

May 7, 2003

3M BY HAND DELIVERY

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Director, Chemical Control Division
Office of Pollution, Prevention & Toxics
U.S. Environmental Protection Agency
Ariel Rios Building, 7405M
1200 Pennsylvania Avenue, N.W.
Washington, D. C. 20460

Re: **Follow-up Questions Regarding 3M and Dyneon
LOI Environmental Monitoring Commitments**

Dear Mr. Penberthy:

This letter responds to EPA's request in your e-mail dated April 30, 2003 for a more detailed description of the environmental monitoring commitment contained in the March 13, 2003 3M Letter of Intent (LOI). In addition, EPA has requested clarification of the plans for continued monitoring of groundwater, surface water and other environmental media outlined on page 7, item 3 of the LOI. This letter will describe: 3M's environmental test methodology, monitoring plans by plant, and summary calendar of monitoring plans.

As described in section II A 3 in the 3M LOI, 3M has already engaged in extensive environmental monitoring, including sampling in the vicinity of its now former PFOA production facility at Decatur, AL; analysis of serum and liver samples from fish, birds and other wildlife for the presence of PFOA and other constituents; and sponsoring a Multi-City Study in which a variety of environmental compartments were analyzed. These data are available through the OPPTS AR-226 docket.

3M's environmental monitoring commitment in the LOI is to continue sampling at 3M plants in Cottage Grove, MN and Decatur, AL, which were former manufacturing locations of PFOA and POSF-based products. This sampling will include ground water and wastewater monitoring which corresponds with 3M's voluntary commitments and/or plans established through permits with local regulators.

The environmental monitoring in the vicinity of 3M's Decatur, AL plant will include the current operations of Dyneon, which, as explained in the 3M LOI, is a 3M subsidiary that continues to use APFO, the ammonium salt of PFOA, in the production of fluoropolymers. Because Dyneon's U.S. fluoropolymer manufacturing facility is located on 3M's manufacturing site, the environmental monitoring studies to satisfy the LOI commitments will be conducted

**Exhibit
1898**

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

jointly and reported by 3M. Hence, the study methodology, sampling strategy and analytical methods described below are for both 3M and Dyneon.¹

Data will be submitted annually in final report format by the first of August of each year, with the first report in by August 1, 2003. Sampling will take place monthly, quarterly, biannually and biennially, as described in the text below. In light of 3M's phase-out of production and significant reduction of use of PFOA in Decatur, all environmental monitoring under the LOI is anticipated to terminate by December 31, 2006 with a final report in by August 1, 2007.

TEST METHODOLOGY AND VALIDATION: GROUND WATER, SURFACE WATER, AND WASTE WATER EFFLUENT

Analytical Test Method: 3M ETS-8-154.1 "Determination of Perfluorinated Acids, Alcohols, Amides, and Sulfonates In Water By Solid Phase Extraction and High Performance Liquid Chromatography/Mass Spectrometry". See *Attachment I*. (Note that this test method supercedes ETS-8-115.1 and 155.1, which are referenced in historic test documents.)

Validation: This sampling and analysis method was validated for the collection, extraction, and analytical procedure for the determination of Perfluorooctanoate (PFOA) in groundwater, surface water, and drinking water samples. Method accuracy $\pm 10\%$. Method precision $\pm 10\%$.

Method Summary: Water samples are collected from a site of interest and shipped cold to an analytical facility. PFOA/APFO is extracted from 40mL water samples using C18 solid phase extraction (SPE) cartridges. PFOA/APFO is eluted from the C18 cartridge, using methanol. Separation, identification, and measurement are accomplished by high-performance liquid chromatography/ tandem mass spectrometry (HPLC/MS/MS) analysis. The concentration of each identified component is measured by comparing the MS response of the quantitation ion produced by that compound to the MS response of the quantitation ion produced by the same compound in an extracted calibration standard (external standard).

TEST METHODOLOGY AND VALIDATION: FISH

Analytical Test Method: 3M ETS-8-231.2 "Solid Phase Extraction and Analysis of Fluorochemical Compounds from Various Matrices". See *Attachment II*.

Validation: ISO 17025 Accredited Test Method, (validation based on FDA guidance documentation "Guidance for Industry- Bioanalytical Method Validation, May, 2001). This sampling and analysis method was validated for the collection, extraction, and analytical

¹ For other clarification specific to Dyneon, a letter from the Society of Plastics Institute (SPI) will address EPA's questions concerning the environmental studies at fluoropolymer manufacturing sites and the questions concerning the Articles of Commerce Test Program in your email to SPI. The current PFOA manufacturers will address the questions concerning the plans for environmental monitoring at the site of PFOA manufacture in your email to SPI.

procedure for the determination of perfluorooctane sulfonate (PFOS) in four biological matrices. The method is a performance based method requiring cross-validation for the biological matrix application of PFOA/APFO in fish. Method accuracy $\pm 5\%$. Method precision $\pm 10\%$.

Method Summary: An amount of sample is prepared (fluids diluted, tissues homogenized, etc.) at a 1/6 dilution, or other dilution using reagent grade water. An aliquot of the dilution/homogenate is spiked with the appropriate surrogate or analyte mixture. Acetonitrile (ACN) is added as an extraction solvent and also serves to precipitate the proteins. The sample is capped, mixed, and put on the centrifuge to clarify the supernatant. The supernatant is transferred to a clean tube, diluted with water, and passed through a pre-conditioned C₁₈ SPE cartridge. Finally, the analytes of interest are eluted from the SPE cartridge and analyzed by high performance liquid chromatography-electrospray tandem mass spectrometry (HPLC-ES/MS/MS).

Cottage Grove, MN

Groundwater Monitoring

To date, numerous groundwater studies have been completed at the site in support of various regulatory programs. These studies have documented that a shallow unconfined groundwater system is the first aquifer beneath the site. A lower confining bed underlies the unconfined aquifer. Natural groundwater flow in the shallow system is generally from north to south and discharges to the Mississippi River along the southern boundary of the site. These wells contain the groundwater in the area of the plant site and would not represent conditions beyond the site boundaries.

These studies focused on conventional substances and have incorporated fluorochemical analytes only recently. These test results will be included in the upcoming August, 2003 report to EPA under the LOI.

Going forward, five (5) existing on-site monitoring wells will be sampled and analyzed for PFOA. The selection of these wells was based on the site hydrogeologic model and will be representative of the site ground water conditions, i.e., both source and non-source areas. These wells will be sampled on a semiannual basis during the month of May and September commencing in 2003.

Wastewater Effluent Monitoring

The site has a multi-phased wastewater treatment plant that is used to treat all process wastewaters generated at Cottage Grove. Two of the systems treat inorganic wastewaters and the third is an organic, biological treatment system. All of the treated process wastewaters from these operations are combined at a single discharge point. These wastewaters are then combined with non-contact cooling and storm water and then discharged to the Mississippi River.

Treated process wastewater and non-contact cooling/storm water are discharged under Minnesota NPDES Permit No. MN000149. The designations in the permit for the treated process wastewater, non-contact cooling/storm water, and the combination of these two wastewaters are listed in the permit as Outfalls SD001, SD002, and SD003, respectively. In accordance with Section 1.12 of NPDES Permit, 3M is currently conducting monthly sampling and analysis at Outfall SD001 for certain perfluorinated chemicals, including PFOA.

A 24-hour composite sample is collected for duplicate analysis during each sampling event. In accordance with Section 1.12 par. 5 of the permit, this monthly analysis at Outfall SD001 will be conducted through 2004. The NPDES Permit defines a process to assess the results and allow revision or reduction in the frequency of monitoring.

Decatur, AL

Groundwater Monitoring

To date, numerous groundwater studies have been completed at the site in support of various regulatory programs. The natural groundwater flow in the shallow system is generally from the southwest to the northeast and discharges to the Tennessee River along the boundary of the site. These investigations have involved an extensive characterization of site subsurface conditions. Most recently, we conducted a dye trace study that validated the earlier hydrogeological findings and our site conceptual model.

These studies have incorporated fluorochemical analytes only recently. Limited analyses addressing PFOA have been conducted and results will be included in the upcoming August, 2003 report under the LOI.

Going forward eight (8) existing on-site monitoring wells will be sampled and analyzed for PFOA. The selection of these wells was based on the site hydrogeologic model and will be representative of the site ground water conditions, i.e., both source and non-source areas. Groundwater samples for PFOA analyses will be collected twice a year, during the June and December sampling events.

Wastewater Effluent Monitoring

3M's Decatur, Alabama manufacturing facilities obtain process water from the City of Decatur Utilities. In addition many of the manufacturing operations utilize non-contact cooling water, which is obtained from the Tennessee River. All process wastewaters are treated in the site's wastewater treatment facility. The system contains both physical-chemical and biological treatment. Process wastewaters are mixed with non-contact cooling water prior to discharge to the Tennessee River. The discharge is permitted under Alabama NPDES Permit No. AL0000205. The process wastewater discharge and combined process wastewater/non-contact cooling water is designated as Outfall 001A and 001, respectively.

Sampling will be conducted quarterly. Sampling will be conducted at Outfall 001 and will consist of 24-hour composites with duplicate analysis being conducted on the collected sample.

Surface Waters, Sediments, and Fish

3M contracted two previous studies which characterize the concentrations of PFOA and other analytes in surface waters, sediment, and fish in the Tennessee River. As part of these efforts, representative samples of surface water and sediment were obtained from locations that are upstream, downstream, and in the vicinity of the plant wastewater outfall. Testing was also conducted on a number of fish and clams from both upstream and downstream locations. The first study was conducted in 2000 and has been submitted to the EPA (AR-226). This study report contains detailed descriptions of sampling locations, sampling and analytical methodologies as well as data tabulations and results summaries. The second study was completed recently and this information will be submitted to AR-226 in the near future.

It is 3M's intention to conduct additional sampling to augment the previous studies. These studies will be conducted once every other year with the next set of samples being collected in 2004. A project plan for future work will be prepared in the 1st or 2nd quarters of 2004. As a part of this work, samples will be obtained upstream, downstream, and adjacent to 3M's manufacturing facilities.

Water samples will be collected using standard protocols. Sediments samples will be collected with the use of a PONAR dredge using the established methodologies. A boat mounted Smith-Root type VI-A electro shocking device will be utilized for fish collection. Detailed descriptions of these sampling protocols and sampling locations will be contained in the work plan.

Monitoring Schedule

Below is a schedule of the current monitoring plans under the 3M LOI.

Activity	2003	2004	2005	2006	2007	2008
Cottage Grove ground water	biannual	biannual	biannual	biannual	biannual	
Cottage Grove effluent	monthly	monthly	quarterly	quarterly	quarterly	
Decatur ground water	biannual	biannual	biannual	biannual	biannual	
Decatur effluent	quarterly	quarterly	quarterly	quarterly	quarterly	
Decatur surface water, sediment & fish		once		once		
Report submission	by Aug.1	by Aug.1	by Aug.1	by Aug.1	by Aug.1	by Aug.1

3M appreciates this opportunity to work with the EPA on this LOI and on our prior, ongoing and future EHS measures for PFOA. We look forward to dialogue with the EPA regarding the content of this letter. In addition, 3M plans to review the environmental monitoring data submitted under the LOI with EPA after two years to determine whether any changes to this overall monitoring program would be appropriate based on the data. We anticipate that this review would include discussion of medium, frequency of sampling and testing and location of sampling.

Please contact one of us if you have any questions.

Sincerely,

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