



DuPont Engineering

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**2002 GROUNDWATER SAMPLING PLAN FOR RESIDENTIAL AND
NON-RESIDENTIAL WELLS**
Former DuPont Barksdale Works
Barksdale, Wisconsin

Dear Mr. Saari:

As you requested in our telephone conversation on April 23, 2002, E. I. du Pont de Nemours and Company, Inc. (DuPont) is hereby transmitting the proposed non-residential and residential sampling plan we discussed. The sampling event that will be addressed by this plan will occur between May 13, 2002 and early June 2002 as part of the on-going investigation of the former Barksdale Works. This sampling plan specifies the scope of work, analytical parameters and methodologies, reporting requirements, and schedule for collection of groundwater and drinking water samples for this single sampling event. The details of the plan are provided in the following paragraphs.

RESIDENTIAL DRINKING WATER WELL SAMPLING

Per our discussion, DuPont will sample 59 residential drinking water wells (Table 1) beginning the week of May 13, 2002 (selected homes will be sampled prior to May 13th due to scheduled treatment system maintenance). The majority of the residential wells that will be sampled during this event were selected based on a February 19, 2002 electronic mail (e-mail) request from the Wisconsin Department of Natural Resources (WDNR) to sample the following residential areas:

- All wells on Nolander Road between Fire Call (FC) Nos. 29600 and 30900,
- All wells on Birch Grove Road between FC Nos. 73025 and 73120, including FC 31120,
- All wells on State Highway 13 between FC Nos. 72040 and 73500, including FC No. 73300 on Bono Creek Road, and
- The single well located at FC No. 72545 on Ondossagon Road.

Within these areas, DuPont is currently aware of the existence of 45 residential drinking water wells (Table 1). Water samples will be collected and analyzed from each home for a number of analyses as discussed in following paragraphs. DuPont requests that WDNR advise them of any additional homes within these areas that have not been included in Table 1.

In an effort to identify all impacted drinking water wells near the former Barksdale Works, DuPont has voluntarily added 14 locations to the 45 sites identified by WDNR. These additional locations are listed in Table 1 and are illustrated in Figure 1. It should be noted that DuPont is not aware that all of these additional locations contain an active drinking water well; however, DuPont will determine whether a well is present and attempt to collect a sample for analysis at each of these properties if the site is accessible.

All residential samples will be quantified for the constituents in at least one of the parameter classes listed in Tables 2, 3, and 4, depending on historical analytical results. The number of proposed samples that will be collected as well as the type(s) of analyses that will be performed for the 59 residential locations is detailed below and summarized in Table 1.

Nitramine and Nitroaromatic Organic Compounds

- At each drinking water supply well that has previously had a detection of any compounds in this parameter class (Table 2), three samples will be collected. These samples will include a single sample from the Influent (location closest to the well and before treatment), System (location between carbon canisters), and Effluent (post-treatment) ports (Table 1). Samples collected from these wells will be submitted to the laboratory for a 21-day turn-around-time (TAT).
- At each drinking water supply well that has not previously had a detection of any compounds in this parameter class, one sample will be collected from an Influent location. Each sample from these wells will be submitted to the laboratory for a 21-day TAT.
- At each drinking water supply well that has never been analyzed for this parameter class (6 of the 59 locations listed in Table 1), a single sample will be collected from the an Influent location. Samples collected from these wells will be submitted to the laboratory for a 7-day TAT.

Wisconsin Regulated Volatile Organic Compounds

- At each drinking water supply well that has previously had a detection of Wisconsin Regulated Volatile Organic Compounds (VOCs) (Table 3), a single sample will be collected from the Influent and Effluent ports. Samples collected from these wells will be submitted to the laboratory for a 21-day TAT.
- At each drinking water supply well that has not previously had a detection of any compounds within this parameter class, a single sample will be collected at the Influent port. Each sample from these wells will be submitted to the laboratory for a 21-day TAT.
- At each drinking water supply well that has never been analyzed for this parameter class (38 of the 59 locations listed in Table 1), a single sample will be collected from the

Influent. Of these 38 locations, 32 of the samples collected will be submitted to the laboratory for a 21-day TAT. The 6 locations that have never been sampled for nitramine and nitroaromatic organic compounds or Wisconsin Regulated VOCs, will be submitted for a 7-day TAT.

Inorganics

- At each residential well from FC Nos. 72040 to 73500 (inclusive) on State Highway 13, including the Bono Creek area, 73030 Birch Grove to 73120 Birch Grove (inclusive), and 29450 Nolander to 30900 Nolander (inclusive), including residences on Bjork Road, where nitramine and nitroaromatic organic compounds *have not* been previously detected, a single sample will be collected from each well at the Influent port. Each sample collected from these wells will be submitted to the laboratory for a 21-day TAT.
- At two drinking water wells where the highest concentrations of nitramine and nitroaromatic organic compounds has been previously detected (FC Nos. 30700 and 30810 on Nolander Road), a single sample for inorganics (Table 4) will be collected from the Influent port. Each sample from these locations will be submitted to the laboratory for a 21-day TAT.

NON-RESIDENTIAL GROUNDWATER WELL SAMPLING PLAN

As you are aware, the two main project objectives have been supplying drinking water to residents that meets Wisconsin Enforcement Standards and evaluating the deeper portion of the aquifer as a potential alternative drinking water supply. The first objective has, and will continue to be addressed through the installation and operation of carbon treatment units at impacted residences, and continued monitoring as specified above. However, further characterization of groundwater within the deeper portion of the aquifer beneath the Barksdale Works is necessary to continue the evaluation of this flow zone as a potential alternative water supply for residents surrounding the site. As such, each of the nine non-residential deep zone wells (Figure 1) will be sampled during the May/June sampling event. Additionally, at two clusters that contain deep zone wells, the shallow and intermediate wells at these locations will also be sampled (Figure 1).

All groundwater samples collected from the 13 non-residential wells will be analyzed for:

- The nitramine and nitroaromatic organic compounds listed in Table 2,
- The Wisconsin Regulated VOCs listed in Table 3, and
- All inorganic constituents listed in Table 5.

ANALYTICAL PROGRAM AND DATA VALIDATION

Analysis of the residential and non-residential samples will be performed at Severn Trent Laboratories' (STL's) Denver, Colorado facility for all tests except for fluoride, which will be analyzed by STL's Austin, Texas facility. Samples will be prepared and analyzed according to the EPA Methods specified in Tables 2 through 5. An independent evaluation of all final data for the nitroaromatic and nitramine organic compounds will be

performed by Environmental Standards, Inc., in Valley Forge, Pennsylvania, in accordance with guidance published in the "National Functional Guidelines for Organic Data Review" (US EPA, 2/94).

SCHEDULE

DuPont anticipates that field activities will begin on Monday, May 13, 2002, with actual sampling to begin on May 14, 2002. The fieldwork will continue until all accessible wells have been sampled. Approximately 14 days after receipt of all validated analytical data, DuPont will prepare a letter report that summarizes the results and contains the laboratory data as an attachment. In the event that any constituents are detected above Wisconsin Enforcement Standards in those samples with a 7-day TAT, DuPont will notify WDNR via e-mail prior to preparation of the report.

DuPont has appreciated your input in the conceptual development of this plan and we welcome your review and comment regarding the specifics detailed herein. If you have any questions or comments, please contact me at (502) 569-2148.

Sincerely,

C. E. Pooler, P.G. /for BSN

Bradley S. Nave
DuPont Corporate Remediation Group
Project Director

Attachments:

- Table 1 - Residential Well Scope of Work Summary
- Table 2 - Nitroaromatic and Nitramine Organics by SW-846 8321A
- Table 3 - Wisconsin Regulated Volatile Organics by SW-846 8260B
- Table 4 - Residential Inorganic Analyses
- Table 5 - Non-residential Inorganic Analyses

Figure 1 - Sampling Locations for the May 2002 Non-residential and Residential Well Monitoring Event

cc: Mr. Cary E. Pooler, P.G., URS Corporation
Mr. Robert J. Raymond, URS Corporation
Mr. Paul Bretting, Bretting Manufacturing, Inc.
Mrs. Amelia Lindsey, RN, Bayfield County Health Department
Mr. Henry Nehls-Lowe, MPH, State of Wisconsin Department of Health and Family Services
Mr. Doug Shultz, Wisconsin Department of Natural Resources, Ashland Service Center

Table 1
Residential Well Scope of Work Summary
Barksdale Non-residential and Residential Sampling Plan
Former Barksdale Works
Barksdale, Wisconsin

State Highway 13 (H)			Requested Laboratory Turn Around (days)	Treatment System Present	Inflow	Analyses	System	Analyses	Effluent	Analyses
Fire Call Number	WDNR Request (2/19/2002)	DuPont Addition								
70990 H		X	7	No	X	NV				
72040 H	X		21	Yes	X	NV	X	N	X	NV
72330 H	X		21	Yes	X	NV	X	N	X	N
72370 H	X		21	Yes	X	NV	X	N	X	NV
72410 H	X		21	Yes	X	NVA	X		X	V
72420 H	X		21	Yes	X	NV	X	N	X	NV
72450 H	X		21	Yes	X	NVA	X		X	
72470 H	X		21	Yes	X	NV	X	N	X	N
72480 H	X		21	Yes	X	NVA	X	N	X	N
72520 H	X		21	Yes	X	NV	X	N	X	NV
72700 H	X		21	Yes	X	NV	X	N	X	NV
72730 H	X		21	No	X	NVA				
72790 H	X		21	Yes	X	NVA	X		X	
72860H	X		21	Yes	X	NVA	X		X	
72910 H	X		21	Yes	X	NVA	X		X	
72920 H	X		21	Yes	X	NVA	X		X	
73110 H	X		21	Yes	X	NV	X	N	X	NV
73160H	X		21	Yes	X	NVA	X		X	
73190 H	X		21	No	X	NVA				
73200 H	X		21	No	X	NVA				
73250 H	X		21	No	X	NVA				
73280 H	X		21	No	X	NVA				
73500 H	X		21	No	X	NVA				
73300 BC (Boyd Creek, off Hwy 13)	X		21	No	X	NVA				
Birch Grove (BG) Wells			Requested Laboratory Turn Around (days)	Treatment System Present	Inflow	Analyses	System	Analyses	Effluent	Analyses
Fire Call Number	WDNR Request (2/19/2002)	DuPont Addition								
31120 BG	X		21	Yes	X	NVA	X	N	X	NV
73025 BG	X		21	No	X	NVA				
73030 BG		X	21	No	X	NVA				
73040 BG	X		21	No	X	NVA				
73080 BG	X		21	Yes	X	NVA	X		X	
73095 BG	X		21	No	X	NVA				
73100 BG	X		21	Yes	X	NVA	X		X	
73110 BG	X		21	Yes	X	NV	X	N	X	NV
73115 BG	X		21	No	X	NVA				
73120 BG	X		21	Yes	X	NV	X	N	X	NV

N = Nitramine and nitroaromatic organic compounds listed in Table 2.
A = Anions/Cations listed in the Water Quality Inorganic section of Table 4.
V = Wisconsin Regulated Volatile Organic Compounds listed in Table 3.
W = Nitrate/nitrite

Table 1 (continued)
Scope of Work Summary
Barksdale Non-residential and Residential Sampling Plan
Former Barksdale Works
Barksdale, Wisconsin

Nolander Road Wells			Requested Laboratory Turn Around (days)	Treatment System Present	Inflow	Analyses	System	Analyses	Effluent	Analyses
Fire Call Number	WDNR Request (2/19/2002)	DuPont Addition								
28515 N		X	7	No	X	N V A				
29450 N		X	21	No	X	N V A				
29600 N	X		21	No	X	N V A				
29890 N	X		21	No	X	N V A				
30110 N	X		21	No	X	N V A				
30240 N	X		21	No	X	N V A				
30300 N	X		21	No	X	N V A				
30380 N	X		21	No	X	N V A				
30490 N	X		21	No	X	N V A				
30600 N	X		21	No	X	N V A				
30700 N	X		21	Yes	X	N V	X	N	X	N
30810 N	X		21	Yes	X	N V	X	N	X	N
30900 N	X		21	Yes	X	N V	X	N	X	N
Ondassagon (O) Road Wells			Requested Laboratory Turn Around (days)	Treatment System Present	Inflow	Analyses	System	Analyses	Effluent	Analyses
Fire Call Number	WDNR Request (2/19/2002)	DuPont Addition								
29250 O		X	7	No	X					
72545 O	X		21	No	X	N V				
73055 O		X	7	No	X	N V				
Bjork Road (BJ) Wells			Requested Laboratory Turn Around (days)	Treatment System Present	Inflow	Analyses	System	Analyses	Effluent	Analyses
Fire Call Number	WDNR Request (2/19/2002)	DuPont Addition								
73150 BJ	X		21	No	X	N V A				
Wedal (W) Road Wells			Requested Laboratory Turn Around (days)	Treatment System Present	Inflow	Analyses	System	Analyses	Effluent	Analyses
Fire Call Number/ID	WDNR Request (2/19/2002)	DuPont Addition								
30145 W		X	21	No	X	N				
30305 W		X	21	No	X	N				
30600 W		X	21	No	X	N				
30765 W		X	21	No	X	N				
30870 W		X	7	No	X	N				
30875 W		X	21	No	X	N				
Church (intersection of Wedal and Hwy 13)		X	7	No	X	N				
On-site Well			Requested Laboratory Turn Around (days)	Treatment System Present	Inflow	Analyses	System	Analyses	Effluent	Analyses
Fire Call Number/ID	WDNR Request (2/19/2002)	DuPont Addition								
CLUBHOUSE			21	Yes	X	N V A	X		X	

N = Nitramine and nitroaromatic organic compounds listed in Table 2.
A = Anions/Cations listed in the Water Quality Inorganic section of Table 5.
V = Wisconsin Regulated Volatile Organic Compounds listed in Table 3.
W = Nitrate/nitrite

Table 2
Nitroaromatic and Nitramine Organics by SW-846 8321A
Non-residential and Residential Sampling Plan
Former Barksdale Works
Barksdale, Wisconsin

Compound	Water (ug/l)	
	Reporting Limit	MDL
HMX (1)	0.12	0.022
RDX (2)	0.12	0.028
1,3,5-Trinitrobenzene	0.12	0.017
1,3-Dinitrobenzene	0.12	0.020
Tetryl (3)	0.12	0.019
2,4,6-Trinitrotoluene	0.12	0.049
Nitrobenzene	0.12	0.025
Nitroglycerin	0.12	0.049
2,4-Dinitrotoluene	0.12	0.016
2-Amino-4,6-dinitrotoluene	0.12	0.013
2,6-Dinitrotoluene	0.12	0.012
4-Amino-2,6-dinitrotoluene	0.12	0.017
2-Nitrotoluene	0.12	0.038
4-Nitrotoluene	0.12	0.038
3-Nitrotoluene	0.12	0.019
PETN (4)	0.12	0.020

- (1) HMX= Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
(2) RDX= Hexahydro-1,3,5-trinitro-1,3,5-triazine
(3) Tetryl= Methyl-2,4,6-trinitrophenylnitramine
(4) PETN= Pentaerythritol Tetranitrate

MDL (Method detection limit) is the minimum concentration of the analyte that can be measured with a 99% probability that it is different from the "blank". MDL values are measured in the laboratory with a series of replicate analyses in a standard matrix, and are updated annually.

Reporting Limit refers to the laboratory's limit of quantitation, or the lowest concentration that can be reliably achieved for a particular analyte within routine operating conditions. Values lower than the Reporting Limit, but above the MDL, are considered estimated concentrations.

Table 3
Wisconsin Regulated Volatile Organics by SW-846 8260B
Non-residential and Residential Sampling Plan
Former Barksdale Works
Barksdale, Wisconsin

COMPOUND	Water (ug/l)	
	Reporting Limit	MDL
1, 1, 1,2-Tetrachloroethane	1.0	0.22
1,1,1-Trichloroethane	1.0	0.26
1,1,2,2-Tetrachloroethane	1.0	0.31
1,1,2-Trichloroethane	1.0	0.39
1,1-Dichloroethane	1.0	0.17
1,1-Dichloroethene	1.0	0.20
1,2,3-Trichloropropane	1.0	0.29
1,2,4-Trichlorobenzene	1.0	0.20
1,2,4-Trimethylbenzene	1.0	0.22
1,2-Dibromo-3-chloropropane (DBCP)	2.0	0.25
1,2-Dibromoethane (EDB)	1.0	0.36
1,2-Dichlorobenzene	1.0	0.24
1,2-Dichloroethane	1.0	0.28
1,2-Dichloroethene (total)	1.0	0.53
1,2-Dichloropropane	1.0	0.21
1,3,5-Trimethylbenzene	1.0	0.29
1,3-Dichlorobenzene	1.0	0.26
1,3-Dichloropropane	1.0	0.26
1,4-Dichlorobenzene	1.0	0.24
2-Butanone (MEK)	5.0	0.93
4-Methyl-2-pentanone	5.0	0.79
Acetone	10.0	1.90
Benzene	1.0	0.21
Bromodichloromethane	1.0	0.22
Bromoform	1.0	0.32
Bromomethane	2.0	0.30
Carbon disulfide	1.0	0.19
Carbon tetrachloride	1.0	0.19
Chlorobenzene	1.0	0.30
Chloroethane	2.0	0.25
Chloroform	1.0	0.23
Chloromethane	2.0	0.30
Dibromochloromethane	1.0	0.38
Dichlorodifluoromethane	2.0	0.23
Ethylbenzene	1.0	0.28
Hexane	1.0	0.25
Methyl tert-butyl ether	5.0	0.21
Methylene chloride	1.0	0.89
Naphthalene	1.0	0.15
Styrene	1.0	0.27
Tetrachloroethene	1.0	0.36
Toluene	1.0	0.29
Trichloroethene	1.0	0.22
Trichlorofluoromethane	2.0	0.28
Vinyl chloride	1.0	0.21
Xylenes	2.0	0.95

MDL (Method detection limit) is the minimum concentration of the analyte that can be measured with a 99% probability that it is different from the "blank". MDL values are measured in the laboratory with a series of replicate analyses in a standard matrix, and are updated annually.

Reporting Limit refers to the laboratory's limit of quantitation, or the lowest concentration that can be reliably achieved for a particular analyte within routine operating conditions.

Values lower than the Reporting Limit, but above the MDL, are considered estimated concentrations.

Table 4
Residential Inorganic Analyses
Non-residential and Residential Sampling Plan
Former Barksdale Works
Barksdale, Wisconsin

Water Quality Inorganics (metals)	Water (ug/l)	
	Reporting Limit	MDL
Sodium, SW-846 6010B	5000	2000
Calcium, SW-846 6010B	5000	29
Magnesium, SW-846 6010B	5000	21
Potassium, SW-846 6010B	5000	500
Water Quality Inorganics (wet chemistry)	Water (mg/l)	
	Reporting Limit	MDL
Nitrate-Nitrite, EPA 353.2	0.10	0.21
Sulfate, EPA 300.0	5.0	0.10
Chloride, EPA 300.0	3.0	0.02
Dissolved Solids, EPA 160.1	10	4.8
Fluoride, EPA 300.0	1.0	0.02
Alkalinity, EPA 310.1 (Hyroxide, Carbonate, Bicarbonate, total)	5.0	1.5

Note: Only selected residential well locations will be analyzed for inorganics parameters.

MDL (Method detection limit) is the minimum concentration of the analyte that can be measured with a 99% probability that it is different from the "blank". MDL values are measured in the laboratory with a series of replicate analyses in a standard matrix, and are updated annually.

Reporting Limit refers to the laboratory's limit of quantitation, or the lowest concentration that can be reliably achieved for a particular analyte within routine operating conditions. Values lower than the Reporting Limit, but above the MDL, are considered estimated concentrations.

Table 5
Non-residential Inorganic Analyses
Non-residential and Residential Sampling Plan
Former Barksdale Works
Barksdale, Wisconsin

Appendix IX Inorganics	Water (ug/l)	
	Reporting Limit	MDL
Beryllium, SW-846 6010B	5.0	0.22
Copper, SW-846 6010B	25	0.83
Nickel, SW-846 6010B	40	0.96
Vanadium, SW-846 6010B	10	0.67
Zinc, SW-846 6010B	20	6.6
Antimony, SW-846 6010B	10	3.1
Cadmium, SW-846 6010B	5	0.29
Cobalt, SW-846 6010B	10	0.34
Silver, SW-846 6010B	10	0.62
Tin, SW-846 6010B	100	3.3
Barium, SW-846 6010B	10	0.64
Chromium, SW-846 6010B	10	0.56
Arsenic, SW-846 6020	5.0	0.19
Lead, SW-846 6020	1.0	0.20
Selenium, SW-846 6020	5.0	0.15
Thallium, SW-846 6020	1.0	0.020
Mercury, SW-846 7470/71B	0.2	0.030
Water Quality Inorganics (metals)	Water (ug/l)	
	Reporting Limit	MDL
Iron, SW-846 6010B	100	5.1
Sodium, SW-846 6010B	5000	2000
Calcium, SW-846 6010B	5000	29
Magnesium, SW-846 6010B	5000	21
Manganese, SW-846 6010B	15	0.38
Potassium, SW-846 6010B	5000	500
Water Quality Inorganics (wet chemistry)	Water (mg/l)	
	Reporting Limit	MDL
Nitrate-Nitrite, EPA 353.2	0.10	0.21
Sulfate, EPA 300.0	5.0	0.10
Chloride, EPA 300.0	3.0	0.02
Bromide, EPA 300.0	0.20	0.08
Dissolved Solids, EPA 160.1	10	4.8
Suspended Solids, EPA 160.2	4.0	1.9
Fluoride, EPA 300.0	1.0	0.02
Alkalinity, EPA 310.1 (Hydroxide, Carbonate, Bicarbonate, total)	5.0	1.5

Note: Non-residential wells will be analyzed for all inorganics parameters; alternate procedures for metals analysis may be utilized for samples containing high sulfide or other interferences.

MDL (Method detection limit) is the minimum concentration of the analyte that can be measured with a 99% probability that it is different from the "blank". MDL values are measured in the laboratory with a series of replicate analyses in a standard matrix, and are updated annually.

Reporting Limit refers to the laboratory's limit of quantitation, or the lowest concentration that can be reliably achieved for a particular analyte within routine operating conditions. Values lower than the Reporting Limit, but above the MDL, are considered estimated concentrations.

