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**NITRATE-NITROGEN LEVELS  
IN PRIVATE RESIDENTIAL WELLS  
IN CENTRAL DANE COUNTY, WISCONSIN**

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**APPENDIX OF THE DANE COUNTY  
REGIONAL HYDROLOGIC STUDY**

August 1993

Prepared by the Staff of the  
Dane County Regional Planning Commission

NITRATE-NITROGEN LEVELS  
IN PRIVATE RESIDENTIAL WELLS  
IN CENTRAL DANE COUNTY, WISCONSIN

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### **APPENDIX I: Nitrate Data for Townships by Section and Subdivision**



# **NITRATE-NITROGEN LEVELS IN PRIVATE RESIDENTIAL WELLS IN CENTRAL DANE COUNTY, WISCONSIN**

## **INTRODUCTION**

### **Background**

Nitrate-nitrogen is considered the most common and widespread contaminant in Dane County's groundwater. Past analyses have indicated that over 30 percent of private wells tested in the county violate the public drinking water standard for nitrate-nitrogen, which is based on health concerns for infants under six months of age (DCRPC, 1987). Because of this, various questions, concerns and public policies have been expressed about this contaminant and its sources.

For example, there are questions whether the levels of nitrate found in local groundwater supplies actually represent a significant public health or environmental threat. On the other hand, stricter controls on contaminant sources, such as septic tanks and lawn and agricultural fertilizers, have been discussed and promoted. A link between such controls and land use decision-making (e.g., siting of rural subdivisions) is often recognized and either supported or rejected.

### **Purpose of Study**

This study compiles existing groundwater quality (nitrate) data and identifies existing residential areas and clusters of rural development in central Dane County that have high percentages of private wells testing above the federal and state public drinking water standard for nitrate-nitrogen of 10 milligrams/liter. Based on this standard, potential problem areas are displayed so that possible planning solutions can be considered. Examples of such solutions include providing sanitary sewer service or a better protected water supply source through installation of deep community-type wells. This study was not designed to provide a basis for formulating land use standards or policies for future rural residential development.

This report represents an element in the appendix on pollution sources of the overall Dane County Regional Hydrologic Study. The multi-year Regional Hydrologic Study, now underway, will furnish information on how urban development, well-water pumping and inter-basin wastewater diversion affects lakes, streams, wetlands and groundwater in central Dane County. Water quantity issues will be of emphasis, though associated water quality concerns will also be addressed. Information from the study will be of assistance in making management decisions to prevent or minimize adverse environmental impacts.

## Summary of Nitrate-Nitrogen Issues

For private wells in Dane County, nitrate-nitrogen and bacteria are the most commonly sampled water quality constituents. High nitrate levels in drinking water have been associated with a serious, but easily treated, blood disorder in infants called methemoglobinemia (commonly called "blue baby" syndrome). Because of this, the federal government has established a nitrate-nitrogen drinking water standard for public water supplies. The standard is also used as a non-mandatory guide for private water supplies. A concentration of 10 milligrams/liter (mg/l), expressed as nitrogen, has been established as the standard, since no cases of methemoglobinemia have been associated with drinking water containing nitrate below this level. The natural concentration of nitrate-nitrogen in Wisconsin's groundwater is reported to be less than 2 mg/l.

There are studies, however, questioning the nitrate standard and indicating that it is too low and should be raised. Contrary opinion is that the existing standard should now be adhered to by pregnant women (see article on next page). Several studies suggest that nitrate alone may not be the cause of methemoglobinemia. This research indicates that bacteriologically unsafe water along with a high nitrate concentration are necessary to cause the disease, which has a very low reported occurrence.

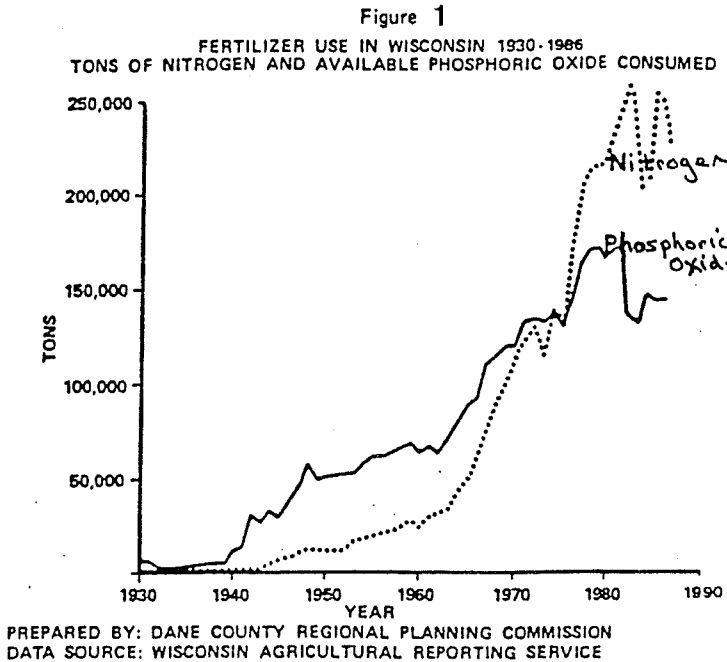
Some epidemiological studies have shown significant relationships between nitrate consumption in drinking water and gastric cancer incidence in Columbia and Chile, though there is currently no conclusive evidence that nitrate or associated compounds are responsible for human cancer. Studies also indicate that nitrate in drinking water typically comprises only a small percentage of the total nitrate intake in an individual's diet. Most of the total comes from vegetables and cured or processed meats rather than drinking water. Nevertheless, the 10 mg/l public drinking water standard remains endorsed by federal and state government.

Prior to this study, investigations have shown that approximately 30-40 percent of the private domestic wells tested in the county have nitrate levels above the 10 mg/l level (Morgan, 1969; MMSD, 1986; WDNR, 1985). No municipal wells in the county have tested above the standard. Compared to private wells, the lower nitrate concentrations in municipal wells are probably due to greater well casing depths and stricter adherence to well construction codes.

Nitrate-nitrogen is highly soluble in water and is not appreciably adsorbed to soil particles, thus it can seep readily through the soil and into groundwater. Since nitrate in groundwater may be derived from several sources and travel considerable distances, its exact source is not always easy to identify. Sources of nitrate include on-site wastewater systems, animal feedlots, landfills, sludge and septage, lawn and agricultural fertilizers, silage juice and decaying plant debris.

Elevated levels of nitrate in Dane County's shallow groundwater system are suspected to be the result of both local and widespread pollution sources. While high nitrate levels have been associated with certain rural subdivisions, the high areawide concentration may be the result of increased nitrogen fertilizer use in the past 30 years (see Figure 1). Stream baseflow data strengthen this assumption. Analysis of the mean baseflow concentrations of nitrate-nitrogen for Dane County streams shows significantly higher concentrations in recent years than

concentrations recorded prior to 1960. The most apparent explanation for the increase in baseflow nitrate concentrations is that significant amounts of nitrate have leached into the shallow groundwater system from agricultural fertilization practices. This has been recognized in other states, such as Nebraska and Iowa. Other sources of nitrate are usually localized and are probably not sufficient to explain the widespread increase of nitrogen in stream baseflow. No direct (well water quality) data are available which display an increasing nitrate trend in the county's groundwater.



**DNR, DHSS differ on nitrate standards for drinking water**

The Wisconsin Departments of Natural Resources (DNR) and Health and Social Services (DHSS) are currently taking different positions regarding recommended limits on nitrate in drinking water for pregnant women. The DHSS is currently recommending that pregnant women avoid consuming water with more than 10 mg/l nitrate-N, while the DNR recommends that only infants less than 6 months of age not consume water containing this concentration of nitrate-N.

DHSS recently sent a letter to Wisconsin health care providers clarifying its position on consumption of drinking water containing nitrate by pregnant women. The letter states,

"Limited scientific evidence suggests that exposure to nitrates during pregnancy may increase the risk of certain developmental abnormalities - principally neural tube defects and cleft palate. Because of these concerns, the Division of Health currently recommends that pregnant women avoid using water with more than 10 mg/l nitrate-N."

However the DNR, which has regulatory authority over water supplies, has still not determined its position on this question. They have been advised by the EPA Office of Drinking Water that the evidence is not strong enough to warrant such a recommendation.

When the public becomes informed about the DHSS recommendation, people may change their thinking and behavior regarding nitrate contamination of drinking water. This behavior may affect decisions ranging from purchases of water treatment and filtration devices to purchases of homes whose wells contain nitrate. For an update on this issue, contact Chris Mechenchor Jo Carlson at the Central Wisconsin Groundwater Center at 715/346-4270.

## STUDY METHODOLOGY

The geographic extent of this study encompasses the nine townships of central Dane County. These are: Blooming Grove, Burke, Dunn, City of Fitchburg, City and Town of Madison, Middleton, Springfield, Verona and Westport. These municipalities contain most of the rural subdivisions in the county.

State Lab of Hygiene test results for private and some noncommunity (e.g., school, church and restaurant) wells were collected from Dane County Public Health Division's Environmental Health files. For the Town of Burke, state Department of Natural Resource (DNR)-Bureau of Water Supply and Madison Metropolitan Sewerage District (MMSD) test results were also compiled. Water samples were taken between January 1980 and March 1993. Multiple samples from the same year were not included. Test results for approximately 1500 wells were recorded. Since nitrate testing of private domestic wells is not mandatory, the number of samples varies widely by subdivision and township. Most subdivisions were not adequately sampled for statistical analyses. The most common reasons noted by well owners for sampling were pregnancy and infant concerns as well as property transfers.

Sample results were recorded by subdivision and section in each township. Mean values for each subdivision and section were determined as well as the number of wells exceeding the 10 mg/l standard. In addition, average lot sizes for each subdivision and each cluster of wells (i.e., close group of three or more) were calculated from large-scale plat maps (scale 1"=400').

## SUMMARY OF RESULTS

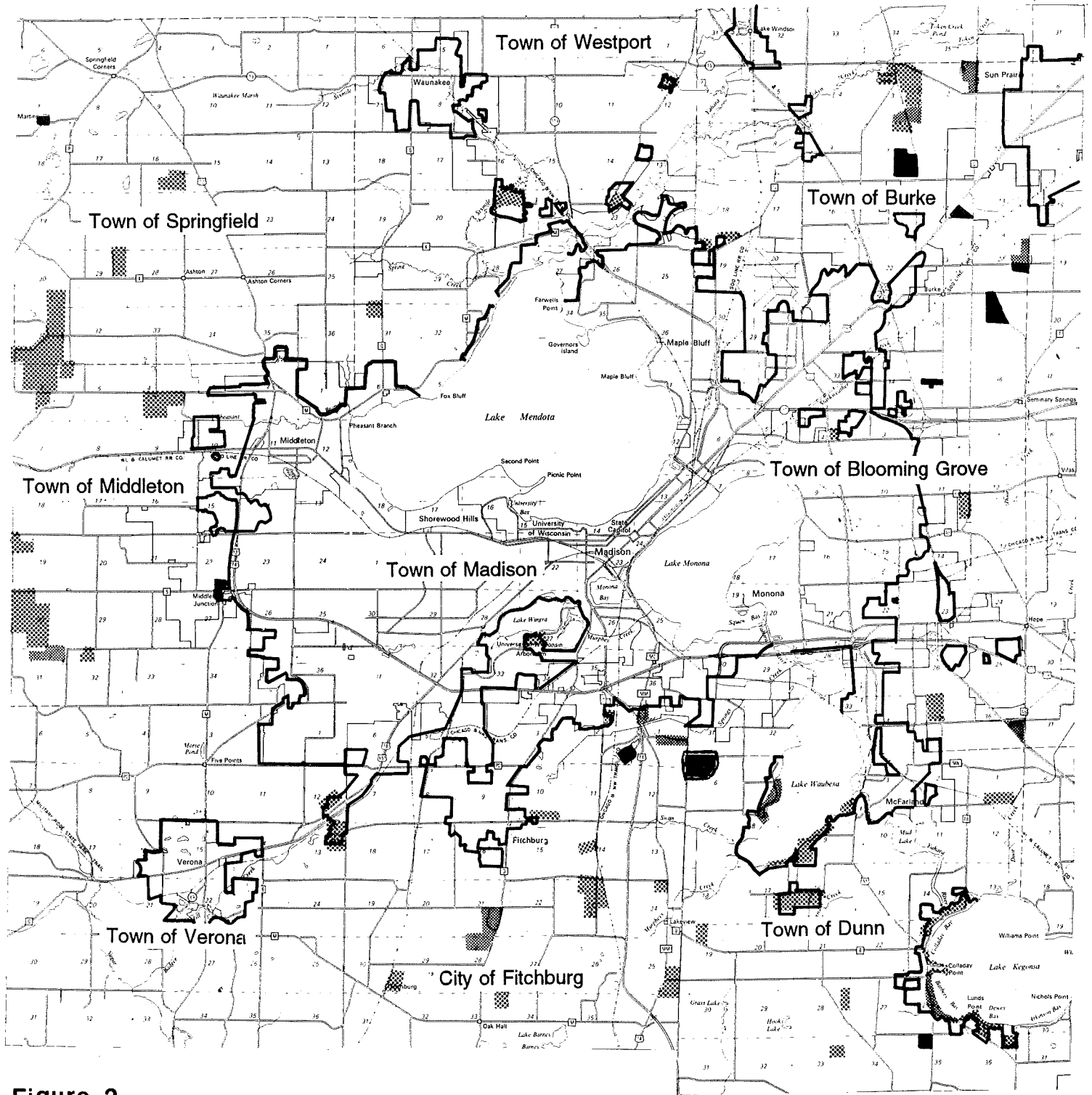
Table 1 presents nitrate test results by municipality. The mean value for each municipality is indicated as well as the percentage of wells exceeding the 10 mg/l standard. Most of the subdivisions with the highest percentage of wells above 10 mg/l are found in eastern townships of the study area. The Town of Burke has both the highest mean concentration (9.26 mg/l) and percentage of wells (43%) that exceed the drinking water standard, followed by the Towns of Verona, Blooming Grove and Dunn. The Town of Middleton has the lowest mean concentration (5.24 mg/l) and percentage of samples (11%) testing over 10 mg/l. In all, 24.8 percent of the sampled wells exceed the drinking water standard, with the mean value being 7.34 mg/l. Appendix I contains summarized nitrate data by subdivision and section for each township.

TABLE 1  
NITRATE TEST RESULTS BY MUNICIPALITY

<u>Municipality</u>	<u>No. of Samples</u>	<u>Mean Concentration (mg/l)</u>	<u>%&gt;10mg/l</u>	<u>#&gt;10mg/l</u>
Town of Blooming Grove	101	7.47	22.0	22
Town of Burke	382	9.26	43.2	165
Town of Dunn	277	7.02	22.0	61
City of Fitchburg	139	7.30	20.0	28
Town of Madison	8	2.08	0.0	0
City of Madison	6	6.51	17.0	1
Town of Middleton	205	5.24	11.0	23
Town of Springfield	133	5.67	15.8	21
Town of Verona	86	8.50	26.0	22
Town of Westport	170	5.77	18.0	31
<b>TOTAL</b>	<b>1507</b>	<b>7.34</b>	<b>24.8</b>	<b>374</b>

Figure 2 displays subdivisions and clusters of wells categorized by the percentage of samples testing above the nitrate standard. Results indicate there is a greater correlation of nitrate concentration by location than by lot size. Several subdivisions showed consistently high or low levels. Some subdivisions with large lot sizes (over 1 acre) have a high percentage of wells exceeding the 10 mg/l standard, and others with relatively small lots (0.5 acre or less) have few wells exceeding the standard. This is the opposite of what would be expected, since lower nitrate concentrations as a result of dilution should generally be associated with lower-density housing and septic systems.

Well construction (i.e., well casing depth), potential contaminant sources and local geologic conditions were not evaluated as part of this analysis, so reasons for the variation in nitrate levels are speculative. One possible explanation for the variation could be the functionality or placement of on-site wastewater (septic tank) systems. Some of the subdivisions with high numbers of wells exceeding the nitrate standard were built in the 1960s. Their nitrate levels could be higher due to several potential reasons, such as less stringent septic tank siting rules prior to 1975, subsequent system deterioration or failure, or simply a longer period of time with sustained nitrate discharges. Additional analyses could explore nitrate loadings over time from on-site wastewater systems in subdivisions.






**Figure 2**

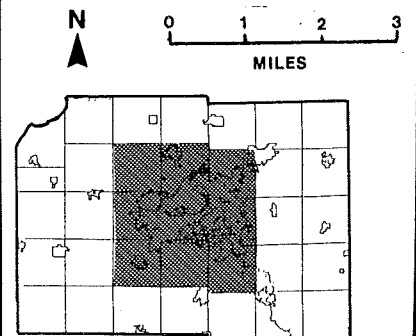
**Nitrate - Nitrogen Levels in Rural Subdivisions and Clustered Development Central Dane County, Wisconsin.\***

\* Based on sites where at least 3 well samples are recorded

Percent of Tested Wells Exceeding 10 mg./l.

-  0 - 24%
-  25 - 49%
-  more than 49%

— 1993 Sanitary Sewer Service Areas of MMSD Verona & Sun Prairie



Prepared by DCRPC, 8/93.

## CONCLUSIONS

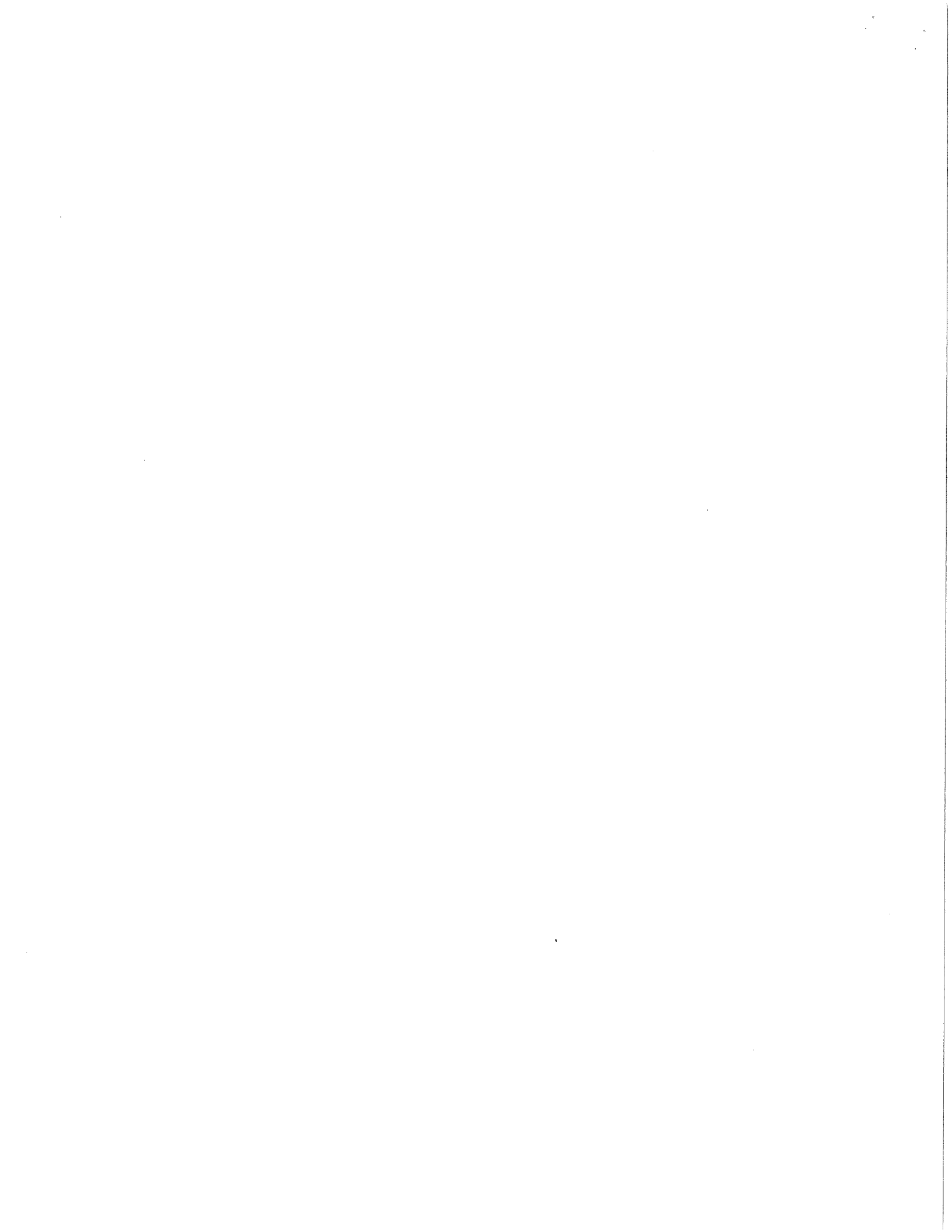
To conclude, this study confirms there are elevated nitrate-nitrogen levels in groundwater in central Dane County, with approximately one quarter of the tested wells exceeding the recommended public drinking water standard. There are areas, particularly in the Towns of Burke and Dunn and the City of Fitchburg, with consistently high nitrate levels, and the variation by location may be used to stress more comprehensive sampling or management planning approaches in the future.

One possible management approach to address high nitrate concentrations associated with on-site wastewater systems is to provide sanitary sewer service. Figure 2 displays the proximity of rural subdivisions and clusters of private wells to existing sewer service areas. Sanitary sewers have already been extended to several of these subdivisions. The extension of sewer service could be considered for other selected developments where cost effective and desirable.

However, extension of sanitary sewers to replace on-site wastewater systems will not necessarily reduce the well nitrate levels enough to meet standards. A more direct and effective solution, in some cases, may be to provide a better protected water supply source by replacing shallow private wells with deeper community-type wells that are less likely to withdraw water with high nitrate concentrations. Wellhead protection areas around these wells should be established, which identify potential pollution sources and specific measures to protect groundwater quality. Aggressive educational efforts also can be undertaken to inform private well owners of methods to limit the use of lawn and agricultural fertilizers. In addition to reducing nitrogen inputs, this can provide economic benefits. For example, in Iowa between 1980 and 1990 every dollar spent on educating farmers on how to use fertilizer more efficiently saved them eight dollars in fertilizer costs (USEPA, 1992).

## REFERENCES CITED

- Dane County Regional Planning Commission, 1987. Groundwater Protection Plan Dane County, Wisconsin. Appendix G of the Dane County Water Quality Plan. 142 pp. plus appendices.
- Madison Metropolitan Sewerage District, 1986. Metrogro file, draft letter to Wisconsin Department of Natural Resources on voluntary groundwater data, February 13, 1986.
- Morgan, R.T., 1969. Memo to Dane County Public Health Committee and County Board of Supervisors. 2nd annual activity report. February 15, 1969. 3 pp. plus appendices.
- United States Environmental Protection Agency, 1992. News-Notes, March 1992. No. 19. 27 p.
- Wisconsin Department of Natural Resources, 1985. Wisconsin Groundwater Coordinating Council annual report to the legislature. August, 1985.



**APPENDIX I**

**NITRATE DATA FOR TOWNSHIPS  
BY SECTION AND SUBDIVISION**

**NITRATE DATA FOR THE TOWN OF BLOOMING GROVE**

**OVERALL DATA**

Section	Total No. of Samples 101	Mean Concentration (mg/l) 7.47	Percent of Samples Over 10 mg/l 22
1	2	11.5	50
2	1	11.9	100
3	1	9.9	0
4	11	7.67	0
11	15	7.9	67
12	2	14.6	100
13	5	10.68	20
14	4	5.58	0
16	1	8.2	0
24	3	6.23	0
26	1	13	100
32	3	0.48	0
35	41	7.16	19.5
36	12	6.17	25

**DATA FOR SUBDIVISIONS**

Section	Subdivision Name	Average Lot Size (Acres)	No. of Samples	Mean Concentration (mg/l)	Percent of Samples Over 10 mg/l
11	Rambling Acres	.41	12	7.05	17
35	April Hill	.34	41	7.16	19.5
36	Freeway Manor	.80	10	6.79	33

Source: Dane County Environmental Health Files  
 Collected: March 1993

**NITRATE DATA FOR THE TOWN OF BURKE**

**OVERALL DATA**

Section	Total No. of Samples 382	Mean Concentration (mg/l) 9.26	Percent of Samples Over 10 mg/l 43.2
1	1	2.5	0
2	43	10.6	47
3	75	7	27
4	5	6.5	20
5	4	3.8	0
8	8	7.6	25
9	14	12.4	86
10	94	10.5	50
12	3	3.8	0
13	1	14.2	100
14	7	10.7	71
15	1	8.5	0
16	4	14.4	100
19	14	1.6	0
22	15	12.5	86.7
23	8	6.8	12.5
24	22	11.2	45.5
25	11	11.6	55
26	11	11.7	55
27	7	10.4	57
28	1	16.5	100
34	6	7.9	16.6
35	8	11.5	25
36	16	9.4	44

**DATA FOR SUBDIVISIONS**

Section	Subdivision Name	Average Lot Size (Acres)	No. of Samples	Mean Concentration (mg/l)	Percent of Samples Over 10 mg/l
2	Foxmoor Hills	0.95	41	10.1	46
3	The Ledges	0.7	34	6.2	15
	Stony Ridge	0.8	20	7.8	40
	Terrace Parklands	1.14	7	4.4	0
10	Rattman	1.21	60	11.4	63
	Sunburst	0.8	31	8.7	19
19	James Taff*	0.5	12	1.35	0
24	Oak Ridge Plat	1.5	15	8.3	33
	Sunny Burke Hts.	1.21	7	17.3	71
35	Bridle Downs	1.4	4	11.4	50

\* James Taff has inconsistent lot sizes.

Sources: Dane County Public Health Files, Wisconsin DNR, and MMSD.

**NITRATE DATA FOR THE TOWN OF DUNN**

**OVERALL DATA**

Section	Total No. of Samples 277	Mean Concentration (mg/l) 7.02	Percent of Samples Over 10 mg/l 22
1	5	3.29	0
2	2	21.9	100
4	3	<.27	0
5	12	9.86	33
6	18	15.13	72
7	5	11.8	60
8	16	16.48	75
9	37	6.68	19
10	4	1.37	0
11	1	13.8	100
13	1	<.5	0
14	14	1.41	0
15	1	13.4	100
16	29	7.08	3
17	10	6.56	20
18	1	6.2	0
19	18	7.76	5
20	3	7.97	33
21	4	1.77	0
23	17	0.67	12
25	11	1.67	0
26	15	5.58	33
27	2	9.45	0
28	6	3.69	0
30	2	7.7	50
31	4	5.64	0
32	2	<.38	0
33	5	3.75	0
34	2	9.95	50
35	7	8.39	29
36	16	2.6	6

**DATA FOR SUBDIVISIONS**

Section	Subdivision Name	Average Lot Size (Acres)	Total No. of Samples	Mean Concentration (mg/l)	Percent of Samples Over 10 mg/l
4	CMP-Leonard-Babcock	0.27	3	<.27	0
5	Waubesa Beach	0.58	12	9.86	33
6	Meadowview	1.14	15	13.45	67
8	Morris Park, Etc.	0.41	16	18.09	75
8	Brixton Park	0.2	3	4.7	0
9	All Subs	0.32	37	6.68	19
14	Olsonia	0.74	2	1.74	0
14	Orvold Park	0.49	12	1.1	0
16	Waubesa Hts, Burm.Woods	0.53	12	6.3	0
17	Simpson-Gilbertson	0.57	10	6.56	20
19	Oregon Hts.	0.93	16	7.73	6
23	Colladay Pt.	0.48	14	4.68	14
23	Orvold Park	0.81	3	<.6	0
25	All Subs	0.32	9	1.96	0
26	All Subs	0.32	14	5.52	36
28	Lally's Oak View	1.29	6	3.69	0
31	Raylew Meadows	0.74	2	4.3	0
33	Burning-Dunwood	1.01	5	3.75	0
35	Kegonsa Manor	0.93	3	13.6	67
36	Kegonsa Heights	0.7	2	<.5	0
36	CC Park	0.45	9	3.11	11

Source: Dane County Environmental Health Files  
 Collected: March 1993

**NITRATE DATA FOR THE CITY OF FITCHBURG**

**OVERALL DATA**

Section	Total No. of Samples 101	Mean Concentration (mg/l) 7.3	Percent of Samples Over 10 mg/l 20
1	13	5.4	0
2	9	9.4	33
5	2	5.85	0
6	1	9.3	0
7	1	2.3	0
10	6	8.44	0
11	4	14.78	75
12	5	17.1	80
13	2	10.9	50
14	6	4.99	0
15	2	9.35	50
18	3	14.3	67
20	3	7.79	33
21	12	6.74	25
22	3	12.67	67
23	14	5.41	7
24	10	6.61	10
25	10	6.87	10
26	1	9.7	0
27	2	2.8	0
28	6	4.23	33
29	1	4.6	0
30	5	5.74	20
33	16	5.67	12.5
36	2	5.79	0

**DATA FOR SUBDIVISIONS**

Section	Subdivision Name	Average Lot Size (Acres)	Total No. of Samples	Mean Concentration (mg/l)	Percent of Samples Over 10 mg/l
14	Tarpleywick Hills	0.56	3	4.57	0
21	Country Heights	0.45	7	6.75	29
22	Hillside Heights	0.89	1	5.2	0
23	Oakhaven	0.73	14	5.41	7
24	Morning Sun	0.5	10	6.61	10
28	Country Vineyard	1.2	6	4.23	33
33	Briarwood	0.59	14	5.06	7

Source: Dane County Environmental Health Files  
 Collected: March 1993

**NITRATE DATA FOR THE TOWN OF MIDDLETON**

**OVERALL DATA**

Section	Total No. of Samples	Mean Concentration (mg/l)	Percent of Samples Over 10 mg/l
	205	5.24	11
1	2	2.34	0
2	1	5.4	0
4	37	4.01	2.7
5	4	5.41	25
6	44	2.97	0
9	2	9.75	50
13	1	6.9	0
15	1	4.2	0
16	1	7	0
17	4	6.47	0
18	5	4.77	0
19	11	6.18	18.2
20	2	9.23	50
21	2	11.5	100
22	7	12.11	57.1
27	4	10	50
29	6	12.69	50
30	48	3.72	0
31	4	9.62	25
32	9	6.47	11.1
33	3	12.9	66.6
34	5	8.36	20
35	1	6.46	0

**DATA FOR SUBDIVISIONS**

Section	Subdivision Name	Average Lot Size (Acres)	Total No. of Samples	Mean Concentration (mg/l)	Percent of Samples Over 10 mg/l
4	Hickory Woods	1.29	33	3.85	12.1
6	Delwood Hills	1.37	3	3.93	0
6	Enchanted Valley/ Pine Manor Estates	0.99	36	2.84	19.4
18	Longview Heights	0.89	2	3.9	0
19	Moraine View	0.7	2	3.65	0
19	Pleasant Point/ Prairie Vista	0.69	5	5.32	0
27	Applewood Hills	0.88	1	3.2	0
30	Cherrywood	0.73	46	3.73	0
31	Denson Plat/ Malmaison	1.46	4	9.62	25
32	Valleyview Woods	0.87	7	5.38	0

Source: Dane County Environmental Health Files

**NITRATE DATA FOR THE TOWN OF SPRINGFIELD**

**OVERALL DATA**

Section	Total No. of Samples	Mean Concentration (mg/l)	Percent of Samples Over 10 mg/l
	133	5.67	15.80
1	2	6.25	50
2	1	2.40	0
3	4	4.95	0
4	9	1.48	0
5	1	6.90	0
6	2	4.55	0
7	6	9.38	57.1
9	3	3.03	0
10	2	2.65	0
11	2	7.10	50
12	3	7.00	0
14	1	13.10	100
15	7	9.36	28.57
16	15	4.59	13.33
17	2	2.30	0
18	2	10.70	100
19	1	2.70	0
20	2	3.50	0
22	6	5.98	16.7
26	1	13.70	100
27	4	10.13	50
28	1	0.80	0
29	17	8.19	11.76
31	28	3.48	0
32	2	10.65	50
33	1	14.60	100
35	5	6.52	0
36	2	0.60	0

**DATA FOR SUBDIVISIONS**

Section	Subdivision Name	Average Lot Size (Acres)	Total No. of Samples	Mean Concentration (mg/l)	Percent of Samples Over 10 mg/l
4	Springfield Woods	1.7	2	0.65	0
11	Harvest Hill	1.9	2	7.10	50
16	Hickory Highlands	2.4	11	3.90	0
29	Prestige Hills/ Scenic Ridge Estates	1.06	12	6.83	0
31	Sunrise Ridge/ Hunters Run\	2.68	28	3.48	0
35	Enchanted Valley Farms Cherry Hill Estates	1.53	2	3.65	0

Source: Dane County Environmental Health Files  
 Collected: January, 1993

**NITRATE DATA FOR THE TOWN OF VERONA**

**OVERALL DATA**

Section	Total No. of Samples 86	Mean Concentration (mg/l) 8.5	Percent of Samples Over 10 mg/l 26
3	3	10.9	67
5	5	3.8	0
6	5	4.8	20
7	3	20.3	100
8	2	6.21	0
9	3	3.3	0
10	5	10.8	40
11	1	6.5	0
12	8	7	12.5
13	8	7.6	12.5
15	5	4.7	0
17	3	22	33
18	1	3.3	0
20	2	15.6	50
21	2	14.3	0
22	4	7	50
23	2	14.8	100
24	5	17.8	80
25	3	6.2	0
27	1	2	0
28	2	5.3	0
29	2	3.7	0
30	1	5.3	0
31	1	1.7	0
32	2	9.7	50
33	1	0.8	0
34	2	19	50
35	1	0.5	0
36	3	3.3	0

**DATA FOR SUBDIVISIONS**

Section	Subdivision Name	Average Lot Size (Acres)	Total No. of Samples	Mean Concentration (mg/l)	Percent of Samples Over 10 mg/l
13	Wendellwood/ Pleasant Acres	1.4	7	6.5	0

Source: Dane County Environmental Health Files

**NITRATE DATA FOR THE TOWN OF WESTPORT**

**OVERALL DATA**

Section	Total No. of Samples 170	Mean Concentration (mg/l) 5.77	Percent of Samples Over 10 mg/l 18
1	1	1	0
2	2	20.6	50
3	4	14	100
4	5	8.94	60
5	5	1.77	0
6	5	2.68	0
8	1	6.9	0
9	3	12.7	100
10	6	10.8	50
12	16	5.63	6.3
13	3	11.1	67
14	2	14.8	100
15	1	11.4	100
16	5	4.9	0
17	5	18.1	100
21	44	2.47	2.3
22	17	2.61	5.9
23	13	8.43	23.1
24	1	0.3	0
28	6	2.67	0
29	4	3.9	0
30	1	0.5	0
31	11	6.03	18.2
32	3	10.9	33
33	6	3.8	0

**DATA FOR SUBDIVISIONS**

Section	Subdivision Name	Average Lot Size (Acres)	Total No. of Samples	Mean Concentration (mg/l)	Percent of Samples Over 10 mg/l
12	Riverview Gardens	0.7	8	5.6	0
21	Mary Lake **	0.8	44	2.5	2
23	Yahara Heights	0.9	9	8.4	22
31	Larwood Hills	0.9	10	6.2	20

\* Levels reported as <.5 were calculated as .5mg/l.

\*\* Mary Lake has private wells but is on public sewer.

All other Subdivisions had an insignificant number of samples.

Source: Dane County Environmental Health Files

