the dioxin 2,3,7,8 – TCDD was not detected above its method detection limit within the sample used by DuPont in its risk assessment". The Iron Rich Material has not been vindicated by this statement. It simply means DuPont did the analysis. Past experience when a toxic tort attorney sampling team enters a DuPont plant site and samples the process and shares the samples with DuPont, both sides find significant concentrations of toxic materials.

Figure 1 shows an extremely simplified diagram showing where the major flows of toxic waste are coming from.

Figure 1 Major Waste Outlets from a DuPont Titanium Dioxide Reaction Area Plant.



The TiO<sub>2</sub> process reacts two black materials, coke (from coal) and a black sand with very hot chlorine. Science dictates that this recipe will produce waste: dioxin, toxic radioactive materials, heavy metals and arsenic. It has to end up somewhere.

The question is where does it go?

**Waste Outlet 1** is “coke and ore dust & recycle”. Recent data developed in 2006 indicate that MASSIVE doses of 2,3,7,8 dioxin and Hexachlorobenzene (HCB) can found in a fraction called coke and ore dust (specifically in the ore roaster, but also produced as dust that is blown around in the process). Huge amounts of coke and ore dust exit through Outlet 3. When coke and ore dust is dried and blows around, it blows over the surrounding neighborhoods.

**Waste Outlet 2** is the vent and fume disposal, the gases that are released from the process flow over the public. Edge Moor is one of Delaware’s largest radon emitters. Residues that build up in the inside of the vent stack contain 2,3,7,8 TCDD, very toxic dioxin. You breath it.

Liquid acid that is sprayed through the fumes winds up in Outlet 3. Sampling of **Waste Outlet 3 is the spray condenser discharge (SCD) shows dioxins at 1 ppm**. Any environmental IRM study should start with the raw material, SCD, simply because the waste has not yet been diluted so low that analytical techniques can not detect the most toxic of toxic dioxins.