

3m meeting with EPA

AR226-1302

3/3/03

39 pp

| <u>name</u>             | <u>affiliation</u> | <u>phone</u>   |
|-------------------------|--------------------|----------------|
| Ward Penberthy          | EPA/OPPT           | 202 564 8171   |
| Margaret Schneider      | EPA/OPPT           | 202 564 3810   |
| Charlie Auer            | EPA/OPPT           | 202 564 3810   |
| Tom DiPasquale          | 3M                 | (651) 733-1891 |
| Mike Santoro            | 3M                 | 651 733-6374   |
| BOB Sussman             | Latham+Watkins     | 202-637-2183   |
| Larry Zobel             | 3M                 | 651 733 5181   |
| Mary Dominick           | EPA/OPPT           | 202-564-8104   |
| Gautam Srinivasan       | EPA/OLC            | 202-564-5647   |
| Oscar Hernandez         | EPA/OPPT           | 102-564-0930   |
| Jennifer Seed           | EPA/OPPT           | 202-564-7634   |
| Andrea Pfahles-Hutchens | EPA/OPPT           | 202-564-7601   |
| Mary Ellen Weber        | EPA/OPPT           | 202 564 8770   |
| Michael Santoro         | 3M                 | 651-733-6374   |

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| NAME               | ORGANIZATION      | TELEPHONE #                                 | E-MAIL ADDRESS                        |
|--------------------|-------------------|---------------------------------------------|---------------------------------------|
| Ward Penberthy     | EPA/OPPT          | 202 564 8171                                | penberthy.ward@epa.gov                |
| Yukiko Nishiyama   | Daikin            | 301 585 7529                                | yukiko.nishiyama@lampart-japan.com    |
| EDWARD LAMPERT     | DAIKIN            | 917-365-4440                                | LAMPERT@LAMPERT-JAPAN.COM             |
| MARK GREENWOOD     | Repegray (Daikin) | 202-646 3905                                | Mgreenwood@repegray.com               |
| Barbara Leczynski  | EPA/OPPT          | 202-5648164                                 | Leczynski.Barbara@epa.gov             |
| Kerichi Ohnishi    | Asahi Glass Co.   | 704-357-6091                                | kohnishi@asahiglass.com               |
| Bobbie Altman      | Clariant Corp.    | 704.395.6557                                | bobbie.altman@clariant.com            |
| Phil Oshida        | EPA/OPPT          | 202 564 4760                                | oshida.phil@epa.gov                   |
| Hans Paulke        | Clariant GmbH     | 449-69-305-5570                             | hanshildwig.paulke@clariant.com       |
| JOHN GANNON        | DUPONT            | 302-366-6609                                | JOHN.GANNON@USA.DUPONT.COM            |
| MARY Ellen Weber   | EPA               | 202 564 8770                                | weber.maryellen@epa.gov               |
| Bob Buck           | DuPont            | 302 <sup>892-8935</sup> <del>625-0172</del> | robert.c.buck@usa.dupont.com          |
| Steve Korzeniewski | DuPont            | 302 <sup>895-8632</sup> <del>625-0172</del> | stephen.h.korzeniewski@usa.dupont.com |
| GARY SPITZER       | DuPont            | 302-942-4722                                | gary.w.spitzer@usa.dupont.com         |
| Bob Ritzhieb       | DuPont            | 302-222-3680                                | ROBERT.B.RITZHIE@USA.DUPONT.COM       |
| Andy Mamantov      | EPA/OPPT          | 202-564-9539                                | mamantov.andy@epa.gov                 |
| John Blouin        | EPA/OPPT/CEB      | 202-564-8519                                | blouin.john@epa.gov                   |
| Wendy Hoffman      | EPA/OPPT/EETD     | 202-564-8794                                | hoffman.wendy@epa.gov                 |
| Jasbir Sarna       | EPA/OPPT/EETD     | 202-564-8576                                | SARNA.JASBIR@EPA.GOV                  |
| Gautam Srinivasan  | EPA/OCC           | 202-564-5647                                | srinivasan.gautam@epa.gov             |
| Margaret Schneider | EPA/OPPT          | 202 564 3810                                | Schneider.Margaret@epa.gov            |
| Katse Smythe       | RAND              |                                             |                                       |

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# TRP Telomer Research Program

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Presentation For

US Environmental Protection Agency

3 April 2003

NO TSCA CBI



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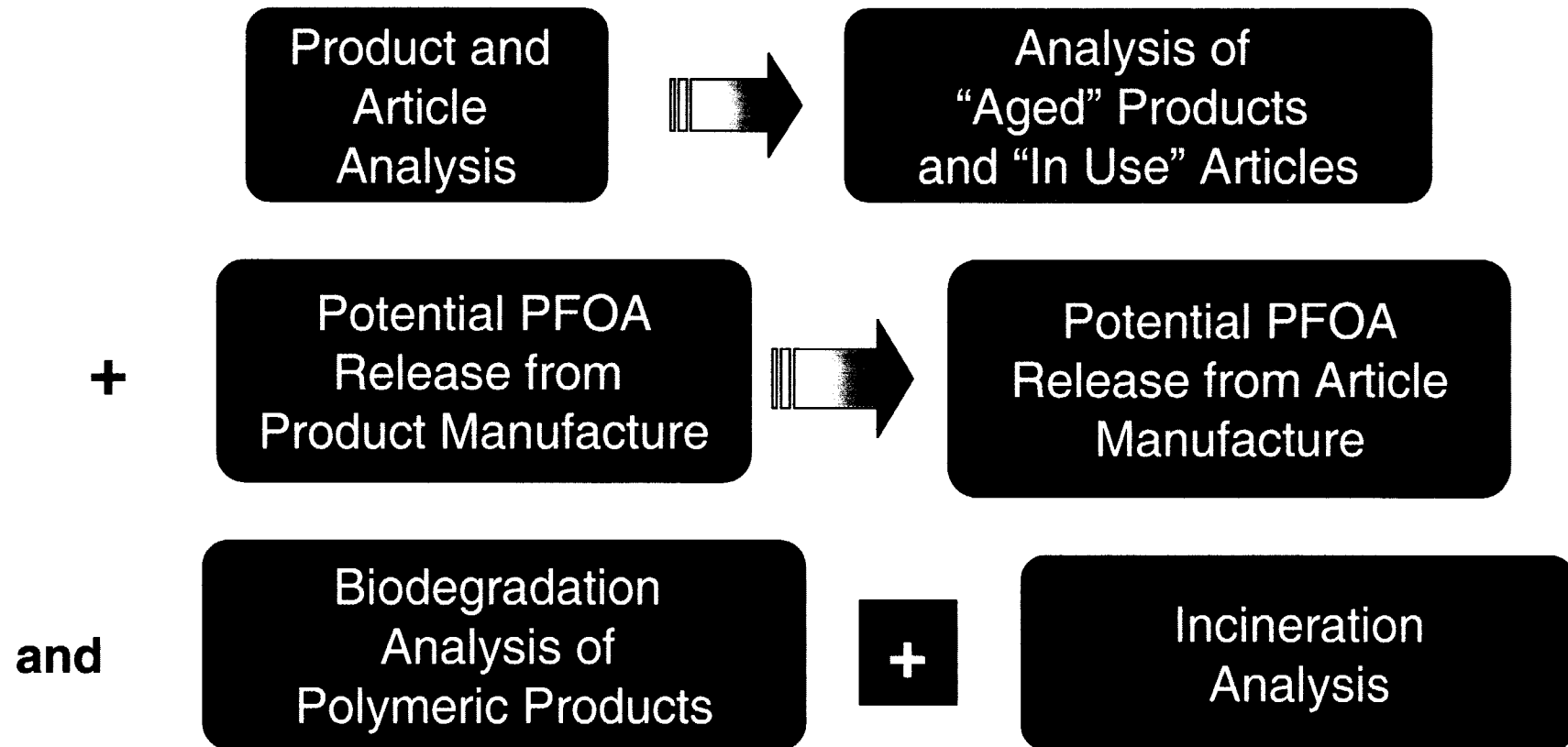
## **TRP Presentation Outline**

- **Introductions and Agenda**
- **TRP US EPA Letter of Intent (LOI)**
- **March LOI Submissions**
- **April LOI Submissions**
- **Product & Article Analysis Rationale**
- **Preliminary Biodegradation Study Overview**
- **Conclusions, Discussion & Questions**

- **Investigate the potential formation and/or release of perfluorooctanoic acid (PFOA) from Fluorotelomer-based polymeric products and consumer articles treated with such products and from manufacturing operations making or using these products**
- **Better understand telomer-based polymeric product environmental fate and disposal**

## Telomer Research Program

### TRP LOI Commitments:

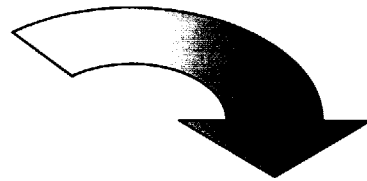


**\*Analyses on Polymeric Products for Carpet, Textile, and Paper Segments**  
**Most of these analyses will be done in parallel, not sequential**

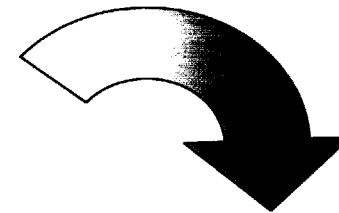
## Telomer Research Program

### TRP LOI Commitments:

Product Stewardship:  
Added Programs &  
Handbook



Continuation of  
8-2 Telomer Alcohol  
Research Activities



Information  
Exchange  
& Document  
Submissions

- Product and Article Analysis

- Scope and rationale for analyzing for PFOA in telomer-based products and telomer-treated articles by 31 March 2003 (done)
- Analysis for PFOA in representative telomer-based polymeric products and telomer-treated articles
- Covers primary polymeric product end-use applications: carpet, textiles, paper
- Information on products to be tested to be provided by TRP companies (under CBI) – by March 2003 (done); other products and applications – by May 2003 [CAS # / name / structure, 2002 use and volume ]
- Method development and validation to begin in March 2003 followed by sample analysis; results expected by June / July 2003

## Telomer Research Program

- Analysis of “Aged” Products and “In Use” Articles\*

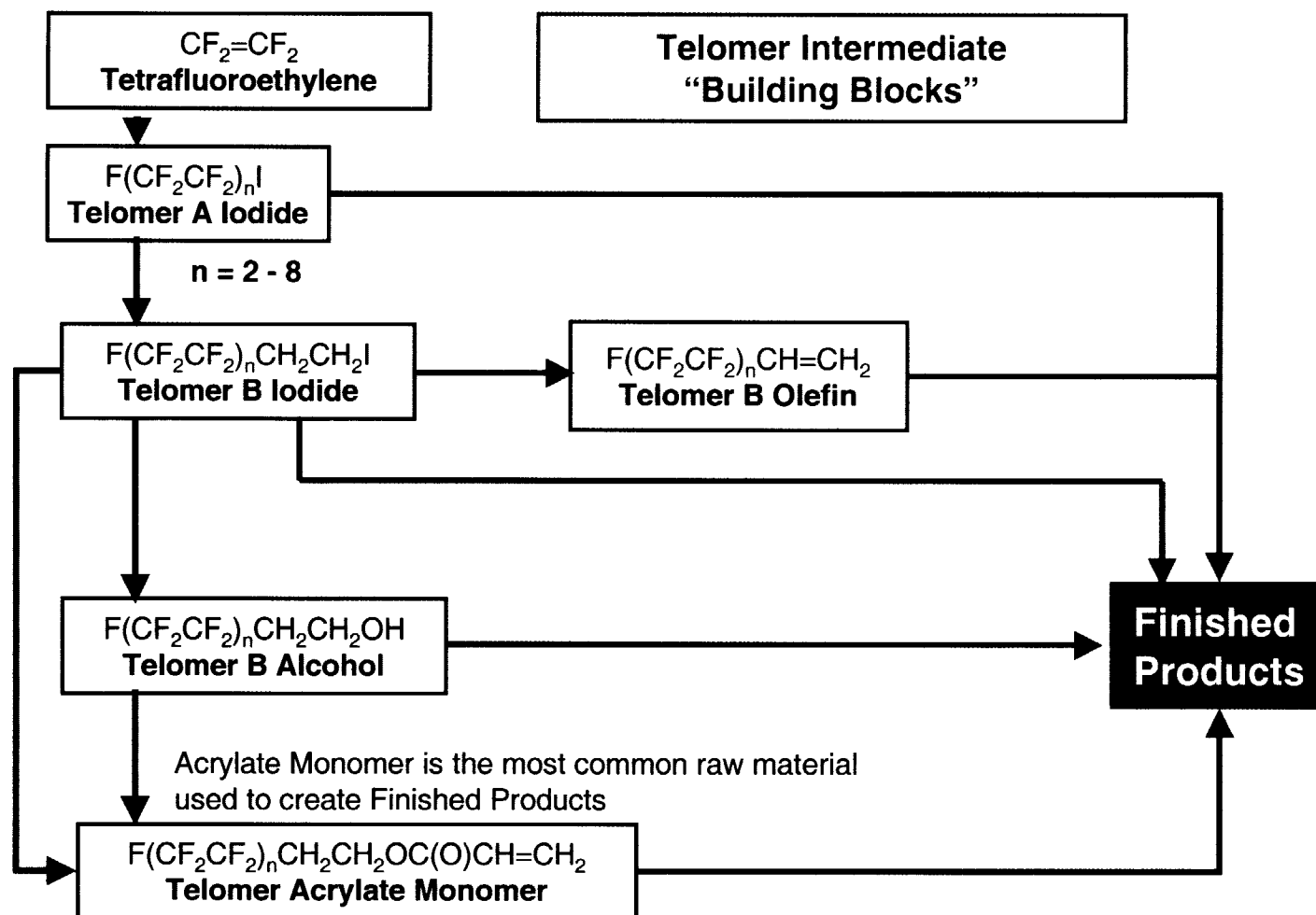
- Develop plan for conducting PFOA “aging” and “in use” analytical studies in initial end use segments of Carpet, Textiles, and Paper by April 2003.
- Define relevant “aging” and “in use” conditions for carpet, textiles, paper including light exposure, “walk off”, degradation, volatilization, and leaching
- Develop appropriate analytical methods and study protocols – in Qtr 2 / 2003
- Conduct and complete studies by Qtr 3 / 2003

\*For this analysis, “aged” means the storage and distribution of products and “in-use” means the distribution and use of the treated articles

## Telomer Research Program

- Characterizing Potential PFOA Release from Product Manufacture
  - Provide general outline of process chemistry employed in telomer manufacturing and processing operations – by March 2003 (done)
  - Describe specific telomer manufacturing process chemistry by member companies and submit information about potential release of PFOA or exposure points from telomer manufacturing and processing (US operations; likely under CBI) - by April 2003
  - Develop action plans to investigate the potential for PFOA release and exposure (TRP member companies) - by end of May 2003

# Telomer Research Program



- Actual process and manufacturing practices vary by company
- PFOA is not used or added in these processes
- Generally, these processes are closed and PFOA creation and/or emissions are expected to be at very low levels

- Characterizing Potential PFOA Release from Article Manufacture

- Develop article manufacture release estimations of PFOA (carpet, textiles, paper); completion by June / July 2003
- Develop and demonstrate sampling and analytical methods for PFOA determination in mill simulations – during Qtr 3 / 2003
- Conduct mill simulations of potential releases of PFOA from telomer-treated article manufacture – begin in Qtr 3 / 2003

- Biodegradation Analysis of Polymeric Products
  - Develop study approach, protocols and rationale for conducting biodegradation analyses of telomer-based polymeric products – by April 2003 to EPA for review and comment
  - Conduct biodegradation studies for potential generation of PFOA from polymeric products used in Product & Article Analysis – results expected beginning in July 2003

# Telomer Research Program

- Analysis of Incineration

- Compile information on polymeric products and uses to understand ultimate fate and disposal routes (landfill versus incineration) for telomer-treated articles in US – provide to EPA by July 2003
- Review applicable incineration tests and provide summary of information to EPA by end of Qtr 2 / 2003

## Telomer Research Program

- Product Stewardship for Customers

- TRP member companies will have additional product stewardship programs for customers / users of telomer-based products and telomer-treated articles in place by July 2003
- Programs will be designed with reference to the Responsible Care guidelines outlined in SOCMA Management Practices / Product Stewardship Code
- Develop TRP Safe Handling and Use Handbook for customer review – by August 2003

- Continuation of 8-2 Telomer Alcohol Research Activities
  - Toxicology and Pharmacokinetics (pilot studies)
  - Physical-Chemical Properties
  - Submit 8-2 Telomer alcohol preliminary biodegradation screening study reports to EPA by 24 March 2003 (done)
  - Environmental Fate & Effects
    - Hydrolysis, atmospheric degradation, ecotoxicity, biodegradation

## Telomer Research Program

### ● Information Exchange

- Final reports from TRP-sponsored studies as they become available (ongoing); report schedule for 2003 provided to EPA
- Provide list and copies of documents and materials in TRP database – March / April 2003; new documents as they become available
- Information from TRP companies on their own studies on telomer products sold in US market – as they become available
- Periodic briefings, expected to be monthly, to summarize current results from telomer studies

## **Telomer Research Program**

- **Develop site specific plans on its US operations to assess levels of PFOA in air and water from manufacturing operations around each site; development of plans will begin not later than 30 days after the date of this letter.**
- **Conduct site-specific air dispersion modeling for applicable manufacturing operations, using the EPA approved Industrial Source Complex Short Term 3 (ISCSTS) model, as described in EPA's Guideline on Air Quality Models (40 C.F.R. Part 51, Appendix W), and assess the results using the air screening levels established in West Virginia.**
- **Conduct ground and surface water analyses at each site, and assess the results using the water screening levels established in West Virginia.**
- **Use the West Virginia screening levels to determine what additional actions, if any, may need to be taken, after reviewing the information with EPA.**

## **Telomer Research Program**

- **Six months after this Letter is submitted, reports will be submitted for each site on progress made with respect to environmental assessments.**
- **In addition, by April 1, 2003: provide EPA with applicable existing industrial hygiene air monitoring data for PFOA from DuPont operations at Chambers Works; and the DuPont telomers business will provide EPA with summary data on existing employee blood monitoring results from telomer manufacturing operations and PFOA recycle operations at Chambers Works. (Item completed)**

# Telomer Research Program

## TRP March LOI Submissions

### TRP Submissions to EPA - Planned for March 2003

3 April 2003

| Title / Description                                                                 | Contractor      |
|-------------------------------------------------------------------------------------|-----------------|
| TRP Database List                                                                   | (TRP)           |
| Company-specific information on products -- submitted as CBI                        | (TRP companies) |
| General Description of Telomer Process                                              | (TRP)           |
| Biodegradation Research - Scope & Rationale                                         | (TRP)           |
| Product & Article Analysis - Scope & Rationale                                      | (TRP)           |
| Air monitoring data for PFOA from DuPont operations at Chambers Works               | (DuPont)        |
| Employee blood monitoring data from telomer manufacturing + PFOA recycle operations | (DuPont)        |

# Telomer Research Program

## TRP April LOI Submissions

### TRP Submissions to EPA - Planned for April 2003

3 April 2003

| Title / Description                                                                                                                                                                   | Contractor      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Submit plan for review and comment on conducting PFOA "aging" and "in-use" analytical studies in carpet, textile, and paper end-use segments                                          | (TRP)           |
| Description of specific telomer manufacturing process chemistry by member companies and information about potential releases of PFOA and exposure routes from US operations           | (TRP Companies) |
| Develop study approach, protocols, and rationale for biodegradation analysis of polymeric products used in the Product and Article Analysis and share with EPA for review and comment | (TRP)           |
| Provide copies of documents and other materials from the TRP database                                                                                                                 | (TRP)           |

### Product & Article Analysis Summary

#### Purpose

- To investigate the potential formation and/or release of PFOA from telomer-based products and consumer articles treated with such products
- To determine whether articles treated with representative telomer-based products contribute to significant human or environmental exposure to PFOA

## Product & Article Analysis Summary

### Overview

- Screening Study -- being conducted by independent research lab
- Treated Articles
  - 3 major end-use applications – *carpets, textiles and paper*
  - Samples of telomer-treated articles under representative or actual mill conditions
- Primary Products
  - *Polymers* – represent approximately 85% of telomer-based products manufactured and sold by TRP member companies
  - Primary product classes in commerce - 12 product formulations to be tested

# Telomer Research Program

## Product & Article Analysis Summary

### Approach & Methodology

#### Method Development and Validation

Develop sampling, shipment and analysis procedures (TRP experts)

Prepare primary and [1,2-<sup>13</sup>C] PFOA analytical standards

Identify and solicit bids from potential contract labs; select lab

Develop method for quantitative determination of PFOA in various article matrices and telomer-based products (contract lab)

Validate methodology for determining PFOA in treated articles

#### Article Analysis

Collect and provide samples of 12 telomer-treated articles (TRP companies)

- samples from pilot plant facilities or commercial manufacturing facilities

Types of samples: representative textile, carpet and paper articles (12 total)

Analyze samples for PFOA using developed / validated analytical method

## Product & Article Analysis Summary

### Approach & Methodology

#### Article Analysis (cont.)

LC/MS/MS method with [1,2-<sup>13</sup>C] PFOA internal standard

Lower limit of quantitation for PFOA: 1 ppb

Relative standard deviation: less than 20%

Extraction efficiencies goal: 70-110% for 3 matrices

- carpet (nylon), textile (polyester) and paper
- PFOA fortification levels: 1 ppb, 10 ppb, 100 ppb

Samples: 162 untreated carpet (shaved), textile and paper samples

Method validation under GLP

- 36 samples for each article: 6 samples each at 1 ppb, 10 ppb, 100 ppb on 2 separate days (108 total)

## Product & Article Analysis Summary

### Approach & Methodology

#### Article Analysis (cont.)

Test Samples: 12 articles treated with single telomer-based polymeric product  
(4 unique carpet/product pairs, 6 textile/product pairs, 2 paper/product pairs)

- 6 sub-samples to be analyzed for each article / product pair (72 total)
- samples selected by block design approach
- 4 untreated samples for control and extraction efficiency verification

## Product & Article Analysis Summary

### Approach & Methodology

#### Product Analysis

Product types: acrylate and urethane polymers (12 product formulations)

LC/MS/MS method with [1,2-<sup>13</sup>C] PFOA internal standard

Lower limit of quantitation for PFOA: 1 ppm

Relative standard deviation: 20%

Extraction efficiencies to be evaluated (prior to product analysis) on 2-3 product groups

Product analysis to be conducted under GLP

# Telomer Research Program

## Product & Article Analysis Summary

### Schedule

#### January – February 2003

Develop sampling, shipment and analysis procedures (TRP experts)

Prepare primary and [1,2-<sup>13</sup>C] PFOA analytical standards

Identify and solicit bids from potential contract labs; select lab

Prepare internal standard for use by contract lab (TRP company)

#### March – April 2003

Develop and validate analytical and sample methods (contract lab)

Prepare and deliver samples to contract lab for analysis (TRP companies)

#### May – June 2003

Analyze telomer-treated articles and telomer-based polymeric products

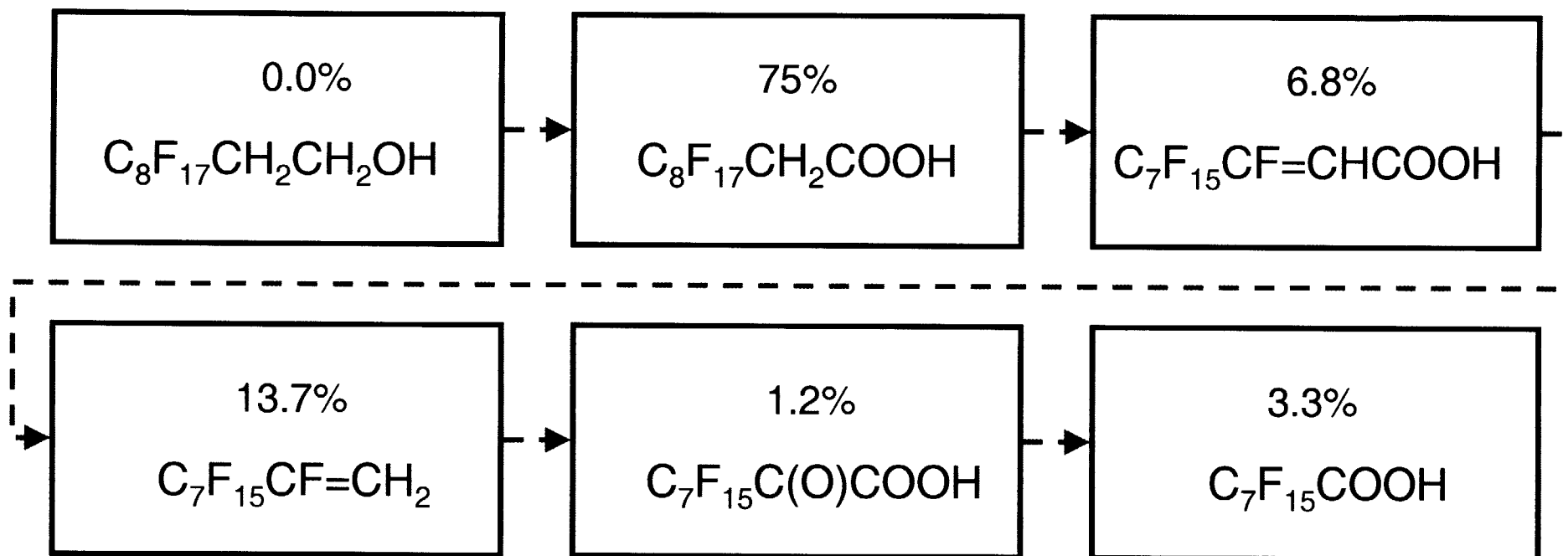
Prepare final report (expected June/July 2003)

## Telomer Research Program

### Preliminary Biodegradation Screening Overview

## Telomer Research Program

### CATABOL Biodegradation Prediction



- The sum of the % values = 100
- The model *predicts* this will be the distribution of transformation products

## Telomer Research Program

### 8-2 Telomer B Alcohol Biodegradation Screening Studies - DuPont

- 28 Day “Ready” Biodegradation Screening Study
  - Cold Test Material  $C_8F_{17}CH_2CH_2OH$
  - Test Systems
    - Non-acclimated municipal sludge
  - 8-2 Telomer B Alcohol is the only carbon source
  - Endpoints monitored : parent loss, fluoride
- Began Dec. 2002

## Telomer Research Program

### 8-2 Telomer B Alcohol Biodegradation Screening Study - DuPont

- Growth medium:

OECD 301D mineral medium  
without yeast extract

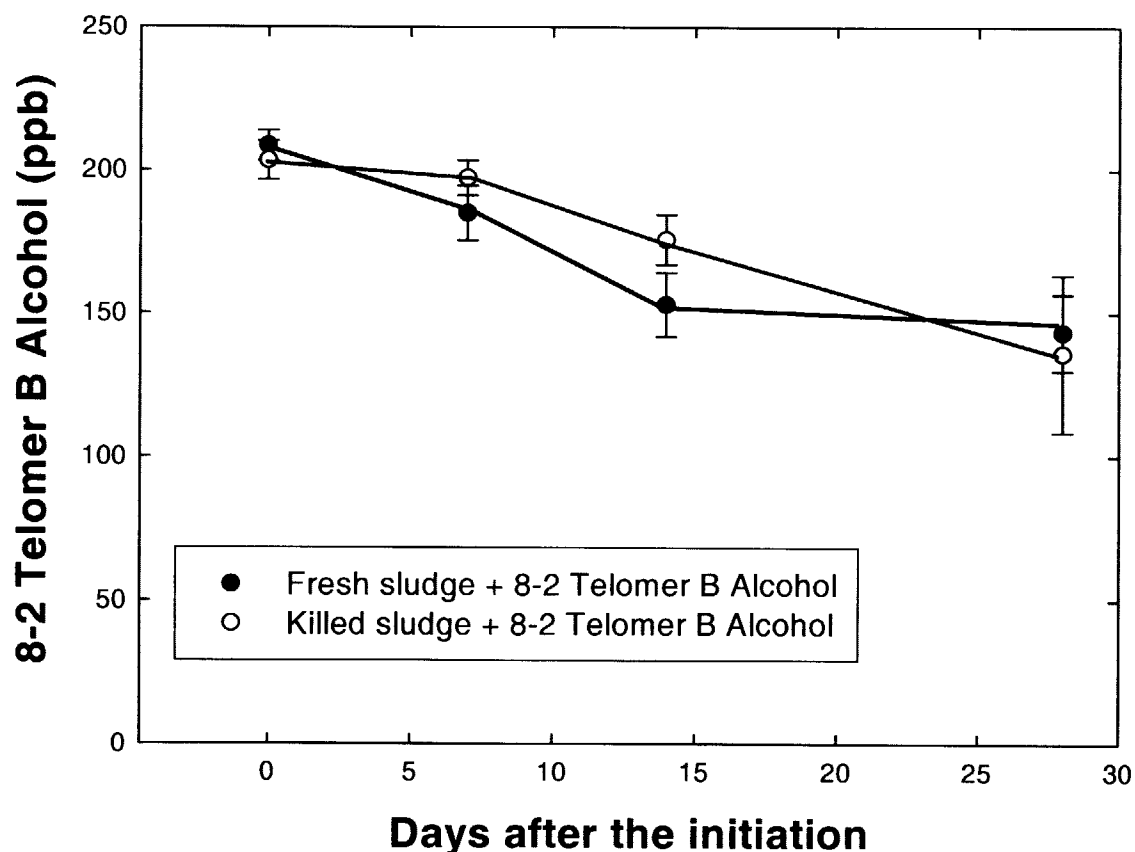
- Inoculum source:

POTW, fresh sludge  
(Incubated for 0 - 28 days)

- Conclusion:

8-2 TBA is not readily  
biodegradable.

Aerobic Ready Biodegradation (Modified OECD  
301D Closed Bottle Test) (12/31/02 - 1/28/03)



# Telomer Research Program

## 8-2 Telomer B Alcohol Biodegradation Screening Study - DuPont

- Growth medium:

OECD 301D mineral medium  
without yeast extract

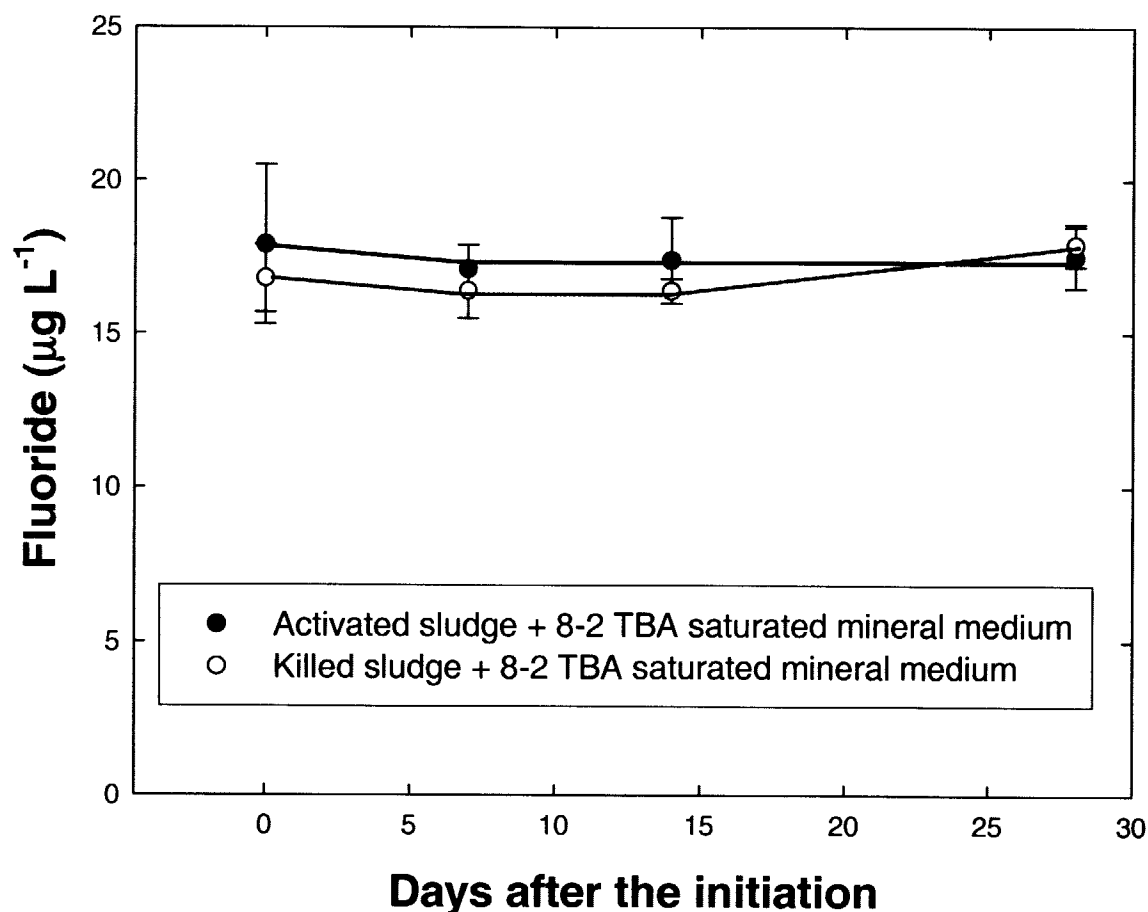
- Inoculum source:

POTW, fresh sludge  
(Incubated for 0 - 28 days)

- Key Observation:

No defluorination occurred.

**Aerobic Ready Biodegradation (Modified OECD  
301D Closed Bottle Test) (12/31/02 - 1/28/03)**



## Telomer Research Program

### 8-2 Telomer B Alcohol Biodegradation Screening Study - DuPont

- **Accelerated Screening Study**
  - Cold Test Material  $C_8F_{17}CH_2CH_2OH$
  - Test Systems
    - Acclimated industrial sludge
  - yeast extract as additional carbon for co-metabolism
  - Endpoints monitored : parent loss, fluoride, fluorinated acids
- Began July 2002, Completed January 2003

# Telomer Research Program

## 8-2 Telomer B Alcohol Biodegradation Screening Study - DuPont

- Growth Medium:

E2-BSMYE (2 g/L of yeast extract as additional carbon)

- Inoculum source:

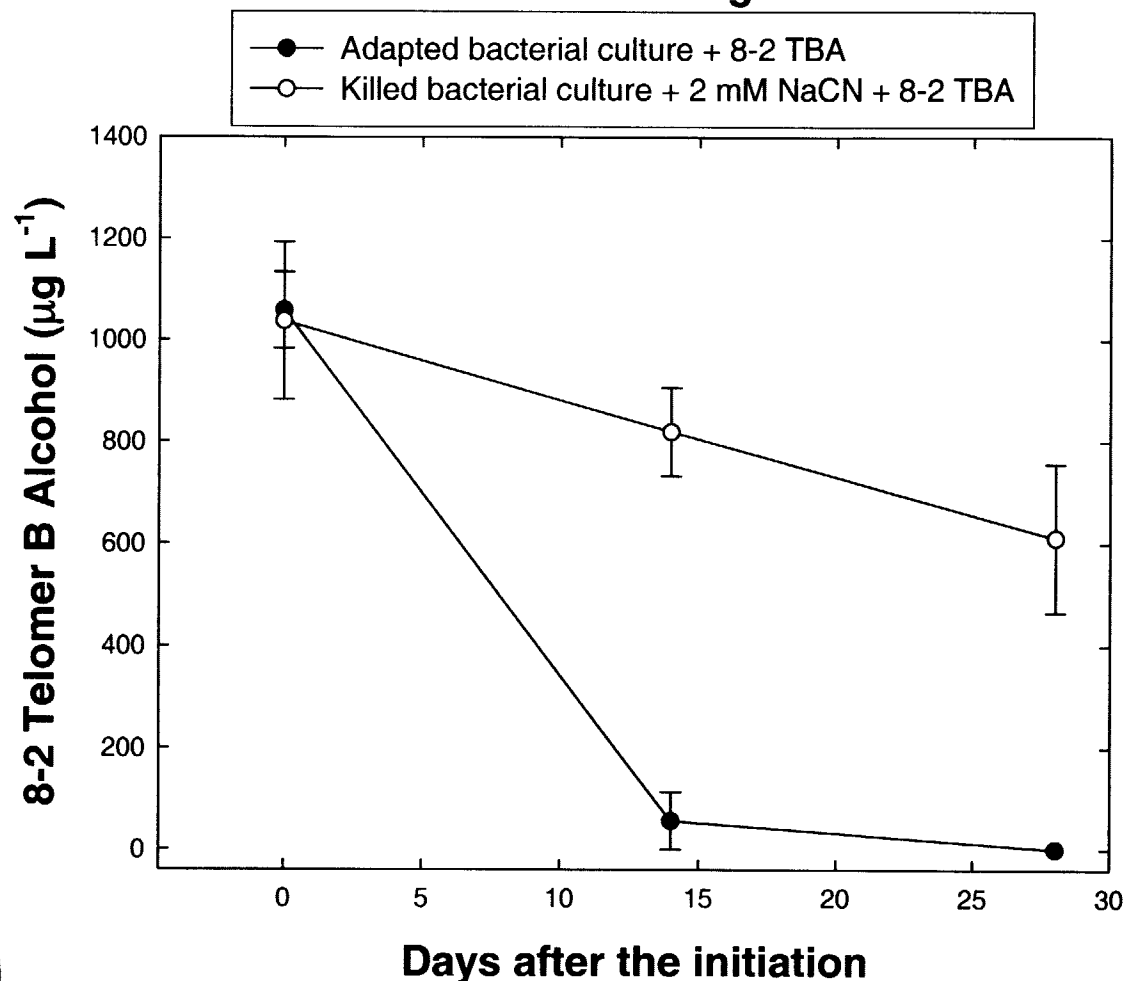
Industrial WTP (28 days; TA50-51-52; 7/19 - 8/16/02)

- Starting Conc of 8-2 TBA:  
~800 ppb

- Observation:

8-2 TBA has been rapidly biotransformed

### Accelerated Biodegradation



# Telomer Research Program

## 8-2 Telomer B Alcohol Biodegradation Screening Study - DuPont

- Growth Medium:

E2-BSMYE (2 g/L of yeast extract as additional carbon)

- Inoculum source:

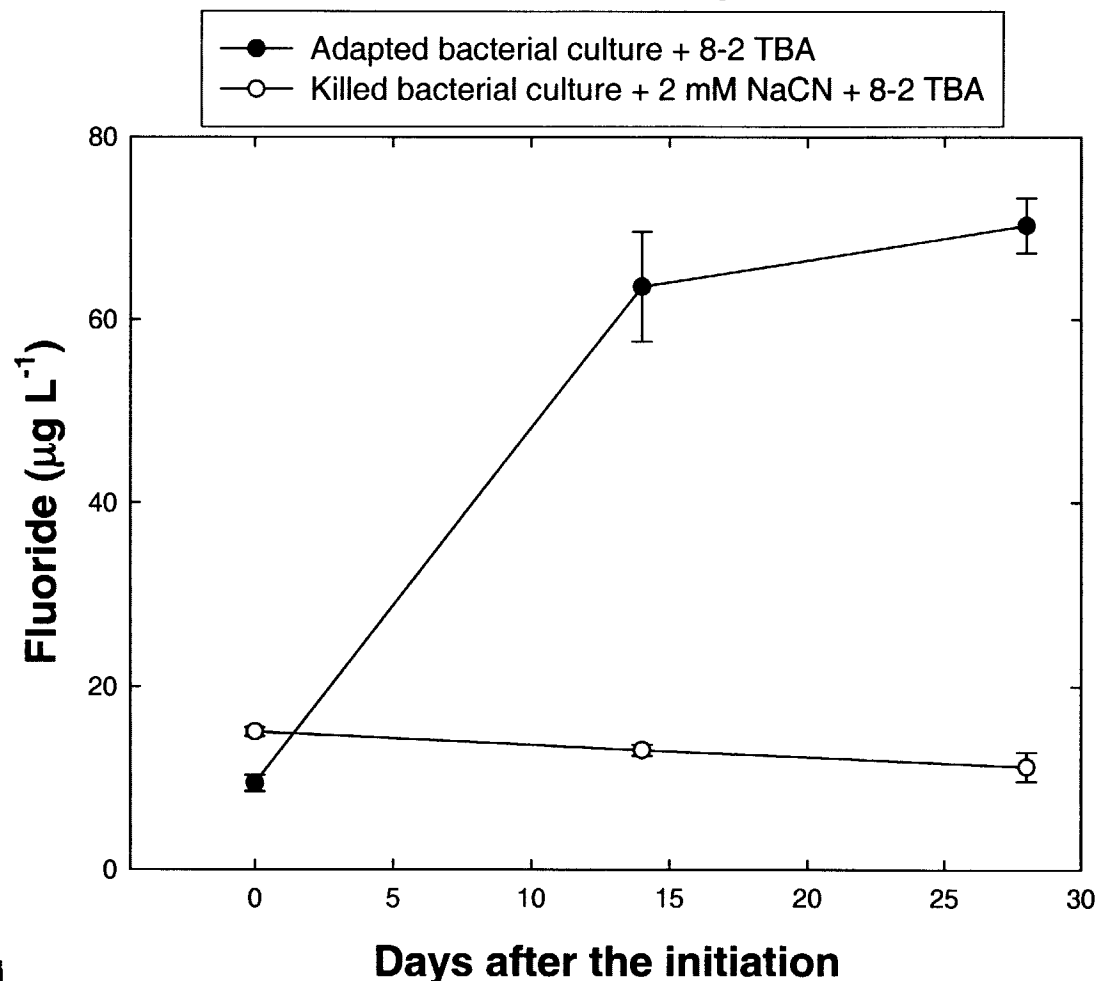
Industrial WTP (28 days; TA50-51-52; 7/19 - 8/16/02)

- Starting Conc of 8-2 TBA:  
~800 ppb

- Observation:

A net increase of 60 ppb of fluoride over 28 days.

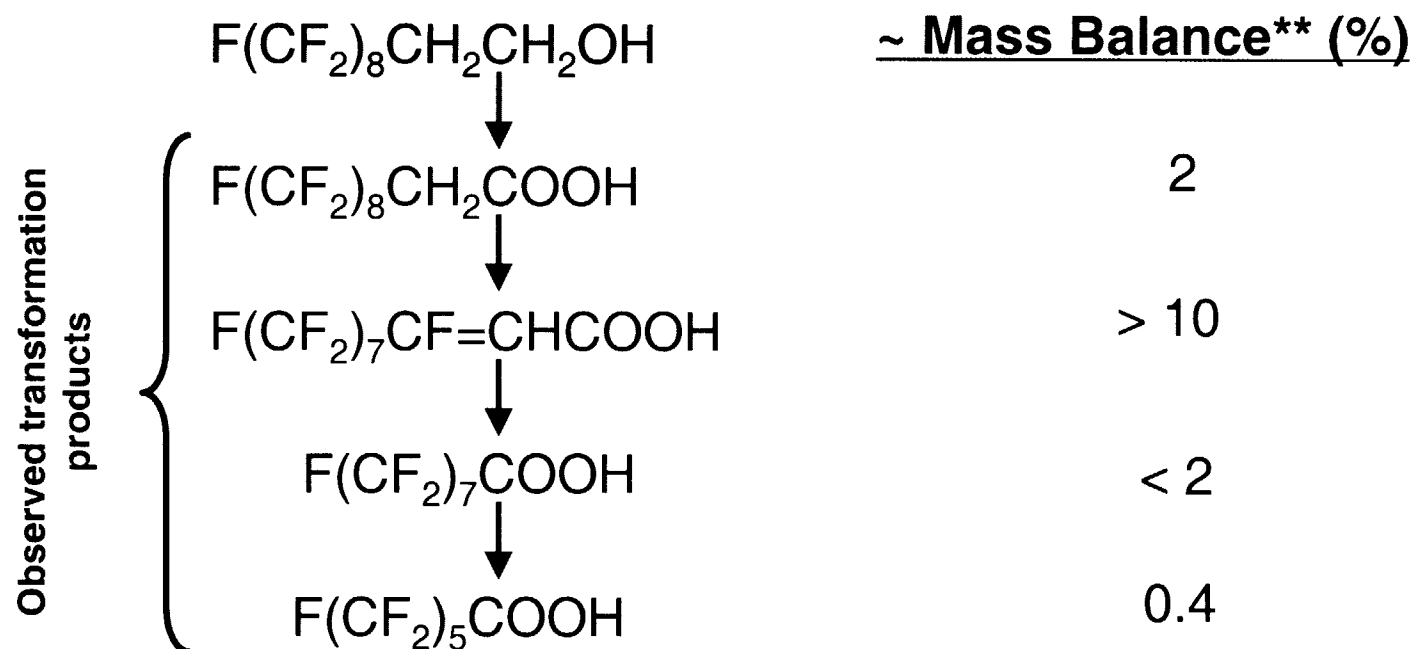
### Accelerated Biodegradation



## Telomer Research Program

### 8-2 Telomer B Alcohol Biodegradation Screening Study - DuPont

#### Accelerated Screening Study : Identified Transformation Products\*



\* Only these four transformation products were monitored for. Other potential transformation products were not determined.

\*\* Mass Balance was not a primary objective and was not achieved

## **Telomer Research Program**

- **TRP is actively and aggressively conducting work and analyses on telomer-based products, treated articles and processes**
- **Protocols and procedures are being developed**
- **Significant analytical challenges remain**
- **The TRP believes telomer-based products are safe for their intended uses and is committed to continued work to support this conclusion.**

### **Discussion and Questions**

- **Letter of Intent Comments**
- **8-2 Alcohol Program**
- **Regulatory Items and Actions**