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June 20, 2002

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DRAFT 2001 SITE INVESTIGATION REPORT
FOR THE FORMER DUPONT BARKSDALE WORKS
Barksdale, Wisconsin

Dear Mr. Saari:

DuPont is pleased to submit the attached *Draft 2001 Site Investigation Report* for the former DuPont Barksdale Works. The report documents the site investigation activities completed in 2001, discusses the data collected, and contains conclusions and recommendations for future work at the former Barksdale Works.

The report is contained in five volumes of which the original and four paper copies plus one electronic version (three PDF files on one CD) are attached. Additionally, one paper copy will be forwarded to the Bayfield County Board of Health and to the State of Wisconsin Department of Health and Family Services. Per our telephone conversation, you will forward one of the copies sent to you to the public library.

Please contact me at (502) 569-2148 if you or your staff have any questions regarding this report.

Sincerely,

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cc: Mr. Paul R. Bretting, Bretting Development Corporation
Mrs. Amelia Lindsey, Bayfield County Health Department (will receive report via hand delivery)
Mr. Henry Nehls-Lowe, MPH, State of Wisconsin Department of Health and Family Services
Mr. Doug Shutlz, Wisconsin Department of Natural Resources, Ashland Service Center

DRAFT
2001 SITE INVESTIGATION REPORT FOR THE FORMER DUPONT BARKSDALE WORKS BARKSDALE, WISCONSIN

Date: June 20, 2002

Project No.: 44-D4BA7431.02

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EXECUTIVE SUMMARY

This report presents the findings of the voluntary environmental investigation completed between April and November 2001 at the former DuPont Barksdale Works, located in Barksdale, Wisconsin that operated from 1904 to 1971. The investigation was conducted in accordance with the Wisconsin Department of Natural Resources (WDNR) approved work plan (March 2001 and as specified in WDNR approved amendments). The investigation was undertaken as part of continuing efforts by E.I. du Pont de Nemours and Company (DuPont) and the WDNR to address the presence of site-related constituents discovered in non-residential groundwater monitoring wells and adjacent residential drinking water wells in 1997.

Since the time that site-related constituents were first identified in residential drinking water wells, DuPont's primary focus has been to identify affected private wells and treat drinking water at the point of use. These efforts have been closely coordinated with the WDNR and have consisted of periodic sampling of residential wells and installing and maintaining carbon treatment systems at affected homes, where warranted, so that site-related constituents detected in residential drinking water meet appropriate Wisconsin enforcement standards.

The 2001 site investigation was implemented to gain a more complete understanding of geologic and hydrogeologic conditions beneath the site and to perform an initial evaluation of whether residual site-related constituents are present in surface soils, sediment, pond substrate, and surface water at select on-site and off-site locations. Additionally, the investigation included characterizing the physical extent of one former production area. Samples of multiple media types were collected and analyzed for the presence of a broad suite of target analytes during the investigation. Analytical data obtained as a result of DuPont's routine residential well sampling activities was also included in the evaluation, where applicable.

Objectives of the 2001 investigation were as follows:

- ❏ Better understand vertical and horizontal groundwater flow, particularly at the northeastern portion of the site, which is adjacent to the majority of impacted residential wells.
- ❏ Better understand the distribution of site-related constituents (i.e., nitroaromatic and nitramine organic constituents) in groundwater within the former manufacturing area of the site.
- ❏ Begin to understand groundwater conditions in the deep sandstone beneath the site and determine whether groundwater within this portion of the aquifer is a feasible alternative supply for residential drinking water.
- ❏ Determine if residual site-related constituents are present at four areas within the former manufacturing grounds and at one off-site residential location (immediately downstream of the former manufacturing grounds).
- ❏ Determine the physical nature of the former Burning Ground.

Major Findings and Conclusions of the investigation are as follows:

- Three groundwater flow zones (shallow, intermediate, and deep) have been identified beneath the facility. The deeper flow zone appears to be hydraulically isolated from the shallow and intermediate flow zone.
- Two plumes of site-related constituents are indicated in groundwater. One plume is located in the northeastern portion of the site and the other is located in the east-central portion of the site. Detections of site-related nitroaromatic and nitramine constituents in both plumes were confined to the shallow and/or intermediate flow zones, where it is believed that the majority of the impacted residential drinking water wells withdraw water.
- Residual site-related constituents were detected in each media sampled at each of the former manufacturing/operating areas investigated. A potential source of site-related constituents detected in groundwater in the east-central portion of the site was identified in the vicinity of the single former operational area investigated (the Former Burning Ground). In addition, low concentrations of residual site-related constituents were detected in sediment in a residential area east of the former manufacturing area.
- Site-related nitroaromatic and nitramine organic constituents were not detected in the deeper portion of the aquifer beneath the former Barksdale Works site. Thus, the deeper portion of the aquifer appears to be a potential viable alternative source for drinking water.

Recommendations made based on these findings, in order of priority for future work, are:

- DuPont and WDNR should jointly develop a plan for continued monitoring of appropriate residential drinking water wells and continue to provide drinking water at the point of use to affected residents that meets appropriate Wisconsin enforcement standards for all site-related constituents.
- DuPont proposes to develop work plans for WDNR's review and comment to further evaluate long-term drinking water supply alternatives and implement them as appropriate.
- DuPont proposes to develop a work plan for WDNR's review and comment to evaluate, identify, and manage potential off-site surface soil or sediment issues and implement as appropriate.
- DuPont proposes to develop a work plan for WDNR review and comment that continues efforts to identify priority source areas and take appropriate action.

DuPont will develop a schedule with WDNR for development of the work plans based on overall project priorities.

1.0 INTRODUCTION

The former DuPont Barksdale Works site (see Figure 1) was used for manufacturing explosives from 1904 to 1971. Decommissioning activities conducted after closure were extensive and included the evaluation, location, and detonation of all pertinent explosives manufacturing and process waste system areas. After decommissioning, the site was sold to Bretting Development, Inc. in 1986 and has been used by Bretting for recreational hunting and minor storage.

Site investigation activities were initiated in 1997 when a sample collected by Wisconsin Department of Natural Resources (WDNR) from an adjacent residential drinking water well indicated the presence of 2,4-dinitrotoluene and 2,6-dinitrotoluene. In response, DuPont has worked with the WDNR and residents to identify affected private wells and, where warranted, installed and maintained carbon treatment systems at affected homes, so that residential drinking water at the point of use meets appropriate Wisconsin enforcement standards for site-related constituents.

Between 1997 and 2000, DuPont prepared a site conditions report and completed two phases of groundwater investigation. Additionally, expanded residential sampling was performed during this time period. In March 2001, DuPont submitted a work plan that was designed to characterize groundwater from approximately the former Burning Ground area to the northern site drainage feature (see Figure 2) and to characterize groundwater in the vicinity of several former manufacturing areas near the northern and central portions of the site. Additionally, a work plan to characterize the former Burning Ground was submitted in March 2001. Both work plans were approved by WDNR in a letter dated June 4, 2001.

Over the course of the 2001 investigation, field activities were expanded to include sampling of multiple media at several other former manufacturing and production areas, as well as an off-site area. Additionally, the groundwater investigation was expanded in order to broaden the distribution of on-site monitoring wells and to evaluate the deeper sandstone as an alternate water supply for affected homes.

All additional activities were completed in accordance with amendments to the March 2001 work plan (approved by WDNR) dated June, July, and August 2001. This report documents the findings of the 2001 site investigation.

1.1 Investigation Objectives

The overall objectives of the 2001 investigation were as follows:

- ❑ Better understand vertical and horizontal groundwater flow, particularly at the northeastern portion of the site, which is adjacent to the majority of impacted residential wells.
- ❑ Better understand the distribution of site-related constituents (i.e., nitroaromatic and nitramine organic constituents) in groundwater within the former manufacturing area of the site.

- ❑ Begin to understand groundwater conditions in the deep sandstone beneath the site and determine whether groundwater within this portion of the aquifer is a feasible alternative supply for residential drinking water.
- ❑ Determine if residual site-related constituents are present at four areas within the former manufacturing grounds and at one off-site residential location.
- ❑ Determine the physical nature of the former Burning Ground.

1.2 Scope Summary

Investigation objectives were accomplished by collecting and analyzing surface soil, sediment, pond substrate (media collected from the bottom of the seasonal ponds), surface water, discarded material, and groundwater samples for a comprehensive list of inorganic and organic target analytes that included site-specific constituents (i.e., nitramines and nitroaromatic organics). Additionally, the scope of work included extensive drilling, logging, and well construction activities.

Investigation samples were collected from the following areas:

- ❑ Site-wide groundwater
- ❑ World War I (WWI) Area
- ❑ World War II (WWII) Area
- ❑ Acid Production Area
- ❑ An off-site pond
- ❑ Former Burning Ground

Each of the above areas is illustrated in Figure 2. Details regarding the scope of work and sampling methodologies are located in Section 4.0.

1.3 Organization

This report is organized into eight sections:

- ❑ Section 1 presents the purpose, objectives, and organization of the report and briefly summarizes the investigation scope of work.
- ❑ Section 2.0 describes the site setting.
- ❑ Section 3.0 contains the site background information.
- ❑ Section 4.0 summarizes the scope of work and investigation methodologies and sampling procedures.
- ❑ Section 5 discusses the data evaluation process
- ❑ Section 6.0 describes of the investigation areas, work objectives and scope, and results and discussion for each area investigated.
- ❑ Section 7.0 contains the conclusions and recommendations.
- ❑ Section 8.0 contains the list of references that are cited in the text.

The report also includes 10 appendices:

- Appendix A contains the "Preliminary Drinking Water Guidelines for Targeted Explosive Compounds" memorandum from Department of Health & Family Services.
- Appendix B contains the summary of the non-residential historical analytical results.
- Appendix C contains the summary of the residential historical analytical results.
- Appendix D contains the boring logs and the monitoring well construction, abandonment, and development logs.
- Appendix E contains the laboratory analytical data for the soil samples.
- Appendix F contains the laboratory analytical data for the on-site wells.
- Appendix G contains the laboratory analytical data for the residential wells.
- Appendix H describes the quality assurance/quality control evaluation of the investigation results.
- Appendix I contains the stream gauge elevation data.
- Appendix J contains the figures showing the geophysical cross sections.

2.0 SITE LOCATION AND SETTING

The former DuPont Barksdale Works consists of approximately 1,800 acres and is located in Bayfield County, south of Washburn, Wisconsin, on Chequamegon Bay, Lake Superior (see Figure 1). The town of Washburn (Bayfield County Seat) is located approximately three miles north of site. The town of Ashland (Ashland County Seat) is located approximately four miles to the southeast. State Highway 13 runs northeast across the eastern portion of the former site at about 1,000 feet from the Lake Superior shoreline. The property is bordered by township roads along its north and west sides. The security fence surrounding the former site marks the southern boundary.

The majority of the former Barksdale Works is zoned Forestry-1 (forest programs and compatible recreational development). Agricultural-1 (general agricultural and minor non-farm residences, with no commercial and industrial enterprises) zoning is limited to small areas near the southern boundary of the site. The property area between State Highway 13 and the shore of Chequamegon Bay is zoned Residential-1 (permanent residential development). The land surrounding the former Barksdale Works is predominantly zoned Agricultural-1. Minor areas are zoned Forestry-1. Aerial photos reviewed from 1938, 1953, 1963, 1975, 1978, 1990, and 1998 are consistent with these land uses. Cleared areas were and continue to be used for agricultural purposes.

Approximately 196 acres of the former Barksdale Works carries a deed restriction. The restricted area roughly corresponds to the WWI era acid production area and the former trinitrotoluene manufacturing area. The deed restriction limits use in the area to hunting, stocking small game, or planting groundcover. Agricultural, livestock breeding, playground, sporting, recreational, or public park use is prohibited.

Fifty residences are located within ¼-mile of the site perimeter (see Figure 2). Eight of these residences are located in a group known as Barksdale Village along the eastern edge of the site between State Highway 13 and the shore of Chequamegon Bay. Six newer homes are spaced out along the lakeshore between the village and Nolander Road. Twelve houses are present on Nolander road to the north of the site, four on Ondassagon to the west, and one on State Highway 13 to the southeast.

Bayfield County plat maps also identify two subdivisions, Birch Grove and Mission Springs, within ½-mile of the site (see Figure 2). Birch Grove, to the northeast beyond the intersection of State Highway 13 and Nolander Road, contains 10 residences. Mission Springs, across State Highway 13 to the southeast, contains 10 to 13 residences (several are temporary dwellings, which are part of the Mission Springs Resort). The Bretting residence is located between State Highway 13 and the lake between Mission Springs and Barksdale Village. Twenty-five to thirty other residences are located within about ½-mile of the site on Nolander, Ondassagon, Wedal, and East Ondassagon Roads.

2.1 Climate, Topography, Surface Water Hydrology, and Drainage

2.1.1 Climate

The Lake Superior region averages 31 inches of perception a year with 20 to 25 percent of the precipitation in the form of snowfall. Bayfield County averages 27 inches of rainfall per year and 53 inches of snowfall per year. The average range in temperatures for spring, summer, fall, and winter are 39° to 45°F, 65° to 71°F, 42° to 47°F, and 18° to 23°F, respectively. In general, wind direction in the area is from the southwest during the spring and fall, from the northeast in the winter, and variable during the rest of the year [DuPont Environmental Remediation Services (DERS), 1997].

2.1.2 Topography

The center of the Bayfield Peninsula rises 750 feet above Lake Superior to 1,350 feet above mean sea level (MSL) at a point about five miles west and northwest of the site. The topography of the center of the peninsula is fairly rugged and consists of coarse-grained, hummocky, pitted glacial outwash known locally as the Moquah Barrens. About three to four miles from the lake, the ground surface drops to just under 1,100-feet MSL. Stream gradients are erratic and change abruptly. In flat areas, gradients as low as 0.2 to 1.8 feet/mile, are be observed on glacially formed plains (DERS, 1997). On bedrock escarpments, gradients can reach 30 to 60 feet/mile (DERS, 1997).

The topography is fairly rugged to the north and west of the former Barksdale Works. However, approximately one mile south, the terrain levels out into a wide, flat, marshy, wetlands area (see Figure 1) where Whittlesey and Fish Creeks drain into Chequamegon Bay.

The surface elevation on-site varies from 793 feet MSL in the northwestern corner of the property to 602 feet MSL at the Lake Superior shoreline. In general, the site surface is relatively smooth with contours paralleling the current lakeshore. Where stream channels cut the site surface, steep banks up to 50 feet high are present. Steep, 20 to 30 feet, bluffs are also present at the lakeshore in the northern part of the site.

2.1.3 Surface Water Features

Streams in the area generally meander from west-northwest to southeast terminating in Chequamegon Bay (see Figure 2). The streams with well-defined channels on or adjacent to the site are Bono Creek, Northern Drainage, Central Drainage, Boyd Creek, and a Mission Springs Creek. Of these streams, only the eastern reaches of Bono and Boyd Creeks maintain flow year round where the streams are gaining base flow from groundwater discharge. The remaining portions of these streams and the other intermittent channels on-site typically become dry during summer months.

Boyd Creek, which bisects the site, is approximately five miles in length and flows roughly west to east from the plains west of the site to Chequamegon Bay on Lake Superior. The elevation of the Boyd Creek streambed decreases from approximately 1,060 feet MSL at its headwaters to about 602 feet where it enters Chequamegon Bay. In

the intermittent headwaters of the creek, the stream bed is fairly steep dropping about 150 feet in the first mile. The creek is fed by groundwater in its downstream reaches where the stream gradient drops to about 50 feet permile.

Bono Creek has similar characteristics to Boyd Creek. Bono Creek is located north of the site and generally runs from west to east. It is about 4.5 miles long and drops from headwaters at 950 feet MSL to the lake. Bono Creek has a intermittent tributary that enters from the south bank. This tributary has its headwaters on-site near the intersection of Nolander and Ondassagon Roads. The 7.5 minute quadrangle map [United States Geological Survey (USGS), 1964] incorrectly shows the tributary originating within the site near the Acid Production Area. In actuality, it is fed by a ditch along Nolander Road. This tributary has received surface water drainage from the northwestern part of the Barksdale site during heavy rains and periods of snow melt. During typical rainfall events, the water entering the tributary is primarily from the surface of Nolander Road and properties to the north.

2.1.4 Site Drainage

In general, drainage of surface water occurs from northwest to southeast along three large creeks, five small creeks, and one swale. Boyd Creek is the largest drainage feature and bisects the site. Flow in Boyd Creek is observed year round. Boyd Creek receives surface water from an area that is approximately 679 acres. The Central Drainage and Mission Springs Creek are the other large drainage features on-site (see Figure 2) and are intermittent. Each of these intermittent streams receives drainage from areas that are approximately 250 acres. The other six other drainages are roadside ditches and one swale.

Three ponds (0.1, 0.2, and 0.4 acres each) are located on-site. The two larger ponds are in the main flow line of the drainage. The 0.1-acre pond is on a side branch that normally only flows during heavy storms. Several smaller intermittent ponded areas have been observed along various ditches. Numerous pocket wetlands (less than an acre each) and three areas of emergent wetland vegetation (1.2, 2.2, and 3.8 acres) have been mapped on the site by the State of Wisconsin (see Figure 2). The pocket wetlands are located primarily in the northwest corner of the property, which is relatively flat and poorly drained.

2.2 Ecological Setting

In the site vicinity, the primary land use is pastureland, with about 60 percent of the adjacent properties cleared and planted in grass or hay. The land between State Highway 13 and the bay contains some old growth pine stands, but the remaining adjacent land is scrub forest that has re-grown since the area was strip logged in the late 1800s.

The native tree species typically present on and in the vicinity of the site include aspen, birch, alder, oak, red maple, and white pine. The site consists of approximately 65 percent scrub forest and 35 percent meadow.

2.3 Geological and Hydrogeological Setting

Within the former Barksdale Works region, there are two main geological units of interest, the Pleistocene-aged glacial sediments of the Miller Creek and Copper Falls Formations and the underlying Chequamegon Sandstone, a Precambrian-aged sedimentary rock. A generalized stratigraphic column is presented in Figure 3. A more detailed discussion of the regional geology is provided in 1997 Site Conditions Report (DERS, 1997).

Pleistocene Sediments

The Pleistocene deposits of the Superior region of Wisconsin include: the Miller Creek Formation, which consists largely of clayey till and offshore clay and silt deposited in the Superior lowland; the Copper Falls Formation, which consists largely of sandy till and stream-deposited sand; and postglacial sediments. The area of the former Barksdale Works lies in the Superior lowland region. The Pleistocene sediments in this region are of the Miller Creek Formation, which consists primarily of clayey, silty till (Clayton, 1984). Underlying the Miller Creek Formation is the Copper Falls Formation, which may be present at the western portion of the Barksdale site.

Glacial till in the central portion of Bayfield County reaches a thickness of greater than 400 feet (Young and Skinner, 1974). Based on field observations made during Barksdale Works site investigations, the thickness of the glacial sediments have been noted to reach as much as 230 feet in the western interior of the site and as little as 5 feet near the Chequamegon Bay shoreline, which is consistent with Clayton (1984).

Pre-Cambrian Rock -- Chequamegon Sandstone

The rocks of the late Keweenawen Supergroup are subdivided, with decreasing age, into the interflow sedimentary rocks of the Oronto Group and the Bayfield Group. The Bayfield Group contains three sandstone units: the Orienta Sandstone (deepest), the Devils Island Sandstone, and the Chequamegon Sandstone (shallowest). The latest member of the Bayfield Group, the Chequamegon Sandstone, is believed to underlie the former Barksdale Works. The Chequamegon Sandstone is also locally known as the "Lake Superior Sandstone."

The Chequamegon Sandstones were fluvially deposited and consist of predominantly red feldspathic to arkosic sandstone and siltstone with locally abundant intercalated layers of shale and conglomerate. Thwaites (1912) noted that small lenticular beds of shale, usually 5 feet or less in thickness and discontinuous, are found in the Chequamegon Sandstone. The conglomerate clasts are predominantly quartz and quartzite (Thwaites, 1912). The estimated thickness of the Chequamegon Sandstone in the area of the former Barksdale Works is 500 feet based on outcrop data (Ojkangas and Morey, 1982). The Precambrian sandstone outcrops along the shore bluffs of the Bayfield Peninsula and Apostle Islands. Locally, the Chequamegon Sandstone is a primary drinking water aquifer.

2.3.1 Regional Hydrogeologic Setting

The ultimate discharge area for groundwater in the region is Lake Superior. The average groundwater discharge rate to the Lake from the Wisconsin shoreline was estimated at approximately 100 cubic feet per second (Young and Skinner, 1974). The main groundwater recharge area for the Chequamegon Sandstone is believed to be located in the central portion of the Bayfield Peninsula called the Moquah Barrens (Young and Skinner, 1974). Infiltration is estimated to be 11 inches per year (Young and Skinner, 1974).

In general, the depth to the water table increases inland. However, in much of the region, the water table is less than 50 feet below ground surface (bgs). Local artesian wells tapping the Chequamegon Sandstone are known to exist in the vicinity of the former Barksdale Works.

In the area near the former Barksdale Works, groundwater flow in the Chequamegon Sandstone is toward Chequamegon Bay from the west-northwest toward the east-southeast. Young and Skinner (1974) have reported a hydraulic gradient of 0.012 feet per foot for this area. The USGS modeled hydraulic conductivity for the Chequamegon Sandstone was estimated at approximately 20 feet per day, or approximately 150 gallons per day per square foot of aquifer thickness (Krohelski, 1997). Average estimates from local well records of 16.5 feet per day agree closely with the USGS values. For wells in the immediate vicinity of the former Barksdale Works, hydraulic conductivities were previously estimated using yield test data (DERS, 1997). These yield test data indicated somewhat lower but similar estimated hydraulic conductivities for the site in the range of 4.8 to10.3 feet per day, with an average of approximately 7 feet per day.

2.3.2 Site Geology

The results of the field investigation conducted in the summer and fall of 2001 were used to develop a detailed lithologic description of the subsurface geology for the former Barksdale Works. This lithologic description is based upon rock core data, drill cuttings, geophysical logs, and field observations (see boring logs in Appendix D). Site geology is shown on cross sections (see Figures 4 through 11 and Appendix J). Isopach maps and structural elevation maps are presented as Figures 12 and 13, respectively.

Glacial deposits vary in thickness across the site from greater than 200 feet in the western portions of the site to less than 6 feet in the eastern portion near the lakeshore. Figures 5, 6, 8, and 11 reflect this dramatic thinning of the glacial till layer from west to east. The glacial clay layer, which forms the uppermost layer of the glacial deposits, also thins from west to east, and persists across the site to the lakeshore.

In the Boyd Creek valley and to lesser extents in the other stream valleys present on-site, both the glacial till and clay layers are either thin or absent in the eastern portions of the site due to the erosional action of the streams. The isopach map of the glacial deposits and the structural top of the Upper Sandstone (see Figures 12 and 13) both illustrate this feature.

Subsurface layers below the former Barksdale Works can be grouped into four units with respect to their age and origins: Topsoil, Early Holocene, Pleistocene, and Precambrian.

A graphical representation and typical elevation and thickness data are presented for the major layers in Table 1.

Topsoil

Topsoil materials at the site are typically fine grained and include organic clays, vegetation derived surface materials such as forest leaf mold or detritus, prairie root zone materials, and hydric soils. Topsoil units range from gray (organic clays) to red (prairie loam) to black (forest detritus and hydric soils).

Early Holocene Deposits

Holocene deposits include proglacial lake clays and isolated, stratified outwash deposits. Lake clay deposits are uniformly observed across the site as medium stiff, moderately-plastic, red to red-brown, silty clay. The layers range from 2 to 33 feet in thickness with an average of 7 feet. The layers are typically thicker in the western portions of the site. This layer is absent in deep stream valleys and man-made cuts.

Pleistocene Deposits

The Pleistocene deposits comprise glacial tills and interbedded outwash deposits. Regionally, two major Pleistocene formations have been identified, the Miller Creek Formation and the Copper Falls Formation. Identifiable layers corresponding to these formations appear to be present on-site.

The Miller Creek Formation is uppermost unit of the two formations. On-site, it appears as two reddish clayey tills occasionally separated by reddish, silty sand and gravel outwash. The upper Douglas Till member of the Miller Creek Formation is red to red-brown, clayey medium sand or sandy clay, with trace to no gravel, and little silt. It has been observed beginning at depths of 5 to 30 feet below grade. Thickness of the Douglas Till member ranges from 5 to 20 feet and averages approximately 10 feet. This member is typically absent in the eastern and southern portions of the site.

In some locations a sandy layer was noted between the Douglas Till and the underlying Hansen Till. The sand layer varies from 2 to 85 feet in thickness with an average of approximately 20 feet.

The Hansen Till is a lighter red, silty or silty-clayey fine sand. Trace gravel in the Hansen till is often angular black igneous or metamorphic material or broken sandstone. The Hansen member ranges from 5 to 20 feet in thickness and averages approximately 15 feet. Typically, a large number of boulders were found at the base of this layer where it contacts the underlying sandstone bedrock.

The Copper Falls Till was encountered sporadically in the western portion of the site at 40 to 70 feet below the ground surface. It is a dark-brown to gray- or olive-brown non-plastic clayey silt. The till includes black rounded igneous pebbles and occasional boulders. Thin 0.1 to 3 feet layers of poorly graded outwash sand or layered silt were often encountered within the Copper Falls till. Thickness of the Copper Falls till ranged from absent to 118 feet, with an average where present of approximately 70 feet.

Precambrian Sandstone

Two precambrian zones of sandstone bedrock have been observed on-site. The upper sanstone zone is characterized as thickly bedded to massive, uniformly orange to medium-brown colored, medium to fine-grained sandstone which is typically mildly to moderately weathered with numerous large (over 0.5-in.) fractures or voids. The lower sandstone zone is thinly to thickly bedded, red-violet to red-brown colored fine-grained sandstone with numerous light bands and spots present. The lower unit contains frequent siltstone inclusions, many of which are expressed as zones of contorted laminations with abrupt closely spaced color changes. The lower zone is typically less weathered and considerably less fractured than the upper zone even though it contains approximately 10 to 20 times as many visible indications of bedding as the upper zone.

Structural Characteristics

Cross sections (see Figures 5, 6, 8, and 11) indicate that eastward thinning of the glacial till is corresponds to the rising surface of the underlying precambrian sandstone bedrock in the eastern portion of the site. Bedrock apparently dips downward again towards the east giving the appearance of an anticlinal feature. According to Clayton (1984), the Bayfield Group consists of nearly flat-lying units. The anticlinal feature may be due to glacial erosion of the sandstone surface with subsequent deposition of till into the low-lying depression. Structural dip of the sandstone units could not be determined from the Borehole Information Processing System (BIPS) dipmeter logs generated during the 2001 investigation due to the lack of a continuous marker layer within the units. The dipmeter features that were visible on the BIPS logs appeared to be more reflective of stratigraphic features than structural orientation.

Other more obvious structural features were revealed in the geophysical logs. Fractures and voids in the sandstone bedrock around the well bore were clearly visible in the BIPs logs. These fractures varied in width from a fraction of a millimeter to several inches. The most pronounced fractures were seen in borings PZ-31, PZ-32, and PZ-15, near the top of the Precambrian sandstone or near the contact of the Upper and Lower Sandstones. Fractures observed in the BIPs are posted on the cross sections.

3.0 SITE BACKGROUND

DuPont operated the former Barksdale Works site from 1904 to 1971. The facility primarily produced dynamite, nitroglycerin and 2,4,6- trinitrotoluene for the U.S. Military and the mining industry. Other products associated with the explosives industry were produced in smaller quantities at the Barksdale Works, including trinitroxylene, trivelene, lydol, nitramon, soda amatol, and nitramex. Intermediate and supplemental materials produced included sulfuric acid (oil of vitriol), nitric acid, and sellite.

Upon termination of operations, DuPont performed periodic dismantling/demolition and clean-up activities until 1984. Following shutdown, the grounds became overgrown by prairie and forest vegetation. A small-scale demolition effort was conducted in 1985. The former Barksdale Works property was sold to Bretting in 1986. The main manufacturing area is currently being used by Bretting as a private game preserve and for minor storage. The site owner's residence (Fire Call No. 72040) and several other residences (Barksdale Village) are located on the former non-manufacturing site property, east of the former main manufacturing area, between State Highway 13 and the Lake Superior shoreline (see Figure 2). In December 1995, the Wisconsin Department of Health and Social Services conducted a site review and concluded that additional data were needed to assess the condition of site groundwater and Boyd Creek water.

Site investigation activities were initiated in 1997 when a sample collected by WDNR from an adjacent residential drinking water well indicated the presence of 2,4-dinitrotoluene and 2,6-dinitrotoluene. In response, DuPont has worked closely with the WDNR to identify affected private wells and, where warranted, installed and maintained carbon treatment systems at affected homes so that residential drinking water meets appropriate Wisconsin regulatory criteria.

DuPont's initial on-site investigation included installation of 17 groundwater monitoring wells in 1998. Groundwater data indicated that elevated concentrations of site-related constituents were present in the east-central portion of the site in the vicinity of a former on-site operational area known as the former Burning Ground.

An expanded residential sampling effort in 1999 identified site-related constituents in several residential wells in an area adjacent to the site that is known as Barksdale Village (see Figure 2). Between April 1999 and December 1999, DuPont collected quarterly groundwater samples at several monitoring wells, residential wells, and peizometers. Furthermore, carbon treatment systems were installed at the Barksdale Village residences and at one on-site potable well. The findings of the quarterly sampling, reported in June 2000, indicated that site-related constituents were present in several areas on- and off-site and that the treatment systems were effectively removing site-related constituents from drinking water at the point of use. Over the course of site activities, four water supply wells that were either unused or in poor condition were properly abandoned in accordance with WDNR statutes.

In 2000, quarterly residential sampling was expanded in an effort to identify all impacted drinking water wells surrounding the site. Additionally, field screening of surface soil at the former Burning Ground and sediment in the adjacent drainage was performed in

October 2000. Based on the results of the quarterly groundwater sampling, DuPont worked with WDNR to develop a plan to more completely investigate groundwater on and in the vicinity of the Barksdale Works.

In March 2001, DuPont submitted a work plan that was designed to characterize groundwater along State Highway 13 from approximately the former Burning Ground area to the northern site drainage feature (see Figure 2), and characterize groundwater in the vicinity of several former manufacturing areas near the northern and central portions of the site. Additionally, a work plan to characterize the former Burning Ground area was submitted in March 2001. Both work plans were approved by WDNR in a letter dated June 4, 2001.

In anticipation of WDNR's approval, DuPont initiated construction activities for drill rig access in April 2001 and performed field screening of surface soil at several areas (i.e., areas where surface vegetation was absent) in May 2001. As a result of the May 2001 field screening, investigation activities were expanded to include sampling of multiple media at several other former manufacturing and production areas, as well as an off-site area. In July 2001, groundwater results for residential wells along Nolander Road and in Birch Grove (see Figure 2) indicated site-related constituents were present. Therefore, the groundwater investigation was expanded in order to broaden the distribution of on-site monitoring wells and to evaluate the deeper sandstone as an alternate water supply for affected homes.

3.1 Regulatory History and Previous Investigations

Investigations conducted to date have been voluntary actions undertaken by DuPont or the WDNR, as detailed below.

3.1.1 Previous Investigations

Between 1943 and 1995, nine screening level assessments were undertaken (DERS, 1997). The majority of these events were related to plant decommissioning actions and WDNR concerns regarding surface conditions at the property (DERS, 1997). In December 1995, a report prepared by the Wisconsin Department of Health and Social Services concluded that additional information was required on the condition of groundwater throughout the plant area and in the surface water of Boyd Creek.

Groundwater samples collected by WDNR in June 1997 from two water supply wells showed detectable levels of 2,4-dinitrotoluene and 2,6-dinitrotoluene in one sample (the Bretting residence well). In order to better understand historical site activities and the hydrogeology of the site, DuPont has worked with the WDNR to plan and implement several investigations that have been documented in the following reports:

- *Site Conditions Report* (DERS, 1997). The report contained the results of a site reconnaissance, operator interviews, historical facility document review, and a geologic literature search. The report also included results of a groundwater sampling event conducted in October 1997 from five water supply wells.
- *Results of the 1998 Sediment and Surface Water Investigation Report at the Former Barksdale Works, Barksdale, Wisconsin* (Exponent, 1999). This report

presented the results of screening level evaluation of Boyd Creek. The report concluded that no nitroaromatic constituents were migrating off-site at concentrations of ecological concern and that detected concentrations of site-related constituents in the eastern reaches of the creek surface water did not exceed ecological risk based standards.

- *Groundwater Investigations Report* (URS Greiner Woodward-Clyde, 1999). Recommendations in the March 1999 *Groundwater Investigation Report* included a proposal to conduct one year of semi-annual sampling and quarterly water level monitoring to determine time trends in chemical concentrations and evaluate seasonal effects on site hydrogeology. In response, WDNR requested that the twelve current on-site wells be included in the one-year sampling program.

Information from these investigations were integrated into the evaluation of the 2001 field investigation results as appropriate. These results are presented in Section 6.0.

4.0 INVESTIGATION SCOPE AND METHODOLOGY

The scope of the 2001 site investigation included a broad range of activities:

- ❑ Drilling 74 boreholes
- ❑ Logging borehole geophysical parameters at 31 locations
- ❑ Constructing and developing 66 permanent wells (see Table 2) and 7 temporary wells
- ❑ Abandoning 3 wells
- ❑ Collecting and analyzing groundwater samples from 89 wells
- ❑ Excavating 4 trenches
- ❑ Collecting and analyzing numerous surface soil, sediment, pond substrate, surface water, and waste characterization samples
- ❑ Installing stream gauging stations
- ❑ Surveying all monitoring wells and sampling points
- ❑ Waste management and disposal

All activities were performed in accordance with the March 2001 investigation work plan and as amended in June, July, and August 2001.

DuPont engaged a number of contractors to perform field investigation activities. Soil boring and monitoring well installation was performed by Layne-Christenson located in Peewaukee, Wisconsin. Colog, Inc. (Colog) of Denver, Colorado was contracted to conduct the geophysical logging (borehole imaging, EM-conductivity, etc.). Enviroscience, Inc. of Eden Prairie, Minnesota Prairie surveyed all monitoring wells. Personnel from URS Diamond, a division of URS Corporation, performed visual logging, trenching, sampling, and documentation and oversight of field activities.

Severn-Trent Laboratories in Denver, Colorado (STL-Denver) analyzed the majority of samples collected during the investigation. En Chem, Inc. (En Chem), in Madison, Wisconsin, was used for the analysis of selected samples that were suspected as being unsuitable for air transport to STL-Denver. The analytical program included an independent data review by Environmental Standards, Inc. of Valley Forge, Pennsylvania for the nitroaromatic and nitramine organic constituents. A list of analyses performed during the investigation is provided in Tables 3 through 8.

4.1 General Sampling Considerations

General sampling guidelines maintained throughout the investigation program are discussed in the following sections.

4.1.1 Sampling Equipment and Containers

Equipment used to transfer samples from each sampling device to the appropriate sampling container was constructed of materials (stainless-steel or Teflon®) that would not contaminate the samples and was easily decontaminated to prevent cross-contamination. Where possible containers were filled directly from the sampling medium. All reusable sampling equipment was decontaminated before each use, and disposable equipment was discarded immediately after use. New, disposable gloves were worn during sample collection. These were replaced each time a different location was sampled and immediately prior to collection of subsequent samples at each location.

All samples were collected into laboratory-provided, certified-clean, pre-preserved containers in the following order: volatiles, nitroaromatic/nitramine organics, total metals, cations, anions, and dissolved metals. Samples were labeled and documented on the Chain-of-Custody (COC) and then immediately placed on ice into a plastic ice cooler.

4.1.2 Equipment Decontamination

Decontamination of portable sampling tools (augers, spades, spoons, water-level indicators, dredges, etc.) was conducted near (and generally downwind of) each specific work area, as necessary, using 5-gallon buckets to contain liquids. Portable tools were decontaminated using a solution of Alconox® and potable water and triple rinsed with distilled water before each use, and between sampling locations.

Each piece of heavy equipment (drilling rigs, augers, support trucks, personnel transports, and equipment racks) was decontaminated at a designated on-site area. All equipment was initially scraped to remove excess solid material at the work location and subsequently cleaned with a hot water/steam mixture from a steam cleaner at pressure of approximately 2,500 pounds per square inch (PSI) and a temperature of approximately 200 degrees Fahrenheit. After cleaning, the equipment was allowed to air dry.

4.1.3 Sample Preservation and Chain-of-Custody (COC)

All samples collected during the investigation were stored and shipped on ice until received by the appropriate analytical laboratory. A COC Record accompanied all samples from the initial collection in the field to their receipt at the selected laboratory. Additionally, all samples were maintained in a secure area during storage prior to laboratory receipt. Signatures present on the COCs provided with the laboratory reports indicate those individuals responsible for sample storage, in order of receipt.

4.2 Sampling Methodologies

Soil, sediment, pond substrate, surface water, groundwater, and waste material samples were collected during the investigation using a variety of methods specific to the media type sampled. The methods and procedures utilized for each media are discussed in the following sections.

4.2.1 Soil, Sediment, Pond Substrate, and Waste Material Sampling

Surface soil sampling was performed to determine if residual site-related constituents were present in bare spots at the following former production/operation areas:

- ❏ WWI Area
- ❏ WWII Area
- ❏ Acid Production Area

Soil samples were collected using a decontaminated stainless-steel hand auger or spade. Samples for metals, nitroaromatic and semi-volatile analyses were typically collected into a decontaminated stainless-steel bowl, sorted to remove debris, and homogenized prior to filling sample containers. Volatile organic compound (VOC) samples were collected directly from the wall of the auger hole using EnCore® samplers.

Sediment and/or pond substrate samples were collected from the following areas:

- ❏ WWI Area
- ❏ Acid Production Area
- ❏ An adjacent residential property

Sediment and pond substrate (WWI Pond 3 and the Acid Production Area Pond) samples were typically collected using a decontaminated stainless-steel spoon at locations accessible from the bank of the water body. The term "pond substrate" applies to media collected from the bottom of the seasonal ponds. At Ponds 1 and 2 in the WWI Area, a stainless-steel, clamshell dredge was used to collect the sample material, which was then transferred into the containers using stainless-steel spoons.

Samples of waste material were collected at the former Burning Ground. These samples were collected from the excavator bucket using a stainless-steel bowl and disposable wooden spoon.

4.2.2 Surface Water Sampling

Surface water samples were collected from four ponds in two areas of the site. These samples were not identified in the work plan but collected due to a request made by the property owner. The two areas include the former WWI (WWI Pond 1 through Pond 3) area and the former Acid Production Area (ACD Pond 1).

Samples at WWI Ponds 1 and 2 were collected using a new disposable Teflon bailer. Samples at WWI Pond 3 and the Acid Production Area Pond were filled directly from the water surface.

4.2.3 Groundwater Sampling

Groundwater samples were collected from 82 permanent monitoring wells (new and previously existing) and the 7 temporary wells in October 2001. Before sampling each well, the static water level was recorded, and the well was then purged to draw fresh groundwater into the well from the formation. Purging was accomplished at each

permanent monitoring well using the dedicated bladder pumps provided, at a rate not exceeding one liter per minute. The pumping rate was adjusted to produce minimal draw down of the water surface and, where possible, the wells were purged in a stabilized-head condition. Because dedicated bladder pumps were not installed at the temporary wells, purging was accomplished by bailing 10 well volumes with new disposable Teflon bailers.

Field parameters (temperature, pH, specific conductance, and dissolved oxygen) were monitored and recorded during purging at 3-minute intervals (or after each well volume at temporary wells). Sampling began after three consecutive sets of field readings were within 10 percent of each other. If the purged water did not stabilize, the wells were sampled after purging for 30 minutes.

4.3 Drilling Methods

Two methods of drilling were originally proposed for the 2001 program: 4.25-inch hollow-stem auger drilling (for overburden material drilling) and dual-tube reverse circulation air rotary (DTRC) for drilling in bedrock. To facilitate special conditions, NX wire line rock coring (for confirmation of borehole video data) and mud rotary (for drilling through boulders) were later added.

Four well types (O, D, R, and X) were installed during the investigation, and the drilling methodologies were changed as needed to facilitate drilling for each well type. O-wells were typically installed in the upper portion of the glacial overburden. D-wells were selected at the predicted most-permeable zone of the upper sandstone, which was typically marked by visible fractures and/or geophysical data anomalies. R-wells were installed in the upper sandstone at elevations similar to nearby residential wells. X-wells were installed below the last observed zone of major permeable features (lower sandstone) typically 40 feet or more below the associated D-wells. Table 2 provides a summary of the installed well depths and construction dimensions.

Hollow-stem auger rigs techniques were typically used for O-well drilling and at temporary well locations. Split spoon samples were collected continuously though the augers when formations permitted. Hollow-stem auger drilling was used in the unconsolidated (soil) formations because it allows split spoon sampling, which recovers soil material to be used in logging the lithology.

DTRC drilling for this project was conducted using a 5.875-inch roller bit advanced on special dual-walled drill rods. The roller bit and rods were advanced inside 6.25-inch overshot casing with carbide cutting teeth when drilling through unconsolidated materials. DTRC drilling produces a mixed stream of air and soil cuttings, which are collected using a cyclone hopper. Because the cuttings are driven to the surface by compressed air, potable water was introduced (at a rate less than 1 gallons per minute) when drilling above the water table to assist segregation of the cuttings from the return air stream and to minimize dust production.

Typically DTRC was used for R-, D-, and X-well drilling. At locations where boulders halted hollow-stem auger drilling a substantial distance above bedrock (PZ-13, PZ-21, and PZ-34), DTRC rigs were used to advance the hole through the obstructions. At such

locations, the DTRC rig was operated at a reduced rate and limited formation information (grain size and overall color) was obtained from disturbed samples bagged at the cyclone. Collection of split spoons was not possible using DTRC due to the seating mechanism of the dual-walled drill rods which required 10 to 20 feet continuous drill runs. DTRC boreholes were, therefore, logged using the BIPS tool to provide the visual information required for logging.

Rock coring was conducted using specially equipped drive heads refitted to one of the all-terrain mounted CME drill rigs. NX-core bits (2-inch inside diameter) were used to ensure a high percentage of sample recovery. Because of the slow production, rock coring was conducted only as a calibration check on the video information at three locations: PZ-18, PZ-19, and PZ-29.

Mud rotary drilling was used to ream out the boreholes for the 4-inch diameter wells at PZ-16. It was also used at PZ-11 to advance the borehole through two very dense boulder layers. Although mud rotary drilling has the ability to advance large diameter boreholes through dense rocky formations, it generates larger quantities of waste than the other methods used, and, like DTRC, it generates a mixed cutting stream that does not lend itself to lithologic logging. Therefore, mud rotary drilling was not frequently used on-site.

4.4 Lithologic Logging

The lithology for each well cluster was recorded continuously from the surface to the bottom of the deepest borehole. The logs (see Appendix D) included with this report are composites developed from portions of the various boreholes at each cluster. Where the shallow well was previously logged, only the portion of the new holes below the existing well bottom was logged during the 2001 fieldwork. The information from the earlier logs was transcribed to the appropriate section of logs produced in this report. The ground surface and plan locations listed on the logs reflect the average values for all the separate boreholes drilled at each location.

Descriptive data for each cluster were obtained from split-spoon samples, down-hole video (collected using the Colog BIPS), rock cores or bagged soil cuttings obtained from the rotary drill return streams.

After completing DTRC drilling of the deepest borehole in a cluster, a temporary steel casing was left in the ground to keep the unconsolidated portion of the borehole open. These temporarily cased boreholes were allowed to settle and equilibrate for a few days (a week on average). The settling period was limited to 10 days in order to ensure that the formation would not settle tightly and prevent casing removal.

After the borehole fluids had settled, Colog measured geophysical parameters. The geophysical readings were collected using self-contained probes lowered by a mechanically metered winch, which tracked the probe depth. Separate probes were used for video (BIPS); fluid temperature and conductivity; natural formation gamma; formation conductivity [electromotive- (EM-) inductance]; and vertical borehole flow (heat-pulse flow metering).

Scheduling of the measurement suites was difficult because each probe type required a different lowering rate for accurate data collection (heat-pulse flow at about 0.5-feet per minute, video 1-foot per minute, EM-inductance 2- to 3- feet per minute, gamma and fluid parameters about 5-feet per min). Initially, only video, gamma, and EM-conductivity were planned for each location since this was all the crew could do in the limited time a borehole could be kept open under the constraints of the available casing and formation-lock time limits.

Video was the primary focus of the Colog activities because it would provide the only descriptive log information for some locations. Gamma and EM-conductivity could be run after well construction and were, therefore, not as limiting to the schedule. However, after the second DTRC crew was added to the project in late July, more boreholes could be prepared for logging during each geophysics crew site visit, and the fluid temperature and conductivity parameters were added at that time. Heat-pulse flow, which took almost a full day per borehole, was not added until PZ-26 and later, when drilling progress had indicated that the additional drill crew wait time could be incurred and drilling of all wells could still be completed in time to meet the planned October sampling date.

Even with the settling period provided, water clarity at some boreholes was too low to provide usable video information. In such cases, the fluid and flow parameters were run first, then potable water was added to the borehole to flush down the cloudy water. Video was then run in the potable water zone. At some locations (PZ-13 and PZ-20), the video was obtained while potable water was being added; otherwise, the turbidity returned before the video could be completed.

Clusters PZ-25, PZ-27,and PZ-28 were not logged because the 2001 field work at these locations consisted only of hollow-stem auger drilling, which did not provide open uncased borehole. At these locations, split-spoon samples were used in-place of video logs.

Locations PZ-01 through PZ-06 were gamma and EM-conductivity logged through the existing casings while waiting for the original lone drill crew to provide open holes in late July.

PZ-20 was erroneously omitted from gamma and EM-conductivity logging. It was the first hole video logged, and the plan to follow-up with EM-gamma logging after well installation was not completed.

4.5 Well Construction, Development, and Surveying

The various wells in each cluster were set in individual boreholes spaced at least 5 feet apart. All wells were installed in accordance with the requirements of Wisconsin Administrative Code Chapter NR 141. A summary of well construction details is provided in Table 2. Well construction and development forms are provided in Appendix D.

4.5.1 Well Construction

All the wells were constructed using 2-inch ID Schedule 80 PVC riser and factory cut, 0.01-inch slotted screens. The D-, R-, and X-wells (except PZ-22X and PZ-29D) have 5-

foot screen sections. The O-wells, 1998 MW-wells, PZ-22X, and PZ-29D have 10-foot screens. Each well was fitted with a dedicated bladder pump and tubing. The pump intakes were set at the mid-point of each screen. A lockable, steel, protective casing was utilized at each well to minimize the potential for damage and vandalism.

The screens for the O-wells were installed so that the midpoint of the screen intersected the groundwater surface at the time of installation. At several locations, the water surface later stabilized slightly outside the screen zone (PZ-07O, PZ-10O, PZ-14O, PZ-18O are 1 to 3 feet above the screen top and PZ-11O and PZ-33O are within about a foot of the screen bottom). PZ-11O was unable to be developed, gauged, or sampled during the 2001 investigation because the well went dry shortly after it was installed. This well was not included in the well count provided in Section 6.6.1.

4.5.2 Well Development

Well development was conducted in three phases: removal of sediment, removal of added construction (drilling/geophysics) water, and purging formation water to stabilization. In all cases, development was conducted no sooner than 48 hours after well/piezometer installation to allow the cement/bentonite grout and bentonite seals to cure. All water removed was collected and added to the drilling fluid waste tanks for subsequent off-site disposal. Volumes removed in each step are listed Table 9.

Sediment removal was conducted either by airlift or surge-block techniques and bailing. The airlift method was used when the water column in the well was deep enough to create the necessary hydraulic head (usually 10 feet or deeper) to keep the exhaust air within the discharge piping. Crews continued sediment removal until the water was no longer visibly turbid.

Construction water removal followed sediment removal. If the sediment removal volume had already exceeded the amount of water added during construction, this step was skipped. Otherwise a decontaminated submersible pump was used to remove a volume equal to the amount introduced during construction and logging of the wells.

Once the volume of water introduced during drilling had been removed, the well was pumped at a rate of 1 to 2 gallons per minute. During this period, field parameters (temperature, pH, specific conductance, and dissolved oxygen) were monitored and recorded after each well volume (wetted riser volume plus the filter pack pore space volume). Purging ceased after three consecutive sets of field readings collected were within 10 percent of each other. If stabilization was not reached, the crews stopped purging after 10 well volumes.

4.5.3 Well Abandonment

Three unused potable wells (IW883, IW710, and the Beach House Well) on-site were abandoned following Wisconsin Administrative Code Chapter NR 812.26 requirements. Cement-bentonite grout was placed into wells IW883 and IW710 through a tremie pipe, which was slowly raised from the bottom of the well as the grout rose. The well at the former Beach Club was filled with bentonite chips and allowed to hydrate.

Following grout or bentonite placement, well casing at Beach Club and IW883 was cut at least 30 inches bgs and sealed to within 6 inches of the ground surface with hydrated, bentonite chips. The top 6 inches at the Beach House Well and IW883 were then covered with native materials. IW710 is located within a concrete pad and was not covered. The casing at this well was cut to 18 inches bgs (access was gained through cracks in the well pad) before the placement of grout in the well.

Temporary wells TW-13, TW-14, and TW-15 were abandoned by pulling the riser piping up 1 foot, popping off the bottom plug and then using the open riser as a tremie pipe to fill the borehole with chipped bentonite as the remaining piping was removed.

4.5.4 Surveying

Between September 26, 2001 and November 10, 2001, all non-residential monitoring wells (PZ-01S through PZ36X), stream gauging stations (SG-PZ-01 and SG-PZ-07 on the Central Drainage and SG-PZ-08, and SG-PZ0 on the Northern Drainage) and temporary wells (TW-10 through TW-16) at the former Burning Ground) were surveyed. Latitude and longitude were recorded with respect to the NAD83 with the 1986 adjustment and Wisconsin State Plane North Section coordinates. Elevation was recorded with respect to the 1988 North American Vertical Datum (1988 NAVD). Coordinate and elevation data for the wells are provided on each log (see Appendix D). Stream gauge coordinate elevation data and water levels are provided in Appendix I.

4.6 Trenching

Four trenches were dug in the former Burning Ground using a backhoe. Vertical excavation was continued until native clay was encountered, at which time the excavation was terminated. Soil samples from these trenches were collected as described in Section 4.2.1 at locations described in Section 6.4.

4.7 Waste Disposal

The only hazardous waste produced by the subsurface investigation was 35 gallons of purge water from the last 12 months of sampling of PZ-01D. The PZ-01D water was drummed and picked-up for off-site disposal by Enseco, a certified waste handler, on October 17, 2001.

The following types of non-hazardous wastes were generated by the site activities: hollow-stem auger drilling cuttings, DTRC cuttings and formation water, NX wire line rock coring return water, mud rotary cuttings and drilling fluids, development water, sample purge water, personal protective equipment (PPE), and decontamination water.

These media were collected at the generation-sites and transported in vacuum trucks, carboys or tunnel buckets to a central temporary storage area north of the facility maintenance building. At this location, the tunnel buckets were emptied into seven plastic-lined 20-cubic yard dumpsters, which were covered with tarps. In the dumpsters, solids were allowed to settle for at least 24 hours; after which, the free liquids were decanted off into a vacuum truck. The decanted water was then transferred to four 20,000-gallon tanks southwest of PZ-20 where it was held pending characterization

sampling. The characterization results showed that both the soil and water media were non-hazardous wastes.

Beginning October 3, 2001, Quality Carriers, Inc. used tanker trucks to haul the water to a rail transfer facility in Appleton, Wisconsin. From Appleton, the water was shipped by rail to DuPont's treatment facility in Deepwater, New Jersey. The water and the four 20,000-gallon tanks were removed from the project site by November 7, 2001. Between November 13 and 15, 2001, dumpsters containing the settled soil and PPE were transferred by Robbie D. Wood, Inc. to Suburban Landfill in Glenford, Ohio.

5.0 DATA EVALUATION

Data from the investigation were compiled and evaluated to determine the presence and concentrations of site-related constituents within the site media. The quality of the data was evaluated with respect to the quality assurance and quality control (QA/QC) information. Other considerations used in evaluating the data included comparison to literature background concentrations and appropriate historical data (if available), and comparisons to Wisconsin residential concentration levels (RCLs) or groundwater quality standards, as appropriate. Based upon the evaluation of these different elements, a list of constituents of potential concern (COPCs) can be identified.

5.1 Historical Data

Historical groundwater data were incorporated into the evaluation of site conditions where such data existed and if the historical data were determined to be applicable to the characterization. For consistency, limited use was made of historical laboratory results that did not include the target analytes quantified during the 2001 investigation.

5.2 QA/QC EVALUATION

The overall quality of the analytical results were evaluated to determine the level of confidence in the analytical data. This effort consisted of evaluating sample holding times, chain-of-custody documentation, and QA/QC and blank sample results. Overall, the quality of the analytical samples was acceptable. A detailed analysis of the QA/QC evaluation is included as Appendix H.

5.3 Results Comparison to Screening Levels

The laboratory analytical results for all media sampled during the investigation are summarized in Tables 10 to 22. In accordance with Chapter NR 720 of the Wisconsin Administrative Code, concentrations of constituents detected in soil were compared against generic RCLs. RCLs represent conservative health-based concentrations that would be protective of human health for a specific land use scenario. Land use for the site is considered non-industrial because it does not meet all of the criteria defined in N.R.720.11. Groundwater quality standards (NR 140) were used to compare to the groundwater data. The analytical results for surface water data were evaluated based on the presence or absence of site-related constituents.

5.3.1 Soil, Sediment, and Pond Substrate Screening Concentrations

RCLs for soil were developed for the former Barksdale Facility using the United States Environmental Protection Agency (USEPA) Soil Screening Level Web Site (http://risk.lsd.ornl.gov/epa/ssl1.htm), as recommended by WDNR in a letter dated May 7, 2001. Default parameters specified in NR 720.19(5) were used in the calculations. Non-industrial RCLs were then used to evaluate the soil data to determine if the constituents detected present a potential concern.

RCLs for non-industrial direct contact to soil were developed for individual constituents using the excess cancer risk of 1×10^{-6}, and the hazard quotient of one for noncarcinogens in accordance with NR 720.19(5). The noncarcinogenic RCLs are based on the generic assumptions that a child weighing 15 kilograms (kg) incidentally ingests 200 milligrams (mg) of contaminated soil, 350 days per year, during a 6-year period. For carcinogenic constituents, the exposure assumptions are averaged over a lifetime. These carcinogenic-based soil RCLs are based on a 30-year exposure (6 years as a 15-kg child incidentally ingesting 200 mg soil plus 24 years as a 70-kg adult incidentally ingesting 100 mg soil) over a 70 year lifetime. These default exposure assumptions do not necessarily reflect the current land use (a game preserve with some commercial/light industrial activities onsite). Potential exposure under current site use is actually less than the generic exposure scenario. Therefore, use of the soil RCLs for the site provides a very conservative evaluation of the site data.

Results of certain sediment and substrate samples collected from ponds were compared to the non-industrial direct contact RCLs for soil. These comparisons were made to screen for potential direct contact issues at locations where the ponded water above sediment and/or the substrate present may evaporate or drain during the year and a potential for direct contact could exist.

To derive the impact to groundwater (IGW) screening criteria provided in the soils detections tables, the "soil to groundwater" model (method 1) located on the USEPA Superfund Risk Assessment Web Site http://risk.lsd.ornl.gov was used. This model was suggested in the May 7, 2001 WDNR letter to DuPont. The assumptions used were as follows.

- Dilution Factor: 20
- Fraction organic carbon in soil: 0.002
- Water-filled soil porosity (L_{water}/L_{soil}): 0.3
- Dry soil bulk density (kg/L): 1.5
- Soil particle density (kg/L): 2.65

The model calculated a soil concentration that if exceeded, may potentially cause groundwater concentrations to be greater than health-based acceptable limits if groundwater came into contact with the soil. IGW values are generally used as a screening tool to identify areas that may be sources for groundwater impact.

Because groundwater contamination issues are known to exist at the Barksdale Works, discussions of how site surface soil compared to these values are not provided. Instead, discussions of the analytical results for site surface soil are limited to potential direct contact issues that are addressed by screening against the RCLs discussed above. Calculated IGW values are listed in Tables 11 through 18 for soil data so that a comparison can be made per Wisconsin regulatory requirements.

5.3.2 Groundwater Screening Concentrations

Groundwater data for the site were screened against preventive action limits (PALs) and enforcement standards (ES) provided in NR 140. The methodology to establish PALs and ES are described Wisconsin Administrative Code NR 160. Enforcement standards are developed by the WDNR and the Department of Health and Family Services and are health-based levels that provide adequate safeguards for public health and welfare.

PALs are set based upon the type of potential health effects associated with the constituent and the corresponding ES. For constituents that have carcinogenic, mutagenic or teratogenic properties or interactive effects, the PAL is 10 percent of the ES. For all other potential health effects, the PAL is established at 20 percent of the ES.

For several explosive-related constituents, PALs and ES have not been established. The Wisconsin Department of Health and Family Services (WDHFS) provided a list of preliminary Drinking Water Guidelines for Targeted Explosive Compounds (see Table 23 and Appendix A for letter). In discussions between DuPont and WDHFS, several values in the table were adjusted based upon levels currently used by USEPA. These values were used to screen the groundwater data, where PALs and ES are not available.

PALs are provided in the analytical summary tables to comply with the applicable WDNR requirements. PALs are established by WDNR to inform the department of potential groundwater contamination problems and serve as the level at which the department is required to commence efforts to control contamination. They are applicable both to controlling new releases of contamination as well as to reporting groundwater quality contaminated by past releases.

In order to focus on potential health issues in groundwater, discussions of the groundwater analytical data herein have been limited to a comparison against the ES or WDHFS values. Because groundwater contamination issues are known to exist at the Barksdale Works, and DuPont and WDNR have commenced efforts to prevent exposure at the point of use, discussions regarding comparisons to PALs are not provided. However, PAL values are listed in Table s 19 through 22 so that a comparison can be made per Wisconsin regulatory requirements.

6.0 RESULTS AND DISCUSSION

This section provides a discussion of the 2001 investigation results. Known historical descriptions of each area investigated are provided along with the objective and scope of the investigation. Relevant results from previous investigations are also provided. Lithologic logs (including sample intervals and field screening results) for the investigation are provided in Appendix D. Laboratory analytical reports are presented in their entirety in Appendices E through G.

6.1 World War I Area

The WWI Area is located north of the Main Plant Drive and east of the North Gate Road (see Figure 14). This area is currently a hay field and woodlands. The WWI Area formerly housed five trinitrotoluene production lines, four trinitroxylene lines, and associated packaging facilities from 1904 through 1919. The production lines were located along a gravel road running parallel to and 900 feet south of Nolander Road. The packaging facilities were located in what is now forested ground to the south of this road. All of these structures were removed in the 1920s. Subsequent use of these areas has not been identified.

During the 2001 investigation, soil samples were collected from two areas where no ground covering vegetation was growing (Area 1 and Area 2). Area 1 is approximately 10 feet by 4 feet across and is located in an open field of grass. The area is fairly flat and the nearest drainage feature is approximately 900 feet to the southeast. Area 2 is approximately 8 feet by 4 feet and is also located in grassy field. The ground surface at Area 2 area is generally flat, and the sampling locations are within 20 feet of a ditch (former railroad track) that drains to the Central Drainage feature.

The WWI Area currently contains three ponds. Ponds 1 and 2 are located at the eastern end of the WWI Area and are dammed impoundments that were constructed by the current property owner in the late 1980s to attract waterfowl. Water drains from the northwestern part of the property into Pond 1. Once the water reaches a certain level, water drains into Pond 2 via a metal culvert. Ponds 1 and 2 are each approximately 0.2 and 0.4 acres in size and are approximately 3 and 8 feet deep, respectively, depending on precipitation. Overflow water from Pond 2 drains into the central drainage area of the site. Pond 3 is a natural low area in the southeastern part of the WWI Area where storm water from the 1917 former Triton Refined Area collects. The size of Pond 3 also varies based precipitation; however, at the time of sampling, the wetted surface area was approximately 1,000-square feet and 1 foot deep. Pond 3 area is currently unused.

6.1.1 Previous Investigations—WWI Area

In July 1981, an area that did not have vegetation on it (Area 1) was sampled by WDNR. Surface soil in the area was analyzed for nitrotoluene, dinitrotoluene, trinitrotoluene, trinitrobenzene, chloride, nitrate, and pH (sample 7 WDNR 1981). The results indicated a pH of 5.5, 4 milligrams per kilogram (mg/kg) chloride, 75 mg/kg nitrate, 5 mg/kg trinitrotoluene, and concentrations of other nitroaromatic and nitramine constituents.

DuPont excavated the surface soils and treated them at the Decontamination Burn Area in 1983. Area 1 was re-graded but did not revegetate. In May 2001, a surficial soil sample from this area was collected and field screened using qualitative colorimetric (EXSPRAY®) and immunoassay (DTech®) test kits. The results of this screening indicated that trinitrotoluene and/or dinitrotoluene were present.

The WWI Area 2 location and the ponds in the WWI Area were not previously investigated.

6.1.2 Investigation Objectives and Scope—WWI Area

The objectives of the WWI Area sampling were to:

- ❑ Confirm qualitative surface soil field screening results at Area 1
- ❑ Determine if residual site-related constituents were present in surface soil where deer were scraping the ground surface (Area 2)

The investigation scope consisted of collecting a single surface soil sample (0 to 2 feet bgs) from each area where no vegetation was growing. Additionally, one surface water sample and two sediment or pond substrate samples were collected from each pond. The Pond 1 surface water sample (WWI Pond1) was taken just before the metal culvert that connects it to Pond 2. The Pond 2 surface water sample (WWI Pond2) was collected after the discharge culvert from Pond 1. Pond 3 surface water sample (WWI Pond3) was collected from the middle of the pond. Pond 3 substrate samples were obtained at opposite ends of each pond at a depth of 2 inches from the top of the pond substrate. Sampling locations are illustrated in Figure 14.

6.1.3 Investigation Results and Discussion—WWI Area

Surface Soil Results

Nitroaromatic/nitramine organic constituents were detected in Area 1, where six constituents were reported by the laboratory at low concentrations (see Table 10). None of the detected nitroaromatic/nitramine organic constituents in surface soil exceed their respective direct contact RCL. Volatiles and semi-volatiles were not detected in surface soil at either area.

The number of inorganic constituents detected in surface soil was generally consistent at Areas 1 and 2 (14 and 13 inorganic detections, respectively), with slightly higher concentrations observed at Area 2. At both areas, arsenic and chromium were the only inorganic constituents detected above the non-industrial direct contact RCL for surface soil. However, in both cases, the concentrations were at or below the median reported background concentrations (see Table 24) for these constituents state-wide (Drugan and Chiasson, 1991).

Surface Water, Sediment, and Pond Substrate Sample Results

Organic constituents detected in surface water (see Table 11) at WWI Ponds 1 and 2 were limited to low concentrations of carbon disulfide and methyl ethyl ketone (at WWI Pond 2 only). Carbon disulfide was detected at similar concentrations in both ponds. Carbon

disulfide was reported in the equipment blank for these samples; therefore, reported concentrations may not be indicative of surface water conditions. The low concentration of methyl ethyl ketone reported in surface water in WWI Pond 2 is estimated. In the single surface water sample from the Pond 3 in the WWI Area, two VOCs (acetone and carbon disulfide), one semi-volatile organic compound (SVOC; o-cresol), and four nitroaromatic/nitramine organic constituents were detected.

No nitroaromatic/nitramine organic constituents were detected in silty sediment (see Table 10) collected from Ponds 1 or 2 in the WWI Area. Detected organics in these ponds were limited to low or estimated concentrations of three polycyclic aromatic hydrocarbons (PAHs) and four VOCs. However, concentrations of these organic constituents in Ponds 1 and 2 did not exceed direct contact RCLs. The clayey substrate sampled in Pond 3 contains elevated concentrations of four nitroaromatic/nitramine constituents, three of which (2,4-dinitrotoluene, 2,6-dinitrotoluene, and 2,4,6-trinitrotoluene) exceeded direct contact RCLs at each sampling location. No other organic constituents were detected in Pond 3 at concentrations above the RCLs.

Inorganic constituents were detected in sediment and pond substrate samples from all three ponds at generally similar concentrations (see Table 10). Only three metals (arsenic, chromium, and lead) were detected above the RCLs. The highest concentrations of chromium and lead were observed in Pond 3. In all three ponds, the concentrations of arsenic and chromium were within the reported range of background concentrations for these constituents in soil state wide (Drugan and Chiasson, 1991). Lead was present at the upper end of the background range in Ponds 1 and 2 and above the reported background range at Pond 3.

Summary of Results—WWI Area

The results of the investigation at the WWI Area indicate that site-related constituents are present in all media types sampled, but not in all locations. Only surface soil Area 1 locations contains nitroaromatic and nitramine constituents; although, concentrations were below non-industrial health-based concentrations for direct contact. Surface water and pond substrate impact is limited to Pond 3, where concentrations of site-related organic constituents and inorganic constituents exceed health-based screening values for direct contact. Although inorganic constituent concentrations exceed RCLs, they are within state-wide background ranges.

Because Area 1 is located in a relatively flat area that is surrounded by healthy grass and is approximately 900 feet from the closest drainage feature, the observed potential for migration of site-related constituents appears to be minimal. The potential for migration of impacted media at Pond 3 also appears to be a minimal because surface water collects in this poorly drained area. Further evaluation will be necessary to confirm that the potential for erosion and transport of site-related constituents from these areas is minimal.

6.2 World War II Area

The WWII Area is located south of the Main Plant Drive, east of the former powerhouse and north of the Boyd Creek valley (see Figure 14). This area housed several

manufacturing operations between 1904 and 1971. The primary structures near the areas investigated in 2001 were the former Trinitrotoluene Production Lines Nos. 1 and 2. The structures in these areas were removed in 1976. The area was used as cattle pasture by the current property owner from 1986 through 1997. It has been unused grassland since 1997. There were seven areas identified within this grassland that do not have ground covering vegetation growing. Each of these areas is approximately 40 square feet and are located within a relatively flat field of healthy grass. Surface water from these areas ultimately drains to Boyd Creek, which is approximately 1,500 feet to southeast. Areas 6 and 7 are surrounded by grass and are within 20 feet of intermittent drainage features. Areas 1 and 5 are bisected by intermittent drainage channels. Areas 2, 3, and 4 are surrounded by healthy grass, and each is approximately 250 feet or more from the nearest drainage.

6.2.1 Previous Investigations—WWII Area

Qualitative colorimetric (EXSPRAY) and immunoassay (DTech) field screening for nitroaromatic and nitramine organic constituents was performed on surface soil from two depths (0 to 6 inches and 18 to 24 inches bgs) at each of seven unvegetated areas within the WWII Area in May 2001. Screening results indicated the presence of dinitrotoluene and/or trinitrotoluene at the surface in four locations. The screening also indicated that these constituents were present at 2-feet bgs in three of these same locations At one location, WW2-5A, the screening indicated that trinitrotoluene concentrations could potentially be as high as 45,000 mg/Kg.

6.2.2 Investigation Objectives and Scope—WWII Area

The objectives of the surface soil sampling within the WWII Area were to determine whether site-related constituents are present in surface soil (as indicated by the field screening).

The scope of the sampling in this area consisted of collecting one surface soil sample from a depth of 0 to 2 feet bgs at six of the seven areas identified. Because of elevated colorimetric test kit results, the sample from WWII Area 5 could not be shipped off-site for laboratory analyses.

6.2.3 Investigation Results and Discussion—WWII Area

Organic constituents were detected in surface soil (see Table 12) at the WWII Area. At least one nitroaromatic/nitramine constituent was detected in surface soil at each of the six areas in excess of RCLs. Of the eight nitroaromatic/nitramine constituents detected, four of these exceed non-industrial RCLs for direct contact. Detected SVOCs were limited to WWII Areas 1, 3, and 6 at low concentrations. Eighteen of the 23 SVOCs detected were qualified as estimated by the laboratory.

Inorganic constituents were detected in surface soil at each of the WWII bare areas at generally consistent concentrations. Generally, more elevated concentrations were detected in Area 6. Concentrations of arsenic and chromium exceed non-industrial direct contact RCLs in each sample collected from the WWII Area. Additionally, the reported

concentration of lead (81 mg/kg) at WWII Area 6 is greater than the direct contact RCL of 50 mg/kg. However, the concentrations of arsenic, chromium, and lead were generally within or close to the boundaries of the reported range of background concentrations for these constituents state wide (see Table 24). Furthermore, with the exception of the single elevated lead detection at Area 6, the concentrations were all at or below the median reported background concentrations for the respective constituents.

Based upon the consistent detections of various nitroaromatic/nitramine organics in surface soil at the WWII Area, it appears that this area has been impacted by historical manufacturing activities. A potential for migration of detected constituents via erosion exists due to the absence of vegetation and the proximity of these areas to drainage features. Further evaluation of the potential for migration of detected site-related constituents should be conducted at each of the areas.

6.3 Former Acid Production Area

The former Acid Production Area is located north of the Main Plant Drive and west of the North Gate Road (see Figure 14). Nitric and Sulfuric Acid Plants were housed in this area between 1904 and 1950. After 1950, the acid production process lines were moved further south toward the WWII Area. After WWII, the area was used primarily for materials storage. The area currently includes a hay shed, numerous foundations, and scrub woodlands.

Vegetation is absent in three locations in the former Acid Production Area named Area 1, 2, and 3. Area 1 (see Figure 14) is located in a topographic low along a former rail spur and is approximately 1,325 square feet. Area 2 is covered by cinders that appear to be the result of demolition of the former oil of vitriol plant and is approximately 1,600 square feet. Clinker material and other cinders that may have originated from the plant powerhouse cover Area 3, which is approximately 15,500 square feet. Powerhouse cinders/clinker were used site-wide as a driving surface and are likely to have been placed around the former sulfur storage buildings. In addition, Area 3 contains some pieces of elemental sulfur on the ground surface, which was used for manufacturing sulfuric acid. Ground covering vegetation is absent in each of these areas; however, the areas are currently populated with healthy stands of birch trees.

Approximately 700 square feet of surface water collects in a portion of Area 1 during periods of extended precipitation. This ponded water evaporates during dry periods and was less than 1 foot deep at the time of sampling. Areas 2 and 3 were dry at the time of sampling, but surface water has been observed in the areas in the past. Additionally, a ditch originating 160 feet south of Area 1 forms the northern boundary of Area 2 (also dry during the sampling event) that drains to Pond 1 and 2 of the World War I Area.

6.3.1 Previous Investigations—Former Acid Production Area

In July 1981, WDNR tested storm water issuing from a culvert in the sulfur storage area (Area 3 of the Acid Production Area) for sulfate, nitrate plus nitrite, and pH (samples 2 and 3; DERS, 1997). The results indicated pH ranging from 3.5 to 4.3 and the presence of elevated sulfate concentrations. WDNR requested that DuPont fill the culvert allowing drainage of surface water so that the water could collect in this area and

"infiltrate" into soil. The culvert was filled later in the summer of 1981. No other prior investigations are known to have been conducted in this area.

6.3.2 Investigation Objectives and Scope—Former Acid Production Area

The objectives of the investigation in the former Acid Production Area were to determine whether site-related constituents are present in surface soil, pond substrate, and surface water.

Twenty-two surface soil samples, one surface water samples, and two pond susbtrate samples were collected to determine if site-related constituents were present in the former Acid Production Area (see Figure 14). Soil samples were collected from 0 to 2 feet bgs in the three areas where vegetation does not grow. The surface water sample (ACD-Pond1) was collected from the center of the pond, while the pond substrate samples (ACD-Pond1-A and ACD-Pond1-B) were collected at opposite ends of the pond.

6.3.3 Investigation Results and Discussion—Former Acid Production Area

Surface Soil Results

Detected VOCs in surface soil included acetone, carbon disulfide, methyl ethyl ketone, and methylene chloride (see Table 13). At least one of these VOCs was present in each sample, but in each sample detected concentrations were significantly less than the direct contact RCLs. Acetone, carbon disulfide, and methylene chloride are typical laboratory contaminants. Therefore, their concentrations may not be indicative of actual site concentrations.

Fourteen SVOCs were detected in the 22 soil samples collected (see Table 13). The majority of the SVOC detections were PAHs that were qualified as estimated by the analytical laboratory. In Area 3, five of the samples reported detectable benzo(a)pyrene concentrations exceeding the direct contact RCL. In Area 2, the estimated concentration of benzo(a)pyrene (150 J at ACD2-01) was the only SVOC that exceeds the RCL (87 µg/kg). None of the detected SVOC concentrations exceeded RCLs in the six samples collected from Area 1.

Ten nitroaromatic/nitramine organic constituents were detected in surface soil in each of the three areas. Low concentrations of 2,4,6-trinitrotoluene were reported in samples ACD1-04 and ACD1-06 from Area 1. Five nitroaromatic/nitramine organic constituents were detected in Area 3. Surface soil samples from Area 2 had least one detection of nitroaromatic/nitramine constituents. Locations ACD2-03 and ACD2-04 were the only samples that had concentrations of nitroaromatic/nitramine constituents above the non-industrial RCL for direct contact.

Inorganic constituents in surface at concentrations exceeding direct contact RCLs were arsenic, chromium, and lead (see Table 14). With the exception of lead, the concentrations of detected inorganics were generally within the reported range of state-wide background concentrations (see Table 24). Inorganic constituents above reported background concentrations may be related to the presence of the powerhouse cinders.

Surface Water and Pond Substrate

Results of the organic analyses of the single surface-water sample collected in the former Acid Production Area (see Table 15) indicate the presence of a single SVOC (benzyl alcohol) and one VOC (carbon disulfide). Concentrations of both of these constituents were qualified as estimated by the analytical laboratory. Nitroaromatic/nitramine organic constituents were not detected in surface water.

Nine inorganic constituents were detected in surface water. However, because there were no primary site-related constituents (i.e., nitroaromatic/nitramine organics) and single, estimated detections of VOCs and SVOCs, surface water in the pond does not appear to be impacted by former manufacturing activities.

Five organic constituents were detected in the clayey pond substrate (see Table 15). Nitroglycerin was the only nitroaromatic/nitramine constituent detected and was present at an estimated concentration of 130 µg/kg. Additionally, four VOCs (acetone, carbon disulfide, methyl ethyl ketone, and methylene chloride) were detected. Due to the general low or estimated concentrations reported for these VOCs, it is unclear whether the results represent actual site conditions or laboratory error. However, none of the organic constituents detected in the clayey pond substrate exceeded non-industrial RCLs for direct contact.

Thirteen metal constituents were detected in the clayey pond substrate (see Table 15) although the majority of the detections were qualified as estimated by the laboratory. None of the reported inorganic concentrations in the substrate exceeded non-industrial RCLs for direct contact.

Summary of Results—Former Acid Production Area

The results of the investigation at the former Acid Production Area indicate that site-related constituents are present in surface soil at all three areas. Concentrations of nitroaromatic and nitramine constituents greater than non-industrial RCLs for direct contact were identified in Area 2, samples 3 and 4. Analytical results for surface water and pond substrate obtained from the single pond in this area do not indicate that residual site-related constituents have affected these media.

Because of the absence of ground covering vegetation at Area 2 and proximity of the area to a drainage feature, a potential for migration of detected site-related constituents exists. Further evaluation of the potential for migration should be conducted at Area 2.

6.4 Former Burning Ground Area

The former Burning Ground area is located south of the Main Plant Drive, east of the Magazine Loop Road and north of the Nitramon Change House drive (see Figure 14). This operation area was the site of off-specification nitroglycerin incineration (via open burning) and other debris disposal between 1903 and 1976 and has been primarily unused since. No manufacturing activities are known to have occurred in this area. The area is bounded by the remains of a trash-barrier fence and is currently overgrown with grass and weeds.

6.4.1 Previous Investigations—Former Burning Ground Area

In September 1981, WDNR tested surface grab samples from the former Burning Ground area for chloride, nitrate, and pH (sample #13 WDNR, 1981). The results indicated a pH of 6.5, 0.5 mg/kg chloride, and 26 mg/kg nitrate. The associated WDNR report concluded that "nothing unusual is noted in these results."

In October 2000, nine surficial soil samples in the former Burning Ground and vicinity were collected and field screened using EXSPRAY and D-Tech test kits. The results of this screening, reported in the April 2001 work plan for the former Burning Ground investigation, indicated that trinitrotoluene and or dinitrotoluene were present on the surface of the former Burning Ground. The field screening did not indicate that these constituents were present in shallow soils of the adjacent valley bottom or in accessible drainage channel sediments.

6.4.2 Objectives and Scope—Former Burning Ground Area

The objectives of the investigation at the former Burning Ground were as follows:

- ❏ Evaluate the extent of waste material present, if any.
- ❏ Characterize the nature of the waste materials present within the area.
- ❏ Determine whether site-related constituents are present in the sediment of an adjacent drainage feature.
- ❏ Determine concentrations of site-related constituents, if any, in the first occurrence of groundwater in the area.

To characterize the material present in the former Burning Ground, four test trenches (TT1 to TT4) were excavated within the perimeter fence using a remote control excavator. These trenches were excavated to approximately 3 to 9 feet bgs starting near the Central Drainage (see Figure 14) bank and working across the former Burning Ground area perpendicular to the drainage channel. Each trench was terminated horizontally once exposed soils appeared to be native material and were free of any waste. The trench depth was limited to 9 feet or less by the reach of the specialized backhoe and the depth of bedrock.

Soil samples were collected to evaluate the nature of wastes present in the area. These samples were collected at trenches TT1 through TT3 from the excavator bucket using a stainless-steel bowl and disposable wooden spoon. Materials selected for grab samples (designated "TTx-00x") were specific to localized deposits, which appeared visually distinct from the typical bank profile and were collected at a depth of 2 to 6 feet bgs. Composite samples (designated 'TTx-comp") were collected from the spoils piles generated during excavation to provide representative data on materials within each of trenches. The fourth trench, TT4, only contained materials comparable to those previously sampled in the other trenches; therefore, this location was not sampled. Figure 14 shows the trench and sample locations.

Seven temporary wells (TW-10 through TW-16) were installed at depths ranging between 25 to 30 feet bgs, which corresponds to the intermediate flow zone discussed in Section 6.2 The wells were installed to attempt to identify whether releases from the

former Burning Ground area are impacting groundwater. Each well was constructed using the same materials and dimensions as the other on-site water table wells. However, no permanent surface completions (shrouds, pads, etc.) were installed so that the wells could be removed after sampling to eliminate potential vehicular hazards. Table 16 presents the metal concentrations and the detected organic constituent concentrations in groundwater per well as compared to the WDNR screening levels.

The sediment sampling that was proposed in the April 2001 work plan was not conducted during the 2001 field activities due to physical access issues and time constraints. DuPont plans to complete this effort as part of planned future investigation work.

6.4.3 Investigation Results and Discussion—Former Burning Ground Area

Physical Dimensions

The estimated surface area of the former Burning Ground encompasses approximately 30,000 square-feet. Waste observed in the area consists of soil, ash, charred wood, metal, broken glass, and ceramic materials and is present at or near the ground surface in most locations. The eastern and northern edges of the former Burning Ground are at, or within, the edge of the former valley wall of the site's central drainage feature (see Figure 14).

Observed waste material extends from the drainage bank to a maximum distance of 105 feet south of the drainage near TT1. Waste materials near the bank of the Central Drainage channel extended beyond reach of the backhoe (approximately 9 feet) at several locations and may extend to a depth of 13 feet bgs, where sandstone bedrock is encountered in this portion of the site (it is unlikely that excavation of bedrock was performed during historical operations). The waste layer thins to the southwest and averages about 7.2 feet thick. Based on these dimensions, the volume of waste present at the former Burning Ground is estimated to be approximately 8,500 cubic yards.

Although no groundwater was encountered during trenching activities, groundwater was estimated to be within 3 feet of the waste based on measurements obtained from TW-16 (groundwater at 16.1 feet bgs). The channel adjacent drainage was dry during the work period due to seasonal fluctuations; however, water has been previously observed in the channel throughout most of the year. Thus, groundwater is likely to be closer or potentially in contact with the waste during heavy or average periods of precipitation.

Waste Characterization Results

All solid samples collected from the former Burning Ground contained waste material. Eight nitramines/nitroaromatic organic constituents were detected in the waste material (see Table 17). Of these constituents, 2-amino-4,6-dinitrotoluene, 2,4-dinitrotoluene, 2,4,6-trinitrotoluene, 2,6-dinitrotoluene, and 4-amino-2,6-dinitrotoluene were the most prevalent. The "amino" dinitrotoluenes are degradation products of 2,4,6-trinitrotoluene. Generally, the highest concentrations of these constituents were detected in Trench TT3. The only nitroaromatic/nitramine constituent observed in waste that did not exceed the non-industrial RCL, was RDX.

Of the remaining organic parameter classes quantified (see Table 17), detected VOCs included several non-halogenated solvent constituents, carbon tetrachloride, and

tetrachloroethene. However, concentrations of all VOCs were qualified as estimated by the laboratory and were well below non-industrial direct contact RCLs. SVOCs were detected within each of the eight waste samples and were predominately PAHs. Reported concentrations were all very near the laboratory detection limit and, in most cases, qualified as estimated. Only one SVOC (benzo(a)pyrene) had a detectable concentration exceeding the non-industrial RCL for direct contact.

Inorganic constituents detected above direct contact RCLs include antimony, arsenic, beryllium, cadmium, chromium, lead, and zinc. Of these arsenic, lead, and chromium were most frequently detected above their corresponding RCL.

Groundwater Results

Organic constituents were detected in groundwater in the vicinity of the former Burning Grounds (see Table 16). Seven nitroaromatic/nitramine constituents were detected in groundwater and at least one of these constituents was reported in each temporary well. Nitramine/nitroaromatic constituents that were detected at concentrations greater than the Wisconsin ES in the temporary wells were 2-amino-4,6-dinitrotoluene, 2,4-dinitrotoluene, 2,4,6-dinitrotoluene, and 4-amino-2,6-dinitrotoluene. Detected VOCs included eight non-halogenated and halogenated constituents, four of which exceeded the ES. Naphthalene was the only detected SVOC, but it did not exceed the ES. Overall, the majority and generally highest concentrations of organic constituents detected were observed in TW-16, which was completed within the center of the former Burning Ground.

Concentrations of 12 inorganic constituents exceeded ES values in groundwater. As was observed for organic constituents, generally higher concentrations of metals were in TW-16. Arsenic, chromium, lead, and manganese were typically the most frequently detected constituents at concentrations exceeding the Wisconsin ES.

The concentration of constituents is observed to decrease rapidly downgradient of the unit (TW-16 to TW-13) (see Figure 14). However, nitroaromatic/nitramine constituents were inconsistently detected in the temporary monitoring wells. A comparison of the waste sample results collected at in the trenches to the groundwater results indicates that similar constituents are present in both media, but the distribution of detected constituents in these media do not clearly indicate a release from the unit to groundwater. Because of the proximity of buried waste material to the water table, the former Burning Ground may be contributing to very localized groundwater impact in TW-16 and TW-10. However, concentrations of nitramines and nitroaromatic constituents in temporary wells TW-12 and TW-13 do not indicate that the former Burning Ground is the source for the elevated contamination that has been historically observed in intermediate well PZ-01D (approximately 1 to 1.5 mg/L 2,4-dinitrotoluene, historically). This is discussed further in subsequent sections where site-wide groundwater is addressed.

Summary of Results—Former Burning Ground Area

The results of the investigation at the former Burning Ground indicate that approximately 8,500 cubic yards of debris-laden waste material are present in the area. A well-developed cover of grass and other vegetation is present at ground surface, which limits the potential for erosion. However, waste material has been observed at ground surface

and at depths of 9 feet bgs. A portion of the former Burning Ground is located within the eroding side of the valley for the site's central drainage feature.

Concentrations of nitroaromatic and nitramine constituents higher than non-industrial direct contact RCLs were reported for many of the waste samples. VOCs, SVOCs, and metals exceed RCLs less frequently. Historical field screening results indicate the presence of site-related constituents at the ground surface. Groundwater beneath and downgradient of the unit contains concentrations of site-related constituents above ES values. However, the distribution and concentrations of these constituents in groundwater do not clearly indicate that a release from the unit to groundwater would account for the concentrations of site–related constituents observed in PZ-01D.

Because of the location of former Burning Ground relative to the site's central drainage feature, a potential for erosion of the material at the northern and eastern edge of the unit exists. Further evaluation of the potential for migration of detected site-related constituents should be conducted.

6.5 Off-site Area

Downgradient of the former Burning Ground, a man-made basin that collects run-off from the site's Central Drainage basin. The basin covers about 2,000 square feet impounded by an earthen dam. In April 2001, heavy rains washed out the dam and exposed the sediments at the basin bottom. Since the exposed sediment was accessible, samples were collected at the request of the property owner to assess whether site-related constituents were present. Since the sampling event, the dam has been repaired, and the pond has been refilled.

6.5.1 Previous Investigations—Off-site Area

No previous investigations have been conducted at this location.

6.5.2 Investigation Objectives and Scope—Off-site Area

Two sediment samples were collected at opposite ends of the pond (from 0 to 2 feet bgs) in order to determine whether site-related constituents are present in sediment. At time of sampling, the pond bottom was dry; therefore, samples were collected using a decontaminated stainless-steel spoon and bowl. Each sample matrix was a silty sand.

6.5.3 Investigation Results and Discussion—Off-site Area

Organic constituents (see Table 18) were only detected in the sample (BRE-Pond1-B) collected directly behind the dam. Detected VOCs included acetone, methyl ethyl ketone, and methylene chloride and three nitroaromatic/nitramine organics (2,4-dinitrotoluene, 2,6-dinitrotoluene, and 2,4,6-trinitrotoluene). Concentrations of each of the detected constituents were less than the non-industrial direct contact RCLs. SVOCs were not detected in the sediment samples.

Fourteen inorganic constituents were detected with two metal concentrations (arsenic and lead) exceeding the RCL for non-industrial direct contact. The majority of the inorganic

detections were qualified as estimated or low concentrations by the laboratory. With the exception of lead in sample BRE-Pond1-B, the concentrations of detected inorganics were generally within the reported range of state-wide background concentrations (see Table 24).

Based on the investigation results, there does not appear to be any direct contact exposure issues at this pond. However, further evaluation of this area is appropriate.

6.6 Hydrogeologic Results

Information collected during the current investigation indicates that the site is underlain by three groundwater zones. The three zones include a shallow zone located within the glacial overburden materials, an intermediate zone located within the upper sandstone unit, and a deep zone located within the lower sandstone unit. Information supporting this conclusion includes:

- ❑ Depth intervals of recognizable stratigraphic units observed during well installations and subsequent BIPS logging efforts
- ❑ Elevations of groundwater potentiometric surfaces in non-residential wells
- ❑ Groundwater cation and anion data collected in October 2001
- ❑ Groundwater heat-pulse data (showing vertical flow in an open borehole) collected in wells installed during the summer and fall of 2001.

All non-residential wells were classified as drawing groundwater from one of the three zones using the criteria outlined in the following section.

6.6.1 Shallow Zone

This is the uppermost groundwater system in the western portion of the site. Wells in this zone draw water from within overburden materials. A few wells in this class reach as deep as 5 feet into the upper sandstone bedrock. Vertical gradients in this zone are strongly downward in the northern part of the site to neutral or slightly upward in the central and far southern parts of the site. Concentrations of total dissolved solids (TDS) range from 300 to 800 milligrams per liter (mg/l) in the central and northern areas and from 200 to 300 mg/l in the southern areas. Cation/anion analyses placed these waters in a Ca+Mg/HCO3 profile group. The 11 wells drawing water from the shallow groundwater zone are listed in Table 2.

6.6.2 Intermediate Zone

Wells in the intermediate zone draw water from the base of the overburden, from within the upper bedrock or within fractured zones at the top of the lower bedrock. Typical vertical hydraulic gradients in the intermediate wells are downward at 0.05 feet per foot or more from above and neutral or upward from below. Eight of the intermediate wells have converging gradients from above and below. TDS values for water withdrawn from these wells range from 50 to 1260 mg/l, with an average of approximately 300 mg/l. Cation/anion analyses also placed waters from the intermediate zone in the

Ca+Mg/HCO3 profile group, except for wells PZ-12 and PZ-01 which seem to have more Na, Cl and SO^4 present than the other intermediate wells. The 62 wells drawing water from the intermediate groundwater zone are listed in Table 2.

6.6.3 Deep Zone

Wells in the deep zone draw water from within the lower sandstone bedrock unit and water gradients are upwards (0.01 to 0.41 feet per foot). Water in this zone is partially confined, and the recorded gradients are typically more strongly upward in the northeastern portion of the site. TDS is generally low and ranges from 60 to 150 mg/l. Cation/anion analyses placed waters in the Na+K/HCO3 profile group in the northeast and more toward the Ca+Mg/HCO3 profile group in the central portions of the site. The 9 wells drawing from the deep groundwater zone are in Table 2.

6.6.4 Groundwater Flow Direction

Groundwater contour (elevation) maps are presented for the three groundwater zones in Figures 15, 16, and 17. These figures are based on October 2001 measurements.

The groundwater flow directions in all three zones are predominately southeastward toward the lake and are generally perpendicular to the shoreline. However, the groundwater flow direction in the northeastern portion of the site is observed to trend in a more easterly direction, roughly paralleling Nolander Road. This easterly flow direction may be caused by Bono Creek and/or the change in shoreline direction near Birch Grove.

Horizontal groundwater gradients for the shallow, intermediate, and deep zones are similar across the site at 0.019, 0.015, and 0.017 feet per foot, respectively. These values compare favorably with the hydraulic gradient of 0.012 feet per foot reported for the region by Young and Skinner (1974).

Surface water drainage features such as Boyd Creek and Bono Creek (see Figure 15) influence the shallow groundwater zone. The groundwater elevation contours on Figure 15 are based on static water levels in on-site wells and on direct field observations. These measurements and observations indicate that Boyd Creek is a losing stream in the central and western portions of the site and a gaining stream in its eastern reach as it approaches State Highway 13. This gaining condition is due to the intersection of the bottom of the incised stream channel with the top of the shallow zone water table and reflects a direct hydraulic communication between groundwater and surface water in this area. The shallow zone is believed to be unconfined and locally recharged directly from precipitation received on-site.

The intermediate groundwater zone (see Figure 16) is also believed to be unconfined and locally recharged directly from the overlying shallow zone. The intermediate zone is not believed to be in direct hydraulic communication with any on-site surface waters, except perhaps in the limited area located between State Highway 13 and the lakeshore. In the vicinity of PZ-12 and PZ-28, the shallow nature of the intermediate zone may provide for a limited amount of recharge directly from precipitation at the ground surface or from infiltration of surface water from the streambed of nearby Boyd Creek. The lake represents the discharge area for the intermediate zone.

The deep groundwater zone (see Figure 17) is not believed to receive any appreciable amount of on-site recharge from the overlying intermediate or shallow zones. As reported by (Young and Skinner, 1974), the regional recharge area for the deep zone underlying the site is believed to be located to the west of the site in the central portion of the Bayfield Peninsula (i.e., the Moquah Barrens). The TDS, cation/anion, and other constituent data collected from the on-site wells in October 2001 also suggest that the deep groundwater zone is not in communication with the shallow and intermediate zones.

The lack of significant hydraulic communication between the deep groundwater zone and the overlying shallow and intermediate zones may be due more to the limited amount of secondary porosity (voids, joint sets, and fractures) present in the lower sandstone unit and/or the regional groundwater flow regime and than due to the presence of a physically-unique barrier or confining bed typical of a traditional confined aquifer system. For this reason, the deep zone is considered to be more representative of a leaky or fractured bedrock system than a traditional confined system, which requires such a confining bed. Like the intermediate zone, the lake represents the most likely discharge area for the deep zone.

6.6.5 Key Findings for Site Geology/Hydrogeology

Key geologic and hydrogeologic findings made as part of the investigation are summarized as follows:

- ❏ Three groundwater flow zones (shallow, intermediate, and deep) are present in two geologic layers beneath the site. The shallow zone occurs predominately within the glacial materials in the western portion of the site. These glacial materials are thin or absent near State Highway 13. Both the intermediate and deep flow zones occur within the underlying sandstones. The intermediate zone extends from the base of the glacial overburden, to the top of the lower bedrock. The deep flow zone is within the lower sandstone bedrock unit.
- ❏ Horizontal groundwater flow in each zone is predominately to the southeast and occurs at consistent gradients. However, the groundwater flow direction does become more eastward in the northeastern portion of the site.
- ❏ Vertical groundwater flow in the shallow and intermediate zones is downward, while the vertical gradient in the deep flow zone is upwards.
- ❏ Hydraulic communication between the deep groundwater zone and the overlying shallow and intermediate zones appears to be limited.

6.7 Groundwater Analytical Results

Comprehensive sampling of non-residential groundwater wells was conducted in October 2001. These data and the results from the concurrent residential sampling event were used to evaluate the nature and spatial distribution of site-related constituents in groundwater at the former Barksdale Works.

To determine at what depths residential wells may have been originally screened, a review of 21 available residential well construction logs was completed. The total depths

for these wells ranged from 25 feet bgs at FC No. 30175 on State Highway 13 (near Mission Springs) to 128 feet bgs at 29700 East Ondassagon Road. These well depths correspond to the non-residential well depths in the intermediate zone. In addition, results of select inorganic water quality data indicate that water drawn by residential wells is generally similar to these data for the non-residential samples from this zone. Therefore, all residential wells are assumed to be completed in the intermediate zone for this evaluation. At residences that have carbon treatment systems in place, the results presented represent samples collected before carbon treatment (i.e., residential inflow samples).

To focus the discussion of groundwater analytical results, detected constituents in each zone were compared to health-based screening criteria in order to identify COPCs (see Tables 19 through 22). As discussed in Section 5.3.2, the health-based screening criteria used for this comparison are the Wisconsin ES and WDHFS values (hereafter collectively known as ES values).

COPCs in groundwater are graphically depicted on Figures 18 through 21. Results posted on these figures for an individual well consist of all constituents detected in all flow zones at or above Wisconsin ES values, anywhere in groundwater, so that an evaluation of the vertical movement, if any, of COPCs could be conducted. At residential wells, where one or more of these detected analytes above ES values is not listed, then the constituent was not quantified in the sample. Tables 3 through 8 list the constituents quantified in residential and non-residential samples for the October 2001 sampling event. A tabular summary of historical groundwater sampling results for both non-residential and residential wells is provided in Appendixes B and C, respectively.

6.7.1 Groundwater Constituents of Potential Concern

Nitramine and nitroaromatic organic constituents were the most frequently detected analytes above health-based ES values in groundwater, followed by a few VOCs and a limited number of inorganic constituents. Eight of the 16 nitroaromatic and nitramine constituents quantified were identified as COPCs (see Table 25) in the shallow and/or intermediate zones. The primary COPCs for this analytical parameter class are 2,6-dinitrotoluene and 2,4-dinitrotoluene. Nitramine and nitroaromatic organic constituents were not detected in any of the nine deep zone wells.

Four of the 46 Wisconsin regulated VOCs quantified were detected at concentrations exceeding ES values in non-residential and residential wells (see Table 25). Chloroform was the most frequently detected COPC in the shallow and intermediate zones. Single low-level detections of acetone (5.4J µg/L in PZ-36O) and chloroform (0.27J µg/L in PZ-11X) were observed in the deep zone (see Table 22). However, the detected concentrations of chloroform and acetone were approximately 20 to 180 times lower than the ES values, respectively.

Inorganic COPCs were iron, manganese, beryllium, and nitrate plus nitrite. It should be noted that the Wisconsin ES values for iron and manganese are identified as “Public Welfare Groundwater Quality Standards” in Chapter NR 720 of the Wisconsin Administrative Code. These criteria are generally established for aesthetic purposes (color, taste, etc.), and are not health-based values.

Both iron and manganese are recognized as regionally elevated in Bayfield County, which would be expected since the Lake Superior region is known for significant iron ore deposits. Samples obtained from wells within Bayfield County by the USGS indicate that the combined average concentration of iron and manganese in groundwater are approximately 325 µg/L. The averages published by the USGS are very near the median concentration observed for all non-residential samples collected during October 2001. Additionally, concentrations of iron and manganese in groundwater are generally consistent throughout the site in the shallow and intermediate zones. Based on this information and the regionally elevated concentrations in groundwater, it can be concluded that the presence of iron and manganese in groundwater beneath the former Barksdale Works is not indicative of former site activities. Consequently, discussions regarding the distribution of COPCs in groundwater presented the following sections are limited to the remaining constituents listed in Table 25.

6.7.2 COPC Distribution and Trends—Shallow Zone

Eleven usable (PZ-11O was dry at the time of sampling) non-residential monitoring wells are present in the shallow zone, or uppermost groundwater system, within the former production property boundaries (see Figure 18). Significant COPCs in the shallow zone are 2,6-dinitrotoluene, 2,4-dinitrotoluene, chloroform, and carbon tetrachloride (see Table 19).

Organic COPCs in this zone are limited to five of the 11 wells sampled in the central, east-central, and northeastern portions of the site. Generally, the highest concentrations of organic constituents were detected in well PZ-26O, which also contained at least one detection of each of the four organic COPCs in this zone. Historical concentration trends were not available for wells in the shallow zone because these wells were installed in the summer and fall of 2001 and initially sampled in October 2001.

6.7.3 COPC Distribution and Trends—Intermediate Zone

Sixty-two non-residential wells are located in the intermediate zone. Groundwater from these wells is obtained from either the base of the overburden, from within the upper bedrock, or from within fractured zones at the top of the lower bedrock. Additionally, it is believed that the majority of the adjacent residential wells are completed in the intermediate zone. Therefore, results for the October 2001 sampling at residential wells are also discussed in this section.

Fifteen COPCs (see Table 25) were identified in the samples collected from the non-residential intermediate zone wells and residential wells. COPCs in this zone are comprised of constituents in each parameter class quantified by the analytical laboratory. Tables 20 and 21 present a summary of detected constituents.

As shown in Figures 19 and 20, COPCs detected in the intermediate zone are generally located in the east-central and the northeastern quarter of the site. Detected concentrations were generally more elevated in the deeper wells in this zone (i.e., the D- and X-wells). Additionally, the majority of COPCs in this zone are observed hydraulically downgradient of the former manufacturing and operation areas. The

distribution of COPCs in residential wells is similar, with the majority of these detections being observed at properties across from the northeastern and east-central portions of site.

A line of wells that roughly parallel the main site road separates detected constituents in the northeastern and east-central areas. From west to east, these wells are PZ-26D, PZ-20D, ClubHouse, PZ-10D, PZ-24 (O and D), MW-04, and residential well 72470H (near the northern limit of Barksdale Village). These results suggest that two plumes are present in the intermediate zone.

The highest detections of COPCs are observed in the east-central area of the site, downgradient of the former Burning Ground in well PZ-01D. The concentration of 2,4-dinitrotoluene (1,000 µg/L) in PZ-01D was the highest detection of any COPC in the intermediate zone in October 2001. This observation is consistent with historical analytical data (see Appendix B). COPCs were also elevated in temporary wells (Section 6.4.3) downgradient of the former Burning Ground, which may indicate a potential release to groundwater. However, elevated COPCs are observed in wells PZ-07X and MW-03, which are hydraulically upgradient of the former Burning Ground. These data indicate that the former Burning Ground does not solely account for the site-related constituents detected in this portion of the site. Historical results for groundwater samples collected at MW-03 have consistently shown elevated COPCs. Therefore, a potential source of the site-related constituents detected in the east-central portion of the site appears to be located in an area encompassing PZ-07X, MW-03, and the former Burning Ground.

The highest detections of COPCs observed in the northeast quarter of the site are found in wells PZ-21D and PZ-9X. A potential source area for these constituents has not been identified based on the October 2001 data. However, the eastern groundwater flow direction indicated in the most northeastern portion of the site likely contributed to the distribution of site-related constituents in wells along Nolander Road and in the Birch Grove area.

Nitrate plus nitrite was identified as a COPC in four intermediate zone wells (MW-02, PZ-18O, PZ-27O, and PZ-28O). This was the only flow zone where a water quality inorganic constituent was identified as a COPC. Concentrations in these four wells ranged from 20.4 mg/L (PZ-18O) to 54.4 mg/L (MW-02). In addition to detections above the ES values, elevated concentrations (near 1,000 µg/L) nitrates appear to be generally present where one or more of the site-related isomers of dinitrotoluene are detected in groundwater. This is observed in non-residential wells and the residential wells in the Birch Grove area and Barksdale Village. Nitrite is commonly formed through the breakdown of ammonia. Once formed, nitrite quickly becomes nitrate. Nitrate containing constituents (nitric acid and crystalized ammonia) were used in many former manufacturing processes; thus, these detections of nitrates and nitrites are likely associated with past site activities.

6.7.4 COPC Distribution and Trends—Deep Zone

Nine monitoring wells obtain groundwater from the deep flow zone. Samples obtained from these wells provide an indication of groundwater quality in the lower sandstone bedrock unit. Analytical results are provided in Table 22, and COPCs are depicted in

Figure 21. As is discussed in Section 6.7.1, concentrations of manganese and iron detected in the deep zone are not believed to be significant because they are regionally elevated. Historical concentration trends were not able to be established for wells in the deep zone because these wells were installed in the summer and fall of 2001 and initially sampled in October 2001.

As discussed previously, detected organic constituents in the deep zone wells are limited to single low-level detections of acetone (5.4J µg/L in PZ-36O) and chloroform (0.27J µg/L in PZ-11X). The detection at PZ-36O is suspect because no former manufacturing activities are known to have taken place in this area of the site. The chloroform at PZ-11X is also suspect because chloroform was not detected in any adjacent intermediate zone wells, including PZ-11D. Analysis of blank samples does not indicate that chloroform or acetone detected in the deep zone were introduced by sample handling during collection or shipping; thus, a laboratory error in measurement is suspected.

The absence of nitroaromatic/nitramine organic constituents in samples collected from this flow zone support the conclusion reached in Section 6.6.4that the deep portion of the aquifer appears to be hydraulically isolated from the intermediate and shallow zones. Therefore, the deep zone may be suitable as an alternative source for residential drinking water.

6.7.5 Key Findings for Groundwater Conditions

Key findings based on the recent groundwater analyses are summarized as follows:

- ❏ Groundwater analytical results suggest two plumes of site-related constituents are present and are limited to the shallow and intermediate zones.
- ❏ Detected COPCs are generally located in the east-central and the northeastern quarter of the site.
- ❏ Nitramine and nitroaromatic organic constituents were the most frequently detected constituents that exceeded the health-based ES in groundwater, followed by VOCs, and inorganic constituents.
- ❏ Manganese and iron in groundwater beneath the former Barksdale Works are not indicative of former site activities.
- ❏ The absence of site-related constituents in the deep zone indicate that this zone may be suitable as an alternative source for residential drinking water.

7.0 FINDINGS AND RECOMENDATIONS

The 2001 site investigation at the Barksdale Works focused primarily on characterizing geologic and hydrogeologic conditions in order to understand the distribution of detected site-related constituents in groundwater. A secondary focus of the investigation was sampling of surface soil, sediment, pond substrate, surface water, and wastes present at select former production and operation areas, including evaluation of one off-site area, in order to:

- ❏ Determine if residual site-related constituents are present
- ❏ Determine the physical nature of the former Burning Ground.

A summary of the findings and recommendations are provided below.

7.1 Findings and Conclusions for Production, Operation, and Off-site Areas

Site-related constituents were found in each of the former major production and operation areas sampled during the investigation. A few of these constituents were also detected at an off-site residential pond, east of State Highway 13. Additionally, waste materials were identified within the former Burning Ground. Based on these results, a potential for migration of site-related constituents exceeding RCLs has been identified in:

- ❏ Surface soil in Area 1 and surface water and the substrate in Pond 3 within the former WWI Area
- ❏ Surface soil within the former WWII Area
- ❏ Surface soil at the former Acid Production Area
- ❏ Surface soil and waste at the former Burning Ground

7.2 Findings and Conclusions for Groundwater

- ❏ Geologic, geophysical, and general chemical data indicate that there are three groundwater flow zones (shallow, intermediate, and deep) beneath the facility. Based on these data, the deeper flow zone appears to be hydraulically isolated from the shallow and intermediate flow zones.
- ❏ Groundwater analytical results suggest two plumes of site-related constituents are present and are limited to the shallow and intermediate zones. One plume is located in the northeastern portion of the site, and the other is located in the east-central portion of the site. Detections of site-related nitroaromatic and nitramine constituents in both plumes were confined to the shallow and/or intermediate flow zones, where it is believed that the majority of the impacted residential drinking water wells withdraw water.
- ❏ A potential source of site-related constituents detected in groundwater in the east-central portion of the site was identified in the vicinity of the former Burning

Ground. Potential sources for site-related constituents detected in groundwater in the northeastern quarter of the facility have not been identified based on the October 2001 analytical results.

- ❑ Site-related nitroaromatic and nitramine organic constituents were not detected in the deeper portion of the aquifer beneath the former Barksdale Works. These data suggest that the deeper portion of the aquifer may be a viable alternative source for drinking water.

7.3 Recommendations

Based on the conclusions above, DuPont has developed the following recommendations, in order of priority, for further work at the former Barksdale Works.

DuPont and WDNR should jointly develop a plan for continued monitoring of appropriate residential drinking water wells and continue to provide drinking water, at the point of use to affected residents, that meets appropriate Wisconsin enforcement standards for all site-related constituents. To accomplish this task, DuPont proposes to:

- ❑ Work with WDNR to review data collected to date and develop an interim residential drinking water monitoring program. This plan would include carbon system maintenance and performance monitoring and be implemented while WDNR and DuPont are evaluating alternative drinking water sources.

DuPont proposes to develop work plans for WDNR's review and comment to further evaluate long-term drinking water supply alternatives and implement as appropriate:

- ❑ The work plans will include details for evaluating the deeper portion of the lower sandstone beneath the site and surrounding residential areas as a potential alternative drinking water supply. DuPont initiated the preliminary steps of this evaluation in May 2002 by conducting additional sampling of the deep zone wells (2002 Groundwater Sampling Plan for Residential and Non Residential Wells).

DuPont proposes to develop a work plan for WDNR's review and comment to evaluate, identify, and manage potential off-site surface soil or sediment issues and implement as appropriate:

- ❑ DuPont has already initiated the first phase of efforts associated with this recommendation by sampling site drainage features in May 2002. The work plan for this effort was submitted to the WDNR and approved in May 2002. Subsequent activities will include additional sampling at the off-site pond area and complete sediment sampling adjacent to the former Burning Ground. The priority of these subsequent activities will be discussed in the report documenting the May 2002 sampling.
- ❑ DuPont intends to work with WDNR to evaluate appropriate interim measures to reduce the potential for transport of site-related constituents that are present in areas and selected ponds in the former manufacturing and/or production areas. DuPont proposes to complete this work based on priority, beginning with areas where a potential for transport of more significantly impacted media exists.

DuPont proposes to develop a work plan for WDNR review and comment that continues efforts to identify priority source areas and take appropriate action.

- ❑ The plan shall include updated descriptions of former production and operation areas based on DuPont's most recent historical archives review and specify plans for further evaluation of these areas based on progress of the remaining site priorities specified above.

DuPont will develop a schedule with WDNR for development of the work plans based on overall project priorities.

8.0 REFERENCES

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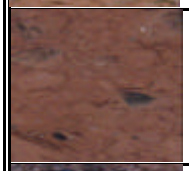
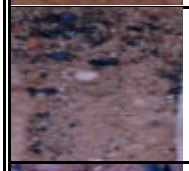
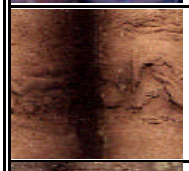
TABLES

Table 1
Typical Elevation and Thickness of Subsurface Layers
Former DuPont Barksdale Site
Barksdale, WI

Color / Texture	Name	Layer Thickness (ft)	Top Elevation (msl)	Bottom Elevation (msl)	Geologic Unit		
	Glacial Clay	min 2.0 ave 7.7 max 33.8	min 620 ave 678 max 790	min 611 ave 670 max 733	Pleistocene	Glacial Clay	
	Miller Creek Outwash	min 2.0 ave 23.9 max 89.5	min 659 ave 697 max 735	min 624 ave 670 max 701		Miller Creek Formation	
	Miller Creek Till	min 8.0 ave 30.8 max 62.0	min 632 ave 700 max 773	min 599 ave 666 max 713			
	Copper Falls Outwash	min 0.3 ave 33.5 max 131.9	min 593 ave 647 max 700	min 519 ave 594 max 658		Copper Falls Formation	
	Copper Falls Till	min 19.8 ave 71.9 max 117.8	min 599 ave 651 max 694	min 503 ave 571 max 632			
	Upper Sandstone	min 1.9 ave 26.7 max 60.2	min 503 ave 621 max 685	min 470 ave 595 max 659	Precambrian	Bay Field Group	Chequamegon
	Lower Sandstone	min 6.0 ave 101.6 max 230.6	min 470 ave 595 max 659	min 376 ave 494 max 607			

min = minimum
ave = average
max = maximum
msl = mean sea level
ft. = feet

Table 2
Well Construction Details and Groundwater Elevations (DRAFT)
Former DuPont Barksdale Site
Barksdale, Wisconsin

Interval	Well ID	Date Installed	Top of Riser (msl)	Ground Elevation (msl)	Screen Top (msl)	Well Bottom (msl)	I.D. Well Casing (inch)	Screen Length (ft)	Depth to Water 10/15/2001 (ft tor)	Water Elevation 10/15/2002 (msl)
Deep	PZ-02-D	10/22/98	749.41	747.5	466.6	461.6	2.00	5	42.38	707.03
	PZ-11-X	07/25/01	708.764	706.4	513.5	508.5	2.00	5	45.54	663.22
	PZ-12-X	09/27/01	628.637	626.2	382.5	377.5	2.00	5	3.08	625.56
	PZ-22-X	07/30/01	712.776	710.4	504.9	494.9	2.00	10	46.20	666.58
	PZ-30-X	09/14/01	648.099	646.1	437.6	432.6	2.00	5	4.95	643.15
	PZ-31-X	09/18/01	643.846	641.5	432.9	427.9	2.00	5	1.50	642.35
	PZ-32-X	09/27/01	644.054	641.5	400.2	395.2	2.00	5	**-7.00**	651.05
	PZ-33-X	09/13/01	665.134	662.7	453.7	448.7	2.00	5	21.00	644.13
	PZ-36-X	09/20/01	686.757	684.6	440.8	435.8	2.00	5	25.29	661.47
Intermediate	MW-01	09/24/98	670.56	668.8	591.9	586.9	2.00	10	34.65	635.91
	MW-02	10/14/98	646.13	644.3	573.5	568.5	2.00	10	22.05	624.08
	MW-03	09/29/98	679.65	678.1	606.8	601.8	2.00	5	32.78	646.87
	MW-04	09/28/98	654.67	652.8	599.5	594.5	2.00	10	30.33	624.34
	MW-05	10/22/98	623.02	621.1	533.5	528.5	2.00	10	9.05	613.97
	PZ-01-D	09/23/98	645.54	643.7	580.8	575.8	2.00	5	17.66	627.88
	PZ-01-S	09/23/98	645.55	643.4	622.4	617.4	2.00	5	16.97	628.58
	PZ-02-S	10/22/98	749.57	747.7	506.5	501.5	2.00	5	26.34	723.23
	PZ-03-D	09/24/98	792.26	790.3	569.7	564.7	2.00	5	41.74	750.52
	PZ-03-S	10/23/98	792.69	790.7	610.0	605.0	2.00	5	41.20	751.49
	PZ-04-D	10/05/98	744.02	742.3	533.9	528.9	2.00	5	45.94	698.08
	PZ-04-S	10/06/98	743.81	742.0	574.7	569.7	2.00	5	46.14	697.67
	PZ-05-D	09/30/98	670.2	668.4	565.9	560.9	2.00	5	30.26	639.94
	PZ-05-S	09/30/98	670.21	668.2	606.2	601.2	2.00	5	26.97	643.24
	PZ-06-D	10/12/98	696.05	693.6	490.8	485.8	2.00	5	38.21	657.84
	PZ-06-S	10/19/98	695.32	693.0	530.2	525.2	2.00	5	37.01	658.31
	PZ-07-X	09/19/01	680.078	677.6	575.4	570.4	2.00	5	36.00	644.08
	PZ-08-D	08/17/01	668.832	666.0	604.9	599.9	2.00	5	37.56	631.27
	PZ-08-O	08/17/01	668.443	666.1	631.7	621.7	2.00	10	34.61	633.83
	PZ-09-O	07/23/01	655.716	652.6	630.4	620.4	2.00	10	30.38	625.34
	PZ-09-X	08/20/01	655.938	653.0	560.6	555.6	2.00	5	33.88	622.06
	PZ-10-D	07/26/01	690.231	687.8	529.2	524.2	2.00	5	34.81	655.42
	PZ-11-D	09/18/01	707.971	705.8	603.0	598.0	2.00	5	44.75	663.22
	PZ-11-O	08/09/01	709.122	706.9	672.2	662.2	2.00	10	dry	na
	PZ-12-D	09/20/01	628.503	626.2	594.6	589.6	2.00	5	8.11	620.39
	PZ-12-O	09/12/01	627.86	626.2	625.8	615.8	2.00	10	7.23	620.63
	PZ-12-R	09/19/01	628.895	626.2	532.1	527.1	2.00	5	10.36	618.54
	PZ-13-D	08/15/01	739.431	737.0	518.5	513.5	2.00	5	44.50	694.93
	PZ-14-D	08/17/01	688.298	685.8	624.4	619.4	2.00	5	33.75	654.55
	PZ-14-O	08/20/01	688.353	686.2	650.1	640.1	2.00	10	32.65	655.70
	PZ-15-D	08/17/01	660.297	657.4	581.5	576.5	2.00	5	35.64	624.66
	PZ-15-O	08/10/01	660.353	657.5	625.5	620.5	2.00	5	35.25	625.10
	PZ-16-O	08/14/01	661.944	659.1	626.2	616.2	4.00	10	36.16	625.78
	PZ-16-X	08/14/01	661.34	658.8	599.2	594.2	4.00	5	35.08	626.26
	PZ-17-D	08/23/01	653.717	651.0	584.7	579.7	2.00	5	26.23	627.49
	PZ-17-O	08/22/01	652.812	650.7	629.7	619.7	2.00	10	27.94	624.87
	PZ-18-O	07/16/01	650.829	647.9	623.2	613.2	2.00	10	17.78	633.05
	PZ-19-D	07/13/01	671.164	668.4	628.5	623.5	2.00	5	36.45	634.71
	PZ-20-D	07/12/01	730.896	727.9	498.3	493.3	2.00	5	46.59	684.31
	PZ-21-D	08/21/01	721.191	718.3	664.3	659.3	2.00	5	48.38	672.81
	PZ-22-D	09/19/01	712.247	710.2	646.3	641.3	2.00	5	46.96	665.29
	PZ-22-O	08/07/01	712.158	709.7	667.1	657.1	2.00	10	47.21	664.95
	PZ-23-D	09/19/01	673.399	671.2	611.8	606.8	2.00	5	39.65	633.75
	PZ-23-O	08/20/01	673.708	671.3	636.7	626.7	2.00	10	40.31	633.40
	PZ-24-D	07/27/01	678.816	676.2	623.0	618.0	2.00	5	37.85	640.97
	PZ-24-O	08/17/01	678.61	676.2	642.5	632.5	2.00	10	37.67	640.94
	PZ-26-D	09/19/01	741.842	739.4	613.6	608.6	2.00	5	39.37	702.47
	PZ-27-O	07/17/01	647.7	645.2	635.6	625.6	2.00	10	16.22	631.48
	PZ-28-O	07/23/01	623.118	620.8	618.1	608.0	2.00	10	10.88	612.24
	PZ-29-D	07/31/01	643.644	641.2	619.2	609.2	2.00	10	26.11	617.53
	PZ-29-X	07/30/01	643.978	641.2	549.1	544.1	2.00	5	24.76	619.22

msl = mean seal level.
ft = feet.
ft tor = feet below top of riser.

Table 2 (continued)
Well Construction Details and Groundwater Elevations (DRAFT)

Former DuPont Barksdale Site
Barksdale, Wisconsin

Interval	Well ID	Date Installed	Top of Riser (msl)	Ground Elevation (msl)	Screen Top (msl)	Well Bottom (msl)	I.D. Well Casing (inch)	Screen Length (ft)	Depth to Water (ft tor)	Water Elevation Oct 2002 (msl)
Intermediate (continued)	PZ-30-D	09/17/01	648.67	646.1	607.6	602.6	2.00	5	15.16	633.51
	PZ-30-O	08/29/01	648.231	646.0	637.1	627.1	2.00	10	14.30	633.93
	PZ-31-D	10/02/01	643.63	641.0	610.1	605.1	2.00	5	22.46	621.17
	PZ-31-O	08/23/01	643.811	641.3	626.3	616.3	2.00	10	22.58	621.23
	PZ-32-D	10/01/01	644.512	642.1	602.1	597.1	2.00	5	24.48	620.03
	PZ-32-O	09/11/01	643.746	641.3	621.9	611.9	2.00	10	24.25	619.50
	PZ-33-D	09/13/01	665.16	662.6	559.4	554.4	2.00	5	25.89	639.27
	PZ-33-O	08/22/01	665.193	662.7	645.9	635.9	2.00	10	dry	na
	PZ-33-R	09/14/01	665.382	662.4	629.3	624.3	2.00	5	28.65	636.73
	PZ-34-D	08/23/01	689.525	687.1	586.8	581.8	2.00	5	35.91	653.62
	PZ-35-D	09/20/01	639.714	637.6	528.8	523.8	2.00	5	12.05	627.66
	PZ-36-D	09/26/01	687.051	684.5	488.7	483.7	2.00	5	32.70	654.35
Shallow	PZ-02-O	08/02/01	750.613	748.1	733.1	723.1	2.00	10	16.41	734.20
	PZ-07-O	07/24/01	680.606	678.0	644.2	634.2	2.00	10	31.97	648.64
	PZ-10-O	08/22/01	690.605	687.9	662.5	652.5	2.00	10	12.75	677.86
	PZ-13-O	08/31/01	739.822	737.2	721.3	711.3	2.00	10	21.48	718.34
	PZ-20-O	08/24/01	729.782	727.6	705.8	695.8	2.00	10	30.66	699.12
	PZ-21-O	08/30/01	720.988	718.4	677.6	667.6	2.00	10	48.13	672.86
	PZ-25-O	07/19/01	695.376	692.4	661.0	651.0	2.00	10	39.61	655.77
	PZ-26-O	09/06/01	741.806	739.2	706.0	696.0	2.00	10	40.72	701.09
	PZ-34-O	08/30/01	690.312	687.4	660.6	650.6	2.00	10	32.25	658.06
	PZ-35-O	09/12/01	640.133	637.5	622.5	612.5	2.00	10	22.78	617.35
	PZ-36-O	09/26/01	686.015	684.4	646.4	636.4	2.00	10	39.68	646.34

msl = mean sea level.
ft = feet.
ft tor = feet below top of riser.

Table 3
Barksdale Analysis Summary (DRAFT)
2000-2001

Former DuPont Barksdale Site
Barksdale, Wisconsin

ANALYSES 2000- 2001								
Sample type/ Matrix	Nitroaromatics & Nitramines	Appendix IX Volatiles	WI regulated Volatiles	Appendix IX Semivolatiles	Appendix IX Metals	Barksdale Metals- total (2)	Barksdale Metals-dissol.(2)	Water Quality Parameters
	Table 4	Table 5	Table 6	Table 7	Table 8	Table 8	Table 8	Table 8
On-site Soil /Sediment	X	X		X	X			
Off-site Soil/Sediment (1)	X	X		X	X			
On-site Monitor Wells	X		X			X	X	X
Off-site Monitor Wells	X		X			X	X	X
Burning Ground Wells	X		X			X	X	X
Surface Water (ponds)	X	X		X	X			
Residential Wells (3)	X		X			X		X

(1) Soil samples collected on National Forest property were analyzed for additional metals: aluminum, calcium, iron, potassium, magnesium, manganese, sodium.

(2) Barksdale metals list for residential/monitor wells includes: antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, zinc, iron, sodium, barium, calcium, magnesium, manganese, potassium.
Residental well samples collected prior to 2001 were analyzed for dissolved metals instead of total.

(3) All residential well samples were analyzed for nitroaromatic/nitramine organics during all sampling rounds.
In October 2001, all residential Inflow samples were also analyzed for the water quality parameters nitrate-nitrite and sulfate. In addition, Barksdale Village residential Inflow and Effluent samples were analyzed for the Barksdale list metals, and location 72040H was analyzed for WI- regulated volatile organics (Inflow and Effluent).

Table 4
Nitroaromatic and Nitramine Organics by SW-846 8321A
Analytes and Reporting Limits (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

Compound	Soil (ug/kg)		Water (ug/l)	
	Reporting Limit	MDL	Reporting Limit	MDL
HMX (1)	250	168	0.12	0.022
RDX (2)	250	215	0.12	0.028
1,3,5-Trinitrobenzene	250	125	0.12	0.017
1,3-Dinitrobenzene	250	73	0.12	0.020
Tetryl (3)	250	183	0.12	0.019
2,4,6-Trinitrotoluene	250	111	0.12	0.049
Nitrobenzene	250	128	0.12	0.025
Nitroglycerin	5000	1090	0.12	0.049
2,4-Dinitrotoluene	250	116	0.12	0.016
2-Amino-4,6-dinitrotoluene	250	143	0.12	0.013
2,6-Dinitrotoluene	250	59	0.12	0.012
4-Amino-2,6-dinitrotoluene	250	120	0.12	0.017
2-Nitrotoluene	250	196	0.12	0.038
4-Nitrotoluene	250	137	0.12	0.038
3-Nitrotoluene	250	152	0.12	0.019
PETN (4)	2500	1010	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.

ug/kg = micrograms per kilogram or parts per billion.

ug/l = micrograms per liter or parts per billion.

Table 5
Appendix IX Volatile Organics by SW-846 8260B
Analytes and Reporting Limits (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

Compound	Soil (ug/kg)		Water (ug/l)	
	Reporting Limit	MDL	Reporting Limit	MDL
1, 1, 1,2-Tetrachloroethane	5.0	1.30	1.0	0.22
1,1,1-Trichloroethane	5.0	0.50	1.0	0.26
1,1,2,2-Tetrachloroethane	5.0	0.50	1.0	0.31
1,1,2-Trichloroethane	5.0	0.98	1.0	0.39
1,1-Dichloroethane	5.0	0.65	1.0	0.17
1,1-Dichloroethene	5.0	0.71	1.0	0.20
1,2,3-Trichloropropane	5.0	1.13	1.0	0.29
1,2-Dibromo-3-chloropropane (DBCP)	10.0	0.68	2.0	0.25
1,2-Dibromoethane (EDB)	5.0	0.50	1.0	0.36
1,2-Dichloroethane	5.0	0.56	1.0	0.28
1,2-Dichloropropane	5.0	0.50	1.0	0.21
1,4-Dioxane	500	42.82	200	16.74
2-Butanone (MEK)	20.0	2.34	5.0	0.93
2-Hexanone	20.0	1.66	5.0	0.70
4-Methyl-2-pentanone	20.0	1.20	5.0	0.79
Acetone	20.0	3.42	10.0	1.88
Acetonitrile	100	16.80	20.0	2.59
Acrolein	100	38.18	20.0	4.71
Acrylonitrile	100	5.91	20.0	2.39
Allyl chloride	10.0	0.54	2.0	0.20
Benzene	5.0	0.50	1.0	0.21
Bromodichloromethane	5.0	0.50	1.0	0.22
Bromoform	5.0	0.50	1.0	0.32
Bromomethane	10.0	0.50	2.0	0.30
Carbon disulfide	5.0	0.52	1.0	0.19
Carbon tetrachloride	5.0	0.54	1.0	0.19
Chlorobenzene	5.0	1.01	1.0	0.30
Chloroethane	10.0	0.50	2.0	0.25
Chloroform	5.0	0.50	1.0	0.23
Chloromethane	10.0	0.91	2.0	0.30
Chloroprene	5.0	0.83	1.0	0.22
cis-l,2-Dichloroethene	2.5	0.56	1.0	0.26
cis-l,3-Dichloropropene	5.0	0.72	1.0	0.28
Dibromochloromethane	5.0	0.50	1.0	0.38
Dibromomethane	5.0	0.50	1.0	0.44
Dichlorodifluoromethane	10.0	0.62	2.0	0.23
Ethyl methacrylate	5.0	0.60	1.0	0.25
Ethylbenzene	5.0	1.14	1.0	0.28
Iodomethane	5.0	0.50	1.0	0.23
Isobutyl alcohol	200	11.66	50.0	11.08
Methacrylonitrile	50.0	5.00	10.0	1.60
Methyl methacrylate	5.0	1.29	1.0	0.30
Methylene chloride	5.0	0.50	1.0	0.89
Propionitrile	20.0	6.26	5.0	2.22
Styrene	5.0	1.25	1.0	0.27
Tetrachloroethene	5.0	1.02	1.0	0.36
Toluene	5.0	0.81	1.0	0.29
trans-1,3-Dichloropropene	5.0	0.53	1.0	0.42
trans-l,2-Dichloroethene	2.5	0.77	0.5	0.27
trans-l,4-Dichloro-2-butene	5.0	1.03	1.0	0.60
Trichloroethene	5.0	0.62	1.0	0.22
Trichlorofluoromethane	10.0	0.55	2.0	0.28
Vinyl acetate	10.0	4.38	2.0	0.31
Vinyl chloride	10.0	0.78	1.0	0.21
Xylenes (total)	5.0	3.08	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.

ug/kg = micrograms per kilogram or parts per billion.

ug/l = micrograms per liter or parts per billion.

Table 6
Wisconsin Regulated Volatile Organics by SW-846 8260B
Analytes and Reporting Limits (DRAFT)

Former DuPont Barksdale Site

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
l,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.

ug/l = micrograms per liter or parts per billion.

Table 7
Appendix IX Semivolatile Organics by SW-846 8270C
Analytes and Reporting Limits (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

Compound	Soil (ug/kg)		Water (ug/l)	
	Reporting Limit	MDL	Reporting Limit	MDL
a,a-Dimethylphenethylamine	1600	174.0	50.0	35.8
Acenaphthene	330	46.0	10.0	1.0
Acenaphthylene	330	34.0	10.0	1.0
Acetophenone	330	33.0	100.0	1.4
2-Acetylaminofluorene	3300	33.0	50.0	1.0
4-Aminobiphenyl	1600	81.8	10.0	12.0
Aniline	330	57.0	10.0	6.0
Anthracene	330	78.0	10.0	1.2
Aramite	660	66.0	20.0	2.0
Benzo(a)anthracene	330	39.0	10.0	1.3
Benzo(b)fluoranthene	330	100.0	10.0	2.2
Benzo(k)fluoranthene	330	93.0	10.0	2.2
Benzo(ghi)perylene	330	70.0	10.0	1.1
Benzo{a)pyrene	330	94.0	10.0	1.9
Benzyl alcohol	330	77.0	10.0	3.0
bis(2-Chloroethoxy)methane	330	74.0	10.0	1.4
bis(2-Chloroethyl) ether	330	49.0	10.0	1.8
bis(2-Chloroisopropyl) ether	330	69.0	10.0	1.3
bis(2-Ethylhexyl) phthalate	330	69.0	10.0	1.9
4-Bromophenyl phenyl ether	330	71.0	10.0	1.3
Butyl benzyl phthalate	330	34.0	10.0	1.9
4-Chloroaniline	330	47.0	10.0	7.3
Chlorobenzilate	330	36.5	10.0	1.8
4-Chloro-3-methylphenol	330	95.0	10.0	1.3
2-Chloronaphthalene	330	33.0	10.0	1.4
2-Chlorophenol	330	38.0	10.0	1.5
4-Chlorophenyl phenyl ether	330	71.0	10.0	1.5
Chrysene	330	53.2	10.0	1.5
Diallate	660	66.0	20.0	2.0
Dibenz(a,h)anthracene	330	47.0	10.0	1.6
Dibenzofuran	330	82.0	10.0	1.3
Di-n-butyl phthalate	330	76.0	10.0	2.1
1,2-Dichlorobenzene	330	64.0	10.0	1.9
1,3-Dichlorobenzene	330	71.0	10.0	2.5
1,4-Dichlorobenzene	330	55.0	10.0	2.2
3,3.-Dichlorobenzidine	1600	70.0	50.0	16.0
2,4-Dichlorophenol	330	88.0	10.0	1.7
2,6-Dichlorophenol	330	33.0	10.0	1.0
Diethylphthalate	660	53.0	10.0	2.0
Dimethoate	660	33.5	20.0	1.1
4-Dimethylaminoazobenzene	660	42.3	20.0	2.8
7,12-Dimethylbenz(a)anthracene	660	37.8	20.0	1.0
3,3'-Dimethylbenzidine	660	57.0	20.0	8.3
2,4-Dimethylphenol	330	174.0	10.0	2.1
Dimethyl phthalate	330	85.0	10.0	1.8
1,3-Dinitrobenzene	330.0	42.4	10.0	1.0
4,6-Dinitro-2-methylphenol	1600.0	420.0	50.0	15.0
2,4-Dinitrophenol	1600.0	500.0	50.0	16.0
2,4-Dinitrotoluene	330.0	96.0	10.0	2.4
2,6-Dinitrotoluene	330.0	100.0	10.0	2.3
Di-n-octyl phthalate	330.0	36.0	10.0	2.0
Diphenylamine	330.0	100.0	10.0	2.0
Ethyl methanesulfonate	330.0	44.5	10.0	1.0
Fluoranthene	330.0	84.0	10.0	2.0
Fluorene	330.0	76.0	10.0	1.4
Hexachlorobenzene	330.0	76.0	10.0	1.5
Hexachlorobutadiene	330.0	100.0	10.0	3.3
Hexachlorocyclopentadiene	1600.0	33.0	50.0	9.1
Hexachloroethane	330.0	50.0	10.0	3.0
Hexachloropropene	3300.0	40.0	100.0	2.0

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.

ug/kg = micrograms per kilogram or parts per billion.

ug/l = micrograms per liter or parts per billion.

Table 7 (continued)
Appendix IX Semivolatile Organics by SW-846 8270C
Analytes and Reporting Limits (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

Compound	Soil (ug/kg)		Water (ug/l)	
	Reporting Limit	MDL	Reporting Limit	MDL
Indeno(1,2,3-cd)pyrene	330.0	48.0	10.0	1.3
Isodrin	330.0	33.0	10.0	1.1
Isophorone	330.0	68.0	10.0	1.6
Isosafrole	660.0	66.0	20.0	3.2
Methapyrilene	1600.0	56.7	50.0	16.0
3-Methylcholanthrene	660.0	33.0	20.0	2.1
Methyl methanesulfonate	330.0	36.3	10.0	1.2
2-Methylnaphthalene	330.0	59.0	10.0	1.9
2-Methylphenol	330.0	77.0	10.0	1.6
3-Methylphenol & 4-Methylphenol	330.0	74.0	10.0	1.4
Naphthalene	330.0	70.0	10.0	1.4
1,4-Naphthoquinone	1600.0	33.0	50.0	1.0
1-Naphthylamine	330.0	83.9	10.0	7.9
2-Naphthylamine	330.0	77.9	10.0	7.6
2-Nitroaniline	1600.0	80.0	50.0	1.6
3-Nitroaniline	1600.0	85.0	50.0	6.7
4-Nitroaniline	1600.0	64.0	50.0	4.4
Nitrobenzene	330.0	85.0	10.0	1.7
2-Nitrophenol	330.0	120.0	10.0	1.7
4-Nitrophenol	1600.0	95.0	50.0	7.1
Nitroquinoline-l-oxide	3300.0	42.7	100.0	15.8
N-Nitrosodi-n-butylamine	330.0	33.0	10.0	1.5
N-Nitrosodiethylamine	330.0	37.0	10.0	1.2
N-Nitrosodimethylamine	330.0	59.0	10.0	1.7
N-Nitrosodiphenylamine	330.0	72.0	10.0	5.3
N-Nitrosodi-n-propylamine	330.0	88.0	10.0	1.8
N-Nitrosomethylethylamine	330.0	45.9	10.0	1.0
N-Nitrosomorpholine	330.0	52.7	10.0	1.5
N-Nitrosopiperidine	330.0	33.0	10.0	1.4
N-Nitrosopyrrolidine	330.0	36.6	10.0	1.1
5-Nitro-o-toluidine	660.0	58.8	20.0	3.2
Parathion	1600.0	70.0	50.0	1.3
Pentachlorobenzene	330.0	33.0	10.0	1.4
Pentachloroethane	1600.0	33.0	50.0	1.4
Pentachloronitrobenzene	1600.0	33.0	50.0	1.0
Pentachlorophenol	1600.0	370.0	50.0	7.7
Phenacetin	660.0	48.8	20.0	1.0
Phenanthrene	330.0	37.0	10.0	1.2
Phenol	330.0	71.0	10.0	1.4
4-Phenylenediamine	1600.0	839.0	100.0	30.9
Phorate	1600.0	33.0	50.0	2.0
2-Picoline	660.0	33.0	20.0	1.4
Pronamide	660.0	33.0	20.0	1.0
Pyrene	330.0	40.0	10.0	1.7
Pyridine	660.0	400.0	20.0	12.0
Safrole	1600.0	36.7	50.0	1.7
Sulfotepp	1600.0	33.0	50.0	1.0
1,2,4,5-Tetrachlorobenzene	330.0	33.0	10.0	1.9
2,3,4,6-Tetrachlorophenol	1600.0	47.9	50.0	1.2
Thionazin	1600.0	48.2	10.0	1.2
o-Toluidine	660.0	98.3	10.0	4.6
1,2,4-Trichlorobenzene	330.0	64.0	10.0	1.8
2,4,5-Trichlorophenol	330.0	75.0	10.0	1.1
2,4,6-Trichlorophenol	330.0	50.0	10.0	1.1
O,O,O-Triethyl phosphorothioate	1600.0	35.1	50.0	1.6
1,3,5-Trinitrobenzene	1600.0	48.2	50.0	1.4

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.

ug/kg = micrograms per kilogram or parts per billion.

ug/l = micrograms per liter or parts per billion.

Table 8
Appendix IX Metals
Analytes and Reporting Limits (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

Compound	Soil (mg/kg)		Water (ug/l)	
	Reporting Limit	MDL	Reporting Limit	MDL
Beryllium, SW-846 6010B	0.5	0.029	5.0	0.22
Copper, SW-846 6010B	2.0	0.091	25	0.83
Nickel, SW-846 6010B	4.0	0.11	40	0.96
Vanadium, SW-846 6010B	1.0	0.60	10	0.67
Zinc, SW-846 6010B	2.0	0.14	20	6.6
Antimony, SW-846 6010B	1.0	0.51	10	3.1
Cadmium, SW-846 6010B	0.5	0.033	5	0.29
Cobalt, SW-846 6010B	1.0	0.067	10	0.34
Silver, SW-846 6010B	1.0	0.071	10	0.62
Tin, SW-846 6010B	10.0	0.17	100	3.3
Barium, SW-846 6010B	1.0	0.088	10	0.64
Chromium, SW-846 6010B	1.0	0.035	10	0.56
Arsenic, SW-846 6020	0.5	0.051	5.0	0.19
Lead, SW-846 6020	0.1	0.021	1.0	0.20
Selenium, SW-846 6020	0.5	0.062	5.0	0.15
Thallium, SW-846 6020	0.1	0.002	1.0	0.020
Mercury, SW-846 7470/71B	0.033	0.0026	0.2	0.030

Additional Metals
Analytes and Reporting Limits

Compound	Soil (mg/kg)		Water (ug/l)	
	Reporting Limit	MDL	Reporting Limit	MDL
Iron, SW-846 6010B	10	0.6	100	5.1
Sodium, SW-846 6010B	500	130	5000	2000
Calcium, SW-846 6010B	20	29	5000	29
Magnesium, SW-846 6010B	20	21	5000	21
Manganese, SW-846 6010B	1	0.065	15	0.38
Potassium, SW-846 6010B	300	65	5000	500

Water Quality Inorganics
Analytes and Reporting Limits

Compound	Soil		Water (mg/l)	
	Reporting Limit	MDL	Reporting Limit	MDL
Nitrate-Nitrite, EPA 353.2	N/A	N/A	0.10	0.21
Sulfate, EPA 300.0	N/A	N/A	5.0	0.10
Chloride, EPA 300.0	N/A	N/A	3.0	0.02
Bromide, EPA 300.0	N/A	N/A	0.20	0.08
Dissolved Solids, EPA 160.1	N/A	N/A	10	4.8
Suspended Solids, EPA 160.2	N/A	N/A	4.0	1.9

Note: Monitor wells were analyzed for all inorganics parameters; residential wells were analyzed for Nitrate-Nitrite and Sulfate. 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.

mg/kg = milligrams per kilogram or parts per million.

ug/l = micrograms per liter or parts per billion.

mg/l = milligrams per liter or parts per million.

N/A = not any.

Table 9
Well Development Volumes (DRAFT)
Former DuPont Barksdale Site
Barksdale, Wisconsin

Zone	Well ID	Water Added to Well During Drilling (gal)	Water Recovered During Drilling (gal)	Water Added To Well During Logging (gal)	Date Sediment Removed	Water Removed with Sediment (gal)	Drilling Water Pumped Prior to Purge (gal)	Date Purged	Wetted Riser Length (ft)	Wetted Filter Pack Length (ft)	Water in Riser (gal)	Water in Filter Pack (gal)	Well Volume (Riser + Filter)	Stable (S) Or 3 X Dry (D)	Water Removed To Purge (gal)
Deep	PZ-02-D	well previously installed													
	PZ-11-X	400	1500	1000	09/19/01	1000	0	09/19/01	187.55	7.00	30.62	2.55	33.17	s	135
	PZ-12-X	300	1500	0	10/02/01	0	0	10/03/01	243.04	7.00	39.68	2.55	42.23	s	130
	PZ-22-X	500	1450	1000	09/06/01	1000	0	10/04/01	170.94	12.00	27.91	4.37	32.28	s	108
	PZ-30-X	300	1650	0	10/02/01	50	0	10/03/01	201.20	7.00	32.85	2.55	35.40	s	120
	PZ-31-X	300	1800	0	10/02/01	100	0	10/03/01	212.10	7.00	34.62	2.55	37.17	s	120
	PZ-32-X	0	2200	0	10/02/01	0	0	10/03/01	36.48	12.00	5.95	4.37	10.33	s	60
	PZ-33-X	350	1700	0	10/02/01	50	0	10/03/01	17.17	7.00	2.80	2.55	5.35	s	102
	PZ-36-X	450	1500	0	NA	25	20160	10/03/01	8.40	12.00	1.37	4.37	5.74	s	60
Intermediate	MW-01	well previously installed													
	MW-02	well previously installed													
	MW-03	well previously installed													
	MW-04	well previously installed													
	MW-05	well previously installed													
	PZ-01-D	well previously installed													
	PZ-01-s	well previously installed													
	PZ-02-s	well previously installed													
	PZ-03-s	well previously installed													
	PZ-04-D	well previously installed													
	PZ-04-s	well previously installed													
	PZ-05-D	well previously installed													
	PZ-06-D	well previously installed													
	PZ-06-s	well previously installed													
	PZ-07-X	1000	900	0	10/02/01	100	0	10/04/01	81.71	7.00	13.34	2.55	15.89	s	60
	PZ-08-D	500	650	500	09/06/01	250	100	09/18/01	29.57	7.00	4.83	2.55	7.38	s	90
	PZ-08-O	350	500	0	09/14/01	5	0	09/18/01	30.38	12.00	4.96	4.37	9.33	s	50
	PZ-09-O	0	0	0	09/11/01	1	0	09/13/01	1.33	1.33	0.22	0.95	1.17	d	10
	PZ-09-X	100	700	500	09/11/01	500	75	09/13/01	62.74	7.00	10.24	2.55	12.79	s	150
	PZ-10-D	1600	1500	1500	09/11/01	1600	0	09/18/01	131.39	7.00	21.45	2.55	24.00	s	90
	PZ-11-D	300	1000	0	10/02/01	0	0	10/03/01	76.12	7.00	12.43	2.55	14.98	s	55
	PZ-11-O	750	600	0	09/19/01	1	150	09/19/01	12.08	12.08	1.97	8.62	10.59	d	10
	PZ-12-D	300	250	0	10/02/01	50	0	10/03/01	4.15	4.15	0.68	1.51	2.19	s	25
	PZ-12-O	100	100	0	10/02/01	50	0	10/03/01	0.05	0.05	0.01	0.02	0.03	s	16
	PZ-12-R	150	500	0	10/02/01	50	0	10/03/01	56.21	7.00	9.18	2.55	11.73	s	72
	PZ-13-D	1400	1500	1500	09/07/01	1500	0	09/19/01	215.54	7.00	35.19	2.55	37.74	s	135
	PZ-14-D	100	750	500	09/06/01	500	0	09/18/01	61.67	7.00	10.07	2.55	12.62	s	45
	PZ-14-O	550	500	0	09/12/01	1	50	09/18/01	3.75	3.75	0.61	1.37	1.98	s	55
	PZ-15-D	150	650	1500	09/12/01	200	800	09/13/01	62.33	7.00	10.18	2.55	12.73	s	120
	PZ-15-O	0	0	0	09/06/01	1	0	09/13/01	6.11	6.11	1.00	4.36	5.36	d	8
	PZ-16-O	500	500	0	09/06/01	0	60	09/13/01	13.14	13.14	8.58	12.14	20.72	s	150
	PZ-16-X	150	650	1000	NA	0	495	09/13/01	31.46	7.00	20.54	6.47	27.01	s	585
	PZ-17-D	0	700	500	09/05/01	500	0	09/17/01	38.73	7.00	6.32	2.55	8.87	s	90
	PZ-17-O	300	350	0	NA	1	0	09/17/01	2.97	2.97	0.48	1.08	1.57	s	24
	PZ-18-O	300	300	0	09/11/01	0	0	10/04/01	2.55	2.55	0.42	0.93	1.35	s	30
	PZ-19-D	500	550	650	09/11/01	5	100	09/19/01	21.42	7.00	3.50	2.55	6.05	s	38
	PZ-20-D	1550	1950	2500	09/10/01	2500	0	09/18/01	219.82	7.00	35.89	2.55	38.44	s	113
	PZ-21-D	0	1500	1000	09/11/01	250	0	09/17/01	15.26	7.00	2.49	2.55	5.04	s	50
	PZ-22-D	600	900	1500	10/02/01	1500	0	10/03/01	22.52	7.00	3.68	2.55	6.23	s	15
	PZ-22-O	0	0	0	10/02/01	5	0	10/03/01	6.92	6.92	1.13	4.94	6.07	d	12
	PZ-23-D	650	750	0	10/02/01	1	0	10/04/01	19.34	7.00	3.16	2.55	5.71	s	60
	PZ-23-O	650	550	0	09/07/01	1	70	09/20/01	0.82	0.82	0.13	0.30	0.43	d	38

gal = gallon.
ft = feet.
NA = not applicable.

Table 9 (continued)
Well Development Volumes
Former DuPont Barksdale Site
Barksdale, Wisconsin

Zone	Well ID	Water Added to Well During Drilling (gal)	Water Recovered During Drilling (gal)	Water Added To Well During Logging (gal)	Date Sediment Removed	Water Removed with Sediment (gal)	Drilling Water Pumped Prior to Purge (gal)	Date Purged	Wetted Riser Length (ft)	Wetted Filter Pack Length (ft)	Water in Riser (gal)	Water in Filter Pack (gal)	Well Volume (Riser + Filter)	Stable (S) Or 3 X Dry (D)	Water Removed To Purge (gal)
Intermediate (continued)	PZ-24-D	250	1900	1500	09/11/01	100	0	09/17/01	20.54	7.00	3.35	2.55	5.90	s	130
	PZ-24-O	350	450	0	09/11/01	1	0	09/17/01	6.44	6.44	1.05	2.35	3.40	d	15
	PZ-26-D	450	1350	0	10/04/01	100	0	10/04/01	95.58	7.00	15.60	2.55	18.15	s	54
	PZ-27-O	0	0	0	09/11/01	1	0	09/19/01	1.34	1.34	0.22	0.96	1.17	s	30
	PZ-28-O	0	0	0	NA	1	0	09/19/01	0.86	0.86	0.14	0.61	0.75	s	25
	PZ-29-D	400	400	0	09/05/01	5	0	09/12/01	8.30	8.30	1.35	3.02	4.38	s	24
	PZ-29-X	500	650	1000	09/05/01	1000	0	09/12/01	75.14	7.00	12.27	2.55	14.82	s	45
	PZ-30-D	300	300	0	10/16/01	50	0	10/16/01	41.15	7.00	6.72	2.55	9.27	s	32
	PZ-30-O	250	200	0	10/02/01	0	50	10/03/01	5.95	5.95	0.97	2.17	3.14	s	24
	PZ-31-D	300	150	0	10/04/01	1	150	10/04/01	2.42	12.00	0.40	4.37	4.77	s	32
	PZ-31-O	300	300	0	NA	1	0	09/19/01	13.43	13.43	2.19	4.89	7.09	s	45
	PZ-32-D	550	350	0	NA	250	0	10/03/01	20.56	7.00	3.36	2.55	5.91	s	30
	PZ-32-O	300	300	0	10/02/01	25	0	10/03/01	222.12	222.12	36.26	80.91	117.17	s	20
	PZ-33-D	500	400	0	10/02/01	100	0	10/03/01	82.30	7.00	13.44	2.55	15.99	s	20
	PZ-33-O	350	300	0	09/11/01	1	50	09/19/01	0.27	0.27	0.04	0.10	0.14	d	6
	PZ-33-R	350	650	0	10/02/01	80	0	10/03/01	185.33	7.00	30.26	2.55	32.81	s	64
	PZ-34-D	400	1700	500	10/02/01	540	0	10/03/01	69.45	7.00	11.34	2.55	13.89	s	30
	PZ-35-D	300	1100	0	10/02/01	25	0	10/04/01	101.82	7.00	16.62	2.55	19.17	s	60
	PZ-36-D	500	1200	0	10/02/01	25	0	10/03/01	223.59	7.00	36.50	2.55	39.05	s	90
Shallow	PZ-02-O	350	300	0	09/06/01	3	50	09/17/01	16.63	12.00	2.71	4.37	7.09	s	50
	PZ-07-O	0	0	0	NA	3	0	09/20/01	14.43	14.43	2.36	10.29	12.65	d	15
	PZ-10-O	300	250	0	09/12/01	3	50	09/18/01	7.76	7.76	1.27	2.83	4.09	d	30
	PZ-13-O	400	350	0	09/06/01	1	50	09/19/01	25.48	12.00	4.16	4.37	8.53	s	30
	PZ-20-O	450	440	0	09/10/01	3	10	09/18/01	1.55	1.55	0.25	0.56	0.82	s	25
	PZ-21-O	700	680	0	09/11/01	1	20	09/17/01	22.68	12.00	3.70	4.37	8.07	s	30
	PZ-25-O	0	0	0	09/11/01	1	0	09/18/01	6.56	6.56	1.07	4.68	5.75	d	10
	PZ-26-O	550	550	0	09/19/01	1	0	09/19/01	6.16	6.16	1.01	4.39	5.40	s	33
	PZ-34-O	500	450	0	09/11/01	1	49	09/20/01	4.59	4.59	0.75	1.67	2.42	s	30
	PZ-35-O	300	300	0	10/02/01	0	0	10/04/01	2.21	2.21	0.36	0.81	1.17	s	40
	PZ-36-O	450	450	0	10/02/01	0	0	10/03/01	168.11	7.00	27.44	2.55	29.99	s	18

gal = gallon.
ft = feet.
NA = not applicable.

Table 10
Summary of Analytical Detections
Soil, Sediment, and Pond Substrate Samples - WW I Area (DRAFT)
Former DuPont Barksdale Site

Barksdale, Wisconsin

	Soil			
			Sample ID	
ANALYTE	Impact to Groundwater	Direct Contact, Non-Industrial Screening Values	WW1-AREA1	WW1-AREA2
Nitroaromatics/Nitramines (ug/kg)				
2-Amino-4,6-Dinitrotoluene	---	4.70E+03	490 J	ND (22)
2,4-Dinitrotoluene	0.98	940	680 J	ND (120)
2,4,6-Trinitrotoluene	11	2.10E+04	4600	ND (16)
2,6-Dinitrotoluene	0.85	940	850 J	ND (14)
4-Amino-2,6-Dinitrotoluene	---	4.70E+03	810 J	ND (22)
4-Nitrotoluene	3,000	7.80E+05	440 J	ND (90)
Metals (mg/kg)				
Arsenic	29	0.039	**1.7**	**3**
Barium	1,600	5.50E+03	48	107
Beryllium	63	160	0.52	1.2 J
Chromium	42	14	**20**	**40.4**
Cobalt	---	1.60E+03	6.2	11.6 J
Copper	11,000	3.10E+03	12	25.2
Lead	---	50	10	13.8
Mercury	2.1	23	0.009 BJ	0.0096 B
Nickel	950	1.60E+03	16	29
Selenium	5.2	390	0.28 B	ND (0.075)
Thallium	---	5.5	0.1 B	0.2
Tin	---	4.70E+04	3.2 J	3.1 BJ
Vanadium	5,100	550	26	52
Zinc	14,000	2.30E+04	33	74.9 J

	Sediment					Pond Substrate		
		Sample ID						
ANALYTE	Direct Contact, Non-Industrial Screening Values	WW1 POND1-A	WW1 POND1-B	WW1 POND2-A	WW1 POND2-B	WWI POND3-A	WWI POND3-A Duplicate	WWI POND3-B
Nitroaromatics and Nitramines (ug/kg)								
2,4,6-Trinitrotoluene	21,000	ND (53)	ND (48)	ND (34)	ND (33)	**12000000**	**16000000**	**9100000**
2,4-Dinitrotoluene	940	ND (140)	ND (130)	ND (90)	ND (85)	**8400**	**13000**	**9200**
2,6-Dinitrotoluene	940	ND (49)	ND (45)	ND (32)	ND (30)	**4100**	**7000**	**4400**
M-Dinitrobenzene	7,800	ND (89)	ND (82)	ND (58)	ND (55)	3200	6700	3900
Semi-Volatile Organics (ug/kg)								
Chrysene	87,000	270 J	ND (200)	ND (140)	ND (130)	ND (220) U	ND (530) U	ND (230) U
Phenanthrene	---	180 J	ND (140)	ND (98)	ND (93)	ND (110) U	ND (260) U	ND (110) U
Pyrene	2,300,000	310 J	190 J	ND (110)	ND (100)	ND (430) U	ND (1000) U	ND (440) U
Volatile Organics (ug/kg)								
Acetone	7,800,000	21 J	42 J	14 J	31 J	47	66	38
Methyl Ethyl Ketone	47,000,000	ND (9.5)	12 J	ND (6.2)	8.9 J	8 Q	16 Q	5.1 Q
Methylene Chloride	85,000	ND (2.0)	2.5 J	ND (1.3)	ND (1.3)	ND (1.2) U	ND (1.5) U	ND (1.2) U
Toluene	16,000,000	ND (3.3)	160	29	4.5 J	1.7 Q	5.6 Q	ND (1.4) U
Metals (mg/kg)								
Arsenic	0.039	7.5	8.3	3.1	5.4	2.9	4	3.3
Barium	5,500	90.1	115	73.7	160	120	150	120
Beryllium	160	0.37 B	0.67 B	0.79 B	1.5	1	1.3	1
Cadmium	78	ND (0.13)	ND (0.12)	ND (0.087)	ND (0.083)	0.34 Q	0.39 Q	0.32 Q
Chromium	14	27.7	38.5	30	51.2	26	34	30
Cobalt	1,600	4.1	8	8	13.9	5.4	7.7	7
Copper	3,100	39.8	53.2	29.7	44.5	31	38	31
Lead	50	62.7	111	103	44.9	1400	1800	1100
Mercury	23	ND (0.011)	ND (0.0096)	ND (0.0069)	ND (0.0065)	0.7	0.77	0.7
Nickel	1,600	13.1 B	23.1	21.4	35.2	15	21	18
Selenium	390	2.6 B	ND (1.4)	ND (1.0)	ND (0.98)	1	1.4	1.2
Silver	390	ND (0.29)	ND (0.26)	ND (0.19)	ND (0.18)	0.22 Q	0.18 Q	0.16 Q
Thallium	5.5	ND (1.5)	ND (1.3)	1.0 B	1.2 B	0.2 Q	0.22 Q	0.19 Q
Tin	47,000	5.3 B	4.6 B	2.6 B	3.2 B	6.2 A	7.9 A	6. A
Vanadium	550	41.5	53.4	41.3	65	31	43	37
Zinc	23,000	45.3	73.9	128	113	60	81	74

ug/kg = micrograms per kilogram or parts per billion.

mg/kg = milligrams per kilogram or parts per million.

Soil samples were collected from 0 to 2 feet below ground surface.

ND = not detected at stated detection limit (detection limit denoted in parentheses).

J (organics) = estimated concentration. Result is less than laboratory reporting limit or qualified for QC exceedance.

J (metals) = contamination in associated lab blank.

U = analyte was not detected at stated detection limit.

B = estimated concentration. Result is less than laboratory reporting limit.

Q = elevated reporting limit due to high analyte concentration or interferences.

A = analyte detected in the associated method blank.

Soil detections above the direct contact, non-industrial screening value are shaded and denoted in **bold.**

Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste*, Method 8830.

Semivolatile organics were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste*, Method 8270C.

Volatile organics were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste*, Method 8260B.

Metals were analyzed using the USEPA-SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste*, Methods 7471A, 6020, or 6010B.

Table 11
Summary of Analytical Detections
Surface Water Samples - WWI Area (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

Sample ID / ANALYTE	WW1-POND1	WW1-POND2	WW1-POND3
Nitroaromatics/Nitramines (ug/l)			
1,3,5-Trinitrobenzene	ND (0.085)	ND (0.085)	960
2-Amino-4,6-Dinitrotoluene	ND (0.065)	ND (0.065)	9100
2,4,6-Trinitrotoluene	ND (0.24)	ND (0.24)	60000
4-Amino-2,6-Dinitrotoluene	ND (0.085)	ND (0.085)	14000
Semi-volatile Organics (ug/l)			
o-Cresol	ND (1.6)	ND (1.6)	2.3 J
Volatile Organics (ug/l)			
Acetone	ND (0.24)	ND (0.24)	60000
Carbon Disulfide	0.23	0.26	1.2
Methyl Ethyl Ketone	ND (0.93)	1.7 J	ND (1.9)
Metals (ug/l)			
Antimony	ND (3.1)	4.6 B	4.5 B
Arsenic	ND (4.3)	ND (4.3)	6.0 B
Barium	85.8	224	989
Beryllium	ND (0.22)	0.29 B	3.0 B
Cadmium	ND (0.29)	ND (0.29)	1.0 B
Chromium	14.2	37.9	127
Cobalt	2.4 B	10.3	30.0
Copper	31.8	65.9	144
Lead	42.1	188	4700
Mercury	0.12 B	0.21	4.0
Nickel	12.4 B	35.8 B	97.3
Selenium	4.6 B	5.2	11.2
Silver	ND (0.62)	ND (0.62)	0.97 B
Tin	ND (3.3)	4.6 B	11.5 B
Vanadium	23.9	65.2	153
Zinc	61.7	272	444

ND = not detected at stated detection limit (detection limit denoted in parentheses).

ug/l = micrograms per liter or parts per billion.

mg/l - milligrams per liter or parts per million.

J = estimated concentration. Result is less than laboratory reporting limit or qualified for QC exceedance.

B = estimated concentration. Result is less than laboratory reporting limit.

Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8231A modified per STL SOP DEN-LC-0010.

Semivolatile organics were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8270C.

Volatile organics were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8260B.

Metals were analyzed using the USEPA-SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Methods 7471A, 6020, or 6010B.

Table 12
Summary of Analytical Detections
Detected Soil Samples - WWII Area (DRAFT)
Former DuPont Barksdale Site
Barksdale, Wisconsin

		Sample ID						
ANALYTE	Impact to Groundwater	Direct Contact, Non-Industrial Screening Values	WWII-AREA1	WWII-AREA2	WWII-AREA3	WWII-AREA4	WWII-AREA6	WWII-AREA7
Nitroaromatics/Nitramines (ug/kg)								
1,3-Dinitrobenzene	190,000	7,800	ND (20000)	1300	ND (20000)	ND (40000)	ND (40000)	ND (10000)
1,3,5-Trinitrobenzene	5,000	2,300,000	20000 J	6300 J	ND (20000)	ND (200000)	ND (40000)	ND (10000)
2-Amino-4,6-Dinitrotoluene	---	4,700	ND (20000)	2100 J	ND (20000)	ND (200000)	ND (40000)	ND (10000)
2,4-Dinitrotoluene	0.98	940	**120000**	**7600**	**110000**	**2000000**	ND (40000)	**30000 J**
2,4,6-Trinitrotoluene	11	21,000	**48000 J**	4400 J	ND (20000)	ND (200000)	**390000**	**62000**
2,6-Dinitrotoluene	0.85	940	ND (20000)	**8300**	**88000**	**2300000**	ND (40000)	**26000 J**
4-Amino-2,6-Dinitrotoluene	---	4,700	ND (20000)	ND (200)	ND (20000)	ND (200000)	ND (40000)	ND (10000)
4-Nitrotoluene	3,000	780,000	ND (20000)	470 J	ND (20000)	ND (200000)	ND (40000)	ND (10000)
Semi-Volatile Organics (ug/kg)								
2-Nitroaniline	---	---	57 J	ND (23)	ND (110)	ND (23)	ND (23)	ND (24)
2,4-Dichlorophenol	1,100	230,000	36 J	ND (18)	ND (89)	ND (18)	ND (18)	ND (19)
4-Bromophenyl Phenyl Ether	---	---	55 J	ND (22)	ND (110)	ND (21)	ND (22)	ND (22)
4-Chlorophenyl Phenyl Ether	---	---	41 J	ND (13)	ND (66)	ND (13)	ND (14)	ND (14)
5-Nitro-O-Toluidine	---	---	ND (28)	ND (27)	8300	ND (27)	ND (27)	ND (28)
Acenaphthene	630,000	4,700,000	25 J	ND (12)	ND (58)	ND (12)	ND (12)	ND (12)
Acenaphthylene	---	---	32 J	ND (16)	ND (79)	ND (16)	ND (16)	ND (17)
Anthracene	13,000,000	23,000,000	70 J	ND (45)	ND (220)	ND (44)	ND (46)	ND (46)
Benzo(A)Anthracene	---	870	86 J	ND (32)	ND (160)	ND (32)	46 J	ND (33)
Benzo(B)Fluoranthene	---	870	82 J	ND (31)	ND (150)	ND (31)	66 J	ND (32)
Benzo(Ghi)Perylene	---	---	64 J	ND (39)	ND (200)	ND (39)	ND (40)	ND (41)
Benzo(K)Fluoranthene	---	8,700	91 J	ND (51)	ND (250)	ND (50)	65 J	ND (53)
Butylbenzylphthalate	17,000,000	16,000,000	84 J	ND (80)	ND (400)	ND (80)	ND (83)	ND (84)
Chrysene	---	87,000	91	ND (27)	ND (130)	ND (27)	99	ND (28)
Di-N-Butylphthalate	500,000	7,800,000	74 J	ND (48)	ND (240)	ND (48)	ND (49)	ND (50)
Di-N-Octylphthalate	---	1,600,000	64 J	ND (33)	ND (170)	ND (33)	ND (34)	ND (35)
Dibenzofuran	48,000	310,000	41 J	ND (16)	ND (81)	ND (16)	ND (17)	ND (17)
Diethylphthalate	450,000	63,000,000	560	ND (20)	ND (100)	ND (20)	ND (21)	ND (21)
Fluoranthene	6,300,000	3,100,000	82 J	ND (49)	ND (240)	ND (49)	200	ND (51)
Fluorene	810,000	3,100,000	60	ND (16)	ND (82)	ND (16)	ND (17)	ND (17)
N-Nitrosodiphenylamine	970	130,000	75 J	ND (62)	ND (310)	ND (62)	ND (64)	ND (64)
Phenanthrene	---	---	86	ND (13)	ND (65)	ND (13)	130	ND (14)
Pyrene	4,600,000	2,300,000	92 J	ND (51)	ND (250)	ND (51)	190	ND (53)
Volatile Organics (ug/kg)								
Acetone	15,000	7,800,000	ND (12)	ND (12)	17	17	ND (11)	35
Metals (mg/kg)								
Antimony	5.4	31	ND (0.65)	ND (0.64)	ND (0.65)	ND (0.59)	ND (0.67)	ND (0.66)
Arsenic	29	0.039	**2.6**	**1.7**	**2**	**1.8**	**3.1**	**2.1**
Barium	1,600	5,500	100	120	97	96	98	110
Beryllium	63	160	0.51	1.2	0.84	1.2	0.92	0.73
Cadmium	7.5	78	ND (0.075)	ND (0.076)	ND (0.08)	ND (0.08)	0.14 B	0.12 B
Chromium	42	14	**25**	**26**	**29**	**21**	**25**	**31**
Cobalt	---	1,600	5.1	13	12	10	8.2	7.9
Copper	11,000	3,100	18	24	17	18	24	25
Lead	---	50	20	7.7	7.4	5.6	**81**	16
Mercury	2.1	23	0.016 BJ	0.025 J	0.017 J	0.023 J	0.02 BJ	0.034 J
Nickel	950	1,600	15	23	20	19	20	22
Selenium	5.2	390	0.39 B	0.93	0.53 B	0.89	0.79	0.33 B
Silver	31	390	ND (0.076)	ND (0.074)	ND (0.076)	ND (0.069)	ND (0.079)	ND (0.077)
Thallium	---	5.5	0.17	0.16	0.14 B	0.12 B	0.15 B	0.15 B
Tin	---	47,000	3.8 B	4 J	4.3 J	3.4 J	3.7 J	4.3 J
Vanadium	5,100	550	40	22	26	19	32	29
Zinc	14,000	23,000	37	36	33	29	50	50

ug/kg = micrograms per kilogram or parts per billion.
mg/kg - milligrams per kilogram or parts per million.
Samples were collected from 0 to 2 feet below ground surface.
ND = not detected at stated detection limit (detection limit denoted in parentheses).
J (organics) = estimated concentration. Result is less than laboratory reporting limit or qualified for QC exceedance.
J (metals) = contamination in associated lab blank.
B = estimated concentration. Result is less than laboratory reporting limit.
Results above the direct contact, non-industrial screening value are shaded and denoted in **bold.**
Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste*, Method 8830.
Semivolatile organics were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste*, Method 8270C.
Volatile organics were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste*, Method 8260B.
Metals were analyzed using the USEPA-SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste*, Methods 7471A, 6020, or 6010B.

Table 13
Summary of Analytical Detections
Organic Soil Samples - Former Acid Production Area (DRAFT)
Former DuPont Barksdale Site
Barksdale, Wisconsin

		Sample ID														
ANALYTE	Impact to Groundwater	Direct Contact, Non-Industrial Screening Values	ACD1-01	ACD1-02	ACD1-03	ACD1-04	ACD1-05	ACD1-06	ACD2-01	ACD2-02	ACD2-03	ACD2-04	ACD3-01	ACD3-02	ACD3-03	ACD3-04
Nitroaromatics/Nitramines (ug/kg)																
1-Methyl-2-Nitrobenzene	3,000	1,600,000	ND (28)	ND (27)	ND (22)	ND (25)	ND (23)	ND (21)	ND (25)	ND (22)	ND (25)	46 J	ND (26)	ND (23)	ND (21)	ND (25)
1-Methyl-4-Nitrobenzene	3,000	780,000	ND (110)	ND (110)	ND (86)	ND (97)	ND (89)	ND (84)	ND (99)	ND (86)	ND (98)	110 J	ND (100)	ND (91)	ND (83)	ND (97)
1,3-Dinitrobenzene	190,000	7,800	ND (33)	ND (31)	ND (25)	ND (28)	ND (26)	ND (25)	ND (29)	ND (25)	130 J	170	ND (30)	ND (27)	ND (24)	ND (28)
1,3,5-Trinitrobenzene	5,000	2,300,000	ND (18)	ND (17)	ND (14)	ND (15)	ND (14)	ND (13)	ND (16)	18 J	41 J	150	ND (16)	ND (15)	ND (13)	ND (15)
2-Amino-4,6-Dinitrotoluene	---	4,700	ND (41)	ND (40)	ND (32)	ND (36)	ND (33)	ND (31)	ND (37)	ND (32)	110 J	ND (32)	ND (38)	ND (34)	ND (31)	ND (36)
2,4-Dinitrotoluene	0.98	940	ND (50)	ND (48)	ND (39)	ND (44)	ND (41)	ND (38)	53 J	150	**2300**	**4700**	ND (47)	42 J	ND (38)	ND (44)
2,4,6-Trinitrotoluene	11	21,000	ND (19)	ND (18)	ND (15)	35 J	ND (15)	15 J	ND (17)	42 J	170	110 J	ND (18)	ND (16)	ND (14)	ND (17)
2,6-Dinitrotoluene	0.85	940	ND (18)	ND (17)	ND (14)	ND (15)	ND (14)	ND (13)	26 J	30 J	**1600**	**4000**	ND (16)	18 J	ND (13)	ND (15)
4-Amino-2,6-Dinitrotoluene	---	4,700	ND (27)	ND (26)	ND (21)	ND (23)	ND (21)	ND (20)	ND (24)	ND (21)	ND (24)	21 J	ND (25)	ND (22)	ND (20)	ND (23)
Nitroglycerin	---	46,000	ND (89)	ND (85)	ND (69)	ND (77)	ND (72)	ND (67)	ND (79)	ND (69)	ND (78)	ND (68)	210	ND (73)	ND (66)	ND (77)
Semi-Volatile Organics (ug/kg)																
2-Methylnaphthalene	---	1,600,000	ND (87)	ND (84)	ND (2700)	95 J	ND (70)	ND (66)	ND (77)	ND (68)	ND (77)	ND (4700)	ND (81)	ND (72)	ND (65)	ND (76)
Anthracene	13,000,000	23,000,000	ND (120)	ND (110)	ND (3600)	ND (100)	ND (93)	ND (87)	ND (100)	ND (89)	ND (100)	ND (6200)	ND (110)	ND (95)	ND (86)	ND (100)
Benzo(A)Anthracene	---	870	ND (58)	90 J	ND (1800)	130 J	ND (46)	ND (44)	170 J	130 J	ND (51)	ND (3100)	120 J	ND (47)	ND (43)	ND (50)
Benzo(A)Pyrene	8,200	87	ND (140)	ND (130)	ND (4300)	ND (120)	ND (110)	ND (110)	**150 J**	ND (110)	ND (120)	ND (7500)	ND (130)	ND (110)	ND (100)	ND (120)
Benzo(B)Fluoranthene	---	870	ND (150)	ND (140)	ND (4600)	ND (130)	ND (120)	ND (110)	150 J	130 J	ND (130)	ND (7900)	ND (140)	ND (120)	ND (110)	ND (130)
Benzo(G,H,I)Perylene	---	---	ND (100)	ND (100)	ND (3200)	ND (90)	ND (83)	ND (78)	120 J	84 J	ND (91)	ND (5600)	ND (96)	ND (85)	ND (77)	ND (90)
Benzo(K)Fluoranthene	---	8,700	ND (140)	ND (130)	ND (4300)	ND (120)	ND (110)	ND (100)	200 J	140 J	ND (120)	ND (7400)	140 J	ND (110)	ND (100)	ND (120)
Bis(2-Ethylhexyl)Phthalate	3,600,000	46,000	ND (100)	220 J	ND (3200)	ND (89)	ND (82)	ND (77)	820	160 J	6600	21000 J	ND (95)	ND (84)	2400	ND (89)
Chrysene	---	87,000	ND (79)	130 J	ND (2400)	200 J	ND (63)	ND (60)	280 J	210 J	ND (69)	ND (4200)	220 J	ND (64)	ND (59)	ND (69)
Fluoranthene	6,300,000	3,100,000	ND (120)	170 J	ND (3900)	250 J	ND (100)	ND (94)	300 J	230 J	ND (110)	ND (6700)	290 J	ND (100)	ND (93)	ND (110)
Indeno(1,2,3-Cd)Pyrene	---	870	ND (71)	ND (68)	ND (2200)	ND (62)	ND (57)	ND (54)	110 J	83 J	ND (63)	ND (3800)	ND (66)	ND (58)	ND (53)	ND (62)
Naphthalene	61,000	1,600,000	ND (100)	ND (100)	ND (3200)	ND (90)	ND (83)	ND (78)	ND (92)	ND (80)	ND (91)	ND (5600)	ND (96)	ND (85)	ND (77)	ND (90)
Phenanthrene	---	---	ND (55)	74 J	ND (1700)	150 J	ND (44)	ND (41)	140 J	120 J	ND (48)	ND (2900)	130 J	ND (45)	ND (41)	ND (48)
Pyrene	4,600,000	2,300,000	ND (59)	150 J	ND (1800)	280 J	ND (48)	45 J	370 J	240 J	ND (52)	ND (3200)	210 J	ND (48)	ND (44)	ND (52)
Volatile Organics (ug/kg)																
Acetone	15,000	7,800,000	6.1 J	8.5 J	46	7.7 J	4.5 J	4.9 J	ND (4.5)	12 J	170	18 J	7.1 J	ND (4.1)	ND (3.8)	32
Carbon Disulfide	29,000	7,800,000	ND (0.77)	ND (0.74)	3.8 J	ND (0.67)	ND (0.62)	ND (0.58)	ND (0.68)	ND (0.60)	ND (1.2)	ND (1.2)	ND (0.71)	ND (0.63)	ND (0.57)	ND (0.67)
Methyl Ethyl Ketone	89,000	47,000,000	ND (3.5)	4.1 J	7.4 J	3.3 J	ND (2.8)	ND (2.6)	ND (3.1)	2.9 J	7.5 J	ND (5.4)	4.1 J	ND (2.8)	ND (2.6)	4.0 J
Methylene Chloride	23	85,000	ND (0.74)	ND (0.71)	0.83 J	1.0 J	0.69 J	0.65 J	0.67 J	0.73 J	1.2 J	ND (1.2)	ND (0.69)	0.75 J	0.62 J	1.0 J

ug/kg = micrograms per kilogram or parts per billion.
Samples were collected from 0 to 2 feet below ground surface.
J = estimated concentration. Result is less than laboratory reporting limit or qualified for QC exceedance.
Results above the direct contact, non-industrial screening value are shaded and denoted in **bold.**
ND = not detected at stated detection limit (detection limit denoted in parentheses).
Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8231A modified per STL SOP DEN-LC-0010.
Semivolatile organics were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8270C.
Volatile organics were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8260B.

Table 13 (continued)
Summary of Analytical Detections
Organic Soil Samples - Former Acid Production Area (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

		Sample ID								
ANALYTE	Impact to Groundwater	Direct Contact, Non-Industrial Screening Values	ACD3-05	ACD3-06	ACD3-07	ACD3-08	ACD3-09	ACD3-10	ACD3-11	ACD3-12
Nitroaromatics/Nitramines (ug/kg)										
1-Methyl-2-Nitrobenzene	3,000	1,600,000	ND (22)	ND (25)	ND (24)	ND (21)	ND (22)	ND (21)	ND (23)	ND (23)
1-Methyl-4-Nitrobenzene	3,000	780,000	ND (88)	ND (98)	ND (94)	ND (84)	ND (87)	ND (84)	ND (89)	ND (90)
1,3-Dinitrobenzene	190,000	7,800	ND (26)	ND (29)	ND (28)	ND (25)	ND (25)	ND (25)	ND (26)	ND (26)
1,3,5-Trinitrobenzene	5,000	2,300,000	ND (14)	ND (16)	ND (15)	ND (13)	ND (14)	ND (13)	ND (14)	ND (14)
2-Amino-4,6-Dinitrotoluene	---	4,700	ND (33)	ND (37)	ND (35)	ND (31)	ND (32)	ND (31)	ND (33)	ND (34)
2,4-Dinitrotoluene	0.98	940	ND (40)	ND (44)	120 J	ND (38)	ND (39)	180	ND (40)	ND (41)
2,4,6-Trinitrotoluene	11	21,000	ND (15)	65 J	31 J	33 J	29 J	50 J	54 J	30 J
2,6-Dinitrotoluene	0.85	940	ND (14)	ND (16)	ND (15)	ND (13)	ND (14)	64 J	ND (14)	ND (14)
4-Amino-2,6-Dinitrotoluene	---	4,700	ND (21)	25 J	ND (23)	ND (20)	ND (21)	23 J	25 J	ND (22)
Nitroglycerin	---	46,000	ND (70)	ND (78)	ND (75)	ND (67)	ND (69)	ND (67)	ND (71)	ND (72)
Semi-Volatile Organics (ug/kg)										
2-Methylnaphthalene	---	1,600,000	ND (69)	ND (2200)	ND (74)	ND (66)	440	ND (66)	ND (70)	ND (1800)
Anthracene	13,000,000	23,000,000	ND (91)	ND (2900)	190 J	ND (87)	ND (90)	ND (88)	ND (93)	ND (2300)
Benzo(A)Anthracene	---	870	150 J	ND (1400)	180 J	660	210 J	190 J	68 J	ND (1200)
Benzo(A)Pyrene	8,200	87	**170 J**	ND (3400)	**150 J**	**550**	**220 J**	**190 J**	ND (110)	ND (2800)
Benzo(B)Fluoranthene	---	870	160 J	ND (3700)	180 J	530	240 J	160 J	ND (120)	ND (3000)
Benzo(G,H,I)Perylene	---	---	130 J	ND (2600)	130 J	300 J	180 J	ND (79)	ND (83)	ND (2100)
Benzo(K)Fluoranthene	---	8,700	180 J	ND (3400)	210 J	690	230 J	170 J	ND (110)	ND (2800)
Bis(2-Ethylhexyl)Phthalate	3,600,000	46,000	ND (81)	ND (2500)	ND (86)	ND (77)	ND (80)	ND (78)	4200	ND (2100)
Chrysene	---	87,000	260 J	ND (1900)	310 J	790	460	270 J	140 J	ND (1600)
Fluoranthene	6,300,000	3,100,000	260 J	ND (3100)	290 J	1300	390	340 J	130 J	ND (2500)
Indeno(1,2,3-Cd)Pyrene	---	870	ND (56)	ND (1800)	ND (60)	310 J	ND (56)	ND (54)	ND (57)	ND (1400)
Naphthalene	61,000	1,600,000	ND (82)	ND (2600)	ND (88)	ND (78)	360 J	ND (79)	ND (83)	ND (2100)
Phenanthrene	---	---	140 J	ND (1400)	180 J	300 J	380	190 J	ND (44)	ND (1100)
Pyrene	4,600,000	2,300,000	260 J	ND (1500)	330 J	1000	410	440	180 J	ND (1200)
Volatile Organics (ug/kg)										
Acetone	15,000	7,800,000	ND (4.0)	9.2 J	ND (4.3)	4.7 J	34	38	ND (4.1)	18 J
Carbon Disulfide	29,000	7,800,000	ND (0.61)	3.9 J	ND (0.65)	ND (0.58)	1.1 J	ND (0.58)	ND (0.62)	1.4 J
Methyl Ethyl Ketone	89,000	47,000,000	ND (2.7)	ND (3.9)	ND (2.9)	ND (2.6)	4.1 J	3.6 J	ND (2.8)	5.7 J
Methylene Chloride	23	85,000	0.85 J	1.0 J	0.80 J	0.64 J	0.80 J	0.76 J	0.80 J	0.87 J

ug/kg = micrograms per kilogram or parts per billion.

Samples were collected from 0 to 2 feet below ground surface.

J = estimated concentration. Result is less than laboratory reporting limit or qualified for QC exceedance.

Results above the direct contact, non-industrial screening value are shaded and denoted in **bold.**

ND = not detected at stated detection limit (detection limit denoted in parentheses).

Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8231A modified per STL SOP DEN-LC-0010.

Semivolatile organics were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8270C.

Volatile organics were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8260B.

Table 14
Summary of Analytical Detections
Inorganic Soil Samples - Former Acid Production Area (DRAFT)
Former DuPont Barksdale Site
Barksdale, Wisconsin

		Sample ID										
ANALYTE	Impact to Groundwater	Direct Contact, Non-Industrial Screening Values	ACD1-01	ACD1-02	ACD1-03	ACD1-04	ACD1-05	ACD1-06	ACD2-01	ACD2-02	ACD2-03	ACD2-04
Antimony	5.4	31	1.3 B	0.81 B	ND (0.59)	1.5	0.98 B	0.58 B	2.2	2.6	ND (0.67)	ND (0.58)
Arsenic	29	0.039	**3.6**	**0.70 B**	ND (0.33)	**7.7**	**2.9**	**1.4**	**5.2**	**5.2**	**6.5**	**2.9**
Barium	1,600	5,500	178	114	80.0	347	82.5	40.9	172	140	35.6	37.8
Beryllium	63	160	0.28 B	0.048 B	0.047 B	0.34 B	0.60	0.13 B	0.18 B	0.27 B	0.12 B	0.068 B
Cadmium	7.5	78	ND (0.049)	ND (0.047)	ND (0.038)	ND (0.043)	ND (0.039)	ND (0.037)	ND (0.043)	ND (0.038)	ND (0.043)	ND (0.037)
Chromium	42	14	**21.3**	2.0	1.0 B	**26.6**	**22.3**	8.0	10.6	**16.6**	2.5	1.1
Cobalt	---	1,600	4.3	0.72 B	0.47 B	5.9	9.8	2.3	3.0	3.8	0.65 B	0.34 B
Copper	11,000	3,100	20.6	2.4 B	1.7 B	23.2	25.0	5.7	19.8	34.3	5.5	2.0 B
Lead	---	50	29.1	**58.2**	44.4	**104**	8.2	12.7	**211**	**166**	28.6	13.2
Mercury	2.1	23	0.050	0.55	0.063	0.12	0.014 B	0.037	0.27	4.5	0.58	0.49
Nickel	950	1,600	5.8 B	0.88 B	1.5 B	13.1	24.1	4.5	5.8	8.2	1.6 B	0.85 B
Selenium	5.2	390	1.4 B	1.6 B	1.6	1.2 B	0.78 B	0.69 B	1.1 B	1.6	3.3	2.6
Silver	31	390	ND (0.11)	ND (0.10)	ND (0.082)	ND (0.092)	ND (0.085)	ND (0.079)	0.18 B	ND (0.081)	ND (0.093)	ND (0.080)
Thallium	---	5.5	ND (0.53)	ND (0.51)	ND (0.41)	ND (0.46)	ND (0.43)	ND (0.40)	ND (0.47)	ND (0.41)	ND (0.47)	ND (0.41)
Tin	---	47,000	ND (0.25)	3.0 B	0.90 B	0.28 B	ND (0.20)	ND (0.19)	4.2 B	2.7 B	2.8 B	1.2 B
Vanadium	5,100	550	20.7	2.3	0.81 B	33.8	39.4	24.5	22.3	22.3	3.6	1.4
Zinc	14,000	23,000	15.6	2.3 B	7.6	20.7	59.7	7.4	15.1	27.6	2.7	1.5 B

		Sample ID											
ANALYTE	Impact to Groundwater	Direct Contact, Non-Industrial Screening Values	ACD3-01	ACD3-02	ACD3-03	ACD3-04	ACD3-05	ACD3-06	ACD3-07	ACD3-08	ACD3-09	ACD3-10	ACD3-11	ACD3-12
Antimony	5.4	31	1.2 B	2.5	ND (0.56)	0.88 B	0.77 B	ND (0.67)	0.97 B	1.2	2.5	2.7	1.0 B	ND (0.61)
Arsenic	29	0.039	**7.7**	**15.2**	**1.8**	**3.5**	**4.5**	**2.3**	**4.1**	**4.6**	**8.3**	**4.2**	**5.4**	**1.3**
Barium	1,600	5,500	221	357	41.0	113	95.4	92.3	147	91.8	108	89.9	149	117
Beryllium	63	160	0.13 B	0.12 B	0.039 B	0.68	0.12 B	ND (0.038)	0.084 B	0.45 B	0.33 B	0.15 B	0.27 B	ND (0.035)
Cadmium	7.5	78	ND (0.045)	ND (0.040)	ND (0.036)	ND (0.043)	ND (0.039)	ND (0.043)	ND (0.041)	ND (0.037)	ND (0.038)	ND (0.037)	ND (0.039)	ND (0.040)
Chromium	42	14	9.6	12.6	5.0	**35.3**	10.2	4.3	12.4	**22.6**	11.4	13.2	**20.1**	2.1
Cobalt	---	1,600	3.4	6.4	2.0	13.8	3.3	1.3	3.1	6.4	4.1	3.4	5.9	0.98 B
Copper	11,000	3,100	11.4	27.9	4.0	45.7	18.1	2.9	11.4	25.7	28.8	16.7	21.5	2.3 B
Lead	---	50	**107**	**190**	9.2	12.6	**69.3**	28.5	**59.1**	**125**	**117**	**50.3**	37.8	36.8
Mercury	2.1	23	0.20	0.41	ND (0.0029)	0.016 B	0.057	0.069	0.065	0.30	*4.3*	1.2	0.12	0.059
Nickel	950	1,600	5.5	19.4	4.2 B	22.8	6.8	1.9 B	3.4 B	12.7	9.4	7.3	11.7	2.1 B
Selenium	5.2	390	ND (0.54)	1.1 B	ND (0.43)	ND (0.50)	ND (0.46)	1.0 B	ND (0.49)	0.58 B	0.71 B	0.75 B	0.48 B	0.61 B
Silver	31	390	0.59 B	0.70 B	ND (0.078)	0.42 B	0.18 B	0.17 B	0.25 B	0.19 B	0.27 B	0.22 B	0.24 B	0.38 B
Thallium	---	5.5	ND (0.49)	0.47 B	ND (0.40)	ND (0.46)	ND (0.42)	ND (0.47)	ND (0.45)	ND (0.40)	ND (0.42)	ND (0.40)	ND (0.43)	ND (0.43)
Tin	---	47,000	0.87 B	0.41 B	ND (0.19)	ND (0.22)	ND (0.20)	0.79 B	ND (0.21)	0.96 B	1.2 B	0.22 B	ND (0.20)	1.0 B
Vanadium	5,100	550	18.2	35.1	15.8	39.6	18.1	5.9	22.6	33.0	21.9	19.4	32.8	3.4
Zinc	14,000	23,000	11.9	23.4	5.5	119	21.6	3.3	11.7	98.0	27.4	16.6	26.4	3.4

All results reported in milligrams per kilogram or parts per million.
Samples were collected from 0 to 2 feet below ground surface.
B = estimated concentration. Result is less than laboratory reporting limit.
Results above the direct contact, non-industrial screening value are shaded and denoted in **bold.**
ND = not detected at stated detection limit (detection limit denoted in parentheses).
Analytes were analyzed using the USEPA-SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Methods 7471A, 6020, or 6010B.

Table 15
Summary of Analytical Detections and Results
Pond Substrate and Surface Water Samples - Former Acid Production Area (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

Pond Substrate Detections			
Sample ID			
ANALYTE	Direct Contact, Non-Industrial Screening Values	ACD-POND1-A	ACD-POND1-B
Nitroaromatics & Nitramines (ug/kg)			
Nitroglycerin	46,000	130 J	ND (100)
Volatile Organics (ug/kg)			
Acetone	7,800,000	40	20 J
Carbon Disulfide	7,800,000	ND (0.70)	2.8 J
Methyl Ethyl Ketone	47,000,000	5.6 J	ND (4.0)
Methylene Chloride	85,000	ND (0.68)	1.3 J
Metals (mg/kg)			
Arsenic	0.039	**1.2 B**	**0.80 B**
Barium	5,500	80.3	59.7
Beryllium	160	0.078 B	0.089 B
Chromium	14	4.2	8.8
Cobalt	1,600	1.1 B	1.2 B
Copper	3,100	7.8	22.3
Lead	50	17.1	14.3
Mercury	23	0.051	0.050 B
Nickel	1,600	2.4 B	1.3 B
Selenium	390	1.2 B	ND (0.66)
Tin	47,000	1.7 B	0.54 B
Vanadium	550	4.3	10.7
Zinc	23,000	4.3	3.5

Surface Water Results	
Sample ID	
ANALYTE	ACD-POND1
Nitroaromatics/Nitramines (ug/l)	
1,3,5-Trinitrobenzene	ND (0.017)
2-Amino-4,6-Dinitrotoluene	ND (0.013)
2,4,6-Trinitrotoluene	ND (0.049)
4-Amino-2,6-Dinitrotoluene	ND (0.017)
Semi-volatile Organics (ug/l)	
Benzyl Alcohol	3.2 J
o-Cresol	ND (1.6)
Volatile Organics (ug/l)	
Acetone	ND (0.049)
Carbon Disulfide	1
Methyl Ethyl Ketone	ND (0.93)
Metals (ug/l)	
Antimony	ND (3.1)
Arsenic	ND (4.3)
Barium	37.5
Beryllium	1.6 B
Cadmium	ND (0.29)
Chromium	18.1
Cobalt	18.5
Copper	10.3
Lead	31.6
Mercury	ND (0.030)
Nickel	57.0
Selenium	ND (4.5)
Silver	ND (0.62)
Tin	ND (3.3)
Vanadium	9.5 B
Zinc	154

ND = not detected at stated detection limit (detection limit denoted in parentheses).

ug/l = micrograms per liter or parts per billion.

mg/l - milligrams per liter or parts per million.

Pond substrate samples were collected at a depth of 2 inches from the top of the substrate.

J = estimated concentration. Result is less than laboratory reporting limit or qualified for QC exceedance.

B = estimated concentration. Result is less than laboratory reporting limit.

Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8231A modified per STL SOP DEN-LC-0010.

Semivolatile organics were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8270C.

Volatile organics were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8260B.

Metals were analyzed using the USEPA-SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Methods 7471A, 6020, or 6010B.

Table 16
October 2001 Groundwater Sampling Event - Summary of Detections
Temporary Well Points - Former Burning Ground Area (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

		Sample ID	TW-10		TW-11		TW-12		TW-13		TW-14		TW-15		TW-16	
		Date	10/4/2001		10/4/2001		10/4/2001		10/4/2001		10/4/2001		10/4/2001		10/4/2001	
ANALYTE	**WI PAL**	**WI ES**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**
Nitroaromatics & Nitramines (ug/l)																
1-Methyl-2-Nitrobenzene	12.2	61*	ND (0.095)	0.095	ND (0.095)	0.095	ND (0.019)	0.019	ND (0.038)	0.038	0.16 J	0.095	ND (0.019)	0.019	ND (9.5)	9.5
2,4,6-Trinitrotoluene	0.22	2.2*	ND (0.24)	0.24	ND (0.24)	0.24	ND (0.049)	0.049	ND (0.098)	0.098	ND (0.24)	0.24	ND (0.049)	0.049	**59 J**	24
2,4-Dinitrotoluene	0.005	0.05	ND (0.080)	0.08	ND (0.080)	0.08	**0.76**	0.016	**0.29**	0.032	**5.7**	0.08	**0.11 J**	0.016	**300**	8
2,6-Dinitrotoluene	0.005	0.05	**1.3**	0.06	**0.77**	0.06	ND (0.012)	0.012	ND (0.024)	0.024	**3.7**	0.06	**0.44**	0.012	ND (6.0)	6
2-Amino-4,6-Dinitrotoluene	0.22	2.2*	**6.2**	0.065	**2.6**	0.065	0.047 J	0.013	ND (0.026)	0.026	2.1	0.065	0.85	0.013	**39 J**	6.5
4-Amino-2,6-Dinitrotoluene	0.22	2.2*	**12**	0.34	**5**	0.085	0.039 J	0.017	0.077 J	0.034	1.9	0.085	0.96	0.017	**59 J**	8.5
M-Dinitrobenzene	0.1	1*	ND	0.1	ND	0.1	0.038 J	0.02	ND	0.04	ND	0.1	ND	0.02	ND	10
Wisconsin Regulated Volatile Organics (ug/l)																
1,1-Dichloroethene	0.7	7	0.60 J	0.2	0.51 J	0.2	0.21 J	0.2	0.31 J	0.2	0.37 J	0.2	ND	0.2	ND	8
Benzene	0.5	5	ND	0.21	ND	0.21	0.83 J	0.21	ND	0.21	ND	0.21	ND	0.21	**32 J**	8.4
Carbon Disulfide	200	1,000	ND	0.19	ND	0.19	ND	0.19	0.19 J	0.19	ND	0.19	0.34 J	0.19	ND	7.6
Carbon Tetrachloride	0.5	5	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19	**1100**	7.6
Chloroform	0.6	6	ND	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23	**520**	9.2
Methyl Ethyl Ketone	90	460	ND	0.93	ND	0.93	ND	0.93	2.0 J	0.93	ND	0.93	1.1 J	0.93	ND	37
Methylene Chloride	0.5	5	ND	0.89	ND	0.89	ND	0.89	ND	0.89	ND	0.89	ND	0.89	**120**	36
Naphthalene	8	40	ND	0.15	ND	0.15	ND	0.15	ND	0.15	ND	0.15	ND	0.15	9.7 J	6
Tetrachloroethene	0.5	5	ND	0.36	ND	0.36	ND	0.36	ND	0.36	ND	0.36	ND	0.36	**26 J**	14
Toluene	200	1,000	45	0.29	ND	0.29	18	0.29	ND	0.29	ND	0.29	ND	0.29	ND	12

ug/l = parts per billion. WI PAL = Wisconsin preventative action limit.

WI ES = Wisconsin enforcement standard. WI ES standards are not currently available for values denoted with (*). Refer to Table 23 for source of these values.

DL = detection limit. Where detections are listed with no qualifiers (i.e., "J", "B", etc.), the DL is the practical quantitative limit; otherwise, the DL is the method detection limit.

ND = not detected.

Results above the WI ES are shaded and denoted in **bold.**

J = estimated concentration. Result is less than laboratory reporting limit or qualified for QC exceedance.

B = estimated concentration. Analyte detected in associated laboratory blank.

Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8321A.

Volatile organics were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8260B.

Table 16 (continued)
October 2001 Groundwater Sampling Event - Summary of Detections
Temporary Well Points: Former Burning Ground Area (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

			Sample ID	TW-10		TW-11		TW-12		TW-13		TW-14		TW-15		TW-16	
			Date	10/4/2001		10/4/2001		10/4/2001		10/4/2001		10/4/2001		10/4/2001		10/4/2001	
ANALYTE	**WI PAL**	**WI ES**		**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**
Metals (ug/l)																	
Antimony	1.2	6		ND	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23	0.82 B	0.23	4.7	0.23
Arsenic	5	50		1.5	0.19	0.54 B	0.19	0.69 B	0.19	0.79 B	0.19	0.43 B	0.19	9.9	0.19	**497**	0.19
Barium	400	2,000		86.9 B	0.64	403	0.64	52.2 B	0.64	79.9 B	0.64	395	0.64	1390	0.64	**3230**	0.64
Beryllium	0.4	4		ND	0.22	0.46 B J	0.22	0.77 B J	0.22	1.0 B J	0.22	0.39 B J	0.22	0.23 B J	0.22	**10.6**	0.22
Cadmium	0.5	5		0.31	0.025	0.026 B	0.025	0.29	0.025	0.15 B	0.025	ND	0.025	1.1	0.025	**20.3**	0.025
Calcium	---	---		246000 J	29	59800 J	29	17500 J	29	6840	29	116000 J	29	81100 J	29	57200 J	29
Chromium	10	100		ND	0.56	ND	0.56	1.0 B	0.56	**102**	0.56	ND	0.56	**464**	0.56	8.8 B	0.56
Copper	130	1,300		3.1 B	0.83	1.9 B	0.83	6.1 B	0.83	43.9	0.83	1.8 B	0.83	1.8 B	0.83	118	0.83
Iron	150	300		14.2 B	5.1	11.0 B	5.1	**639**	5.1	**59500**	5.1	13.4 B	5.1	14.2 B	5.1	**582**	5.1
Lead	1.5	15		ND	0.2	0.27 B	0.2	**58.4**	0.2	ND	0.2	0.52 B	0.2	**51.6**	0.2	**10500**	2
Magnesium	---	---		110000	21	20600	21	6400	21	8220	21	33000	21	25600	21	43600	21
Manganese	25	50		**1400**	0.38	**358**	0.38	**303**	0.38	**881**	0.38	35.1	0.38	**473**	0.38	**184**	0.38
Mercury	0.2	2		ND	0.03	ND	0.03	ND	0.03	0.053 B	0.03	ND	0.03	ND	0.03	0.96	0.03
Nickel	20	100		30.5	0.17	3.0 B	0.17	55.6	0.17	9.6	0.17	3.1 B	0.17	**151**	0.17	**392**	0.17
Potassium	---	---		9990	500	3830 B	500	4730 B	500	18200	500	2070 B	500	5180	500	30200	500
Selenium	10	50		13.6	4.5	ND	4.5	ND	4.5	ND	4.5	ND	4.5	ND	4.5	27.8	4.5
Sodium	---	---		91900	2000	4600 B	2000	7680	2000	5550	2000	8870	2000	40100	2000	341000	2000
Thallium	0.4	2		ND	0.02	ND	0.02	0.53 B	0.02	0.052 B	0.02	ND	0.02	1.9	0.02	**3.4**	0.02
Zinc	2,500	5,000		32.8	6.6	49.4	6.6	54.1	6.6	65.6	6.6	69.6	6.6	283	6.6	44	6.6
Water Quality Inorganics (mg/l)																	
Chloride	---	---		3	0.1	2.5 B	0.1	3.4	0.1	3.1	0.1	3.2	0.1	4.6	0.1	30	0.1
Nitrate Plus Nitrite (As N)	2	10		1.4 J	0.021	0.38 J	0.021	0.060 B J	0.021	0.11 J	0.021	0.58 J	0.021	0.30 J	0.021	1.1 J	0.021
Sulfate	---	---		890 Q	2	18.4	0.1	5	0.1	25.5	0.1	48.6 Q	0.5	145 Q	0.5	238 Q	0.5
Total Dissolved Solids	---	---		1700 G	9.6	254 G	9.6	1000 G	9.6	296 G	9.6	518 G	9.6	820 G	96	2450 G	240
Total Suspended Solids	---	---		4170 Q	47.5	3260 Q	19	4260 Q	19	2690 Q	19	2650 Q	19	61200 Q	47.5	145000 Q	47.5

ug/l = parts per billion. mg/l = parts per million. WI PAL = Wisconsin preventative action limit.

WI PAL = Wisconsin preventative action limit.

DL = detection limit. Where detections are listed with no qualifiers (i.e., "J", "B", etc.), the DL is the practical quantitative limit; otherwise, the DL is the method detection limit.

ND = not detected.

Results above the WI ES are shaded and denoted in **bold.**

J (metals and water quality inorganics) = estimated concentration. Analyte detected in associated laboratory blank.

B (metals and water quality inorganics) = estimated concentration. Result is less than laboratory reporting limit.

Q = elevated reporting limit due to high analyte concentration or interferences.

G = elevated reporting limit due to matrix interferences.

Metals were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Methods 6010B, 6020, 7470, or 7471B.

Water quality inorganics were analyzed using the USEPA 600 4-79-020 (with revisions), *Methods for the Chemical Analysis of Water and Wastes,* Methods 353.2, 300.0, 160.1, 160.2, or 310.1.

Table 17
Summary of Analytical Detections
Waste Samples - Burning Ground Investigation (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

		Sample ID								
ANALYTE	Impact to Groundwater	Direct Contact, Non-Industrial Screening Values	TT1-R	TT2-001	TT2-002	TT2-003	TT2-004	TT2-005	TT3-001	TT3-002
Nitroaromatics/Nitramines (ug/kg)										
1,3-Dinitrobenzene	190,000	7,800	72 J	ND (33)	ND (26)	1500	170	ND (27)	320	650
1,3,5-Trinitrobenzene	5,000	2,300,000	770	29 J	ND (14)	2900	75 J	ND (15)	5500	49 J
2-Amino-4,6-Dinitrotoluene	---	4,700	4000	190 J	NC (33)	**9400**	590	ND (35)	**31000**	**7200**
2,4-Dinitrotoluene	0.98	940	**9300**	830	120 J	**120000**	**2400**	**2000**	**5500**	**950000**
2,4,6-Trinitrotoluene	11	21,000	**79000**	41 J	31 J	**43000**	220	28 J	**350000**	1100
2,6-Dinitrotoluene	0.85	940	**11000**	270	ND (14)	**5600**	710	340	**1900**	**77000**
4-Amino-2,6-Dinitrotoluene	---	4,700	**16000**	160 J	29 J	**9400**	250	39 J	**81000**	260
RDX	---	5,800	140 J	84 J	ND (24)	ND (30)	ND (29)	ND (25)	ND (29)	ND (27)
Semi-volatile Organics (ug/kg)										
2-Methylnaphthalene	---	1,600,000	ND (88)	ND (89)	ND (70)	ND (90)	510	ND (73)	ND (85)	ND (78)
Benzo(A)Anthracene	---	870	150 J	ND (59)	ND (46)	ND (59)	ND (56)	ND (48)	180 J	ND (52)
Benzo(A)Pyrene	---	87	ND (140)	ND (140)	ND (110)	ND (140)	ND (130)	ND (120)	**210 J**	ND (120)
Benzo(B)Fluoranthene	---	870	ND (150)	ND (150)	ND (120)	ND (150)	ND (140)	ND (120)	250 J	ND (130)
Benzo(G,H,I)Perylene	---	---	ND (100)	ND (110)	ND (83)	ND (110)	ND (100)	ND (87)	150 J	ND (93)
Benzo(K)Fluoranthene	---	8,700	ND (140)	ND (140)	ND (110)	ND (140)	ND (130)	ND (120)	190 J	ND (120)
Bis(2-Ethylhexyl)Phthalate	3,600,000	46,000	300 J	ND (100)	ND (82)	ND (100)	ND (99)	ND (86)	ND (99)	4900
Chrysene	---	87,000	120 J	ND (80)	ND (63)	99 J	79 J	ND (66)	250 J	ND (71)
Dibenzofuran	48,000	310,000	ND (120)	ND (120)	ND (97)	ND (120)	140 J	ND (100)	ND (120)	ND (110)
Fluoranthene	6,300,000	3,100,000	240 J	ND (130)	ND (100)	ND (130)	ND (120)	ND (100)	330 J	ND (110)
Indeno(1,2,3-Cd)Pyrene	---	870	ND (71)	ND (73)	ND (57)	ND (73)	ND (69)	ND (60)	150 J	ND (64)
Naphthalene	61,000	1,600,000	ND (100)	ND (110)	ND (83)	ND (110)	400 J	ND (87)	ND (100)	ND (93)
Phenanthrene	---	---	62 J	ND (56)	ND (44)	78 J	270 J	ND (46)	98 J	ND (49)
Pyrene	4,600,000	2,300,000	190 J	99 J	ND (47)	67 J	ND (57)	ND (50)	290 J	ND (53)
Volatile Organics (ug/kg)										
Acetone	15,000	7,800,000	18 J	ND (5.2)	ND (4.1)	7.2 J	5.2 J	ND (4.2)	6.2 J	ND (4.5)
Benzene	34	12,000	ND (0.74)	ND (0.76)	ND (0.59)	1.1 J	1.3 J	ND (0.62)	ND (0.72)	ND (0.66)
Carbon Tetrachloride	66	4,900	ND (0.8)	ND (0.82)	ND (0.64)	1.4 J	2.1 J	ND (0.67)	ND (0.78)	ND (0.72)
Methyl Ethyl Ketone	89,000	47,000,000	ND (3.5)	ND (3.5)	3.3 J	5.4 J	5.2 J	4.2 J	ND (3.4)	ND (3.1)
Methylene Chloride	23	85,000	ND (0.74)	ND (0.76)	ND (0.59)	ND (0.76)	ND (0.72)	0.69 J	1.2 J	0.76 J
Tetrachloroethene	58	12,000	ND (1.5)	ND (1.5)	1.5 J	3.0 J	ND (1.5)	ND (1.3)	2.5 J	ND (1.4)
Toluene	12,000	16,000,000	ND (1.2)	ND (1.2)	ND (0.96)	ND (1.2)	1.4 J	ND (1.1)	1.8 J	ND (1.1)
Metals (mg/kg)										
Antimony	5.4	31	7.3	11	**49.4**	**462**	1.4	**42.6**	8.3	2.2
Arsenic	29	0.039	**45.2**	**61.7**	**9.8**	**22.3**	**4.1**	**18**	**12.5**	**2.9**
Barium	1,600	5,500	502	286	2760	310	181	701	850	151
Beryllium	63	160	0.47 B	0.38 B	0.16 B	ND (0.044)	0.25 B	0.43 B	0.091 B	1.3
Cadmium	7.5	78	3.6	10.3	**526**	7.3	0.92	5.4	1.4	ND (0.044)
Chromium	42	14	**21.4**	**19.3**	**31.8**	**60.4**	7.6	**73.1**	**25.7**	**44.6**
Cobalt	---	1,600	5.9	46.1	11.9	4.4	2.7	15.9	4.5	15.0
Copper	11,000	3,100	654	315	1170	1020	24.1	322	534	59.1
Lead	---	50	**3700**	**818**	**13500**	**7360**	**74.9**	**15400**	**6490**	**203**
Mercury	2.1	23	0.30	0.49	0.11	0.58	0.53	0.049	1.6	0.030 B
Nickel	950	1,600	29	334	38.7	26.2	6.5	165	38.7	33.4
Selenium	5.2	390	1.9	ND (0.47)	30.8	0.94	0.76	0.17 B	0.84	ND (0.082)
Silver	31	390	1.1 B	1.5	1.6	2.7	ND (0.1)	0.68 B	1.6	ND (0.094)
Thallium	---	5.5	0.83	1.3	0.095 B	0.24	0.085 B	0.18	0.16	0.23
Tin	---	47,000	11.3 B	32.2	18600	1960	3.3 B	44.3	73.8	6.8 B
Vanadium	5,100	550	38.9	76.4	15.9	21.7	12	47.1	18.7	56.1
Zinc	14,000	23,000	538	940	**280000**	886	49	1120	1030	241

ND = not detected at stated detection limit (detection limit denoted in parentheses).

ug/kg = micrograms per kilogram or parts per billion.

mg/kg - milligrams per kilogram or parts per million.

Samples were collected from 2 to 6 feet below ground surface.

Results above the direct contact, non-industrial screening value are shaded and denoted in **bold.**

J = estimated concentration. Result is less than laboratory reporting limit or qualified for QC exceedance.

B = estimated concentration. Result is less than laboratory reporting limit.

Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8830.

Semivolatile organics were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8270C.

Volatile organics were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8260B.

Metals were analyzed using the USEPA-SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Methods 7471A, 6020, or 6010B.

Table 18
Summary of Analytical Detections
Sediment Samples - Offsite Pond (DRAFT)

Former DuPont Barksdale Site
Barksdale, Wisconsin

	Sample ID		
ANALYTE	Direct Contact, Non-Industrial Screening Values	BRE-POND1-A	BRE-POND1-B
Nitroaromatics/Nitramines (ug/kg)			
2,4-Dinitrotoluene	940	ND (45)	250
2,4,6-Trinitrotoluene	21000	ND (17)	82 J
2,6-Dinitrotoluene	940	ND (16)	30 J
Volatile Organics (ug/kg)			
Acetone	7,800,000	ND (4.5)	47
Methyl Ethyl Ketone	47,000,000	ND (3.1)	13 J
Methylene Chloride	85,000	ND (0.66)	1.1 J
Metals (mg/kg)			
Antimony	31	ND (0.67)	1.3 B
Arsenic	0.039	1.3	9.2
Barium	5,500	7.1	54.1
Beryllium	160	0.079 B	0.31 B
Cadmium	78	ND (0.043)	ND (0.065)
Chromium	14	1.7	11.4
Cobalt	1,600	0.63 B	3.9
Copper	3,100	1.6 B	21.8
Lead	50	5.9	85.5
Mercury	23	0.018 B	0.31
Nickel	1,600	0.93 B	7.6 B
Selenium	390	ND (0.51)	1.8 B
Silver	390	ND (0.093)	ND (0.14)
Thallium	5.5	ND (0.47)	ND (0.71)
Tin	47,000	0.41 B	1.5 B
Vanadium	550	2.6	15.1
Zinc	23,000	8.5	109

ug/kg = micrograms per kilogram or parts per billion.

mg/kg - milligrams per kilogram or parts per million.

ND = not detected at stated detection limit (detection limit denoted in parentheses).

J = estimated concentration. Result is less than laboratory reporting limit or qualified for QC exceedance.

B = estimated concentration. Result is less than laboratory reporting limit.

Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8231A modified per STL SOP DEN-LC-0010.

Semivolatile organics were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8270C.

Volatile organics were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8260B.

Metals were analyzed using the USEPA-SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Methods 7471A, 6020, or 6010B.

Table 19
October 2001 Groundwater Sampling Event - Summary of Detections
Non-Residential Wells - Shallow Zone (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

		Sample ID	PZ-02O		PZ-07O		PZ-10O		PZ-13O		PZ-20O		PZ-21O	
		Date	10/16/2001		10/24/2001		10/21/2001		10/19/2001		10/17/2001		10/19/2001	
ANALYTE	**WI PAL**	**WI ES**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**
Nitroaromatics & Nitramines (ug/l)														
1,3,5-Trinitrobenzene	110	1,100*	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017
1-Methyl-2-Nitrobenzene	12.2	61*	ND	0.019	0.37 B	0.019	0.034 J	0.019	ND	0.019	ND	0.019	0.060 J	0.019
1-Methyl-3-Nitrobenzene	24	120*	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019
1-Methyl-4-Nitrobenzene	12.2	61*	ND	0.019	0.049 J	0.019	ND	0.019	ND	0.019	ND	0.019	0.021 J	0.019
2,4-Dinitrotoluene	0.005	0.05	ND	0.016	ND	0.016	ND	0.016	ND	0.016	ND	0.016	ND	0.016
2,6-Dinitrotoluene	0.005	0.05	ND	0.012	**7.3**	1.2	ND	0.012	ND	0.012	0.028 J	0.012	**2.4**	0.6
2-Amino-4,6-Dinitrotoluene	0.22	2.2*	ND	0.013	0.10 J	0.013	0.017 J	0.013	ND	0.013	ND	0.013	ND	0.013
4-Amino-2,6-Dinitrotoluene	0.22	2.2*	ND	0.017	0.17	0.12	ND	0.017	ND	0.017	ND	0.017	0.064 J	0.017
M-Dinitrobenzene	0.1	1*	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	0.028 J	0.02
Nitrobenzene	0.7	3.5*	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025
RDX	0.06	0.6*	ND	0.028	ND	0.028	0.034 J	0.028	ND	0.028	ND	0.056	ND	0.028
Wisconsin Regulated Volatile Organics (ug/l)														
Acetone	200	1,000	ND	1.9	ND	1.9	ND	1.9	ND	1.9	ND	1.9	ND	1.9
Carbon Tetrachloride	0.5	5	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19
Chloroform	0.6	6	ND	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23
Methylene Chloride	0.5	5	ND	0.89	ND	0.89	ND	0.89	ND	0.89	ND	0.89	ND	0.89
Naphthalene	8	40	ND	0.15	ND	0.15	0.19 J	0.15	ND	0.15	ND	0.15	ND	0.15
Metals (ug/l)														
Arsenic	5	50	0.90 B	0.19	0.64 B	0.19	4	1	0.29 B	0.19	0.66 B	0.19	1.3	1
Barium	400	2,000	87.4 B	0.64	102 B	0.64	393	200	142 B	0.64	87.0 B	0.64	89.9 B	0.64
Beryllium	0.4	4	0.24 B J	0.22	ND	0.22	2.0 B	0.22	ND	0.22	ND	0.22	ND	0.22
Cadmium	0.5	5	ND	0.025	ND	0.025	0.17 B	0.025	ND	0.025	0.026 B	0.025	ND	0.025
Calcium	---	---	93500	5000	105000	5000	109000	5000	84400	5000	91900	5000	62500	5000
Chromium	10	100	3.4 B	0.56	8.0 B	0.56	56	10	3.9 B J	0.56	ND	0.56	6.4 B J	0.56
Copper	130	1,300	4.1 B J	0.83	4.5 B J	0.83	58.1	0.83	3.5 B	0.83	5.0 B	0.83	3.0 B	0.83
Iron	150	300	185 J	5.1	**1500 J**	5.1	**42700**	100	**583**	100	**1070**	100	**1180**	100
Lead	1.5	15	0.24 B	0.2	0.53 B	0.2	10	1.3	0.39 B	0.2	0.95 B	0.2	0.54 B	0.2
Magnesium	---	---	30300	5000	59400	5000	81800	5000	27400	5000	86500	5000	34400	5000
Manganese	25	50	**119 J**	0.38	**56.4 J**	0.38	**1150**	15	**81.5**	15	**265**	15	**63.6**	15
Nickel	20	100	1.9 B	0.17	5.8 B	0.17	65.4	8	1.4 B	0.17	4.5 B	0.17	1.7 B	0.17
Potassium	---	---	1090 B	500	3140 B	500	13100	5000	1890 B	500	4990 B	500	2640 B	500
Selenium	10	50	ND	4.5	ND	4.5	5.2	5	ND	4.5	ND	4.5	ND	4.5
Sodium	---	---	14400	5000	37400	5000	34400	5000	4390 B	2000	22500	5000	6500	5000
Thallium	0.4	2	ND	0.02	ND	0.02	0.29 B	0.02	ND	0.02	ND	0.02	ND	0.02
Zinc	2,500	5,000	ND	6.6	ND	6.6	80	20	ND	6.6	7.6 B	6.6	ND	6.6
Water Quality Inorganics (mg/l)														
Bromide	---	---	ND	0.079	ND	0.079	0.22	0.2	ND	0.079	ND	0.079	ND	0.079
Chloride	---	---	2.8 B J	0.1	4.2	3	3.2 J	0.1	1.9 B	0.1	3.9 J	0.1	2.3 B	0.1
Nitrate Plus Nitrite (As N)	2	10	0.53	0.1	0.38	0.1	0.031 B	0.021	0.23 J	0.021	0.090 B	0.021	0.21 J	0.021
Sulfate	---	---	35.2	5	199 Q	0.1	27.7	5	52.1 Q	0.1	167 Q	0.1	57.8 Q	0.1
Total Dissolved Solids	---	---	461	10	678	10	440 G	4.8	379	10	709	10	347	10
Total Suspended Solids	---	---	2.4 B	4	45.6	4	1510 Q	1.9	10.8	4	42.8	4	27.6	4

ug/l = parts per billion. mg/l = parts per million. NA = not analyzed. ND = not detected. WI PAL = Wisconsin preventative action limit.

WI ES = Wisconsin enforcement standard. WI ES standards are not currently available for values denoted with (*). Refer to Table 23 for source of these values.

DL = detection limit. Where detections are listed with no qualifiers (i.e., "J", "B", etc.), the DL is the practical quantitative limit; otherwise, the DL is the method detection limit.

Results above the WI ES are shaded and denoted in **bold.**

J (metals and water quality inorganics) = estimated concentration. Analyte detected in associated laboratory blank.

J (nitroaromatics and nitramines) = estimated concentration. Result is less than laboratory reporting limit or qualified for QC exceedance.

B (metals and water quality inorganics) = estimated concentration. Result is less than laboratory reporting limit.

B (nitroaromatics and nitramines) = estimated concentration. Analyte detected in associated laboratory blank.

G = elevated reporting limit due to matrix interferences.

Q = elevated reporting limit due to high analyte concentration or interferences.

Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8321A.

Metals were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Methods 6010B, 6020, 7470, or 7471B.

Water quality inorganics were analyzed using the USEPA 600 4-79-020 (with revisions), *Methods for the Chemical Analysis of Water and Wastes,* Methods 353.2, 300.0, 160.1, 160.2, or 310.1.

Table 19 (continued)
October 2001 Groundwater Sampling Event - Summary of Detections
Non-Residential Wells - Shallow Zone (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

		Sample ID	PZ-25O		PZ-26O		PZ-34O		PZ-35O		PZ-36O	
		Date	10/19/2001		10/20/2001		10/20/2001		10/17/2001		10/17/2001	
ANALYTE	**WI PAL**	**WI ES**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**
Nitroaromatics & Nitramines (ug/l)												
1,3,5-Trinitrobenzene	110	1,100*	0.36	0.12	ND	0.017	0.61	0.12	ND	0.017	ND	0.017
1-Methyl-2-Nitrobenzene	12.2	61*	ND	0.019	0.11 J	0.019	ND	0.019	ND	0.019	ND	0.019
1-Methyl-3-Nitrobenzene	24	120*	ND	0.019	0.17	0.12	ND	0.019	ND	0.019	ND	0.019
1-Methyl-4-Nitrobenzene	12.2	61*	ND	0.019	1.2	0.12	ND	0.019	ND	0.019	ND	0.019
2,4-Dinitrotoluene	0.005	0.05	ND	0.016	**0.46**	0.46	**0.093 J**	0.016	ND	0.016	ND	0.016
2,6-Dinitrotoluene	0.005	0.05	**0.13**	0.12	**4.5**	1.2	**1.4**	0.12	ND	0.012	ND	0.012
2-Amino-4,6-Dinitrotoluene	0.22	2.2*	0.49	0.12	0.039 J	0.013	0.11 J	0.013	ND	0.013	ND	0.013
4-Amino-2,6-Dinitrotoluene	0.22	2.2*	0.34	0.12	ND	0.017	0.15	0.12	ND	0.017	ND	0.017
M-Dinitrobenzene	0.1	1*	ND	0.02	0.061 J	0.02	ND	0.02	ND	0.02	ND	0.02
Nitrobenzene	0.7	3.5*	ND	0.025	0.032 J	0.025	ND	0.025	ND	0.025	ND	0.025
RDX	0.06	0.6*	ND	0.028	ND	0.028	ND	0.028	ND	0.028	ND	0.028
Wisconsin Regulated Volatile Organics (ug/l)												
Acetone	200	1,000	ND	1.9	ND	1.9	ND	1.9	4.3 J	1.9	13	10
Carbon Tetrachloride	0.5	5	ND	0.19	**9.7**	1	ND	0.19	ND	0.19	ND	0.19
Chloroform	0.6	6	ND	0.23	**62**	2	ND	0.23	0.26 J	0.23	ND	0.23
Methylene Chloride	0.5	5	ND	0.89	4.9	1	ND	0.89	ND	0.89	ND	0.89
Naphthalene	8	40	ND	0.15	ND	0.15	ND	0.15	ND	0.15	ND	0.15
Metals (ug/l)												
Arsenic	5	50	0.64 B	0.19	0.43 B	0.19	0.58 B	0.19	0.40 B	0.19	1.5	1
Barium	400	2,000	108 B	0.64	193 B	0.64	67.7 B	0.64	33.8 B	0.64	83.1 B	0.64
Beryllium	0.4	4	ND	0.22	ND	0.22	0.49 B J	0.22	ND	0.22	0.30 B	0.22
Cadmium	0.5	5	0.031 B J	0.025	ND	0.025	ND	0.025	ND	0.025	0.056 B	0.025
Calcium	---	---	72100	5000	56000	5000	67900	5000	36100	5000	51900	5000
Chromium	10	100	5.7 B J	0.56	ND	0.56	5.3 B	0.56	ND	0.56	13.2	10
Copper	130	1,300	6.3 B	0.83	ND	0.83	9.9 B	0.83	16.5 B	0.83	15.4 B	0.83
Iron	150	300	**2300**	100	**382**	100	**2410 J**	5.1	**1620**	100	**9630**	100
Lead	1.5	15	1.0 B	0.2	0.21 B	0.2	0.97 B	0.2	0.48 B	0.2	2	1.3
Magnesium	---	---	31600	5000	62300	5000	29500	5000	13800	5000	23800	5000
Manganese	25	50	**226**	15	**203**	15	**97.1**	15	**208**	15	**162**	15
Nickel	20	100	4.1 B	0.17	5.9 B	0.17	5.0 B	0.17	5.0 B	0.17	9.5	0.17
Potassium	---	---	4610 B	500	4180 B	500	2050 B	500	1150 B	500	3360 B	500
Selenium (dissolved)	10	50	ND	4.5	ND	4.5	5.4 J	4.5	ND	4.5	ND	4.5
Sodium	---	---	6020	5000	18500	5000	4240 B	2000	4340 B	5000	8150	5000
Thallium	0.4	2	ND	0.02	ND	0.02	ND	0.02	ND	0.02	0.066 B	0.02
Zinc	2,500	5,000	7.9 B	20	ND	6.6	ND	6.6	12.0 B	6.6	16.2 B	20
Water Quality Inorganics (mg/l)												
Bromide	---	---	ND	0.079	ND	0.079	ND	0.079	ND	0.079	ND	0.079
Chloride	---	---	2.3 B	0.1	2.7 B J	0.1	1.4 B	0.1	2.5 B J	0.1	2.0 B J	0.1
Nitrate Plus Nitrite (As N)	2	10	0.11 J	0.021	0.79	0.1	0.18	0.1	0.083 B	0.021	0.15	0.1
Sulfate	---	---	16.3	5	22.8	5	16.5	5	14.8	5	10.7	5
Total Dissolved Solids	---	---	348	10	418	10	312	10	208	10	270	10
Total Suspended Solids	---	---	116	4	7.6	4	36	4	55.2	4	362	4

ug/l = parts per billion. mg/l = parts per million. NA = not analyzed. ND = not detected. WI PAL = Wisconsin preventative action limit.

WI ES = Wisconsin enforcement standard. WI ES standards are not currently available for values denoted with (*). Refer to Table 23 for source of these values.

DL = detection limit. Where detections are listed with no qualifiers (i.e., "J", "B", etc.), the DL is the practical quantitative limit; otherwise, the DL is the method detection limit.

Results above the WI ES are shaded and denoted in **bold.**

J (metals and water quality inorganics) = estimated concentration. Analyte detected in associated laboratory blank.

J (nitroaromatics and nitramines) = estimated concentration. Result is less than laboratory reporting limit or qualified for QC exceedance.

B (metals and water quality inorganics) = estimated concentration. Result is less than laboratory reporting limit.

B (nitroaromatics and nitramines) = estimated concentration. Analyte detected in associated laboratory blank.

Q = elevated reporting limit due to high analyte concentration or interferences.

Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8321A.

Metals were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Methods 6010B, 6020, 7470, or 7471B.

Water quality inorganics were analyzed using the USEPA 600 4-79-020 (with revisions), *Methods for the Chemical Analysis of Water and Wastes,* Methods 353.2, 300.0, 160.1, 160.2, or 310.1.

Table 20
October 2001 Groundwater Sampling Event - Summary of Detections
Non-Residential Wells - Intermediate Zone (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

		Sample ID	CLUB HOUSE		CLUB HOUSE Duplicate		MW-01				MW-02		MW-03	
		Date	10/16/2001		10/16/2001		10/23/2001		11/6/2001		10/24/2001		10/24/2001	
ANALYTE	**WI PAL**	**WI ES**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**
Nitroaromatics & Nitramines (ug/l)														
1,3,5-Trinitrobenzene	110	1,100*	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.17
1-Methyl-2-Nitrobenzene	12.2	61*	ND	0.019	ND	0.019	0.050 J B	0.019	ND	0.019	0.10 J B	0.019	0.50 J B	0.19
1-Methyl-3-Nitrobenzene	24	120*	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.19
1-Methyl-4-Nitrobenzene	12.2	61*	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.19
2,4,6-Trinitrotoluene	0.22	2.2*	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.49
2,4-Dinitrotoluene	0.005	0.05	ND	0.016	ND	0.016	ND	0.016	ND	0.016	**0.53**	0.12	**26**	6
2,6-Dinitrotoluene	0.005	0.05	ND	0.012	ND	0.012	ND	0.012	ND	0.012	**1.3**	0.24	**3.1**	1.2
2-Amino-4,6-Dinitrotoluene	0.22	2.2*	ND	0.013	ND	0.013	ND	0.013	ND	0.013	1.3	0.12	0.42 J	0.13
4-Amino-2,6-Dinitrotoluene	0.22	2.2*	ND	0.017	ND	0.017	ND	0.017	ND	0.017	0.94	0.12	0.29 J	0.17
M-Dinitrobenzene	0.1	1*	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.2
Nitrobenzene	0.7	3.5*	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.25
RDX	0.06	0.6*	ND	0.028	ND	0.028	ND	0.028	ND	0.028	ND	0.028	ND	0.28
Wisconsin Regulated Volatile Organics (ug/l)														
1,1-Dichloroethene	0.7	7	NA	NA	NA	NA	ND	0.2	NA	NA	ND	0.2	ND	0.2
1,2,4-Trimethylbenzene	96	480	NA	NA	NA	NA	ND	0.22	NA	NA	ND	0.22	ND	0.22
1,3,5-Trimethylbenzene	96	480	NA	NA	NA	NA	ND	0.29	NA	NA	ND	0.29	ND	0.29
Acetone	200	1,000	NA	NA	NA	NA	ND	1.9	NA	NA	ND	1.9	ND	1.9
Benzene	0.5	5	NA	NA	NA	NA	ND	0.21	NA	NA	ND	0.21	ND	0.21
Bromodichloromethane	0.06	0.6	NA	NA	NA	NA	ND	0.22	NA	NA	ND	0.22	ND	0.22
Carbon Disulfide	200	1,000	NA	NA	NA	NA	1.9	1	NA	NA	ND	0.19	ND	0.19
Carbon Tetrachloride	0.5	5	NA	NA	NA	NA	ND	0.19	NA	NA	ND	0.19	ND	0.19
Chloroform	0.6	6	NA	NA	NA	NA	0.69 J	0.23	NA	NA	ND	0.23	ND	0.23
Ethylbenzene	140	700	NA	NA	NA	NA	ND	0.28	NA	NA	ND	0.28	ND	0.28
Hexane	120	600	NA	NA	NA	NA	ND	0.25	NA	NA	ND	0.25	ND	0.25
Methyl Chloride	0.3	3	NA	NA	NA	NA	ND	0.3	NA	NA	ND	0.3	ND	0.3
Methyl Ethyl Ketone	90	460	NA	NA	NA	NA	ND	0.93	NA	NA	ND	0.93	ND	0.93
Methylene Chloride	0.5	5	NA	NA	NA	NA	ND	0.89	NA	NA	ND	0.89	ND	0.89
Naphthalene	8	40	NA	NA	NA	NA	ND	0.15	NA	NA	ND	0.15	ND	0.15
Tetrachloroethene	0.5	5	NA	NA	NA	NA	ND	0.36	NA	NA	ND	0.36	ND	0.36
Toluene	200	1,000	NA	NA	NA	NA	ND	0.29	NA	NA	ND	0.29	ND	0.29
Xylenes (Total)	1,000	10,000	NA	NA	NA	NA	ND	0.95	NA	NA	ND	0.95	ND	0.95
Metals (ug/l)														
Antimony	1.2	6	NA	NA	NA	NA	ND	0.23	NA	NA	ND	0.23	2.4	1.8
Arsenic	5	50	NA	NA	NA	NA	1.6	1	NA	NA	0.27 B	0.19	1.3	1
Barium	400	2,000	NA	NA	NA	NA	29.1 B	200	NA	NA	154 B	0.64	80.0 B	0.64
Beryllium	0.4	4	NA	NA	NA	NA	ND	0.22	NA	NA	ND	0.22	ND	0.22
Cadmium	0.5	5	NA	NA	NA	NA	ND	0.025	NA	NA	ND	0.025	ND	0.025
Calcium	---	---	NA	NA	NA	NA	20200	5000	NA	NA	105000	5000	41300	5000
Chromium	10	100	NA	NA	NA	NA	1.1 B	10	NA	NA	ND	0.56	0.78 B	0.56
Copper	130	1,300	NA	NA	NA	NA	2.6 B J	0.83	NA	NA	2.4 B J	0.83	3.3 B J	0.83
Iron	150	300	NA	NA	NA	NA	72.8 B J	5.1	NA	NA	19.7 B J	5.1	**502 J**	5.1
Lead	1.5	15	NA	NA	NA	NA	ND	0.2	NA	NA	ND	0.2	0.21 B	0.2
Magnesium	---	---	NA	NA	NA	NA	8120	5000	NA	NA	46500	5000	39300	5000
Manganese	25	50	NA	NA	NA	NA	1.5 B J	0.38	NA	NA	3.4 B J	0.38	34.2 J	0.38
Mercury	0.2	2	NA	NA	NA	NA	ND	0.03	NA	NA	ND	0.03	ND	0.03
Nickel	20	100	NA	NA	NA	NA	0.79 B	0.17	NA	NA	4.2 B	0.17	1.4 B	0.17
Potassium	---	---	NA	NA	NA	NA	1030 B	500	NA	NA	2050 B	500	2810 B	500
Selenium	10	50	NA	NA	NA	NA	ND	4.5	NA	NA	ND	4.5	ND	4.5
Sodium	---	---	NA	NA	NA	NA	2810 B	2000	NA	NA	23200	5000	16900	5000
Thallium	0.4	2	NA	NA	NA	NA	ND	0.02	NA	NA	ND	0.02	0.022 B	0.02
Zinc	2,500	5,000	NA	NA	NA	NA	ND	6.6	NA	NA	ND	6.6	ND	6.6
Water Quality Inorganics (mg/l)														
Bromide	---	---	NA	NA	NA	NA	ND	0.079	NA	NA	ND	0.079	ND	0.079
Chloride	---	---	NA	NA	NA	NA	1.4 B	0.1	NA	NA	5.8	3	2.3 B	0.1
Nitrate Plus Nitrite (As N)	2	10	0.036 B J	0.021	0.040 B J	0.021	0.043 B	0.021	NA	NA	**54.4 Q**	0.21	ND	0.021
Sulfate	---	---	3.7 B	0.1	3.8 B	0.1	4.0 B	0.1	NA	NA	90.1 Q	0.5	50.6 Q	0.2
Total Dissolved Solids	---	---	NA	NA	NA	NA	94	10	NA	NA	656	10	316	10
Total Suspended Solids	---	---	NA	NA	NA	NA	ND	1.9	NA	NA	ND	1.9	3.6 B	1.9

ug/l = parts per billion. mg/l = parts per million. NA = not analyzed. ND = not detected. WI PAL = Wisconsin preventative action limit.

WI ES = Wisconsin enforcement standard. WI ES standards are not currently available for values denoted with (*). Refer to Table 23 for source of these values.

DL = detection limit. Where detections are listed without qualifiers (i.e., "J", "B", etc.), the DL is the practical quantitative limit; otherwise, the DL is the method detection limit.

Results above the WI ES are shaded and denoted in **bold.**

J (organics) = estimated concentration. Result is less than laboratory reporting limit or qualified for QC exceedance.

J (metals and water quality inorganics) = estimated concentration. Analyte detected in associated laboratory blank.

B (organics) = estimated concentration. Analyte detected in associated laboratory blank.

B (metals and water quality inorganics) = estimated concentration. Result is less than laboratory reporting limit.

Q = elevated reporting limit due to high analyte concentration or interferences.

Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8321A

Metals were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Methods 6010B, 6020, 7470, or 7471B

Water quality inorganics were analyzed using the USEPA 600 4-79-020 (with revisions), *Methods for the Chemical Analysis of Water and Wastes,* Methods 353.2, 300.0, 160.1, 160.2, or 310.1.

Table 20 (continued)
October 2001 Groundwater Sampling Event - Summary of Detections
Non-Residential Wells - Intermediate Zone (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

		Sample ID	MW-04		MW-05				PZ-01D		PZ-01S		PZ-02S	
		Date	10/18/2001		10/22/2001		11/6/2001		10/24/2001		10/24/2001		10/16/2001	
ANALYTE	**WI PAL**	**WI ES**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**
Nitroaromatics & Nitramines (ug/l)														
1,3,5-Trinitrobenzene	110	1,100*	ND	0.017	ND	0.017	ND	0.017	ND	1.7	ND	0.017	ND	0.017
1-Methyl-2-Nitrobenzene	12.2	61*	ND	0.019	0.030 J B	0.019	ND	0.019	15 B	1.9	0.22 B	0.019	ND	0.019
1-Methyl-3-Nitrobenzene	24	120*	ND	0.019	ND	0.019	ND	0.019	2.0 J	1.9	ND	0.019	ND	0.019
1-Methyl-4-Nitrobenzene	12.2	61*	ND	0.019	ND	0.019	ND	0.019	8.0 J	1.9	0.083 J	0.019	ND	0.019
2,4,6-Trinitrotoluene	0.22	2.2*	ND	0.049	ND	0.049	ND	0.049	**190**	120	ND	0.049	ND	0.049
2,4-Dinitrotoluene	0.005	0.05	ND	0.016	ND	0.016	ND	0.016	**1000**	120	**0.16**	0.12	ND	0.016
2,6-Dinitrotoluene	0.005	0.05	ND	0.012	ND	0.012	ND	0.012	**450**	120	**0.13**	0.12	ND	0.012
2-Amino-4,6-Dinitrotoluene	0.22	2.2*	ND	0.013	ND	0.013	ND	0.013	**64**	12	0.14	0.12	ND	0.013
4-Amino-2,6-Dinitrotoluene	0.22	2.2*	ND	0.017	ND	0.017	ND	0.017	**58**	12	0.38	0.12	ND	0.017
M-Dinitrobenzene	0.1	1*	ND	0.02	ND	0.02	ND	0.02	**48**	12	ND	0.02	ND	0.02
Nitrobenzene	0.7	3.5*	ND	0.025	ND	0.025	ND	0.025	ND	2.5	ND	0.025	ND	0.025
RDX	0.06	0.6*	ND	0.028	ND	0.028	ND	0.028	ND	2.8	ND	0.056	ND	0.028
Wisconsin Regulated Volatile Organics (ug/l)														
1,1-Dichloroethene	0.7	7	ND	0.2	ND	0.2	NA	NA	0.59 J	0.2	ND	0.2	ND	0.2
1,2,4-Trimethylbenzene	96	480	ND	0.22	ND	0.22	NA	NA	ND	0.22	ND	0.22	ND	0.22
1,3,5-Trimethylbenzene	96	480	ND	0.29	ND	0.29	NA	NA	ND	0.29	ND	0.29	ND	0.29
Acetone	200	1,000	ND	1.9	ND	1.9	NA	NA	ND	1.9	ND	1.9	ND	1.9
Benzene	0.5	5	ND	0.21	ND	0.21	NA	NA	**48**	1	ND	0.21	ND	0.21
Bromodichloromethane	0.06	0.6	ND	0.22	ND	0.22	NA	NA	ND	0.22	ND	0.22	ND	0.22
Carbon Disulfide	200	1,000	ND	0.19	ND	0.19	NA	NA	ND	0.19	0.41 J	0.19	ND	0.19
Carbon Tetrachloride	0.5	5	ND	0.19	ND	0.19	NA	NA	**270**	10	ND	0.19	ND	0.19
Chloroform	0.6	6	ND	0.23	ND	0.23	NA	NA	**26**	1	ND	0.23	ND	0.23
Ethylbenzene	140	700	ND	0.28	ND	0.28	NA	NA	ND	0.28	ND	0.28	ND	0.28
Hexane	120	600	ND	0.25	ND	0.25	NA	NA	ND	0.25	ND	0.25	ND	0.25
Methyl Chloride	0.3	3	ND	0.3	ND	0.3	NA	NA	ND	0.3	ND	0.3	ND	0.3
Methyl Ethyl Ketone	90	460	ND	0.93	ND	0.93	NA	NA	ND	0.93	ND	0.93	ND	0.93
Methylene Chloride	0.5	5	ND	0.89	ND	0.89	NA	NA	ND	0.89	ND	0.89	ND	0.89
Naphthalene	8	40	ND	0.15	ND	0.15	NA	NA	ND	0.15	ND	0.15	ND	0.15
Tetrachloroethene	0.5	5	ND	0.36	ND	0.36	NA	NA	0.83 J	0.36	ND	0.36	ND	0.36
Toluene	200	1,000	ND	0.29	ND	0.29	NA	NA	0.43 J	0.29	ND	0.29	ND	0.29
Xylenes (Total)	1,000	10,000	ND	0.95	ND	0.95	NA	NA	ND	0.95	ND	0.95	ND	0.95
Metals (ug/l)														
Antimony	1.2	6	0.89 B	0.23	ND	0.23	NA	NA	ND	0.23	ND	0.23	ND	0.23
Arsenic	5	50	ND	0.19	0.53 B	0.19	NA	NA	0.36 B	0.19	1.5	0.19	0.55 B	0.19
Barium	400	2,000	19.6 B	0.64	30.8 B	0.64	NA	NA	13.4 B	0.64	59.2 B	0.64	13.5 B	0.64
Beryllium	0.4	4	ND	0.22	ND	0.22	NA	NA	**77**	5	ND	0.22	0.46 B J	5
Cadmium	0.5	5	ND	0.025	ND	0.025	NA	NA	1	0.2	0.071 B	0.22	ND	0.025
Calcium	---	---	37400	5000	19700	5000	NA	NA	85900	5000	53400	5000	16500	5000
Chromium	10	100	1.7 B J	0.56	1.1 B	0.56	NA	NA	1.2 B	0.56	2.0 B	0.56	ND	0.56
Copper	130	1,300	1.9 B	0.83	4.6 B J	0.83	NA	NA	6.5 B J	0.83	6.6 B J	0.83	2.7 B J	0.83
Iron	150	300	81.1 B	5.1	**571 J**	5.1	NA	NA	170 J	5.1	**2460 J**	5.1	188 J	5.1
Lead	1.5	15	ND	0.2	ND	0.2	NA	NA	ND	0.2	0.45 B	0.2	ND	0.2
Magnesium	---	---	10300	5000	6710	5000	NA	NA	46200	5000	20700	5000	7190	5000
Manganese	25	50	2.0 B	0.38	**102 J**	0.38	NA	NA	**1990 J**	0.38	**67.2 J**	0.38	**84.3 J**	0.38
Mercury	0.2	2	ND	0.03	**ND**	0.03	NA	NA	**ND**	0.03	**ND**	0.03	**ND**	0.03
Nickel	20	100	ND	0.17	0.89 B	0.03	NA	NA	71.9	8	4.8 B	0.03	0.39 B	0.03
Potassium	---	---	511 B	500	2220 B	500	NA	NA	12600	500	2290 B	500	952 B	500
Selenium	10	50	6.3	5	ND	4.5	NA	NA	ND	4.5	ND	4.5	ND	4.5
Sodium	---	---	4560 B	2000	3470 B	2000	NA	NA	191000	2000	7730	2000	2270 B	2000
Thallium	0.4	2	0.036 B	0.02	ND	0.02	NA	NA	0.043 B	0.02	ND	0.02	ND	0.02
Zinc	2,500	5,000	ND	6.6	ND	6.6	NA	NA	138	20	18.6 B	6.6	ND	6.6
Water Quality Inorganics (mg/l)														
Bromide	---	---	ND	0.079	ND	0.079	NA	NA	ND	0.079	ND	0.079	ND	0.079
Chloride	---	---	2.6 B	0.1	1.3 B	0.1	NA	NA	26.7	3	2.7 B	0.1	1.3 B J	0.1
Nitrate Plus Nitrite (As N)	2	10	0.21 J	0.021	ND	0.021	NA	NA	6	0.1	0.47	0.1	ND	0.021
Sulfate	---	---	22.2	5	4.0 B	0.1	NA	NA	825 Q	2	39.7	5	4.4 B	0.1
Total Dissolved Solids	---	---	173	10	95	10	NA	NA	1260	10	254	10	117	10
Total Suspended Solids	---	---	ND	1.9	15.6	4	NA	NA	ND	1.9	8	4	2.4 B	4

ug/l = parts per billion. mg/l = parts per million. NA = not analyzed. ND = not detected. WI PAL = Wisconsin preventative action limit.

WI ES = Wisconsin enforcement standard. WI ES standards are not currently available for values denoted with (*). Refer to Table 23 for source of these values.

DL = detection limit. Where detections are listed without qualifiers (i.e., "J", "B", etc.), the DL is the practical quantitative limit; otherwise, the DL is the method detection limit.

Results above the WI ES are shaded and denoted in **bold.**

J (organics) = estimated concentration. Result is less than laboratory reporting limit or qualified for QC exceedance.

J (metals and water quality inorganics) = estimated concentration. Analyte detected in associated laboratory blank.

B (organics) = estimated concentration. Analyte detected in associated laboratory blank.

B (metals and water quality inorganics) = estimated concentration. Result is less than laboratory reporting limit.

Q = elevated reporting limit due to high analyte concentration or interferences.

Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8321A

Metals were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Methods 6010B, 6020, 7470, or 7471B.

Water quality inorganics were analyzed using the USEPA 600 4-79-020 (with revisions), *Methods for the Chemical Analysis of Water and Wastes,* Methods 353.2, 300.0, 160.1, 160.2, or 310.1.

Table 20 (continued)
October 2001 Groundwater Sampling Event - Summary of Detections
Non-Residential Wells - Intermediate Zone (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

		Sample ID	PZ-03D		PZ-03S		PZ-04D		PZ-04S		PZ-05D		PZ-05S	
		Date	10/15/2001		10/15/2001		10/17/2001		10/17/2001		10/18/2001		10/18/2001	
ANALYTE	**WI PAL**	**WI ES**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**
Nitroaromatics & Nitramines (ug/l)														
1,3,5-Trinitrobenzene	110	1,100*	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017
1-Methyl-2-Nitrobenzene	12.2	61*	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019
1-Methyl-3-Nitrobenzene	24	120*	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019
1-Methyl-4-Nitrobenzene	12.2	61*	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019
2,4,6-Trinitrotoluene	0.22	2.2*	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049
2,4-Dinitrotoluene	0.005	0.05	ND	0.016	ND	0.016	ND	0.016	**0.051 J**	0.016	ND	0.016	ND	0.016
2,6-Dinitrotoluene	0.005	0.05	ND	0.012	ND	0.012	ND	0.012	0.014 J	0.012	ND	0.012	ND	0.012
2-Amino-4,6-Dinitrotoluene	0.22	2.2*	ND	0.013	ND	0.013	ND	0.013	0.072 J	0.013	ND	0.013	ND	0.013
4-Amino-2,6-Dinitrotoluene	0.22	2.2*	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017
M-Dinitrobenzene	0.1	1*	ND	0.02	ND	0.02	ND	0.02	0.036 J	0.02	ND	0.02	ND	0.02
Nitrobenzene	0.7	3.5*	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025
RDX	0.06	0.6*	ND	0.028	ND	0.028	ND	0.028	ND	0.028	ND	0.028	ND	0.028
Wisconsin Regulated Volatile Organics (ug/l)														
1,1-Dichloroethene	0.7	7	ND	0.2	ND	0.2	ND	0.2	ND	0.2	ND	0.2	ND	0.2
1,2,4-Trimethylbenzene	96	480	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22
1,3,5-Trimethylbenzene	96	480	ND	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29
Acetone	200	1,000	ND	1.9	ND	1.9	ND	1.9	3.2 J	1.9	ND	1.9	ND	1.9
Benzene	0.5	5	ND	0.21	ND	0.21	ND	0.21	ND	0.21	ND	0.21	ND	0.21
Bromodichloromethane	0.06	0.6	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22
Carbon Disulfide	200	1,000	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19
Carbon Tetrachloride	0.5	5	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19
Chloroform	0.6	6	ND	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23
Ethylbenzene	140	700	ND	0.28	ND	0.28	ND	0.28	ND	0.28	ND	0.28	ND	0.28
Hexane	120	600	ND	0.25	ND	0.25	ND	0.25	ND	0.25	ND	0.25	ND	0.25
Methyl Chloride	0.3	3	ND	0.3	ND	0.3	ND	0.3	ND	0.3	ND	0.3	ND	0.3
Methyl Ethyl Ketone	90	460	ND	0.93	ND	0.93	ND	0.93	ND	0.93	ND	0.93	ND	0.93
Methylene Chloride	0.5	5	ND	0.89	ND	0.89	ND	0.89	ND	0.89	ND	0.89	ND	0.89
Naphthalene	8	40	ND	0.15	ND	0.15	ND	0.15	ND	0.15	ND	0.15	ND	0.15
Tetrachloroethene	0.5	5	ND	0.36	ND	0.36	ND	0.36	ND	0.36	ND	0.36	ND	0.36
Toluene	200	1,000	ND	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29
Xylenes (Total)	1,000	10,000	ND	0.95	ND	0.95	ND	0.95	ND	0.95	ND	0.95	ND	0.95
Metals (ug/l)														
Antimony	1.2	6	0.95 B	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23
Arsenic	5	50	2.4	0.19	2.6	0.19	0.76 B	0.19	0.45 B	0.19	1.1	1	1.7	1
Barium	400	2,000	21.3 B	0.64	15.1 B	0.64	15.6 B	0.64	15.2 B	0.64	38.9 B	0.64	46.1 B	0.64
Beryllium	0.4	4	0.77 B J	5	0.47 B J	5	ND	0.22	ND	0.22	ND	0.22	ND	0.22
Cadmium	0.5	5	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025
Calcium	---	---	17700	5000	20500	5000	17400	5000	21900	5000	23300	5000	29300	5000
Chromium	10	100	3.7 B	0.56	2.7 B	0.56	1.9 B	0.56	1.8 B	0.56	2.4 B	0.56	ND	0.56
Copper	130	1,300	3.8 B J	0.83	2.2 B J	0.83	6.0 B	0.83	ND	0.83	3.3 B	0.83	ND	0.83
Iron	150	300	**1020 J**	5.1	22.7 B J	5.1	**328**	100	9.3 B	5.1	**401**	100	141	100
Lead	1.5	15	0.57 B	0.2	ND	0.2	0.40 B	0.2	ND	0.2	0.95 B	0.2	0.25 B	0.2
Magnesium	---	---	5890	5000	6920	5000	5890	5000	8510	5000	9350	5000	12800	5000
Manganese	25	50	49.6 J	0.38	14.0 B J	0.38	11.0 B	0.38	1.2 B	0.38	35.1	15	102	15
Mercury	0.2	2	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.03
Nickel	20	100	0.79 B	0.03	0.43 B	0.03	1.4 B	0.03	0.73 B	0.17	1.3 B	0.17	1.0 B	0.17
Potassium	---	---	1760 B	500	911 B	500	1140 B	500	1140 B	500	1930 B	500	1830 B	500
Selenium	10	50	ND	4.5	ND	4.5	ND	4.5	ND	4.5	ND	4.5	ND	4.5
Sodium	---	---	3740 B	2000	2830 B	2000	2320 B	2000	3830 B	2000	5010	5000	6490	5000
Thallium	0.4	2	0.023 B	1.2	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02
Zinc	2,500	5,000	28.7	20	ND	6.6	25.8	20	ND	6.6	20.6	20	23.4	20
Water Quality Inorganics (mg/l)														
Bromide	---	---	ND	0.079	ND	0.079	ND	0.079	ND	0.079	ND	0.079	ND	0.079
Chloride	---	---	1.2 B J	0.1	1.3 B J	0.1	1.2 B J	0.1	1.3 B J	0.1	1.7 B J	0.1	2.4 B J	0.1
Nitrate Plus Nitrite (As N)	2	10	0.022 B	0.021	0.094 B	0.021	0.062 B	0.1	0.084 B	0.1	0.031 B	0.1	ND	0.021
Sulfate	---	---	4.2 B	0.1	3.6 B	0.1	3.0 B	0.1	5.7	5	6.8	5	12	5
Total Dissolved Solids	---	---	116	10	117	10	100	10	119	10	131	10	159	10
Total Suspended Solids	---	---	46.6	4	3.0 B	1.9	23.2	4	ND	1.9	36.2	4	8.8	4

ug/l = parts per billion. mg/l = parts per million. NA = not analyzed. ND = not detected. WI PAL = Wisconsin preventative action limit.

WI ES = Wisconsin enforcement standard. WI ES standards are not currently available for values denoted with (*). Refer to Table 23 for source of these values.

DL = detection limit. Where detections are listed without qualifiers (i.e., "J", "B", etc.), the DL is the practical quantitative limit; otherwise, the DL is the method detection limit.

Results above the WI ES are shaded and denoted in **bold.**

J (organics) = estimated concentration. Result is less than laboratory reporting limit or qualified for QC exceedance.

J (metals and water quality inorganics) = estimated concentration. Analyte detected in associated laboratory blank.

B (organics) = estimated concentration. Analyte detected in associated laboratory blank.

B (metals and water quality inorganics) = estimated concentration. Result is less than laboratory reporting limit.

Q = elevated reporting limit due to high analyte concentration or interferences.

Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8321A.

Metals were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Methods 6010B, 6020, 7470, or 7471B.

Water quality inorganics were analyzed using the USEPA 600 4-79-020 (with revisions), *Methods for the Chemical Analysis of Water and Wastes,* Methods 353.2, 300.0, 160.1, 160.2, or 310.1.

Table 20 (continued)
October 2001 Groundwater Sampling Event - Summary of Detections
Non-Residential Wells - Intermediate Zone (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

		Sample ID	PZ-06D		PZ-06D Duplicate		PZ-06S		PZ-07X		PZ-08D		PZ-08O	
		Date	10/21/2001		10/21/2001		10/21/2001		10/24/2001		10/21/2001		10/21/2001	
ANALYTE	**WI PAL**	**WI ES**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**
Nitroaromatics & Nitramines (ug/l)														
1,3,5-Trinitrobenzene	110	1,100*	ND	0.017	ND	0.017	ND	0.017	ND	0.085	0.021 J	0.017	ND	0.017
1-Methyl-2-Nitrobenzene	12.2	61*	0.020 J	0.019	ND	0.019	0.036 J	0.019	1.2 B	0.019	0.020 J	0.019	ND	0.019
1-Methyl-3-Nitrobenzene	24	120*	ND	0.019	ND	0.019	ND	0.019	0.13 J	0.019	ND	0.019	ND	0.019
1-Methyl-4-Nitrobenzene	12.2	61*	ND	0.019	ND	0.019	ND	0.019	0.40 J	0.019	ND	0.019	ND	0.019
2,4,6-Trinitrotoluene	0.22	2.2*	ND	0.049	ND	0.049	ND	0.049	0.75	0.6	ND	0.049	ND	0.049
2,4-Dinitrotoluene	0.005	0.05	**0.72**	0.12	**0.64**	0.12	**1**	0.12	**93**	12	0.039 J	0.016	0.034 J	0.016
2,6-Dinitrotoluene	0.005	0.05	**0.050 J**	0.012	0.045 J	0.012	**0.084 J**	0.012	**7.0 J**	1.2	**0.17**	0.12	**0.17**	0.12
2-Amino-4,6-Dinitrotoluene	0.22	2.2*	0.014 J	0.013	0.014 J	0.013	0.018 J	0.013	1.4	0.6	0.020 J	0.013	ND	0.013
4-Amino-2,6-Dinitrotoluene	0.22	2.2*	0.036 J	0.017	0.033 J	0.017	0.046 J	0.017	1	0.6	ND	0.017	ND	0.017
M-Dinitrobenzene	0.1	1*	ND	0.02	ND	0.02	ND	0.02	0.15 J	0.02	ND	0.02	ND	0.02
Nitrobenzene	0.7	3.5*	ND	0.025	ND	0.025	ND	0.025	ND	0.12	ND	0.025	ND	0.025
RDX	0.06	0.6*	ND	0.028	ND	0.028	ND	0.028	ND	0.14	0.033 J	0.028	ND	0.028
Wisconsin Regulated Volatile Organics (ug/l)														
1,1-Dichloroethene	0.7	7	ND	0.2	ND	0.2	ND	0.2	ND	0.2	ND	0.2	ND	0.2
1,2,4-Trimethylbenzene	96	480	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22
1,3,5-Trimethylbenzene	96	480	ND	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29
Acetone	200	1,000	ND	1.9	ND	1.9	ND	1.9	ND	1.9	ND	1.9	ND	1.9
Benzene	0.5	5	ND	0.21	ND	0.21	ND	0.21	ND	0.21	ND	0.21	ND	0.21
Bromodichloromethane	0.06	0.6	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22
Carbon Disulfide	200	1,000	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19
Carbon Tetrachloride	0.5	5	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19
Chloroform	0.6	6	3.1	1	3	1	4.1	1	ND	0.23	ND	0.23	ND	0.23
Ethylbenzene	140	700	ND	0.28	ND	0.28	ND	0.28	ND	0.28	ND	0.28	ND	0.28
Hexane	120	600	ND	0.25	ND	0.25	ND	0.25	ND	0.25	ND	0.25	ND	0.25
Methyl Chloride	0.3	3	ND	0.3	ND	0.3	ND	0.3	ND	0.3	ND	0.3	ND	0.3
Methyl Ethyl Ketone	90	460	ND	0.93	ND	0.93	ND	0.93	ND	0.93	ND	0.93	ND	0.93
Methylene Chloride	0.5	5	ND	0.89	ND	0.89	ND	0.89	ND	0.89	ND	0.89	ND	0.89
Naphthalene	8	40	ND	0.15	0.15 J	0.15	ND	0.15	ND	0.15	ND	0.15	ND	0.15
Tetrachloroethene	0.5	5	ND	0.36	ND	0.36	ND	0.36	ND	0.36	ND	0.36	ND	0.36
Toluene	200	1,000	ND	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29
Xylenes (Total)	1,000	10,000	ND	0.95	ND	0.95	ND	0.95	ND	0.95	ND	0.95	ND	0.95
Metals (ug/l)														
Antimony	1.2	6	ND	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23
Arsenic	5	50	0.40 B	0.19	0.40 B	0.19	0.42 B	0.19	1.2	1	ND	0.19	0.56 B	0.19
Barium	400	2,000	61.6 B	0.64	61.6 B	0.64	98.4 B	0.64	111 B	0.64	39.1 B	0.64	46.8 B	0.64
Beryllium	0.4	4	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22	1.4 B	0.22
Cadmium	0.5	5	ND	0.025	ND	0.025	ND	0.025	0.026 B	0.025	ND	0.025	ND	0.025
Calcium	---	---	42800	5000	42600	5000	54200	5000	56000	5000	41600	5000	38900	5000
Chromium	10	100	ND	0.56	ND	0.56	ND	0.56	9.1 B	0.56	ND	0.56	5.7 B	0.56
Copper	130	1,300	0.93 B	0.83	1.1 B	0.83	ND	0.83	12.1 B J	0.83	1.1 B	0.83	2.3 B	0.83
Iron	150	300	**376**	100	**371**	100	38.4 B	100	**5700 J**	5.1	25.0 B	100	**2320**	100
Lead	1.5	15	0.34 B	0.2	0.31 B	0.2	ND	0.2	1.2 B	0.2	0.42 B	0.2	0.74 B	0.2
Magnesium	---	---	25700	5000	25600	5000	37400	5000	42300	5000	17200	5000	15900	5000
Manganese	25	50	15.2	15	15.4	15	3.7 B	0.38	**343 J**	0.38	4.2 B	0.38	27.6	15
Mercury	0.2	2	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.03
Nickel	20	100	1.3 B	0.17	1.3 B	0.17	1.4 B	0.17	7.1 B	0.17	1.6 B	0.17	2.9 B	0.17
Potassium	---	---	2630 B	500	2250 B	500	2970 B	500	4090 B	500	1370 B	500	1650 B	500
Selenium	10	50	ND	4.5	ND	4.5	ND	4.5	ND	4.5	ND	4.5	ND	4.5
Sodium	---	---	10100	5000	9640	5000	14700	5000	19300	5000	4560 B	2000	3540 B	2000
Thallium	0.4	2	ND	0.02	ND	0.02	ND	0.02	0.033 B	0.02	ND	0.02	ND	0.02
Zinc	2,500	5,000	14.4 B	6.6	14.6 B	6.6	ND	6.6	9.9 B	6.6	ND	6.6	ND	6.6
Water Quality Inorganics (mg/l)														
Bromide	---	---	ND	0.079	ND	0.079	ND	0.079	ND	0.079	ND	0.079	ND	0.079
Chloride	---	---	6.4 J	0.1	6.4 J	0.1	9.0 J	0.1	3.1	3	1.7 B J	0.1	1.6 B J	0.1
Nitrate Plus Nitrite (As N)	2	10	1.3	0.1	1.2	0.1	2.1	0.1	0.11	0.1	0.25	0.1	0.19	0.1
Sulfate	---	---	41	5	41.5	5	67.8 Q	0.1	84.1 Q	0.1	16.6	5	12.2	5
Total Dissolved Solids	---	---	261	10	247	10	355	10	405	10	202	10	206	10
Total Suspended Solids	---	---	7.4	4	7.2	4	ND	1.9	283 Q	1.9	3.0 B	1.9	20	4

ug/l = parts per billion. mg/l = parts per million. NA = not analyzed. ND = not detected. WI PAL = Wisconsin preventative action limit.

WI ES = Wisconsin enforcement standard. WI ES standards are not currently available for values denoted with (*). Refer to Table 23 for source of these values.

DL = detection limit. Where detections are listed without qualifiers (i.e., "J", "B", etc.), the DL is the practical quantitative limit; otherwise, the DL is the method detection limit.

Results above the WI ES are shaded and denoted in **bold.**

J (organics) = estimated concentration. Result is less than laboratory reporting limit or qualified for QC exceedance.

J (metals and water quality inorganics) = estimated concentration. Analyte detected in associated laboratory blank.

B (organics) = estimated concentration. Analyte detected in associated laboratory blank.

B (metals and water quality inorganics) = estimated concentration. Result is less than laboratory reporting limit.

Q = elevated reporting limit due to high analyte concentration or interferences.

Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8321A.

Metals were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Methods 6010B, 6020, 7470, or 7471B.

Water quality inorganics were analyzed using the USEPA 600 4-79-020 (with revisions), *Methods for the Chemical Analysis of Water and Wastes,* Methods 353.2, 300.0, 160.1, 160.2, or 310.1.

Table 20 (continued)
October 2001 Groundwater Sampling Event - Summary of Detections
Non-Residential Wells - Intermediate Zone (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

		Sample ID	PZ-09O		PZ-09X		PZ-10D		PZ-11D		PZ-12D		PZ-12O	
		Date	10/18/2001		10/18/2001		10/21/2001		10/19/2001		10/22/2001		10/22/2001	
ANALYTE	**WI PAL**	**WI ES**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**
Nitroaromatics & Nitramines (ug/l)														
1,3,5-Trinitrobenzene	110	1,100*	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.085
1-Methyl-2-Nitrobenzene	12.2	61*	ND	0.019	0.2	0.12	ND	0.019	2.9	0.6	0.067 J	0.019	1.5	0.6
1-Methyl-3-Nitrobenzene	24	120*	ND	0.019	ND	0.019	ND	0.019	0.12	0.12	ND	0.019	ND	0.095
1-Methyl-4-Nitrobenzene	12.2	61*	ND	0.019	0.063 J	0.019	ND	0.019	0.29	0.12	0.031 J	0.019	0.56 J	0.019
2,4,6-Trinitrotoluene	0.22	2.2*	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.24
2,4-Dinitrotoluene	0.005	0.05	ND	0.016	**1.2**	0.12	ND	0.016	**0.52**	0.12	**3.2**	0.6	**26**	2.4
2,6-Dinitrotoluene	0.005	0.05	ND	0.012	**0.52**	0.12	ND	0.012	**0.48**	0.12	**0.17**	0.12	**2.1**	0.6
2-Amino-4,6-Dinitrotoluene	0.22	2.2*	ND	0.013	1.3	0.24	ND	0.013	ND	0.013	0.38	0.12	**5.9**	1.2
4-Amino-2,6-Dinitrotoluene	0.22	2.2*	ND	0.017	**2.4**	0.24	ND	0.017	0.027 J	0.017	0.53	0.12	**8.4**	1.2
M-Dinitrobenzene	0.1	1*	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.1
Nitrobenzene	0.7	3.5*	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.12
RDX	0.06	0.6*	ND	0.028	ND	0.056	ND	0.028	ND	0.028	ND	0.028	ND	0.14
Wisconsin Regulated Volatile Organics (ug/l)														
1,1-Dichloroethene	0.7	7	ND	0.2	ND	0.2	ND	0.2	ND	0.2	ND	0.2	ND	0.2
1,2,4-Trimethylbenzene	96	480	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22
1,3,5-Trimethylbenzene	96	480	ND	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29
Acetone	200	1,000	ND	1.9	ND	1.9	ND	1.9	ND	1.9	ND	1.9	ND	1.9
Benzene	0.5	5	ND	0.21	ND	0.21	ND	0.21	ND	0.21	ND	0.21	ND	0.21
Bromodichloromethane	0.06	0.6	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22
Carbon Disulfide	200	1,000	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19
Carbon Tetrachloride	0.5	5	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19
Chloroform	0.6	6	0.56 J	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23
Ethylbenzene	140	700	ND	0.28	ND	0.28	ND	0.28	ND	0.28	ND	0.28	ND	0.28
Hexane	120	600	ND	0.25	ND	0.25	ND	0.25	ND	0.25	ND	0.25	ND	0.25
Methyl Chloride	0.3	3	ND	0.3	ND	0.3	ND	0.3	ND	0.3	ND	0.3	ND	0.3
Methyl Ethyl Ketone	90	460	ND	0.93	1.6 J	0.93	ND	0.93	ND	0.93	ND	0.93	ND	0.93
Methylene Chloride	0.5	5	ND	0.89	ND	0.89	ND	0.89	ND	0.89	ND	0.89	ND	0.89
Naphthalene	8	40	ND	0.15	1	1	ND	0.15	ND	0.15	ND	0.15	ND	0.15
Tetrachloroethene	0.5	5	ND	0.36	ND	0.36	ND	0.36	ND	0.36	ND	0.36	ND	0.36
Toluene	200	1,000	ND	0.29	0.44 J	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29
Xylenes (Total)	1,000	10,000	ND	0.95	ND	0.95	ND	0.95	ND	0.95	ND	0.95	ND	0.95
Metals (ug/l)														
Antimony	1.2	6	ND	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23
Arsenic	5	50	0.47 B	0.19	0.58 B	0.19	0.73 B	0.19	2.2	1	1.2	1	2	1
Barium	400	2,000	70.8 B	0.64	44.8 B	0.64	35.9 B	0.64	136 B	0.64	72.8 B	0.64	48.5 B	0.64
Beryllium	0.4	4	ND	0.22	ND	0.22	0.30 B	0.22	ND	0.22	1.3 B	0.22	1.2 B	0.22
Cadmium	0.5	5	0.038 B J	0.025	ND	0.025	ND	0.025	ND	0.025	0.068 B	0.025	0.26	0.2
Calcium	---	---	38900	5000	42100	5000	25300	5000	74400	5000	16000	5000	18800	5000
Chromium	10	100	31.7 J	0.56	1.9 B J	0.56	ND	0.56	2.7 B J	0.56	ND	0.56	3.8 B	0.56
Copper	130	1,300	3.8 B	0.83	1.4 B	0.83	ND	0.83	1.0 B	0.83	6.6 B	0.83	26.5	25
Iron	150	300	**2980**	100	**499**	100	**423**	100	**698**	100	**4980**	100	**12400**	100
Lead	1.5	15	1.4	1.3	0.38 B	0.2	0.68 B	0.2	0.36 B	0.2	7	1.3	0.87 B	0.2
Magnesium	---	---	12400	5000	18000	5000	10900	5000	48600	5000	5750	5000	6880	5000
Manganese	25	50	**198**	15	**69.6**	15	**225**	15	35.5	15	**102**	15	**565**	15
Mercury	0.2	2	**ND**	0.03	**ND**	0.03	**ND**	0.03	ND	0.03	**ND**	0.03	**ND**	0.03
Nickel	20	100	9.8	0.17	1.2 B	0.17	1.2 B	0.17	ND	0.17	3.0 B	0.17	20.8	8
Potassium	---	---	7440	500	1410 B	500	2140 B	500	3060 B	500	3820 B	500	7070	500
Selenium	10	50	ND	4.5	ND	4.5	ND	4.5	ND	4.5	ND	4.5	ND	4.5
Sodium	---	---	6550	5000	5000	5000	4700 B	2000	7430	5000	12300	5000	17000	5000
Thallium	0.4	2	0.059 B	0.02	ND	0.02	ND	0.02	ND	0.02	0.037 B	0.02	0.067 B	0.02
Zinc	2,500	5,000	ND	6.6	23.2	20	ND	6.6	ND	6.6	20.4	20	103	20
Water Quality Inorganics (mg/l)														
Bromide	---	---	ND	0.079	ND	0.079	ND	0.079	ND	0.079	ND	0.079	ND	0.079
Chloride	---	---	2.9 B	0.1	2.0 B	0.1	1.2 B J	0.1	2.1 B	0.1	3.2 J	0.1	24.0 J	0.1
Nitrate Plus Nitrite (As N)	2	10	0.30 J	0.021	0.25 J	0.021	ND	0.021	0.042 B J	0.021	0.034 B	0.021	0.1	0.1
Sulfate	---	---	17.9	5	11.9	5	14.5	5	134 Q	0.1	11.6	5	79.4 Q	0.1
Total Dissolved Solids	---	---	233	10	213	10	130	10	471	10	123	10	221	10
Total Suspended Solids	---	---	432	4	10.4	4	9.4	4	3.2 B	1.9	185	4	66	4

ug/l = parts per billion. mg/l = parts per million. NA = not analyzed. ND = not detected. WI PAL = Wisconsin preventative action limit.

WI ES = Wisconsin enforcement standard. WI ES standards are not currently available for values denoted with (*). Refer to Table 23 for source of these values.

DL = detection limit. Where detections are listed without qualifiers (i.e., "J", "B", etc.), the DL is the practical quantitative limit; otherwise, the DL is the method detection limit.

Results above the WI ES are shaded and denoted in **bold.**

J (organics) = estimated concentration. Result is less than laboratory reporting limit or qualified for QC exceedance.

J (metals and water quality inorganics) = estimated concentration. Analyte detected in associated laboratory blank.

B (metals and water quality inorganics) = estimated concentration. Result is less than laboratory reporting limit.

Q = elevated reporting limit due to high analyte concentration or interferences.

Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8321A.

Metals were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Methods 6010B, 6020, 7470, or 7471B.

Water quality inorganics were analyzed using the USEPA 600 4-79-020 (with revisions), *Methods for the Chemical Analysis of Water and Wastes,* Methods 353.2, 300.0, 160.1, 160.2, or 310.1.

Table 20 (continued)
October 2001 Groundwater Sampling Event - Summary of Detections
Non-Residential Wells - Intermediate Zone (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

		Sample ID	PZ-12R				PZ-13D		PZ-14D		PZ-14O		PZ-15D	
		Date	10/21/2001		10/22/2001		10/19/2001		10/19/2001		10/19/2001		10/18/2001	
ANALYTE	**WI PAL**	**WI ES**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**
Nitroaromatics & Nitramines (ug/l)														
1,3,5-Trinitrobenzene	110	1,100*	NA	NA	0.26	0.24	ND	0.017	0.21	0.12	0.042 J	0.017	ND	0.017
1-Methyl-2-Nitrobenzene	12.2	61*	NA	NA	0.39	0.24	ND	0.019	0.020 J	0.019	0.035 J	0.019	ND	0.019
1-Methyl-3-Nitrobenzene	24	120*	NA	NA	0.11 J	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019
1-Methyl-4-Nitrobenzene	12.2	61*	NA	NA	0.14 J	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019
2,4,6-Trinitrotoluene	0.22	2.2*	NA	NA	**7.4**	2.4	ND	0.049	ND	0.049	ND	0.049	ND	0.049
2,4-Dinitrotoluene	0.005	0.05	NA	NA	**9.9**	2.4	ND	0.016	**0.074 J**	0.016	**0.071 J**	0.016	**0.4**	0.12
2,6-Dinitrotoluene	0.005	0.05	NA	NA	**32**	6	ND	0.012	**0.39**	0.12	**0.25**	0.12	**0.36**	0.12
2-Amino-4,6-Dinitrotoluene	0.22	2.2*	NA	NA	**7.7**	2.4	ND	0.013	0.055 J	0.013	0.035 J	0.013	0.67	0.12
4-Amino-2,6-Dinitrotoluene	0.22	2.2*	NA	NA	**8.6**	2.4	ND	0.017	0.13	0.12	0.10 J	0.017	**2.3**	0.6
M-Dinitrobenzene	0.1	1*	NA	NA	0.22 J	0.02	ND	0.02	0.026 J	0.02	0.023 J	0.02	ND	0.02
Nitrobenzene	0.7	3.5*	NA	NA	ND	0.05	ND	0.025	ND	0.025	ND	0.025	ND	0.025
RDX	0.06	0.6*	NA	NA	ND	0.056	ND	0.028	ND	0.028	ND	0.028	ND	0.028
Wisconsin Regulated Volatile Organics (ug/l)														
1,1-Dichloroethene	0.7	7	NA	NA	ND	0.2	ND	0.2	ND	0.2	ND	0.2	ND	0.2
1,2,4-Trimethylbenzene	96	480	NA	NA	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22
1,3,5-Trimethylbenzene	96	480	NA	NA	ND	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29
Acetone	200	1,000	NA	NA	ND	1.9	ND	1.9	ND	1.9	ND	1.9	ND	1.9
Benzene	0.5	5	NA	NA	ND	0.21	ND	0.21	ND	0.21	ND	0.21	ND	0.21
Bromodichloromethane	0.06	0.6	NA	NA	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22
Carbon Disulfide	200	1,000	NA	NA	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19
Carbon Tetrachloride	0.5	5	NA	NA	4.6	1	ND	0.19	ND	0.19	ND	0.19	ND	0.19
Chloroform	0.6	6	NA	NA	0.32 J	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23
Ethylbenzene	140	700	NA	NA	ND	0.28	ND	0.28	ND	0.28	ND	0.28	ND	0.28
Hexane	120	600	NA	NA	ND	0.25	ND	0.25	ND	0.25	ND	0.25	ND	0.25
Methyl Chloride	0.3	3	NA	NA	ND	0.3	ND	0.3	ND	0.3	ND	0.3	ND	0.3
Methyl Ethyl Ketone	90	460	NA	NA	ND	0.93	ND	0.93	ND	0.93	ND	0.93	ND	0.93
Methylene Chloride	0.5	5	NA	NA	ND	0.89	ND	0.89	ND	0.89	0.91 J	0.89	ND	0.89
Naphthalene	8	40	NA	NA	ND	0.15	ND	0.15	ND	0.15	ND	0.15	ND	0.15
Tetrachloroethene	0.5	5	NA	NA	ND	0.36	ND	0.36	ND	0.36	ND	0.36	ND	0.36
Toluene	200	1,000	NA	NA	ND	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29
Xylenes (Total)	1,000	10,000	NA	NA	ND	0.95	ND	0.95	ND	0.95	ND	0.95	ND	0.95
Metals (ug/l)														
Antimony	1.2	6	NA	NA	ND	0.23	ND	0.23	1.5 B	0.23	ND	0.23	ND	0.23
Arsenic	5	50	NA	NA	0.22 B	0.19	0.40 B	0.19	0.65 B	0.19	0.40 B	0.19	0.29 B	0.19
Barium	400	2,000	NA	NA	62.4 B	0.64	19.4 B	0.64	49.0 B	0.64	33.7 B	0.64	66.4 B	0.64
Beryllium	0.4	4	NA	NA	ND	0.22	ND	0.22	0.42 B J	0.22	ND	0.22	ND	0.22
Cadmium	0.5	5	NA	NA	0.068 B	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025
Calcium	---	---	NA	NA	78800	5000	16600	5000	66400	5000	63700	5000	45500	5000
Chromium	10	100	NA	NA	ND	0.56	2.4 B J	0.56	3.5 B	0.56	3.5 B J	0.56	1.4 B J	0.56
Copper	130	1,300	NA	NA	2.3 B	0.83	2.3 B	0.83	ND	0.83	1.7 B	0.83	ND	0.83
Iron	150	300	NA	NA	**3230**	100	**1140**	100	**408 J**	5.1	73.0 B	5.1	127	100
Lead	1.5	15	NA	NA	0.28 B	0.2	1.1 B	0.2	0.63 B	0.2	0.20 B	0.2	0.34 B	0.2
Magnesium	---	---	NA	NA	40600	5000	5570	5000	27600	5000	26000	5000	24700	5000
Manganese	25	50	NA	NA	**445**	15	**70**	15	6.4 B	0.38	1.6 B	0.38	8.7 B	0.38
Mercury	0.2	2	NA	NA	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.03
Nickel	20	100	NA	NA	19.5	8	0.78 B	0.17	2.4 B	0.17	ND	0.17	0.36 B	0.17
Potassium	---	---	NA	NA	4180 B	500	2220 B	500	1520 B	500	1180 B	500	1750 B	500
Selenium	10	50	NA	NA	ND	4.5	ND	4.5	ND	4.5	ND	4.5	5.5	5
Sodium	---	---	NA	NA	42500	5000	3890 B	2000	3400 B	2000	3870 B	2000	5310	5000
Thallium	0.4	2	NA	NA	0.030 B	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02
Zinc	2,500	5,000	NA	NA	29	20	14.4 B	6.6	ND	6.6	ND	6.6	ND	6.6
Water Quality Inorganics (mg/l)														
Bromide	---	---	NA	NA	ND	0.079	ND	0.079	ND	0.079	ND	0.079	ND	0.079
Chloride	---	---	NA	NA	8.9 J	0.1	1.2 B	0.1	2.3 B	0.1	2.6 B	0.1	2.4 B	0.1
Nitrate Plus Nitrite (As N)	2	10	NA	NA	7.6	0.1	0.056 B J	0.021	0.43 J	0.021	0.43 J	0.021	0.29 J	0.021
Sulfate	---	---	NA	NA	250 Q	0.1	3.8 B	0.1	11.4	5	11.3	5	19.2	5
Total Dissolved Solids	---	---	NA	NA	609	10	75	10	311	10	291	10	245	10
Total Suspended Solids	---	---	NA	NA	12	4	13.6	4	19.2	4	ND	1.9	4.6	4

ug/l = parts per billion. mg/l = parts per million. NA = not analyzed. ND = not detected. WI PAL = Wisconsin preventative action limit.

WI ES = Wisconsin enforcement standard. WI ES standards are not currently available for values denoted with (*). Refer to Table 23 for source of these values.

DL = detection limit. Where detections are listed without qualifiers (i.e., "J", "B", etc.), the DL is the practical quantitative limit; otherwise, the DL is the method detection limit.

Results above the WI ES are shaded and denoted in **bold.**

J (organics) = estimated concentration. Result is less than laboratory reporting limit or qualified for QC exceedance.

J (metals and water quality inorganics) = estimated concentration. Analyte detected in associated laboratory blank.

B (metals and water quality inorganics) = estimated concentration. Result is less than laboratory reporting limit.

Q = elevated reporting limit due to high analyte concentration or interferences.

Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8321A.

Metals were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Methods 6010B, 6020, 7470, or 7471B.

Water quality inorganics were analyzed using the USEPA 600 4-79-020 (with revisions), *Methods for the Chemical Analysis of Water and Wastes,* Methods 353.2, 300.0, 160.1, 160.2, or 310.1.

Table 20 (continued)
October 2001 Groundwater Sampling Event - Summary of Detections
Non-Residential Wells - Intermediate Zone (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

		Sample ID	PZ-15O		PZ-16O		PZ-16X		PZ-17D		PZ-17O		PZ-18O	
		Date	10/18/2001		10/18/2001		10/18/2001		10/18/2001		10/18/2001		10/24/2001	
ANALYTE	**WI PAL**	**WI ES**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**
Nitroaromatics & Nitramines (ug/l)														
1,3,5-Trinitrobenzene	110	1,100*	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	1.7
1-Methyl-2-Nitrobenzene	12.2	61*	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019	**20000 B**	0.019
1-Methyl-3-Nitrobenzene	24	120*	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019	**120**	12
1-Methyl-4-Nitrobenzene	12.2	61*	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	1.9
2,4,6-Trinitrotoluene	0.22	2.2*	ND	0.049	ND	0.049	ND	0.049	ND	0.049	0.055 J	0.049	ND	4.9
2,4-Dinitrotoluene	0.005	0.05	ND	0.016	0.025 J	0.016	ND	0.016	ND	0.016	ND	0.016	**4.9 J**	0.016
2,6-Dinitrotoluene	0.005	0.05	ND	0.012	**0.21**	0.12	ND	0.012	ND	0.012	**0.22**	0.12	**1.5 J**	0.012
2-Amino-4,6-Dinitrotoluene	0.22	2.2*	ND	0.013	0.051 J	0.013	ND	0.013	ND	0.013	0.55	0.12	ND	1.3
4-Amino-2,6-Dinitrotoluene	0.22	2.2*	ND	0.017	0.21	0.12	ND	0.017	ND	0.017	0.3	0.12	ND	1.7
M-Dinitrobenzene	0.1	1*	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	2
Nitrobenzene	0.7	3.5*	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025	**11 J**	0.025
RDX	0.06	0.6*	ND	0.056	ND	0.028	ND	0.028	ND	0.028	ND	0.028	ND	2.8
Wisconsin Regulated Volatile Organics (ug/l)														
1,1-Dichloroethene	0.7	7	ND	0.2	ND	0.2	ND	0.2	ND	0.2	ND	0.2	ND	0.2
1,2,4-Trimethylbenzene	96	480	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22	0.92 J	0.22
1,3,5-Trimethylbenzene	96	480	ND	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29	0.34 J	0.29
Acetone	200	1,000	6.9 J	1.9	ND	1.9	ND	1.9	ND	1.9	ND	1.9	ND	1.9
Benzene	0.5	5	ND	0.21	ND	0.21	ND	0.21	ND	0.21	ND	0.21	ND	0.21
Bromodichloromethane	0.06	0.6	ND	0.22	ND	0.22	**1.1**	1	ND	0.22	ND	0.22	ND	0.22
Carbon Disulfide	200	1,000	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19
Carbon Tetrachloride	0.5	5	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19
Chloroform	0.6	6	ND	0.23	ND	0.23	4.8	1	ND	0.23	ND	0.23	ND	0.23
Ethylbenzene	140	700	ND	0.28	ND	0.28	ND	0.28	ND	0.28	ND	0.28	0.37 J	0.28
Hexane	120	600	1.1	1	ND	0.25	ND	0.25	ND	0.25	ND	0.25	ND	0.25
Methyl Chloride	0.3	3	2.9	2	ND	0.3	ND	0.3	ND	0.3	ND	0.3	ND	0.3
Methyl Ethyl Ketone	90	460	ND	0.93	ND	0.93	ND	0.93	ND	0.93	ND	0.93	ND	0.93
Methylene Chloride	0.5	5	1.1	1	ND	0.89	ND	0.89	ND	0.89	ND	0.89	ND	0.89
Naphthalene	8	40	0.16 J B	0.15	ND	0.15	ND	0.15	ND	0.15	ND	0.15	0.65 J	0.15
Tetrachloroethene	0.5	5	ND	0.36	ND	0.36	ND	0.36	ND	0.36	ND	0.36	ND	0.36
Toluene	200	1,000	0.39 J	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29	6.4	1
Xylenes (Total)	1,000	10,000	ND	0.95	ND	0.95	ND	0.95	ND	0.95	ND	0.95	2.2	2
Metals (ug/l)														
Antimony	1.2	6	ND	0.23	0.49 B	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23
Arsenic	5	50	1.2	1	0.34 B	0.19	0.97 B	0.19	0.63 B	0.19	1.5	1	3.4	1
Barium	400	2,000	157 B	0.64	53.2 B	0.64	27.4 B	0.64	60.7 B	0.64	148 B	0.64	307	200
Beryllium	0.4	4	0.32 B	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22	3.7 B	0.22
Cadmium	0.5	5	0.092 B J	0.025	0.032 B J	0.025	ND	0.025	ND	0.025	0.030 B J	0.025	0.17 B	0.025
Calcium	---	---	56100	5000	54800	5000	24800	5000	26900	5000	48900	5000	102000	5000
Chromium	10	100	58.1 J	0.56	1.4 B J	0.56	1.3 B J	0.56	1.8 B J	0.56	2.6 B J	0.56	41.7	10
Copper	130	1,300	10.9 B	0.83	1.8 B	0.83	ND	0.83	ND	0.83	1.6 B	0.83	39.8 J	0.83
Iron	150	300	**8060**	100	116	100	103	100	**449**	100	**816**	100	**22300 J**	5.1
Lead	1.5	15	2.9	1.3	0.31 B	0.2	0.34 B	0.2	1.5	1.3	0.33 B	0.2	6.7	1.3
Magnesium	---	---	25700	5000	21000	5000	10100	5000	12900	5000	29800	5000	41100	5000
Manganese	25	50	**1030**	15	**117**	15	**185**	15	**228**	15	**1030**	15	**513 J**	0.38
Mercury	0.2	2	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.03	0.034 B	0.2
Nickel	20	100	34.1	8	3.6 B	0.17	0.73 B	0.17	0.77 B	0.17	3.0 B	0.17	36.1	8
Potassium	---	---	35200	500	2300 B	500	2370 B	500	1930 B	500	2890 B	500	5830	500
Selenium	10	50	ND	4.5	ND	4.5	ND	4.5	ND	4.5	ND	4.5	ND	4.5
Sodium	---	---	11600	5000	7540	5000	6580	5000	4810 B	2000	22800	5000	13300	5000
Thallium	0.4	2	0.094 B	0.02	ND	0.02	ND	0.02	ND	0.02	0.036 B	0.02	0.22 B	0.02
Zinc	2,500	5,000	17.0 B	6.6	7.2 B	6.6	ND	6.6	ND	6.6	ND	6.6	164	20
Water Quality Inorganics (mg/l)														
Bromide	---	---	0.130 B	0.079	ND	0.079	ND	0.079	ND	0.079	ND	0.079	ND	0.079
Chloride	---	---	10.2	3	2.6 B	0.1	2.1 B	0.1	1.4 B	0.1	3	3	4.8	3
Nitrate Plus Nitrite (As N)	2	10	0.069 B J	0.021	0.28 J	0.021	0.11 J	0.021	0.043 B J	0.021	0.59 J	0.021	**20.4 Q**	0.021
Sulfate	---	---	19.5	5	27.4	5	6.2	5	4.8 B	0.1	100 Q	0.1	35.8	5
Total Dissolved Solids	---	---	382 G	4.8	268	10	135	10	152	10	399	10	796 G	4.8
Total Suspended Solids	---	---	1430 Q	1.9	8.2	4	3.0 B	1.9	54	4	39.2	4	427 Q	1.9

ug/l = parts per billion. mg/l = parts per million. NA = not analyzed. ND = not detected. WI PAL = Wisconsin preventative action limit.

WI ES = Wisconsin enforcement standard. WI ES standards are not currently available for values denoted with (*). Refer to Table 23 for source of these values.

DL = detection limit. Where detections are listed without qualifiers (i.e., "J", "B", etc.), the DL is the practical quantitative limit; otherwise, the DL is the method detection limit.

Results above the WI ES are shaded and denoted in **bold.**

J (organics) = estimated concentration. Result is less than laboratory reporting limit or qualified for QC exceedance.

J (metals and water quality inorganics) = estimated concentration. Analyte detected in associated laboratory blank.

B (organics) = estimated concentration. Analyte detected in associated laboratory blank.

B (metals and water quality inorganics) = estimated concentration. Result is less than laboratory reporting limit.

G = elevated reporting limit due to matrix interferences.

Q = elevated reporting limit due to high analyte concentration or interferences.

Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8321A.

Metals were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Methods 6010B, 6020, 7470, or 7471B.

Water quality inorganics were analyzed using the USEPA 600 4-79-020 (with revisions), *Methods for the Chemical Analysis of Water and Wastes,* Methods 353.2, 300.0, 160.1, 160.2, or 310.1.

Table 20 (continued)
October 2001 Groundwater Sampling Event - Summary of Detections
Non-Residential Wells - Intermediate Zone (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

		Sample ID	PZ-19D				PZ-19D Duplicate				PZ-20D		PZ-20D Duplicate	
		Date	10/23/2001		11/6/2001		10/23/2001		11/6/2001		10/17/2001		10/17/2001	
ANALYTE	**WI PAL**	**WI ES**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**
Nitroaromatics & Nitramines (ug/l)														
1,3,5-Trinitrobenzene	110	1,100*	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017
1-Methyl-2-Nitrobenzene	12.2	61*	0.024 J B	0.019	ND	0.019	0.048 J B	0.019	ND	0.019	ND	0.019	ND	0.019
1-Methyl-3-Nitrobenzene	24	120*	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019
1-Methyl-4-Nitrobenzene	12.2	61*	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019
2,4,6-Trinitrotoluene	0.22	2.2*	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049
2,4-Dinitrotoluene	0.005	0.05	ND	0.016	ND	0.016	ND	0.016	ND	0.016	ND	0.016	ND	0.016
2,6-Dinitrotoluene	0.005	0.05	ND	0.012	ND	0.012	ND	0.012	ND	0.012	ND	0.012	ND	0.012
2-Amino-4,6-Dinitrotoluene	0.22	2.2*	ND	0.013	ND	0.013	ND	0.013	ND	0.013	ND	0.013	ND	0.013
4-Amino-2,6-Dinitrotoluene	0.22	2.2*	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017
M-Dinitrobenzene	0.1	1*	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02
Nitrobenzene	0.7	3.5*	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025
RDX	0.06	0.6*	ND	0.028	ND	0.028	ND	0.028	ND	0.028	ND	0.028	ND	0.028
Wisconsin Regulated Volatile Organics (ug/l)														
1,1-Dichloroethene	0.7	7	ND	0.2	ND	0.2	NA	NA	NA	NA	ND	0.2	ND	0.2
1,2,4-Trimethylbenzene	96	480	ND	0.22	NA	NA	ND	0.22	NA	NA	ND	0.22	ND	0.22
1,3,5-Trimethylbenzene	96	480	ND	0.29	NA	NA	ND	0.29	NA	NA	ND	0.29	ND	0.29
Acetone	200	1,000	ND	1.9	ND	1.9	NA	NA	NA	NA	ND	1.9	ND	1.9
Benzene	0.5	5	ND	0.21	ND	0.21	NA	NA	NA	NA	ND	0.21	ND	0.21
Bromodichloromethane	0.06	0.6	ND	0.22	NA	NA	ND	0.22	NA	NA	ND	0.22	ND	0.22
Carbon Disulfide	200	1,000	0.26 J	0.19	NA	NA	0.78 J	0.19	NA	NA	ND	0.19	ND	0.19
Carbon Tetrachloride	0.5	5	ND	0.19	ND	0.19	NA	NA	NA	NA	ND	0.19	ND	0.19
Chloroform	0.6	6	0.31 J	0.23	NA	NA	0.35 J	0.23	NA	NA	ND	0.23	ND	0.23
Ethylbenzene	140	700	ND	0.28	NA	NA	ND	0.28	NA	NA	ND	0.28	ND	0.28
Hexane	120	600	ND	0.25	ND	0.25	NA	NA	NA	NA	ND	0.25	ND	0.25
Methyl Chloride	0.3	3	ND	0.3	ND	0.3	NA	NA	NA	NA	ND	0.3	ND	0.3
Methyl Ethyl Ketone	90	460	ND	0.93	ND	0.93	NA	NA	NA	NA	ND	0.93	ND	0.93
Methylene Chloride	0.5	5	ND	0.89	ND	0.89	NA	NA	NA	NA	ND	0.89	ND	0.89
Naphthalene	8	40	ND	0.15	NA	NA	ND	0.15	NA	NA	ND	0.15	ND	0.15
Tetrachloroethene	0.5	5	ND	0.36	ND	0.36	NA	NA	NA	NA	ND	0.36	ND	0.36
Toluene	200	1,000	ND	0.29	NA	NA	ND	0.29	NA	NA	ND	0.29	ND	0.29
Xylenes (Total)	1,000	10,000	ND	0.95	NA	NA	ND	0.95	NA	NA	ND	0.95	ND	0.95
Metals (ug/l)														
Antimony	1.2	6	0.43 B	0.23	NA	NA	ND	0.23	NA	NA	ND	0.23	ND	0.23
Arsenic	5	50	0.47 B	0.19	NA	NA	0.58 B	0.19	NA	NA	0.77 B	0.19	0.74 B	0.19
Barium	400	2,000	76.9 B	0.64	NA	NA	ND	0.64	NA	NA	20.7 B	0.64	21.3 B	0.64
Beryllium	0.4	4	ND	0.22	NA	NA	ND	0.22	NA	NA	ND	0.22	ND	0.22
Cadmium	0.5	5	ND	0.025	NA	NA	ND	0.025	NA	NA	ND	0.025	ND	0.025
Calcium	---	---	64900	5000	NA	NA	65100	5000	NA	NA	16200	5000	16200	5000
Chromium	10	100	1.4 B	0.56	NA	NA	ND	0.56	NA	NA	2.0 B	0.56	ND	0.56
Copper	130	1,300	4.2 B J	0.83	NA	NA	ND	0.83	NA	NA	2.2 B	0.83	3.0 B	0.83
Iron	150	300	**750 J**	5.1	NA	NA	**674 J**	5.1	NA	NA	**504**	100	**596**	100
Lead	1.5	15	0.21 B	0.2	NA	NA	ND	0.2	NA	NA	0.51 B	0.2	0.69 B	0.2
Magnesium	---	---	26100	5000	NA	NA	26300	5000	NA	NA	6150	5000	6130	5000
Manganese	25	50	13.4 B J	0.38	NA	NA	ND	0.38	NA	NA	**150**	15	**151**	15
Mercury	0.2	2	ND	0.03	NA	NA	ND	0.03	NA	NA	ND	0.03	ND	0.03
Nickel	20	100	3.4 B	0.17	NA	NA	3.5 B	0.17	NA	NA	1.1 B	0.17	1.1 B	0.17
Potassium	---	---	1670 B	500	NA	NA	1530 B	500	NA	NA	2070 B	500	1940 B	500
Selenium	10	50	ND	4.5	ND	4.5	NA	NA	NA	NA	ND	4.5	ND	4.5
Sodium	---	---	9030	5000	NA	NA	9060	5000	NA	NA	4210 B	2000	4590 B	2000
Thallium	0.4	2	ND	0.02	NA	NA	ND	0.02	NA	NA	ND	0.02	ND	0.02
Zinc	2,500	5,000	ND	6.6	NA	NA	ND	6.6	NA	NA	6.9 B	6.6	10.7 B	6.6
Water Quality Inorganics (mg/l)														
Bromide	---	---	ND	0.079	ND	0.079	NA	NA	NA	NA	ND	0.079	ND	0.079
Chloride	---	---	3.3	3	NA	NA	3.2	3	NA	NA	1.3 B J	0.1	1.2 B J	0.1
Nitrate Plus Nitrite (As N)	2	10	0.58	0.1	NA	NA	0.58	0.1	NA	NA	ND	0.021	0.022 B	0.021
Sulfate	---	---	28.3	5	NA	NA	29.1	5	NA	NA	4.0 B	5	3.9 B	0.1
Total Dissolved Solids	---	---	309	10	NA	NA	304	10	NA	NA	91	10	91	10
Total Suspended Solids	---	---	8.8	4	NA	NA	6.4	4	NA	NA	9.4	4	8.8	4

ug/l = parts per billion. mg/l = parts per million. NA = not analyzed. ND = not detected. WI PAL = Wisconsin preventative action limit.

WI ES = Wisconsin enforcement standard. WI ES standards are not currently available for values denoted with (*). Refer to Table 23 for source of these values.

DL = detection limit. Where detections are listed without qualifiers (i.e., "J", "B", etc.), the DL is the practical quantitative limit; otherwise, the DL is the method detection limit.

Results above the WI ES are shaded and denoted in **bold.**

J (organics) = estimated concentration. Result is less than laboratory reporting limit or qualified for QC exceedance.

J (metals and water quality inorganics) = estimated concentration. Analyte detected in associated laboratory blank.

B (organics) = estimated concentration. Analyte detected in associated laboratory blank.

B (metals and water quality inorganics) = estimated concentration. Result is less than laboratory reporting limit.

Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8321A.

Metals were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Methods 6010B, 6020, 7470, or 7471B.

Water quality inorganics were analyzed using the USEPA 600 4-79-020 (with revisions), *Methods for the Chemical Analysis of Water and Wastes,* Methods 353.2, 300.0, 160.1, 160.2, or 310.1.

Table 20 (continued)
October 2001 Groundwater Sampling Event - Summary of Detections
Non-Residential Wells - Intermediate Zone (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

		Sample ID	PZ-21D		PZ-22D		PZ-22O		PZ-23D		PZ-23O		PZ-24D	
		Date	10/19/2001		10/19/2001		10/19/2001		10/21/2001		10/21/2001		10/21/2001	
ANALYTE	**WI PAL**	**WI ES**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**
Nitroaromatics & Nitramines (ug/l)														
1,3,5-Trinitrobenzene	110	1,100*	ND	0.017	ND	0.017	0.028 J	0.017	ND	0.017	ND	0.017	ND	0.017
1-Methyl-2-Nitrobenzene	12.2	61*	0.021 J	0.019	ND	0.019	ND	0.019	ND	0.019	0.021 J	0.019	ND	0.019
1-Methyl-3-Nitrobenzene	24	120*	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019
1-Methyl-4-Nitrobenzene	12.2	61*	ND	0.019	ND	0.019	0.027 J	0.019	ND	0.019	ND	0.019	ND	0.019
2,4,6-Trinitrotoluene	0.22	2.2*	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049
2,4-Dinitrotoluene	0.005	0.05	ND	0.016	ND	0.016	**0.052 J**	0.016	ND	0.016	ND	0.016	ND	0.016
2,6-Dinitrotoluene	0.005	0.05	**1.3**	0.12	0.014 J	0.012	**0.11 J**	0.012	**0.070 J**	0.012	**0.12**	0.12	ND	0.012
2-Amino-4,6-Dinitrotoluene	0.22	2.2*	ND	0.013	ND	0.013	0.069 J	0.013	0.025 J	0.013	0.048 J	0.013	ND	0.013
4-Amino-2,6-Dinitrotoluene	0.22	2.2*	0.032 J	0.017	0.022 J	0.017	0.13	0.12	0.11 J	0.017	0.12	0.12	ND	0.017
M-Dinitrobenzene	0.1	1*	0.022 J	0.02	ND	0.02	0.024 J	0.02	ND	0.02	ND	0.02	ND	0.02
Nitrobenzene	0.7	3.5*	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025
RDX	0.06	0.6*	ND	0.028	ND	0.028	ND	0.028	ND	0.028	ND	0.028	ND	0.028
Wisconsin Regulated Volatile Organics (ug/l)														
1,1-Dichloroethene	0.7	7	ND	0.2	ND	0.2	ND	0.2	ND	0.2	ND	0.2	ND	0.2
1,2,4-Trimethylbenzene	96	480	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22
1,3,5-Trimethylbenzene	96	480	ND	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29
Acetone	200	1,000	ND	1.9	ND	1.9	ND	1.9	ND	1.9	ND	1.9	ND	1.9
Benzene	0.5	5	ND	0.21	ND	0.21	ND	0.21	ND	0.21	ND	0.21	ND	0.21
Bromodichloromethane	0.06	0.6	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22
Carbon Disulfide	200	1,000	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19
Carbon Tetrachloride	0.5	5	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19
Chloroform	0.6	6	ND	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23
Ethylbenzene	140	700	ND	0.28	ND	0.28	ND	0.28	ND	0.28	ND	0.28	ND	0.28
Hexane	120	600	ND	0.25	ND	0.25	ND	0.25	ND	0.25	ND	0.25	ND	0.25
Methyl Chloride	0.3	3	ND	0.3	ND	0.3	ND	0.3	ND	0.3	ND	0.3	ND	0.3
Methyl Ethyl Ketone	90	460	ND	0.93	ND	0.93	ND	0.93	ND	0.93	2.4 J	0.93	ND	0.93
Methylene Chloride	0.5	5	ND	0.89	ND	0.89	ND	0.89	ND	0.89	ND	0.89	ND	0.89
Naphthalene	8	40	ND	0.15	ND	0.15	ND	0.15	0.16 J	0.15	ND	0.15	ND	0.15
Tetrachloroethene	0.5	5	ND	0.36	ND	0.36	ND	0.36	ND	0.36	ND	0.36	ND	0.36
Toluene	200	1,000	ND	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29
Xylenes (Total)	1,000	10,000	ND	0.95	ND	0.95	ND	0.95	ND	0.95	ND	0.95	ND	0.95
Metals (ug/l)														
Antimony	1.2	6	ND	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23
Arsenic	5	50	1	1	1.5	1	1.2	1	1.1	1	0.43 B	0.19	1.1	1
Barium	400	2,000	80.4 B	0.64	101 B	0.64	74.0 B	0.64	145 B	0.64	73.9 B	0.64	136 B	0.64
Beryllium	0.4	4	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22
Cadmium	0.5	5	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025
Calcium	---	---	59900	5000	62700	5000	56200	5000	52400	5000	67000	5000	56900	5000
Chromium	10	100	3.8 B J	0.56	2.2 B J	0.56	3.3 B J	0.56	ND	0.56	ND	0.56	ND	0.56
Copper	130	1,300	1.6 B	0.83	2.0 B	0.83	ND	0.83	2.5 B	0.83	ND	0.83	ND	0.83
Iron	150	300	85.4 B	5.1	**1220**	100	133	100	252	100	110	100	37.6 B	5.1
Lead	1.5	15	0.22 B	0.2	0.70 B	0.2	0.43 B	0.2	0.26 B	0.2	ND	0.2	ND	0.2
Magnesium	---	---	32200	5000	35700	5000	35300	5000	29500	5000	27900	5000	46400	5000
Manganese	25	50	15	15	**212**	15	33.8	15	**430**	15	33.7	15	29.1	15
Mercury	0.2	2	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.03
Nickel	20	100	0.39 B	0.17	1.2 B	0.17	1.2 B	0.17	3.8 B	0.17	3.8 B	0.17	1.7 B	0.17
Potassium	---	---	2080 B	500	3220 B	500	2370 B	500	2860 B	500	1660 B	500	2990 B	500
Selenium	10	50	ND	4.5	ND	4.5	ND	4.5	ND	4.5	ND	4.5	ND	4.5
Sodium	---	---	6280	5000	8370	5000	7270	5000	7030	5000	5460	5000	12900	5000
Thallium	0.4	2	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02
Zinc	2,500	5,000	ND	6.6	ND	6.6	ND	6.6	ND	6.6	ND	6.6	ND	6.6
Water Quality Inorganics (mg/l)														
Bromide	---	---	ND	0.079	ND	0.079	ND	0.079	ND	0.079	ND	0.079	ND	0.079
Chloride	---	---	2.8 B	0.1	2.1 B	0.1	2.7 B	0.1	1.6 B J	0.1	2.2 B J	0.1	1.8 B J	0.1
Nitrate Plus Nitrite (As N)	2	10	0.21 J	0.021	0.060 B J	0.021	0.34 J	0.021	0.066 B	0.021	0.18	0.1	0.048 B	0.021
Sulfate	---	---	55.7 Q	0.1	47.7	5	29.1	5	20.3	5	30.1	5	56.8 Q	0.1
Total Dissolved Solids	---	---	332	10	348	10	326	10	282	10	317	10	375	10
Total Suspended Solids	---	---	ND	1.9	33.6	4	ND	1.9	12	4	5	4	2.0 B	1.9

ug/l = parts per billion. mg/l = parts per million. NA = not analyzed. ND = not detected. WI PAL = Wisconsin preventative action limit.

WI ES = Wisconsin enforcement standard. WI ES standards are not currently available for values denoted with (*). Refer to Table 23 for source of these values.

DL = detection limit. Where detections are listed without qualifiers (i.e., "J", "B", etc.), the DL is the practical quantitative limit; otherwise, the DL is the method detection limit.

Results above the WI ES are shaded and denoted in **bold.**

J (organics) = estimated concentration. Result is less than laboratory reporting limit or qualified for QC exceedance.

J (metals and water quality inorganics) = estimated concentration. Analyte detected in associated laboratory blank.

B (metals and water quality inorganics) = estimated concentration. Result is less than laboratory reporting limit.

Q = elevated reporting limit due to high analyte concentration or interferences.

Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8321A.

Metals were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Methods 6010B, 6020, 7470, or 7471B.

Water quality inorganics were analyzed using the USEPA 600 4-79-020 (with revisions), *Methods for the Chemical Analysis of Water and Wastes*, Methods 353.2, 300.0, 160.1, 160.2, or 310.1.

Table 20 (continued)
October 2001 Groundwater Sampling Event - Summary of Detections
Non-Residential Wells - Intermediate Zone (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

		Sample ID	PZ-24O		PZ-26D		PZ-27O		PZ-28O		PZ-29D		PZ-29X	
		Date	10/21/2001		10/20/2001		10/24/2001		10/22/2001		10/18/2001		10/18/2001	
ANALYTE	**WI PAL**	**WI ES**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**
Nitroaromatics & Nitramines (ug/l)														
1,3,5-Trinitrobenzene	110	1,100*	ND	0.017	ND	0.017	ND	0.017	0.077 J	0.017	ND	0.017	ND	0.017
1-Methyl-2-Nitrobenzene	12.2	61*	ND	0.019	ND	0.019	0.029 J B	0.019	0.20 B	0.019	ND	0.019	ND	0.019
1-Methyl-3-Nitrobenzene	24	120*	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019
1-Methyl-4-Nitrobenzene	12.2	61*	ND	0.019	ND	0.019	ND	0.019	0.057 J	0.019	ND	0.019	ND	0.019
2,4,6-Trinitrotoluene	0.22	2.2*	ND	0.049	ND	0.049	ND	0.049	0.16	0.12	ND	0.049	ND	0.049
2,4-Dinitrotoluene	0.005	0.05	ND	0.016	ND	0.016	**0.32**	0.12	**8.6**	1.2	ND	0.016	ND	0.016
2,6-Dinitrotoluene	0.005	0.05	ND	0.012	ND	0.012	**0.27**	0.12	**0.57**	0.12	ND	0.012	ND	0.012
2-Amino-4,6-Dinitrotoluene	0.22	2.2*	ND	0.013	ND	0.013	0.47	0.12	1.5	1.2	ND	0.013	ND	0.013
4-Amino-2,6-Dinitrotoluene	0.22	2.2*	ND	0.017	ND	0.017	0.53	0.12	1.4	1.2	ND	0.017	ND	0.017
M-Dinitrobenzene	0.1	1*	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02
Nitrobenzene	0.7	3.5*	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025
RDX	0.06	0.6*	ND	0.028	ND	0.028	ND	0.028	ND	0.028	ND	0.028	ND	0.028
Wisconsin Regulated Volatile Organics (ug/l)														
1,1-Dichloroethene	0.7	7	ND	0.2	ND	0.2	ND	0.2	ND	0.2	ND	0.2	ND	0.2
1,2,4-Trimethylbenzene	96	480	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22
1,3,5-Trimethylbenzene	96	480	ND	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29
Acetone	200	1,000	ND	1.9	ND	1.9	ND	1.9	ND	1.9	ND	1.9	ND	1.9
Benzene	0.5	5	ND	0.21	ND	0.21	ND	0.21	ND	0.21	ND	0.21	ND	0.21
Bromodichloromethane	0.06	0.6	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22
Carbon Disulfide	200	1,000	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19	0.84 J	0.19
Carbon Tetrachloride	0.5	5	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19
Chloroform	0.6	6	ND	0.23	ND	0.23	0.47 J	0.23	ND	0.23	ND	0.23	ND	0.23
Ethylbenzene	140	700	ND	0.28	ND	0.28	ND	0.28	ND	0.28	ND	0.28	ND	0.28
Hexane	120	600	ND	0.25	ND	0.25	ND	0.25	ND	0.25	ND	0.25	ND	0.25
Methyl Chloride	0.3	3	ND	0.3	ND	0.3	ND	0.3	ND	0.3	ND	0.3	ND	0.3
Methyl Ethyl Ketone	90	460	ND	0.93	ND	0.93	ND	0.93	ND	0.93	ND	0.93	ND	0.93
Methylene Chloride	0.5	5	ND	0.89	ND	0.89	ND	0.89	ND	0.89	ND	0.89	ND	0.89
Naphthalene	8	40	ND	0.15	ND	0.15	ND	0.15	ND	0.15	ND	0.15	ND	0.15
Tetrachloroethene	0.5	5	ND	0.36	ND	0.36	ND	0.36	ND	0.36	ND	0.36	ND	0.36
Toluene	200	1,000	ND	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29
Xylenes (Total)	1,000	10,000	ND	0.95	ND	0.95	ND	0.95	ND	0.95	ND	0.95	ND	0.95
Metals (ug/l)														
Antimony	1.2	6	ND	0.23	1.4 B	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23
Arsenic	5	50	1.9	1	0.64 B	0.19	0.20 B	0.19	0.45 B	0.19	0.50 B	0.19	2.5	1
Barium	400	2,000	242	200	20.7 B	0.64	120 B	0.64	78.5 B	0.64	65.9 B	0.64	36.8 B	0.64
Beryllium	0.4	4	1.2 B	0.22	ND	0.22	ND	0.22	ND	0.22	1.1 B	0.22	0.64 B	0.22
Cadmium	0.5	5	0.097 B	0.025	ND	0.025	0.034 B	0.025	0.046 B	0.025	0.025 B	0.025	0.036 B	0.025
Calcium	---	---	89200	5000	21500	5000	101000	5000	139000	5000	57000	5000	20400	5000
Chromium	10	100	53.4	10	ND	0.56	1.1 B	0.56	3.3 B	0.56	1.0 B	0.56	14.2	10
Copper	130	1,300	19.5 B	0.83	ND	0.83	3.2 B J	0.83	5.8 B J	0.83	2.4 B	0.83	4.9 B	0.83
Iron	150	300	**19500**	100	168	100	**698 J**	5.1	**3600 J**	5.1	**1940**	100	**2380**	100
Lead	1.5	15	5.1	1.3	ND	0.2	0.26 B	0.2	0.74 B	0.2	0.71 B	0.2	0.80 B	0.2
Magnesium	---	---	47100	5000	8490	5000	35700	5000	58400	5000	20100	5000	8110	5000
Manganese	25	50	**1390**	15	6.2 B	0.38	**280 J**	0.38	**289 J**	0.38	**413**	15	**211**	15
Mercury	0.2	2	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.03
Nickel	20	100	28.6	8	0.69 B	0.17	7.0 B	0.17	7.2 B	0.17	5.7 B	0.17	6.0 B	0.17
Potassium	---	---	18500	5000	1170 B	500	4810 B	500	2190 B	500	3320 B	500	2240 B	500
Selenium	10	50	ND	4.5	ND	4.5	ND	4.5	ND	4.5	4.8 B	4.5	ND	4.5
Sodium	---	---	10300	5000	2560 B	2000	13300	5000	28100	5000	5890	5000	4650 B	2000
Thallium	0.4	2	0.21 B	0.02	ND	0.02	0.038 B	0.02	0.046 B	0.02	0.032 B	0.02	ND	0.02
Zinc	2,500	5,000	21.5	20	ND	6.6	18.6 B	6.6	ND	6.6	18.2 B	6.6	9.1 B	6.6
Water Quality Inorganics (mg/l)														
Bromide	---	---	ND	0.079	ND	0.079	ND	0.079	0.14 B	0.2	ND	0.079	ND	0.079
Chloride	---	---	2.5 B J	0.1	1.1 B J	0.1	3.6	3	16.7	3	3.8 J	0.1	1.4 B J	0.1
Nitrate Plus Nitrite (As N)	2	10	0.12	0.1	0.098 B	0.021	**29.9 Q**	0.021	**20.6 Q**	0.021	0.18	0.1	0.11	0.1
Sulfate	---	---	48.5 Q	0.1	3.3 B	0.1	55.9 Q	0.1	147 Q	0.1	14.2	5	4.0 B	0.1
Total Dissolved Solids	---	---	474 G	4.8	113	10	526	10	799	10	290	10	120	10
Total Suspended Solids	---	---	1150 Q	1.9	6.6	4	21.2	4	58	4	79.6	4	42.4	4

ug/l = parts per billion. mg/l = parts per million. NA = not analyzed. ND = not detected. WI PAL = Wisconsin preventative action limit.

WI PAL = Wisconsin preventative action limit.

WI ES = Wisconsin enforcement standard. WI ES standards are not currently available for values denoted with (*). Refer to Table 23 for source of these values.

DL = detection limit. Where detections are listed without qualifiers (i.e., "J", "B", etc.), the DL is the practical quantitative limit; otherwise, the DL is the method detection limit.

Results above the WI ES are shaded and denoted in **bold.**

J (organics) = estimated concentration. Result is less than laboratory reporting limit or qualified for QC exceedance.

J (metals and water quality inorganics) = estimated concentration. Analyte detected in associated laboratory blank.

B (organics) = estimated concentration. Analyte detected in associated laboratory blank.

B (metals and water quality inorganics) = estimated concentration. Result is less than laboratory reporting limit.

Q = elevated reporting limit due to high analyte concentration or interferences.

G = elevated reporting limit due to matrix interferences.

Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8321A.

Metals were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Methods 6010B, 6020, 7470, or 7471B.

Water quality inorganics were analyzed using the USEPA 600 4-79-020 (with revisions), *Methods for the Chemical Analysis of Water and Wastes,* Methods 353.2, 300.0, 160.1, 160.2, or 310.1.

Table 20 (continued)
October 2001 Groundwater Sampling Event - Summary of Detections
Non-Residential Wells - Intermediate Zone (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

		Sample ID	PZ-30D		PZ-30O		PZ-31D		PZ-31D Duplicate		PZ-31O		PZ-32D	
		Date	10/20/2001		10/20/2001		10/20/2001		10/20/2001		10/20/2001		10/21/2001	
ANALYTE	**WI PAL**	**WI ES**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**
Nitroaromatics & Nitramines (ug/l)														
1,3,5-Trinitrobenzene	110	1,100*	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017
1-Methyl-2-Nitrobenzene	12.2	61*	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019	0.13	0.12
1-Methyl-3-Nitrobenzene	24	120*	ND	0.019	ND	0.019	ND	0.019	0.019 J	0.019	ND	0.019	ND	0.019
1-Methyl-4-Nitrobenzene	12.2	61*	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019
2,4,6-Trinitrotoluene	0.22	2.2*	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049
2,4-Dinitrotoluene	0.005	0.05	0.020 J	0.016	ND	0.016	**0.28**	0.12	**0.27**	0.12	**0.17**	0.12	**0.078 J**	0.12
2,6-Dinitrotoluene	0.005	0.05	**0.21**	0.12	ND	0.012	**3.8**	0.6	**5.1**	0.6	**1.4**	0.12	**0.13**	0.12
2-Amino-4,6-Dinitrotoluene	0.22	2.2*	ND	0.013	ND	0.013	0.041 J	0.013	0.057 J	0.013	0.036 J	0.013	ND	0.013
4-Amino-2,6-Dinitrotoluene	0.22	2.2*	ND	0.017	ND	0.017	0.075 J	0.017	0.090 J	0.017	0.058 J	0.017	ND	0.017
M-Dinitrobenzene	0.1	1*	ND	0.02	ND	0.02	0.033 J	0.02	0.044 J	0.02	0.028 J	0.02	ND	0.02
Nitrobenzene	0.7	3.5*	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025
RDX	0.06	0.6*	ND	0.028	ND	0.028	ND	0.028	ND	0.028	ND	0.028	ND	0.028
Wisconsin Regulated Volatile Organics (ug/l)														
1,1-Dichloroethene	0.7	7	ND	0.2	ND	0.2	ND	0.2	ND	0.2	ND	0.2	ND	0.2
1,2,4-Trimethylbenzene	96	480	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22
1,3,5-Trimethylbenzene	96	480	ND	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29
Acetone	200	1,000	ND	1.9	ND	1.9	ND	1.9	ND	1.9	ND	1.9	ND	1.9
Benzene	0.5	5	ND	0.21	ND	0.21	ND	0.21	ND	0.21	ND	0.21	ND	0.21
Bromodichloromethane	0.06	0.6	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22
Carbon Disulfide	200	1,000	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19
Carbon Tetrachloride	0.5	5	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19
Chloroform	0.6	6	ND	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23
Ethylbenzene	140	700	ND	0.28	ND	0.28	ND	0.28	ND	0.28	ND	0.28	ND	0.28
Hexane	120	600	ND	0.25	ND	0.25	ND	0.25	ND	0.25	ND	0.25	ND	0.25
Methyl Chloride	0.3	3	ND	0.3	ND	0.3	ND	0.3	ND	0.3	ND	0.3	ND	0.3
Methyl Ethyl Ketone	90	460	ND	0.93	ND	0.93	ND	0.93	ND	0.93	ND	0.93	ND	0.93
Methylene Chloride	0.5	5	ND	0.89	ND	0.89	ND	0.89	ND	0.89	ND	0.89	ND	0.89
Naphthalene	8	40	ND	0.15	ND	0.15	ND	0.15	ND	0.15	ND	0.15	ND	0.15
Tetrachloroethene	0.5	5	ND	0.36	ND	0.36	ND	0.36	ND	0.36	ND	0.36	ND	0.36
Toluene	200	1,000	ND	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29
Xylenes (Total)	1,000	10,000	ND	0.95	ND	0.95	ND	0.95	ND	0.95	ND	0.95	ND	0.95
Metals (ug/l)														
Antimony	1.2	6	ND	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23
Arsenic	5	50	1.7	1	0.37 B	0.19	0.27 B	0.19	0.24 B	0.19	2.3	1	0.78 B	0.19
Barium	400	2,000	143 B	0.64	54.3 B	0.64	84.7 B	0.64	83.9 B	0.64	67.0 B	0.64	68.4 B	0.64
Beryllium	0.4	4	**4.0 B J**	0.22	0.73 B J	0.22	0.48 B J	0.22	0.56 B J	0.22	1.4 B J	0.22	ND	0.22
Cadmium	0.5	5	0.060 B	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025
Calcium	---	---	34300	5000	55400	5000	49100	5000	48500	5000	39300	5000	31500	5000
Chromium	10	100	19.7	10	3.7 B	0.56	1.5 B	0.56	1.8 B	0.56	5.9 B	0.56	ND	0.56
Copper	130	1,300	12.9 B	0.83	ND	0.83	ND	0.83	ND	0.83	ND	0.83	ND	0.83
Iron	150	300	**21200 J**	5.1	**2020 J**	5.1	**542 J**	5.1	**463 J**	5.1	**4620 J**	5.1	125	100
Lead	1.5	15	4.1	1.3	0.70 B	0.2	ND	0.2	ND	0.2	1.4	1.3	0.26 B	0.2
Magnesium	---	---	15500	5000	15400	5000	28500	5000	28200	5000	16800	5000	19400	5000
Manganese	25	50	**415**	15	37.9	15	**259**	15	**257**	15	**64.8**	15	**76.8**	15
Mercury	0.2	2	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.03
Nickel	20	100	16.2	8	3.6 B	0.17	2.4 B	0.17	2.3 B	0.17	4.5 B	0.17	0.93 B	0.17
Potassium	---	---	5610	5000	1040 B	500	2530 B	500	2440 B	500	2300 B	500	2310 B	500
Selenium	10	50	ND	4.5	ND	4.5	ND	4.5	ND	4.5	ND	4.5	ND	4.5
Sodium	---	---	3630 B	2000	4760 B	2000	4300 B	2000	4370 B	2000	13600	5000	5460	5000
Thallium	0.4	2	0.12 B	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02
Zinc	2,500	5,000	27.6	20	ND	6.6	ND	6.6	ND	6.6	7.1 B	6.6	ND	6.6
Water Quality Inorganics (mg/l)														
Bromide	---	---	ND	0.079	ND	0.079	ND	0.079	ND	0.079	ND	0.079	ND	0.079
Chloride	---	---	1.7 B	0.1	1.7 B	0.1	1.7 B	0.1	1.6 B	0.1	1.6 B	0.1	1.2 B J	0.1
Nitrate Plus Nitrite (As N)	2	10	0.33	0.1	0.1	0.1	0.55	0.1	0.53	0.1	0.22	0.1	ND	0.021
Sulfate	---	---	14	5	14.5	5	18.9	5	18.6	5	21.3	5	7.6	5
Total Dissolved Solids	---	---	203	10	367	10	239	10	247	10	216	10	183	10
Total Suspended Solids	---	---	281 Q	1.9	340 Q	1.9	12.8	4	16.4	4	40.8	4	4.6	4

ug/l = parts per billion. mg/l = parts per million. NA = not analyzed. ND = not detected. WI PAL = Wisconsin preventative action limit.

WI PAL = Wisconsin preventative action limit.

WI ES = Wisconsin enforcement standard. WI ES standards are not currently available for values denoted with (*). Refer to Table 23 for source of these values.

DL = detection limit. Where detections are listed without qualifiers (i.e., "J", "B", etc.), the DL is the practical quantitative limit; otherwise, the DL is the method detection limit.

Results above the WI ES are shaded and denoted in **bold.**

J (organics) = estimated concentration. Result is less than laboratory reporting limit or qualified for QC exceedance.

J (metals and water quality inorganics) = estimated concentration. Analyte detected in associated laboratory blank.

B (metals and water quality inorganics) = estimated concentration. Result is less than laboratory reporting limit.

Q = elevated reporting limit due to high analyte concentration or interferences.

Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8321A.

Metals were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Methods 6010B, 6020, 7470, or 7471B.

Water quality inorganics were analyzed using the USEPA 600 4-79-020 (with revisions), *Methods for the Chemical Analysis of Water and Wastes,* Methods 353.2, 300.0, 160.1, 160.2, or 310.1.

Table 20 (continued)
October 2001 Groundwater Sampling Event - Summary of Detections
Non-Residential Wells - Intermediate Zone (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

		Sample ID	PZ-32O		PZ-33D		PZ-33O		PZ-33R		PZ-34D		PZ-34D Duplicate	
		Date	10/21/2001		10/20/2001		10/20/2001		10/20/2001		10/19/2001		10/19/2001	
ANALYTE	**WI PAL**	**WI ES**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**
Nitroaromatics & Nitramines (ug/l)														
1,3,5-Trinitrobenzene	110	1,100*	ND	0.017	ND	0.017	ND	0.017	ND	0.017	5.9	0.6	6.1	0.6
1-Methyl-2-Nitrobenzene	12.2	61*	ND	0.019	0.26	0.12	ND	0.019	ND	0.019	4.3	0.6	3.9	0.6
1-Methyl-3-Nitrobenzene	24	120*	ND	0.019	ND	0.019	ND	0.019	ND	0.019	0.14	0.12	0.15	0.12
1-Methyl-4-Nitrobenzene	12.2	61*	ND	0.019	ND	0.019	ND	0.019	ND	0.019	0.29	0.12	0.29	0.12
2,4,6-Trinitrotoluene	0.22	2.2*	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049
2,4-Dinitrotoluene	0.005	0.05	ND	0.016	ND	0.016	ND	0.016	0.036 J	0.12	**0.73**	0.12	**0.74**	0.12
2,6-Dinitrotoluene	0.005	0.05	**0.056 J**	0.12	0.035 J	0.12	**0.058 J**	0.12	**0.61**	0.12	**2.9**	0.6	**2.6**	0.6
2-Amino-4,6-Dinitrotoluene	0.22	2.2*	ND	0.013	ND	0.013	ND	0.013	ND	0.013	0.22	0.12	0.2	0.12
4-Amino-2,6-Dinitrotoluene	0.22	2.2*	ND	0.017	ND	0.017	ND	0.017	ND	0.017	0.27	0.12	0.26	0.12
M-Dinitrobenzene	0.1	1*	ND	0.02	ND	0.02	ND	0.02	ND	0.02	0.030 J	0.02	0.032 J	0.02
Nitrobenzene	0.7	3.5*	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025
RDX	0.06	0.6*	ND	0.028	ND	0.028	ND	0.028	ND	0.028	ND	0.028	ND	0.028
Wisconsin Regulated Volatile Organics (ug/l)														
1,1-Dichloroethene	0.7	7	ND	0.2	ND	0.2	ND	0.2	ND	0.2	ND	0.2	ND	0.2
1,2,4-Trimethylbenzene	96	480	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22
1,3,5-Trimethylbenzene	96	480	ND	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29
Acetone	200	1,000	ND	1.9	ND	1.9	ND	1.9	ND	1.9	ND	1.9	ND	1.9
Benzene	0.5	5	ND	0.21	ND	0.21	ND	0.21	ND	0.21	ND	0.21	ND	0.21
Bromodichloromethane	0.06	0.6	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22
Carbon Disulfide	200	1,000	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19
Carbon Tetrachloride	0.5	5	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19	ND	0.19
Chloroform	0.6	6	ND	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23
Ethylbenzene	140	700	ND	0.28	ND	0.28	ND	0.28	ND	0.28	ND	0.28	ND	0.28
Hexane	120	600	ND	0.25	ND	0.25	ND	0.25	ND	0.25	ND	0.25	ND	0.25
Methyl Chloride	0.3	3	ND	0.3	ND	0.3	ND	0.3	ND	0.3	ND	0.3	ND	0.3
Methyl Ethyl Ketone	90	460	ND	0.93	ND	0.93	ND	0.93	ND	0.93	ND	0.93	ND	0.93
Methylene Chloride	0.5	5	ND	0.89	ND	0.89	ND	0.89	ND	0.89	ND	0.89	ND	0.89
Naphthalene	8	40	ND	0.15	ND	0.15	ND	0.15	ND	0.15	ND	0.15	ND	0.15
Tetrachloroethene	0.5	5	ND	0.36	ND	0.36	ND	0.36	ND	0.36	ND	0.36	ND	0.36
Toluene	200	1,000	ND	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29	ND	0.29
Xylenes (Total)	1,000	10,000	ND	0.95	ND	0.95	ND	0.95	ND	0.95	ND	0.95	ND	0.95
Metals (ug/l)														
Antimony	1.2	6	ND	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23	ND	0.23
Arsenic	5	50	1.2	0.19	0.87 B	0.19	0.32 B	0.19	0.27 B	0.19	0.76 B	0.19	0.77 B	0.19
Barium	400	2,000	109 B	0.64	90.2 B	0.64	42.9 B	0.64	40.7 B	0.64	142 B	0.64	137 B	0.64
Beryllium	0.4	4	1.5 B	0.22	0.56 B J	0.22	1.1 B J	0.22	0.98 B J	0.22	0.43 B J	0.22	0.48 B J	0.22
Cadmium	0.5	5	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025
Calcium	---	---	22700	5000	29600	5000	4470 B	5000	14200	5000	64300	5000	64100	5000
Chromium	10	100	31.5	10	2.5 B	0.56	13.8	10	2.9 B	0.56	3.3 B	0.56	2.6 B	0.56
Copper	130	1,300	14.6 B	0.83	ND	0.83	ND	0.83	ND	0.83	ND	0.83	ND	0.83
Iron	150	300	**16300**	100	**792 J**	5.1	**3240 J**	5.1	**966 J**	5.1	107 J	5.1	139 J	5.1
Lead	1.5	15	2.1	1.3	1.3	1.3	1.3	1.3	0.39 B	0.2	ND	0.2	0.21 B	0.2
Magnesium	---	---	10600	5000	16700	5000	1970 B	21	5560	5000	38000	5000	37400	5000
Manganese	25	50	**299**	15	**445**	15	**60.9**	15	12.3 B	0.38	23.6	15	20.9	15
Mercury	0.2	2	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.03
Nickel	20	100	13.8	0.17	2.0 B	0.17	7.9 B	0.17	2.0 B	0.17	2.7 B	0.17	2.5 B	0.17
Potassium	---	---	4490 B	500	1920 B	500	1660 B	500	1140 B	500	2240 B	500	2270 B	500
Selenium	10	50	ND	4.5	ND	4.5	ND	4.5	ND	4.5	6.1	5	ND	4.5
Sodium	---	---	10700	5000	5740	5000	ND	2000	ND	2000	5300	5000	5870	5000
Thallium	0.4	2	0.088 B	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02
Zinc	2,500	5,000	20.1	20	ND	6.6	6.9 B	6.6	ND	6.6	ND	6.6	ND	6.6
Water Quality Inorganics (mg/l)														
Bromide	---	---	ND	0.079	ND	0.079	ND	0.079	ND	0.079	ND	0.079	ND	0.079
Chloride	---	---	2.2 B J	0.1	1.2 B	0.1	1.4 B	0.1	1.4B	0.1	2.2 B	0.1	2.1B	0.1
Nitrate Plus Nitrite (As N)	2	10	0.15	0.1	0.040 B	0.021	0.2	0.1	0.21	0.1	0.50 J	0.021	0.54 J	0.021
Sulfate	---	---	11	5	9.3	5	6.7	5	10.8	5	85.7 Q	0.1	80.9 Q	0.1
Total Dissolved Solids	---	---	195	10	155	10	50	10	82	10	379	10	377	10
Total Suspended Solids	---	---	151 Q	1.9	8.2	4	418	4	8.4	4	ND	1.9	NA	NA

ug/l = parts per billion. mg/l = parts per million. NA = not analyzed. ND = not detected. WI PAL = Wisconsin preventative action limit.

WI PAL = Wisconsin preventative action limit.

WI ES = Wisconsin enforcement standard. WI ES standards are not currently available for values denoted with (*). Refer to Table 23 for source of these values.

DL = detection limit. Where detections are listed without qualifiers (i.e., "J", "B", etc.), the DL is the practical quantitative limit; otherwise, the DL is the method detection limit.

Results above the WI ES are shaded and denoted in **bold.**

J (organics) = estimated concentration. Result is less than laboratory reporting limit or qualified for QC exceedance.

J (metals and water quality inorganics) = estimated concentration. Analyte detected in associated laboratory blank.

B (metals and water quality inorganics) = estimated concentration. Result is less than laboratory reporting limit.

Q = elevated reporting limit due to high analyte concentration or interferences.

Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8321A.

Metals were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Methods 6010B, 6020, 7470, or 7471B.

Water quality inorganics were analyzed using the USEPA 600 4-79-020 (with revisions), *Methods for the Chemical Analysis of Water and Wastes,* Methods 353.2, 300.0, 160.1,

Table 20 (continued)
October 2001 Groundwater Sampling Event - Summary of Detections
Non-Residential Wells - Intermediate Zone (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

			Sample ID	PZ-35D		PZ-36D	
			Date	10/17/2001		10/17/2001	
ANALYTE	**WI PAL**	**WI ES**		**Result**	**DL**	**Result**	**DL**
Nitroaromatics & Nitramines (ug/l)							
1,3,5-Trinitrobenzene	110	1,100*		ND	0.017	ND	0.017
1-Methyl-2-Nitrobenzene	12.2	61*		ND	0.019	ND	0.019
1-Methyl-3-Nitrobenzene	24	120*		ND	0.019	ND	0.019
1-Methyl-4-Nitrobenzene	12.2	61*		ND	0.019	ND	0.019
2,4,6-Trinitrotoluene	0.22	2.2*		ND	0.049	ND	0.049
2,4-Dinitrotoluene	0.005	0.05		ND	0.016	ND	0.016
2,6-Dinitrotoluene	0.005	0.05		ND	0.012	ND	0.012
2-Amino-4,6-Dinitrotoluene	0.22	2.2*		ND	0.013	ND	0.013
4-Amino-2,6-Dinitrotoluene	0.22	2.2*		ND	0.017	ND	0.017
M-Dinitrobenzene	0.1	1*		ND	0.02	ND	0.02
Nitrobenzene	0.7	3.5*		ND	0.025	ND	0.025
RDX	0.06	0.6*		ND	0.028	ND	0.028
Wisconsin Regulated Volatile Organics (ug/l)							
1,1-Dichloroethene	0.7	7		ND	0.2	ND	0.2
1,2,4-Trimethylbenzene	96	480		ND	0.22	ND	0.22
1,3,5-Trimethylbenzene	96	480		ND	0.29	ND	0.29
Acetone	200	1,000		ND	1.9	18	10
Benzene	0.5	5		ND	0.21	ND	0.21
Bromodichloromethane	0.06	0.6		ND	0.22	ND	0.22
Carbon Disulfide	200	1,000		ND	0.19	ND	0.19
Carbon Tetrachloride	0.5	5		ND	0.19	ND	0.19
Chloroform	0.6	6		ND	0.23	ND	0.23
Ethylbenzene	140	700		ND	0.28	ND	0.28
Hexane	120	600		ND	0.25	ND	0.25
Methyl Chloride	0.3	3		1.2 J	0.3	ND	0.3
Methyl Ethyl Ketone	90	460		ND	0.93	ND	0.93
Methylene Chloride	0.5	5		ND	0.89	ND	0.89
Naphthalene	8	40		ND	0.15	ND	0.15
Tetrachloroethene	0.5	5		ND	0.36	ND	0.36
Toluene	200	1,000		ND	0.29	ND	0.29
Xylenes (Total)	1,000	10,000		ND	0.95	ND	0.95
Metals (ug/l)							
Antimony	1.2	6		ND	0.23	ND	0.23
Arsenic	5	50		1.3	1	0.82 B	0.19
Barium	400	2,000		35.3 B	0.64	95.6 B	0.64
Beryllium	0.4	4		ND	0.22	ND	0.22
Cadmium	0.5	5		ND	0.025	ND	0.025
Calcium	---	---		16500	5000	38300	5000
Chromium	10	100		ND	0.56	1.1 B	0.56
Copper	130	1,300		3.4 B	0.83	1.5 B	0.83
Iron	150	300		**948**	100	**1330**	100
Lead	1.5	15		0.31 B	0.2	0.24 B	0.2
Magnesium	---	---		7250	5000	20100	5000
Manganese	25	50		**99.9**	15	**147**	15
Mercury	0.2	2		ND	0.03	ND	0.03
Nickel	20	100		1.2 B	0.17	2.4 B	0.17
Potassium	---	---		2140 B	500	2430 B	500
Selenium	10	50		ND	4.5	ND	4.5
Sodium	---	---		7200	5000	6160	5000
Thallium	0.4	2		ND	0.02	ND	0.02
Zinc	2,500	5,000		11.7 B	6.6	ND	6.6
Water Quality Inorganics (mg/l)							
Bromide	---	---		ND	0.079	ND	0.079
Chloride	---	---		1.8 B J	0.1	1.7 B J	0.1
Nitrate Plus Nitrite (As N)	2	10		ND	0.021	ND	0.021
Sulfate	---	---		4.2 B	0.1	6.6	0.1
Total Dissolved Solids	---	---		118	4.8	207	4.8
Total Suspended Solids	---	---		18.8	1.9	2.0 B	1.9

ug/l = parts per billion. mg/l = parts per million. NA = not analyzed. ND = not detected. WI PAL = Wisconsin preventative action limit.

WI PAL = Wisconsin preventative action limit.

WI ES = Wisconsin enforcement standard. WI ES standards are not currently available for values denoted with (*). Refer to Table 23 for source of these values.

DL = detection limit. Where detections are listed without qualifiers (i.e., "J", "B", etc.), the DL is the practical quantitative limit; otherwise, the DL is the method detection limit.

Results above the WI ES are shaded and denoted in **bold.**

J (organics) = estimated concentration. Result is less than laboratory reporting limit or qualified for QC exceedance.

J (metals and water quality inorganics) = estimated concentration. Analyte detected in associated laboratory blank.

B (metals and water quality inorganics) = estimated concentration. Result is less than laboratory reporting limit.

Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8321A.

Metals were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Methods 6010B, 6020, 7470, or 7471B.

Water quality inorganics were analyzed using the USEPA 600 4-79-020 (with revisions), *Methods for the Chemical Analysis of Water and Wastes,* Methods 353.2, 300.0, 160.1,

Table 21
October 2001 Groundwater Sampling Event - Summary of Detections
Residential Wells - Intermediate Zone (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

		Sample ID	29450N		29600N		29890N		30110N		30240N		30300N		30380N		30490N		30600N	
		Date	10/23/2001		10/23/2001		10/23/2001		10/23/2001		10/23/2001		10/23/2001		10/23/2001		10/23/2001		10/23/2001	
ANALYTE	**WI PAL**	**WI ES**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**
Nitroaromatics & Nitramines (ug/l)																				
1-Methyl-2-Nitrobenzene	12.2	61*	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019
2,4,6-Trinitrotoluene	0.22	2.2*	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049
2,4-Dinitrotoluene	0.005	0.05	ND	0.016	ND	0.016	ND	0.016	ND	0.016	ND	0.016	ND	0.016	ND	0.016	ND	0.016	ND	0.016
2,6-Dinitrotoluene	0.005	0.05	ND	0.012	ND	0.012	ND	0.012	ND	0.012	ND	0.012	ND	0.012	ND	0.012	ND	0.012	ND	0.012
2-Amino-4,6-Dinitrotoluene	0.22	2.2*	ND	0.013	ND	0.013	ND	0.013	ND	0.013	ND	0.013	ND	0.013	ND	0.013	ND	0.013	ND	0.013
4-Amino-2,6-Dinitrotoluene	0.22	2.2*	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017
Metals (ug/l)																				
Antimony	1.2	6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	5	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	400	2,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	0.4	4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.5	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	---	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	10	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	130	1,300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	150	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	1.5	15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	---	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	25	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	20	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	---	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	10	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	---	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	0.4	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2,500	5,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Water Quality Inorganics (mg/l)																				
Nitrate Plus Nitrite (As N)	2,000	10	0.038 B	0.021	ND	0.021	ND	0.021	ND	0.021	ND	0.021	ND	0.021	ND	0.021	0.2	0.021	0.12	0.021
Sulfate	---	---	5.6 J	0.1	6.3 J	0.1	4.7 B J	0.1	4.7 B J	0.1	3.9 B J	0.1	6.0 J	0.1	29.4 J	0.1	24.2 J	0.1	24.0 J	0.1

ug/l = parts per billion. mg/l = parts per million. NA = not analyzed. ND = not detected. WI PAL = Wisconsin preventative action limit.

WI ES = Wisconsin enforcement standard. WI ES standards are not currently available for values denoted with (*). Refer to Table 23 for source of these values.

DL = detection limit. Where detections are listed without qualifiers (i.e., "J", "B", etc.), the DL is the practical quantitative limit; otherwise, the DL is the method detection limit.

Results above the WI ES are shaded and denoted in **bold.**

J (metals and water quality inorganics) = estimated concentration. Analyte detected in associated laboratory blank.

B (metals and water quality inorganics) = estimated concentration. Result is less than laboratory reporting limit.

Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8321A.

Water quality inorganics were analyzed using the USEPA 600 4-79-020 (with revisions), *Methods for the Chemical Analysis of Water and Wastes*, Methods 353.2, 300.0, 160.1, 160.2, or 310.1.

Table 21 (continued)
October 2001 Groundwater Sampling Event - Summary of Detections
Residential Wells - Intermediate Zone (DRAFT)
Former DuPont Barksdale Site
Barksdale, Wisconsin

		Sample ID	30700N		30810N		30900N		30900N Duplicate		31120BG		72040H		72330H		72370H		72410H	
		Date	10/23/2001		10/17/2001		10/17/2001		10/17/2001		10/16/2001		10/16/2001		10/16/2001		10/16/2001		10/24/2001	
ANALYTE	**WI PAL**	**WI ES**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**
Nitroaromatics & Nitramines (ug/l)																				
1-Methyl-2-Nitrobenzene	12.2	61*	0.030 U	0.019	0.039 J	0.019	0.025 J	0.019	0.021 J	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019
2,4,6-Trinitrotoluene	0.22	2.2*	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049
2,4-Dinitrotoluene	0.005	0.05	ND	0.016	**0.16**	0.016	0.045 J	0.016	**0.057 J**	0.016	**0.14**	0.016	ND	0.016	ND	0.016	ND	0.016	ND	0.016
2,6-Dinitrotoluene	0.005	0.05	**1.5**	0.012	**1.4**	0.012	**0.71**	0.012	**0.67**	0.012	**0.67**	0.012	**1.1**	0.024	0.031 J	0.012	0.012 J	0.012	ND	0.012
2-Amino-4,6-Dinitrotoluene	0.22	2.2*	ND	0.013	0.065 J	0.013	ND	0.013	ND	0.013	ND	0.013	0.2	0.013	ND	0.013	ND	0.013	ND	0.013
4-Amino-2,6-Dinitrotoluene	0.22	2.2*	0.052 J	0.017	0.14	0.017	0.024 J	0.017	0.023 J	0.017	ND	0.017	0.19	0.017	ND	0.017	ND	0.017	ND	0.017
Metals (ug/l)																				
Antimony	1.2	6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0 B J	0.23	ND	0.23	ND	0.23	ND	0.23
Arsenic	5	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.1	0.19	0.27 B	0.19	0.28 B	0.19	ND	0.19
Barium	400	2,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	47.0 B	0.64	62.0 B	0.64	75.2 B	0.64	71.3 B	0.64
Beryllium	0.4	4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	0.22	ND	0.22	ND	0.22	0.68 B J	0.22
Cadmium	0.5	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.028 B	0.025	0.037 B	0.025	0.045 B	0.025	0.033 B	0.025
Calcium	---	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	36500	29	56300	29	67400	29	51900	29
Chromium	10	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.3 B	0.56	0.77 B	0.56	0.89 B	0.56	ND	0.56
Copper	130	1,300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	609 J	0.83	96.0 J	0.83	102 J	0.83	194	0.83
Iron	150	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	5.1	11.9 B	5.1	ND	5.1	267	5.1
Lead	1.5	15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.2	0.2	2.4	0.2	1.8	0.2	2.5	0.2
Magnesium	---	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	14400	21	21100	21	23700	21	21600	21
Manganese	25	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.78 B	0.38	4.3 B	0.38	11.0 B	0.38	30.9	0.38
Nickel	20	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.23 B	0.17	0.84 B	0.17	0.43 B	0.17	3.3 B	0.17
Potassium	---	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2400 B	500	1860 B	500	1620 B	500	1420 B	500
Silver	10	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	0.62	ND	0.62	ND	0.62	ND	0.62
Sodium	---	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7940	2000	20700	2000	35200	2000	55300	2000
Thallium	0.4	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	0.02	ND	0.02	ND	0.02	ND	0.02
Zinc	2,500	5,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	114	6.6	73.5	6.6	450	6.6	153 J	6.6
Water Quality Inorganics (mg/l)																				
Nitrate Plus Nitrite (As N)	2,000	10	0.55	0.021	1.1 J	0.021	0.32 J	0.021	0.30 J	0.021	0.13 J	0.021	2.2 J	0.021	1.9 J	0.021	3.8 J	0.021	1.5	0.021
Sulfate	---	---	46.8 J	0.1	27.5	0.1	49.6 Q	0.5	48.9 Q	0.5	10.5	0.1	23.8	0.1	23.7	0.1	28.1	0.1	20.5 J	0.1

ug/l = parts per billion. mg/l = parts per million. NA = not analyzed. ND = not detected. WI PAL = Wisconsin preventative action limit.

WI ES = Wisconsin enforcement standard. WI ES standards are not currently available for values denoted with (*). Refer to Table 23 for source of these values.

DL = detection limit. Where detections are listed without qualifiers (i.e., "J", "B", etc.), the DL is the practical quantitative limit; otherwise, the DL is the method detection limit.

Results above the WI ES are shaded and denoted in **bold.**

J (metals and water quality inorganics) = estimated concentration. Analyte detected in associated laboratory blank.

J (nitroaromatics and nitramines) = estimated concentration. Result is less than laboratory reporting limit or qualified for QC exceedance.

B (metals and water quality inorganics) = estimated concentration. Result is less than laboratory reporting limit.

B (nitroaromatics and nitramines) = estimated concentration. Analyte detected in associated laboratory blank.

U = analyte was not detected at stated detection limit.

Q = elevated reporting limit due to high analyte concentration or interferences.

Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8321A.

Metals were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Methods 6010B, 6020, 7470, or 7471B.

Water quality inorganics were analyzed using the USEPA 600 4-79-020 (with revisions), *Methods for the Chemical Analysis of Water and Wastes*, Methods 353.2, 300.0, 160.1, 160.2, or 310.1.

Table 21 (continued)
October 2001 Groundwater Sampling Event - Summary of Detections
Residential Wells - Intermediate Zone (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

		Sample ID	72420H		72450H		72470H		72480H		72520H		72545O		72700H		72730H		72790H	
		Date	10/24/2001		10/16/2001		10/22/2001		10/16/2001		10/16/2001		10/23/2001		10/22/2001		10/17/2001		10/22/2001	
ANALYTE	**WI PAL**	**WI ES**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**
Nitroaromatics & Nitramines (ug/l)																				
1-Methyl-2-Nitrobenzene	12.2	61*	ND	0.019	ND	0.019	ND	0.019	0.058 J	0.019	0.089 J	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019
2,4,6-Trinitrotoluene	0.22	2.2*	ND	0.049	ND	0.049	ND	0.049	0.087 J	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049
2,4-Dinitrotoluene	0.005	0.05	ND	0.016	ND	0.016	ND	0.016	**0.24**	0.016	**0.11 J**	0.016	ND	0.016	ND	0.016	ND	0.016	ND	0.016
2,6-Dinitrotoluene	0.005	0.05	ND	0.012	ND	0.012	ND	0.012	**0.15**	0.012	**0.35**	0.012	ND	0.012	ND	0.012	ND	0.012	ND	0.012
2-Amino-4,6-Dinitrotoluene	0.22	2.2*	ND	0.013	ND	0.013	ND	0.013	0.46	0.013	ND	0.013	ND	0.013	ND	0.013	ND	0.013	ND	0.013
4-Amino-2,6-Dinitrotoluene	0.22	2.2*	ND	0.017	ND	0.017	ND	0.013	0.75	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017
Metals (ug/l)																				
Antimony	1.2	6	ND	0.23	ND	0.23	1.3 B	0.23	ND	0.23	ND	0.23	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	5	50	ND	0.19	ND	0.19	ND	0.19	0.44 B	0.19	0.21 B	0.19	NA	NA	NA	NA	NA	NA	NA	NA
Barium	400	2,000	153 B	0.64	55.8 B	0.64	86.6 B	0.64	38.8 B	0.64	64.8 B	0.64	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	0.4	4	ND	0.22	ND	0.22	ND	0.22	ND	0.22	ND	0.22	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.5	5	0.064 B	0.025	0.030 B	0.025	0.042 B	0.025	ND	0.025	0.072 B	0.025	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	---	---	61800	29	39100	29	62700	29	28300	29	43700	29	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	10	100	ND	0.56	0.90 B	0.56	ND	0.56	0.56 B	0.56	0.99 B	0.56	NA	NA	NA	NA	NA	NA	NA	NA
Copper	130	1,300	153	0.83	567 J	0.83	138	0.83	11.2 B J	0.83	41.7 J	0.83	NA	NA	NA	NA	NA	NA	NA	NA
Iron	150	300	131	5.1	214	5.1	64.4 B	5.1	ND	5.1	ND	5.1	NA	NA	NA	NA	NA	NA	NA	NA
Lead	1.5	15	7	0.2	6.9	0.2	3.2	0.2	1.1 B	0.2	1.3	0.2	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	---	---	20100	21	14000	21	17800	21	13800	21	23000	21	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	25	50	12.1 B	0.38	10.8 B	0.38	20.6	0.38	5.9 B	0.38	1.4 B	0.38	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	20	100	5.7 B	0.17	2.7 B	0.17	2.5 B	0.17	0.25 B	0.17	0.61 B	0.17	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	---	---	1970 B	500	1710 B	500	1860 B	500	2040 B	500	1890 B	500	NA	NA	NA	NA	NA	NA	NA	NA
Silver	10	50	1.4 B J	0.62	ND	0.62	ND	0.62	ND	0.62	ND	0.62	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	---	---	136000	2000	30800	2000	98700	2000	5700	2000	5710	2000	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	0.4	2	0.022 B	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2,500	5,000	136 J	6.6	227	6.6	232	6.6	29.9	6.6	614	6.6	NA	NA	NA	NA	NA	NA	NA	NA
Water Quality Inorganics (mg/l)																				
Nitrate Plus Nitrite (As N)	2000	10	1.3	0.021	0.73 J	0.021	1.7	0.021	0.11 J	0.021	0.26 J	0.021	0.14	0.021	ND	0.021	0.037 B J	0.021	ND	0.021
Sulfate	---	---	23.5 J	0.1	20.4	0.1	17.1	0.1	6.5	0.1	16.3	0.1	3.9 B J	0.1	3.9 B	0.1	4.3 B	0.1	4.3 B	0.1

ug/l = parts per billion. mg/l = parts per million. NA = not analyzed. ND = not detected. WI PAL = Wisconsin preventative action limit.

WI ES = Wisconsin enforcement standard. WI ES standards are not currently available for values denoted with (*). Refer to Table 23 for source of these values.

DL = detection limit. Where detections are listed without qualifiers (i.e., "J", "B", etc.), the DL is the practical quantitative limit; otherwise, the DL is the method detection limit.

Results above the WI ES are shaded and denoted in **bold.**

J (metals and water quality inorganics) = estimated concentration. Analyte detected in associated laboratory blank.

J (nitroaromatics and nitramines) = estimated concentration. Result is less than laboratory reporting limit or qualified for QC exceedance.

B (metals and water quality inorganics) = estimated concentration. Result is less than laboratory reporting limit.

Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8321A.

Metals were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Methods 6010B, 6020, 7470, or 7471B.

Water quality inorganics were analyzed using the USEPA 600 4-79-020 (with revisions), *Methods for the Chemical Analysis of Water and Wastes,* Methods 353.2, 300.0, 160.1, 160.2, or 310.1.

Table 21 (continued)
October 2001 Groundwater Sampling Event - Summary of Detections
Residential Wells - Intermediate Zone (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

		Sample ID	72860H		72910H		72920H		73025BG		73030BG		73040BG		73080BG		73095BG		73100BG	
		Date	10/22/2001		10/17/2001		10/17/2001		10/23/2001		10/23/2001		10/23/2001		10/23/2001		10/23/2001		10/22/2001	
ANALYTE	**WI PAL**	**WI ES**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**
Nitroaromatics & Nitramines (ug/l)																				
1-Methyl-2-Nitrobenzene	12.2	61*	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019
2,4,6-Trinitrotoluene	0.22	2.2*	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049
2,4-Dinitrotoluene	0.005	0.05	ND	0.016	ND	0.016	ND	0.016	ND	0.016	ND	0.016	ND	0.016	ND	0.016	ND	0.016	ND	0.016
2,6-Dinitrotoluene	0.005	0.05	ND	0.012	ND	0.012	ND	0.012	ND	0.012	ND	0.012	ND	0.012	ND	0.012	ND	0.012	ND	0.012
2-Amino-4,6-Dinitrotoluene	0.22	2.2*	ND	0.013	ND	0.013	ND	0.013	ND	0.013	ND	0.013	ND	0.013	ND	0.013	ND	0.013	ND	0.013
4-Amino-2,6-Dinitrotoluene	0.22	2.2*	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017
Metals (ug/l)																				
Antimony	1.2	6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	5	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	400	2,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	0.4	4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.5	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	---	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	10	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	130	1,300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	150	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	1.5	15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	---	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	25	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	20	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	---	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	10	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	---	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	0.4	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2,500	5,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Water Quality Inorganics (mg/l)																				
Nitrate Plus Nitrite (As N)	2,000	10	ND	0.021	ND	0.021	0.043 B J	0.021	ND	0.021	ND	0.021	ND	0.021	ND	0.021	3.2	0.021	ND	0.021
Sulfate	---	---	4.1 B	0.1	4.4 B	0.1	4.5 B	0.1	4.9 B J	0.1	4.7 B J	0.1	4.9 B J	0.1	4.6 B J	0.1	13.4 J	0.1	4.4 B	0.1

ug/l = parts per billion. mg/l = parts per million. NA = not analyzed. ND = not detected. WI PAL = Wisconsin preventative action limit.

WI ES = Wisconsin enforcement standard. WI ES standards are not currently available for values denoted with (*). Refer to Table 23 for source of these values.

DL = detection limit. Where detections are listed without qualifiers (i.e., "J", "B", etc.), the DL is the practical quantitative limit; otherwise, the DL is the method detection limit.

Results above the WI ES are shaded and denoted in **bold.**

J (metals and water quality inorganics) = estimated concentration. Analyte detected in associated laboratory blank.

B (metals and water quality inorganics) = estimated concentration. Result is less than laboratory reporting limit.

Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8321A.

Water quality inorganics were analyzed using the USEPA 600 4-79-020 (with revisions), *Methods for the Chemical Analysis of Water and Wastes*, Methods 353.2, 300.0, 160.1, 160.2, or 310.1.

Table 21 (continued)
October 2001 Groundwater Sampling Event - Summary of Detections
Residential Wells - Intermediate Zone (DRAFT)

Former DuPont Barksdale Site

Barksdale, Wisconsin

		Sample ID	73110BG		73110BG Duplicate		73110H		73120BG		73160H		73190H		73200H		73500H		73500H Duplicate	
		Date	10/22/2001		10/22/2001		10/16/2001		10/17/2001		10/17/2001		10/22/2001		10/17/2001		10/22/2001		10/22/2001	
ANALYTE	**WI PAL**	**WI ES**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**
Nitroaromatics & Nitramines (ug/l)																				
1-Methyl-2-Nitrobenzene	12.2	61*	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019	ND	0.019
2,4,6-Trinitrotoluene	0.22	2.2*	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049	ND	0.049
2,4-Dinitrotoluene	0.005	0.05	ND	0.016	ND	0.016	ND	0.016	ND	0.016	ND	0.016	ND	0.016	ND	0.016	ND	0.016	ND	0.016
2,6-Dinitrotoluene	0.005	0.05	**0.54**	0.012	**0.66**	0.012	**0.19**	0.012	**0.16**	0.012	ND	0.012	ND	0.012	ND	0.012	ND	0.012	ND	0.012
2-Amino-4,6-Dinitrotoluene	0.22	2.2*	ND	0.013	ND	0.013	ND	0.013	ND	0.013	ND	0.013	ND	0.013	ND	0.013	ND	0.013	ND	0.013
4-Amino-2,6-Dinitrotoluene	0.22	2.2*	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017	ND	0.017
Metals (ug/l)																				
Antimony	1.2	6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	0.23	NA	NA	ND	0.23	ND	0.23
Arsenic	5	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	0.19	NA	NA	ND	0.19	ND	0.19
Barium	400	2,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	18.5 B	0.64	NA	NA	30.8 B	0.64	30.8 B	0.64
Beryllium	0.4	4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	0.22	NA	NA	ND	0.22	ND	0.22
Cadmium	0.5	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.7	0.025	NA	NA	ND	0.025	ND	0.025
Calcium	---	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	17800	29	NA	NA	39800	29	39400	29
Chromium	10	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	0.56	NA	NA	2.1 B	0.56	1.9 B	0.56
Copper	130	1,300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.8 B	0.83	NA	NA	ND	0.83	ND	0.83
Iron	150	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	208	5.1	NA	NA	14.7 B	5.1	7.9 B	5.1
Lead	1.5	15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.6	0.2	NA	NA	ND	0.2	ND	0.2
Magnesium	---	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6320	21	NA	NA	16300	21	16200	21
Manganese	25	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**51.3**	0.38	NA	NA	ND	0.38	ND	0.38
Nickel	20	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.39 B	0.17	NA	NA	1.1 B	0.17	0.93 B	0.17
Potassium	---	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2270 B	500	NA	NA	1520 B	500	1460 B	500
Silver	10	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	0.62	NA	NA	ND	0.62	ND	0.62
Sodium	---	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4230 B	2000	NA	NA	4180 B	2000	3510 B	2000
Thallium	0.4	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	0.02	NA	NA	0.030 B	0.02	0.055 B	0.02
Zinc	2,500	5,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	304	6.6	NA	NA	ND	6.6	ND	6.6
Water Quality Inorganics (mg/l)																				
Nitrate Plus Nitrite (As N)	2,000	10	0.25	0.021	0.26	0.021	5.2 J	0.021	0.64 J	0.021	1.1 J	0.021	ND	0.021	0.050 B J	0.021	0.38	0.021	0.33	0.021
Sulfate	---	---	7.3	0.1	7.2	0.1	20.6	0.1	8.6	0.1	17.3	0.1	4.2 B	0.1	4.9 B	0.1	6.3	0.1	6.4	0.1

ug/l = parts per billion. mg/l = parts per million. NA = not analyzed. ND = not detected. WI PAL = Wisconsin preventative action limit.

WI ES = Wisconsin enforcement standard. WI ES standards are not currently available for values denoted with (*). Refer to Table 23 for source of these values.

DL = detection limit. Where detections are listed without qualifiers (i.e., "J", "B", etc.), the DL is the practical quantitative limit; otherwise, the DL is the method detection limit.

Results above the WI ES are shaded and denoted in **bold.**

J (metals and water quality inorganics) = estimated concentration. Analyte detected in associated laboratory blank.

B (metals and water quality inorganics) = estimated concentration. Result is less than laboratory reporting limit.

Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8321A.

Metals were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Methods 6010B, 6020, 7470, or 7471B.

Water quality inorganics were analyzed using the USEPA 600 4-79-020 (with revisions), *Methods for the Chemical Analysis of Water and Wastes,* Methods 353.2, 300.0, 160.1, 160.2, or 310.1.

Table 22
October 2001 Groundwater Sampling Event - Summary of Detections
Non-Residential Wells - Deep Zone

Former DuPont Barksdale Site

Barksdale, Wisconsin

		Sample ID	PZ-02D		PZ-11X		PZ-12X		PZ-22X		PZ-30X	
		Date	10/16/2001		10/19/2001		10/22/2001		10/19/2001		10/20/2001	
ANALYTE	**WI PAL**	**WI ES**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**
Wisconsin Regulated Volatile Organics (ug/l)												
Acetone	200	1,000	ND	1.9	ND	1.9	ND	1.9	ND	1.9	ND	1.9
Chloroform	0.6	6	ND	0.23	0.27 J	0.023	ND	0.23	ND	0.23	ND	0.23
Metals (ug/l)												
Arsenic	5	50	0.38 B	0.19	1.2	1	0.31 B	0.19	1.1	1	0.35 B	0.19
Barium	400	2,000	14.8 B	0.64	22.9 B	0.64	29.6 B	0.64	16.5 B	0.64	16.5 B	0.64
Beryllium	0.4	4	ND	0.22	ND	0.22	ND	0.22	ND	0.22	0.69 B J	0.22
Cadmium	0.5	5	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025
Calcium	---	---	16500	5000	20600	5000	11900	5000	18900	5000	12700	5000
Chromium	10	100	ND	0.56	0.91 B J	0.56	ND	0.56	1.1 B J	0.56	1.1 B	0.56
Copper	130	1,300	ND	0.83	1.6 B	0.83	ND	0.83	ND	0.83	ND	0.83
Iron	150	300	78.3 B	5.1	168	100	196	100	46.2 B	5.1	127 J	5.1
Lead	1.5	15	0.23 B	0.2	0.72 B	0.2	ND	0.2	0.27 B	0.2	0.36 B	0.2
Magnesium	---	---	5790	5000	8500	5000	4130 B	21	7170	5000	4260 B	5000
Manganese	25	50	**110**	15	**92.1**	15	2.9 B	0.38	**98.2**	15	19.2	15
Nickel	20	100	0.90 B	0.17	0.24 B	0.17	0.61 B	0.17	0.22 B	0.17	0.78 B	0.17
Potassium	---	---	2300 B	500	1960 B	500	3050 B	500	1670 B	500	2420 B	500
Sodium	---	---	3840 B	2000	5250	5000	11500	5000	3470 B	2000	8290	5000
Zinc	2,500	5,000	34.1	20	9.9 B	6.6	ND	6.6	ND	6.6	ND	6.6
Water Quality Inorganics (mg/l)												
Chloride	---	---	1.2 B J	0.1	1.4 B	0.1	1.6 B J	0.1	1.2 B	0.1	1.4 B	0.1
Nitrate Plus Nitrite (As N)	2	10	ND	0.021	0.098 B J	0.021	ND	0.021	0.040 B J	0.021	ND	0.021
Sulfate	---	---	4.0 B	0.1	4.5 B	0.1	5.1	5	4.1 B	0.1	4.9 B	0.1
Total Dissolved Solids	---	---	97	10	97	10	82	10	90	10	80	10
Total Suspended Solids	---	---	ND	1.9	4.2	4	4.6	4	ND	1.9	8.8	4

		Sample ID	PZ-31X		PZ-32X		PZ-33X		PZ-36X	
		Date	10/20/2001		10/21/2001		10/20/2001		10/17/2001	
ANALYTE	**WI PAL**	**WI ES**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**
Wisconsin Regulated Volatile Organics (ug/l)										
Acetone	200	1,000	ND	1.9	ND	1.9	ND	1.9	5.4 J	1.9
Metals (ug/l)										
Arsenic	5	50	0.28 B	0.19	ND	0.19	ND	0.19	0.30 B	1
Barium	400	2,000	9.7 B	0.64	21.3 B	0.64	14.4 B	0.64	47.2 B	0.64
Beryllium	0.4	4	0.58 B J	0.22	ND	0.22	0.60 B J	0.22	1.4 B	0.22
Cadmium	0.5	5	ND	0.025	ND	0.025	ND	0.025	0.028 B	0.025
Calcium	---	---	12700	5000	13300	5000	13200	5000	12900	5000
Chromium	10	100	0.85 B	0.56	ND	0.56	0.68 B	10	ND	0.56
Copper	130	1,300	ND	0.83	ND	0.83	ND	0.83	ND	0.83
Iron	150	300	39.6 B J	5.1	13.3 B	5.1	12.3 B J	5.1	**1370**	100
Lead	1.5	15	0.50 B	0.2	ND	0.2	ND	0.2	1.6	1.3
Magnesium	---	---	4230 B	21	4470 B	21	4360 B	21	4980 B	21
Manganese	25	50	8.2 B	0.38	30	15	7.5 B	0.38	**448**	15
Nickel	20	100	0.70 B	0.17	1.4 B	0.17	0.63 B	0.17	1.8 B	0.17
Potassium	---	---	2510 B	500	2750 B	500	2680 B	500	2410 B	500
Sodium	---	---	7490	5000	6990	5000	6090	5000	10100	5000
Zinc	2,500	5,000	ND	6.6	ND	6.6	ND	6.6	69.2	20
Water Quality Inorganics (mg/l)										
Chloride	---	---	2.4 B	0.1	1.9 B J	0.1	1.9 B	0.1	1.8 B J	0.1
Nitrate Plus Nitrite (As N)	2	10	ND	0.021	ND	0.021	0.030 B	0.021	ND	0.021
Sulfate	---	---	4.6 B	0.1	4.4 B	0.1	4.4 B	0.1	4.2 B	0.1
Total Dissolved Solids	---	---	74	10	81	10	62	10	118	10
Total Suspended Solids	---	---	ND	1.9	ND	1.9	ND	1.9	18.8	4

ug/l = parts per billion. mg/l = parts per million. NA = not analyzed. ND = not detected. WI PAL = Wisconsin preventative action limit.
WI ES = Wisconsin enforcement standard. WI ES standards are not currently available for values denoted with (*). Refer to Table 23 for source of these values.
DL = detection limit. Where detections are listed with no qualifiers (i.e., "J", "B", etc.), the DL is the practical quantitative limit; otherwise, the DL is the method detection limit.
Results above the WI ES are shaded and denoted in **bold.**
J (metals and water quality inorganics) = estimated concentration. Analyte detected in associated laboratory blank.
J (organics) = estimated concentration. Result is less than laboratory reporting limit or qualified for QC exceedance.
B (metals and water quality inorganics) = estimated concentration. Result is less than laboratory reporting limit.
Metals were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Methods 6010B, 6020, 7470, or 7471B.
Nitroaromatic and nitramine organic compounds were analyzed using the USEPA SW-846 3rd Ed., *Test Methods for Evaluating Solid Waste* , Method 8321A.
Water quality inorganics were analyzed using the USEPA 600 4-79-020 (with revisions), *Methods for the Chemical Analysis of Water and Wastes,* Methods 353.2, 300.0, 160.1, 160.2, or 310.1.

Table 23
Preliminary Drinking Water Guidelines for Compounds Targeted Under Method SW846-8321A (DRAFT)
September 17, 2001
Former DuPont Barksdale Site
Barksdale, Wisconsin

Compound	Wisconsin Groundwater Enforcement Standard (NR140)	Other Drinking Water Quality Guidelines
2,4-Dinitrotoluene	0.05	100.0[a]
2,6-Dinitrotoluene	0.05	40.0[a]
1,3-Dinitrobenzene	N/A	1.0[b]
1,3,5-Trinitrobenzene	N/A	1,100.0[c]
2,4,6-Trinitrotoluene	N/A	2.2[b]
2-Amino-4,6-Dinitrotoluene	N/A	2.2[d]
4-Amino-2,6-Dinitrotoluene	N/A	2.2[d]
2-Nitrotoluene	N/A	61.0[e]
3-Nitrotoluene	N/A	120.0[d]
4-Nitrotoluene	N/A	61.0[e]
Nitrobenzene	N/A	20.0[c]
Nitroglycerin	N/A	5.0[b]
PETN	N/A	n/a
HMX	N/A	1,800.0[c]
RDX	N/A	0.6[f]
Tetryl	N/A	370.0[e]

Concentrations in parts per billion by volume (ppb), as micrograms per liter (ug/L).

N/A = no standard or guideline currently available.

Source
a = EPA Drinking Water Equivalent Level.
b = Lifetime Health Advisory.
c = EPA Reference Dose media Evaluation Guideline.
d = EPA Region III Provisional Health Value.
e = Withdrawn EPA Reference Dose Concentration.
f = EPA Cancer Risk Evaluation Guideline (1 in 1,000,000).

Table 24
Background Metal Concentrations in Soils
Former DuPont Barksdale Site
Barksdale, Wisconsin

Metal	Low	Median	High
Arsenic	1.4	4.4	10
Barium	150	543	1000
Cadmium	na	na	na
Chromium	7	40	100
Copper	3	12	50
Iron	na	na	na
Lead	nd	12	30
Mercury	0.02	0.15	0.58
Nickel	nd	14	50
Zinc	25	44	180

All values are reported in mg/kg or parts per million.

Source: Dragun and Chiasson, 1991. *Elements in NA Soils.*
Hazardous Materials Control Institute, Greenbelt, Maryland

Analytes Detected Above Direct Contact, Non-Industrial Screening Values in Soils

Analyte	Background Concentation
Nitroaromatics and Nitramines	
2,4-Dinitrotoluene	--
2,4,6-Trinitrotoluene	--
2,6-Dinitrotoluene	--
Semi-Volatile Organics	
Benzo(A)Pyrene	--
Metals	
Arsenic	2.8 ppm
Chromium	7 ppm
Lead	10 ppm

ppm = parts per million.

Source: Boerngen and Shacklette, 1981. *Chemical Analyses of Soil and Other Surficial Material of the Conterminous United States.*
United States Department of the Interior, Geological Survey.

Table 25
Constituents of Potential Concern (COPCs) (DRAFT)
Former DuPont Barksdale Site
Barksdale, Wisconsin

ANALYTE	Shallow Zone		Intermediate Zone		Deep Zone	
	No. of Detections (includes J)	Detect's > WI ES or DOH Values	No. of Detections (includes J)	Detect's > WI ES or DOH Values	No. of Detections (includes J)	Detect's > WI ES or DOH Values
Nitramine/Nitroaromatic Organic Compounds						
2,6-Dinitrotoluene	6	5	40	35	0	0
2,4-Dinitrotoluene	2	2	32	27	0	0
4-Amino-2,6-dinitrotoluene	4	0	30	5	0	0
2-Amino-4,6-dinitrotoluene	5	0	29	3	0	0
2-Nitrotoluene	4	0	17	1	0	0
1,3-Dinitrobenzene	2	0	13	1	0	0
2,4,6-Trinitrotoluene	0	0	5	2	0	0
Nitrobenzene	1	0	1	1	0	0
Volatile Organic Compounds						
Benzene	0	0	1	1	0	0
Bromodichloromethane	0	0	1	1	0	0
Carbon Tetrachloride	1	1	2	1	0	0
Chloroform	2	1	11	1	1	0
Inorganic Compounds						
Beryllium	4	0	25	1	4	0
Iron	11	10	67	44	9	1
Manganese	11	11	66	38	9	4
Water Quality Inorganics						
Nitrate plus Nitrite (as N)	8	0	60	4	6	0

WI ES = Wisconsin enforcement standard.
DOH = Wisconsin department of Health and Family Services.

FIGURES

APPENDICES