

3M/INTERNAL CORRESPONDENCE

---

To: Craig A. Burton - Fluorochemical Technology Center - 236-3C-89  
From: Robert D. Howell (778-7540) EE&PC - 2-3E-09  
Subject: Environmental Concerns with Fluorochemicals  
Date: September 15, 1992

At the request of the Fluorochemical Technical Advisory Committee, I have prepared a list of projects to investigate fluorochemicals in the environment along with the major reasons the projects are needed and a short description of each one.

I prepared the list by combining concerns from a variety of sources. One source was the Fluorochemicals Conference held in January, 1991. In addition to the Conference, Craig Olson held a series of follow-up meetings with various individuals from the fluorochemical divisions and staff groups. Craig shared his notes from the follow-up meetings with me and I have incorporated his notes into the projects and the descriptions. There are also contributions to the project list from the Environmental Science and Assessment group. These contributions are based on our knowledge of current global environmental issues and the questions we receive from 3M's international product responsibility liaisons, product development labs, regulatory agencies, and customers.

I have also included as a separate attachment a list of the concerns brought out in the Fluorochemical Conference and Craig's follow-up meeting notes. This list is intended to provide additional background information on the need for the projects in my list. Since the Conference discussion sessions and follow-up meetings were organized around product lines, I organized the list of concerns into six product line categories: Fabric Treatments, Paper Treatments, Engineering Fluids, Fire Extinguishing Foam Concentrates, Surfactants, and Performance Polymers. There is also a category that includes general concerns that could not be assigned to any particular product line. I also included a category for non-fluorochemical issues. This category includes many valid concerns for 3M products, but the concerns are not directly related to fluorochemical components. The concerns within each category are not in any particular order, but are listed as they came up in the Conference discussion or Craig's notes. Also, the concerns have not been attributed to any single person since some concerns were mentioned several times.

There are some important points I would like to make regarding the list of projects. First, the projects are not given in a prioritized order since prioritizing is one of the tasks of the Advisory Committee. Second, I haven't given any cost estimates since

**Exhibit  
1378**

State of Minnesota v. 3M Co.,  
Court File No. 27-CV-10-28862


3MA00323897

1378.0001

Mr. Craig Burton  
Page 2

this is intended to represent concepts and general project descriptions without protocols. Third, I haven't indicated where these studies could be done. Nevertheless, I am confident that the studies are possible and that they could be carried out to the satisfaction of the Fluorochemical Steering Committee either in the 3M Environmental Laboratory, at a university, or possibly a contract laboratory. Finally, I believe the approach should be to look at specific molecules and not formulated products. Where appropriate, I have made some suggestions as to what I think would be good choices of fluorochemical molecules but the Advisory Committee will determine which molecules should be used for study.

I am looking forward to working with you and the other members of the Technical Advisory Committee on these projects. I am hoping we can move forward quickly with the prioritizing of projects and get the more important projects underway very soon. I can be reached on 8-7540; please call me if necessary.

  
RDH:jms

cc: D. L. Bacon - EE&PC - 2-3E-09  
Craig W. Olson - Chemical, Film & Allied Group Compliance - 236-GL-4

3MA00323898

1378.0002

List of concerns expressed by participants in the Fluorochemical Conference and follow-up meetings.

1. Fabric Treatments (Fabric, Carpet, and Leather Protectors)
  1. Incineration
  2. Disposal of carpet waste
2. Paper Treatments
  1. Incineration (industrial and home; burning vs. smoldering)
  2. Compost
  3. Microwave breakdown of FC's
  4. Gamma sterilization effects on FC's
  5. Build up of 807/809 in "closed" mill water systems
  6. "Final states" of 807/809 in landfills
3. Engineering Fluids
  1. GWP
  2. Atmospheric lifetime (define what is "ideal" atm. lifetime)
  3. Atmospheric fate (ultimate location, evaluation of degradation products and pathways)
  4. Toxicity (mammalian and ecotox, starting materials and degradation products)
  5. Identification of materials which meet the needs applications but with low toxicity, low atmospheric lifetime, low GWP, etc.
  6. Thermal break-down (FC-40, 70, or 43) and subsequent corrosion problems
  7. Identification and characterization of impurities
  8. Political situation
4. Fire Extinguishing Foam Concentrates
  1. Soil binding/soil mobility
  2. Fate in wastewater treatment
  3. Removal from waste stream
  4. Aquatic toxicity
  5. Recycling/reworking of usage waste
  6. Bacteria that will degrade fluorochemical
  7. Air emissions from use
  8. "Environmental misinformation" being published by competitors in Europe
5. Surfactants
  1. Fate in wastewater treatment (floor polish and cleaning uses)
  2. Political - need to convince regulatory authorities that the materials are specialty items.
  3. Biodegradability (90% requirement in Ger.)
  4. Bacterial degradation (anaerobic)
  5. Recovery/recycling/reworking
  6. Removal of C8 from waste streams
  7. Commercialization of the waste from C8
  8. Assess the quantity of fluorochemicals in customers' (e.g., Dupont) plants

6. Performance Polymers
  1. Waste disposal
  2. Scrap disposal
  3. Return of scrap
  4. Monomer atmospheric effects: GWP, VOC, ODP
  5. Toxicology of monomers, emulsifiers, curatives
  
7. General Concerns
  1. Biodegradability
  2. Toxicity
  3. Regulatory/political situation (esp. in Europe)
  4. Assessment of fluorochemicals in the environment and update on activities
  5. Physical/chemical properties (water solubility, octanol/water partition coefficient, vapor pressure)
  
8. Other Non-Fluorochemical Issues
  1. Cost reduction
  2. Formaldehyde content in SaniFoam brand synthetic daily cover
  3. Improving ECF quality
  4. Proprietary/Trade Secret protection
  5. Chemical vs. thermal post cell treatment of inerts to remove less stable impurities
  6. Alternative production methods
  7. Waste reduction (esp. tars)
  8. EPA guidelines on HF
  9. Distillation column length for inerts and removal of hydrides
  10. Longer cell runs
  11. Energy and material balances on existing and new processes
  12. Improved RM quality
  13. Use for waste H<sub>2</sub>
  14. "Leasing" of inerts to customers rather than sale and return
  15. Becoming "basic" in HF
  16. Chromium in Scotchgard leather protector products
  17. Flammability
  18. Elimination of drums
  19. Solve "sick house syndrome"
  20. Toluene in manufacture of Scotchban; acetone in FX-845 mfg. process
  21. Butyl Cellosolve in FC-809; IPA in FC-807
  22. Formaldehyde on cure of FX-1800/461 (med. nonwoven)
  23. Packaging waste disposal/returnable containers
  24. Need to educate sales staff on issues