

DuPont
2004 Multi-Media Sampling Plan
WV and OH
January 15, 2004

EXP000190

January 15, 2004

DuPont

“Phase 2”

Media to be Sampled by DuPont in 2004 in WV and OH

- Air
- Private Water Sources
- Public Water Sources
- Soil
- Biota

[above listing excludes sampling required by permit]

January 15, 2004

DuPont

DuPont Washington Works Area

Air Modeling/Sampling

- ***Completed*** - Air dispersion modeling completed and updated for ambient air concentrations (Time periods: year 2002 and 9/02 - 8/03, AR226 and ECA docket)
- ***In-progress*** - Fence line sampling in progress to compare results from ambient air sampling and air dispersion modeling to understand how modeling predictions relate to measured ambient air concentrations

January 15, 2004

DuPont

3

EXP000192

Air

- **Objective:** Compare results from ambient air sampling to air dispersion modeling.
- **Detail:** Verification study of ambient air in community locations
- **Locations:** Eight representative sample locations for four wind directions and a range in predicted concentrations
- **Number of Samples:** 56 (8 locations/7 events)
- **Frequency:** 7 events over 6 weeks
- **Duration:** 24 hours
- **Analytical Methodology:** Validated method conducted by Exygen. Acetone extraction followed by LC/MS/MS with PQL of 0.1 ug/m3. [Docket no. OPPT-2003-0012-0317 to 0320]

EXP000193

January 15, 2004

DuPont

Rationale for Air Sample Locations

- Representative of all major wind directions
- Access to property is feasible
- Locations in both Ohio and West Virginia
- Representative of a range of predicted concentrations (min - max)

EXP000194

January 15, 2004

DuPont

DuPont Washington Works Area

Water Sampling/Monitoring

- Private Water Sources - WV and OH
- Public Water Sources - WV and OH
- Ohio River
- Washington Works Surface Water and Groundwater Monitoring
- Ohio EPA proposal specific to Little Hocking Well Field

EXP000196

January 15, 2004

DuPont

DuPont Washington Works Area

Private Water Sources (WV & OH)

- *Off-site sampling - completed*
 - WV Multi-Media Consent Order (MMCO); final GIST report
 - ~250 Samples in a two mile radius (WV and OH)
 - Includes wells, springs, and cisterns

EXP000197

January 15, 2004

DuPont

Private Water Sources

- **Objective:** Continue to monitor trends in PFOA concentrations
- **Detail:** Quarterly or annual sampling of private water sources (i.e., groundwater wells, springs, and cisterns) at locations near the Washington Works facility/Local Landfill (WV and Ohio), Dry Run Landfill, and Letart Landfill.
- **Locations:** 10 in WV, 10 in Ohio, 10 near Dry Run, and 2 near Letart
- **Number of Samples:** 122
- **Frequency:** Quarterly all areas, exception annual at Letart
- **Duration:** 1 Year
- **Analytical Methodology:** Current validated LC/MS/MS aqueous method utilized by Exygen (PQL is .05 ug/L). [Docket no. OPPT-2003-0012-0040]

EXP000198

January 15, 2004

DuPont

Rationale for Private Water Source

Locations

- Follows recommendations per WV Multi-Media

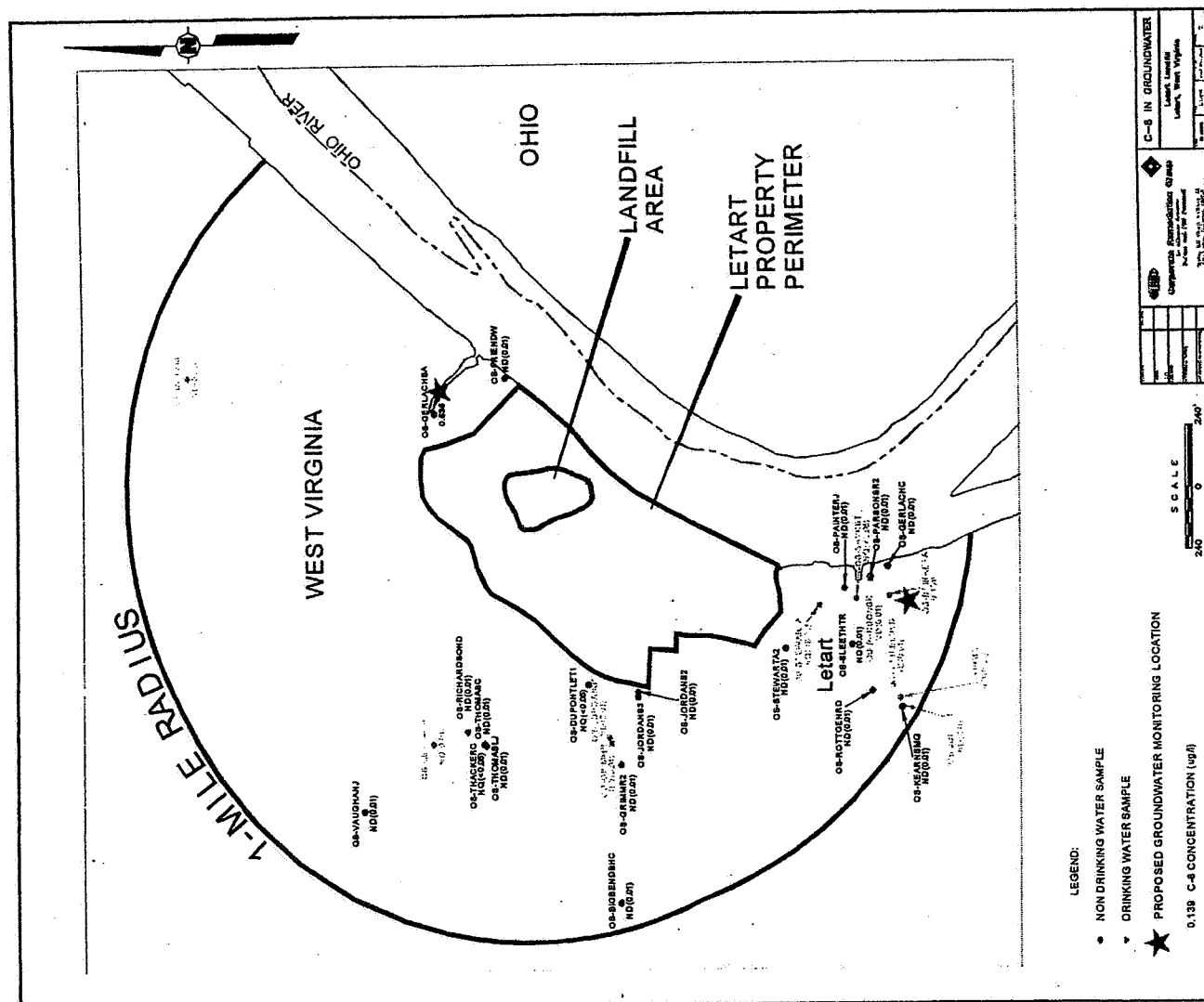
Consent Order/GIST:

- Drinking water wells
- Drinking water springs
- Non-Drinking water wells
- Springs and cisterns
- One well and spring used for cattle where prior sampling results were $> 5 \text{ ug/L}$

January 15, 2004

DuPont





January 15, 1941

DuPont Washington Works Area Public Water Sources (WV & OH)

- *Off-site & on-site sampling - completed*
 - WV MMCO; final GIST report
 - 16 public water systems sampled 7 miles upstream to 57 miles downstream (10 systems sampled multiple times)

EXP000203

January 15, 2004

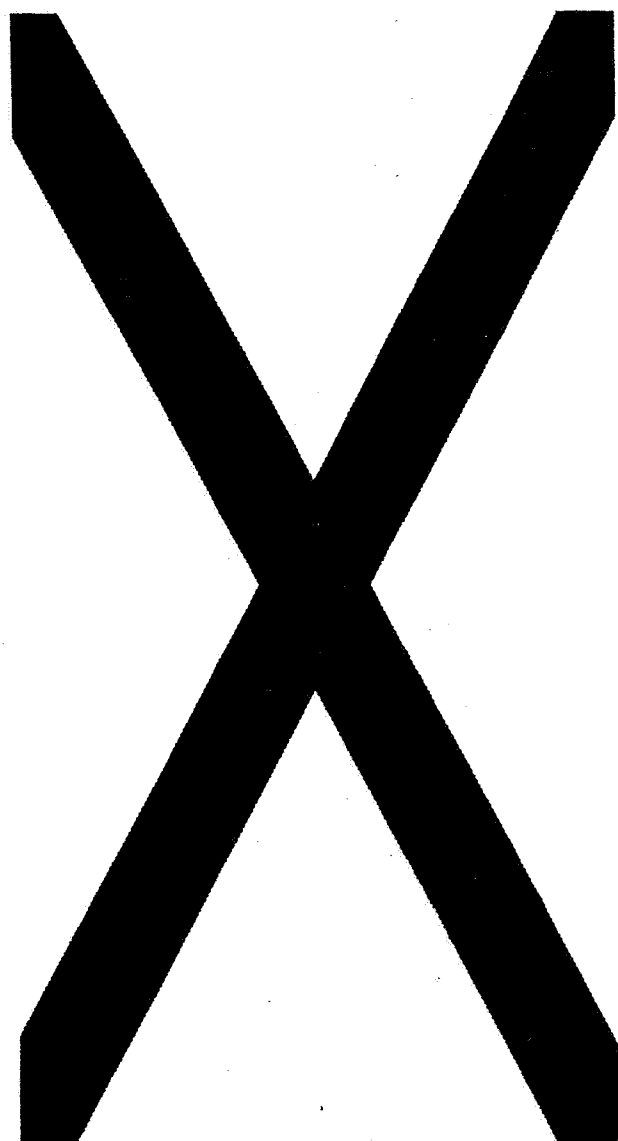
DuPont

Public Water Systems

- **Objective:** Continue to monitor trend in PFOA concentrations in public water systems near Washington Works
- **Detail:**
 - Quarterly or annual sampling of public water systems near site, including Little Hocking WA, Lubeck PSD, General Electric, DuPont, Blennerhasset Island State Park, Mason County PSD, Racine Lock and Dam PSD, and Tupper Plains-Chester PSD
 - Install four monitoring wells at Little Hocking WA to monitor shallow portion of saturated zone
- **Locations:** 8 (includes the four new monitoring wells at LHWA)
- **Number of Samples:** 121
- **Frequency:** First four will be quarterly, second four annual; Saturated zone to be sampled quarterly
- **Duration:** 2 Years
- **Analytical Methodology:** Current validated LC/MS/MS aqueous method utilized by Exygen (PQL is .05 ug/l). [Docket no. OPPT-2003-

0012-0040]
January 15, 2004

DuPont



DuPont Washington Works Area

Ohio River Water Sampling

- ***River Sampling - completed***
 - WV MMCO, GIST final report
 - Samples taken 28 miles upstream to 46 miles downstream
 - 12 transects, various depths and cross river locations
 - 49 samples taken
- ***Additional sampling*** - to continue via site and landfill outfall monitoring permit requirements

January 15, 2004

DuPont

17

EXP000206

DuPont Washington Works

Surface water and Groundwater Monitoring

- *Groundwater and surface water sampling - completed*
 - WV MMCO; final GIST report
 - 19 groundwater wells and 6 outfalls sampled
 - Over 250 samples taken
- *Groundwater and surface water monitoring - additional work*
 - Outfall sampling - monthly, quarterly, and semi-annually depending on the outfall (permit)
 - Process treatment outlet monitoring - weekly (permit)

January 15, 2004

DuPont

18

EXP000207

DuPont

Soil Sampling/Modeling

Completed work

- Adsorption/desorption testing - APME Report, ECA Docket
- Over 200 on-site samples (ECA docket-Washington Works RCRA Facility Investigation)
- 2 off-site samples - (Sampling Investigation Results Little Hocking Water Association Well Field, April 2003)

EXP000208

January 15, 2004

DuPont

Soil

- **Objective:** Determine range of PFOA concentration in off-site soil.
- **Detail:** Surface soil sampling will be conducted at locations in WV and OH. Sampling locations consistent with groundwater and ambient air monitoring locations. Events will be conducted after wet and dry weather conditions.
- **Locations:** 10 in WV and 10 in OH
- **Number of Samples:** 40
- **Frequency:** 2 Events (dry and wet)
- **Analytical Methodology:** Current validated LC/MS/MS method utilized by Severn Trent-Denver (PQL of 0.19 ug/kg). [Docket no. OPPT-2003-0012-xxxx]

EXP000209

January 15, 2004

DuPont

Rationale for Soil Sample Locations

- Representative of all major wind directions
- Access to property is feasible
- Locations in both Ohio and West Virginia
- Representative of a range of predicted concentrations (min - max)



Biota - WV Fish Study

- Fish from the Ohio River at Belleville Dam
- 4 species, 16 samples
- All results were Non-Detect

EXP000212

January 15, 2004

DuPont

Biota

- **Objective:** Determine if PFOA is present in grass, and determine if air deposited PFOA is present on grass surface.
- **Detail:** Sample grass/vegetative layer at each soil sampling location. Will include grass, grass litter layer, and root zone (with soil removed). A “washed” sample will likely be conducted at some locations during “dry” event (prior to sample homogenization)
- **Locations:** 10 in WV and 10 in Ohio
- **Number of Samples:** 40 (plus some washed samples)
- **Frequency:** 2 events (dry and wet) during soil sampling
- **Analytical Methodology:** A validated analytical method does not currently exist (in progress, but will be in-place before work is conducted).

Evaluation of Off-site

Soil/Biota Results

- The 40 total soil and 40 total biota sample results will receive basic summary statistical analysis to determine:
 - minimum and maximum concentration
 - median
 - mean (if all results $>$ than ND)
- These results will form a baseline off-site soil/biota data set. If warranted, this data set will then be utilized to formulate objectives and scope of work for additional off-site soil sampling.

DuPont Summary

Proposed "Phase 2" Monitoring Activities

Air

- Air dispersion model verification with off-site sampling

Water

- Install four wells to monitor the shallow portion of the saturated zone in the Little Hocking well field
- Private water monitoring at 32 locations
- Public water system monitoring at eight locations

Soil

- Conduct two surface soil sampling events at twenty locations (10 in Ohio; 10 in Wva); one after dry period and one after rain event

Biota

- Sample grass in the same location as the surface soil sampling

January 15, 2004

DuPont

Peer Consultation Process

- Concept drawn from the Voluntary Children's Chemical Evaluation Program Guidelines
- Advisory Group
- Third party technical experts
- Independent/No conflict of interest
- Will review results of Phase 1 and Phase 2 monitoring activities and the industry proposal(s) for Phase 3 activities and provide feedback on the proposal(s)

EXP000217

January 15, 2004

DuPont

Statistical Analysis of Off-Site Private Water Sampling in WV and Ohio

State	Source	Radius (miles)	Sample Size	Number (%) Quantified	Median ($\mu\text{g/l}$)	Significance
Ohio	Spring/Cistern	0 to 1	21	21 (100)	4.97	$p < 0.01$
		1 to 2	4	4 (100)	0.48	
	Well	0 to 1	48	43 (90)	0.92	$p < 0.01$
		1 to 2	59	40 (68)	0.21	
West Virginia	Spring/Cistern	0 to 1	10	10 (100)	2.06	$p = 0.02$
		1 to 2	13	12 (92)	0.90	
	Well	0 to 1	38	38 (100)	1.73	$p < 0.01$
		1 to 2	52	39 (75)	0.36	

EXP000218

January 15, 2004

DuPont