August 1, 2003 VIA FEDERAL EXPRESS

Document Control Office (DCO)
Office of Pollution Prevention and Toxics (OPPT)
US Environmental Protection Agency
EPA East, Room 6428
1201 Constitution Avenue, MW
Washington DC 20460

Attention: Docket No. AR-226 and the FYI Docket

Subject: Submission of Monitoring Data Pursuant to the 3M LOI dated March 13, 2003 and APFO Users LOI dated March 14, 2003

Dear Sir or Madam:

This report is submitted pursuant to the 3M Letter of Intent (LOI) dated March 13, 2003 and the APFO Users LOI dated March 14, 2003. The report is the first submission under the LOIs of the results of groundwater and wastewater monitoring at the 3M manufacturing sites at Cottage Grove, MN and Decatur, AL. As you know, perfluorooctanoic acid (PFOA) was previously produced at these sites. In addition, use of PFOA is continuing at the Decatur site, as part of the Dyneon fluoropolymer manufacturing operation.

As noted in the 3M LOI, monitoring of wastewater treatment plant effluent and groundwater for the presence of PFOA has been underway at the Decatur and Cottage Grove sites for a number of years. This monitoring was initiated as a result of 3M voluntary commitments and/or plans established through permits with local regulators. Under the 3M LOI, 3M agreed to continue this monitoring in order to assess the trends that are likely to occur as a result of the 3M production phase-out of PFOA, completed at the end of 2002. The Decatur monitoring program was continued for the additional purpose of assessing the impact of Dyneon's ongoing use of APFO in fluoropolymer manufacturing activities at the site and, in this manner, meeting Dyneon's monitoring commitments under the APFO Users LOI. Because the Dyneon and former 3M manufacturing operations are located at the same site, it was determined that monitoring would be conducted and reported jointly by 3M and Dyneon.

In our May 7, 2003 letter to Ward Penberthy of EPA, we provided a detailed description of the test methodology, sampling plans and proposed test schedule for future wastewater and groundwater monitoring at the Cottage Grove and Decatur sites. Please note that previous monitoring at these sites differed in some respects from the future program outlined in our May 7 letter. These differences are discussed below in the course of reviewing the results of monitoring conducted prior to the LOIs and in mid-2003. Background analytical reports for the monitoring are voluminous and are available from 3M on request.

As noted in our LOI, 3M has previously conducted monitoring for PFOA in surface water, sediments and fish in the vicinity of the Decatur site. The latest results of this monitoring, carried out in 2002, were submitted on July 9, 2003 to the OPPTS AR-226 Docket as part of the ongoing 3M investigation of perfluorochemistry. As described in our May 7 letter, 3M will update these monitoring results in 2004 and 2006.

It should also be noted that under the APFO Users LOI, Dyneon is conducting air dispersion modeling for its Decatur operations. Dyneon will submit this information to EPA by January 1, 2004.

COTTAGE GROVE, MN SITE MONITORING DATA

The 3M Cottage Grove facility (the site) occupies approximately 865 acres of property in Cottage Grove Minnesota. The site is bounded by open space and farmland on the north, the Mississippi River on the south, a municipal wastewater treatment plant on the west and sparsely populated open space to the east. Manufacturing operations began at the site in 1947 and existing records indicate that PFOA production began about 1976.

Site Setting and Hydrogeology

The site is located on a flat to gently undulating bluff overlooking the main channel of the Mississippi River. Both the southeast and southwest sides of the site have been steeply incised by stream activities. The site is underlain by glacio-fluvial deposits which increase in thickness from north to south across the site. These deposits are underlain by the Prairie Du Chein Group and the Jordan Sandstone Formation. The St. Lawrence Shale Formation (a confining layer) is present at the base of the Jordan Formation, approximately 200 feet below the central portion of the site.

Six high-capacity pumping wells supply water to the manufacturing operations at the site. The groundwater from four of these wells is blended in a water supply distribution system on a continuous basis for various site needs including production, sanitation, and limited potable use. Bottled water has been provided for a number of years at the site for drinking water. The remaining two wells are utilized independently on a periodic basis for site-wide fire protection and non-contact cooling at the site incinerator. These six high-capacity wells were installed during the period 1947 to 1970. Four of the wells are drilled into the Jordan Formation and two of the wells are located in unconsolidated alluvium near the Mississippi River. However, all pumping wells obtain groundwater from the surficial, unconfined aquifer. Although historical water level data indicates a natural hydraulic gradient toward the river, pumping of the wells (which started in 1947) has created a persistent cone of depression in the ground water beneath the developed portions of the site. The cone of depression effectively limits movement of ground water from the site to the adjacent river. All groundwater used for the production processes is treated after use at the site wastewater treatment facility prior to NPDES permitted discharge to the Mississippi River.

Monitoring Results

Groundwater Monitoring

Starting in 2001, 3M conducted groundwater monitoring for fluorochemicals as part of a more extensive investigation carried out in conjunction with the State of Minnesota. This additional monitoring was initiated to assess the impact of fluorochemical production on the groundwater beneath the site. Initially, monitoring was carried out at five of the production wells and a number of monitoring wells. Based on understanding of the hydrogeology and the results of 2001 and 2002 sampling, 3M reviewed the scope of groundwater monitoring to be conducted under the LOI. The revised monitoring program adopted by 3M is described in our May 7 letter to EPA. As explained in that letter, 3M selected five ground water sampling locations for semi-annual PFOA monitoring on a going-forward basis. The five monitoring points were chosen as representative of the following site conditions (See attached site map):

Monitoring Point	Site Condition
MW-7	Upgradient of site industrial activities
MW-4	Central to site industrial activities
PZ-14	Western/downgradient of site industrial activities
MW-101	Eastern/downgradient of site industrial activities
Water supply distribution system	Site-wide ground water from the production wells

PZ, piezometer, a small monitoring well

Sampling of the water supply distribution system was substituted for sampling of the individual high-capacity pumping wells because the water that supplies this system is a composite of water drawn from these wells and therefore is representative of groundwater throughout the developed portion of the site.

PFOA data from the five monitoring points listed above was collected on June 5, 2003. The results of the 2003 and previous sampling events for these points are presented in the table below.

3M Cottage Grove PFOA Data Summary						
Sample Identification	**Date Sampled**	**PFOA (ppb)**	**PFOA Lab DS (ppb)**	**PFOA Field DS (ppb)**	**PFOA Avg. (ppb)**	**Std. Deviation (+/-)**
MW-7	07/11/01	NA	NA	NA	NA	NC
	09/07/01	NA	NA	NA	NA	NC
	10/31/01	NA	NA	NA	NA	NC
	11/12/01	NA	NA	NA	NA	NC
	12/03/02	NA	NA	NA	NA	NC
	06/05/03	0.309	0.307	0.326	0.314	0.01
MW-101	07/11/01	NA	NA	NA	NA	NC
	09/07/01	NA	NA	NA	NA	NC
	10/31/01	NA	NA	NA	NA	NC
	11/12/01	NA	NA	NA	NA	NC
	12/03/02	170	180	172	174	5.29
	06/05/03	135	149	125	136	12.06
Water Supply Distribution System	07/11/01	1.23	1.14	NA	1.185	0.06
	09/07/01	NA	NA	NA	NA	NC
	10/31/01	40.6	38.5	41.1	40.1	1.38
	11/12/01	11.4	10.8	17.1	13.1	3.48
	12/03/02	NA	NA	NA	NA	NC
	06/05/03	28.0	28.1	27.7	27.9	0.21
PZ-14	07/11/01	NA	NA	NA	NA	NC
	09/07/01	6.40	6.77	6.06	6.41	0.36
	10/31/01	5.89	4.96	5.25	5.37	0.48
	11/12/01	4.66	4.63	4.60	4.63	0.03
	12/03/02	NA	NA	NA	NA	NC
	06/05/03	4.80	4.67	4.96	4.81	0.15
MW-4	07/11/01	NA	NA	NA	NA	NC
	09/07/01	NA	NA	NA	NA	NC
	10/31/01	5.67	5.93	7.39	6.33	0.93
	11/12/01	5.30	5.11	5.45	5.29	0.17
	12/03/02	NA	NA	NA	NA	NC
	06/05/03	10.2	10.2	10.1	10.2	0.06

Table Notes:

ppb: Parts per billion
NA: Data not available for sampling period
NC: Not calculated
Field DS: Field duplicate sample
Lab DS: Laboratory duplicate sample

Results of groundwater monitoring for sampling locations that were tested in previous years but not in 2003 are summarized in the Table attached to this report. The results presented above and in the attached Table indicate that groundwater levels of PFOA have remained relatively constant from 2001 to 2003, notwithstanding the recent cessation of PFOA production at the site.

Please note that, during all groundwater monitoring at this site, 3M has collected a field duplicate sample to provide a measure of the precision associated with sample collection, preservation and storage as well as laboratory procedures. The laboratory duplicate sample is taken in the laboratory and provides a measure of the precision associated with laboratory procedures, but not with sample collection, preservation or storage procedures.

As described in the May 7 letter, monitoring points sampled in June 2003 will be sampled again in September 2003 and May 2004 and a summary report of that data will be provided on August 1, 2004.

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.

Since January 2000, the 3M Cottage Grove plant has conducted PFOA analysis of its effluent. Sampling has been performed monthly beginning in January 2003 in accordance with the requirements of 3M's NPDES permit. This information is reported to the Minnesota Pollution Control Agency in the monthly Discharge Monitoring Reports (DMR). Effluent wastewater samples are collected at the plant outfall on the Mississippi River. This is the common discharge point for all of the plant's process wastewaters. All samples are collected as 24-hour composites and duplicate analysis is conducted for each sample.

The following table presents the monitoring results of the Cottage Grove process wastewater effluent discharged under Minnesota NPDES Permit No. MN000149, Outfall SD 001. The data includes results of all monitoring events in 2003 and in previous years.

3M Cottage Grove Effluent Monitoring Results PFOA Analysis from SD 001		
	Sample Date	**PFOA** (ppb)
January-March 2000	Average of 8 Data Points	1991
September-October 2000	Average of 3 Data Points	216
December 2002	12/12/02	180
January 2003	1/15/03	80.1
January 2003		77.9
January 2003 Average		**79.0**
February 2003	2/12/03	80.0
February 2003		78.8
February 2003 Average		**79.4**
March 2003	3/12/03	74.3
March 2003		74.7
March 2003 Average		**74.5**
April 2003	4/23/03	112.0
April 2003		109.0
April 2003 Average		**110.5**
May 2003	5/15/03	95.0
May 2003		101.0
May 2003 Average		**98.0**
June 2003	6/11/03	18.9
June 2003		16.4
June 2003 Average		**17.7**

As shown above, PFOA levels dropped substantially from 2000 to 2003. Monthly PFOA levels remained fairly constant throughout the first half of 2003 with a substantial decrease noted in June. Data obtained in future months will enable us to determine whether effluent concentrations will remain at this low level and therefore have declined as a result of the production phase-out.

The expected in-stream concentration of PFOA in the Mississippi River resulting from wastewater discharges would be extremely low. Assuming an average base flow for the Mississippi River of 7500 MGD (million gallons a day) and an effluent flow of about 3 MGD, the expected in-stream PFOA concentration would be about 30 ppt (parts per trillion), very near the detection limit of PFOA.

DECATUR, AL SITE MONITORING DATA

The 3M Decatur site is approximately 900 acres with the area of the manufacturing facilities being approximately 200 acres. The current Dyneon fluoropolymer production facilities are co-located with 3M's other manufacturing operations at the site where 3M previously produced PFOA and other fluorochemicals. The land surrounding the site is predominantly industrial and commercial. Chemical manufacturing operations began at the site in 1961. In 1962 the facility was expanded to include a film manufacturing plant. Production of PFOA at the site occurred in 1999--2000.

Site Setting and Hydrogeology

The geology beneath the 3M Decatur site consists of a dense residuum underlain by limestone (bedrock), which, in turn, is underlain by a chert (hard rock) layer. The limestone underlies the residuum to an approximate depth of 150 feet below ground surface. The number, extent, orientation, and interconnection of water-bearing fractures control groundwater flow associated with this system. Water-bearing fractures observed in this unit are not continuous, and do not yield significant quantities of water. An asphaltic limestone approximately 10 feet thick occurs below the upper limestone layer, and acts as a lower confining unit for the limestone.

The aquifer below the 3M facility and the City of Decatur is not used as a water supply. Potable water used at the site, and the Decatur area in general, is provided by the Decatur municipal water system whose source is the Tennessee River. Samples of the Decatur drinking water taken as part of the 3M Six Cities Study failed to detect the presence of PFOA at a detection limit of 7.5 ppt (parts per trillion).

Because of the presence of other contaminants, 3M has undertaken extensive studies to characterize the groundwater below the Decatur site and related hydrogeology. Copies of these studies are available on request. Potentiometric data for the site indicate that groundwater occurs both as unconfined and semiconfined systems. Unconfined groundwater occurs within the residuum, epikarst, and to some extent, shallow fractures within the limestone. Groundwater flow is generally to the north and east toward the Tennessee River. Groundwater flow rates in the residuum and limestone are extremely slow and wells installed in both the residuum and limestone horizons exhibit very low yields of typically less than 0.5 gpm.

The 3M studies show that there are two major groundwater plumes at the site. The two groundwater plumes are down gradient of the inactive landfill, and down gradient of the chemical manufacturing facility. The studies show that the plumes are predominantly confined beneath the site and have negligible releases to the Tennessee River. This is consistent with the results of 3M surface water monitoring, previously submitted to EPA, which show very low PFOA levels in the river (1- 2.65 ppb in 2000 and less than 50 ppt in 2002).

Monitoring Results

Groundwater Monitoring

Based on its extensive site investigations, 3M developed a PFOA sampling and analysis program in 2001 to assess the PFOA levels in the site groundwater. In developing its strategy for monitoring under the LOI, 3M selected the following wells for groundwater sampling and PFOA analysis going forward (see attached site map):

Monitoring Location	Site Condition
Wells 226R & L	Located east of inactive landfill and south of wastewater treatment – monitors background conditions in residuum and shallow limestone groundwater
Wells 220R and L	Located northeast of inactive landfill – monitors predominant flow path of plume in residuum and shallow limestone zones
Well 320L	Located north of inactive landfill – monitors secondary flow path of plume
Wells 327R	Located in the former incinerator area – monitors residuum groundwater near source area
Wells 310R & 317L	Located in the Chemical Plant – monitors dominant groundwater flow pathways in the Chemical Plant

Groundwater samples from the eight monitoring points were collected on July 15-16, 2003 and the PFOA results are presented in the table below. With the exception of the Well 310R, these monitoring points are different then those sampled in previous events, but provide a more accurate representation of the groundwater conditions for the measurement of fluorochemicals.

As at Cottage Grove, 3M collected field duplicate samples during the monitoring to provide a measure of the precision associated with sample collection, preservation and storage as well as laboratory procedures. The laboratory duplicate sample is taken in the laboratory and provides a measure of the precision associated with laboratory procedures, but not with sample collections, preservation or storage procedures.

As indicated in the May 7, 2003 letter to EPA, these monitoring locations will be sampled again in December 2003 and June 2004 and a summary report of the cumulative data will be provided on August 1, 2004.

The groundwater data for recent and previous monitoring events are shown in the following Table.

GROUNDWATER WELL MONITORING DATA
FOR THE 3M DECATUR, AL MANUFACTURING SITE

SAMPLE ID	SAMPLE DATE	PFOA (ppb)	PFOA (ppb) Lab Dup	PFOA (ppb) Field Dup	PFOA (ppb) Average
210R	3/28/01	1060	996	1000	1018
213R	3/28/01	223	231	220	224
216R	3/28/01	75.7	81.8	79.9	79.1
217R	3/28/01	0.091	0.088	0.082	0.087
306R	3/28/01	3280	3690	3330	3433
308R	3/28/01	107	131	117	355
315R	3/28/01	637	635	640	1912
310R	3/28/01	1060	1110	1190	1120
310R	7/16/03	1570	1560	1590	1573
220R	7/16/03	68.2	68.6	65.8	67.5
220L	7/16/03	89.2	88.8	90.2	89.4
226R	7/16/03	10.6	11.0	10.6	10.7
226L	7/16/03	NQ	ND	ND	ND
317L	7/16/03	0.94	0.95	0.99	0.96
310L	7/16/03	ND	ND	NQ	ND
327R	7/16/03	2280	2600	2280	2386

As indicated by the data presented in the Table, there is a wide range of PFOA levels measured in the groundwater beneath the site. However, the data suggest a low likelihood of off-site groundwater contamination. For example, the levels in the well 310R during two sampling events show little change, which is predictable considering the slow movement of ground water explained above. In addition, wells 220L, 226L, and 310L show extremely low to non-detectable levels of PFOA. These wells are drilled into the aphaltic limestone, which acts as the confining layer that prevents groundwater movement downward. These factors indicate that the groundwater is not moving off site and therefore would not represent an exposure pathway for PFOA.

Effluent Monitoring

3M's Decatur, Alabama manufacturing facilities obtain process water from the City of Decatur Utilities. and directly from the Tennessee River. In addition, many of the manufacturing operations utilize non-contact cooling water, which is obtained from the Tennessee River. All process wastewaters from the 3M and Dyneon manufacturing operations 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.

As explained in our May 7 letter, wastewater sampling at the Decatur site for PFOA analysis is being conducted on a quarterly basis. Samples are collected at Outfall 001, which consists of treated process wastewater and non-contact cooling water. The outfall discharges to Baker's Creek, which in turn empties into the Tennessee River. All samples are collected as 24-hour composites and duplicated analysis is conducted for each sample. The specific sampling and analytical protocols were described in 3M'sMay 7, 2003 letter to EPA.

The following table presents the PFOA monitoring results for the Decatur wastewater effluent discharged under Alabama NPDES Permit No. AL000205, Outfall 001. The data summary includes the historical data and the 2003 monitoring events.

3M Decatur
2nd Quarter, 2003 and Historical Events
Outfall 001 FC Sampling Results

Sample Date	Results	Duplicate	Average
	(all values are listed as ug/l)		
1998	N/A	N/A	602
1999	N/A	N/A	766
2000	N/A	N/A	1028
2001	N/A	N/A	310
January, 2003	N/A	N/A	58
May 28, 2003	89.0	87.5	88.3

As indicated by these data, there has been a decrease in the levels of PFOA in the effluent discharged to the Tennessee River. The overall reduction throughout these 5 years is mainly a result of the production phase-out of PFOA at this site, and the improvements in the fluoropolymer production process occurring at the Dyneon operation. Continued decreases in the effluent concentration are anticipated because of ongoing process improvement efforts.

In addition, the results of Tennessee River surface water monitoring recently submitted to the AR-226 Docket indicate that PFOA levels in the river have declined significantly as well. In fact, PFOA levels downstream from the 3M Decatur Outfall are below detectable limits of 0.050 ppb.

HISTORIC MONITORING DATA SUBMISSION

As noted in the LOI, 3M's monitoring programs for the Cottage Grove and Decatur sites have included sampling results for other fluorochemicals besides PFOA. While much of this information has been reported to local agencies, 3M is shortly providing a comprehensive summary of results from those monitoring programs as part of a separate submission to the AR-226 Docket.

In summary, this letter reports results of wastewater and groundwater monitoring at the Decatur and Cottage Grove sites. These data fulfill the commitments of 3M and Dyneon under the March 13, 2003 3M LOI and the March 14, 2003 APFO Users LOI. If there are any questions, please contact the writer at the address provided below.

Sincerely,

Michael A. Santoro
Director, Environmental, Health,
Safety and Regulatory Affairs
3M - Bldg. 236-1B-10
P.O. Box 33331
St. Paul, MN 55144
651 733-6374 (phone)
651 733-1958 (fax)
E-mail: masantoro@mmm.com

cc: Mary Dominiak – Room 4410

Attachments

3M COTTAGE GROVE

HISTORIC GROUNDWATER MONITORING DATA SUMMARY

Sample Identification	Date Sampled	PFOA (ppb)	PFOA lab dup (ppb)	PFOA field dup (ppb)
MW-101	12/03/02	170	180	172
	04/01/03	NQ	NQ	NQ
	05/19/03	NQ	NQ	NQ
MW-102	12/03/02	324	404	369
	04/01/03	NQ	NQ	NQ
	05/19/03	NQ	NQ	NQ
PW-2	06/10/01	0.491	0.473	0.577
	06/28/01	2.64	2.84	10.70
	09/07/01	0.359	0.395	0.405
	10/31/01	2.46	2.21	2.15
	11/12/01	0.765	0.706	0.356
PW-3	06/10/01	0.6	0.561	0.554
	06/28/01	0.763	0.772	0.778
	09/07/01	0.716	0.693	0.737
	10/31/01	0.519	0.542	0.615
	11/12/01	0.721	0.713	0.739
PW-4	06/10/01	1.170	1.110	1.180
	06/28/01	0.851	1.000	0.988
	09/07/01	0.823	0.816	0.782
	10/31/01	14.000	13.500	4.100
	11/12/01	0.792	0.755	0.827
PW-5	06/10/01	42.500	45.700	56.400
	06/28/01	26.900	30.100	NA
	09/07/01	28.600	27.500	28.700
	10/31/01	40.800	39.400	39.700
	11/12/01	20.900	21.800	22.600
PW-6	07/11/01	138.000	132.000	NA
	09/07/01	NA	NA	NA
	10/31/01	11.600	11.200	14.000
	11/12/01	91.600	93.300	93.900
Water Supply Distribution Loop at Cafeteria 116	07/11/01	1.230	1.140	NA
	10/31/01	40.600	38.500	41.100
	11/12/01	11.400	10.800	17.100
PZ-14	09/07/01	6.400	6.770	6.060
	10/31/01	5.890	4.960	5.250
	11/12/01	4.660	4.630	4.600
SP100	09/07/01	0.623	0.566	0.614
	10/31/01	0.547	0.523	0.578
	11/12/01	0.593	0.577	0.561
Trap Range Well	09/07/01	0.541	0.565	0.571
MW-4	10/31/01	5.670	5.930	7.390
	11/12/01	5.300	5.110	5.450
MW-14	09/07/01	846.000	845.000	848.000
	10/31/01	840.000	824.000	730.000
	11/12/01	780.000	836.000	858.000

Notes
1. ND - Not detected
2. NQ – Not quantitated
3. NA – Not Analyzed