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Schwalbe, John
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GROUNDWATER
Wisconsin's
buried treasure

Wisconsin Department of Natural Resources

RESEARCH AND DATA ANALYSIS OF GROUNDWATER CONTAMINATION FROM MUNICIPAL RAPID INFILTRATION LAND DISPOSAL SYSTEMS

Submitted in partial fulfillment of
the requirements of the Degree of Master of
Science, Civil and Environmental Engineering.

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JOHN SCHWALBE

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INTRODUCTION

Municipal Rapid Infiltration Land disposal systems (RI systems) have been used for over 100 years for the disposal of treated municipal sewage. Rapid Infiltration systems are also called seepage cells or absorption ponds. RI systems were developed as a cost effective method to dispose of a variety of wastewaters. The EPA design manual on RI systems describes the RI process as an application of treated wastewater to highly permeable soils followed by rapid percolation of the wastewater vertically or laterally away from the point of application. [10]

The EPA manual reports the following uses for the treated water:

1. Groundwater recharge.
2. Recovery of renovated water by wells or underdrains with subsequent reuse or discharge.
3. Recharge of surface streams by interception of the groundwater.
4. Temporary storage of renovated water in the aquifer.

There are 131 municipalities in Wisconsin with Wisconsin Pollution Discharge Elimination System permits (WPDES permits) for land disposal of treated effluent. Sixty of the permitted sites that use RI systems were included in the research (See Table 1). The remaining 71 municipalities were excluded because they either accept industrial wastes or use an RI system in conjunction with a surface discharge or underground absorption system. WPDES permits are issued to all municipalities and industries that discharge any type of waste. WPDES permits for RI systems include

Table 1 Facility listing

Municipalities using Rapid Infiltration Land Disposal Systems, (RI systems) for disposal of secondary treated municipal sewage.	
ADELL, VILLAGE	NEW AUBURN, VILLAGE OF
ALMA CENTER, VILLAGE OF	NORTHERN MORAINE UTILITY COMM.
ALMOND VILLAGE	OSSEO SEWAGE TREATMENT PLANT
AMERICAN BAPTIST ASSEMBLY	PARDEEVILLE WATER & SEWER
ARENA VILLAGE	PITTSVILLE WATER AND SEWER DEPT.
BALSAM LAKE	PLAINFIELD, VILLAGE OF
BARRON SEWAGE PLANT	SAUK-PRAIRIE SEWERAGE COMM.
BIRCHWOOD, VILLAGE OF	SHELL LAKE
BOYCEVILLE, VILLAGE	SOLON SPRINGS
BOYD SEWAGE TREATMENT PLANT	SPOONER SEWAGE TREATMENT PLANT
BRUCE WATER & SEWER UTILITY	TURTLE LAKE, VILLAGE OF
CECIL, VILL OF	UNITY, VILLAGE OF
CENTURIA, VILLAGE OF	WAUSAUKEE WATER & SEWER UTILITY
COCHRANE SEWAGE TREATMENT PLANT	WAUTOMA, CITY OF
CRANDON WATER & SEWER UTILITY	WILD ROSE, VILLAGE OF
CRIVITZ SANITARY DISTRICT	WILLIAMS BAY VILLAGE OF
EVANSVILLE	WINTER VILLAGE OF
FAIRCHILD, VILLAGE	WI-DVA VETERANS HOME
FALL CREEK	WOODVILLE VILLAGE OF
FLORENCE MUNICIPAL SEWER SYSTEM	LAKE GENEVA
FRANCIS CREEK	LAKE WAPOGASSET-BEAR TRAP
FREDERIC SEWAGE TREATMENT PLANT	LONE ROCK, VILLAGE OF
GLENWOOD CITY	LUCK SEWAGE TREATMENT PLANT
GOODMAN SANITARY DISTRICT #1	MELLEN SEWAGE TREATMENT PLANT
GRANTSBURG, VILLAGE	MERRIMAC, VILLAGE OF
HAMMOND, VILLAGE OF	MILLTOWN SEWAGE TREATMENT PLANT
HAYWARD SEWER AND WATER UTILITY	MILTON
IRON RIVER SANITARY DISTRICT #1	MINONG, VILLAGE OF
KELLY LAKE S.D. #1	MOUNT CALVARY
MUSCODA, VILLAGE OF	MOUNT TELEMARK LODGE

Table 2 RI system design requirements.

Parameter	Requirement
Max. Hydraulic Loading	90,000 gl/ac/day
Max. BOD Loading	37.5 lb/ac/day
Min. Depth to Water Table	5 feet
Min. Depth to Bedrock	10 feet

Table 3 NR 140 Groundwater limits

PARAMETER	Preventive Action Limit	Enforcement
TDS	250 MG/L	500 MG/L
NO2 & NO3-N	2 MG/L	10 MG/L
CHLORIDE	125 MG/L	250 MG/L
ORGANIC-N	Increase of 2 MG/L over background	
AMMONIA	Increase of 2 MG/L over background	

limitations on the level of contamination that can occur in the aquifer beneath the RI system. These permits set forth a monitoring program for each facility to insure they are complying with the standards set forth in Wisconsin Administrative code NR140 (Referred to as NR140). [15]

Tables 2 and 3 list the Wisconsin Administrative code NR110, NR206, and NR140 regulations for municipal RI systems.

The department is required to take remedial action in cases where an enforcement limit is exceeded within the boundaries of a given facilities Design Management Zone (DMZ). (NR140.26) The DMZ for municipalities with RI systems is at the property boundary or 250 feet from the point of application of effluent. The department requires monitoring from two to four times each year for municipalities with RI systems. The data set generated from this monitoring program extends over the last fifteen years. Additional required monitoring at each facility includes weekly sampling of influent and effluent for Biochemical Oxygen Demand (BOD) and Suspended Solids (SS).

Figure 1 gives the distribution of pretreatment systems. Figures 2 and 3 give the distribution of soil types and design flows for the 60 facilities studied. The majority of RI systems use aerated lagoons for pretreatment and have sandy soils.

The research was performed in two parts. For part one, the existing data for RI systems were analyzed and compared to the results of a monitoring program performed for the research. The second part of the research was to study the potential for monitoring groundwater for coliforms and to perform an initial survey of the extent of contamination

FIGURE 1 PRETREATMENT TYPES

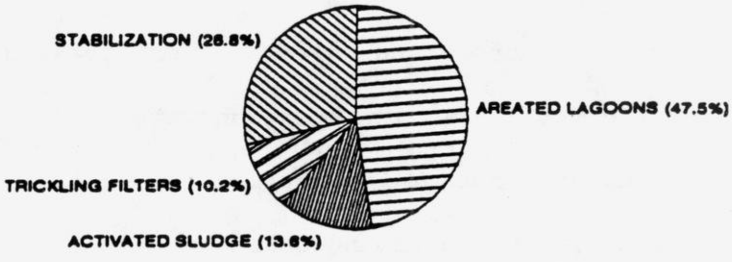


FIGURE 2 DISTRIBUTION OF SOIL TYPES

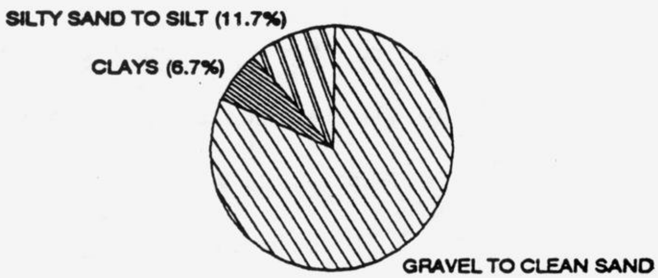
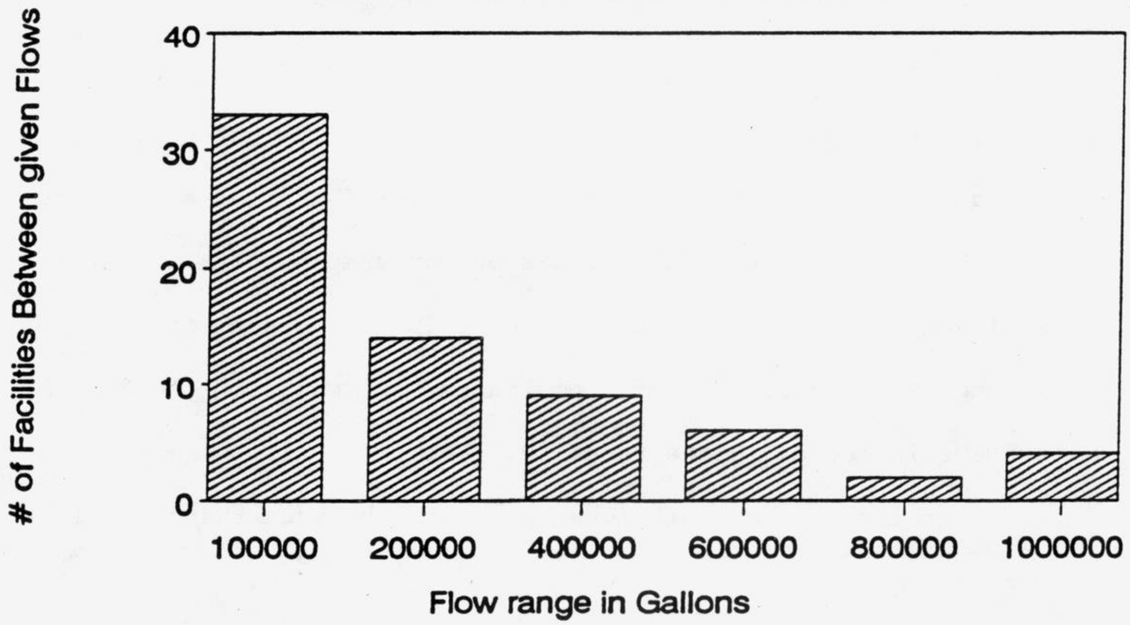


FIGURE 3 RI SYSTEM FLOW RANGES



of groundwater by coliforms at RI systems. Presently none of the 131 municipal facilities with permits to use land disposal of treated effluent are required to monitor for coliforms in the groundwater. This is mainly due to the lack of a reliable method to retrieve an unbiased sample from the groundwater. The Wisconsin groundwater quality code, NR140, standard for total coliforms is < 1 per 100 ml sample.

METHOD OF RESEARCH

The research was performed in the following sequence:

1. Available literature was studied and a literature search was performed with the University of Wisconsin computerized reference search program. The search was for literature published in the last ten years on groundwater monitoring at treatment plants using land disposal for final discharge of treated effluent. The literature review section of the report discusses the findings.
2. A data analysis of all available data collected by the Wisconsin Department of Natural Resources (DNR) for RI systems was performed. The data consisted of sampling results from influent monitoring, effluent monitoring, in-plant monitoring, groundwater sampling, and compliance surveys for the 60 RI systems included in the research. The analysis was performed to determine if any relationships exist between the following variables:
   A. Effluent quality and groundwater quality
   B. Level of pretreatment and effluent quality

C. Level of pretreatment and groundwater quality

D. Plant design and water quality

E. Effluent loadings and compliance with NR140

The data set consisted of 18,000 groundwater samples; 38,000 effluent samples; and the various design variables for each facility.

3. A monitoring program of influent and effluent at 20 RI systems representative of the 60 included in the research was performed. Samples were collected according to DNR sampling procedures and analyzed at the State Laboratory of Hygiene, Madison, Wisconsin. Sample analysis was for the parameters listed in Table 3 plus BOD and SS. Samples were collected during late winter (3/2/88 - 4/11/88) and spring (4/11/88 - 5/18/88) to determine seasonal effects.

4. A preliminary economic analysis of various treatment schematics that could reduce the occurrence of non complying RI systems, was performed.

5. For the second part of the research (Coliform groundwater study) a similar approach was taken:

   A. Available data were collected and a computerized reference search was performed.

   B. A coliform monitoring program was performed concurrently with the previously discussed program. The coliform monitoring program was designed to test various sampling procedures and determine if the results were biased due to outside contamination.

C. The sampling procedure determined most reliable was used to perform a preliminary survey of coliforms in groundwater at RI systems.

SUMMARY OF RESULTS

Data Analysis

Sixty percent of the municipalities using RI systems in Wisconsin have elevated levels of TDS, chlorides, or nitrates in background wells.

Over 70% of the RI systems studied had exceedances of regulatory limits that require remedial action to correct the problem.

The analysis of the effluent data did not show any significant statistical correlations to the groundwater data being collected for RI systems.

Statistical analysis showed that a relationship exists between the hydraulic loading rate to seepage cells and the increase in ammonia levels in downgradient well samples. The relationship showed that a hydraulic loading of less than 20,000 gallons/acre/day (gad) is required to keep the ammonia level below the 2 mg/l increase over background that is setforth in NR140. The current regulation for hydraulic loading is <90,000 gad.

Influent and Effluent Sampling Program

The nitrogen speciation of the effluent sampled was comprised of ammonia during the winter and 1/2 ammonia + 1/2 nitrates in the spring. The monitoring program found that pretreatment during the winter removed only 32% of the total nitrogen from the influent. One month later the nitrogen removal was up to 69% in the samples collected of influent and effluent.

Site visits revealed that although all facilities had sufficient seepage area to meet requirements, the actual hydraulic loading of the seepage cells at many facilities occurs over only a portion of the cell, resulting in excessive hydraulic loadings to that portion of the cell.

Coliform study results

Soil samples collected near monitoring wells contained sufficient total coliforms and fecal streptococcus bacteria to contaminate sampling equipment. The results of all future monitoring for coliforms must consider all sources of potential contamination. Sources of contamination found during the research include; transfer equipment, monitoring well protective cases, soil, aerosols in mist, etc.

Sixteen of the 25 wells samples had detects of either total coliforms or fecal streptococcus. Only two of these wells had levels above 100/100ml.

CONCLUSIONS/RECOMMENDATIONS

The analysis of the groundwater data collected at RI systems showed that there are many limitations on the usefulness of the groundwater data. These limitations are a result of:

1. Nonrepresentative sampling due to spatial variability: Groundwater sampling gives results for only the area adjacent to the well screen. If the water bearing units being recharged by RI systems are nonhomogeneous, preferential flow paths will exist. This makes finding and monitoring contaminated groundwater difficult.

2. Varied well construction potentially causing varying levels of surface contamination.
3. Seasonal variability: With monitoring only twice per year seasonal trends are not determined.
4. Insufficient wells: The average per facility is only three.
5. Insufficient monitoring: The average monitoring frequency is twice/year.

The data analysis indicates a need to redefine monitoring requirements for RI systems. The inherent limitations of groundwater monitoring previously discussed make it necessary to determine the quality of effluent before it enters the groundwater. The monitoring program showed that by monitoring the influent and effluent of RI systems for parameters other than BOD and SS (i.e. nitrates & nitrites, chlorides, ammonia, and TDS) it is possible to evaluate the efficiency of pretreatment and the potential for groundwater contamination before it occurs. The current monitoring program for BOD and SS does not provide the necessary information about the dissolved inorganics in effluent to estimate the impact that a given effluent will have on the groundwater.

With only 32% removal of nitrogen during pretreatment in the winter, RI systems with average influent concentrations of total nitrogen (determined to be 32 mg/l) will not comply with NR140 at all points in the groundwater. Given the quality of effluent that is being applied to RI systems in Wisconsin during the winter, the soil systems that comprise the unsaturated zone beneath the seepage cells would have to effectively remove 50% of the nitrogen and total dissolved solids in the infiltrating wastewater for these systems to comply with NR140. The objective of 50% removal of total dissolved solids cannot be met in a groundwater system. The monitoring program showed that during the winter months (November through April) 50% nitrogen removal is also not occurring in the RI pretreatment systems. As a result, the limit of 10 mg/l for nitrates & nitrites in the groundwater has been shown to be a limit on the total nitrogen of effluents discharged to RI systems during the winter. This is due mainly to the minimal treatment capabilities of a soil system and the final conversion of all nitrogen forms to nitrates and nitrites. The fact that many of the RI systems are not nitrifying during the winter months could be overcome by storing wastewater during the winter and treating during the summer. The possibility of underdraining seepage cells to recover and treat nitrified effluent is also an option.

Coliform Study

With the current permitting system and monitoring programs only TDS, nitrates, nitrites, and chloride exceedances are used as groundwater quality standards in cases where remedial action is required. These parameters are ineffective as a regulating tool due to the high percentage of facilities with elevated background conditions and poor monitoring networks. Unlike TDS, nitrates, nitrites, and chloride, continually elevated coliform counts in a monitoring well would only occur if a significant source of coliforms was entering the groundwater on a regular basis. (Inorganic parameters will remain in an aquifer for extended periods, making background contamination from distant sources possible.) Using coliforms as an indicator of contamination from these systems would be a useful tool to determine if an RI system is impacting the background wells. Further research should be directed towards answering the following questions:

1. Are the low levels of coliforms found in monitoring wells representative of residual populations or actual groundwater concentrations? (The possibility that bacteria may adhere to surfaces and dislodge during purging should be researched.)
2. What would be the main objective of bacterial monitoring? If bacterial data were to be used as an indicator of a potential health hazard from pathogens, the value of coliforms as an indicator of pathogens in a groundwater environment would have to be researched. There exists much controversy over the use of coliforms as an indicator of pathogenic contamination in groundwater. Virus and certain pathogenic bacteria will survive longer in the groundwater and be more resistant to stress in an aquifer. These two facts preclude the accuracy of coliforms as indicators of pathogens in the groundwater.

Sampling for coliforms with a reliable procedure has the following advantages.

1. It is an indicator of groundwater contamination from secondary treated municipal effluent.
2. The analytical procedure costs half of conventional inorganics.
3. The test is run the day of collection with results in 48 hours.
4. Storage and handling involve only cooling the sample. Filtering or preserving are not required.

Under current regulations detection of even one coliform in a groundwater sample is a violation of NR140. If a standard for monitoring coliforms in the groundwater is adapted by the State of Wisconsin the research indicates that many facilities will be in violation of there WPDES permit.

LITERATURE REVIEW

There are four parameters listed in Wisconsin's groundwater quality code NR140 that are present in RI system effluent which represent a potential threat to the health of the general public:

1. Nitrates
2. Total dissolved solids (TDS)
3. Chloride
4. Total coliforms

These four parameters are classified as Health and Welfare parameters in Wisconsin's groundwater quality code NR140. There are two limits of groundwater contamination set for all health and welfare parameters: a Preventive Action Limit (PAL), and an Enforcement Standard (ES). The PAL is used as an indicator of a potential problem. The ES is used as an indicator that a problem already exists in the form of unsafe drinking water.

Background on NR140 Limits

The four parameters mentioned above are used to regulate the quality of groundwater in Wisconsin through enforcement actions taken by the

Department of Natural Resources when exceedances of these parameters are documented. The range of enforcement actions that can be taken are as follows. (Refer to Wisconsin's Administrative code NR140.26. [15])

Table 4

1. Revision of the operational procedures at the facility.
2. Change in the design or construction of the facility.
3. Alternate method of waste treatment or disposal.
4. Prohibition or closure and abandonment of a facility.
5. Remedial action to renovate or restore groundwater quality.
6. Revision of rules or criteria on facility design, location or management practices.

Action number 1 assumes that operational procedures will remedy the current problem. For the parameters TDS and chloride, current technologies are cost prohibitive for their treatment. In a paper by Dave Sauer P.E. (Revised Total Dissolved Solids, "White Paper" June 1988) [14] two important issues concerning TDS and chloride are introduced:

1. The existing background levels of TDS in the groundwaters impacted by RI systems are generally above the preventive action limit of 250 mg/l for TDS, and in many cases above the enforcement standard of 500 mg/l. Ninety-five percent of the municipalities with RI systems in the southeast corner of Wisconsin have had exceedances of the TDS enforcement standard. This corresponds to the area of Wisconsin that has the highest background concentrations of TDS.

2. Due to the nature of the soil systems present at RI systems

there will not be any effective treatment of TDS or chloride after these parameters enter the soil system. For chloride, this is due to the negative charge associated with the ionic form that allows it to travel freely through soils. For total dissolved solids, the system is more complex and involves the solubility of various minerals associated with the soil. In many cases wastewater affecting the carbonate system within the soil will have an increase in TDS as the wastewater infiltrates to the groundwater.

The most effective method for removing the major ions associated with total dissolved solids in wastewaters is with ion exchange resins. Due to the presence of both cationic and anionic contaminants in wastewater this method would involve a multi-step process with the appropriate resins.

Discussion of Nitrates & Nitrites

Due to the seriousness of the actions required by Wisconsin's Groundwater Quality Code NR140.26 for facilities exceeding health or welfare limits, the DNR began researching the two remaining parameters of health concern applicable to RI systems: total coliforms and nitrates. The research on total coliforms is presented in the second half of this report. The results of a monitoring survey are presented as well as three literature reviews in the form of case studies.

There are four methods of nitrogen removal used to a varying degree for treatment of municipal and industrial wastewater:

1. Breakpoint chlorination
2. Selective ion exchange for ammonium removal

3. Airstripping for nitrogen removal

4. Biological nitrification/denitrification

Processes 1-3 have been applied successfully on a very limited scale. The reader is referred to the EPA's design manual on Nitrogen Control, 1975. [10] A simple economic analysis of three existing plants (each incorporating either method 1, 2, or 3), shows that the annual operating costs far exceed the amortized capital cost (Amortization was done over 20 years at an annual rate of 8%.) [10])

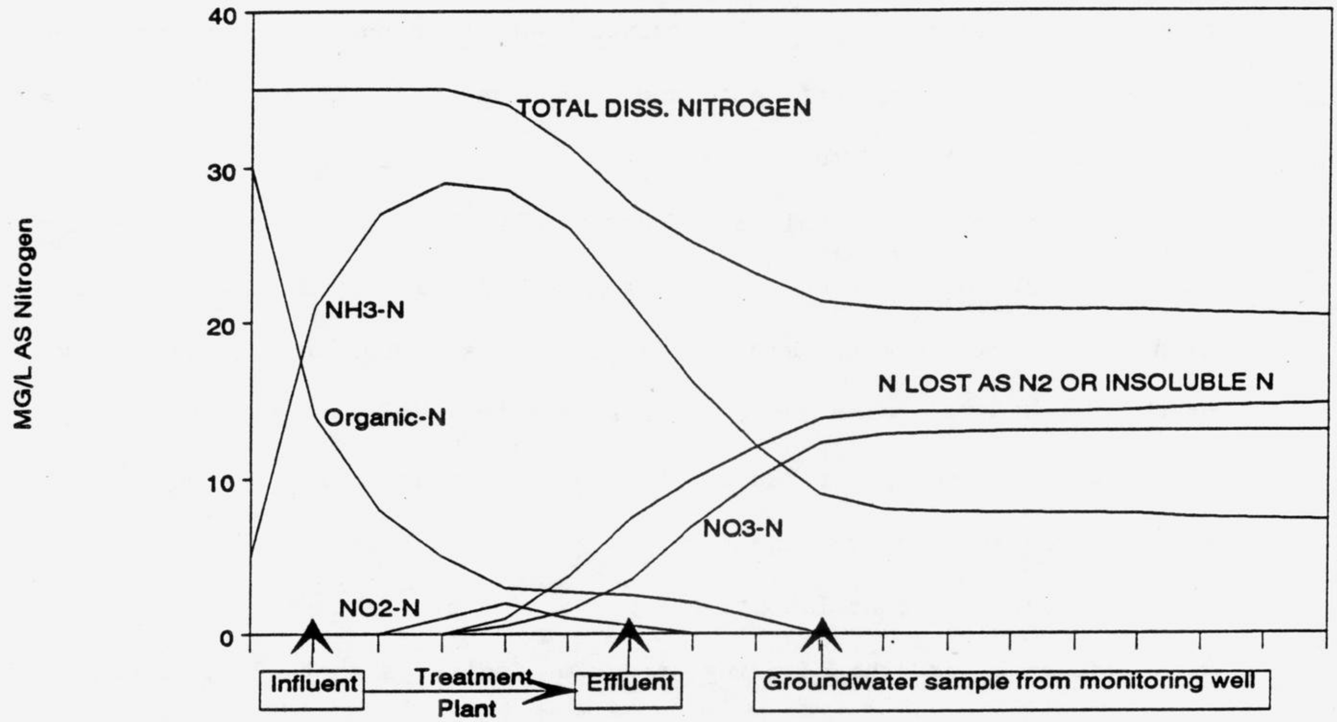
For small communities this would require more money to be spent on labor, chemicals, transport of various side streams, electricity, and maintenance than would be spent on the construction of the treatment facility. The annual operating costs of maintenance and labor present the most difficulty for small communities upgrading a treatment plant. Capital costs have in the past been reduced through federal grants and loans. With the current switch over to a "loan only" funding system small communities with limited financial resources will not be able to finance high technology treatment systems that require a substantial initial investment, followed by expensive annual operating costs. Biological nitrification followed by denitrification treatment methods that take advantage of existing unit processes are the alternatives most likely to be feasible for small communities forced to meet stringent nitrogen limits in effluent discharged to RI systems.

Biological Nitrification/Denitrification

Figures 4 and 5 illustrate the speciation of nitrogen as it travels through a treatment plant and into the groundwater (winter and spring

FIGURE 4 Dissolved Nitrogen Speciation

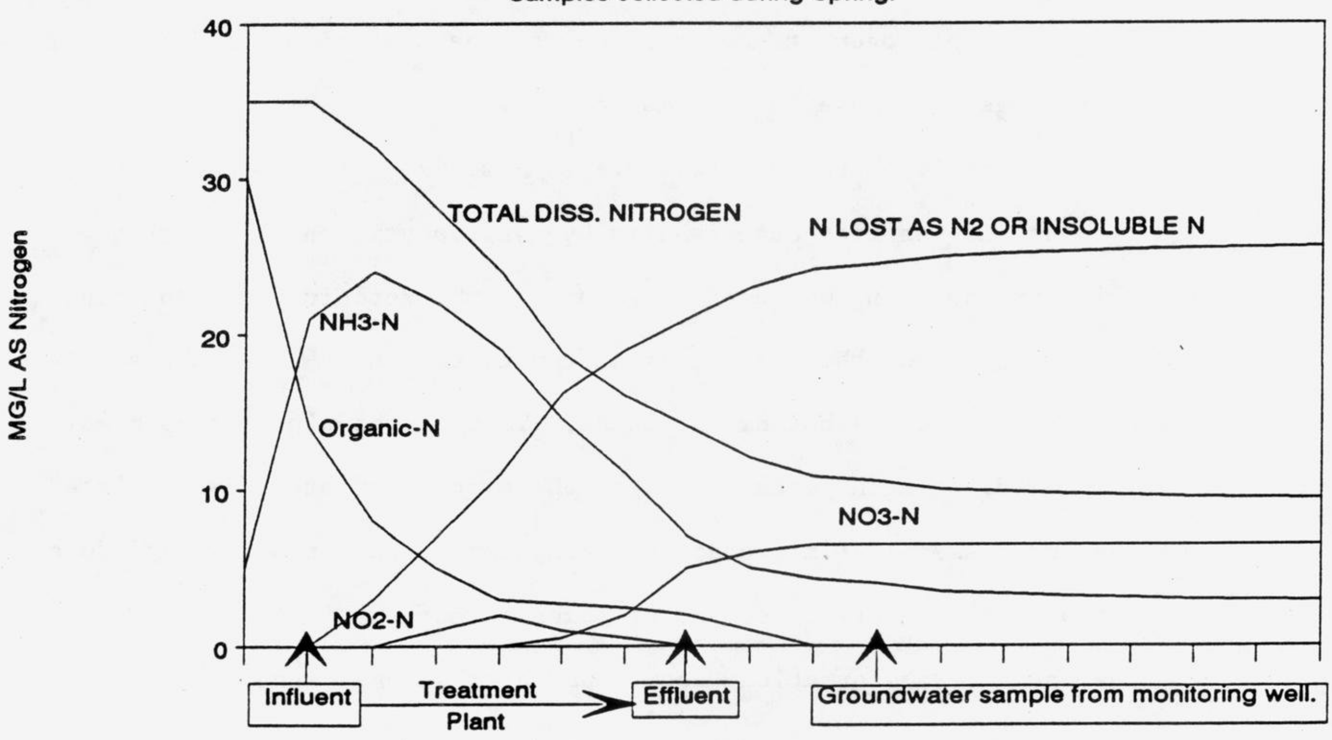
Samples collected during Winter.



RI System N Treatment during Winter

FIGURE 5 Dissolved Nitrogen Speciation

Samples collected during Spring.



RI System N Treatment during Spring.

conditions, respectively). The curves were extrapolated from sampling results of influent, effluent, and groundwater at RI systems. These samples were collected for the research, during the winter and spring of 1987-88. The nitrogen values illustrated by the initial portion of the curve correspond to values for nitrogen found in municipal facilities using RI systems in Wisconsin. The entire graph would be representative of the fate of nitrogen as it breaks down from organic nitrogen in raw sewage to nitrogen gas released to the environment. If the horizontal axis is used as relative time then the graph can be used to determine the level of treatment that is obtained by various pretreatment systems. The data gathered for the sampling program indicates that RI systems in Wisconsin primarily convert the influent organic nitrogen to ammonia during pretreatment in the winter. The complete nitrification of ammonia to nitrates will only occur in the soil or groundwater in these systems.

The first nitrogen transformation is the biological breakdown of organic nitrogen by bacteria to ammonia.

Organic nitrogen + Bacteria -- Ammonia

This process is carried out readily by saprophytic bacteria that are naturally present in wastewater under both aerobic and anaerobic conditions. Some of the organic matter will remain in an undigestible form and settle to the bottom as sludge. This reserve of nitrogen may, if not removed, be transported through the system and breakdown in later treatment processes. (This phase of treatment occurs readily and does not control the rate of subsequent nitrogen transformations.)

The next transformation occurs as nitrosomonas and nitrobacter bacteria convert the ammonium ion to nitrite (NO2-) and nitrate (NO3-) respectively: (During this transformation some of the ammonium is assimilated as cell tissue and accumulates as sludge.)

1. **Ammonium + oxygen + nitrosomonas bacteria ---**
   nitrite + hydrogen + water

2. **Nitrite + oxygen + nitrobacter bacteria -- nitrate**

This transformation will occur in all aerobic treatment plants with proper aeration and sufficient sludge residence times. The sampling program of facilities with RI systems in Wisconsin revealed that few of the pretreatment systems took the nitrification step to completion. This was due to an unfavorable environment for nitrosomanos and nitrobacter bacteria caused by low temperatures and short sludge residence times. The presence of ice cover also restricted the availability of oxygen. Past research by the EPA and DNR has revealed that aerated lagoons, trickling filters, and activated sludge pretreatment systems in Wisconsin will take the nitrification step to completion during warm weather if all design criteria and guidelines are followed. The reader is referred to The EPA's design manuals on Stabilization Ponds, Aerated Lagoons, Trickling Filters and a DNR research study on the operating conditions at the wastewater treatment plant for the city of Evansville, Wisconsin [8], [11], [12]. The fact that many of the RI systems are not nitrifying during the winter months could be overcome by storing wastewater during the winter and treating during the summer.

The possibility also exists that many of the RI systems will not nitrify during the summer months. This conclusion is based on observations of several facilities that were compromised by low dissolved oxygen and short sludge residence times. For these systems an increase in aeration and sludge residence times would be required.

The possibility of underdraining the seepage cells to recover nitrified effluent is also an option. This is listed as one of the original purposes of RI systems in the EPA RI guidance document. [11]

For RI systems the limit of 10 mg/l for nitrate and nitrite (measured as nitrogen) in the groundwater has been shown to be a limit for total nitrogen in the effluents discharged to RI systems. This conclusion is drawn from work done by past researchers (Siegrist, Hargett, and Anderson, and column studies by Lance and Whistler) that show the total nitrogen applied to soil will undergo minimal nitrogen removal before ending up as nitrate or nitrite in the groundwater. [8], [13]

The conversion of ammonia to nitrate and nitrite in aerobic soils and groundwaters is well documented. For the case of RI systems this will present a problem in the form of exceedances of Wisconsin's groundwater quality code NR140. As a result, facilities using RI systems will have to reduce the total nitrogen level of discharged effluent to less than 10 mg/l to comply with NR140 at all points in the groundwater. To meet this level of treatment RI systems will have to perform an additional biological denitrification step that removes the nitrates as nitrogen gas. The energy reaction is as follows:

1. Nitrite + oxygen --- nitrate
2. Nitrate + organic carbon source (Electron Donor) ---

nitrogen gas + carbon dioxide + water + OH-

Reaction 2 requires anaerobic conditions. When sufficient combined hydrogen is not present the preferred source is to add methanol. The costs of using methanol as an energy source for denitrification can be derived from empirical equations developed for the methanol demand of wastewaters. [10]

Methanol required (mg/l) = 2.47*(nitrate concentration) + 1.53*(nitrite concentration) + 0.87*(initial dissolved oxygen)

(all concentrations are mg/l)

The level of treatment obtained in the unsaturated zone has yet to be determined. EPA studies at Boulder Colorado report 90% of the total nitrogen entering an RI system showed up as nitrate in the groundwater. [10] Nitrogen removal studies in soil columns by Lance and Whistler, 1972, could not achieve greater than 30% nitrogen removal. [8] The column studies also illustrated the cation exchange capacity of certain soils for ammonia. During the study, large amounts of ammonium were absorbed in the column and later released as nitrates. Large scale studies by Siegrist, Hargett, and Anderson, demonstrated a complete leaching through of all ammonia to the groundwater when anaerobic conditions existed in the soil beneath RI systems. [13]

In summary none of the RI systems in Wisconsin will be able to meet the required levels of nitrogen removal during the winter months (November - April) unless some level of denitrification or alternate nitrogen removal is employed. For most facilities the solution will involve either switching to surface discharge, implementing some form of nitrification/denitrification treatment, or storing wastewater during the winter for treatment during the summer.

DATA ANALYSIS OF DNR RECORDS ON RI SYSTEMS

Background

Currently 131 municipalities have WPDES permits that require some form of groundwater monitoring for RI Systems. Monitoring requirements for RI systems are outlined in Wisconsin Administrative codes NR110, NR206, and NR140.

The current monitoring requirements for municipalities using RI systems for land disposal of secondary treated municipal sewage are as follows:

1. Weekly sampling of the effluent for Biochemical Oxygen Demand (BOD) and Suspended Solids (SS).
2. Weekly sampling of the influent for BOD and SS.
3. Daily flow measurements.
4. Groundwater monitoring according to each facilities' WPDES permit. (Usually from one to four times per year.)
5. Hydraulic loading rate (Flow/unit area of seepage cell).

The resulting data set consisted of 18,000 groundwater samples, 38,000 effluent samples, and various design variables for each facility.

Source of Data

The following data sets were included in the data analysis:

1. Groundwater Data (WPDES permit monitoring program):

This data set was generated from approximately 3,000 samples of groundwater collected at the sixty facilities included in the research. Each sample was analyzed for nitrates, nitrites, TDS, chlorides, ammonia, and organic nitrogen amounting to 18,000 total analysis. The municipalities averaged 3.2 wells with 14 samples collected at each well since 1978.

2. Weekly samples of the influent and effluent (WPDES permit monitoring program). Each sample was analyzed for BOD and SS. Flow rate was also measured.
3. Compliance Maintenance Annual Report (CMAR). The DNR requires municipalities to send CMARs in annually. Data collected with the CMAR include a scoring system for various parameters which the DNR uses to evaluate facility performance.
4. Permit files containing maps and various design information as well as applicable limits.

Method

To facilitate the data review, all data were converted into files compatible with the LOTUS 123 system. A complete listing of all facilities permitted for land disposal is in Appendix A.

For the analysis, all of the available data from influent monitoring, effluent monitoring, in-plant monitoring, groundwater sampling, and compliance surveys were collected and summarized to determine if any relationships exist between the following variables:

1. Effluent quality and groundwater quality

2. Level of pretreatment and effluent quality
3. Level of pretreatment and groundwater quality
4. Plant design and water quality
5. Effluent loadings and compliance with NR140

By finding any relationships that exist between the above parameters it would be possible to identify operation and design variables of RI systems that affect compliance with Wisconsin's Administrative Groundwater Quality Code NR140. The following steps were used to evaluate the data:

1. For step 1 of the data analysis all of the groundwater data were checked for exceedances of NR140 preventive action limits and enforcement standards. All data for the 131 facilities permitted for land disposal of treated wastewater were checked. (After this step, 71 of the facilities were excluded from the research because they either had industrial wastewater contributions or used RI in conjunction with another effluent disposal type.)
2. For step 2, the 60 facilities included in the research were ranked according to exceedances of various parameters and the resulting lists were compared to soil type, pretreatment type, and design considerations. The groundwater data were analyzed by dividing the number of exceedances by the number of samples for each parameter. This gave a number that could be used to compare the exceedances of Wisconsin Administrative Code NR140 groundwater quality standards at one facility to other

facilities. Then by ranking the sites according to this average number of exceedances of NR140 groundwater standards, comparisons on the effectiveness of various design considerations could be made on a site by site basis. (Design considerations include treatment processes, detention times, unit sizings, etc.) These comparisons were then analyzed to reveal which design considerations are the most important for compliance with NR140.

3. For step 3, the groundwater data for the 60 facilities included in the research was analyzed according to type of pretreatment.
4. For step 4, the sixty facilities were prioritized according to the score each facility received for average levels of the following parameters: flow exceedances, BOD loading, SS loading, and various groundwater parameters. The scoring system was from the DNR's priority system for effluent parameters. The groundwater parameters were scored according to exceedances of NR140. The data set consisted of 18,000 groundwater samples, 38,000 effluent samples, and the various design variables for each facility. (I.e. flow rate, pretreatment type etc.)
5. For step 5, all groundwater data prior 1986 was omitted to check if improvements in pretreatment efficiency occurred.
6. For step 6, site maps of all facilities were obtained and groundwater flow directions were calculated from groundwater elevation information available on the DNR mainframe computer.

All background data were then omitted. All sites with elevated background concentrations were also deleted from the data set. The resulting data set contained only results from downgradient wells at facilities without elevated background conditions.

7. For step 7, the data from wells that were not directly downgradient were deleted from the data set. This reduced the groundwater data set to 720 samples from 30 facilities.

   The following guidelines were used to make the data set and choose the facilities that would be included in this step of the research.

   A. Sites chosen had to have appropriate background and downgradient wells, determined by both location and parameter concentrations.

   B. The impact from the RI system was calculated as the increase in downgradient concentrations over background concentrations.

   C. Hydraulic loadings were determined from effluent flow data and the surface area of the infiltrating seepage.

   D. Only 1986 and 1987 groundwater data was used.

Results:

The results of steps 1 and 2 of the data analysis did not reveal any significant relationships between the groundwater quality, effluent quality, or design variables. The research found that more than 25% of the facilities are in violation of NR140 enforcement standards, and more than 65% percent of the TDS samples were above the NR140 preventive action limit. Tables 5 and 6 summarize the results.

The data sets analyzed during step 3 did not reveal any relationship between type of pretreatment and groundwater quality. Table 7 summarizes the results.

For step 4 of the data analysis, the facilities were ranked according to the score each facility received for average levels of the following parameters: flow exceedances, BOD loading, SS loading, and various combinations of groundwater parameters (See Table 8 for an explanation of the scoring system.). The scoring system allows each facility to be prioritized according to the ranking that it received for a given parameter. Because the scoring was linear according to the number of exceedances of NR140 limits, the effect of various parameters, and/or combinations of parameters, could be added and compared to other combinations of parameters. To show the effect of comparing various parameters, the columns in Table 8 have been plotted against one another as X and Y coordinates (See Figures 6 and 7). Each figure shows if there is a correlation between the given parameters plotted. Figure 6 should reveal if there is any correlation between the combined effluent scores and the combined groundwater scores (columns 1 and 7 in Table 8). Figure 7 would show if there is a correlation between the level of BOD discharged to a seepage cell and the organic nitrogen and ammonia in the groundwater. Similar comparisons were made for the remaining parameters. No relationships were determined from the data used for the scoring system shown in Table 8.

TABLE 5 Percentage of all groundwater samples greater than NR140 Preventive Action Limit

Parameter	% Of Samples > Preventive Action Limit	Preventive Action Limit
NO3 NO2-N	38%	2 mg/l
ORGANIC-N	13%	2 mg/l
NH3	18%	2 mg/l
CHLORIDES	18%	125 mg/l
TDS	65%	250 mg/l

Percentage of all groundwater samples greater than NR140 Enforcement Standard

Parameter	% Of Samples > Enforcemen Standard	Enforcement Standard
NO2 NO3-N	11%	10 mg/l
CHLORIDES	4%	250 mg/l
TDS	25%	500 mg/l

TABLE 6 SUMMARY OF GROUNDWATER EXCEEDANCES

PARAMETER		ALL DATA	ONLY DATA FROM 1986-87	ONLY DG WELLS And Data from 86-87
NO2 & NO3 -N				
PERCENT	>2 (PAL)	37.5%	41%	35%
	>10 (ES)	11%	9%	6%
NUMBER OF SAMPLES		2628	782	311
ORGANIC NITROGEN				
PERCENT	>2 (PAL)	12.5%	13%	14%
NUMBER OF SAMPLES		2407	782	285
AMMONIUM-N				
PERCENT	>2 (PAL)	17.7%	12%	20%
NUMBER OF SAMPLES		2650	782	309
CHLORIDE				
PERCENT	>125 (PAL)	17.5%	18.5%	19%
	>250 (ES)	3.3%	2.3%	3%
NUMBER OF SAMPLES		2668	782	310
TDS				
PERCENT	>250 PAL	65%	74%	75%
	>500	25%	30%	30%
NUMBER OF SAMPLES		2554	738	293

TABLE 7

Summary sheet of groundwater data for Municipal Wastewater treatment plants with RI systems. (All Data)

TREATMENT TYPE	AVERAGE DESIGN FLOW Gallons/Day	AVERAGE DESIGN HYD LDG Gl/Ac/Day	PERCENT OF SAMPLES > X			
			NO. SAMPLES	% TDS >250	% NOX >2	% CL >125
ACTIVATED SLUDGE (EIGHT PLANTS)	400,000	161,060	340	76	33	30
AERATED LAGOONS (TWENTY EIGHT PLANTS)	307,017	166,314	1,031	63	50	22
STAB PONDS (SEVENTEEN PLANTS)	97,882	122,413	471	70	25	6
TRICKLING FILTERS (SIX PLANTS)	101,350	53,053	163	77	37	4

TABLE 8 EFFLUENT & GROUNDWATER DATA ANALYSIS

(ONLY DATA FROM 1986 AND 87 WAS USED TO COMPILE THE FOLLOWING TABLE)

THE ANALYSIS INVOLVED SCORING THE QUALITY OF VARIOUS WASTE STREAMS AS FOLLOWS:

COL. 1 SCORES WERE DEVELOPED FROM DNR CMAR REPORTS. THE SCORING SYSTEM IS DEFINED IN THE REPORTS WHICH THE DNR SENDS TO EACH FACILITY ANNUALLY.

COLUMN 2; BOD SCORES ARE FROM DNR MONITORING. SCORE=(1 FOR EVERY 5MG/L OVER 10)/# OF SAMPLES.
COLUMN 3; SS SCORES ARE FROM DNR MONITORING. SCORE=(1 FOR EVERY 5MG/L OVER 10)/# OF SAMPLES.
(EFFLUENT BOD AND SS SAMPLING ARE REQUIRE WEEKLY AT ALL RI SYSTEMS.)

COLUMNS 4, 5, AND 6 WERE CALCULATED FROM DOWNGRADIENT WELL DATA FOR; TDS, CL, SO4, NH3, ORG-N, AND NOX. SCORED AS FOLLOWS:
TDS CL AND SO4 SCORE = (1 FOR EACH MG/L ABOVE THE PAL, 1 FOR EACH MG/L ABOVE THE ES)/# SAMPLES
NH3, ORG-N, AND NOX SCORE=(1 FOR EACH MG/L ABOVE 2 MG/L, 4 FOR EACH MG/L ABOVE 10)/# SAMPLES

	EFFLUENT PARAMETERS				GW PARAMETERS		
COLUMN	1	2	3	4	5	6	7
FACILITY NAME	FLOW	BOD	SS	1+2+3	ALL	N's	ORG-N & NH3
ADELL, VILLAGE	0	43	22	65	88	67	133
ALMOND VILLAGE	35	55	59	149	0	0	0
AMERICAN BAPTIST ASSEMBLY	0	19	13	32	56	33	33
ARENA VILLAGE	20	40	54	114	11	11	0
BALSAM LAKE	0	17	34	51	0	0	0
BARRON SEWAGE PLANT	0	38	40	78	106	167	250
BOYCEVILLE, VILLAGE	60	52	44	156	28	11	0
BOYD SEWAGE TREATMENT PLANT	50	80	80	210	11	22	0
BRUCE WATER & SEWER UTILITY	0	24	18	43	28	44	67
CECIL, VILL OF	80	34	29	143	42	22	8
CENTURIA, VILLAGE OF	0	39	24	63	22	11	0
COCHRANE SEWAGE TREATMENT PLANT	5	21	52	78	67	100	0
CRANDON WATER & SEWER UTILITY	0	57	36	93	90	143	214
CRIVITZ SANITARY DISTRICT	65	30	26	121	78	122	183
EVANSVILLE	0	26	27	52	68	56	4
FAIRCHILD, VILLAGE	40	37	35	112	17	33	25
FALL CREEK SEWAGE TREATMENT PLANT	0	32	9	41	56	83	0
FLORENCE MUNICIPAL SEWER SYSTEM	5	11	12	29	58	83	0
FOX LAKE	5	40	17	63	50	33	13
FRANCIS CREEK	30	13	12	54	61	50	0
FREDERIC SEWAGE TREATMENT PLANT	0	64	36	100	22	11	17
GLENWOOD CITY	5	13	31	49	17	0	0
GOODMAN SANITARY DISTRICT #1	25	37	37	99	17	6	17
GRANTSBURG, VILLAGE	80	40	46	166	29	13	25
HAMMOND, VILLAGE OF	0	33	27	60	38	42	13
HAYWARD SEWER AND WATER UTILITY	0	27	7	35	17	10	0
IRON RIVER SANITARY DISTRICT #1	65	39	44	149	44	61	92
KELLY LAKE S.D. #1	20	20	35	75	117	167	250
LAKE GENEVA	0	2	1	3	47	40	16
LONE ROCK, VILLAGE OF	0	37	34	71	11	22	17

TABLE 8 EFFLUENT & GROUNDWATER DATA ANALYSIS

(ONLY DATA FROM 1986 AND 87 WAS USED TO COMPILE THE FOLLOWING TABLE)

THE ANALYSIS INVOLVED SCORING THE QUALITY OF VARIOUS WASTE STREAMS AS FOLLOWS:

COL. 1 SCORES WERE DEVELOPED FROM DNR CMAR REPORTS. THE SCORING SYSTEM IS DEFINED IN THE REPORTS WHICH THE DNR SENDS TO EACH FACILITY ANNUALLY.

COLUMN 2; BOD SCORES ARE FROM DNR MONITORING. SCORE=(1 FOR EVERY 5MG/L OVER 10)/# OF SAMPLES.
COLUMN 3; SS SCORES ARE FROM DNR MONITORING. SCORE=(1 FOR EVERY 5MG/L OVER 10)/# OF SAMPLES.
(EFFLUENT BOD AND SS SAMPLING ARE REQUIRE WEEKLY AT ALL RI SYSTEMS.)

COLUMNS 4, 5, AND 6 WERE CALCULATED FROM DOWNGRADIENT WELL DATA FOR; TDS, CL, SO4, NH3, ORG-N, AND NOX. SCORED AS FOLLOWS:
TDS CL AND SO4 SCORE = (1 FOR EACH MG/L ABOVE THE PAL, 1 FOR EACH MG/L ABOVE THE ES)/# SAMPLES
NH3, ORG-N, AND NOX SCORE=(1 FOR EACH MG/L ABOVE 2 MG/L, 4 FOR EACH MG/L ABOVE 10)/# SAMPLES

	EFFLUENT PARAMETERS				GW PARAMETERS		
COLUMN	1	2	3	4	5	6	7
FACILITY NAME	FLOW	BOD	SS	1+2+3	ALL	N's	ORG-N & NH3
LUCK SEWAGE TREATMENT PLANT	0	13	10	23	22	11	0
MELLEN SEWAGE TREATMENT PLANT	80	48	23	150	22	0	0
MERRIMAC, VILLAGE OF	25	8	13	46	50	44	17
MILLTOWN SEWAGE TREATMENT PLANT	0	12	7	19	83	33	50
MILTON	0	34	28	62	111	122	67
MINONG, VILLAGE OF	0	15	14	30	33	66	0
MOUNT CALVARY	10	3	13	26	75	42	63
MUSCODA, VILLAGE OF	45	39	58	142	44	78	117
NEW AUBURN, VILL OF	0	40	24	64	6	0	0
NORTHERN MORAINE	0	7	0	8	67	33	0
OSSEO SEWAGE TREATMENT PLANT	5	37	16	58	61	122	83
PARDEEVILLE	60	46	42	148	50	22	33
PITTSVILLE WATER AND SEWER DEPT.	80	9	10	99	44	83	83
PLAINFIELD, VILLAGE OF	10	23	35	68	33	56	0
SAUK-PRAIRIE SEWERAGE COMMISSION	0	28	58	86	117	133	200
SHELL LAKE SEWAGE TREATMENT PLANT	0	28	19	47	8	0	0
SOLON SPRINGS, VILLAGE OF	0	0	0	0	0	0	0
SPOONER SEWAGE TREATMENT PLANT	0	54	54	108	39	56	83
TURTLE LAKE, VILLAGE OF	15	4	11	30	19	5	15
UNITY, VILLAGE OF	20	28	47	96	0	0	0
WAUSAUKEE WATER & SEWER UTILITY	75	34	57	166	72	78	117
WAUTOMA, CITY OF	80	46	30	155	17	17	0
WILD ROSE, VILLAGE OF	40	72	73	185	54	92	0
WIS STATE DVA-VETERANS HOME	20	13	11	44	11	11	33
WOODVILLE VILLAGE OF	10	38	11	59	20	13	0

Figure 6

Effluent score vs G W Score

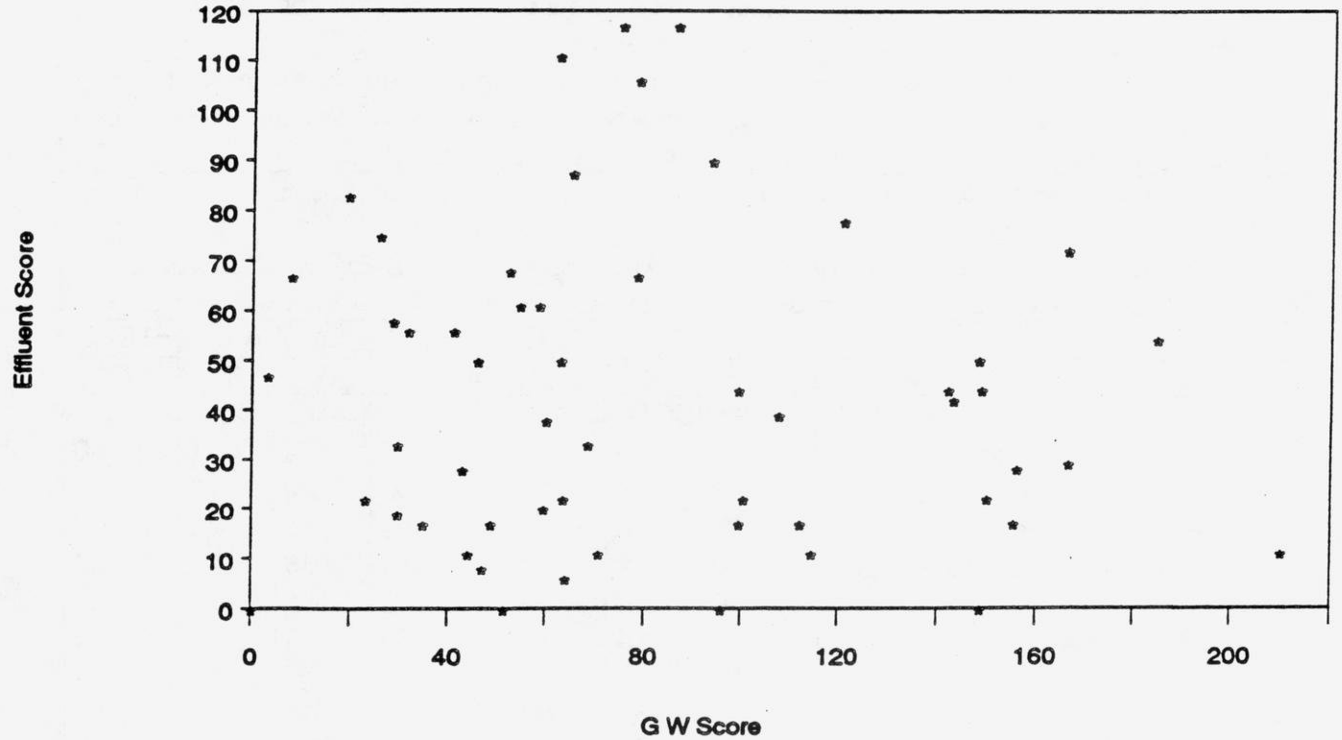
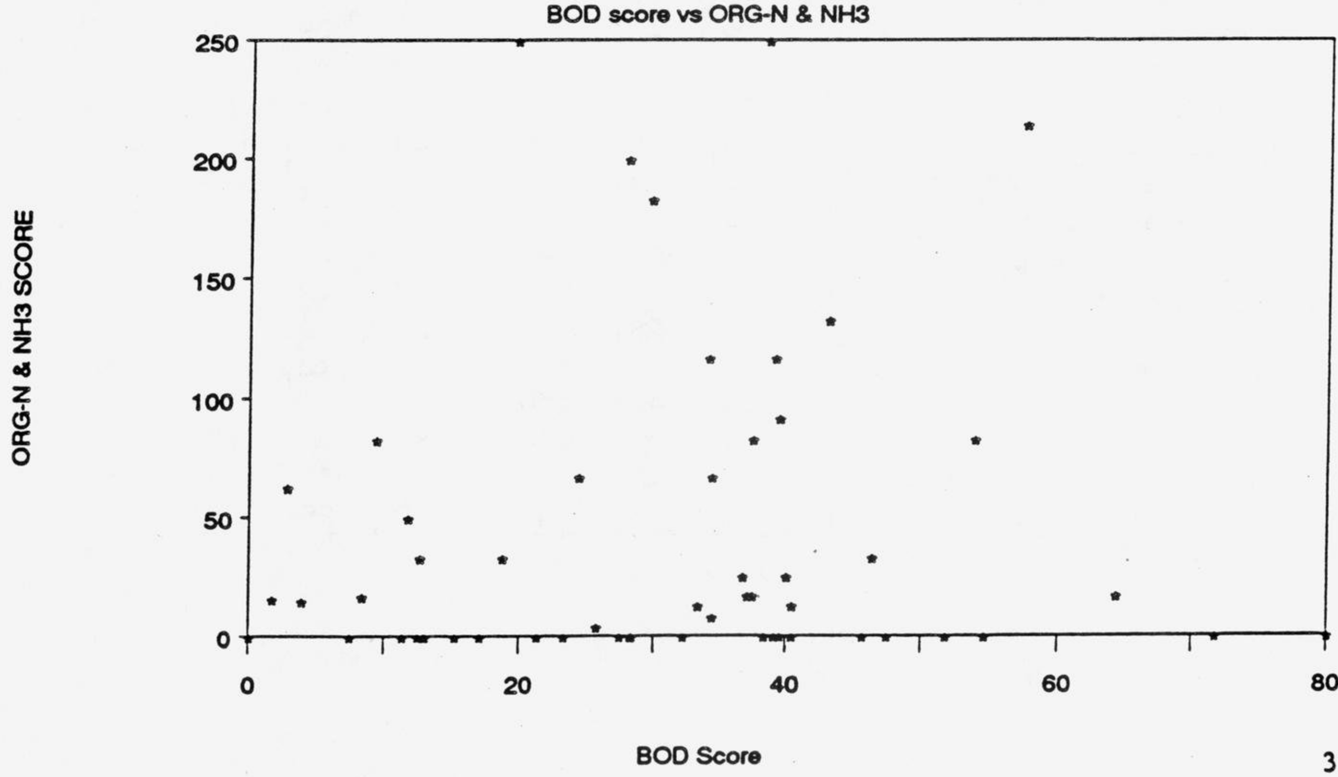


Figure 7

BOD score vs ORG-N & NH3



The results of step 5 of the data analysis are in Table 6. The results of the data for 1986 and 1987 were similar to the results of the data from the previous years.

Step 6 of the data analysis found that 60% of the facilities had background wells showing elevated levels of TDS, chlorides, or nitrates. Elevated levels may be due to the impact of the RI system, background contamination, or in the case of TDS by naturally occurring minerals.

Step 7 of the data analysis showed that a relationship exists between the hydraulic loading rate to the seepage cells and ammonia levels in downgradient well samples (See Figure 8 and Table 9). The relationship showed that a hydraulic loading of less than 20,000 gad is required to keep the ammonia increase below the 2 mg/l limit set in NR140.

The relationship found between the level of ammonia in the groundwaters downgradient of RI systems and the hydraulic loading rate to the RI systems was the most significant found. The remaining groundwater parameters were compared to the hydraulic loading, but no relationships were found.

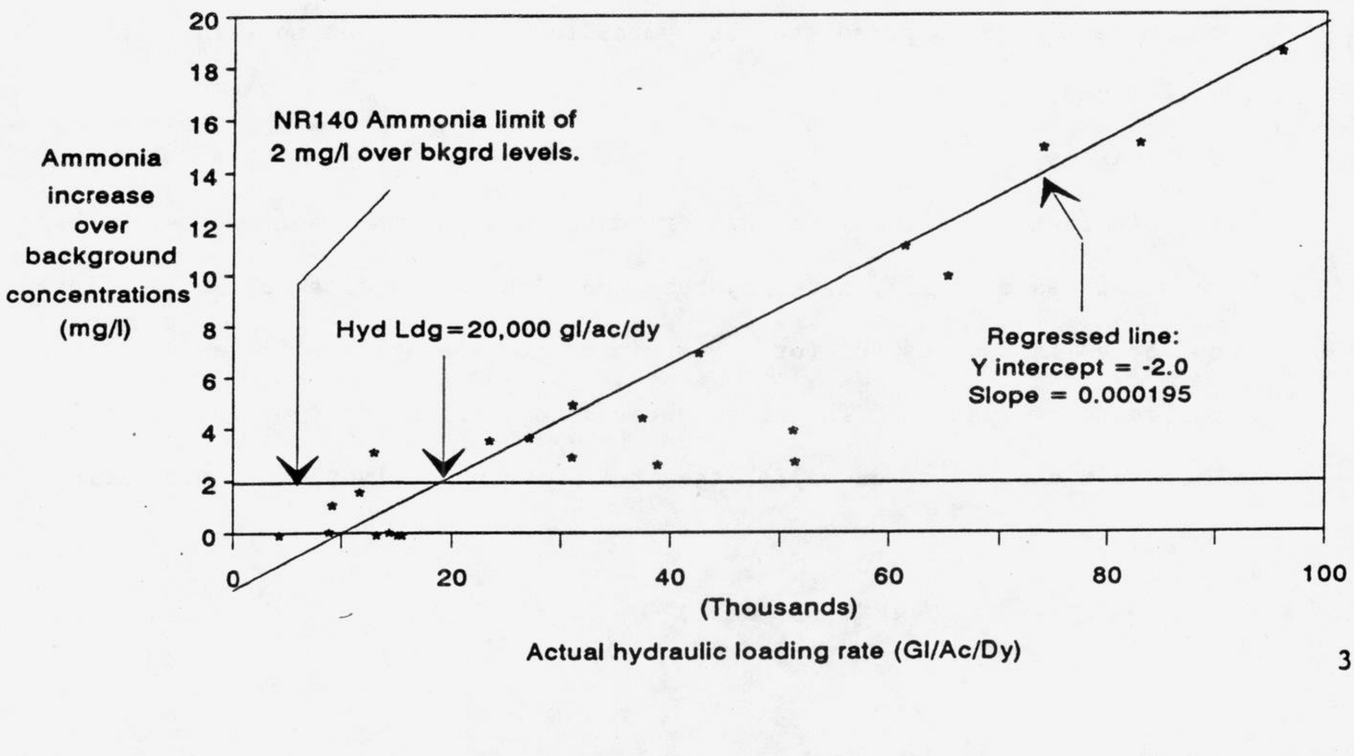
Conclusions:

Analysis of the groundwater data has shown that due to the complexities of soil/aquifer systems the groundwater data currently being collected is not useful for determining the operating efficiency of RI pretreatment systems. The groundwater data collected from RI systems in Wisconsin does not accomplish the following objectives of a monitoring data set:

Table 9 Data include in Figure 8

Facility	NH3 increase over bkgrd	Flow (gl/dy)	SEEPAGE AREA (ac)	Actual hyd ldg, gl/ac/dy	PRETREATMENT
ADELL	7.04	44,600	1.05	42,470	Act Sludge
ALMOND	3.75	35,000	1.3	26,923	Stab Pond
BIRCHWOOD	0	33,300	2.22	15,000	Aerated L
BOYCEVILLE, VILLAGE	0.13	203,782	23.4	8,709	Aerated L
BRUCE WATER & SEWER	1.65	149,777	13	11,521	Stab Pond
BUTTERNUT	4.5	485,000	13	37,308	Stab Pond
COCHRANE	0	45,000	10.6	4,200	Stab Pond
CRANDON WATER & SEWER	15	179,391	4.7	73,800	Stab Pond
GOODMAN SANITARY DIST	4	35,727	0.7	51,039	T Filter
IRON RIVER SANITARY DIST	3.63	34,909	1.5	23,273	Stab Pond
LONE ROCK	0.1	29,000	2.04	14,200	Aerated L
MILLTOWN	2.8	41,000	0.8	51,250	Aerated L
MINONG	0	80,000	6.27	13,000	Aerated L
MOUNT TELEMARK LODGE	1.15			9,000	Act Sludge
MUSCODA, VILLAGE OF	5	158,273	5.12	30,913	Stab Pond
OSSEO CITY	3.2	191,478	14.96	12,800	T Filter
PARDEEVILLE	2.7	137,000	3.54	38,700	Aerated L
SAUK-PRAIRIE SEWER	18.64	512,000	5.34	95,880	Aerated L
SOLON SPRINGS, VILLAGE OF	0	70,910	4.61	15,382	Stab Pond
SPOONER	15.13	157,173	1.9	82,723	Aerated L
UNITY, VILLAGE OF	0.01	27,590	1.8	15,328	Stab Pond
WAUSAUKEE	10	119,900	1.8	65,000	Stab Pond
WINTER VILLAGE OF	11.2	63,000	1.03	61,165	Stab Pond
WIS DVA VETS	3	290,000	9.4	30,851	Act Sludge

Figure 8 Ammonia increase over bkgrd vs Actual Hyd Ldg



1. The data set should give a clear picture of the full extent of contamination.
2. The statistical measures used to define the level of contamination should be representative of actual conditions. (The statistical measures used to define the level of contamination present should have a specified level of confidence.)
3. The data set should describe the effects of all variables (i.e. Seasonal effects, shock loads, etc.)

By relying on groundwater data for regulatory purposes the DNR must scrutinize every sample that is analyzed to determine if it is representative of actual conditions. The reliability of groundwater data is questionable due to the many limitations of groundwater monitoring. Some of these limitations are:

1. Spatial variability: (The volume of aquifer that must be monitored is > 10**6 ft**3, the plume may travel through less than 10% of it. This makes finding the plume difficult.)
2. Well construction: Poor well construction leads to surface contamination of the groundwater.
3. Seasonal variability: With monitoring only twice/year no seasonal trends will be noted.
4. Screening depth of well. (See 1)
5. Unknown background conditions due to past land use. Most of the RI systems are located on lands previously used by cities

or towns for public work activities such as sludge handling, previous waste treatment plant, chemical storage, road salt storage, etc. Most of these activities can cause considerable groundwater contamination.

6. Variability in travel time due to:

   A. Depth to groundwater

   B. Permeability

Upgrading the monitoring systems to correct for these limitations would involve tripling the number of existing monitoring wells and doubling the monitoring frequency. (This result was derived from procedures outlined in the RCRA groundwater monitoring guidance document, 1987) The limitations of groundwater monitoring previously discussed make it necessary to determine the quality of effluent before it enters the groundwater.

The research has shown that most of the RI systems in Wisconsin are not operated to minimize the hydraulic loading rate to seepage cells. At many facilities the discharge is allowed to infiltrate at the maximum capacity of the soil. This practice of loading soils at their full infiltrating capacity results in hydraulic loading rates in excess of 1,000,000 gad. Actual hydraulic loadings based on the area of infiltrating wastewater are up to ten times the acceptable limit at many facilities. This type of practice increases the potential for groundwater contamination, by reducing the effective treatment in the unsaturated zone.

The ability of RI systems to treat wastewater to the levels required by Wisconsin's Administrative Code NR140 has yet to be determined. Given the quality of effluent that is being applied to RI systems in Wisconsin the soil systems that comprise the unsaturated zone beneath the seepage cells would have to effectively remove 50% of the nitrogen and total dissolved solids in the infiltrating wastewater for these systems to comply with NR140 (This conclusion is based on infiltrate with a nitrogen concentration of 20 mg/l. The effects of dilution are not considered). The objective of 50% removal of total dissolved solids cannot be met. The groundwater data from RI systems in Wisconsin indicate that the nitrogen removal in the soil is minimal. The problem of elevated TDS and nitrogen concentrations in the background groundwater adds to the current problems that RI systems in Wisconsin are experiencing.

The data analysis indicates a need to redefine monitoring requirements for facilities using land disposal. Parameters that cause contamination of the groundwater such as nitrates, ammonia, chlorides, and TDS should be monitored in the effluent so that the potential for groundwater contamination from these parameters can be determined before it occurs. By monitoring the effluent for BOD and SS little information is gained about the potential health hazard of discharged effluent.

Using this monitoring approach the Wisconsin DNR will have a greater degree of confidence that the effluents discharged to land disposal systems are not contaminating the groundwater. This end of pipe monitoring approach would provide the data set necessary for the following:

1. Calculation of treatment efficiencies.

2. The determination of seasonal variations in pretreatment processes.
3. It would aid in the consistent and uniform application of regulatory actions based on performance rather than uncertain groundwater data.
4. It would provide operators with valuable information that could be used for O & M changes.
5. Calculation of loading rates to RI systems for all potential contaminants to the groundwater. (A series of guidelines on acceptable loadings could be developed. In the beginning these guidelines could be based on NR140 limits plus a factor for dispersion effects.)

INFLUENT AND EFFLUENT SAMPLING PROGRAM

Introduction

Previous research ([1], [8], [13]) has shown that compliance with groundwater nitrogen limits such as those imposed by NR140 will be difficult with the pretreatment systems currently in use at facilities using RI systems for disposal of secondary treated municipal sewage during the winter (November through April). These pretreatment systems are: stabilization ponds, trickling filters, aerated lagoons, and small scale activated sludge plants. The main reasons why these systems do not comply with regulations include:

1. A decrease in biological activity during the winter that causes:

   A. Decreased breakdown of organic nitrogen.

   B. Decreased nitrification.

2. Restricted oxygen transfer caused by ice cover.

3. Limited oxygen in the unsaturated zone of the soil. This causes ammonia to leach directly into the groundwater. This anaerobic zone is caused by the operational practice of continually loading only one seepage cell to keep the system from freezing.

Method

To study these effects, influent and effluent samples were collected from 20 municipalities representative of the 60 facilities included in the research during March and April of 1988. All samples were collected in accordance with DNR standards and analyzed at the State Laboratory of Hygiene. To test the effects of seasonal changes, ten facilities were also sampled in late May. At four facilities samples of effluent that had been ponded for greater than one week were collected. Samples collected before 4/11/88 are designated "Winter samples" and samples collected after 4/11/88 are designated "Spring samples." Ponded samples refer to samples taken of effluent that was ponded in a seepage cell for greater than one week.

Results/discussions

The results of the effluent sampling program are summarized in Table 10. The average effluent TDS concentration was 626 mg/l (24% higher than

TABLE 10 EFFLUENT DATA (ALL UNITS MG/L)

FACILITY	DATE	BOD	CL	NH3	NOX	TKN	TDS	SS	ORG-N
ADELL	51788	13	560	18.0	5.5	23.0	1540	38	5.0
ADELL	41488	4	465	10.0	5.4	13.0	1360	76	3.0
ADELL PONDED	41488	3	468	6.0	3.7	8.1	1310	32	2.1
ADELL PONDED	51788	4	490	1.0	2.8	2.4	1220	36	1.4
ALMOND	41388	15	96	21.0	0.0	23.0	414	42	2.0
ALMOND	51888	12	130	9.2	0.0	12.0	576	64	2.8
ARENA	51188	6	90	8.6	0.0	10.0	492	64	1.4
ARENA	30288	30	120	23.0	1.0	24.0	600	26	1.0
BALSAM LAKE	41188	9	100	28.0	0.1	31.0	420	-	3.0
BIRCHWOOD	41088	19	36	28.0	0.1	31.0	286	36	3.0
BRUCE	42388	9	66	33.0	0.0	34.0	374	22	1.0
CENTURIA	41088	8	270	29.0	0.1	32.0	1040	22	3.0
CRIVITZ	42888	-	-	24.0	0.2	31.0	-		7.0
EVAN POND	51088	17	240	10.0	5.0	12.0	848	56	
EVANSVILLE	50988	24	240	11.0	3.8	12.0	848	48	1.0
FLORENCE	42888	7	53	23.0	0.2	26.0	332	24	3.0
FONTANA	51088	3	349	0.3	0.0	0.8	1020	2	0.5
FOX LAKE PONDED	51788	4	130	0.1	0.7	3.2	520	190	3.1
GOODMAN	42888	12	143	7.0	2.7	9.2	554	108	2.2
L GENEVA	31488	3	260	0.1	1.9	0.7	-	7	0.6
L GENEVA	51088	3	230	0.8	0.8	1.6	830	11	0.8
LONE ROCK	51188	4	130	0.5	18.6	2.0	580	108	1.5
LONE ROCK	30288	6	140	38.0	1.0	38.0	534	24	0.0
MILLTOWN	41388	6	410	16.0	0.3	17.0	962	8	1.0
MILTON	41188	4	260	6.5	19.0	8.1	916	14	1.6
MILTON	51088	3	230	5.1	11.4	6.0	836	3	0.9
MUSCODA	51688	4	93	2.0	0.2	3.7	394	68	1.7
MUSCODA	41088	7	83	12.0	0.1	12.0	384	36	0.0
MUSCODA	30288	5	110	14.0	0.1	13.0	486	26	0.0
MUSCODA PONDED	51188	4	94	1.3	0.4	3.8	386	64	2.5
PARDEEVILLE	31488	9	150	27.0	0.1	27.0	576	12	0.0
PARDEEVILLE	51788	8	140	0.1	9.5	1.2	610	92	1.1
PLAINFIELD	51888	7	120	9.2	0.1	11.0	528	38	1.8
SAUK CITY	40588	10	170	30.0	0.1	31.0	682	26	1.0
SAUK CITY	31088	11	180	29.0	0.1	29.0	686	20	0.0
SAUK CITY	51188	62	180	13.0	9.6	13.0	774	44	0.0
SPOONER	41088	11	46	27.0	0.1	31.0	294	10	4.0
WI VETS PONDED	51888	15	120	13.0	0.1	21.0	572	760	8.0
WAUTOMA	41388	5	45	4.3	2.0	5.9	330	3	1.6
WAUTOMA	51888	30	71	3.4	4.6	4.4	388	9	1.0
WI VET	41388	4	110	7.3	0.0	8.8	410	7	1.5
WILD ROSE	51888	13	160	8.1	5.6	10.0	596	190	1.9
WIS VETS	51888	4	100	0.1	7.4	1.3	428	11	1.2
AVERAGES ALL DATA		10	179	13.0	2.9	14.8	626	59	1.9
WINTER SAMPLES (BEFORE 4/11)		10	160	21.9	0.7	22.0	480	19	0.3
SPRING SAMPLES (AFTER 4/11)		10	182	11.5	3.3	13.7	650	66	2.2
AVERAGES PONDED		8	257	5.2	2.1	8.4	809	190	3.2

the average influent TDS concentration). The results of the influent sampling program are summarized in Table 11. This increase in TDS during pretreatment is due to a number of ongoing processes during pretreatment including: evaporation, biological activity, transformations, etc. With only minimal treatment of TDS in the vadose zone the only effective decrease in TDS will occur with dilution in the groundwater. As was discussed in the literature review, the natural levels of TDS in the groundwater are above the 250 mg/l NR140 limit for many of the RI systems in Wisconsin. This helps explain why a majority of the RI systems are not complying with the NR140 TDS groundwater limit.

BOD was effectively treated by all of the RI systems monitored. BOD was reduced from an influent average of 94 mg/l to an average effluent concentration of 10 mg/l. Effluent BOD is not a reliable measure of nitrogen, chloride, or TDS concentrations. Figure 11 is a plot of the effluent BOD concentration at a given facility versus the effluent total dissolved nitrogen concentrations at the same facility. The random plot shows that BOD concentration are not related to the level of total dissolved nitrogen in effluent. A similar analysis was done for the remaining inorganic parameters vs both BOD and SS with similar results. The current effluent monitoring requirement for facilities discharging to RI systems is for weekly samples of BOD and SS. With this information little will be known about the potential of the effluent to contaminate the groundwater. BOD is a valuable parameter for a treatment plant operator to use for determining oxygen requirements or for checking operating conditions, but it has limited usefulness as an indicator of

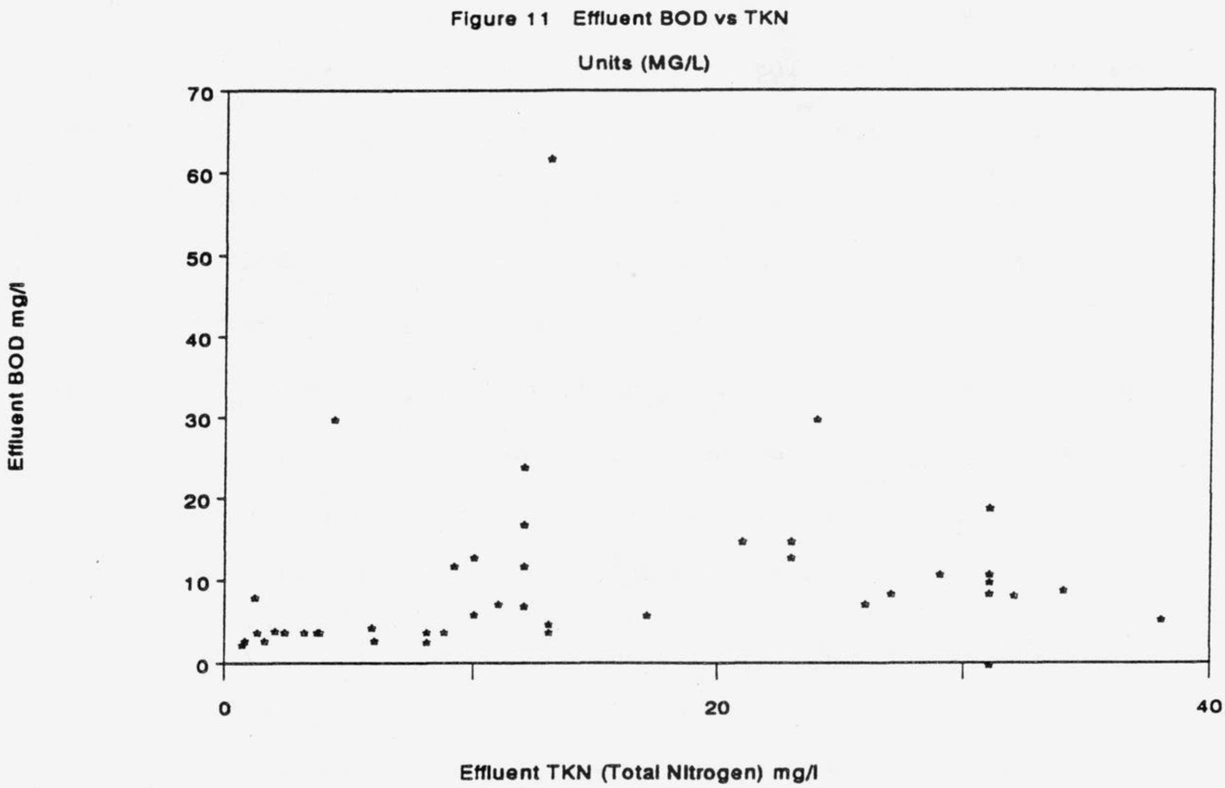


TABLE 11 SAMPLING PROGRAM INFLUENT DATA
(ALL UNITS MG/L)

FACILITY	DATE	BOD	CL	NH3	NOX	TKN	TDS	SS	ORG-N
ALMOND	41288	100	42	20.0	1.6	33.0	572	200	13.0
ARENA	40588	58	46	25.0	0.1	28.0	390	42	3.0
BALSAM LAKE	41188	74	80	25.0	0.1	32.0	428	208	7.0
BIRCHWOOD	41188	130	54	49.0	0.1	79.0	412	320	30.0
BRUCE	41188	110	76	34.0	0.2	34.0	410	136	0.0
CENTURIA	41188	110	76	19.0	0.1	31.0	694	268	12.0
CRIVITZ	42888	-	-	32.0	0.2	49.0	-		17.0
FLORENCE	42788	97	56	30.0	0.0	56.0	386	164	26.0
GOODMAN	42788	46	41	5.2	0.2	11.0	316	160	5.8
L GENEVA	31488	87	240	20.0	0.6	26.0	910	192	6.0
MILLTOWN	41388	69	61	19.0	0.0	29.0	406	104	10.0
MILTON	41188	92	110	25.0	0.1	34.0	624	340	9.0
MUSCODA	41088	150	58	30.0	0.1	34.0	446	196	4.0
PARDEEVILLE	31588	150	43	26.0	0.1	31.0	460	168	5.0
SAUK CITY	31088	140	93	23.0	0.3	27.0	598	190	4.0
SAUK CITY	40588	160	578	26.0	0.1	40.0	1476	188	14.0
SPOONER	41188	100	38	24.0	0.1	41.0	342	160	17.0
WAUTOMA	41288	65	36	6.8	0.8	14.0	318	76	7.2
WI VET	41288	55	100	11.0	0.0	17.0	380	128	6.0
AVERAGE		94	96	24.0	0.3	34.0	504	180	10.0
Standard Deviation		40	123	10.0	0.4	15.0	291	73	7.8

potential groundwater contamination.

The chloride sample results were similar to TDS with an increase in concentration during pretreatment. The chloride data was more variable than the other parameters. This variability is due to the variety of chloride sources that can contribute to the chloride loading of a facility (softened water, road salting, industrial sources, etc.). The samples analyzed for chloride averaged 180 mg/l in the effluent. At this level a 44% dilution is required to bring the concentration below the NR140 PAL of 125 mg/l.

SS is a collective parameter that measures the level of solids suspended in solution. It is of little use as an indicator of potential groundwater contamination from dissolved inorganics in effluent discharged to RI systems. During the winter, effluent SS settle out of solution to form a sludge layer which results in a buildup of organic material. The average concentration of SS for the samples collected during the winter was 1/3 the average concentration of the spring samples. This increase in SS was caused by the increase in photosynthetic activity brought on by the warmer temperatures (i.e. algae blooms etc.). For the above reasons, SS is a useful measure of the potential for matting of the seepage cell floor. This type of data could be used to determine rest/load cycles of seepage cells.

Influent nitrogen speciation was 30% dissolved organic nitrogen and 70 ammonia. The average total dissolved nitrogen concentration of the influent was 34 mg/l. The average pretreatment system removed only 35% of the total nitrogen during the winter. One month later the total nitrogen removed by the pretreatment systems averaged 69%. These figures are based on the average value of 34 mg/l calculated for the influent. Although the effluent samples were grab samples they represent the averaging effects of the residence time at a given system (> 10 days). As a result, they are representative of the effluent quality for a significant period of time.)

Evaluation of the effluent data reveals several important trends in the nitrogen data. The effluent nitrogen speciation for various conditions is illustrated in Figure 9. The figure illustrates that the pretreatment nitrogen removal rate doubled from winter to spring. The speciation went from all ammonia during the winter to 1/2 ammonia and 1/2 nitrates during the spring. Figures 4 and 5 presented in the literature review were calibrated to fit the results of the sampling program.

Conclusions

The data collected show that both chloride and TDS will require significant dilution within the aquifer to comply with NR140. Given the hydraulic loading rates at RI systems in Wisconsin it will not be possible for these systems to meet the PAL for chloride or the ES for TDS at all points in the groundwater. The effluent ammonia values for the winter samples had an average of 22 mg/l. Considering that the only transformation that could occur under the high loading rate conditions of RI systems during the winter, given the presence of active nitrosomonas bacteria, is nitrification, most RI systems will either exceed the ammonia or nitrate NR140 limit at some point in the groundwater. (This does not consider the effects of dilution.)

FIGURE 9 SEASONAL NITROGEN SPECIATION

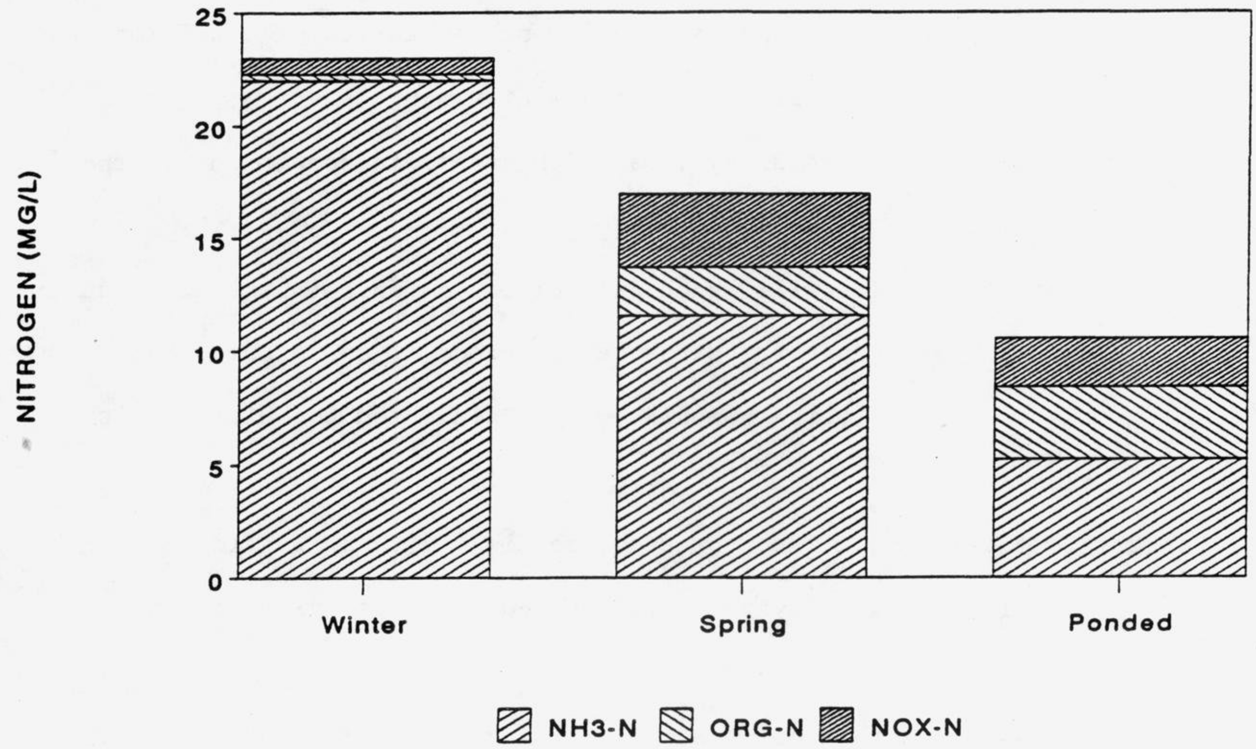
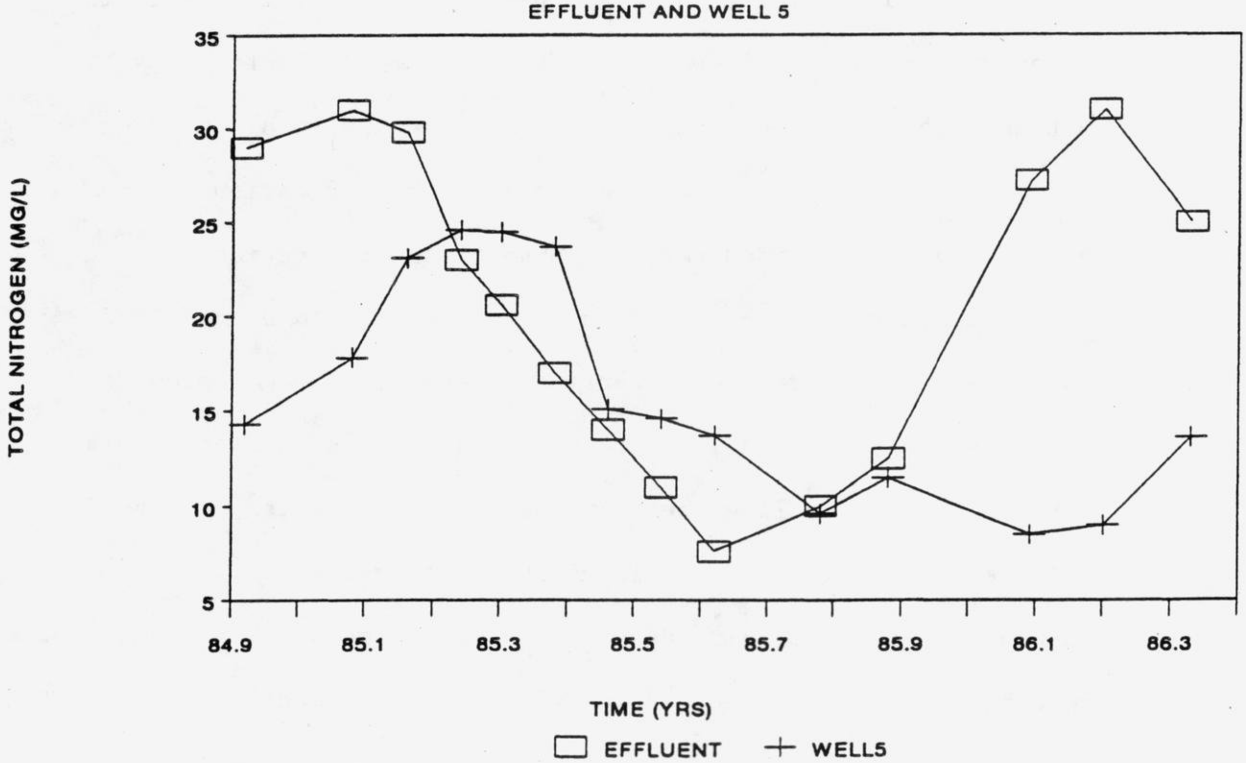


FIG. 10 EVANSVILLE TOTAL NITROGEN DATA

EFFLUENT AND WELL 5



The research found that the following categories of conditions exist at RI systems in Wisconsin during the winter months.

1. Continually ponded RI systems with anaerobic conditions in the vadose zone:

   These facilities will leach all of the ammonia in the effluent into the groundwater. With the presence of an aerobic zone at the water table the ammonia may be converted to nitrate with time.

2. RI systems that incorporate a resting with a loading cycle:

   Ammonia in these systems will be converted to nitrate in the vadose zone.

3. RI systems with a combination of 1 and 2 above:

   The conditions at a given RI system are continually changing due to varied loadings. High SS in the effluent will result in a conversion of a given system to a category 1 facility by matting the pond surface and causing continual ponding. Category 3 facilities may result in denitrification if the duration of the ponded period converts the vadose zone to an anaerobic state. A source of organic carbon would be required. This has been an area of extensive research, that has provided few conclusions. It is evident that with RI systems this portion of the cycling between loading and resting the cell will be the critical period if nitrogen removal is to occur.

The results of the sampling program correspond to the results of a past research study performed at Evansville. The seasonal trend of total nitrogen in the effluent at Evansville is illustrated in Figure 10. Figure 10 illustrates an identical seasonal trend as was found during the sampling program, which showed decreased nitrogen removal during the winter months (See Figure 9). It is expected that similar seasonal results would be found at all RI systems. Figure 10 also shows a plot of total nitrogen in a well downgradient of the RI system. Note the lag in the peak and the breakthrough of 80% of the effluent nitrogen to the groundwater. The minimal removal of nitrogen in a soil system has been documented in various studies (Refer to [1], [8], [11], [13]) Summarizing the nitrogen data that has been collected reveals that for a properly operated system it might be possible to meet the nitrate and nitrite limit of 10 mg/l (measured as nitrogen) for a portion of the year. This assumes an ideal system where ammonia does not adsorb in the unsaturated zone and release later at elevated levels.

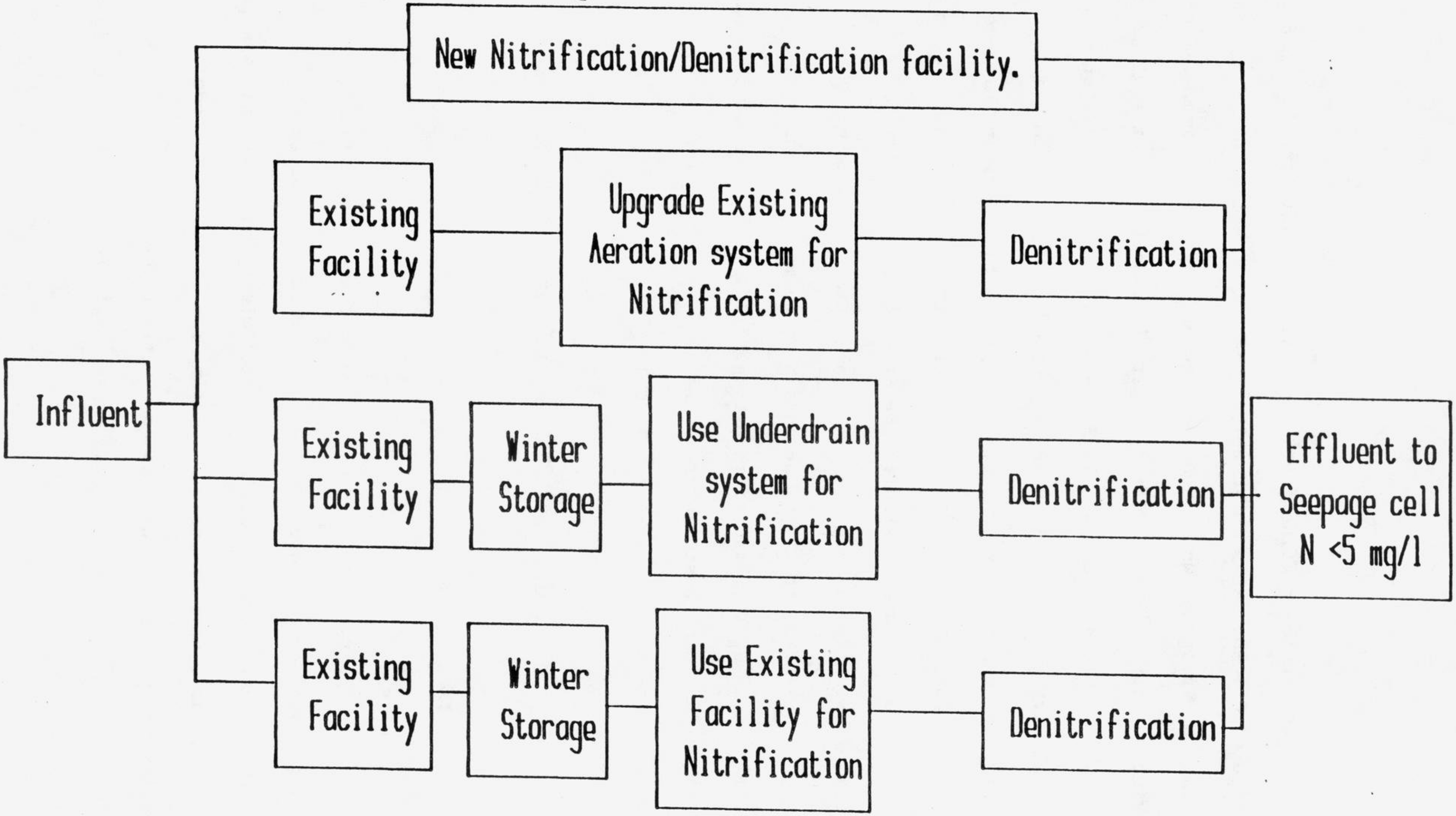
PRELIMINARY ECONOMIC ANALYSIS OF NITROGEN REMOVAL

Introduction

The four nitrogen removal flow schemes illustrated in Figure 12 correspond to possible treatment alternatives for existing facilities with RI systems in Wisconsin. A preliminary cost analysis was performed for several of the processes using simple economic models to convert existing cost information to cost data relevant to RI systems. "Means Site Work Cost Data, 1988" was used to obtain additional cost

FIGURE 12

Nitrogen removal flow chart.



information. [7] All cost analysis are for a 0.5 mgd treatment facility with capital costs based on present worth and all reoccurring costs annualized.

The following is a preliminary economic analysis intended for comparison purposes. The feasibility of each process has only been determined by the success of existing systems for specific conditions. In many cases the existing systems have been operating under varied conditions and may not be applicable to RI systems in Wisconsin.

Nitrification/Denitrification Facility

The costs for a Nitrification/Denitrification facility have been calculated from three existing treatment facilities by applying two simple economic models.

To adjust the cost to a 0.5 mgd facility the following economy of scale model was used.

$$\text{Cost} = (\text{Cost of Existing}) \times (0.5/\text{Flow existing, mgd})^{0.7}$$

To bring the cost to a present value the EPA's treatment plant index was used (Engineering News Record Index). The trend for the past ten years shows that a 9.7% increase in the costs of a treatment facility has occurred each year. This model becomes:

$$\text{Cost Now} = (\text{Cost Then}) \times (1.097)^{n}$$

(n = number of years since construction.)

The following list summarizes the costs calculated for three existing treatment plants using the models described above.

Existing facility (Year built)	Flow mgd	Original Costs	Adjusted Cost
Hookers WWTP Florida (1976)	60 mgd		
Capital Costs		88.5 M	9.5 M
O & M Costs per year		6.8 M	0.18 M
Molongo WWTP Australia (1976)	40 mgd	35.6 M	5.1 M
Costa Sanitary District (1976)	30 mgd		
Capital costs		61.0 M	10.3 M
O & M Costs per year		2.0 M	0.035 M

The above costs include all engineering as well as legal fees. The models used to adjust the costs provide preliminary results only. The original costs depend on many factors that may not apply to a smaller communities seeking to install a similar facility (i.e. pilot plant studies, land values, court fees, public versus private funding, availability of materials etc.).

2. Denitrification unit

The denitrification unit analyzed was based on a process consisting of two deep bed sand filters with a supplemental carbon source (methanol) operated under anaerobic conditions. Two units allow for continual operation when backwashing is required. Each unit will be sized for 0.5 mgd by using the design parameters from an existing facility (EPA's Nitrogen Removal Design Manual, Case study for El Lago WWTP [10]). The sizing of each unit is as follows:

Depth of media -------- 8 feet

Diameter -------------- 15 feet

Media ------------- Coarse sand

Methanol -------------- 50 mg/l

Hyd Ldg ----- 2900 gl/(ft**2-day)

Using the two economic models previously discussed the following costs of the El Lago denitrification unit have been calculated.

1988 Capital cost --- $1,790,000

3. Upgrading an existing 0.5 mgd aeration system for nitrification

The cost analysis for upgrading an existing system for nitrification will assume that additional aeration volume is all that is required to complete the nitrification process. Secondary sedimentation will be incorporated with this system.

Means Site Work Cost Data, 1988 reports that an aeration system consisting of a tank capable of handling 0.5 mgd, with aeration equipment capable of maintaining normal dissolved oxygen levels, followed by a sedimentation tank would cost, [7]:

Initial Capital Investment ---- $975,000

4. **Winter storage facility for a 0.5 mgd treatment plant**

The storage facility priced consists of a clay lined lagoon with a synthetic liner for added protection. The lagoon will be designed for 6 months of storage (90 MG of primary treated effluent) with allowances for 4 feet of freeboard and 10 inches of precipitation as snow. Conventional aerators will be used to minimize odors and stabilize the effluent. Sludge removal equipment will consist of portable positive displacement pumps driven by a tractor PTO shaft. Three lagoons will be used with the following dimensions:

Depth ----- 20 Feet

Width ---- 250 Feet

Length -- 1000 Feet

Cost includes one manhole per lagoon with piping to underdrain each lagoon and one pump station.

Item	Price	Units	Total Cost
2 manholes	$2,350	each	$4,700
Manhole frame and cover	$455.00	each	$910
6" PVC collection pipe	$3.19	lin. ft.	$900
Pumping Station & Aeration unit	$70,000	0.5 mgd	$70,000
Excavation of 3 ft of overburden	$4.00	cyd	$330,000
Clay liner and berm installation	$2.30	cyd	$127,000

Clay costs (Estimated cost using			
Clay from a borrow site < 50mi.	$10.00	cyd	$550,000
Synthetic liner (installed)	$3.60	sqyd	$378,000

****

Total cost (1988 dollars) $1,461,510

****

The cost of excavation and clay lining will vary considerably according to location and materials.

5. Installing an underdrained seepage cell

The following costs have been calculated for a system capable of underdraining a fifteen acre seepage cell. The seepage cell will be underdrained by excavating the top ten feet of earth, placing a one foot clay liner, a sand and gravel protective layer, and a collection system with a pump station to remove the treated effluent for additional treatment as required (recycling). The system will use existing seepage cell acreage for the ultimate disposal of the treated effluent. The system will meet the following design requirements.

Hydraulic loading without recycling --------- 33,000 gad

Depth to underdrains ----------------------- 10 feet

Item	Price	Units	Total Cost

****

In place perforated 6" diameter PVC	$5.35	Lin Ft.	$90,000
15 acre cell with pipes every 40'.	$30.00	Each	$500
ft. Elbows and Connections	$3,880	Each	$3,880
Manhole frame and cover	$455.00	Each	$455
Pump Station	$29,000	.5 MGD	$29,000
Gravel Fill for collection system	$4.00	cyd	$96,800
10 ft of Excavation/backfilling	$3.50	cyd	$847,000
Clay liner beneath collection system	$10.00	cyd	$240,000

****

Total cost 1988 dollars $1,307,635

****

Discussion

The economic analysis illustrates the significant price of improving the quality of effluents discharged to RI systems. It would be cost prohibitive for a community generating less than one mgd of sewage to abandon its current treatment facility and install a new denitrification/nitrification treatment plant. The alternatives of implementing unit processes such as extended aeration, underdraining an existing system, denitrification, or storing wastewater for treatment during the summer, have a better chance of being affordable to small communities.

COLIFORM CONTAMINATION OF GROUNDWATERS BENEATH RI SYSTEMS A PRELIMINARY SURVEY

INTRODUCTION

After the first outbreaks of salmonella and E. histolytica bacteria the importance of pathogenic bacteria and virus in municipal sewage was recognized. The transport of these pathogens has been well documented in sewage that has caused contamination of public water supplies. As a result municipalities discharging to surface waters perform regular checks on the levels of coliforms in discharged effluent. However at the present time none of the 131 municipal facilities with permits to use land disposal of treated effluent are required to monitor for coliforms in the groundwater. This is mainly due to the lack of a reliable method to retrieve an unbiased sample from the groundwater. The potential for contamination from outside sources has in the past made the results of coliform analysis suspect to bias. The need for a better indicator of groundwater contamination from RI systems prompted the Wisconsin Department of Natural Resources (DNR) to have further research done in this area.

Currently little information exists on coliform persistence in soil or groundwater. A literature search performed for the research found only three papers relevant to coliform sampling of groundwater. These papers have been summarized as case studies I-III following. Studies have reported survival times as great as five years in soil and three years in groundwater for related enteric bacteria (Refer to case study I). However there is little agreement among studies on the required treatment or level of coliforms that constitute a health hazard. It is agreed that bacteria can persist and possibly multiply under favorable conditions in the groundwater for a length of time that would enable them to pose a serious concern in many communities. In addition coliforms are considered an indicator of contamination by many other pathogens including salmonella, shigella, and Entamoeba histolytica. These pathogens are a significant health hazard at undetectable concentrations and can persist in groundwater for up to six months. The value of coliforms as indicators of pathogens and viruses in groundwater has not been validated. ASTM lists the following as criteria that an indicator should meet:

1. The indicator should be consistently and exclusively associated with the source of pathogens.
2. It must be present in sufficient numbers to provide an accurate density estimate whenever the level of each of the pathogens is such that the risk of illness is unacceptable.
3. It should approach the resistance to disinfectants and environmental stress of the most resistant pathogen present.
4. It should be quantifiable in all groundwater matrices and have accurate analytical tests associated with it.

The objectives of the coliform research were:

1. The development of protocol for sampling monitoring wells that minimizes bias from outside contamination.

2. Survey the extent of bacterial groundwater contamination, by collecting samples with the developed protocol.
3. Study the value of bacteria as indicators of groundwater contamination from secondary treated effluent discharged to RI systems.

METHOD

The initial coliform research involved an extensive survey of literature on bacterial sampling. The literature search included library sources and a computerized reference search. The computerized library search used the Water Resource Abstracts Data Base for publications after 1968. The literature survey found three articles relevant to researching coliform contamination of groundwater. The articles have been summarized following the coliform groundwater sampling survey.

COLIFORM GROUNDWATER SAMPLING SURVEY

Experimental Design

The sampling survey was intended to develop protocol for sampling groundwater monitoring wells for coliforms and to survey the presence of coliforms in the following environments.

1. Influent and effluent from RI systems throughout Wisconsin.
2. Monitoring wells around RI systems.
3. Background (i.e. soil, grass, clothing).

All monitoring was done during the winter to insure coliforms were not entering the groundwater with infiltrating rainwater, and to sample when temperatures were optimal for bacterial survival in groundwater. Ten influent samples were collected and fifteen effluent samples.

Method

Twenty five monitoring wells were sampled by the following method:

1. A 2 inch diameter PVC bailer was disinfected with a solution containing 100 mg/l free chlorine and rinsed. After disinfecting the bailer a sample of undisturbed well water was collected;
2. The bailer was disinfected again, the well purged three well volumes, and a second sample was collected;
3. Next the bailer and well were disinfected according to steps 1 through 7 described below, and a final sample was collected.

Approximately 50 quality assurance checks were performed by wiping a cotton swab on disinfected equipment and then incubating the swab with an enriched agar medium to test for the presence of coliforms. All tests were negative. To determine background sources of contamination, soil samples were collected and various surfaces were checked for the presence of Total Coliforms.

The following steps were used to disinfect the monitoring wells before the final sample was collected:

1. A solution of 100 mg/l free chlorine was prepared by adding 1/3 cup of Clorox bleach to 25 liters distilled water. A carboy was used to store the solution. A Haach CN66 colorimetric wheel was used to develop a standardized curve for free chlorine in the Clorox, DI water solution. (See Figure 13)

FIGURE 13 FREE CHLORINE VS DILUTION

DILUTION=(FREE CHLORINE)*.03112

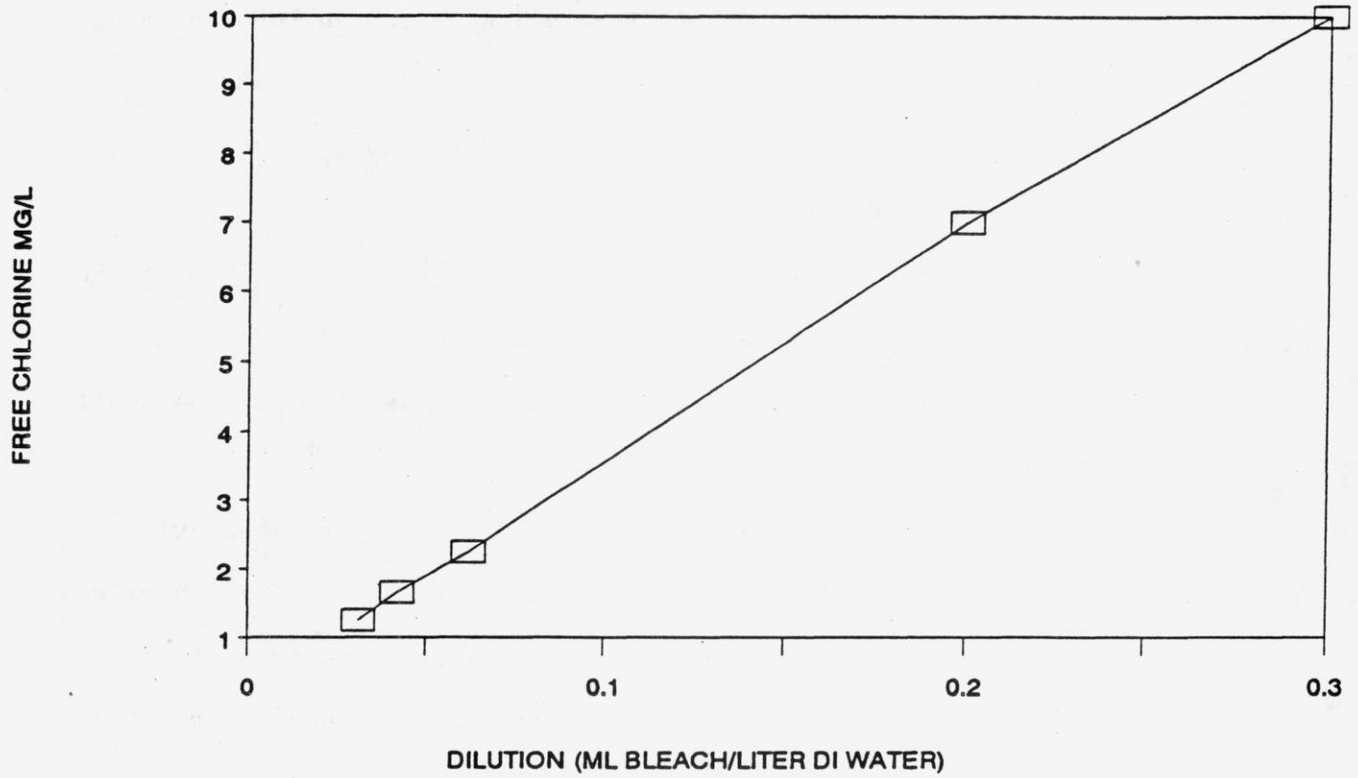
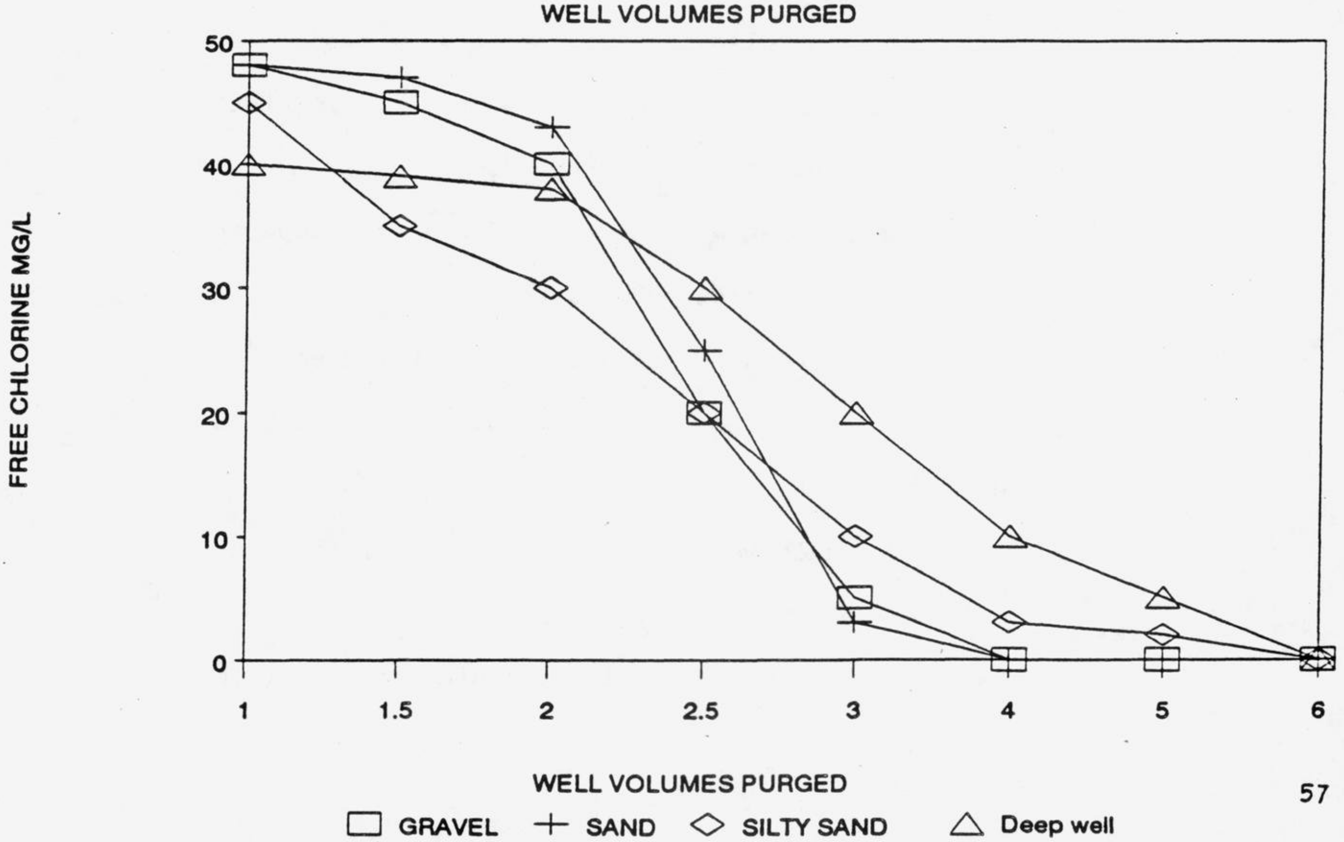


FIGURE 14 FREE CHLORINE (MG/L) VS.

WELL VOLUMES PURGED



2. The bailer was lowered into the well with enough rope to permit it to be fully submerged.
3. A volume of chlorine solution equivalent to two well volumes was introduced into the well.
4. The solution was poured so that it ran down the sides of the well and over the rope, insuring disinfection of both areas.
5. The bailer was then lifted several times to mix the well contents.
6. After fifteen minutes, the concentration of free chlorine in the well was checked with the Haach kit to insure free chlorine was present. This step was a precautionary measure to insure that demands from ammonia or organics did not use up the free chlorine.
7. The well was then purged and the water retained in a bucket. While purging, the following procedures were performed:
   A) The first well water removed was used to disinfect the bucket and the samplers hands.
   B) Purged well water was then poured over the rope to rinse off the Clorox solution.
   C) The well was then purged until Haach kit checks of the free chlorine indicated no free chlorine present (See Figure 14).
   D) The well walls were then rinsed free of chlorine with two well volumes of DI water.
   E) The well was purged again according to 3. (See

figure 14 purging requirements.)

F) A sample was then collected in a sample bottle containing thiosulfate to remove residual chlorine. The sample was placed on ice for transport to the testing laboratory.

Samples were analyzed according to Standard Methods at the State laboratory of Hygiene, Madison, Wisconsin.

RESULTS

Tables 12 & 13 present the results of the coliform samples collected between February 1988 and May 1988. All samples were analyzed by the State Laboratory of Hygiene, Madison, Wisconsin.

The results of the sampling survey led to the following findings: (Note that all findings are for conditions that existed in the winter and early spring of 1988.)

1. Soil samples near monitoring wells contain sufficient total coliforms and fecal streptococcus bacteria to contaminate sampling equipment. Neither fecal coliforms or E. coli bacteria were detected in any of the soil samples. The following table lists the results of soil samples collected near monitoring wells. Samples were analyzed by the State Laboratory of Hygiene using the MPN procedure.

TABLE 12 GROUNDWATER COLIFORM SAMPLING RESULTS

(ALL RESULTS ARE COLIFORM COUNT PER 100 ML SAMPLE)

CODES
1=SAMPLE TAKEN BEFORE DISTURBING WELL
2=SAMPLE TAKEN AFTER PURGING WELL
3=SAMPLE TAKEN AFTER DISINFECTING WELL

WELL SAMPLES WITH COLIFORMS DETECTED

Location	Well	CODE	Date (MO/DY)	Total Coli.	Fecal Coli.	Fecal Strep.	E. Coli
Pardeeville	DG	1	3/15	10	-	-	-
Pardeeville	DG	2	3/15	–	-	20	-
Pardeeville	BKGRD	1	3/15	–	-	10	-
Pardeeville	BKGRD	2	3/15	30	-	-	-
Sauk City	DG	2	3/4	Confirmed	-	-	-
Sauk City	DG	3	5/11	Confirmed	-	-	–
Sauk City	BKGRD	2	3/4	-	-	10	-
L Geneva	DG	2	2/28	-	-	20	-
L Geneva	DG	3	2/28	1000	-	-	-
Arena	DG	1	3/2	Confirmed	-	20	-
Arena	Bkgrd	2	3/2	Confirmed	-	-	-
Arena	DG	3	5/11	Confirmed	260	60	–
Milton	DG	3	5/9	Confirmed	<10	30	20
Muscoda	DG	3	3/2	Confirmed	-	-	-
Bruce	DG	2	3/27	10	-	-	-
Winter	DG	2	3/27	80000	80	860	-
Boyceville	DG	2	3/25	Confirmed	-	-	-
Birchwood	DG	2	3/27	Confirmed	-	-	-
Crandon	DG	2	3/28	Confirmed	-	40	-
Wautoma well 1	DG	3	5/17	10	-	240	-
Wild Rose	DG	1	5/17	40	-	-	-

TABLE 12 CONTINUED WELL SAMPLES WITHOUT COLIFORMS DETECTED

Location	WELL	MO/DY	CONDITIONS
Sauk City	DG	3/4	BEFORE AND AFTER DISINFECTION
Sauk City	BKGRD	3/4	BEFORE AND AFTER DISINFECTION
Lone Rock	DG	3/2	AFTER PURGING
L Geneva	BKGRD	5/9	BEFORE AND AFTER DISINFECTION
Muscoda	BKGRD	3/2	BEFORE AND AFTER DISINFECTION
Muscoda	DG	3/2	BEFORE AND AFTER DISINFECTION
Lone Rock	DG	3/2	BEFORE AND AFTER DISINFECTION
Arena	DG	3/2	AFTER DISINFECTION
Arena	BKGRD	3/2	AFTER DISINFECTION
Milton	BKGRD	5/9	AFTER PURGING
Wautoma	DG	5/17	BEFORE AND AFTER DISINFECTION
Plainfield	DG	5/17	AFTER PURGING
Wild Rose	DG	5/17	BEFORE AND AFTER DISINFECTION
Milltown	DG	10/15	AFTER PURGING

TABLE 13

COLIFORM SAMPLING RESULTS OF RI SYSTEM INFLUENT & EEFLUENT
(ALL RESULTS ARE COLIFORM COUNT PER 100 ML SAMPLE)

RI SYSTEM INFLUENT SAMPLING RESULTS

Location	Date (Mo/Dy/Yr)	Total Coliforms	Fecal Coliforms	Fecal Strep.	E. Coli
ALMOND	3/28/88	24,000,000	1,700,000	10,000	600,000
BIRCHWOOD	3/29/88	85,000,000	4,600,000	1,800,000	3,100,000
BOYCEVILLE	3/28/88	120,000,000	66,000,000	23,000,000	82,000,000
CRANDON	3/29/88	79,000,000	17,000,000	610,000	6,500,000
LAKE GENEVA	3/14/88	50,000,000	5,500,000	2,400,000	4,000,000
MADISON	3/24/88	29,000,000	2,500,000	13,000,000	1,800,000
PARDEEVILLE	3/15/88	55,000,000	7,500,000	360,000	3,000,000
SAUK CITY	3/10/88	26,000,000	5,000,000	650,000	3,700,000
SPOONER	3/28/88	25,000,000	5,700,000	1,600,000	4,600,000
WINTER	3/28/88	40,000,000	4,100,000	220,000	2,800,000
AVERAGE		53,300,000	11,960,000	4,365,000	11,210,000
SDV		30,496,065	18,454,495	7,211,106	23,644,257

TABLE 13 CONTINUED
RI SYSTEM EFFLUENT SAMPLING RESULTS

Location	Date (MoDyYr)	Total Coliforms	Fecal Coliforms	Fecal Strep.	E. Coli
BARRON	10/15/87	37,000	1,400	6,300	1,700
MILLTOWN	10/15/87	700	410		420
GRANTSBURG	10/15/87	750,000	11,000	13,000	24,000
ALMOND	3/28/88	10,000,000	710,000	180,000	600,000
BIRCHWOOD	3/29/88	450,000	51,000	11,000	43,000
BOYCEVILLE	3/28/88	25,000,000	140,000	940,000	240,000
CRANDON	3/29/88	270,000	5,000	1,000	2,000
LAKE GENEVA	3/14/88	4,200	300	100	100
PARDEEVILLE	3/15/88	63,000	3,300	1,600	2,700
SAUK CITY	3/04/88	37,000	1,200	600	2,000
SPOONER	3/28/88	18,000	1,000	1,000	4,000
WINTER	3/28/88	560,000	48,000	7,000	41,000
MILTON	5/09/88	-	92,000	28,000	87,000
ARENA	3/02/88	999,000	83,000	11,400	60,000
BRUCE	3/28/88	200,000	580	2,900	400
LAKE GENEVA	3/28/88	4,000	70	30	50
LONE ROCK	3/02/88	200,000	5,500	3,800	3,400
MUSCODA	3/02/88	999,000	75,000	20,000	60,000
AVERAGE		2,771,729	81,063	80,562	76,377
SDV		6,655,374	173,413	233,832	152,412

Location	Total Coliform	Fecal Coliform	Fecal Strep.	E. Coli

(All results are for a 100ml sample.)

(-) Less than detection limit

Pardeeville	Detected	-	-	-
Sauk City	6	-	220	-
Lake Geneva	1400	-	190	-
Sauk City	Detected	-	30	-

2. Background tests of monitoring well pipes, grass, clothing, etc. also tested positive for total coliforms.

The following samples were analyzed by the author at the University of Wisconsin sanitary engineering laboratory. All tests were performed by subjecting a membrane filter to various environments before analysis. Background wipes were performed by wiping a sterile membrane filter on grass, clothing, and other objects surrounding the monitoring wells.

	Coliform count
Condensate inside well cap, Pardeeville	10
Condensate inside well cap, Sauk City	5
Condensate inside well cap, Lake Geneva	0
Condensate inside well cap, Muscoda	0
Aerosols near effluent discharge, Arena	1
Aerosols in woods, Arena	17
Background wipe, Arena	2
Background wipe, Muscoda	5

Background wipe, Lone Rock	1
Background wipe, Lake Geneva	9
Bailer rope in trunk	10

Results 1 and 2 indicate that sampling for coliforms has many sources of potential contamination.

3. By sampling before and after disinfection it was determined that the disinfection procedure worked effectively. However two wells that tested negative for coliforms before disinfection had total coliforms confirmed after disinfection. (See Table 12) It is possible that the purging done during the disinfection procedure pulled a representative (contaminated) sample of groundwater into the monitoring well. Or, purging may have caused bacteria to break loose from the well screen. This issue requires further research.
4. Total coliforms or fecal streptococcus were detected in 16 of the 25 wells sampled. Only two of these wells had levels above 100/100ml. (See Table 12)
5. The chlorine used to disinfect a monitoring well was easily removed by purging the well (See Figure 14). The sampling indicates that a time saving technique for future monitoring would be to perform a similar survey on a larger number of wells without disinfecting the wells. (The average well took approximately 45 minutes to disinfect. By eliminating the well disinfection step the time required would be shortened to less than five minutes.) If coliforms were detected a follow up

sample could be collected at a later date after disinfecting the well

6. The reduction of bacteria during pretreatment was greater than 97% for all but one facility. In most cases there remained greater than 10,000 coliforms/100ml in the effluent. The facilities that did remove coliforms to below this level had either extensive aeration or longer residence times.

SUMMARY

The DNR regulates the quality of groundwater according to standards set forth in Wisconsin's Groundwater Quality Code NR140. The standard for total coliforms is <1 per 100 ml sample.

The results of background wipes and soil samples collected by the author show that potential contamination of sampling equipment from total coliforms or fecal streptococcus could occur.

Purging tests done in three soil types on varying depth wells showed that approximately 50 mg/l free chlorine will be present in the well after adding the disinfectant. Approximately five well volumes were required to remove the residual chlorine. The high concentration of free chlorine is required so that the disinfectant will kill bacteria on contact as it is rinsed over the rope and down the side of the well.

Sampling for coliforms has the following advantages.

1. It is a reliable indicator of groundwater contamination from secondary treated municipal effluent.
2. The analytical procedure costs half of conventional inorganics. (The Membrane filter test involves filtering a 100ml sample

and then culturing the filter paper.)

3. The test is run the day of collection with results in 48 hours.
4. Storage and handling involves only cooling the sample. Filtering or preserving are not required.

LITERATURE REVIEW

Case study I

EPA Process Design Manual

"Land Treatment of Municipal Wastewater"

October 1977

Case Study I is a review and summary of the pertinent material in sections D4.1 - D10 of Appendix A in the above manual (pages D6-D26). The manual represents a culmination of resources and technologies relating to bacteria and virus in the groundwater, prior to October 1977. An extensive reference check of the period following publication of the manual produced little additional information in the area of survival and transport of bacteria in groundwater. Refer to case study II and III. The intent of this review is to present the results of the manual in a concise abbreviated form. The reader is referred to the above manual for a complete discussion of the results.

Bacteria survival in soil; study results:

1. Enteric bacteria generally survive in soil for two to three months. Under favorable conditions organisms may multiply in soil.
2. The following factors were listed in the manual as affecting the survival of enteric bacteria and viruses in soil.
   1. Moisture content

Both bacteria and viruses survive longer as the moisture content increases.

2. pH and Temperature

Bacteria require a pH < 5. Both bacteria and viruses survive longer at lower temperatures.

3. Organic matter

Both bacteria and viruses survive longer as the organic matter content increases.

The manual references the organic matter content of soil as a potential food source for organisms. The conditions at RI systems in Wisconsin are favorable for the extended survival of bacteria and viruses, both in the unsaturated zone and in the saturated zone:

The pH generally ranges from 6-8

Continual seepage maintains a high moisture content.

Temperatures are low (10 degrees Celsius)

The treated effluent has a high organic content.

Movement and Retention of Bacteria in Soil

Bacteria are removed from soil by one of the following: sorption (adhesion), adsorption, or straining (filtering). Filtering is reported to be the predominant process under normal circumstances. Three field studies were cited in the manual with the following results.

1. **Whittier, California**

Treated effluent containing 110,000 total coliforms/100ml was reduced to 40,000/100ml after percolation through 3 feet of soil. (The reported travel time was twelve days.) It could not be determined if sorption or filtering was the dominant process responsible for the reduction.

2. **Santee Project**

Under conditions of saturated flow in a coarse gravel and sand aquifer it was found that the highest coliform reductions occurred in the first 200 feet of horizontal flow, with little removal in the next 1,300 feet. The fecal streptococcus concentration of the oxidation ditch effluent was 4,500/100ml while wells at 200 feet had concentrations of 20/100ml and wells at 1,500 feet had concentrations of 6.8/100ml. It was not stated if the removal could have occurred in the unsaturated zone. With only a 55% reduction in 1,300 feet of saturated flow it is likely that most of the reduction occurred in the unsaturated zone due to filtering action. (The results of this study are similar to the results of Case Study II).

3. **Flushing Meadows Project, Phoenix Arizona**

This study consisted of a layer of fine silty loam sand underlain by layers of gravel and coarse sand to a depth of 250 feet. The wastewater applied had a total coliform concentration ranging from 10**5 to 10**6/100ml. During the study a rest load cycle of 2 weeks and 3 weeks, respectively, was used. The study found that the total coliform concentration was reduced to less than 200/100ml at a point 30 feet from the point of application. (The results of this study are similar to Case study III.)

Movement and retention of viruses in soil.

Removal of viruses in soil is predominantly by adsorption. As such, the removal rate is controlled by the ion exchange capacity of the soil; increased organic carbon and clay content of soils will increase a soils ion exchange capacity. The manual reports that several studies had monitoring wells with significant levels of pathogens present without coliforms being detected.

Case Study II

Microbial contamination of Alluvial Gravel Aquifers by septic tank effluent.

By L. W. Sinton

1985

Hydrology centre, Water and Soil Directorate, Ministry of Works and Development, Christchurch, New Zealand.

The study site was a simulated septic tank discharge located at Burnham, New Zealand. Raw sewage was diverted from a local treatment plant into a single-chambered septic tank. The effluent from the septic tank was then diverted into either a deep injection well or a soakage pit. The deep injection well provided a source of microbial contamination to a confined aquifer 3.5 meters below the water table. The soakage pit provided microbial contamination to the upper water table aquifer. The fecal coliform count of the effluent diverted to the soakage pit averaged 700,000/100ml during the 20 month study period. The study found that coliforms travelled vertically through the unsaturated zone and horizontally in the unsaturated zone to a monitoring well 9 meters away in concentrations ranging from 300 to 1100 fecal coliforms/100ml. The deep well injections showed that fecal coliforms travelled with the groundwater flow greater than 42 meters, at concentrations ranging between 100 and 700/100ml. (42 meters was the distance to the farthest sampling point.)

Background for Case Study II

The study was undertaken in response to a groundwater quality survey that showed over 33% of the private water supply wells in unsewered communities were contaminated with fecal bacteria. Approximately 20% of the New Zealand households used underground septage systems at this time. The study site was located on well sorted glacial outwash gravels, overlain by stony silt loam. The study site was designed to duplicate a standard four bedroom, five person household using a septic tank for sewage disposal. Once each hour, fifteen times each day, a timer controlled pump located in the comminuter chamber at a nearby treatment plant discharged 66 liters of raw sewage to the single chambered septic tank. The effluent from the septic tank was then discharged to either a 5.5 meter deep soakage pit (1.5 meters in diameter) or an injection well that was screened from 3 to 9 meters below the water table. A confining clay lens located 1 meter below the water table divided the upper and lower aquifers. The monitoring network consisted of eight shallow wells radially surrounding the soakage pit and fourteen deep wells downgradient of the injection well. The system was operated continuously for 20 months with the first 10 months of discharge to the soakage pit, followed by 6 months of discharge to the injection well, and the final 4 months of discharge, again to the soakage pit. The study was set up as two experimental designs, one for the upper aquifer (recharged by the soakage pit) and the other for the lower aquifer (recharged by the injection well). The two aquifers were investigated as separate units with the shallow wells monitoring the contamination from the soakage pit and the deep wells monitoring the contamination from the injection well. The results of the soakage pit were presented as the average of the two periods. Groundwater samples were analyzed for fecal coliforms by the membrane filter technique

Hydrogeology

Several confining clay layers serve to define the lower aquifer and validate the assumption that two separate aquifers existed. The presence of a peizometric surface for the deep wells, 2.5 meters below the upper water table illustrated the presence of a confining layer between the two aquifers.

The direction of groundwater flow could not be determined in the upper aquifer due to mounding of the system. The fecal coliform data support the radial spreading of the contamination caused by water table mounding beneath the soakage pit. Groundwater flow in the confined aquifer was directly towards the monitoring wells.

Case Study II (Information on residual groundwater populations)

All groundwater samples were collected with a sterilized stainless steel bailer. To determine the potential for other sources of contamination, the study included 76 samples taken during periods when the effects of discharge would not influence the samples collected. The 76 samples had an average of 7 fecal coliforms/100 ml with a range of 4-14/100 ml. No details were given on the conditions that existed when the 76 samples were collected. The study referred to the 76 samples as predischarge fecal coliform concentrations and indicated that they were collected throughout the study period. The study reported that samples were collected between 10:00 and 11:00 AM the day of discharge. In the confined aquifer, all samples were collected 5 hours after injection to allow the contaminated groundwater to travel to the monitoring points.

Table 14 summarizes the pertinent data that were included in the report for the shallow monitoring network. The lysimeter sampling point was a passive collector located one meter below and adjacent to the soakage pit in the unsaturated zone. The study reports that 500 ml of groundwater could be collected in the lysimeter each hour. Table 15 summarizes the pertinent data that was included in the report for the deep monitoring network.

Table 14 Case Study II Fecal coliform concentrations shallow monitoring network

Sampling Point	Geometric Mean
SOAKAGE PIT	692,000
LYSIMETER	3,030
Wells are located radially in all directions, 3 meters away.	
S2	15,600
S3	206
S4	570
S5	240
S6	76
S7	106

S8	11

****
Results are Fecal Coliforms/100 ml
With 30 samples collected

TABLE 15 Fecal coliform bacteria concentrations deep wells

Sampling Point	Geometric Mean
EFFLUENT	2,290,000
INJECTION WELL	450,000
10 METERS AWAY	26
10 METERS AWAY	155
10 METERS AWAY	637
10 METERS AWAY	1,160
42 METERS AWAY	242
42 METERS AWAY	90
42 METERS AWAY	229

Results are Fecal Coliforms/100 ml
With 18 samples collected

Case Study II Results

Bacterial Tracer studies indicated travel rates of 1-5 meters/hour in the unsaturated zone and 0.6-6.3 meters/hour in the saturated zone. The rates in the unsaturated zone could not be determined accurately and the rates in the saturated zone depend on the hydraulic gradient present. Using the average hydraulic gradient in the area (0.025m/m), a porosity of 0.3, and the average travel rate in the saturated zone of 3 meters/hour, the calculated hydraulic conductivity in the lower aquifer would be 1 cm/sec.

$$(K=(3m/hr*0.3)/.025=1 \text{ cm/sec})$$

This corresponds to values reported for a sand and gravel aquifer [6]. An important result of the soakage pit experiment was the finding of a 99% reduction in the fecal coliform count from the soakage pit to the lysimeter. This finding was based on 50 samples collected throughout the study period. With the lysimeter only one meter from the pit, the travel time would have been less than one hour, making a 99% reduction impossible according to sorption or decay models for a gravel aquifer. The study reported that is was likely that this reduction was due to the filtering action of the sidewalls caused by a clogging of the pore spaces with organic solids and biomass. The study reported significant sealing of the lower portions of the pit as was evidenced by the immediate ponding of the effluent in the pit.

The fecal coliform data for the shallow system showed constant levels of fecal coliforms ranging from 50/100 ml to 1,130/100ml for six of the seven wells in the vicinity of the soakage pit. The data indicate a 90% reduction of fecal coliforms as they travelled with the groundwater two meters through unsaturated conditions and three meters through saturated conditions to the nearest monitoring wells.

The fecal coliform data for the confined aquifer consists of samples collected over a 6-month period from a series of wells aligned perpendicular to the flow at distances of 10 meters and 42 meters from the injection well. Only data for downgradient wells was include in Table 15. The data indicates that an 80% reduction in the fecal coliform concentration occurred over a period of five hours and over a horizontal distance of 25 meters.

Case Study II Research Review Conclusions

The study concluded that deep disposal of septic tank effluent results in significant microbial contamination of the groundwater. The remaining results of the study relate to the safety of the existing septic tanks and drain fields in New Zealand. The data collected for the study provided several results which are applicable to RI Systems in Wisconsin. The following conditions of the study make these results amendable to RI Systems in Wisconsin:

1. The geology of the site is similar to many of the RI Systems in Wisconsin; glacial outwash gravels and sand overlain by silt loam soil.
2. The depth to groundwater is similar to many RI Systems in Wisconsin; 12 feet.
3. The hydraulic loading rate to the bottom area of the soakage pit is representative of many RI Systems in Wisconsin; 340,000 gal/acre/day.
4. Secondary treated effluent was used as the source of microbial contamination.
5. Sample analysis was done for fecal coliforms.

The following additional results were concluded from the data collected during the study:

The results of 76 samples taken before a discharge period and after sufficient time had passed so as to allow the discharge from the previous period to pass, showed levels of fecal coliforms ranging from 4/100 ml to 14/100 ml. This result was obtained by only disinfecting the equipment used to collect the sample and not the monitoring well itself. The study did not make any conclusions about the source of the coliforms.

The most efficient reduction of fecal coliforms occurred in the sidewalls of the soakage pit where filtering action caused by clogging and biological activity lowered fecal coliform counts three orders of magnitude from 700,000/100 ml to 3,000/100 ml.

CASE STUDY III

Survival and movement of Fecal Indicator Bacteria in Soil under conditions of Saturated Flow

C. Hagedorn, D. T. Hansen, and G. H. Simsonson

1979

Oregon State University; Department of Microbiology

The study was a simulated septic tank discharge located in Land County, Oregon. Antibiotic resistant fecal streptococcus and Escherichia coli (E. coli) were isolated from raw sewage. Four liters of the isolated bacteria were applied to each of two locations. The bacteria were introduced to the groundwater through a pit filled with pea gravel to the depth of the groundwater. The monitoring network consisted of eight wells surrounding the two pits at distances of 0, 50, and 100 centimeters and downgradient wells at 300, 500, 1,500 and 3,000 cm. Injections were made December 8, 1975 and December 19, 1976 at both sites. Monitoring began immediately after each injection and continued for 33 days. The injections contained from 3-5 X 10**20 bacteria/100 ml. The injections were made immediately before a rainfall event to allow migration of the bacteria into the aquifer with the infiltrating rainfall. The soil at both sites was described as clay.

Bacteria were not detected in the wells 3,000 cm away. The study reported that the sampling may not have continued long enough for the bacteria to reach the wells. Peak values of 150,000/100 ml were reported in the well 1,500 cm away. The results indicate a 99% reduction in both E. coli and fecal streptococcus after travelling through 1.5 meters of soil in the saturated zone. Compared to the data in study II the data for the less permeable clays of Case study III indicates a significantly higher efficiency at reducing fecal coliforms. Travel distances in the sand aquifer studied for Case Study II were in excess of 42 meters with only an 80% reduction while the clay aquifer studied for Case Study II had a similar reduction in only 1.5 meters. The data from Case Study III indicate that significant concentrations of fecal coliforms and E. coli can travel through a clay aquifer. The results of the data extended over a 18 day period and showed that a reduction from 1EE10**7 to 1EE10**5 occurred over a travel distance of 1.5 meters during this time.

Background Case study III

The study was undertaken to determine the adequacy of bacteria as indicators of groundwater contamination. To differentiate between fecal bacteria from sources other than the injection, antibiotic resistant strain of E. coli and fecal streptococcus were cultured and used for the injections. Two sites were chosen to represent various depths to groundwater. The depths to groundwater varied between 15 cm and 50 cm below the ground surface. All monitoring wells were four inch diameter PVC pipe extending 50 centimeters below the ground surface. Analysis was done using agar specific to the antibiotic resistant E. coli and fecal streptococcus cultured for the injections. The monitoring wells were sampled through a one centimeter glass pipe that ended 5 centimeters from the bottom of the well and extruded through the sealed well cap.

To illustrate the results in a form that presents only the relevant information the units have been converted to cells/100ml. Figures 15 - 18 show the results of the sampling for both sites.

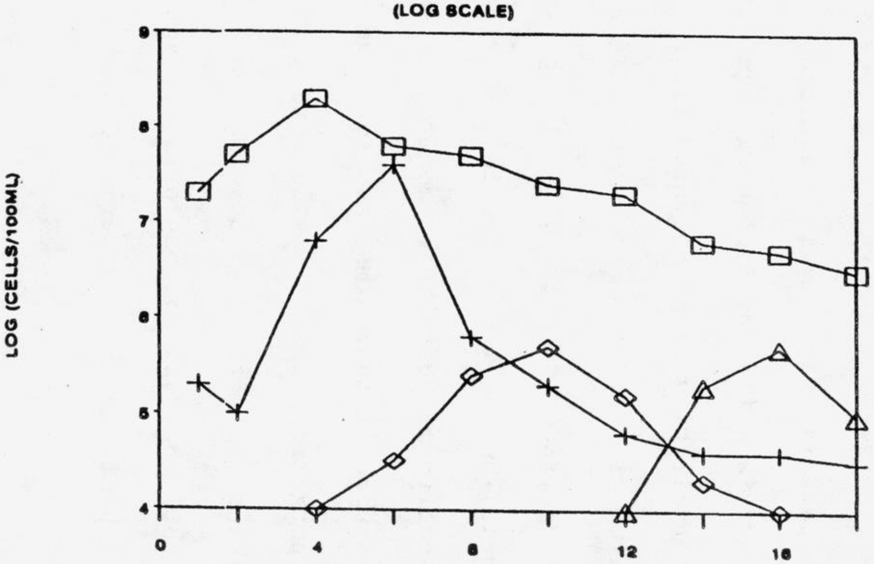
COLIFORM CONTAMINATION OF GROUNDWATERS BENEATH RI SYSTEMS

Conclusions and Recommendations

With the current permitting system and monitoring programs, only TDS, nitrates, nitrites, and chloride exceedances are used as groundwater quality standards in cases where remedial action is required. As previously discussed, these parameters are ineffective as a regulating tool due to the high percentage of facilities with elevated background conditions and poor monitoring networks. (Refer to NR140.26 for a listing of the factors that are considered when determining what constitutes an enforceable exceedance.) Unlike TDS, nitrates, nitrites, and chloride, continually elevated coliform counts in a monitoring well would only occur if a significant source of coliforms was entering the groundwater on a regular basis. (Inorganic parameters will remain in an aquifer for extended periods, making background contamination from distant sources possible.) The current standard for bacteria is set at less than one Total Coliform in any 100 ml sample as determined by the

FIGURE 15 E. COLI. (SITE ONE)

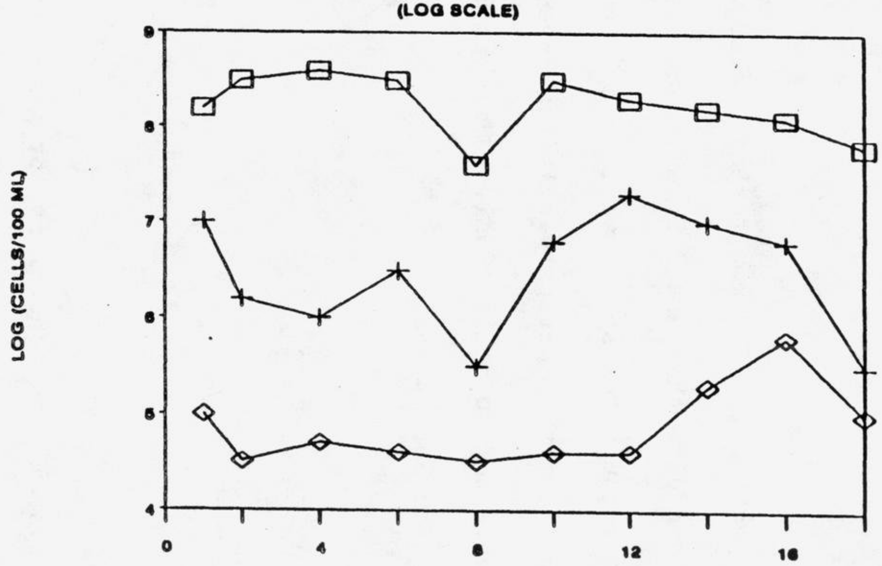
(LOG SCALE)



☐ PIT + 100 CM ◇ 500 CM △ 1500 CM

FIGURE 16 FECAL STREP. (SITE TWO)

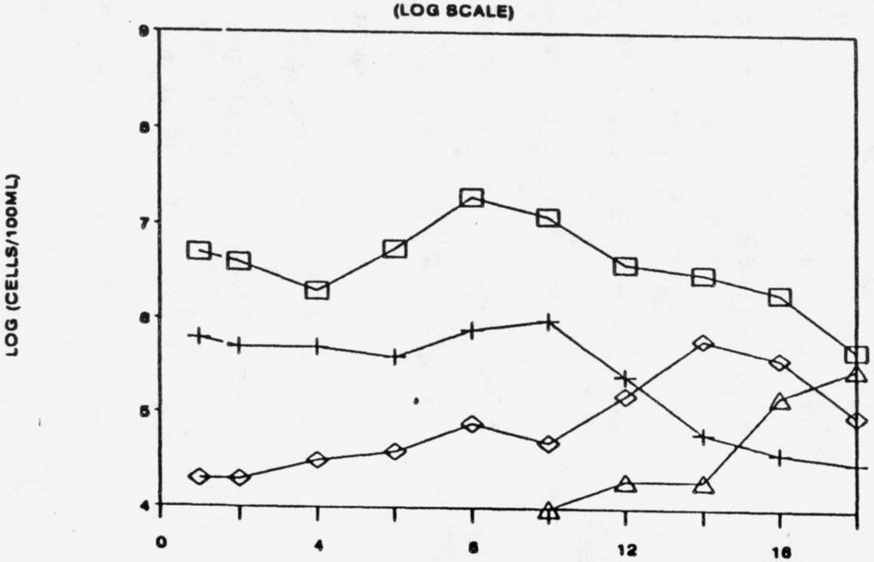
(LOG SCALE)



☐ PIT + 100 CM ◇ 500 CM △ 1500 CM

FIGURE 17 FECAL STREP. (SITE ONE)

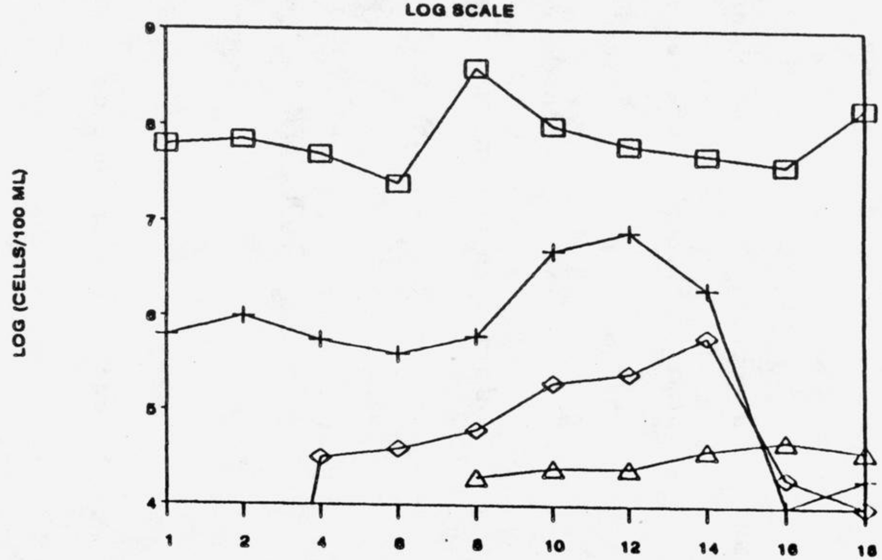
(LOG SCALE)



☐ PIT + 100 CM ◇ 500 CM △ 1500 CM

FIGURE 18 E. COLI. (SITE TWO)

LOG SCALE



☐ PIT + 100 CM ◇ 500 CM △ 1500 CM

membrane filter technique or an unconfirmed presumptive test as indicated by the most probable number technique. (MPN procedure)

The fact that coliforms are not present in background groundwater but are found in significant numbers in secondary treated effluent discharged to seepage cells, makes them ideal as indicators of groundwater contamination. The disadvantages are that sampling for coliforms involves a risk of contamination from other sources. The usefulness of coliform monitoring results from it being a simple test that requires minimal handling and preservation.

Future research should involve an extensive state wide survey of monitoring wells that includes warm weather sampling. (The possibility for surface contamination of monitoring wells by coliforms increases during the summer due to infiltrating rainwater.) The MPN five tube technique should be run at several dilutions so that results can be quantified. Factors that need to be incorporated into future sampling include; seasonality, travel distance to wells (saturated and unsaturated), transport & survival properties of various coliforms, and background sources of coliforms. Further research should be directed towards answering the following questions:

1. Are the low levels of coliforms found in monitoring wells representative of residual populations or actual groundwater concentrations? (The possibility that bacteria may adhere to surfaces and dislodge during purging should be researched.)
2. What would be the main objective of bacterial monitoring?

    If bacterial data were to be used as an indicator of a potential health hazard from pathogens the value of coliforms as an indicator of pathogens in a groundwater environment would have to be researched. There exists much controversy over the use of coliforms as an indicator of pathogenic contamination in groundwater. Viruses and certain pathogenic bacteria will survive longer in the groundwater and be more resistant to stress in an aquifer. These two facts preclude the accuracy of coliforms as indicators of pathogens in the groundwater. A more likely objective would be to use coliforms as an indicator of contamination from seepage cells in general.

Research has already documented the ability of coliforms to travel within an aquifer under a variety of conditions similar to those of RI systems. (Refer to Case Studies II and III) The results of Case Studies I, II, and III showed significantly higher groundwater contamination than were found in samples from monitoring wells around RI systems. It is not known if RI Systems are more effective at removing bacteria or if the wells are simply not intercepting the plume. Evidence from the inorganic chemistry data for RI systems indicate that the latter may be the case for many facilities. There is the possibility that increased organic buildup in these systems acts as a filter to remove coliforms before they enter the groundwater.

The survey performed showed that 80% of the wells sampled were exceeding the NR140 limit for total coliforms. Since there exist many complicating factors (such as residual populations, background sources of contamination, and uncertainty about well placement) the use of bacterial monitoring at the present time should be restricted to indicating general contamination of the groundwater by these systems.

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APPENDIX A

TABLE A1	Facilities using RI systems for disposal of treated municipal sewage.
TABLE A2	Facility priority according to groundwater quality.
TABLE A3	Precision/Accuracy of HACH CN-66 Chlorine kit
TABLE A4	Municipalities permitted for land disposal of treated sewage.

APPENDIX A TABLE A1

FACILITY INFORMATION Facilities using RI systems for disposal of treated municipal sewage.

Name	PERMIT NO.	System Type	Design Flow (GAL)	Soil	LEVEL OF Trtmt	Hyd Ldg (gl/ac/dy) (Design)	Smp Freq	Wells
ADELL, VILLAGE	60127	ABSORP	=100-500T	SAND	SEC	95000	SEMIANN	3
ALMA CENTER, VILLAGE OF	21385	ABSORP	50-100T	SAND	SEC	7791	MONTHLY	4
ALMOND VILLAGE	60780	ABSORP	50-100T	SAND	SEC	46154	MONTHLY	2
AMERICAN BAPTIST ASSEMBLY	60691	ABSORP	100-500T	SAND		103600	SEMIANN	2
ARENA VILLAGE	60704	ABSORP	10-50T	SAND	SEC	138889	MONTHLY	3
BALSAM LAKE	20648	ABSORP	100-500T	SAND	SEC	83500	SEMIANN	5
BARRON SEWAGE PLANT	21687	ABSORP	>1M	SAND	SEC	154200	MONTHLY	12
BIRCHWOOD, VILLAGE OF	60003	ABSORP	50-100T	SAND	SEC	38117	MONTHLY	2
BOYCEVILLE, VILLAGE	60330	ABSORP	100-500T	SAND	SEC	70000	MONTHLY	8
BOYD SEWAGE TREATMENT PLANT	21261	ABSORP	50-100T	SAND	SEC	67140	MONTHLY	3
BRUCE WATER & SEWER UTILITY	60143	ABSORP	50-100T	SILT	SEC	3800	SEMIANN	2
CECIL, VILL OF	60020	ABSORP	50-100T	SILT	SEC	54287	MONTHLY	4
CENTURIA, VILLAGE OF	60283	ABSORP	50-100T	SAND	SEC	59375	MONTHLY	2
COCHRANE SEWAGE TREATMENT PLANT	20214	ABSORP	50-100T	SAND	SEC	6809	MONTHLY	2
CRANDON WATER & SEWER UTILITY	36277	ABSORP	100-500T	SAND	SEC	73800	SEMIANN	5
CRIVITZ SANITARY DISTRICT	60372	ABSORP	50-100T	SILT	PRIM	6600	SEMIANN	2
EVANSVILLE	23957	ABSORP	500T-1M	SAND	SEC	375000	MONTHLY	2
FAIRCHILD, VILLAGE	36200	ABSORP	50-100T	SAND	SEC	17333	MONTHLY	2
FALL CREEK								
FLORENCE MUNICIPAL SEWER SYSTEM	22845	ABSORP	50-100T	SAND	SEC	25907	MONTHLY	4
FRANCIS CREEK	21377	ABSORP	50-100T	SAND	SEC	29536	MONTHLY	2
FREDERIC SEWAGE TREATMENT PLANT	29254	ABSORP	100-500T	SAND	0	69400	MONTHLY	2
GLENWOOD CITY	60381	ABSORP	50-100T	SAND	SEC	8836	OTHER	3
GOODMAN SANITARY DISTRICT #1	60844	ABSORP	50-100T	SAND	SEC	114300	SEMIANN	5
GRANTSBURG, VILLAGE	60429	ABSORP	100-500T	SAND	SEC	1303383	SEMIANN	4
HAMMOND, VILLAGE OF	24171	ABSORP	100-500T	SAND	SEC	77000	MONTHLY	2
HAYWARD SEWER AND WATER UTILITY	21121	ABSORP	500T-1M	SAND	SEC	268000	BIANN	5
IRON RIVER SANITARY DISTRICT #1	22446	ABSORP	50-100T	SAND	SEC	40000	MONTHLY	3
KELLY LAKE S.D. #1	60224	ABSORP	50-100T	SAND	SEC	24150	MONTHLY	2
LAKE GENEVA								
LAKE WAPOGASSET-BEAR TRAP	60313	ABSORP	100-500T	SAND	SEC	189400	SEMIANN	4
LONE ROCK, VILLAGE OF	60763	ABSORP	50-100T	SAND	SEC	27941	MONTHLY	2
LUCK SEWAGE TREATMENT PLANT	21482	ABSORP	100-500T	SAND	SEC	79100	MONTHLY	4
MELLEN SEWAGE TREATMENT PLANT	20311	ABSORP	100-500T	SAND	SEC	480400	SEMIANN	2
MERRIMAC, VILLAGE OF	61042	ABSORP	50-100T	SAND	SEC	96100	SEMIANN	2
MILLTOWN SEWAGE TREATMENT PLANT	24741	ABSORP	50-100T	SAND	SEC	69767	BIANN	2
MILTON	60453	ABSORP	50-100T	SAND	SEC	604300	SEMIANN	2
MINONG, VILLAGE OF	35939	ABSORP	50-100T	SAND	0	47847	SEMIANN	4
MOUNT CALVARY	35963	ABSORP	100-500T	SAND	SEC	1566000	SEMIANN	2
MOUNT TELEMARK LODGE	60640	ABSORP	50-100T	SAND	SEC		SEMIANN	3
MUSCODA, VILLAGE OF	60615	ABSORP	100-500T	SAND	PRIM	42000	SEMIANN	2
NEW AUBURN, VILL OF	30635	ABSORP	50-100T	SAND	SEC	43083	MONTHLY	2
NORTHERN MORAINE UTILITY COMM.	60879	ABSORP	=500T-1M	SAND	SEC	24300	SEMIANN	11
OSSEO SEWAGE TREATMENT PLANT	25046	ABSORP	100-500T	SAND	SEC	15501	MONTHLY	2
PARDEEVILLE WATER & SEWER	21644	ABSORP	100-500T	SAND	SEC	226271	MONTHLY	2
PITTSVILLE WATER AND SEWER DEPT.	20494	ABSORP	50-100T	SILT	SEC	9986	MONTHLY	3
PLAINFIELD, VILLAGE OF	60062	ABSORP	50-100T	SAND	SEC	38425	MONTHLY	2
SAUK-PRAIRIE SEWERAGE COMM.	60534	ABSORP	>1M	SAND	SEC	187200	MONTHLY	2
SHELL LAKE	20095	ABSORP	100-500T	SAND	SEC	58800	BIANN	3
SOLON SPRINGS	61115	ABSORP						
SPOONER SEWAGE TREATMENT PLANT	21067	ABSORP	500T-1M	SAND	SEC	29900	SEMIANN	4
TURTLE LAKE, VILLAGE OF	25631	ABSORP	100-500T	SILT	SEC	21150	MONTHLY	13
UNITY, VILLAGE OF	60526	ABSORP	50-100T	SAND	SEC	29444	MONTHLY	2
WAUSAUKEE WATER & SEWER UTILITY	60011	ABSORP	50-100T	SAND	SEC	40000	SEMIANN	4
WAUTOMA, CITY OF	60178	ABSORP	100-500T	SAND	SEC	66500	SEMIANN	3
WILD ROSE, VILLAGE OF	60071	ABSORP	50-100T	SAND	SEC	51725	MONTHLY	2
WILLIAMS BAY VILLAGE OF	60046	ABSORP	=500T-1M	SAND	SEC		MONTHLY	5
WINTER VILLAGE OF	60089	ABSORP	50-100T	SAND	SEC	77670	MONTHLY	2
WI-DVA VETERANS HOME	60411	ABSORP	100-500T	SAND	SEC	23500	SEMIANN	3
WOODVILLE VILLAGE OF	60097	ABSORP	100-500T	SAND	SEC	16364	MONTHLY	4

APENDIX A TABLE A2 FACILITY PRIORITY ACCORDING TO GROUNWADTER QUALITY

Facility rank according to exceedances of groundwater limits. Rank was determined as follows
SCORE = 2*(Fraction > ES) + (Fraction > PAL)
Rank is from low score to high score.

						Number of samples greater than X .								
						TDS			NO3 & NO2			Chloride		
Facility	Type	Design Flow	Hyd Ldg (gl/ac/dy) (Actual)	No. Samples	No. Wells	> 250	> 500	Bkgrd Conc	> 2	> 10	Bkgrd Conc	> 125	> 250	Bkgrd Conc
NEW AUBURN	Aer Lag	63,300	43,083	14	2	2	0	100	0	0	0.1	0	0	1
MOUNT TELEMARK	Act S	100,000		36	3	6	0	100	0	0	0.1	0	0	1
WINTER	Stab	50,000	77,670	12	2	1	0	100	2	0	0.1	0	0	10
OSSEO	T F	231,000	15,501	14	2	0	0	50	2	1	1	0	0	1
ALMA CENTER	T F	70,000	7,791	15	3	0	0	75	6	0	4	0	0	2
FAIRCHILD	Stab	81,000	17,333	5	2	0	0	150	2	0	2	0	0	1
CENTURIA	Aer Lag	95,000	59,375	14	2	4	0	120	2	0	1	0	0	5
WI-DVA	Act S	290,000	23,500	44	3	12	0	2000	6	1	0.1	0	0	10
SPOONER	Aer Lag	567,000	29,900	72	5	28	0	150	5	0	0.1	0	0	2
LUCK	Aer Lag	365,000	79,100	20	2	6	0	100	4	0	0.1	0	0	1
WILD ROSE	Aer Lag	90,000	51,725	23	2	2	0	150	8	2	1	0	0	1
MUSCODA	Stab	215,000	42,000	44	2	19	1	100	5	0	0.2	1	0	2
LAKE WAPOGASSET	Aer Lag	50,000	189,400	74	5	2	0	75	44	0	4	0	0	10
LONE ROCK	Aer Lag	57,000	27,941	14	2	1	0	110	9	0	4	0	0	5
SHELL LAKE	Aer Lag	195,000	58,800	38	3	19	0	300	5	1	0.1	1	1	10
FALL RIVER	Stab	182,000	14,297	22	2	15	1	390	0	0	0.2	0	0	19
IRON RIVER	Stab	60,000	40,000	30	3	18	0	50	4	1	0.1	0	0	1
GOODMAN	T F	80,000	114,300	42	3	28	3	200	0	0	0.1	0	0	5
BIRCHWOOD	Aer Lag	852,000	38,117	6	2	0	0	120	3	1	2	0	0	10
GRANTSBURG	Stab	125,000	1,303,383	94	7	59	8	40	6	0	0.1	1	0	1
HAYWARD	Aer Lag	385,000	268,000	42	5	24	0	200	14	0	0.1	0	0	10
BOYCEVILLE	Aer Lag	120,000	70,000	34	11	18	2	100	6	2	0.1	0	0	5
BALSAM LAKE	Aer Lag	120,000	83,500	83	6	38	7	300	11	2	0.1	19	2	10
PLAINFIELD	Stab	97,000	38,425	22	2	11	1	250	9	1	2	0	0	10
MELLEN	Aer Lag	140,000	480,400	36	2	25	6	200	3	0	0.1	1	0	10
WIS STATE DHSS	Act S	60,000		35	5	25	5	220	0	0	0.1	7	0	2
FLORENCE	Aer Lag	109,000	25,907	13	12	12	0	360	2	1	0.4	0	0	20
CRANDON	Stab	260,000	73,800	64	6	35	14	200	8	5	0.1	4	0	10
GLENWOOD CITY	Aer Lag	300,000	8,836	34	4	34	6	450	3	0	0.1	0	0	5
PITTSVILLE	T F	50-100T	9,986	27	3	8	0	200	20	6	10	0	0	20
WAUTOMA	Act S	450,000	66,500	57	4	51	5	350	26	1	1	0	0	35
WAUSAUKEE	Stab	80,000	40,000	30	2	29	13	360	1	0	0.1	3	0	20
BOYD	T F	67,100	67,140	21	3	10	0	110	18	7	3	0	0	10
BARRON	Aer Lag	1,373,000	154,200	113	11	94	10	300	59	30	5	0	0	30
HAMMOND	Aer Lag	154,000	77,000	8	2	8	1	400	8	0	6	0	0	60
PARDEEVILLE	Aer Lag	314,200	226,271	8	2	6	3	380	4	0	0.6	2	0	58
KELLY LAKE	Stab	80,000	24,150	16	2	16	10	450	2	0	0.2	0	0	50
CECIL	Stab	80,000	54,287	36	4	36	17	500	17	0	4	3	0	50
MERRIMAC	Stab	52,000	96,100	26	2	26	11	600	18	0	4	0	0	20
ARENA	Stab	50,000	138,889	12	2	8	1	200	11	6	4	0	0	30
AMERICAN BAP.	T F	160,000	103,600	44	2	42	30	480	15	0	0.2	7	0	80
COCHRANE	Stab	72,000	6,809	10	2	10	1	400	7	5	10	0	0	20
ALMOND	Stab	60,000	46,154	16	2	10	10	250	6	5	0.1	2	0	1
MILLTOWN	Aer Lag	75,000	69,767	22	2	16	11	300	10	0	0.1	12	8	15
MOUNT CALVARY	Aer Lag	170,000	1,566,000	40	2	40	32	510	1	0	0.2	20	8	15
MILTON	Act S	500,000	604,300	46	2	46	22	450	36	15	9	21	1	20
FRANCIS CREEK	Stab	70,000	29,536	31	2	31	26	500	18	3	0.1	15	5	10
ADELL, VILLAGE	Act S	100,000	95,000	56	3	56	56	1000	17	0	4	52	35	100
EVANSVILLE	Aer Lag	600,000	375,000	130	18	130	51	380	208	113	12	152	27	15
SAUK-PRAIRIE	Aer Lag	1,000,000	187,200	24	2	24	12	450	12	12	15	12	50	25

Aer Lag = Aerated Lagoon
Stab = Stabilization Pond
Act S = Activated Sludge
T F = Trickling Filters

TABLE A3 Precision/Accuracy of HACH CN-66 Chlorine kit

PRECISION AND ACCURACY OF THE DETERMINATION OF TOTAL AVAILABLE RESIDUAL CHLORINE IN VARIOUS SAMPLE MATRICES BY THE CN-66 KIT

SAMPLE[a] MATRIX	AVERAGE mg/l	STANDARD DEVIATION ± mg/l	RELATIVE STANDARD DEVIATION,%	TRUE VALUE[b]	%RECOVERY
Distilled Water[c]	0.44	0.012	2.6	----	----
	1.43	0.006	0.4	----	----
Drinking Water	1.22	0.04	3.4	0.91	134.1
River Water	0.39	0.02	4.2	0.75	52.0
Domestic Sewage	1.92	0.10	5.1	1.75	109.7
Raw Sewage[d]	----	----	---	----	----

a Three replicates for distilled water. Seven replicates for other samples.

b Arbitrarily assigned to the Iodo-I value.

c When the same solutions were transferred to a spectrophotometer cell and read, then compared to a standard curve prepared as in the DPD Colorimetric Method the results were 0.42 ± 0.02 mg/l and 1.35 ± 0.03 mg/l. If these values are called the "true value" the recoveries from the kit method are 105% and 106% respectively.

d Turbidity and deep straw color prevented raw sewage from being analyzed.

TABLE A4 Municipalities permitted for land disposal of treated sewage.

MUNICIPALITIES WITH LAND DISPOSAL BY DISTRICT 11:23 THURSDAY, JUNE 9, 1988

DIST=SOUTHEAST

PERMIT NO	PERNAME	COUNTY	DESFLOW	TRTTYP01
0060127	ADELL VILLAGE	SHEBOYGAN	0.1000	NONE LISTED
0060208	ALPINE VALLEY RESORT INC	WALWORTH	0.0400	NONE LISTED
0061077	ALPINE VALLEY RESORT MUSIC THEATER	WALWORTH	0.1000	NONE LISTED
0060291	AMERICAN MOBILE HOME COMMUNITIES	WAUKESHA	0.0366	NONE LISTED
0060119	CEDAR LAKE HOME	WASHINGTON	0.0500	NONE LISTED
0031526	EAGLE LAKE SEWER UTILITY	RACINE	0.4000	ACT SLDG-CON ST
0060569	FONTANA-ON-GENEVA LAKE	WALWORTH	0.9000	ACT SLDG-CON ST
0060275	INTERLAKEN RESORT VILLAGE	WALWORTH	0.1750	NONE LISTED
0060879	NORTHERN MORAINE UTILITY COMMISSION	SHEBOYGAN	0.6000	NONE LISTED
0031011	WHEATLAND MOBILE HOME PARK	KENOSHA	0.0390	ACT SLDG-EXT AE
0060721	WI DHSS KETTLE MORRAINE COR INST	SHEBOYGAN	0.0600	ACT SLDG-EXT AE
0060267	WI DHSS WI SCHOOL FOR BOYS	WAUKESHA	0.0500	ACT SLDG-CON ST
0060356	WI DNR LONG LAKE RECREATION AREA	SHEBOYGAN	0.0100	STAB POND
0036153	WI DNR PIKE LAKE STATE PARK	WASHINGTON	0.0100	STAB POND

PERMIT NO	TRTTYP02	TRTTYP03	TRTTYP04	TRTTYP05	LOCATION

MUNICIPALITIES WITH LAND DISPOSAL BY DISTRICT 11:23 THURSDAY, JUNE 9, 1988

DIST=LAKE MICHIGAN

PERMIT NO	PERNAME	COUNTY	DESFLOW	TRTTYP01
0061026	BRAZEAU SANITARY DISTRICT 1	OCONTO	0.0490	STAB POND
0022829	CAROLINE SAN DIST #1	SHAWANO	0.0870	AERATED LAGOON
0060020	CECIL, VILL OF	SHAWANO	0.1080	STAB POND
0060861	COLOMA, VILLAGE	WAUSHARA	0.0400	STAB POND
0022845	FLORENCE MUNICIPAL SEWER SYSTEM	FLORENCE	0.1010	AERATED LAGOON
0021377	FRANCIS CREEK VILLAGE	MANITOWOC	0.0700	STAB POND
0060844	GOODMAN SANITARY DISTRICT #1	MARINETTE	0.0800	PRIM/GRAV SED
0035149	HANCOCK VILLAGE OF	WAUSHARA	0.0668	OXIDATION DITCH
0035807	IRON MOUNTAIN-KINGSFORD JOINT SEWAGER BOARD	FLORENCE	-1.0000	LAND DISP-GEN
0060976	KELLNERSVILLE, VILLAGE OF	MANITOWOC	0.0450	STAB POND
0060224	KELLY LAKE SANITARY DISTRICT 1	OCONTO	0.0390	STAB POND
0031828	LIBERTY SAN. DIST. #1	MANITOWOC	0.0400	AERATED LAGOON
0061051	MARIBEL SEWAGE TREATMENT PLANT	MANITOWOC	0.0500	AERATED LAGOON
0060160	MATTOON VILL OF	SHAWANO	0.0375	STAB POND
0061140	NORTHLAND MISSION INC.	MARINETTE	0.0450	ACT SLDG-EXT AE
0060062	PLAINFIELD, VILLAGE OF	WAUSHARA	0.0970	STAB POND
0020931	ROYAL SCOTT SANITARY DISTRICT	BROWN	0.0520	ACT SLDG-EXT AE
0061221	SANGER B. POWERS,CORRECTIONAL CENTER	OUTAGAMIE	0.0090	SPRAY IRRIG
0060186	SCANDINAVIA SEWAGE TREATMENT PLANT	WAUPACA	0.0500	STAB POND
0060011	WAUSAUKEE WATER & SEWER UTILITY	MARINETTE	0.0800	STAB POND
0060178	WAUTOMA, CITY OF	WAUSHARA	0.4500	ACT SLDG-CON ST
0060411	WI-DVA VETERANS HOME	WAUPACA	0.2900	NONE LISTED
0060071	WILD ROSE, VILLAGE OF	WAUSHARA	0.0900	AERATED LAGOON
0028444	WITTENBERG SEWER DEPARTMENT	SHAWANO	0.2500	AERATED LAGOON

PERMIT NO	TRTTYP02	TRTTYP03	TRTTYP04	TRTTYP05	LOCATION

MUNICIPALITIES WITH LAND DISPOSAL BY DISTRICT 11:23 THURSDAY, JUNE 9, 1988

DIST=NORTHWEST

PERMIT NO	PERNAME	COUNTY	DESFLOW	TRTTYP01
0020648	BALSAM LAKE VILLAGE	POLK	0.1200	AERATED LAGOON
0021687	BARRON CITY	BARRON	1.3730	AERATED LAGOON
0060003	BIRCHWOOD VILLAGE	WASHBURN	0.8520	AERATED LAGOON
0060143	BRUCE VILLAGE	RUSK	0.1000	AERATED LAGOON
0061158	BRULE SANITARY DISTRICT	DOUGLAS	0.0165	STAB POND
0020656	BUTTERNUT VILLAGE	ASHLAND	0.0736	STAB POND
0060283	CENTURIA VILLAGE	POLK	0.0950	AERATED LAGOON
0031623	EXELAND VILLAGE	SAWYER	0.0273	STAB POND
0060593	FIFIELD SANITARY DISTRICT	PRICE	0.0550	STAB POND
0029254	FREDERIC SEWAGE TREATMENT PLANT	POLK	0.2570	TRICKL FILTERS
0030937	GILMAN VILLAGE	TAYLOR	0.1250	AERATED LAGOON
0060429	GRANTSBURG, VILLAGE	BURNETT	0.1250	STAB POND
0061000	HAUGEN VILLAGE	BARRON	0.2460	AERATED LAGOON
0021121	HAYWARD CITY	SAWYER	0.3850	AERATED LAGOON
0022446	IRON RIVER SANITARY DISTRICT 1	BAYFIELD	0.0600	STAB POND
0060313	LAKE WAPOGASSET BEAR TRAP L SAN DIST	POLK	0.0500	AERATED LAGOON
0021482	LUCK VILLAGE	POLK	0.3650	AERATED LAGOON
0020311	MELLEN SEWAGE TREATMENT PLANT	ASHLAND	0.1400	AERATED LAGOON
0035939	MINONG, VILLAGE OF	WASHBURN	0.3000	STAB POND
0060640	MOUNT TELEMARK LODGE	BAYFIELD	0.1000	ACT SLDG-CON ST
0060798	RADISSON SEWAGE TREATMENT PLANT	SAWYER	0.0300	ACT SLDG-EXT AE
0020095	SHELL LAKE SEWAGE TREATMENT PLANT	WASHBURN	0.1950	AERATED LAGOON
0028924	SIREN VILLAGE	BURNETT	0.1880	AERATED LAGOON
0061115	SOLON SPRINGS VILLAGE	DOUGLAS	0.1180	STAB POND

PERMIT NO	TRTTYP02	TRTTYP03	TRTTYP04	TRTTYP05	LOCATION

0021067	SPOONER SEWAGE TREATMENT PLANT	WASHBURN	0.5670	AERATED LAGOON
0060925	STONE LAKE SANITARY DISTRICT	SAWYER	0.0300	STAB POND
0025631	TURTLE LAKE VILLAGE	BARRON	0.7230	S ABSRP-DRNFLD
0060461	WI UNIVERSITY PIGEON LAKE STATION	BAYFIELD	0.0112	NONE LISTED
0060089	WINTER VILLAGE OF	SAWYER	0.0500	STAB POND

PERMIT NO	TRTTYP02	TRTTYP03	TRTTYP04	TRTTYP05	LOCATION

MUNICIPALITIES WITH LAND DISPOSAL BY DISTRICT 11:23 THURSDAY, JUNE 9, 1988

DIST=WEST CENTRAL

PERMIT NO	PERNAME	COUNTY	DESFLOW	TRTTYP01
0021385	ALMA CENTER VILLAGE	JACKSON	0.0700	TRICKL FILTERS
0060330	BOYCEVILLE VILLAGE	DUNN	0.1200	AERATED LAGOON
0021261	BOYD VILLAGE	CHIPPEWA	0.0671	TRICKL FILTERS
0020214	COCHRANE VILLAGE	BUFFALO	0.0720	STAB POND
0025356	DEER PARK VILLAGE	ST CROIX	0.0300	AERATED LAGOON
0036200	FAIRCHILD VILLAGE	EAU CLAIRE	0.0810	STAB POND
0025976	FALL CREEK VILLAGE	EAU CLAIRE	0.1549	TRICKL FILTERS
0060747	FOREST SANITARY DISTRICT NO. 1	ST CROIX	0.0075	STAB POND
0024171	HAMMOND VILLAGE	ST CROIX	0.1540	AERATED LAGOON
0024236	HIXTON VILLAGE	JACKSON	0.0400	STAB POND
0028339	HOLCOMBE SAN DIST 1 C/O HOWARD RICKER	CHIPPEWA	0.0250	STAB POND
0060500	KNAPP VILLAGE	DUNN	0.0400	STAB POND
0030635	NEW AUBURN VILLAGE	CHIPPEWA	0.0633	AERATED LAGOON
0025046	OSSEO CITY	TREMPEALEAU	0.2310	TRICKL FILTERS
0025119	PIGEON FALLS VILLAGE	TREMPEALEAU	0.0500	STAB POND
0061069	RICHMOND TN SAN DIST 1	ST CROIX	0.0075	STAB POND
0061018	SAND CREEK SANITARY DISTRICT #1	DUNN	0.0323	STAB POND
0060887	ST. BEDES PRIORY	EAU CLAIRE	0.0066	STAB POND
0060984	STAR PRAIRIE VILLAGE	ST CROIX	0.0591	STAB POND
0060585	TWIN CITY WEST AUTO/TRUCK PLAZA, INC.	ST CROIX	0.0150	NONE LISTED
0060259	WARRENS VILLAGE	MONROE	0.0450	STAB POND
0060852	WHEELER VILLAGE	DUNN	0.0250	STAB POND
0060097	WOODVILLE VILLAGE	ST CROIX	0.1080	AERATED LAGOON

PERMIT NO	TRTTYP02	TRTTYP03	TRTTYP04	TRTTYP05	LOCATION

MUNICIPALITIES WITH LAND DISPOSAL BY DISTRICT 11:23 THURSDAY, JUNE 9, 1988

DIST=NORTH CENTRAL

PERMIT NO	PERNAME	COUNTY	DESFLOW	TRTTYP01
0060780	ALMOND VILLAGE OF	PORTAGE	0.0600	STAB POND
0036277	CRANDON CITY	FOREST	0.2600	AERATED LAGOON
0032085	HUSTLER,VILLAGE OF	JUNEAU	0.0214	STAB POND
0031909	KENTOMAL INC ARROWHEAD RESORT CAMPGROUND	JUNEAU	0.0259	STAB POND
0060488	LYNDON STATION VILLAGE OF	JUNEAU	0.0550	STAB POND
0060496	RIVEREDGE COUNTRY CLUB	WOOD	0.0075	NONE LISTED
0060810	ROSHOLT SEWER COMMISSION	PORTAGE	0.1000	AERATED LAGOON
0060895	WHITE LAKE, VILL OF	LANGLADE	0.0500	STAB POND
0060305	WI DHSS MCNAUGHTON CAMP	ONEIDA	-1.0000	STAB POND
0060135	WORLDWIDE CHURCH OF GOD	ADAMS	0.0800	STAB POND

PERMIT NO	TRTTYP02	TRTTYP03	TRTTYP04	TRTTYP05	LOCATION

DIST=SOUTHERN

PERMIT NO	PERNAME	COUNTY	DESFLOW	TRTTYP01
0060691	AMERICAN BAPTIST ASSEMBLY	GREEN LAKE	0.1600	TRICKL FILTERS
0060704	ARENA VILLAGE	IOWA	0.0500	STAB POND
0060992	BLUFFVIEW ACRES INC	SAUK	0.0340	STAB POND
0020818	CAMPBELLSPORT VILLAGE	FOND DU LAC	0.5300	AERATED LAGOON
0021407	COBB VILLAGE	IOWA	0.0600	AERATED LAGOON
0060941	DEVI BARA RESORT	SAUK	0.0200	AERATED LAGOON
0060968	DEVILS HEAD LODGE	SAUK	0.0550	NONE LISTED
0023957	EVANSVILLE CITY	ROCK	0.6000	AERATED LAGOON
0060623	EVERGREEN MOBILE HOME PARK	LAFAYETTE	0.0200	AERATED LAGOON
0023973	FALL RIVER VILLAGE	COLUMBIA	0.1820	STAB POND
0031992	FOX LAKE WATER POLLUTION CONTROL COMMISSION	DODGE	0.4550	AERATED LAGOON
0061123	FRONTIER PETROLEUM	FOND DU LAC	0.0150	NONE LISTED
0036790	HIGHLAND VILLAGE	IOWA	0.0850	STAB POND
0030775	J L OIL INC	COLUMBIA	0.0300	NONE LISTED
0030368	JUDA SANITARY DISTRICT	GREEN	0.0400	STAB POND
0060763	LONE ROCK VILLAGE	RICHLAND	0.0570	AERATED LAGOON
0061042	MERRIMAC VILLAGE	SAUK	0.0520	STAB POND
0060453	MILTON CITY	ROCK	0.5000	NONE LISTED
0060712	MORRISONVILLE SANITARY DISTRICT	DANE	0.2012	STAB POND
0035963	MOUNT CALVARY VILLAGE	FOND DU LAC	0.1700	AERATED LAGOON
0060666	NESHKORO VILLAGE	MARQUETTE	0.0600	STAB POND
0060933	PACKWAUKEE SANITARY DISTRICT #1	MARQUETTE	0.0500	STAB POND
0021644	PARDEEVILLE VILLAGE	COLUMBIA	0.3142	AERATED LAGOON
0060607	RAL-YIELD EQUITIES II	JEFFERSON	-1.0000	ACT SLDG-EXT AE

PERMIT NO	TRTTYP02	TRTTYP03	TRTTYP04	TRTTYP05	LOCATION

DIST=SOUTHERN

PERMIT NO	PERNAME	COUNTY	DESFLOW	TRTTYP01
0060534	SAUK-PRAIRIE SEWERAGE COMMISSION	SAUK	1.000	AERATED LAGOON
0026867	ST CLOUD VILLAGE	FOND DU LAC	0.044	AERATED LAGOON
0022250	WESTFIELD VILLAGE	MARQUETTE	0.450	OXIDATION DITCH
0032018	WI CORP SEVENTH DAY ADVENT GO SEEK	MARQUETTE	0.100	STAB POND
0060470	WI DHSS FOX LAKE CORRECTIONAL INST	DODGE	0.090	NONE LISTED
0060950	WYOCENA VILLAGE	COLUMBIA	0.122	AERATED LAGOON

PERMIT NO	TRTTYP02	TRTTYP03	TRTTYP04	TRTTYP05	LOCATION

APPENDIX B GROUNDWATER DATA FOR RI SYSTEMS.

DATA RETRIEVED FROM DNR MAINFRAME ON 8/15/87 FOR ALL LAND DISPOSAL FACILITES. (UNITS MG/L)

FACILITY NAME	PERMIT NO.	WELL	DATE	NOX	ORG	CL	TDS	SO4	NH3
ADELL, VILLAGE	60127	201	770331	6.77	5.2	32	1008	102	2.11
ADELL, VILLAGE	60127	201	780410	0.54	3.4	140	3700	20.9	0.5
ADELL, VILLAGE	60127	201	830524	0.01	0.9	451	1486	127	0.25
ADELL, VILLAGE	60127	201	770706	0.03	0.8	225	1100	28.8	0.3
ADELL, VILLAGE	60127	201	820505	0.492	1.46	433	1200	95.2	0.89
ADELL, VILLAGE	60127	201	770518	0.09	0.88	277	1245	43.2	1.8
ADELL, VILLAGE	60127	201	810606	0.103	0.27	380	2260	89	0.45
ADELL, VILLAGE	60127	201	840501	0.04	1.5	518	1480	129	0.24
ADELL, VILLAGE	60127	201	800617	0.29	0.9	303	1040	8.6	0.01
ADELL, VILLAGE	60127	201	841105	1.31	2.15	336	1480	109	1.2
ADELL, VILLAGE	60127	201	790611	2.27	3.16	290	1236	90	0.11
ADELL, VILLAGE	60127	201	850520	0.38	1.02	518	1500	107	0.1
ADELL, VILLAGE	60127	201	821116	0.01	0.32	488	1350	94.8	0.28
ADELL, VILLAGE	60127	201	851126	2.45	1.41	460	1420	96	0.1
ADELL, VILLAGE	60127	201	801106	0.653	0.7	360	1080	94	0.1
ADELL, VILLAGE	60127	201	860520	0.94	1.24	372	1340	90.6	0.07
ADELL, VILLAGE	60127	201	781206	1.071	0.9	201	734	78	0.01
ADELL, VILLAGE	60127	201	791120	0.426	1.44			88	1.41
ADELL, VILLAGE	60127	201	811112	0.003	1.09	544	1280	88	0.599
ADELL, VILLAGE	60127	201	861105	4.1	2.12	509	1290	63.5	2.42
ADELL, VILLAGE	60127	202	770518	4.34	0.89	390	7920	50.4	0.2
ADELL, VILLAGE	60127	202	820505	10.2	0.276	336	1034	112	0.24
ADELL, VILLAGE	60127	202	770331	4.36	4.22	40	1200	132	1.53
ADELL, VILLAGE	60127	202	821116	4.4	1.13	454	1390	132	0.88
ADELL, VILLAGE	60127	202	780410	5.05	1.5	355	1680	30.4	0.5
ADELL, VILLAGE	60127	202	830524	3.6	0.53	297	1162	92.8	0.1
ADELL, VILLAGE	60127	202	790611	0.49	1.43	325	1054	97	0.09
ADELL, VILLAGE	60127	202	840501	0.88	0.1	521	1460	128	3.6
ADELL, VILLAGE	60127	202	800617	1.86	0.97	268	946	9.4	0.02
ADELL, VILLAGE	60127	202	841105	2.02	2.68	513	1430	112	5.67
ADELL, VILLAGE	60127	202	810606	2.003	0.02	460	2780	140	0.28
ADELL, VILLAGE	60127	202	850520	5.3	0.64	398	1340	112	1.36
ADELL, VILLAGE	60127	202	770706	1.46	0.35	220	1240	31.6	0.7
ADELL, VILLAGE	60127	202	851126	1.3	5.15	358	1203	99	3.47
ADELL, VILLAGE	60127	202	791120	0.456	1.43			110	1.13
ADELL, VILLAGE	60127	202	860520	1.32	2.78	255	1060	82	3.88
ADELL, VILLAGE	60127	202	811112	1.15	0.895	554	1340	142	0.115
ADELL, VILLAGE	60127	202	801106	1.703	1.05	358	1080	112	0.25
ADELL, VILLAGE	60127	202	781206	3.296	1.89	400	1168	124	0.08
ADELL, VILLAGE	60127	202	861105	1.95	7.2	221	1130	45.4	10.2
ADELL, VILLAGE	60127	203	810606	0.103	0.37	185	1510	61	0.24
ADELL, VILLAGE	60127	203	811112	0.081	0.963	352	810	60	0.117
ADELL, VILLAGE	60127	203	840501	0.12	0.33	242	879	70	0.3
ADELL, VILLAGE	60127	203	820505	0.097	0.829	239	832	64.8	0.3
ADELL, VILLAGE	60127	203	770518	5.29	1.34	420	11100	43.2	0.8
ADELL, VILLAGE	60127	203	821116	0.42	0.48	240	840	65.2	0.2
ADELL, VILLAGE	60127	203	780410	6.55	2.5	430	10050	33.6	0.5
ADELL, VILLAGE	60127	203	830524	0.03	0.41	238	1030	75.4	0.1
ADELL, VILLAGE	60127	203	790611	0.14	1.58	171	794	69	0.24
ADELL, VILLAGE	60127	203	861105	0.5	0.92	221	850	58.8	0.1
ADELL, VILLAGE	60127	203	800617	0.05	1.36	65		7.1	0.03
ADELL, VILLAGE	60127	203	860520	0.29	0.1	162	808	59.6	0.68
ADELL, VILLAGE	60127	203	770331	0.1	3.47	25	1000	78	0.05
ADELL, VILLAGE	60127	203	851126	0.05	2.16	197	799	19	1.17
ADELL, VILLAGE	60127	203	781206	4.532	1.42	328	970	116	0.14
ADELL, VILLAGE	60127	203	850520	0.19	0.1	216	828	56.1	0.1
ADELL, VILLAGE	60127	203	801106	0.053	0.58	95.3	552	86	0.3
ADELL, VILLAGE	60127	203	791120	0.207	1.24			78.4	0.49
ADELL, VILLAGE	60127	203	770706	0.59	1	190	20307	31.6	0:2
ADELL, VILLAGE	60127	203	841105	0.96	0.96	250	836	63	0.7
ALMA CENTER VILLAG	21385	601	841210	2.61	0.691	2	72	7.5	0.6

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ALMA CENTER VILLAG	21385	601	850325	4.19	0.03	1.1	51	8.9	0.03
ALMA CENTER VILLAG	21385	601	850108	4.05	0.224	2	105	8.5	0.056
ALMA CENTER VILLAG	21385	601	840402			244.9	36.5		
ALMA CENTER VILLAG	21385	601	840926	2.59	0.317	2	68	9.7	0.06
ALMA CENTER VILLAG	21385	602	850108	1.07	0.034	1	80	12.1	0.056
ALMA CENTER VILLAG	21385	602	850325	1.24	0.03	0.5	30	10.9	0.03
ALMA CENTER VILLAG	21385	602	841210	2.59	0.317	2	68	9.7	0.06
ALMA CENTER VILLAG	21385	602	840402			14.2	183		
ALMA CENTER VILLAG	21385	602	840926	2.61	0.691	2	72	7.5	0.6
ALMA CENTER VILLAG	21385	603	850325	0.07	0.51	8.2	50	4.9	1.26
ALMA CENTER VILLAG	21385	603	840926	0.03	0.57	15.5	96	47	
ALMA CENTER VILLAG	21385	603	841210	0.03	0.57	15.5	96	47.7	1.2
ALMA CENTER VILLAG	21385	603	850108	0.05	0.15	10	91	2	1.06
ALMA CENTER VILLAG	21385	603	840402			25.2	0.06		
ALMOND VILLAGE	60780	701	860429	0.2	0.28	3	107	15	0.02
ALMOND VILLAGE	60780	701	841016	0.046	0.272	0	230	17	0.024
ALMOND VILLAGE	60780	701	840416	0.1	0.5	1.5	1682	14	0.036
ALMOND VILLAGE	60780	701	861015	0.1	0.02	1	122	15	0.1
ALMOND VILLAGE	60780	701	831110	0.265	0.152	0.499	243	19	0.012
ALMOND VILLAGE	60780	701	871012	0.64	0.12	3	219	22	0.02
ALMOND VILLAGE	60780	701	870413	1.5	0.02	3	200	18	0.28
ALMOND VILLAGE	60780	701	850415	0.2	0.01	0.5	720	14.5	0.01
ALMOND VILLAGE	60780	701	831007	0.34	0.096	3	348	17	0.012
ALMOND VILLAGE	60780	702	831007	1.864	0.704	121	952	21	0.108
ALMOND VILLAGE	60780	702	860429	15.2	0.87	113	724	9	0.02
ALMOND VILLAGE	60780	702	861015	20.3	0.5	78	788	70	0.16
ALMOND VILLAGE	60780	702	840416			127	1022	26	0.192
ALMOND VILLAGE	60780	702	870413	23.2	0.67	64	780	57	1.8
ALMOND VILLAGE	60780	702	850415	5.6	0.07	119.5	224	6	0.06
ALMOND VILLAGE	60780	702	841016	14.5	1.07	110	800	22	0.024
ALMOND VILLAGE	60780	702	831110	15	0.496	129.7	843	23	0.01
ALMOND VILLAGE	60780	702	871012	22.7	0.8	41	687	52	9.3
AMERICAN BAPTIST A	60691	201	850620		0.02	130		12	0.7
AMERICAN BAPTIST A	60691	201	840717	1.3	1.7	112	532	12	1.7
AMERICAN BAPTIST A	60691	201	770701	7	0.68	122	604	11	1.04
AMERICAN BAPTIST A	60691	201	870607	2.4	0.6	134	555	7	1.1
AMERICAN BAPTIST A	60691	201	770901	2.9	1.4	91	530	18	1.8
AMERICAN BAPTIST A	60691	201	850215	3.1	0.02	140	604	13	1.2
AMERICAN BAPTIST A	60691	201	780901	0.16	0.2	85	530	19	0.2
AMERICAN BAPTIST A	60691	201	790904	0.25	0.26	95	607	20	1.86
AMERICAN BAPTIST A	60691	201	861229	0.1	1.8	100	518	10	2.4
AMERICAN BAPTIST A	60691	201	800303	4.4	2.2	86	416	11	0.05
AMERICAN BAPTIST A	60691	201	830721	0.1	0.02	106	525	15	1.2
AMERICAN BAPTIST A	60691	201	800903	0.24	0.38	63	457	26	0.5
AMERICAN BAPTIST A	60691	201	851220	0.1	0.5	155	591	16	1.5
AMERICAN BAPTIST A	60691	201	810303	3.4	0.16	80	497	22	0.52
AMERICAN BAPTIST A	60691	201	770801	9.4	0.1	99	542	21	1.61
AMERICAN BAPTIST A	60691	201	810903	0.1	0.3	96	548	33	3.8
AMERICAN BAPTIST A	60691	201	790301	4.2	0.34	78	605	19	0.92
AMERICAN BAPTIST A	60691	201	820302	5.4	1.2	148	605	17	0.62
AMERICAN BAPTIST A	60691	201	860625	0.4	1.8	110	570	7	2.4
AMERICAN BAPTIST A	60691	201	820915	0.1	0.02	115	566	13	2.4
AMERICAN BAPTIST A	60691	201	780303	5.2	0.22	30	400	14	0.05
AMERICAN BAPTIST A	60691	201	840113	5.9	0.16	129	686	11	0.94
AMERICAN BAPTIST A	60691	201	850620	0.7	0.02	130	556	12	1.9
AMERICAN BAPTIST A	60691	201	830720	0.1	0.02	106	525	15	1.2
AMERICAN BAPTIST A	60691	202	840717	0.5	0.64	86	450	27	0.64
AMERICAN BAPTIST A	60691	202	770701	6	0.5	126	595	14	0.96
AMERICAN BAPTIST A	60691	202	870607	1.5	0.02	16	295	14	4.2
AMERICAN BAPTIST A	60691	202	780901	0.1	0.47	93	524	25	0.29
AMERICAN BAPTIST A	60691	202	860625	0.7	0.1	5	186	12	1
AMERICAN BAPTIST A	60691	202	790301	3.2	0.36	83	497	19	1.04
AMERICAN BAPTIST A	60691	202	850620		0.02	10		14	0.9
AMERICAN BAPTIST A	60691	202	790904	0.48	0.86	84	533	20	1.3

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AMERICAN BAPTIST A	60691	202	850215	0.3	0.02	60	517	5	3
AMERICAN BAPTIST A	60691	202	800303	2.1	0.05	98	526	16	1.1
AMERICAN BAPTIST A	60691	202	840113	0.2	0.07	97	623	3	1.73
AMERICAN BAPTIST A	60691	202	800903	0.1	0.34	64	428	35	0.12
AMERICAN BAPTIST A	60691	202	770901	0.42	1.7	124	566	17	1.6
AMERICAN BAPTIST A	60691	202	810303	1.8	1.34	114	534	18	0.54
AMERICAN BAPTIST A	60691	202	861229	0.1	3.6	72	442	4	4
AMERICAN BAPTIST A	60691	202	810903	0.1	0.52	116	615	10	0.32
AMERICAN BAPTIST A	60691	202	850620	0.9	0.02	10	191	14	1.1
AMERICAN BAPTIST A	60691	202	820302	0.3	1	103	513	21	0.62
AMERICAN BAPTIST A	60691	202	780303	5	0.36	54	388	15	1
AMERICAN BAPTIST A	60691	202	820915	0.1	0.28	117	569	9	1.6
AMERICAN BAPTIST A	60691	202	851220	0.1	0.4	93	491	6	2.1
AMERICAN BAPTIST A	60691	202	770801	4.5	1.75	94	534	22	2.03
AMERICAN BAPTIST A	60691	202	830721	0.1	0.02	107	480	6	1.9
AMERICAN BAPTIST A	60691	202	830720	0.1	0.02	107	480	6	2.9
ARENA VILLAGE	60704	101	841009	2.79	0.22	69.7		16.4	0.05
ARENA VILLAGE	60704	101	860423	1.05	0.28	21	148	19.2	0.28
ARENA VILLAGE	60704	101	851009	1.06	0.13	22	202	239	0.06
ARENA VILLAGE	60704	101	870422	2.3	0.62	55.9	301	39.3	0.73
ARENA VILLAGE	60704	101	840508	6.23	0.36	5.2	118	9	0.11
ARENA VILLAGE	60704	101	861022	1.04	0.45	36.6	184	11.8	0.76
ARENA VILLAGE	60704	101	850516	5.86	0.78	51	326	22	0.06
ARENA VILLAGE	60704	103	840508	5.92	0.2	51.5	416	11	0.17
ARENA VILLAGE	60704	103	860423	11.4	0.73	24	353	85.4	0.06
ARENA VILLAGE	60704	103	851009	16	0.22	57	570	161	0.06
ARENA VILLAGE	60704	103	841009	17.3	0.03	40.7		75.4	0.05
ARENA VILLAGE	60704	103	861022	16.7	0.09	31.5	418	95.6	0.06
ARENA VILLAGE	60704	103	870422	13	0.009	17.7	359	82	0.23
ARENA VILLAGE	60704	103	850516	13.25	0.13	32	317	87	0.06
BALSAM LAKE SEWAGE	20648	801	811015	0.18	0.15	80	320	4.1	0.85
BALSAM LAKE SEWAGE	20648	801	821102	0.02		2.9	188	4.2	0.1
BALSAM LAKE SEWAGE	20648	801	830518	0.04	0.5	3	195	5	0.5
BALSAM LAKE SEWAGE	20648	801	790810	0.6	0.26	90	386	1.9	0.25
BALSAM LAKE SEWAGE	20648	801	831101	0.01	0.5	118	419	31	6.3
BALSAM LAKE SEWAGE	20648	801	791026	0.03	0.28	181	204	1.5	0.07
BALSAM LAKE SEWAGE	20648	801	840523	0.01	0.5	4	214	4	0.5
BALSAM LAKE SEWAGE	20648	801	801015	0.13	0.24	200	454	3.4	0.07
BALSAM LAKE SEWAGE	20648	801	841115	4.58	0.61	3	191	4	0.5
BALSAM LAKE SEWAGE	20648	801	810515	1.04	0.26	77	444	3.4	0.05
BALSAM LAKE SEWAGE	20648	801	850501	0.09	0.5	5	204	6	0.5
BALSAM LAKE SEWAGE	20648	801	790912	0.21	0.26	326	190	1	0.1
BALSAM LAKE SEWAGE	20648	801	851018	0.1	0.69	6	213	3	0.5
BALSAM LAKE SEWAGE	20648	801	800506	0.34		135			0.08
BALSAM LAKE SEWAGE	20648	801	860528	0.1	0.6	8	194	11	0.5
BALSAM LAKE SEWAGE	20648	801	821015	0.08	0.2	3.06	447.9	7.6	0.4
BALSAM LAKE SEWAGE	20648	801	820519	0.01	0.47	2.85	500	15.6	0.1
BALSAM LAKE SEWAGE	20648	801	870507	0.1	0.5	6	188	4	0.5
BALSAM LAKE SEWAGE	20648	801	861111	0.2	0.6	6	206	3	0.5
BALSAM LAKE SEWAGE	20648	802	840523	0.15	0.5	63	203	1	0.5
BALSAM LAKE SEWAGE	20648	802	801015	0.21	0.88	123	316	4	0.07
BALSAM LAKE SEWAGE	20648	802	820519	0.1	0.54	99	491.7	28.7	0.1
BALSAM LAKE SEWAGE	20648	802	810515	2.66		143	446	12.8	2.05
BALSAM LAKE SEWAGE	20648	802	860528	0.1	0.5	52	162	8	0.5
BALSAM LAKE SEWAGE	20648	802	800506	1.36	1.05	165			0.11
BALSAM LAKE SEWAGE	20648	802	861111	0.1	0.5	61	184	6	0.5
BALSAM LAKE SEWAGE	20648	802	821102	0.02		56	162	2.8	0.06
BALSAM LAKE SEWAGE	20648	802	870507	0.1	0.5	50	155	6	0.5
BALSAM LAKE SEWAGE	20648	802	831101	0.29	0.5	68	187	1	0.5
BALSAM LAKE SEWAGE	20648	802	811015	2.06	0.65	133	456	7.9	1.65
BALSAM LAKE SEWAGE	20648	802	850501	0.01	0.5	66	223	5	0.5
BALSAM LAKE SEWAGE	20648	802	790810	1.26	0.34	113	1234	4.5	0.2
BALSAM LAKE SEWAGE	20648	802	821015	0.02	0.2	47.9	977.9	1	0.36
BALSAM LAKE SEWAGE	20648	802	790912	1.16	0.56	452	810	3.2	0.1

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BALSAM LAKE SEWAGE	20648	802	841115	3.09	0.81	50	155	2	0.5
BALSAM LAKE SEWAGE	20648	802	830518	0.85	0.93	83	318	13	0.86
BALSAM LAKE SEWAGE	20648	802	851018	0.1	0.5	49	168	7	0.5
BALSAM LAKE SEWAGE	20648	802	791026	1.21	0.45	137	470	7.2	0.21
BALSAM LAKE SEWAGE	20648	803	811015	0.26	0.3	77	210	5.3	0.31
BALSAM LAKE SEWAGE	20648	803	851018	0.55	0.5	55	220	6	0.5
BALSAM LAKE SEWAGE	20648	803	850501	0.71	0.5	92	313	13	0.5
BALSAM LAKE SEWAGE	20648	803	820519	0.01	1.18	70.8	297	14.7	0.1
BALSAM LAKE SEWAGE	20648	803	841115	2.2	0.75	54	215	3	0.5
BALSAM LAKE SEWAGE	20648	803	800506	0.04		143			0.01
BALSAM LAKE SEWAGE	20648	803	840523	0.66	0.5	59	200	5	0.5
BALSAM LAKE SEWAGE	20648	803	790912	0.91	0.42	514	295	2.7	0.1
BALSAM LAKE SEWAGE	20648	803	801015	0.19	0.99	131	432	3.8	0.04
BALSAM LAKE SEWAGE	20648	803	861111	1.1	1.2	100	349	16	0.5
BALSAM LAKE SEWAGE	20648	803	831101	0.58	0.82	86	366	39	0.5
BALSAM LAKE SEWAGE	20648	803	810515	0.71	0.3	128	246	5.4	0.37
BALSAM LAKE SEWAGE	20648	803	830518	0.02	1.7	63	185	1	0.5
BALSAM LAKE SEWAGE	20648	803	791026	0.14	0.33	69	204	1.3	0.07
BALSAM LAKE SEWAGE	20648	803	821102	3.6		120	472	16	5.6
BALSAM LAKE SEWAGE	20648	803	860528	0.3	0.7	39	162	5	0.5
BALSAM LAKE SEWAGE	20648	803	790810	1.2	0.2	118	290	2.2	0.2
BALSAM LAKE SEWAGE	20648	803	870507	1	6.1	100	351	16	3.2
BALSAM LAKE SEWAGE	20648	803	821015	2.59	1.48	50.4	459.3	17.5	1.5
BALSAM LAKE SEWAGE	20648	804	851018	0.1	0.5	52	225	5	0.57
BALSAM LAKE SEWAGE	20648	804	790810	0.45	0.18	105	290	1.6	0.15
BALSAM LAKE SEWAGE	20648	804	821015	21.4	1.1	63.8	832.1	7.6	2.26
BALSAM LAKE SEWAGE	20648	804	810515	0.25	0.37	67	150	2	0.2
BALSAM LAKE SEWAGE	20648	804	820519	0.01	1.16	97.7	197.5	1	0.12
BALSAM LAKE SEWAGE	20648	804	850501	0.45	0.67	67	254	7	0.84
BALSAM LAKE SEWAGE	20648	804	791026	0.13	0.38	116	290	1.7	0.38
BALSAM LAKE SEWAGE	20648	804	841115	11	1.7	132	487	35	3.2
BALSAM LAKE SEWAGE	20648	804	801015	0.1	0.77	95	286	2	0.14
BALSAM LAKE SEWAGE	20648	804	840523	0.2	0.5	66	247	10	4.6
BALSAM LAKE SEWAGE	20648	804	861111	0.1	1.2	58	214	3	0.7
BALSAM LAKE SEWAGE	20648	804	831101	0.01	0.5	121	420	34	6.4
BALSAM LAKE SEWAGE	20648	804	790912	0.29	0.96	90	220	1	0.16
BALSAM LAKE SEWAGE	20648	804	830518	0.95	0.65	45	193	11	6.5
BALSAM LAKE SEWAGE	20648	804	870507	0.8	0.5	80	267	11	0.8
BALSAM LAKE SEWAGE	20648	804	800506	0.64		176			0.14
BALSAM LAKE SEWAGE	20648	804	860528	0.1	0.5	52	151	7	0.7
BALSAM LAKE SEWAGE	20648	804	811015	0.18	0.35	40	125	2.43	0.26
BALSAM LAKE SEWAGE	20648	805	850501	0.04	1.1	155	523	35	13
BALSAM LAKE SEWAGE	20648	805	790810	0.17	0.04	6	240	1.6	0.3
BALSAM LAKE SEWAGE	20648	805	811015	0.14	0.25	21	160	2.71	0.19
BALSAM LAKE SEWAGE	20648	805	830518	0.01	1.1	119	422	27	9.8
BALSAM LAKE SEWAGE	20648	805	810515	0.22	0.2	0.5	198	2.6	0.05
BALSAM LAKE SEWAGE	20648	805	840523	0.01	0.5	123	144	28	10
BALSAM LAKE SEWAGE	20648	805	801015	0.06	0.16	4	222	2.8	0.12
BALSAM LAKE SEWAGE	20648	805	790912	0.13		6	190	1.5	0.12
BALSAM LAKE SEWAGE	20648	805	791026	0.06	0.26	3	202	2.6	0.25
BALSAM LAKE SEWAGE	20648	805	831101	0.01	0.5	3	191	4	0.5
BALSAM LAKE SEWAGE	20648	805	821015	6.16	0.2	101	680.3	27.6	1.76
BALSAM LAKE SEWAGE	20648	805	820519	0.01	4.43	130	97.9	1	3.35
BALSAM LAKE SEWAGE	20648	805	841115	2.94	0.91	128	444	12	9.7
BARRON SEWAGE PLAN	21687	801	821221	5.77	0.03	47	335	5	0.03
BARRON SEWAGE PLAN	21687	801	851204	0.05	1.55	58	420	29	6.75
BARRON SEWAGE PLAN	21687	801	840612	0.1	2.58	57	470	12	7.76
BARRON SEWAGE PLAN	21687	801	850613		0.76	93	520	20	15
BARRON SEWAGE PLAN	21687	801	841107	0.22	1.29	84	345	26	9.63
BARRON SEWAGE PLAN	21687	801	830510	0.03	1.34	82	418	31	0.03
BARRON SEWAGE PLAN	21687	801	870526	0.05	0.2	74	520	2	11.6
BARRON SEWAGE PLAN	21687	801	830726	0.03	1.2	110	475	13	0.03
BARRON SEWAGE PLAN	21687	801	860528	0.05	1.7	57	365	7	11.4
BARRON SEWAGE PLAN	21687	801	831003	9.63	1.74	74	455	27	0.28

FACILITY NAME	PERMIT NO.	WELL	DATE	NOX	ORG	CL	TDS	SO4	NH3
BARRON SEWAGE PLAN	21687	801	820929	37	0.5	24	630	3	0.5
BARRON SEWAGE PLAN	21687	801	840717	0.1	2.27	71	450	10	8.23
BARRON SEWAGE PLAN	21687	801	861118	0.05	0.4	49	315	23	15.4
BARRON SEWAGE PLAN	21687	801	840124	5.24	2.74	92	510	27	1.74
BARRON SEWAGE PLAN	21687	802	821221	45.8	0.3	27	435	2	0.3
BARRON SEWAGE PLAN	21687	802	841107	0.1	1.12	80	345	25	1.85
BARRON SEWAGE PLAN	21687	802	820929	33	0.5	22	554	3	0.5
BARRON SEWAGE PLAN	21687	802	850613	0.39	1.09	90	485	25	1.99
BARRON SEWAGE PLAN	21687	802	830726	0.03	1.2	90	355	23	0.03
BARRON SEWAGE PLAN	21687	802	851204		0.05	70	435	14	4.4
BARRON SEWAGE PLAN	21687	802	840124	7	1.65	86	410	28	0.03
BARRON SEWAGE PLAN	21687	802	860528	0.05	0.99	65	385	19	5.56
BARRON SEWAGE PLAN	21687	802	840717	0.1	1.73	67	400	20	0.59
BARRON SEWAGE PLAN	21687	802	861118	0.05	0.37	56	355	16	5.68
BARRON SEWAGE PLAN	21687	802	831003	4.93	1.26	92	425	27	0.36
BARRON SEWAGE PLAN	21687	802	830510	0.14	1.34	84	324	34	0.03
BARRON SEWAGE PLAN	21687	802	840612	0.1	1.26	83	480	22	0.39
BARRON SEWAGE PLAN	21687	802	870526	0.05	0.3	81	500	17	10
BARRON SEWAGE PLAN	21687	803	851204	0.05	0.5	81	310	29	0.3
BARRON SEWAGE PLAN	21687	803	840612	2.02	0.95	87	400	15	0.1
BARRON SEWAGE PLAN	21687	803	870526	0.05	0.5	77	360	22	0.75
BARRON SEWAGE PLAN	21687	803	840717	1.04	1.01	80	282	28	0.1
BARRON SEWAGE PLAN	21687	803	821221	12.6	0.03	8	176	9	0.03
BARRON SEWAGE PLAN	21687	803	841107	0.1	0.36	73	280	25	0.1
BARRON SEWAGE PLAN	21687	803	830726	1.46	0.45	74	370	20	0.03
BARRON SEWAGE PLAN	21687	803	850613		0.67	80	265	23	0.1
BARRON SEWAGE PLAN	21687	803	840124	2.63	1.6	85	340	36	1.62
BARRON SEWAGE PLAN	21687	803	860528	0.05	0.53	72	298	22	0.43
BARRON SEWAGE PLAN	21687	803	830510	2.49	0.56	54	234	6	0.67
BARRON SEWAGE PLAN	21687	803	820929	5	0.5	3	158	2	0.5
BARRON SEWAGE PLAN	21687	803	831003	1.2	0.53	80	310	19	0.03
BARRON SEWAGE PLAN	21687	803	861118	0.05	0.8	62	335	11	0.12
BARRON SEWAGE PLAN	21687	804	870526	0.05	0.54	57	296	24	1.23
BARRON SEWAGE PLAN	21687	804	840612	11	0.1	38	590	9	0.2
BARRON SEWAGE PLAN	21687	804	831003	31.36	0.03	46	440	11	0.25
BARRON SEWAGE PLAN	21687	804	850613		0.17	30	420	11	0.1
BARRON SEWAGE PLAN	21687	804	841107	32	0.1	60	530	17	0.1
BARRON SEWAGE PLAN	21687	804	851204	12.2	0.54	66	250	25	0.59
BARRON SEWAGE PLAN	21687	804	821221	13.3	0.03	8	180	8.5	0.03
BARRON SEWAGE PLAN	21687	804	860528	19.8	0.4	63	310	22	0.78
BARRON SEWAGE PLAN	21687	804	830726	32.3	0.03	19	360	8	0.03
BARRON SEWAGE PLAN	21687	804	861118	0.09	0.42	55	355	28	1.18
BARRON SEWAGE PLAN	21687	804	820929	25	0.5	21	552	9	0.5
BARRON SEWAGE PLAN	21687	804	840717	67.2	0.1	49	770	5	0.22
BARRON SEWAGE PLAN	21687	804	830510	13.69	0.03	30	534	9.5	0.06
BARRON SEWAGE PLAN	21687	804	840124	31.8	0.08	26	400	13	0.03
BARRON SEWAGE PLAN	21687	807	840612	10.5	0.3	75	440	27	1.04
BARRON SEWAGE PLAN	21687	807	841107	29	0.1	62	420	14	0.17
BARRON SEWAGE PLAN	21687	807	840717	17.2	0.1	54	410	28	0.9
BARRON SEWAGE PLAN	21687	807	851204	0.36	0.55	70	305	26	0.07
BARRON SEWAGE PLAN	21687	807	831003	3.08	0.09	7	300	6	0.08
BARRON SEWAGE PLAN	21687	807	860528	0.71	0.47	65	284	19	0.07
BARRON SEWAGE PLAN	21687	807	830510	10.75	0.03	30	246	9	0.03
BARRON SEWAGE PLAN	21687	807	861118	0.22	0.24	57	300	28	0.14
BARRON SEWAGE PLAN	21687	807	820929	14	0.5	9	300	4	0.5
BARRON SEWAGE PLAN	21687	807	870526	1.67	0.48	57	310	26	0.1
BARRON SEWAGE PLAN	21687	807	830726	5.29	0.37	61	295	8	0.22
BARRON SEWAGE PLAN	21687	807	840124	1.48	0.36	75	345	15	0.03
BARRON SEWAGE PLAN	21687	807	821221	20.3	0.03	13	220	9.5	0.03
BARRON SEWAGE PLAN	21687	807	850613		0.59	83	315	37	0.1
BARRON SEWAGE PLAN	21687	808	840717	13.7	0.2	67	385	6	1.48
BARRON SEWAGE PLAN	21687	808	841107	33	0.1	20	415	12	0.1
BARRON SEWAGE PLAN	21687	808	870526	0.25	0.36	57	244	29	0.09
BARRON SEWAGE PLAN	21687	808	850613		0.48	85	325	36	0.1

FACILITY NAME	PERMIT NO.	WELL	DATE	NOX	ORG	CL	TDS	SO4	NH3
BARRON SEWAGE PLAN	21687	808	820929	24	0.5	9	300	1	0.5
BARRON SEWAGE PLAN	21687	808	851204	0.34	0.28	71	270	44	0.1
BARRON SEWAGE PLAN	21687	808	830510	10.5	0.03	23	220	8.5	0.03
BARRON SEWAGE PLAN	21687	808	840612	4.62	0.33	97	385	9	1.32
BARRON SEWAGE PLAN	21687	808	831003	3.36	0.03	74	335	4.5	0.03
BARRON SEWAGE PLAN	21687	808	860528	0.13	0.33	66	186	24	0.05
BARRON SEWAGE PLAN	21687	808	821221	15.5	0.03	12	235	9	0.06
BARRON SEWAGE PLAN	21687	808	840124	8.12	0.22	51	280	9	0.17
BARRON SEWAGE PLAN	21687	808	830726	2.72	0.14	72	360	5	0.64
BARRON SEWAGE PLAN	21687	808	861118	0.53	0.31	58	300	31	0.09
BARRON SEWAGE PLAN	21687	809	820929	11	0.5	4	206	3	0.5
BARRON SEWAGE PLAN	21687	809	861117	0.18	0.37	56	380	26	0.07
BARRON SEWAGE PLAN	21687	809	870527	0.76	0.35	56	230	32	0.1
BARRON SEWAGE PLAN	21687	809	860528	0.19	0.43	69	198	24	0.05
BARRON SEWAGE PLAN	21687	809	830510	12.74	0.03	23	222	7	0.03
BARRON SEWAGE PLAN	21687	809	851204	0.05	0.3	65	240	36	0.13
BARRON SEWAGE PLAN	21687	809	831003	3.81	0.14	68	320	3	0.11
BARRON SEWAGE PLAN	21687	809	850613		0.76	83	300	52	0.1
BARRON SEWAGE PLAN	21687	809	840612	8.93	0.1	70	400	5	0.53
BARRON SEWAGE PLAN	21687	809	841107	21	0.1	55	380	15	0.1
BARRON SEWAGE PLAN	21687	809	830726	6.89	0.03	55	295	3	0.03
BARRON SEWAGE PLAN	21687	809	821221	16.5	0.03	7	220	2	0.03
BARRON SEWAGE PLAN	21687	809	840124	4.31	0.14	66	315	8	0.03
BARRON SEWAGE PLAN	21687	809	840717	17.6	0.1	70	460	5	0.98
BARRON SEWAGE PLAN	21687	810	840124	2.72	0.84	120	495	28	0.03
BARRON SEWAGE PLAN	21687	810	840612	8.74	0.2	97	445	33	0.36
BARRON SEWAGE PLAN	21687	810	840717	1.34	0.76	89	340	26	0.1
BARRON SEWAGE PLAN	21687	810	820929	10	0.5	7	212	6	0.5
BARRON SEWAGE PLAN	21687	810	870527	39	0.52	38	400	14	0.1
BARRON SEWAGE PLAN	21687	810	861117	8.56	0.43	56	340	26	0.15
BARRON SEWAGE PLAN	21687	810	860528	0.44	0.47	65	315	18	1.61
BARRON SEWAGE PLAN	21687	810	831003	1.57	0.84	115	395	25	0.03
BARRON SEWAGE PLAN	21687	810	850613		0.81	73	310	22	0.1
BARRON SEWAGE PLAN	21687	810	830726	2.49	0.36	92	355	0	0.03
BARRON SEWAGE PLAN	21687	810	821222	6.69	0.03	19	162	10.7	0.03
BARRON SEWAGE PLAN	21687	810	841107	0.1	0.84	80	310	27	0.1
BARRON SEWAGE PLAN	21687	810	851204	0.05	0.2	70	365	13	2
BARRON SEWAGE PLAN	21687	810	830510	2.02	0.64	34	288	20	0.17
BARRON SEWAGE PLAN	21687	811	870527	39	0.18	22	296	2	0.08
BIRCHWOOD, VILLAGE	60003	801	841211	3.01	1.9	9	152	4	0.5
BIRCHWOOD, VILLAGE	60003	801	841010	1.07	0.5	16	198	7	0.5
BIRCHWOOD, VILLAGE	60003	801	841108	1.68	0.53	12	134	7	0.5
BIRCHWOOD, VILLAGE	60003	802	841010	0.87	0.5	19	132	13	0.5
BIRCHWOOD, VILLAGE	60003	802	841108	245	0.5	16	152	10	0.5
BIRCHWOOD, VILLAGE	60003	802	841211	4.56	1.3	15	152	12	0.5
BOYCEVILLE, VILLAG	60330	601	780417			7	200	10.5	0.2
BOYCEVILLE, VILLAG	60330	601	790129		1.5	10	183	8.1	0.2
BOYCEVILLE, VILLAG	60330	602	790129		1	8	99	7.9	0.2
BOYCEVILLE, VILLAG	60330	602	780417		1	10	106	10.1	0.1
BOYCEVILLE, VILLAG	60330	603	780417		0.3	5	100	1.1	0.2
BOYCEVILLE, VILLAG	60330	603	790129		1.2	9	146	3.4	0.2
BOYCEVILLE, VILLAG	60330	604	790129		0.8	8	96	2.3	0.2
BOYCEVILLE, VILLAG	60330	604	780417		0.1	5	111	0.2	0.1
BOYCEVILLE, VILLAG	60330	605	780417		0.1	5	102	2.1	0.1
BOYCEVILLE, VILLAG	60330	605	790129		1.4	8	141	2.3	0.2
BOYCEVILLE, VILLAG	60330	606	790129		1.3	7	198	2.9	0.2
BOYCEVILLE, VILLAG	60330	606	780417		0.1	6	199	1.5	0.1
BOYCEVILLE, VILLAG	60330	607	790129		1.3	8	53	4.5	0.2
BOYCEVILLE, VILLAG	60330	607	780417		0.5	21	125	3.5	0.1
BOYCEVILLE, VILLAG	60330	608	780417		0.1	8	101	0.8	0.9
BOYCEVILLE, VILLAG	60330	608	790129		0.7	25	129	5.7	0.2
BOYCEVILLE, VILLAG	60330	609	870504	2	0.5	125	533	33	0.5
BOYCEVILLE, VILLAG	60330	609	831018	8.46	0.7	40	356	16	0.5
BOYCEVILLE, VILLAG	60330	609	840507	9.37	0.95	53	387	38	2.4

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BOYCEVILLE, VILLAG	60330	609	850520	12	2	92	512	39	1.7
BOYCEVILLE, VILLAG	60330	609	851112	1.8	0.5	72	417	24	3.8
BOYCEVILLE, VILLAG	60330	609	830624	3.04	1.1	48	383	29	0.5
BOYCEVILLE, VILLAG	60330	609	841030	3.41	1.2	74	446	7	7.2
BOYCEVILLE, VILLAG	60330	609	861103	1.8	1.6	100	460	10	0.5
BOYCEVILLE, VILLAG	60330	609	860416	5.9	1.3	82	487	52	0.9
BOYCEVILLE, VILLAG	60330	610	870504	0.3	0.5	3	283	23	0.5
BOYCEVILLE, VILLAG	60330	610	841030	0.58	0.5	3	299	32	0.5
BOYCEVILLE, VILLAG	60330	610	830624	0.26	0.68	3	272	31	0.5
BOYCEVILLE, VILLAG	60330	610	831018	1.36	0.5	3	262	31	0.5
BOYCEVILLE, VILLAG	60330	610	860416	1.2	0.5	2	311	37	0.5
BOYCEVILLE, VILLAG	60330	610	840507	0.52	0.5	4	307	43	0.5
BOYCEVILLE, VILLAG	60330	610	851112	0.67	0.5	3	308	29	0.5
BOYCEVILLE, VILLAG	60330	610	850520	0.85	0.62	2	308	33	0.5
BOYCEVILLE, VILLAG	60330	610	861103	1.1	0.7	8	307	25	0.5
BOYD VILLAGE	21261	601	841114	1.79	2.2	18	118	8	0.5
BOYD VILLAGE	21261	601	841217	4.36	1.5	7	74	7	0.5
BOYD VILLAGE	21261	601	860520	0.6	0.8	8	117	7	0.5
BOYD VILLAGE	21261	601	870602	3.2	0.5	10	143	6	0.5
BOYD VILLAGE	21261	601	861118	2.4	0.8	12	137	5	0.5
BOYD VILLAGE	21261	601	851112	1.9	0.5	8	108	17	0.5
BOYD VILLAGE	21261	601	850522	2.2	1.3	7	109	4	0.5
BOYD VILLAGE	21261	602	841217	11.3	1.9	13	169	18	0.5
BOYD VILLAGE	21261	602	841114	2.02	1.8	8	117	12	0.5
BOYD VILLAGE	21261	602	861118	9.6	1	44	296	33	0.5
BOYD VILLAGE	21261	602	860520	8.5	1.6	64	323	40	0.5
BOYD VILLAGE	21261	602	870602	15	1.6	82	462	61	0.5
BOYD VILLAGE	21261	602	850522	2.5	1.5	40	249	29	0.5
BOYD VILLAGE	21261	602	851112	11	0.88	60	316	46	0.82
BOYD VILLAGE	21261	603	850522	3.9	1.1	52	317	37	2
BOYD VILLAGE	21261	603	870602	8.6	1.2	70	377	42	0.5
BOYD VILLAGE	21261	603	861118	13	1.6	53	344	37	0.5
BOYD VILLAGE	21261	603	860520	7.3	1.5	63	320	43	0.6
BOYD VILLAGE	21261	603	851112	15	1.1	54	338	45	1.7
BOYD VILLAGE	21261	603	841217	17.7	1.9	34	203	43	0.5
BOYD VILLAGE	21261	603	841114	13	2.7	37	291	38	0.5
BRUCE WATER & SEWE	60143	801	870302	0.3	0.5	3	88	6	0.5
BRUCE WATER & SEWE	60143	801	800903	0.65	0.9	6	103	5	0.2
BRUCE WATER & SEWE	60143	801	830901	0.27	0.66	4	91	4	0.5
BRUCE WATER & SEWE	60143	801	840910	0.01	1.5	4	92	4	0.5
BRUCE WATER & SEWE	60143	801	851015	0.36	0.5	4	107	10	0.5
BRUCE WATER & SEWE	60143	801	850225	0.11	0.5	6	98	7	0.5
BRUCE WATER & SEWE	60143	801	780913	1.44	0.5	12	117	2.9	0.5
BRUCE WATER & SEWE	60143	801	860922	0.5	0.8	4	104	10	0.5
BRUCE WATER & SEWE	60143	801	800303	0.3	0.41	9	87	8	0.21
BRUCE WATER & SEWE	60143	801	820928	0.02	0.5	5	130	5	0.5
BRUCE WATER & SEWE	60143	801	830418	0.36	0.65	5	116	5	0.5
BRUCE WATER & SEWE	60143	801	820325	0.06	0.5	3	125	9	0.5
BRUCE WATER & SEWE	60143	801	840313	0.69	0.5	7	112	9	0.51
BRUCE WATER & SEWE	60143	801	810902	0.16	0.5	3	86	7	0.5
BRUCE WATER & SEWE	60143	801	780802	1.43	0.2	11	123	2.1	0.3
BRUCE WATER & SEWE	60143	801	810305	0.07	0.75	3	107	5	0.4
BRUCE WATER & SEWE	60143	801	790905	0.88	1.3	6	79	4.2	0.5
BRUCE WATER & SEWE	60143	801	780622	0.28	1	9	118	2.6	0.31
BRUCE WATER & SEWE	60143	801	790327	0.96	0.5	10	109	2	0.5
BRUCE WATER & SEWE	60143	801	860303	0.8	0.5	10	117	4	0.5
BRUCE WATER & SEWE	60143	802	840313	0.01	0.63	40	222	23	9.6
BRUCE WATER & SEWE	60143	802	830901	0.01	1.2	71	411	18	22
BRUCE WATER & SEWE	60143	802	810902	0.09	1.97	66	399	15	20
BRUCE WATER & SEWE	60143	802	830418	0.03	0.82	50	327	4	17
BRUCE WATER & SEWE	60143	802	780913	0.2	0.5	64	452	8.9	8.1
BRUCE WATER & SEWE	60143	802	780622	0.04	1.4	68	490	3.4	19.6
BRUCE WATER & SEWE	60143	802	870302	0.1	1.3	32	183	23	1.3
BRUCE WATER & SEWE	60143	802	820928	0.01	1.1	59	514	11	13

FACILITY NAME	PERMIT NO.	WELL	DATE	NOX	ORG	CL	TDS	SO4	NH3
BRUCE WATER & SEWE	60143	802	860303	0.1	2.4	50	254	24	8.6
BRUCE WATER & SEWE	60143	802	820325	0.01	0.88	58	397	18	13
BRUCE WATER & SEWE	60143	802	850225	0.41	0.5	52	259	20	15
BRUCE WATER & SEWE	60143	802	790905	2.56	0.5	50	379	1	11.8
BRUCE WATER & SEWE	60143	802	780802	0.01	3	59	471	1.4	12.3
BRUCE WATER & SEWE	60143	802	800303	0.02	0.44	68	315	3	15
BRUCE WATER & SEWE	60143	802	860922	0.1	2.2	40	218	16	3
BRUCE WATER & SEWE	60143	802	800903	0.29	1.2	60	373	8	18.3
BRUCE WATER & SEWE	60143	802	840910	0.01	1.6	62	297	18	13
BRUCE WATER & SEWE	60143	802	851015	0.1	3	52	347	32	12
BRUCE WATER & SEWE	60143	802	790327	0.11	1	40	333	5	14.1
BRUCE WATER & SEWE	60143	802	810305	0.02	1	62	437	56	14.8
CECIL, VILL OF	60020	401	861117	7.43	0.66	71	450	20	2.52
CECIL, VILL OF	60020	401	860424	3.34	0.59	135	510	15	0.67
CECIL, VILL OF	60020	401	851009	0.7	0.9	70	440	26	4.64
CECIL, VILL OF	60020	401	840419	3.71	0.02	84	180	32	0.66
CECIL, VILL OF	60020	401	850429	0.84	1.57	58	528	20	1.97
CECIL, VILL OF	60020	401	870603	0.18	0.3	92	550	13	0.32
CECIL, VILL OF	60020	401	840523	4.7	0.5	70	504	19	0.02
CECIL, VILL OF	60020	401	840628	3.91	0.71	70	470	16	0.35
CECIL, VILL OF	60020	401	841101	1.1	0.06	62	538	24	1.7
CECIL, VILL OF	60020	402	851009	0.46	0.5	71	420	40	4.88
CECIL, VILL OF	60020	402	840523	0.6	0.18	78	552	15	0.04
CECIL, VILL OF	60020	402	860424	4.76	0.32	135	445	18	2.72
CECIL, VILL OF	60020	402	840628	1.81	0.37	66	484	12	0.11
CECIL, VILL OF	60020	402	861117	1.19	0.62	73	425	17	0.06
CECIL, VILL OF	60020	402	850429	0.1	0.92	60	500	20	3.22
CECIL, VILL OF	60020	402	841101	0.6	0.02	56	414	21	1.8
CECIL, VILL OF	60020	402	840419	6.21	0.02	84	430	20	0.51
CECIL, VILL OF	60020	402	870603	1.94	0.45	78	325	23	0.05
CECIL, VILL OF	60020	403	840523	9.4	0.76	26	396	12	0.02
CECIL, VILL OF	60020	403	851009	1.6	0.6	55	560	64	0.24
CECIL, VILL OF	60020	403	860424	0.4	0.3	118	580	21	0.06
CECIL, VILL OF	60020	403	840628	4.11	0.92	62	382	16	0.41
CECIL, VILL OF	60020	403	861117	0.1	0.27	61	470	20	0.07
CECIL, VILL OF	60020	403	850429	0.1	0.18	68	608	18	0.1
CECIL, VILL OF	60020	403	841101	6.1	0.05	46	506	15	0.02
CECIL, VILL OF	60020	403	840419	9.91	0.02	28	520	15	0.16
CECIL, VILL OF	60020	403	870603	3.32	0.53	94	540	14	0.05
CECIL, VILL OF	60020	404	850429	0.1	0.84	55	492	18	0.7
CECIL, VILL OF	60020	404	840419	3.71	0.02	86	450	19	0.4
CECIL, VILL OF	60020	404	841101	0.2	1.2	58	704	13	0.86
CECIL, VILL OF	60020	404	861117	13.7	0.57	59	425	22	0.98
CECIL, VILL OF	60020	404	840628	4.61	0.49	56	491	16	0.07
CECIL, VILL OF	60020	404	851009	2.98	1.98	68	415	64	2.32
CECIL, VILL OF	60020	404	860424	2.52	0.46	145	540	20	2.64
CECIL, VILL OF	60020	404	870603	1.1	0.05	92	550	15	0.19
CECIL, VILL OF	60020	404	840523	0.3	0.32	78	506	11	0.02
CENTURIA, VILLAGE	60283	801	851017	2.1	0.65	2	132	11	0.5
CENTURIA, VILLAGE	60283	801	840928	1.64	0.61	1	135	11	0.5
CENTURIA, VILLAGE	60283	801	870421	1.2	0.74	4.7	112	4.8	0.15
CENTURIA, VILLAGE	60283	801	840815	1.98	0.5	4	138	20	0.5
CENTURIA, VILLAGE	60283	801	841018	1.95	0.5	3	223	14	0.5
CENTURIA, VILLAGE	60283	801	850425	1.48	0.67	1	10		0.5
CENTURIA, VILLAGE	60283	801	861006	1.3	1.1	1	103	12	0.5
CENTURIA, VILLAGE	60283	801	860415	1.9	0.5	5	140	14	0.5
CENTURIA, VILLAGE	60283	802	850425	1.1	0.93	3	33.5		0.5
CENTURIA, VILLAGE	60283	802	860415	0.8	0.5	1	276	16	0.5
CENTURIA, VILLAGE	60283	802	840815	0.01	0.5	10	340	102	1.5
CENTURIA, VILLAGE	60283	802	861006	3	1.3	10	350	23	0.5
CENTURIA, VILLAGE	60283	802	841018	1.34	0.5	4	190	30	0.5
CENTURIA, VILLAGE	60283	802	840928	1.06	0.97	4	199	36	0.5
CENTURIA, VILLAGE	60283	802	851017	1.1	0.89	2	339	20	0.5
CENTURIA, VILLAGE	60283	802	870421	1.34	0.71	17.5	374	11.8	0.15

FACILITY NAME	PERMIT NO.	WELL	DATE	NOX	ORG	CL	TDS	SO4	NH3
COCHRANE VILLAGE	20214	601	830303	34.23	2.38	21	523	41	0.05
COCHRANE VILLAGE	20214	601	831011	3.45	1.12	19.5	438	18	0.28
COCHRANE VILLAGE	20214	601	830505	1.37	0.74	20	342	10	0.05
COCHRANE VILLAGE	20214	601	830411	11.92	1.6	22.5	278	8	0.05
COCHRANE VILLAGE	20214	601	860519	26	0.23	19.4	440	26.2	0.18
COCHRANE VILLAGE	20214	602	830411	27.46	3.4	18	439	10	0.05
COCHRANE VILLAGE	20214	602	831011	1.05	0.66	10	283	4	0.4
COCHRANE VILLAGE	20214	602	830505	1.8	2.28	19	458	22	0.05
COCHRANE VILLAGE	20214	602	830303	16.5	2.94	26.2	270	10	0.05
COCHRANE VILLAGE	20214	602	860519	8	0.25	13.9	291	13.4	0.22
CRANDON WATER & SE	36277	701	841127	0.1	4.53	120	530	42	3.98
CRANDON WATER & SE	36277	701	821213	3.39	1.72	113	568	52	0.88
CRANDON WATER & SE	36277	701	820615	8.79	1.45	121	302	55	0.03
CRANDON WATER & SE	36277	701	851105	0.05	1.3	126	640	32	12.1
CRANDON WATER & SE	36277	701	811124	9.18	0.39	80.5	160	29	0.11
CRANDON WATER & SE	36277	701	861211	0.05	1	84	480	5	25
CRANDON WATER & SE	36277	701	810625	1.01	0.78	36.5	92	18	0.06
CRANDON WATER & SE	36277	701	840626	0.1	2.16	125	504	42	4.84
CRANDON WATER & SE	36277	701	810309	0.64	0.34	4.5	134	13	0
CRANDON WATER & SE	36277	701	850620	0.11	2.89	130	540	34	8.23
CRANDON WATER & SE	36277	701	810112	0.41	0.06	4.5	66	9	0
CRANDON WATER & SE	36277	701	870624	0.05	0.1	96	475	25	27.4
CRANDON WATER & SE	36277	701	860603	0.05	0.1	110	560	20	20.8
CRANDON WATER & SE	36277	701	830629	0.7	2.27	110	484	44	0.11
CRANDON WATER & SE	36277	701	801217	1.4	0.4	3	57	8	0.1
CRANDON WATER & SE	36277	702	850620	0.11	1.6	130	590	22	18.3
CRANDON WATER & SE	36277	702	821213	4.7	0.93	101	608	48	4
CRANDON WATER & SE	36277	702	820615	17.19	0.1	107	420	54	0.84
CRANDON WATER & SE	36277	702	851105	0.05	0.4	100	540	30	17.1
CRANDON WATER & SE	36277	702	811124	25.14	0.08	107	390	34	0.06
CRANDON WATER & SE	36277	702	861211	0.31	1.8	74	475	22	15
CRANDON WATER & SE	36277	702	810625	0.17	0.25	95.5	130	44	0.39
CRANDON WATER & SE	36277	702	840626	1.82	2.32	115	570	50	18.1
CRANDON WATER & SE	36277	702	810309	1.09	0.4	9	220	13	0.22
CRANDON WATER & SE	36277	702	841127	0.42	2.24	115	450	27	14.7
CRANDON WATER & SE	36277	702	810112	1.25	0	24	172	11	0.06
CRANDON WATER & SE	36277	702	870624	0.05	1.8	190	385	17	18
CRANDON WATER & SE	36277	702	860603	0.05	0.1	96	510	24	28
CRANDON WATER & SE	36277	702	830629	1.6	2.1	120	394	42	8.01
CRANDON WATER & SE	36277	702	801217	1.46	0.62	37	450	10	0
CRANDON WATER & SE	36277	703	850620	0.17	1.45	110	485	54	13.6
CRANDON WATER & SE	36277	703	810309	1.37	0.73	62.5	240	29	0.28
CRANDON WATER & SE	36277	703	810625	0.56	1.32	63	438	34	0.14
CRANDON WATER & SE	36277	703	851105	0.05	0.8	126	640	28	16.5
CRANDON WATER & SE	36277	703	811124	15.54	7.78	92.5	450	25	7.76
CRANDON WATER & SE	36277	703	861211	0.1	1	82	475	26	25
CRANDON WATER & SE	36277	703	820615	0.17	1.6	102	376	48	0.95
CRANDON WATER & SE	36277	703	801217	0.9	0.6	37	450	11	0.2
CRANDON WATER & SE	36277	703	821213	11.4	0.44	52	554	42	12.38
CRANDON WATER & SE	36277	703	841127	0.34	1.76	105	500	25	19.7
CRANDON WATER & SE	36277	703	830629	0.2	2.44	86	394	42	0.84
CRANDON WATER & SE	36277	703	870624	0.05	0.9	104	450	20	15.8
CRANDON WATER & SE	36277	703	860603	0.05	0.1	98	490	29	16.5
CRANDON WATER & SE	36277	703	810112	0.69	0.31	19	192	10	0
CRANDON WATER & SE	36277	703	840626	0.1	1.12	115	460	36	6.16
CRANDON WATER & SE	36277	704	850620	0.45	0.64	6	196	7	0.1
CRANDON WATER & SE	36277	704	821213	0.48	0.45	4.5	180	12	0.03
CRANDON WATER & SE	36277	704	820615	0.5	0.17	5	128	13	0.03
CRANDON WATER & SE	36277	704	851105	0.54	0.05	8	290	8	0.05
CRANDON WATER & SE	36277	704	811124	0.62	0.39	4.75		9	0.14
CRANDON WATER & SE	36277	704	861211	0.54	0.15	6	192	10	0.13
CRANDON WATER & SE	36277	704	810625	0.7	0.17	5	204	9	0.14
CRANDON WATER & SE	36277	704	840626	0.39	0.98	7	184	3	0.1
CRANDON WATER & SE	36277	704	810309	1.74	0.53	17.5	222	16	0

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CRANDON WATER & SE	36277	704	841127	0.45	0.5	4	132	11	0.1
CRANDON WATER & SE	36277	704	810112	0.38	0.31	23.5	170	9	0
CRANDON WATER & SE	36277	704	870624	0.53	0.16	6	230	10	0.05
CRANDON WATER & SE	36277	704	860603	0.53	0.1	6	210	9	0.06
CRANDON WATER & SE	36277	704	830629	0.48	1.04	7.5	178	11	0.03
CRANDON WATER & SE	36277	704	801217	0.8	1.2	22	450	10	0.1
CRANDON WATER & SE	36277	705	810112	0.45	0.19	15.5	170	9	0.06
CRANDON WATER & SE	36277	705	830629	0.03	0.76	16	202	6	0.14
CRANDON WATER & SE	36277	705	841127	0.1	0.59	7	128	12	0.1
CRANDON WATER & SE	36277	705	860603	0.05	0.32	18	220	10	0.05
CRANDON WATER & SE	36277	705	850620	0.1	1.96	13	170	9	0.1
CRANDON WATER & SE	36277	705	810309	0.67	0.48	6.5	202	11	0
CRANDON WATER & SE	36277	705	801217	1.3	2.1	14	178	9	0.1
CRANDON WATER & SE	36277	705	840626	0.1	1.43	18	224	10	0.1
CRANDON WATER & SE	36277	705	851105	0.05	0.94	16	290	7	0.05
CRIVITZ SANITARY D	60372	403	870512	0.05	1	19	340	20	7.4
CRIVITZ SANITARY D	60372	403	811202	0.25	16	116	516	1	32
CRIVITZ SANITARY D	60372	403	820616	0.09	0.1	128	660	3.7	7.5
CRIVITZ SANITARY D	60372	403	800520	0.024	0.6	130	808	1	11.7
CRIVITZ SANITARY D	60372	403	821216	0.01	4	78	356	3.5	13
CRIVITZ SANITARY D	60372	403	790629	0.15	1.4	58	392	1	4.3
CRIVITZ SANITARY D	60372	403	830614	0.01	3.5	66	448	8	9.5
CRIVITZ SANITARY D	60372	403	771001	0.03	2	117	512	1	29
CRIVITZ SANITARY D	60372	403	840710	0.01	8.3	91	528	5	8.5
CRIVITZ SANITARY D	60372	403	770918	0.02	2	110	922	1	27
CRIVITZ SANITARY D	60372	403	841211	0.1	1	97	456	28	0.1
CRIVITZ SANITARY D	60372	403	770817		1.6	108	360	2	8.4
CRIVITZ SANITARY D	60372	403	850628	0.07	0.1	75	504	5	10.3
CRIVITZ SANITARY D	60372	403	791221	0.1	20.8	96	416	1	9.8
CRIVITZ SANITARY D	60372	403	851209	0.05	3	100	440	19	26.3
CRIVITZ SANITARY D	60372	403	770712		1.5	110	424	2	7.6
CRIVITZ SANITARY D	60372	403	860421	0.06	2	41	388	5	13.3
CRIVITZ SANITARY D	60372	403	801217	0.03	0.79	72	416	1	6.9
CRIVITZ SANITARY D	60372	403	810618		1.1	140	476	1	9.8
CRIVITZ SANITARY D	60372	403	780529	0.06	3	127	864	11	68
CRIVITZ SANITARY D	60372	403	861013	0.22	1	35	420	5	11
CRIVITZ SANITARY D	60372	406	771001		1.7	117	390	1	6.4
CRIVITZ SANITARY D	60372	406	770730	0.08	1.3	96	356	7	5.6
CRIVITZ SANITARY D	60372	406	770817	0.03	2	118	474	2	21
CRIVITZ SANITARY D	60372	406	860421	0.06	2	55	388	29	22
CRIVITZ SANITARY D	60372	406	770918	0.02	2.5	117	632	1	6.1
CRIVITZ SANITARY D	60372	406	850628	0.06	0.1	80	480	41	23.8
CRIVITZ SANITARY D	60372	406	820616	0.06	1.8	110	724	3.7	15
CRIVITZ SANITARY D	60372	406	840710	0.01	17.3	83	478	5	19.8
CRIVITZ SANITARY D	60372	406	811202	0.18	33.2	86	388	1	10.2
CRIVITZ SANITARY D	60372	406	830614	0.01	1	80	464	9	28
CRIVITZ SANITARY D	60372	406	810618		0.6	140	572	1	26.7
CRIVITZ SANITARY D	60372	406	870512	0.05	1	46	580	170	22
CRIVITZ SANITARY D	60372	406	801217	0.02	1	126	586	1	4.1
CRIVITZ SANITARY D	60372	406	861013	0.05	2	60	436	11	27
CRIVITZ SANITARY D	60372	406	800520	0.025	2.5	100	840	1	32.8
CRIVITZ SANITARY D	60372	406	841211	0.1	6	89	420	48	0.1
CRIVITZ SANITARY D	60372	406	791221	0.4	0.1	118	576	1	16.9
CRIVITZ SANITARY D	60372	406	821216	0.01	7	84	484	4	32
CRIVITZ SANITARY D	60372	406	790629	0.16	1	152	616	1	23.2
CRIVITZ SANITARY D	60372	406	851209	0.05	1	65	392	13	14.3
CRIVITZ SANITARY D	60372	406	770712	0.1	1.7	116	528	2	27.2
CRIVITZ SANITARY D	60372	406	831212	0.01	25	70	456	5	0.1
CRIVITZ SANITARY D	60372	406	780529	0.14	2	79	598	13	18
FAIRCHILD VILLAGE	36200	601	861024	1.64		59.4	100	61.4	5.9
FAIRCHILD VILLAGE	36200	601	850521	5.11		1	221	15.5	0.06
FAIRCHILD VILLAGE	36200	601	840613	0.88		1.8	990	6	0.17
FAIRCHILD VILLAGE	36200	602	861024	5.72		24.8	109	5.4	0.14
FAIRCHILD VILLAGE	36200	602	840613	1.16		5.2	158	4	0.18

FACILITY NAME	PERMIT NO.	WELL	DATE	NOX	ORG	CL	TDS	SO4	NH3
FALL CREEK SEWAGE	25976	601	850204	2.2	0.15	7	388	13	0.083
FALL CREEK SEWAGE	25976	601	850313	6.4	0.28	9	217	12	0.1
FALL CREEK SEWAGE	25976	601	860820	6.9	0.34	13	128	9	0.061
FALL CREEK SEWAGE	25976	601	850905	5.6	0.38	40	130	13	0.36
FALL CREEK SEWAGE	25976	601	850102	3.9	0.29	9	300	13	0.11
FALL CREEK SEWAGE	25976	601	870311	6.7	0.17	80	105	40	0.027
FALL CREEK SEWAGE	25976	601	841205	3.7	0.52	9		16	0.11
FALL CREEK SEWAGE	25976	601	860227	12	0.01	15	250	12	0.03
FALL CREEK SEWAGE	25976	602	860227	17	0.38	87	105	35	0.049
FALL CREEK SEWAGE	25976	602	850204	2	0.18	7	187	11	0.056
FALL CREEK SEWAGE	25976	602	860820	15	0.61	93	370	35	0.015
FALL CREEK SEWAGE	25976	602	850102	6	0.48	8	175	12	0.082
FALL CREEK SEWAGE	25976	602	850905	4.7	0.01	10	109	11	0.34
FALL CREEK SEWAGE	25976	602	870311	15	0.29	10	490	13	0.075
FALL CREEK SEWAGE	25976	602	850313	5.6	3.9	7.5	129	13	0.1
FALL CREEK SEWAGE	25976	602	841205	6	0.31	8	250	11	0.16
FALL RIVER SEWAGE	23973	101	841114	0.14	0.24	19	315	64	0.1
FALL RIVER SEWAGE	23973	101	840426	0.92	0.22	14	364	40	0.15
FALL RIVER SEWAGE	23973	101	850529	0.04	0.77	17	428	57	0.16
FALL RIVER SEWAGE	23973	101	840415	0.77	0.24	17	384	33	0.01
FALL RIVER SEWAGE	23973	101	860610	0.1	0.4	24	498	59	0.02
FALL RIVER SEWAGE	23973	101	840405	0.77	0.24	17	384	33	0.01
FALL RIVER SEWAGE	23973	101	870519	0.2	0.25	24	576	58	0.14
FALL RIVER SEWAGE	23973	101	840907	0.55	0.62	18	255	42	0.1
FALL RIVER SEWAGE	23973	101	840515	0	1.43	1	368	48	0.04
FALL RIVER SEWAGE	23973	101	851105	0.11	0.44	16	308	30	0.15
FALL RIVER SEWAGE	23973	101	861216	0.1	0.02	26	424	56	0.39
FALL RIVER SEWAGE	23973	102	840426	0.78	0.32	28	190	46	0.18
FALL RIVER SEWAGE	23973	102	840907	0.75	0.42	17	440	34	0.1
FALL RIVER SEWAGE	23973	102	850529	0.05	1.45	33	240	26	0.1
FALL RIVER SEWAGE	23973	102	840405	0.76	0.72	33	244	47	0.01
FALL RIVER SEWAGE	23973	102	860610	0.1	0.55	55	398	41	0.02
FALL RIVER SEWAGE	23973	102	840415	0.76	0.72	33	244	47	0.01
FALL RIVER SEWAGE	23973	102	870519	0.1	0.49	46	474	47	0.1
FALL RIVER SEWAGE	23973	102	841114	0.08	0.58	14	152	50	0.1
FALL RIVER SEWAGE	23973	102	840515	0	5.84	25	226	54	0.06
FALL RIVER SEWAGE	23973	102	861216	0.1	0.12	57	382	41	0.22
FALL RIVER SEWAGE	23973	102	851105	0.85	1.01	44	214	26	0.1
FLORENCE MUNICIPAL	22845	401	840510	0.01	2.3	28	392	30	3.7
FLORENCE MUNICIPAL	22845	401	851014	0.23	1	80	404	34	3.3
FLORENCE MUNICIPAL	22845	401	870511	0.05	1	40	350	30	1.3
FLORENCE MUNICIPAL	22845	401	840718	0.28	5.3	45	424	56	5.6
FLORENCE MUNICIPAL	22845	401	830513	0.04	1	30	436	36	5.6
FLORENCE MUNICIPAL	22845	402	860604	15.9	1	37	396	32	0.1
FLORENCE MUNICIPAL	22845	403	830513	0.01	2.3	30	400	14	11
FLORENCE MUNICIPAL	22845	404	851014	0.1	1	35	392	93	4.6
FLORENCE MUNICIPAL	22845	404	860604	0.05	1	12	364	32	1.8
FLORENCE MUNICIPAL	22845	404	840510	0.7	0.2	21	460	75	3.8
FLORENCE MUNICIPAL	22845	404	830513	0.01	3.4	30	244	14	7.2
FLORENCE MUNICIPAL	22845	404	860926	0.05	1	14	380	37	2.5
FLORENCE MUNICIPAL	22845	404	840718	0.47	1.2	32	360	32	6.2
FLORENCE MUNICIPAL	22845	404	870511	0.05	1	13	260	23	3
FLORENCE MUNICIPAL	22845	405	860926	3.9	1	50	320	27	0.5
FLORENCE MUNICIPAL	22845	405	870511	1.3	1	48	310	33	0.8
FRANCIS CREEK SEWA	21377	401	850522	6.3	0.3	240	716	35	0.1
FRANCIS CREEK SEWA	21377	401	830422	1.48	7.28	13	479.4	21.5	0.56
FRANCIS CREEK SEWA	21377	401	830308	1.35	9.52	15.5	452.3	38	1.4
FRANCIS CREEK SEWA	21377	401	830526	1.56	26.6	12.5	430	18.8	1.12
FRANCIS CREEK SEWA	21377	401	831107	3.52	0.84	11.5	428.6	27	0.56
FRANCIS CREEK SEWA	21377	401	870521	2.5					7.9
FRANCIS CREEK SEWA	21377	401	860521	9.4	1	115	700	52	0.1
FRANCIS CREEK SEWA	21377	401	850522	5.61	2.94	215.9	918.4	55.6	1.68
FRANCIS CREEK SEWA	21377	401	861217	1.6	1	295	636	54	0.4
FRANCIS CREEK SEWA	21377	401	841120	1136	4.06	130.5	1149	24.6	0.28

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FRANCIS CREEK SEWA	21377	401	870521	0.1					0.1
FRANCIS CREEK SEWA	21377	401	851128	9.11	1.12	206.9	707.9	62.5	0.1
FRANCIS CREEK SEWA	21377	401	860521	14.5	0.7	110	700	40	0.1
FRANCIS CREEK SEWA	21377	401	860521	9.4	1	115	700	52	0.1
FRANCIS CREEK SEWA	21377	401	870521	7.9	0.3	110	672	37	0.1
FRANCIS CREEK SEWA	21377	401	840522	30.89	0.1	79.4	987.4	21.6	0.1
FRANCIS CREEK SEWA	21377	402	860521	0.36	1	167	676	42	0.1
FRANCIS CREEK SEWA	21377	402	830526	1.97	3.36	120.7	1180	34	1.4
FRANCIS CREEK SEWA	21377	402	830422	0.53	0.56	100.3	1044	32	0.56
FRANCIS CREEK SEWA	21377	402	851128	252	0.84	260.9	260.9	70.4	0.1
FRANCIS CREEK SEWA	21377	402	830308	1.18	1.4	46.6	781.4	45	0.7
FRANCIS CREEK SEWA	21377	402	860521	0.8	0.4	180	688	34	0.1
FRANCIS CREEK SEWA	21377	402	860521	0.36	1	167	676	42	0.1
FRANCIS CREEK SEWA	21377	402	850522	1.46	2.52	263.9	898	53.2	2.24
FRANCIS CREEK SEWA	21377	402	850522	1.4	0.4	260	806	39	0.1
FRANCIS CREEK SEWA	21377	402	840522	27.23	0.56	50.9	803.3	44.9	0.1
FRANCIS CREEK SEWA	21377	402	861217	8.3	1	255	760	51	0.7
FRANCIS CREEK SEWA	21377	402	870521	2.9	0.6	220	828	42	0.1
FRANCIS CREEK SEWA	21377	402	831107	14.1	0.84	52.48	647.7	63.8	0.84
FRANCIS CREEK SEWA	21377	402	841120	9.7	1.4	155	873.6	25.8	0.28
FRANCIS CREEK SEWA	21377	402	870521	2.2	1	220	916	38	1
FRANCIS CREEK SEWA	21377	404	870521	0.1	0.3	6.3	500	83	0.1
FRANCIS CREEK SEWA	21377	404	870820	0.1	0.2	6	500	74	0.1
FRANCIS CREEK SEWA	21377	404	870521	0.05	1	7	532	91	1
FRANCIS CREEK SEWA	21377	404	870819	0.1	0.6	6	476	74	0.1
FREDERIC SEWAGE TR	29254	801	820923	5.9	0.75	14	201	12	0.5
FREDERIC SEWAGE TR	29254	801	821119	7.7	1.5	16	231	16	0.68
FREDERIC SEWAGE TR	29254	801	830612	4.47	0.9	11	197	10	0.5
FREDERIC SEWAGE TR	29254	801	860404	2.2	1.3	5	135	10	0.5
FREDERIC SEWAGE TR	29254	801	831014	6.54	1.6	17	188	11	0.5
FREDERIC SEWAGE TR	29254	801	820723	3.91	1.1	11	60	13	0.5
FREDERIC SEWAGE TR	29254	801	851009	3.3	1.22	9	141	83	5
FREDERIC SEWAGE TR	29254	801	840709	2.8	0.5	10	182	11	0.5
FREDERIC SEWAGE TR	29254	801	850529	3.9	0.78	10	124	8	0.5
FREDERIC SEWAGE TR	29254	801	870702	1.7	1.5	11	68	14	0.5
FREDERIC SEWAGE TR	29254	801	861215	1.7	0.5	7	138	14	0.5
FREDERIC SEWAGE TR	29254	801	820825	7.27	1.6	15	212	13	0.5
FREDERIC SEWAGE TR	29254	801	841012	0.03	1.4	10	172	9	0.5
FREDERIC SEWAGE TR	29254	802	820723	0.38	0.62	26	152	19	0.5
FREDERIC SEWAGE TR	29254	802	870702	0.7	1.7	35	287	22	0.5
FREDERIC SEWAGE TR	29254	802	841012	1.2	1.6	31	317	18	0.76
FREDERIC SEWAGE TR	29254	802	850529	0.64	0.71	40	249	18	0.5
FREDERIC SEWAGE TR	29254	802	820426	0.82	0.5	15	286	17	0.5
FREDERIC SEWAGE TR	29254	802	851009	0.27	1.45	9	302	27	0.55
FREDERIC SEWAGE TR	29254	802	830612	1	1	36	316	32	0.5
FREDERIC SEWAGE TR	29254	802	860404	0.2	2.1	48	292	22	0.5
FREDERIC SEWAGE TR	29254	802	840709	2.24	0.82	38	281	29	0.5
FREDERIC SEWAGE TR	29254	802	861215	0.1	0.7	32	320	24	0.5
FREDERIC SEWAGE TR	29254	802	821119	20	2.9	28	253	36	0.5
FREDERIC SEWAGE TR	29254	802	820218	0.53	0.7	20	159	34	0.5
FREDERIC SEWAGE TR	29254	802	831014	7.11	2.1	27	311	31	0.5
FREDERIC SEWAGE TR	29254	802	820317	0.26	0.5	4	263	18	0.5
GLENWOOD CITY	60381	601	870715	1.3	0.9	29	349	16	0.5
GLENWOOD CITY	60381	601	840603	0.64	0.5	41	416	37	0.58
GLENWOOD CITY	60381	601	801021	0.13	0.7	47	342	14	1.3
GLENWOOD CITY	60381	601	841205	2.63	2.3	3	401	12	0.5
GLENWOOD CITY	60381	601	830803	0.07	0.56	15	288	26	0.5
GLENWOOD CITY	60381	601	850703	0.21	1.2	44	388	17	1.2
GLENWOOD CITY	60381	601	840401	2.43	0.55	9	386	20	0.5
GLENWOOD CITY	60381	601	800922	0.13	0.96	38	318	11	1.1
GLENWOOD CITY	60381	601	801209	0.25	0.17	52	303	1	1.8
GLENWOOD CITY	60381	601	861217	1.2	0.5	30	295	17	0.5
GLENWOOD CITY	60381	602	840603	0.01	0.5	31	498	6	0.5
GLENWOOD CITY	60381	602	841205	0.17	1.8	4	405	12	0.5

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GLENWOOD CITY	60381	602	800922	0.1	1	32	443	6	1.1
GLENWOOD CITY	60381	602	850703	0.52	0.66	1	400	4	0.5
GLENWOOD CITY	60381	602	801209	0.13	27.6	30	539	1	0.99
GLENWOOD CITY	60381	602	861217	0.1	0.5	55	456	5	0.7
GLENWOOD CITY	60381	602	840401	2.07	0.5	50	443	4	0.55
GLENWOOD CITY	60381	602	830803	0.01	0.88	42	448	1	1.6
GLENWOOD CITY	60381	602	801021	0.01	1.1	34	422	1	1.2
GLENWOOD CITY	60381	602	870715	0.1	1.1	29	404	3	0.5
GLENWOOD CITY	60381	603	870715	0.1	0.8	60	419	7	2.4
GLENWOOD CITY	60381	603	840603	0.03	0.5	49	401	6	0.83
GLENWOOD CITY	60381	603	841205	0.1	1	1	416	13	0.5
GLENWOOD CITY	60381	603	800922	0.14	0.64	54	396	1	0.82
GLENWOOD CITY	60381	603	801209	0.06	9.9	47	423	16	0.62
GLENWOOD CITY	60381	603	850703	1.5	0.5	49	454	2	1.7
GLENWOOD CITY	60381	603	840401	0.5	0.5	53	383	1	1.3
GLENWOOD CITY	60381	603	830803	0.01	0.68	57	442	7	0.57
GLENWOOD CITY	60381	603	801021	0.01	1.3	55	382	1	0.76
GLENWOOD CITY	60381	603	861217	0.1	0.7	56	417	18	1.4
GLENWOOD CITY	60381	604	850703	0.29	0.5	1	445	1	0.5
GLENWOOD CITY	60381	604	830803	0.01	1.1	1	640	26	1
GLENWOOD CITY	60381	604	841205	0.02	0.98	21	408	13	0.5
GLENWOOD CITY	60381	604	861217	0.1	1	16	363	9	0.6
GLENWOOD CITY	60381	604	840603	0.07	0.5	1	657	7	0.5
GLENWOOD CITY	60381	604	840613	0.07	0.5	1	657	7	0.5
GLENWOOD CITY	60381	604	840401	0.5	0.57	1	906	6	0.73
GLENWOOD CITY	60381	604	870715	0.1	0.5	9	292	13	0.7
GOODMAN SANITARY D	60844	401	851016	1.04	0.68		380	42	1.9
GOODMAN SANITARY D	60844	401	801126	1.42	5.7	20	396	20	6.3
GOODMAN SANITARY D	60844	401	861117	0.05	0.37	28	209	36	1.03
GOODMAN SANITARY D	60844	401	820831	0.07	2.2	29	524	190	3.5
GOODMAN SANITARY D	60844	401	870528	0.05	0.22	26	400	16	0.73
GOODMAN SANITARY D	60844	401	830823	0.15	6.2	8	552	84	6.3
GOODMAN SANITARY D	60844	401	820608	0.16		26	286	1	4.5
GOODMAN SANITARY D	60844	401	841126	1.2	1.2	28	316	26	0.3
GOODMAN SANITARY D	60844	401	810805	0.15	1.5	30	314	7	4.1
GOODMAN SANITARY D	60844	401	860424	0.05	0.36	26	300	40	1.12
GOODMAN SANITARY D	60844	401	801016	0.79	2.2	22	368	10	3.9
GOODMAN SANITARY D	60844	401	840524	1.5	2.5	11	704	320	4.6
GOODMAN SANITARY D	60844	401	830607	0.38	1.8	6	444	140	5.5
GOODMAN SANITARY D	60844	401	850604	0.17	1.95	16	452	186	1.2
GOODMAN SANITARY D	60844	401	800918	0.19	3	22	472	80	0.1
GOODMAN SANITARY D	60844	403	820831	0.71	3.2	27	368	18	0.96
GOODMAN SANITARY D	60844	403	840524	0.4	1.1	53	408	12	0.8
GOODMAN SANITARY D	60844	403	841126	0.1	1.2	34	284	9	0.1
GOODMAN SANITARY D	60844	403	830607	1.82	1	60	448	24	0.8
GOODMAN SANITARY D	60844	403	850604	0.28	3.95	44	348	18	1.4
GOODMAN SANITARY D	60844	403	801126	0.14	1.52	17	410	13	0.78
GOODMAN SANITARY D	60844	403	851016	0.05	0.86		400	14	0.2
GOODMAN SANITARY D	60844	403	800918	0.16	1.5	18	432	1	0.1
GOODMAN SANITARY D	60844	403	860424	0.05	0.94	65	315	13	1.56
GOODMAN SANITARY D	60844	403	820608	0.11		24	310	18	1
GOODMAN SANITARY D	60844	403	861117	0.05	0.4	27	300	14	0.87
GOODMAN SANITARY D	60844	403	801016	0.24	2.5	20	328	12	0.1
GOODMAN SANITARY D	60844	403	810805	1.21	1.9	36	402	32	0.21
GOODMAN SANITARY D	60844	403	830823	0.01	3.1	36	536	5	0.2
GOODMAN SANITARY D	60844	403	870528	0.05	0.55	41	395	6	4.7
GOODMAN SANITARY D	60844	404	830823	0.55	1.1	6	9	9	6
GOODMAN SANITARY D	60844	404	810805	0.09	0.36	1	166	25	0.24
GOODMAN SANITARY D	60844	404	801126	0.14	0.59	2	140	10	0.16
GOODMAN SANITARY D	60844	404	841126	0.2	1.2	4	124	6	0.1
GOODMAN SANITARY D	60844	404	801016	0.32	1.1	6	168	8	0.1
GOODMAN SANITARY D	60844	404	851016	0.32	0.48		215	11	0.05
GOODMAN SANITARY D	60844	404	800918	0.12	22.4	8	444	16	0.1
GOODMAN SANITARY D	60844	404	820831	0.48	0.25	1	162	11	0.06

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GOODMAN SANITARY D	60844	404	860424	0.15	0.18	2	138	11	0.05
GOODMAN SANITARY D	60844	404	850604	0.17	2.6	3	129	9	0.4
GOODMAN SANITARY D	60844	404	861117	0.13	0.07	3	93	13	0.07
GOODMAN SANITARY D	60844	404	830607	0.22	1	6	216	12	0.15
GOODMAN SANITARY D	60844	404	840524	0.2	1.8	4	192	7	0.24
GOODMAN SANITARY D	60844	404	820608	0.35		1	180	9	0.05
GOODMAN SANITARY D	60844	404	870528	0.17	0.06	1	142	11	0.09
GRANTSBURG, VILLAG	60429	801	770819	0.11	0.707	3.3	78	11	0.002
GRANTSBURG, VILLAG	60429	801	840229	2.84	0.5	31	268	115	0.5
GRANTSBURG, VILLAG	60429	801	831019	1.71	0.5	22	204	65	0.58
GRANTSBURG, VILLAG	60429	801	780501	0.18	0.34	3.5	350	10	0.005
GRANTSBURG, VILLAG	60429	801	830622	3.9	0.65	73	494	238	0.5
GRANTSBURG, VILLAG	60429	801	790803	0.76	1	6	62	8	0.5
GRANTSBURG, VILLAG	60429	801	821227	2.68	0.5	95	511	200	0.5
GRANTSBURG, VILLAG	60429	801	861119	1.6	1.4	7	214	64	0.5
GRANTSBURG, VILLAG	60429	801	800105	0.05	0.56	5	61	11	0.38
GRANTSBURG, VILLAG	60429	801	851023	1.8	0.5	13	182	80	0.5
GRANTSBURG, VILLAG	60429	801	820616	3.42	0.5	93	436	240	0.5
GRANTSBURG, VILLAG	60429	801	841018	1.6	0.6	19	125	44	0.5
GRANTSBURG, VILLAG	60429	801	820106	0.36	0.6	28	223	74	0.6
GRANTSBURG, VILLAG	60429	801	770916	2.15	1.804	2.4	988	12	0.19
GRANTSBURG, VILLAG	60429	801	810701	1.71	0.5	4	75	21	0.5
GRANTSBURG, VILLAG	60429	801	860416	2.4	0.5	1	79	16	0.5
GRANTSBURG, VILLAG	60429	801	810205	0.68	0.79	1	61	13	0.5
GRANTSBURG, VILLAG	60429	801	781213	0.157	0.259	0.6	75		0.22
GRANTSBURG, VILLAG	60429	801	850619	1.7	0.5	15	335	158	0.5
GRANTSBURG, VILLAG	60429	801	870401	0.6	0.5	5	95	16	0.5
GRANTSBURG, VILLAG	60429	801	800703	0.27	0.56	8	52	15	0.2
GRANTSBURG, VILLAG	60429	802	820106	0.11	0.6	1	39	10	0.6
GRANTSBURG, VILLAG	60429	802	800105	0.15	0.42	5	39	4	0.1
GRANTSBURG, VILLAG	60429	802	870401	0.1	0.5	3	35	6	0.5
GRANTSBURG, VILLAG	60429	802	800703	0.1	0.56	6	26	7	0.18
GRANTSBURG, VILLAG	60429	802	810701	0.2	0.5	1	29	8	0.5
GRANTSBURG, VILLAG	60429	802	810205	0.19	0.5	1	24	10	0.5
GRANTSBURG, VILLAG	60429	802	851023	0.1	0.5	2	28	7	0.5
GRANTSBURG, VILLAG	60429	802	841018	0.01	0.5	1	56	6	0.5
GRANTSBURG, VILLAG	60429	802	770819	0.23		0.7	8	6	0.206
GRANTSBURG, VILLAG	60429	802	850619	0.16	0.52	1	230	3	0.5
GRANTSBURG, VILLAG	60429	802	861119	0.1	1.1	1	51	5	0.5
GRANTSBURG, VILLAG	60429	802	790803	0.3	0.8	5	44	4	0.5
GRANTSBURG, VILLAG	60429	802	821227	0.01	0.5	1	29	10	0.5
GRANTSBURG, VILLAG	60429	802	781213	0.154	0.45	1.4	86		0.028
GRANTSBURG, VILLAG	60429	802	831019	0.07	0.5	1	28	4	0.5
GRANTSBURG, VILLAG	60429	802	780501	0.31	0.27	3.5	187	4	0.012
GRANTSBURG, VILLAG	60429	802	860416	0.1	0.5	1	29	5	0.5
GRANTSBURG, VILLAG	60429	802	771201	0.28	0.3	1	50	12	0.03
GRANTSBURG, VILLAG	60429	802	830622	0.4	0.5	1	51	7	0.5
GRANTSBURG, VILLAG	60429	802	820616	0.28	0.6	1	30	7	0.63
GRANTSBURG, VILLAG	60429	802	840229	0.51	0.5	1	32	5	0.5
GRANTSBURG, VILLAG	60429	802	770916	0.12	1.3	1.9		9	0.08
GRANTSBURG, VILLAG	60429	803	771201	0.02	1	70	272	22	13
GRANTSBURG, VILLAG	60429	803	870401	0.1	1.2	120	563	8	0.6
GRANTSBURG, VILLAG	60429	803	770916	0.1	5.21	71		15	5.77
GRANTSBURG, VILLAG	60429	803	850619	0.02	1.5	101	414	12	3.3
GRANTSBURG, VILLAG	60429	803	841018	0.7	0.8	96	342	10	4.3
GRANTSBURG, VILLAG	60429	803	831019	0.01	1.6	97	399	20	8.7
GRANTSBURG, VILLAG	60429	803	820106	0.01	1	106	480	19	4.6
GRANTSBURG, VILLAG	60429	803	821227	0.01	0.7	86	383	28	17
GRANTSBURG, VILLAG	60429	803	810701	0.01	1.6	105	376	25	15.4
GRANTSBURG, VILLAG	60429	803	800105	0.06	0.98	107	506	29	13.9
GRANTSBURG, VILLAG	60429	803	800703	0.02	1	90	405	32	10.1
GRANTSBURG, VILLAG	60429	803	781213	0.022	1.97	92	373	17	1.56
GRANTSBURG, VILLAG	60429	803	810205	0.04	1.3	158	611	30	3.6
GRANTSBURG, VILLAG	60429	803	840229	0.73	0.5	100	439	24	3.8

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GRANTSBURG, VILLAG	60429	803	851023	0.1	0.1	120	443	17	3.7
GRANTSBURG, VILLAG	60429	803	820616	0.01	1	82	439		5.9
GRANTSBURG, VILLAG	60429	803	860416	0.1	0.7	120	549	4	0.9
GRANTSBURG, VILLAG	60429	803	780501	0.24	0.9	95	757	15	15.51
GRANTSBURG, VILLAG	60429	803	790803	0.14	0.2	93	389	41	7.6
GRANTSBURG, VILLAG	60429	803	830622	0.05	0.85	103	471	21	5.3
GRANTSBURG, VILLAG	60429	803	861119	0.1	1.2	100	379	2	0.9
GRANTSBURG, VILLAG	60429	804	770819	0.6		65	419	14	3.66
GRANTSBURG, VILLAG	60429	804	821227	0.02	0.5	90	360	19	3.4
GRANTSBURG, VILLAG	60429	804	771201	0.02	0.7	71	372	19	1.1
GRANTSBURG, VILLAG	60429	804	820106	0.03	0.83	104	275	5	7.4
GRANTSBURG, VILLAG	60429	804	870401	0.2	4.3	98	397	1	2.6
GRANTSBURG, VILLAG	60429	804	810701	0.01	0.54	80	338	12	10.8
GRANTSBURG, VILLAG	60429	804	851023	0.1	0.5	120	418	7	7.9
GRANTSBURG, VILLAG	60429	804	810205	0.06	1.1	116	287	5	6
GRANTSBURG, VILLAG	60429	804	841018	0.01	0.6	88	344	7	4.7
GRANTSBURG, VILLAG	60429	804	800703	0.02	0.99	112	473	5	8.3
GRANTSBURG, VILLAG	60429	804	831019	0.01	1.3	103	388	9	8.2
GRANTSBURG, VILLAG	60429	804	800105	0.03	0.8	104	454	34	5.5
GRANTSBURG, VILLAG	60429	804	770916	0.22	13.67	82		7	10.6
GRANTSBURG, VILLAG	60429	804	790803	0.24	2.7	83	786	27	7.5
GRANTSBURG, VILLAG	60429	804	850619	0.08	2	100	429	5	5.6
GRANTSBURG, VILLAG	60429	804	781213	0.022	1.7	100	293		2.013
GRANTSBURG, VILLAG	60429	804	830622	0.04	0.8	89	351	6	7.1
GRANTSBURG, VILLAG	60429	804	840229	0.04	0.5	98	446	15	7.1
GRANTSBURG, VILLAG	60429	804	861119	0.1	2.1	99	321	1	1.2
GRANTSBURG, VILLAG	60429	804	780501	0.01	13.45	86	328	10	1.55
GRANTSBURG, VILLAG	60429	805	841018	0.01	0.7	96	428	33	7
GRANTSBURG, VILLAG	60429	805	781213	0.016	12.1	120	519		6.59
GRANTSBURG, VILLAG	60429	805	831019	0.58	1.8	101	422	33	13
GRANTSBURG, VILLAG	60429	805	770916	0.1	10.13	93	786	30	0.174
GRANTSBURG, VILLAG	60429	805	770819	0.1		78	497	26	6.4
GRANTSBURG, VILLAG	60429	805	780501	0.1	11.7	102	635	25	7
GRANTSBURG, VILLAG	60429	805	840229	0.01	0.5	100	450	8	2.4
GRANTSBURG, VILLAG	60429	806	861119	0.1	1	99	391	2	2
GRANTSBURG, VILLAG	60429	806	841018	1.07	1	88	373	21	7.7
GRANTSBURG, VILLAG	60429	806	870401	0.3	2	116	498	14	1.4
GRANTSBURG, VILLAG	60429	806	851023	0.1	7	120	440	4	22
GRANTSBURG, VILLAG	60429	806	860416	0.1	0.5	110	389	4	2.4
GRANTSBURG, VILLAG	60429	806	850619	0.06	1.6	106	500	11	2.9
HAMMOND, VILLAGE O	24171	601	871009	3.3	1.6	50	423	33	0.5
HAMMOND, VILLAGE O	24171	601	850523	5.3	2	42	362	18	0.5
HAMMOND, VILLAGE O	24171	601	870603	9.5	1.1	50	399	32	0.5
HAMMOND, VILLAGE O	24171	601	860521	8.2	3.6	94	485	34	0.5
HAMMOND, VILLAGE O	24171	601	861222	10	1.4	60	415	30	0.5
HAMMOND, VILLAGE O	24171	601	841116	6.13	1.6	65	443	33	3
HAMMOND, VILLAGE O	24171	602	861222	6.8	0.7	85	460	35	0.5
HAMMOND, VILLAGE O	24171	602	871009	2.2	0.6	96	540	33	0.5
HAMMOND, VILLAGE O	24171	602	870603	5.5	0.8	100	516	36	0.5
HAMMOND, VILLAGE O	24171	602	850523	6.9	2.7	59	463	31	1.5
HAYWARD SEWER AND	21121	801	870512	3.04	0.2	15	260	12	0.11
HAYWARD SEWER AND	21121	801	830502	6.71	1.3	46	382	24	0.5
HAYWARD SEWER AND	21121	801	821116	1.37	0.71	15	180	8	0.5
HAYWARD SEWER AND	21121	801	841210	1.57	0.2	32	260	12	0.1
HAYWARD SEWER AND	21121	801	850603	3.3	0.14	21	162	15	0.1
HAYWARD SEWER AND	21121	801	820405	0.05	0.5	1	52	10	0.5
HAYWARD SEWER AND	21121	801	851209	2.16	0.11	23	74	15	0.05
HAYWARD SEWER AND	21121	801	831026	1.74	1.1	35	320	20	0.5
HAYWARD SEWER AND	21121	801	860519	2.15	0.11	13		11	0.05
HAYWARD SEWER AND	21121	801	820302	0.01	0.5	2	355	9	0.5
HAYWARD SEWER AND	21121	801	840606	0.76		14	158	10	0.1
HAYWARD SEWER AND	21121	801	820504	0.08	0.5	1	67	7	0.6
HAYWARD SEWER AND	21121	801	861118	3.11	0.1	20	310	14	0.07
HAYWARD SEWER AND	21121	802	831026	1.84	1.1	22	151	7	0.5

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HAYWARD SEWER AND	21121	802	830412	0.02	1.2	38	429	19	0.5
HAYWARD SEWER AND	21121	802	870512	1.2	0.28	47	358	19	0.05
HAYWARD SEWER AND	21121	802	821116	0.01	0.5	4	63	7	0.5
HAYWARD SEWER AND	21121	802	830502	5.84	1.5	45	382	23	0.5
HAYWARD SEWER AND	21121	802	830314	0.05	0.82	39	308	18	0.5
HAYWARD SEWER AND	21121	802	861118	1.84	0.26	38	480	17	0.05
HAYWARD SEWER AND	21121	803	861118	5.57	0.42	42	480	19	0.05
HAYWARD SEWER AND	21121	803	821116	0.01	0.5	1	73	13	0.5
HAYWARD SEWER AND	21121	803	830502	0.16	0.5	2	139	10	0.5
HAYWARD SEWER AND	21121	803	811214	0.17	0.6	6	119	15	0.5
HAYWARD SEWER AND	21121	803	831026	1.62	0.5	7	390	9	0.5
HAYWARD SEWER AND	21121	803	820405	0.05	0.5	2	96	12	0.5
HAYWARD SEWER AND	21121	803	850603	0.9	0.53	45	430	20	0.1
HAYWARD SEWER AND	21121	803	820504	0.03	0.5	1	116	12	0.76
HAYWARD SEWER AND	21121	803	840606	0.1		39	380	17	0.1
HAYWARD SEWER AND	21121	803	860519	1.91	0.11	60		21	0.05
HAYWARD SEWER AND	21121	803	870512	0.05	0.51	64	426	20	0.07
HAYWARD SEWER AND	21121	803	841210	2.91	0.73	40	510	18	0.1
HAYWARD SEWER AND	21121	803	820302	0.06	0.5	3	146	13	0.5
HAYWARD SEWER AND	21121	803	851209	4.39	0.7	47	370	22	0.05
HAYWARD SEWER AND	21121	804	820302	0.07	0.5	4	202	5	0.5
HAYWARD SEWER AND	21121	804	830714	0.07	1.9	8	87	12	0.5
HAYWARD SEWER AND	21121	804	811008	0.33	0.5	4	247	4	0.5
HAYWARD SEWER AND	21121	805	850603	3.49	0.84	44	290	20	0.1
HAYWARD SEWER AND	21121	805	861118	5.14	0.51	56	405	23	0.69
HAYWARD SEWER AND	21121	805	831129	2.69	0.69	22	185	18	0.5
HAYWARD SEWER AND	21121	805	860519	0.77	0.48	57		20	0.05
HAYWARD SEWER AND	21121	805	840606	0.78	0.31	40	300	21	0.1
HAYWARD SEWER AND	21121	805	841210	0.81		38	362	19	0.1
HAYWARD SEWER AND	21121	805	870512	0.96	0.67	59	388	21	1.39
HAYWARD SEWER AND	21121	805	851209	2.48	0.5	50	300	20	0.07
IRON RIVER SANITAR	22446	801	850528	0.65	0.5	1	47	5	0.5
IRON RIVER SANITAR	22446	801	870601	2.1	0.6	3	57	6	0.5
IRON RIVER SANITAR	22446	801	841001	0.19	0.5	1	48	4	0.5
IRON RIVER SANITAR	22446	801	830829	0.01	0.69	1	37	7	0.5
IRON RIVER SANITAR	22446	801	830920	0.5	0.5	1	15	7	0.01
IRON RIVER SANITAR	22446	801	851007	0.2	0.5	1	24	7	0.5
IRON RIVER SANITAR	22446	801	840611	4.08	2.1	2	76	7	0.5
IRON RIVER SANITAR	22446	801	831019	0.5	0.5	1	29	10	0.07
IRON RIVER SANITAR	22446	801	861006	0.2	1	1	28	4	0.5
IRON RIVER SANITAR	22446	801	860505	1.2	0.5	0.1	32	3	0.5
IRON RIVER SANITAR	22446	802	861006	0.1	9.6	48	243	4	4.6
IRON RIVER SANITAR	22446	802	841001	7.46	2.7	38	354	32	88
IRON RIVER SANITAR	22446	802	870601	0.4	5	50	284	12	1.5
IRON RIVER SANITAR	22446	802	850528	0.07	1.7	53	342	5	4.8
IRON RIVER SANITAR	22446	802	830920	0.23	1.7	40	285	19	4.9
IRON RIVER SANITAR	22446	802	851007	0.1	1.7	37	235	5	4.9
IRON RIVER SANITAR	22446	802	840611	0.46	0.66	42	252	6	4.9
IRON RIVER SANITAR	22446	802	831019	0.53	1.8	39	281	18	6.2
IRON RIVER SANITAR	22446	802	830829	0.01	2.2	39	311	1	5.3
IRON RIVER SANITAR	22446	802	860505	0.1	3.3	46	338	14	6.3
IRON RIVER SANITAR	22446	803	851007	0.1	2	46	277	19	9
IRON RIVER SANITAR	22446	803	830920	0.01	1.2	44	256	1	6.4
IRON RIVER SANITAR	22446	803	841001	0.37	2.1	43	287	2	8.9
IRON RIVER SANITAR	22446	803	840611	0.16	0.5	48	276	9	5.4
IRON RIVER SANITAR	22446	803	861006	0.1	7.8	50	273	13	4.3
IRON RIVER SANITAR	22446	803	831019	0.01	1.1	42	272	4	6.5
IRON RIVER SANITAR	22446	803	850528	0.04	2.1	45	284	14	6.6
IRON RIVER SANITAR	22446	803	860505	0.1	3.1	66	290	14	5.7
IRON RIVER SANITAR	22446	803	870601	0.2	3.4	55	316	14	2.9
IRON RIVER SANITAR	22446	803	830829	0.01	1.5	45	299	1	5.6
KELLY LAKE S.D. #1	60224	401	840408	1.18	1.37	72	455	22	12.3
KELLY LAKE S.D. #1	60224	401	840115	0.14	2.55	52	730	2	7.31
KELLY LAKE S.D. #1	60224	401	860413	0.05	0.05	47	350	21	13.6

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KELLY LAKE S.D. #1	60224	401	831206	2.41	2.52	60	880	3	6.8
KELLY LAKE S.D. #1	60224	401	841104	0.31	0.98	70	460	2	8.76
KELLY LAKE S.D. #1	60224	401	851117	0.25	1.2	71	420	53	10.8
KELLY LAKE S.D. #1	60224	401	861207	0.06	1	100	524	5	17.2
KELLY LAKE S.D. #1	60224	401	831108	0.03	1.09	72	425	2	2.55
KELLY LAKE S.D. #1	60224	402	861207	0.05	1	85	740	5	10.5
KELLY LAKE S.D. #1	60224	402	841104	0.1	1.37	62	750	2	6.72
KELLY LAKE S.D. #1	60224	402	831108	0.03	2.69	58	770	2	5.77
KELLY LAKE S.D. #1	60224	402	851117	0.05	0.95	72	770	21	5.24
KELLY LAKE S.D. #1	60224	402	840115	0.08	1.35	72	440	3	5.99
KELLY LAKE S.D. #1	60224	402	831206	3.02	1.4	92	430	10	5.43
KELLY LAKE S.D. #1	60224	402	840408	0.03	2.43	50	660	10	5.94
KELLY LAKE S.D. #1	60224	402	860413	0.05	0.1	61	780	21	10.2
LAKE GENEVA WASTEW	21130	201	870605	1.14	0.206	12.8	344	25.7	0.39
LAKE GENEVA WASTEW	21130	201	860611	3.33	1.35	21.4	357.1	32	0.11
LAKE GENEVA WASTEW	21130	201	860102	26.41	3.05	23	377.8	27.3	0.28
LAKE GENEVA WASTEW	21130	201	860922	2.75	2.46	11.01	608	32.29	0.11
LAKE GENEVA WASTEW	21130	201	860116	4.99	2.41	24.5	428	37.8	0.28
LAKE GENEVA WASTEW	21130	201	861126	0.714	4.03	10.1	480	56.9	0.11
LAKE GENEVA WASTEW	21130	201	860331	4.92	2.55	18.5	324.3	28.2	0.39
LAKE GENEVA WASTEW	21130	201	860130	4.54	3.56	16.7	428.3	34.8	0.28
LAKE GENEVA WASTEW	21130	201	860108	6.59	3.4	19.7	26.5	34.8	0.28
LAKE GENEVA WASTEW	21130	201	870319	5.54	0.36	13.1	358	32.7	0.1
LAKE GENEVA WASTEW	21130	202	860116	0.12	0.48	8.2	389.8	24.1	0.28
LAKE GENEVA WASTEW	21130	202	860325	0.04	0.54	7	392	18	0.94
LAKE GENEVA WASTEW	21130	202	860130	0.22	0.17	6.2	408.5	22.3	0.28
LAKE GENEVA WASTEW	21130	202	861121	1.02	1.9	344	668	29.5	0.11
LAKE GENEVA WASTEW	21130	202	860108	0.06	0.1	6.6	355.2	35.6	0.28
LAKE GENEVA WASTEW	21130	202	870319	2.06	0.18	26.1	416	41.4	0.17
LAKE GENEVA WASTEW	21130	202	860609	0.52	0.42	8.65	401.2	39.2	0.11
LAKE GENEVA WASTEW	21130	202	860102	11.44	0.28	8	383	21.2	0.28
LAKE GENEVA WASTEW	21130	202	860916	0.42	2.58	6.52	139.8	24.87	0.11
LAKE GENEVA WASTEW	21130	202	870605	0.56	0.073	13.6	420	33.7	0.15
LAKE GENEVA WASTEW	21130	203	860116	1.74	1.46	49.5	596.7	32.1	0.28
LAKE GENEVA WASTEW	21130	203	860916	2.52	4.37	209.1	220.6	26.61	0.11
LAKE GENEVA WASTEW	21130	203	860130	2.13	1.26	140	567.8	25.6	0.28
LAKE GENEVA WASTEW	21130	203	861121	0.126	2.6	8.06	390	26.4	0.11
LAKE GENEVA WASTEW	21130	203	860108	0.58	0.84	198.3	545.5	33.3	0.28
LAKE GENEVA WASTEW	21130	203	870319	3.3	0.28	211	666	25.7	0.1
LAKE GENEVA WASTEW	21130	203	860609	1.21	1.31	170.2	701.4	28	0.11
LAKE GENEVA WASTEW	21130	203	860102	24.7	0.59	172	622.2	31.1	0.28
LAKE GENEVA WASTEW	21130	203	860325	0.97	2.71	74.3	575	35.7	0.17
LAKE GENEVA WASTEW	21130	203	870605	3.32	0.143	240	802	26	0.1
LAKE GENEVA WASTEW	21130	204	861121	0.923	1.17	197	620	23.3	0.59
LAKE GENEVA WASTEW	21130	204	860130	7.24	0.63	162.8	682.9	35.9	0.28
LAKE GENEVA WASTEW	21130	204	860325	8.1	1.37	150.8	590	33.7	0.39
LAKE GENEVA WASTEW	21130	204	860916	2.29	1.4	128.3	175.5	22.26	0.11
LAKE GENEVA WASTEW	21130	204	860609	2.05	0.86	125.2	585.2	33.2	0.11
LAKE GENEVA WASTEW	21130	204	870605	3.48	0.344	233	790	37.6	0.1
LAKE GENEVA WASTEW	21130	204	860108	7.91	2	126	413.8	36	0.28
LAKE GENEVA WASTEW	21130	204	860102	33.45	1.93	116	589.5	23.6	0.28
LAKE GENEVA WASTEW	21130	204	870319	4.12	0.36	316	708	40.1	0.1
LAKE GENEVA WASTEW	21130	204	860116	6.49	1.51	186.5	648.5	32.5	0.28
LAKE GENEVA WASTEW	21130	205	860130	4.49	2.02	255	842.7	16.1	0.28
LAKE GENEVA WASTEW	21130	205	860609	1.31	1.56	122.5	785	29.1	0.18
LAKE GENEVA WASTEW	21130	205	860916	2.29	4.56	146.2	175.5	22.26	0.11
LAKE GENEVA WASTEW	21130	205	860102	21.21	3.67	189	748.9	21.7	0.28
LAKE GENEVA WASTEW	21130	205	861124	0.803	3.3	124	728	41.2	0.11
LAKE GENEVA WASTEW	21130	205	860325	4.83	2.99	161.2	796	25	0.45
LAKE GENEVA WASTEW	21130	205	860116	3.9	4.59	233.6	896	12.5	0.28
LAKE GENEVA WASTEW	21130	205	870605	3.25	0.166	209	676	30.1	0.1
LAKE GENEVA WASTEW	21130	205	870319	3.44	0.42	134	852	14.5	0.1
LAKE GENEVA WASTEW	21130	206	861121	1.15	2.41	158	604	35.3	0.11
LAKE GENEVA WASTEW	21130	206	860116	2.73	1.23	56.8	505.8	28.3	0.28

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LAKE GENEVA WASTEW	21130	206	870605	3.81	0.186	210	736	38.1	0.1
LAKE GENEVA WASTEW	21130	206	860108	3.09	0.98	31.9	304.2	31.9	0.28
LAKE GENEVA WASTEW	21130	206	860609	1.54	1.13	179.2	762.6	56.7	0.11
LAKE GENEVA WASTEW	21130	206	860102	14.3	0.45	53	421.6	25.3	0.28
LAKE GENEVA WASTEW	21130	206	860130	3.52	1.12	78.8	461.3	20.1	0.28
LAKE GENEVA WASTEW	21130	206	860325	1.67	1.69	12.3	432	31.9	0.35
LAKE GENEVA WASTEW	21130	206	860916	2.98	1.34	218.1	1031	37.59	0.11
LAKE GENEVA WASTEW	21130	206	870319	3.57	0.29	157	766	44.8	0.1
LAKE GENEVA WASTEW	21130	207	870319	5.54	0.14	263	775	44.3	0.1
LAKE GENEVA WASTEW	21130	207	860610	1.32	0.37	225	750	54.4	0.11
LAKE GENEVA WASTEW	21130	207	870605	2.65	0.169	197	557	35.6	0.1
LAKE GENEVA WASTEW	21130	207	860917	2.6	3.14	212.6	1056	68.33	0.11
LAKE GENEVA WASTEW	21130	207	860116	1.48	0.48	19.3	394.4	19.3	0.28
LAKE GENEVA WASTEW	21130	207	860102	8.8	0.95	17	372	34.7	0.28
LAKE GENEVA WASTEW	21130	207	860331	2.3	1.06	121.1	523	28.7	1.12
LAKE GENEVA WASTEW	21130	207	860130	1.68	3.36	25.4	432.1	25.4	0.28
LAKE GENEVA WASTEW	21130	207	860108	0.54	2.27	19.6	320	28	0.28
LAKE GENEVA WASTEW	21130	207	861125	0.91	2.45	220	564	59.4	0.11
LAKE GENEVA WASTEW	21130	208	860917	0.42	1.43	188	137.4	31.06	0.11
LAKE GENEVA WASTEW	21130	208	860108	0.63	2.58	22.4	251.4	54.6	0.28
LAKE GENEVA WASTEW	21130	208	860102	10.12	2.1	20	317.9	38.4	0.28
LAKE GENEVA WASTEW	21130	208	861124	0.807	3.64	203	620	90.1	0.11
LAKE GENEVA WASTEW	21130	208	860130	1.04	2.46	21.6	320.2	50.5	0.28
LAKE GENEVA WASTEW	21130	208	870319	4.97	0.09	227	854	53.6	0.1
LAKE GENEVA WASTEW	21130	208	860610	1.42	0.97	163.2	776.8	56.11	0.11
LAKE GENEVA WASTEW	21130	208	860331	1.7	1.56	181.5	648	31.3	0.63
LAKE GENEVA WASTEW	21130	208	860116	0.59	0.59	18	438.2	12.5	0.28
LAKE GENEVA WASTEW	21130	208	870605	3.03	0.103	205	720		0.1
LAKE GENEVA WASTEW	21130	209	860108	3.71	1.1	101.5	305.2	25.9	0.28
LAKE GENEVA WASTEW	21130	209	860917	2.25	1.32	119.5	303.4	31.06	0.11
LAKE GENEVA WASTEW	21130	209	860102	16.72	1.04	13	371.2	17.6	0.28
LAKE GENEVA WASTEW	21130	209	861124	0.588	2.41	194	692	53.6	0.11
LAKE GENEVA WASTEW	21130	209	860130	4.16	0.53	48.5	378.1	18.6	0.28
LAKE GENEVA WASTEW	21130	209	870319	4.18	0.21	181	660	38.7	0.1
LAKE GENEVA WASTEW	21130	209	860610	1.7	0.11	55.7	463.1	41.9	0.11
LAKE GENEVA WASTEW	21130	209	860331	1.7	0.63	11.6	370.5	18.4	0.47
LAKE GENEVA WASTEW	21130	209	860116	3.37	0.28	77.3	372.5	25	0.28
LAKE GENEVA WASTEW	21130	209	870605	3.36	0.14	221	754	41.5	0.1
LAKE GENEVA WASTEW	21130	210	861124	0.657	2.89	111	552	57.6	0.11
LAKE GENEVA WASTEW	21130	210	860325	2.13	1.34	33.3	343	17.5	0.82
LAKE GENEVA WASTEW	21130	210	870605	3.81	0.037	232	852	41.3	0.1
LAKE GENEVA WASTEW	21130	210	860611	1.51	0.11	49.2	299.7	22.8	0.65

FACILITY NAME	PERMIT NO.	WELL	DATE	NOX	ORG	CL	TDS	SO4	NH3
LAKE GENEVA WASTEW	21130	217	860108	5.31	3.42	245.9	477.2	40.2	0.28
LAKE GENEVA WASTEW	21130	217	870605	3.96	0.115	235	636	47.8	0.1
LAKE GENEVA WASTEW	21130	218	860108	3.94	0.7	112.8	455.4	48	0.28
LAKE GENEVA WASTEW	21130	218	860611	2.34	0.21	50.2	344.1	34.6	0.11
LAKE GENEVA WASTEW	21130	218	860102	15.4	1.43	82	521.1	34.7	0.28
LAKE GENEVA WASTEW	21130	218	860918	2.15	0.9	143.4	896	42.66	0.11
LAKE GENEVA WASTEW	21130	218	860116	3.48	0.17	86.5	590.9	44.1	0.28
LAKE GENEVA WASTEW	21130	218	861126	0.592	1.71	159	640	73.6	0.11
LAKE GENEVA WASTEW	21130	218	860331	15.4	1.43	82	515	34.7	0.28
LAKE GENEVA WASTEW	21130	218	860130	4.06	0.7	107.3	626.9	49.6	0.28
LAKE GENEVA WASTEW	21130	218	870605	3.74	0.574	206	676	36.2	0.1
LAKE GENEVA WASTEW	21130	218	870319	4.93	0.12	225	624	37.6	0.1
LAKE GENEVA WASTEW	21130	219	860918	2.75	1.12	177.5	1020	23.79	0.11
LAKE GENEVA WASTEW	21130	219	860331	6.55	2.07	13.5	358.5	26.2	0.91
LAKE GENEVA WASTEW	21130	219	860611	7.9	0.26	206.2	932.4	70.1	0.11
LAKE GENEVA WASTEW	21130	219	860108	13.08		12.7	333.6	24.9	
LAKE GENEVA WASTEW	21130	219	860102	15.43	70.51	3.5	58.5	6.2	1.99
LAKE GENEVA WASTEW	21130	219	860130	6.19	1.06	12.1	301.9	29.1	0.28
LAKE GENEVA WASTEW	21130	219	860116	11.15		13.8	438.8	24.1	
LAKE GENEVA WASTEW	21130	219	870605	4.28	4.93	167	636	35.2	0.14
LAKE GENEVA WASTEW	21130	219	861125	0.738	2.41	152	736	35.1	0.22
LAKE GENEVA WASTEW	21130	220	861125	0.075	1.6			51.24	0.11
LAKE GENEVA WASTEW	21130	220	860130	1.11	0.42	39	375	58.7	0.28
LAKE GENEVA WASTEW	21130	220	860102	8.84	1.15	42	516.1	43.3	0.28
LAKE GENEVA WASTEW	21130	220	860327	1.66	0.5	58.3	449	44.5	0.2
LAKE GENEVA WASTEW	21130	220	860108	1.03	0.1	52.1	340.1	57.3	0.28
LAKE GENEVA WASTEW	21130	220	870319	2.73	0.06	26.3	458	40.4	0.1
LAKE GENEVA WASTEW	21130	220	860922	0.75	1.12	44.67	648		
LAKE GENEVA WASTEW	21130	220	860611	1.95		43.5	438.4	46.9	0.11
LAKE GENEVA WASTEW	21130	220	860116	1.49	0.1	46.5	523.7	48.1	0.28
LAKE GENEVA WASTEW	21130	220	870605	1.36	0.154	78.7	614	60.7	0.1
LAKE GENEVA WASTEW	21130	221	860108	37.36	0.5	42.6	511.1	57.3	0.28
LAKE GENEVA WASTEW	21130	221	860919	0.39	1.65	51.56	772	71.12	0.11
LAKE GENEVA WASTEW	21130	221	860102	81.28	2.88	21	523.8	43.3	0.28
LAKE GENEVA WASTEW	21130	221	860611	0.58	0.11	47	502.1	68.2	0.11
LAKE GENEVA WASTEW	21130	221	870605	1.74	0.01	53.6	456	54	0.21
LAKE GENEVA WASTEW	21130	221	860331	16.18	1.66	41.3	431	51.9	0.63
LAKE GENEVA WASTEW	21130	221	861126	0.121	0.88	34.3	532	137	0.21
LAKE GENEVA WASTEW	21130	221	870319	0.07	0.01	45.1	494	59.9	0.12
LAKE GENEVA WASTEW	21130	221	860116	27.31	1.01	38.5	612.2	50	0.28
LAKE GENEVA WASTEW	21130	221	860130	26.26	0.17	84.3	600.7	51.9	0.28
LAKE GENEVA WASTEW	21130	222	860108	5.69	0.4	90.5	481.9	41.3	0.28
LAKE GENEVA WASTEW	21130	222	860919	4.09	0.67	72.6	792	37.54	0.11
LAKE GENEVA WASTEW	21130	222	860102	11.44	9.44	6	447	16.4	0.28
LAKE GENEVA WASTEW	21130	222	861125	0.418	2.62				0.11
LAKE GENEVA WASTEW	21130	222	860130	5.25	0.17	76.5	542.5	45.6	0.28
LAKE GENEVA WASTEW	21130	222	870319	4.97	0.01	87.3	612	38.3	0.1
LAKE GENEVA WASTEW	21130	222	860611	2.71	0.11	72	356.9	32.7	0.61
LAKE GENEVA WASTEW	21130	222	860331	3.29	1.2	71.8	526	23.9	0.38
LAKE GENEVA WASTEW	21130	222	860116	4.8	0.03	79.3	600.8	37.9	0.28
LAKE GENEVA WASTEW	21130	222	870605	2.41	0.089	128	580	46.5	0.1
LAKE GENEVA WASTEW	21130	223	860919	4.09	0.46	71.79	868	33.44	0.11
LAKE GENEVA WASTEW	21130	223	861125	1.75	2.78	526	636	94.4	0.11
LAKE GENEVA WASTEW	21130	223	860108	2.58	1.46	24.2	357.3	21.6	0.28
LAKE GENEVA WASTEW	21130	223	870319	4.53	0.1	40.2	598	40.5	0.1
LAKE GENEVA WASTEW	21130	223	860130	2.2	0.43	5.9	455.4	20.7	0.28
LAKE GENEVA WASTEW	21130	223	870605	2.36	0.22	140	696	28.9	0.56
LAKE GENEVA WASTEW	21130	223	860611	2.43	0.11	38.5	436.3	24.2	0.11
LAKE GENEVA WASTEW	21130	223	860331	1.57	1.01	15.8	425	15.4	1.32
LAKE GENEVA WASTEW	21130	223	860116	4.89	0.1	123	478.6	38.9	0.28
LAKE GENEVA WASTEW	21130	223	860102	15.4	1.01	21	411	15.8	0.28
LAKE WAPOGASSET-BE	60313	801	811118	0.2	0.5	5	12.6	5	0.5
LAKE WAPOGASSET-BE	60313	801	831101	1.97	0.5	9	159	20	0.5
LAKE WAPOGASSET-BE	60313	801	790601	6.28	0.65	42	252	7.4	0.5

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LAKE WAPOGASSET-BE	60313	801	840522	1.76	0.5	10	142	18	0.5
LAKE WAPOGASSET-BE	60313	801	810603	1.92	0.5	11	151	17	0.5
LAKE WAPOGASSET-BE	60313	801	841113	5.47	1.2	11	161	13	0.5
LAKE WAPOGASSET-BE	60313	801	790629	0.47	0.8	19	181	10	0.3
LAKE WAPOGASSET-BE	60313	801	850507	3.2	0.88	14	155	10	0.5
LAKE WAPOGASSET-BE	60313	801	820526	3.62	0.98	7	204	19	0.5
LAKE WAPOGASSET-BE	60313	801	851112	3.2	0.5	15	157	13	0.5
LAKE WAPOGASSET-BE	60313	801	830517	1.57	0.5	7	157	19	0.5
LAKE WAPOGASSET-BE	60313	801	860514	0.8	1	10	114	18	0.5
LAKE WAPOGASSET-BE	60313	801	800604	1.25	0.18	12	158	7	0.19
LAKE WAPOGASSET-BE	60313	801	861125	0.7	1.6	6	117	13	0.5
LAKE WAPOGASSET-BE	60313	801	821103	1.35	0.5	7	161	26	0.5
LAKE WAPOGASSET-BE	60313	801	790727	1	0.91	10	123	10	0.5
LAKE WAPOGASSET-BE	60313	801	801022	0.48	0.54	6	164	14	0.1
LAKE WAPOGASSET-BE	60313	801	870519	1.1	0.6	9	150	26	0.5
LAKE WAPOGASSET-BE	60313	802	801022	3.17	1.4	10	106	1	0.37
LAKE WAPOGASSET-BE	60313	802	830517	2.04	2.4	4	66	7	0.5
LAKE WAPOGASSET-BE	60313	802	870519	1	0.5	21	83	6	0.5
LAKE WAPOGASSET-BE	60313	802	831101	4.86	0.5	6	77	6	0.5
LAKE WAPOGASSET-BE	60313	802	790629	0.06	0.8	30	160	1	0.1
LAKE WAPOGASSET-BE	60313	802	840522	2.82	0.5	3	51	7	0.5
LAKE WAPOGASSET-BE	60313	802	800604	1.63	0.45	15	79	5	1.1
LAKE WAPOGASSET-BE	60313	802	841113	4	1.3	2	60	6	0.5
LAKE WAPOGASSET-BE	60313	802	811118	0.01	0.5	21	49	10	0.5
LAKE WAPOGASSET-BE	60313	802	850507	2.8	0.5	1	51	4	0.5
LAKE WAPOGASSET-BE	60313	802	821103	2.99	0.5	4	70	10	0.5
LAKE WAPOGASSET-BE	60313	802	851112	2.4	0.5	3	65	9	0.5
LAKE WAPOGASSET-BE	60313	802	790727	1.3	2.4	24	102	1	1.8
LAKE WAPOGASSET-BE	60313	802	860514	1.5	0.5	17	80	19	0.5
LAKE WAPOGASSET-BE	60313	802	820526	2.61	0.94	6	132	4	0.5
LAKE WAPOGASSET-BE	60313	802	810603	1.95	0.5	5	56	8	0.5
LAKE WAPOGASSET-BE	60313	802	790601	3.9	0.5	26	110	1.6	0.5
LAKE WAPOGASSET-BE	60313	802	861125	2.9	0.7	23	89	6	0.5
LAKE WAPOGASSET-BE	60313	803	790601	2.16	0.5	15	122	5	2.2
LAKE WAPOGASSET-BE	60313	803	800604	2.15	0.59	19	119	5	0.16
LAKE WAPOGASSET-BE	60313	803	801022	0.73	0.61	13	97	1	2.1
LAKE WAPOGASSET-BE	60313	803	790629	2.6	4.1	16	114	4	4.4
LAKE WAPOGASSET-BE	60313	803	810603	3.12	0.5	12	115	9	0.51
LAKE WAPOGASSET-BE	60313	803	870519	6.1	0.5	12	142	6	0.5
LAKE WAPOGASSET-BE	60313	803	811118	0.39	0.5	6	93	10	1.4
LAKE WAPOGASSET-BE	60313	803	860514	8.6	0.5	12	495	12	0.5
LAKE WAPOGASSET-BE	60313	803	820526	2.62	0.83	4	67	4	3.7
LAKE WAPOGASSET-BE	60313	803	850507	7.6	0.5	12	154	6	0.5
LAKE WAPOGASSET-BE	60313	803	821102	8.3		15	148	4	0.16
LAKE WAPOGASSET-BE	60313	803	840522	8.59	0.5	13	192	3	0.5
LAKE WAPOGASSET-BE	60313	803	821103	7.75	0.65	15	176	10	0.5
LAKE WAPOGASSET-BE	60313	803	861125	7.4	0.6	10	124	6	0.5
LAKE WAPOGASSET-BE	60313	803	830517	4.31	0.84	15	121	7	1.4
LAKE WAPOGASSET-BE	60313	803	841113	9.06	1.4	13	155	5	0.62
LAKE WAPOGASSET-BE	60313	803	851112	6.9	0.5	13	140	8	0.5
LAKE WAPOGASSET-BE	60313	803	790727	3.53	1.7	17	117	6	1.3
LAKE WAPOGASSET-BE	60313	803	831101	8.26	0.5	12	166	4	0.5
LAKE WAPOGASSET-BE	60313	804	860514	2.4	2.2	20	161	5	0.5
LAKE WAPOGASSET-BE	60313	804	821102	3		14	166	6.7	0.02
LAKE WAPOGASSET-BE	60313	804	821103	3.23	0.5	15	186	17	0.5
LAKE WAPOGASSET-BE	60313	804	790601	1.51	0.68	18	191	6.4	0.5
LAKE WAPOGASSET-BE	60313	804	830517	1.4	0.58	19	156	8	0.5
LAKE WAPOGASSET-BE	60313	804	790727	0.99	2.5	13	115	5	2
LAKE WAPOGASSET-BE	60313	804	831101	3.02	0.5	17	195	7	0.5
LAKE WAPOGASSET-BE	60313	804	801022	0.69	0.4	13	161	9	0.54
LAKE WAPOGASSET-BE	60313	804	840522	4.34	0.5	26	143	8	0.5
LAKE WAPOGASSET-BE	60313	804	811118	0.06	0.5	15	134	7	0.6
LAKE WAPOGASSET-BE	60313	804	841113	5.23	1.2	27	218		0.5
LAKE WAPOGASSET-BE	60313	804	870519	1.5	0.5	30	223	6	0.5

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LAKE WAPOGASSET-BE	60313	804	850507	1.1	0.5	20	191	4	0.5
LAKE WAPOGASSET-BE	60313	804	800604	3.31	0.4	9	172	12	1.7
LAKE WAPOGASSET-BE	60313	804	851112	2.7	0.5	25	197	7	0.5
LAKE WAPOGASSET-BE	60313	804	820526	3.63	1.2	21	220	11	0.5
LAKE WAPOGASSET-BE	60313	804	810603	0.55	0.5	17	141	11	0.5
LAKE WAPOGASSET-BE	60313	804	790629	2.09	1.6	11	170	4	1.2
LAKE WAPOGASSET-BE	60313	804	861125	3	0.5	23	189	4	0.5
LONE ROCK, VILLAGE	60763	101	850522	4.78	0.4	4	143	18.2	0.11
LONE ROCK, VILLAGE	60763	101	861022	1.72	0.43	4	106	13.6	0.22
LONE ROCK, VILLAGE	60763	101	841119	4.29	0.48	6	131	15.8	0.17
LONE ROCK, VILLAGE	60763	101	851016	0.12	0.1	2	63	15.7	0.08
LONE ROCK, VILLAGE	60763	101	860514	1.78	7.58	2	66	11.6	0.45
LONE ROCK, VILLAGE	60763	101	870513	2.02	0.23	3.9	118	12	0.14
LONE ROCK, VILLAGE	60763	101	840612	4.5	0.1	5	137	13	0.06
LONE ROCK, VILLAGE	60763	102	841119	3.99	0.5	79	290	17.8	0.06
LONE ROCK, VILLAGE	60763	102	860514	3.7	0.22	2.7	102	12.7	0.06
LONE ROCK, VILLAGE	60763	102	861022	5.45	0.3	5.7	80	15.6	0.17
LONE ROCK, VILLAGE	60763	102	850522	1.61	0.31	3	164	20.2	0.06
LONE ROCK, VILLAGE	60763	102	840612	2.68	0.28	3.5	98	13	0.06
LONE ROCK, VILLAGE	60763	102	851016	4.4	0.06	8	55	17.8	0.42
LONE ROCK, VILLAGE	60763	102	870513	1.88	0.38	6.3	87	15.6	0.18
LUCK SEWAGE TREATM	21482	801	841113	5.31	1.1	2	150	9	0.5
LUCK SEWAGE TREATM	21482	801	851120	1.6	0.62	2	146	17	0.5
LUCK SEWAGE TREATM	21482	801	830722	0.7	0.2	1.7	220	8.9	0.2
LUCK SEWAGE TREATM	21482	801	860512	0.96	0.5	1	140	11	0.1
LUCK SEWAGE TREATM	21482	801	831123	1.13	0.5	2	114	9	0.5
LUCK SEWAGE TREATM	21482	801	861117	1.1	1.7	1	140	10	0.1
LUCK SEWAGE TREATM	21482	801	850530	1.4	0.5	2	116	7	0.5
LUCK SEWAGE TREATM	21482	801	840529	1.53	0.5	3	163	8	0.5
LUCK SEWAGE TREATM	21482	801	831018	0.43	0.5	1	114	10	0.5
LUCK SEWAGE TREATM	21482	801	870527	4.7	0.3	3	210	9	0.1
LUCK SEWAGE TREATM	21482	802	830722	0.5	0.3	2.5	270	7.9	0.2
LUCK SEWAGE TREATM	21482	802	850530	0.18	0.5	36	267	4	0.5
LUCK SEWAGE TREATM	21482	802	831018	0.4	0.52	1	108	7	0.52
LUCK SEWAGE TREATM	21482	802	851120	0.1	0.5	41	291	12	0.5
LUCK SEWAGE TREATM	21482	802	840529	0.36	0.5	8	123	5	0.5
LUCK SEWAGE TREATM	21482	802	860512	0.05	0.7	44	340	18	0.1
LUCK SEWAGE TREATM	21482	802	841113	6.7	1.6	13	162	5	0.5
LUCK SEWAGE TREATM	21482	802	870527	4	0.35	46	350	12	0.2
LUCK SEWAGE TREATM	21482	802	831123	1.57	0.5	1	103	7	0.53
LUCK SEWAGE TREATM	21482	802	861117	0.2	0.5	50	330	12	0.1
MELLEN SEWAGE TREA	20311	801	840113			8.5	154	14	0.03
MELLEN SEWAGE TREA	20311	801	840605	0.28	0.24	17	100	13	1.65
MELLEN SEWAGE TREA	20311	801	791019	0.61	1.7	13	118	6	0.3
MELLEN SEWAGE TREA	20311	801	841127	0.1	2.8	21	230	2	0.1
MELLEN SEWAGE TREA	20311	801	801117	1.46	0	14.5	168	6	0.08
MELLEN SEWAGE TREA	20311	801	850617	0.53	1.23	45	490	6	1.74
MELLEN SEWAGE TREA	20311	801	811116	1.93	0.11	33	226	9	0
MELLEN SEWAGE TREA	20311	801	851219	0.1	0.69	41	510	6	3.35
MELLEN SEWAGE TREA	20311	801	821117	2.16	0.59	32	350	13	0.03
MELLEN SEWAGE TREA	20311	801	860708	0.06	0.49	72	530	3	0.06
MELLEN SEWAGE TREA	20311	801	790501	0.28	3.8	13	215	16	0.5
MELLEN SEWAGE TREA	20311	801	861114	0.15	1.97	24	320	8	1.67
MELLEN SEWAGE TREA	20311	801	810505	2.24	0.19	15	246	10	0.06
MELLEN SEWAGE TREA	20311	801	870513	0.6	0.76	72	310	6	0.05
MELLEN SEWAGE TREA	20311	801	830519			130	620	19	0.03
MELLEN SEWAGE TREA	20311	801	820517	2.16	2.86	34	420	16	0.17
MELLEN SEWAGE TREA	20311	801	800414	0.28	0.94	18	185	9	0.15
MELLEN SEWAGE TREA	20311	801	790628	0.5	1	15	171	8	0.52
MELLEN SEWAGE TREA	20311	802	791019	0.06	3.1	9	188	5	0.45
MELLEN SEWAGE TREA	20311	802	840605	0.1	0.62	67	470	16	0.1
MELLEN SEWAGE TREA	20311	802	790628	0.06	5.3	8	252	14	0.28
MELLEN SEWAGE TREA	20311	802	840113	0.03	0.78	73	360	16	0.03
MELLEN SEWAGE TREA	20311	802	800414	0.15	0.74	12	255	17	0.65

FACILITY NAME	PERMIT NO.	WELL	DATE	NOX	ORG	CL	TDS	SO4	NH3
MELLEN SEWAGE TREA	20311	802	830519			68	530	22	0.03
MELLEN SEWAGE TREA	20311	802	861114	0.05	0.96	73	496	7	0.22
MELLEN SEWAGE TREA	20311	802	821117	0.03	0.36	60	456	15	0.03
MELLEN SEWAGE TREA	20311	802	851219	0.1	0.84	75	445	4	0.05
MELLEN SEWAGE TREA	20311	802	820517	0.06	0.42	43.5	418	34	0.08
MELLEN SEWAGE TREA	20311	802	841127	0.1	1.32	71	510	8	0.1
MELLEN SEWAGE TREA	20311	802	811116	0	0.23	38.5	400	28	0.08
MELLEN SEWAGE TREA	20311	802	870513	0.05	0.97	82	516	7	0.14
MELLEN SEWAGE TREA	20311	802	810505	0.22	0.16	24.5	370	32	0.18
MELLEN SEWAGE TREA	20311	802	850617	0.1	0.64	70	485	7	0.1
MELLEN SEWAGE TREA	20311	802	860708	0.24	0.54	30	435	3	1.13
MELLEN SEWAGE TREA	20311	802	790501	0.28	8.5	9	277	20	0.5
MELLEN SEWAGE TREA	20311	802	801117	0.56	0.39	6.5	274	17	0
MERRIMAC, VILLAGE	61042	101		1.84	1.17		3390	760	0.5
MERRIMAC, VILLAGE	61042	101	800604	0.88	0.28	4	483	10	0.5
MERRIMAC, VILLAGE	61042	101	791204	0.55	0.47	3	401	12	0.5
MERRIMAC, VILLAGE	61042	101	831209	1.1	1.3	6.8	306	22.4	0.5
MERRIMAC, VILLAGE	61042	101	870511	2.37	7.36	104	446	24	0.5
MERRIMAC, VILLAGE	61042	101	821103	5.62	1.12	10.8	380	14	0.5
MERRIMAC, VILLAGE	61042	101	861110	6	0.04	83.1	665	18	0.5
MERRIMAC, VILLAGE	61042	101	811104	1.04	1.77	12.8	502	15.5	0.5
MERRIMAC, VILLAGE	61042	101	860528	1.33	1.9	45.3	418	13	0.5
MERRIMAC, VILLAGE	61042	101	801210	3.2	0.45	15.2	408	9.8	0.5
MERRIMAC, VILLAGE	61042	101	851009	2.5	0.87	80	485	32	0.5
MERRIMAC, VILLAGE	61042	101	831020	4.16	1.73	22.4	3852	13	0.5
MERRIMAC, VILLAGE	61042	101	850611	1.87	0.59	57.5	439	12.4	0.5
MERRIMAC, VILLAGE	61042	101	810512	2.72	3.4	22.6	600	16	0.5
MERRIMAC, VILLAGE	61042	101	820511	5.2	1.68	14	512	20	0.5
MERRIMAC, VILLAGE	61042	101	840626	2.82	0.1	5	476	36	0.5
MERRIMAC, VILLAGE	61042	101	841010	8.12	0.313	46.2	436	31.2	0.5
MERRIMAC, VILLAGE	61042	102	831208	2.78	0.5	46	419	16.1	0.5
MERRIMAC, VILLAGE	61042	102	861110	2.37	0.14	58.7	533	4	0.5
MERRIMAC, VILLAGE	61042	102	860528	5.7	2.14	64.4	554	11	0.5
MERRIMAC, VILLAGE	61042	102	831209	2.2	0.3	40	380	33.1	0.5
MERRIMAC, VILLAGE	61042	102	840626	7.28	0.84	50	553	33.7	0.5
MERRIMAC, VILLAGE	61042	102	850611	6.43	0.59	63	603	25	0.5
MERRIMAC, VILLAGE	61042	102	841010	1.31	0.593	45	353	20.2	0.5
MERRIMAC, VILLAGE	61042	102	851009	6.2	0.69	57	584	14	0.5
MERRIMAC, VILLAGE	61042	102	870511	5.91	1.62	73	486	8	0.5
MILLTOWN SEWAGE TR	24741	801	861121	10.85	0.63	13.1	214	13.2	0.15
MILLTOWN SEWAGE TR	24741	801	820902	0.01	0.1	14.7	386.8	15.3	0.1
MILLTOWN SEWAGE TR	24741	801	820707	0.1	0.46	17.6	214.9	15	0.1
MILLTOWN SEWAGE TR	24741	801	820824	0.01	0.46	17.6	214.9	15	0.01
MILLTOWN SEWAGE TR	24741	801	850522	4.37	0.53	29.3	315	12.1	0.1
MILLTOWN SEWAGE TR	24741	801	831115	6.14	0.15	26.3	200	12.6	0.12
MILLTOWN SEWAGE TR	24741	801	851106	7.09	0.58	13.4	238	12.9	0.1
MILLTOWN SEWAGE TR	24741	801	841106	9.1	3.22	320	877	9.7	2.44
MILLTOWN SEWAGE TR	24741	801	821117	6.07	0.4	18.4	132.1	22.4	0.2
MILLTOWN SEWAGE TR	24741	801	840529	6.6	0.51	47.4	265	12.8	0.14
MILLTOWN SEWAGE TR	24741	801	860412	9.24	0.57	22.8	482	13.2	0.26
MILLTOWN SEWAGE TR	24741	802	840529	2.6	3.3	348.1	1072	36.5	2.32
MILLTOWN SEWAGE TR	24741	802	831115	0.17	2.39	292.6	850		1.33
MILLTOWN SEWAGE TR	24741	802	850522	2.09	5.5	357	914	38.9	3.9
MILLTOWN SEWAGE TR	24741	802	820824	0.01	1.1	236.6	826.8	31.4	0.38
MILLTOWN SEWAGE TR	24741	802	851106	0.5	3.98	351	794	13.2	3.1
MILLTOWN SEWAGE TR	24741	802	841106	0.5	3.28	320	807	9	2.47
MILLTOWN SEWAGE TR	24741	802	860412	0.86	0.64	351	1105	36.2	3.5
MILLTOWN SEWAGE TR	24741	802	820707	0.01	1.1	236.6	826.8	31.4	0.38
MILLTOWN SEWAGE TR	24741	802	821117	1.08	0.96	273	934	21.2	0.3
MILLTOWN SEWAGE TR	24741	802	820902	0.01	1.31	251	722.5	16.3	0.56
MILLTOWN SEWAGE TR	24741	802	861121	0.05	0.65	333	814	5.6	3.03
MILTON WASTEWATER	60453	104	830914	10.55	0.93	164	735	29	0.76
MILTON WASTEWATER	60453	104	870629	3.07	4.35	218	772	115	9.7
MILTON WASTEWATER	60453	104	830914	15	1.5	180	666	38	0.6

FACILITY NAME	PERMIT NO.	WELL	DATE	NOX	ORG	CL	TDS	SO4	NH3
MILTON WASTEWATER	60453	104	761116	2.2	2.5	56	478	44	4.2
MILTON WASTEWATER	60453	104	841113	12.2	0.99	157	545	58	3.79
MILTON WASTEWATER	60453	104	770620	0.1	6	176	786	52	4.2
MILTON WASTEWATER	60453	104	850306	22	0.51	283	870	54	0.7
MILTON WASTEWATER	60453	104	780630	1.33	4	174	695	21.4	20
MILTON WASTEWATER	60453	104	850821	30.4	0.18	149	712	34	1.15
MILTON WASTEWATER	60453	104	861120	3.84	4.04	215	930	33	8.68
MILTON WASTEWATER	60453	104	811118	7.04	1.98	232	843	73	0.1
MILTON WASTEWATER	60453	104	790619	10.07	6	202	808	56	16
MILTON WASTEWATER	60453	104	800627	4.03	3	206	838	37	25
MILTON WASTEWATER	60453	104	830105	6.34	4.1	229	898	14.1	8.7
MILTON WASTEWATER	60453	104	801219	1.54	5	208	740	36	27
MILTON WASTEWATER	60453	104	771227	0.47	4.3	186	827	33.2	8.8
MILTON WASTEWATER	60453	104	810618	0.77	4.8	181	635	54	23.2
MILTON WASTEWATER	60453	104	781222	1.38	9.2	209	705	44.4	19
MILTON WASTEWATER	60453	104	761006	5.6	11.6	34	418	27	10
MILTON WASTEWATER	60453	104	770409	0.8	0.1	154	721	54	6.9
MILTON WASTEWATER	60453	104	791223	0.435	4	248	790	17.8	32
MILTON WASTEWATER	60453	104	860217	12.8	0.31	215	936	52	0.91
MILTON WASTEWATER	60453	104	820519	2.89	0.5	120	530	17.6	13.9
MILTON WASTEWATER	60453	106	830105	8.33	0.3	22	465	1.5	0.33
MILTON WASTEWATER	60453	106	810618	9.15	0.46	160	403	54	0.42
MILTON WASTEWATER	60453	106	801219	9.28	2.08	22	385	38	0.42
MILTON WASTEWATER	60453	106	830608	9.2	0.02	22	425	34.4	0.31
MILTON WASTEWATER	60453	106	770409	7.7	1	23	381	35	0.2
MILTON WASTEWATER	60453	106	830914	17.2	1.2	24	376	25	0.1
MILTON WASTEWATER	60453	106	770620	8.4	0.1	39	377	48	0.6
MILTON WASTEWATER	60453	106	850306	26	0.4	30	357	31	0.5
MILTON WASTEWATER	60453	106	771227	8.36	0.2	8	445	27.4	0.2
MILTON WASTEWATER	60453	106	860217	13.6	0.35	14	460	21	0.85
MILTON WASTEWATER	60453	106	780630	5.73	0.16	13	387	14	0.45
MILTON WASTEWATER	60453	106	870629	6.37	0.2	6	264	20	0.2
MILTON WASTEWATER	60453	106	781222	9.39	0.94	16	355	29.8	0.23
MILTON WASTEWATER	60453	106	820519	11.3	0.38	18	445	17.6	0.1
MILTON WASTEWATER	60453	106	790619	0.885	0.62	16	350	24	0.2
MILTON WASTEWATER	60453	106	841113	25.2		30	402	21.5	0.69
MILTON WASTEWATER	60453	106	791213	10.73	2.9	25	405	27.4	0.7
MILTON WASTEWATER	60453	106	861120	3.23	0.18	12	408	20	0.2
MILTON WASTEWATER	60453	106	800627	10.2	1.56	22	465	38.8	0.39
MILTON WASTEWATER	60453	106	830914	7.95	0.56	28	428	4	0.19
MILTON WASTEWATER	60453	106	811118	10.75	0.3	14	408	44	0.26
MILTON WASTEWATER	60453	106	850821	0.68	0.11	20	712	19	25.1
MILTON WASTEWATER	60453	106	761116	9.6	0.3	17	359	50	0.1
MINONG, VILLAGE OF	35939	801	861202	4.4	0.9	32	146	19	0.5
MINONG, VILLAGE OF	35939	801	831122	6.85	1	30	196	25	0.53
MINONG, VILLAGE OF	35939	801	870605	11	1.2	16	200	7	0.5
MINONG, VILLAGE OF	35939	801	840607	4.66	0.5	3	234	5	0.5
MINONG, VILLAGE OF	35939	801	820416	0.11	1.2	1	367	11	0.5
MINONG, VILLAGE OF	35939	801	841129	6.61	1.6	31	86	20	0.5
MINONG, VILLAGE OF	35939	801	820721	0.16	0.5	1	71	8	0.5
MINONG, VILLAGE OF	35939	801	850523	3.7	1.6	30	206	21	0.5
MINONG, VILLAGE OF	35939	801	830602	7.59	1.4	2	158	28	0.5
MINONG, VILLAGE OF	35939	801	851210	2.4	0.5	1	193	8	0.5
MINONG, VILLAGE OF	35939	801	820521	0.05	0.5	1	34	10	0.5
MINONG, VILLAGE OF	35939	801	771221	0.02	1.8	77	480	1	15.6
MINONG, VILLAGE OF	35939	801	821203	0.69	0.5	27	44	30	0.5
MINONG, VILLAGE OF	35939	801	860519		0.8	33	107	18	0.5
MINONG, VILLAGE OF	35939	802	831122	2.03	0.5	2	79	5	0.5
MINONG, VILLAGE OF	35939	802	870605	9.2	0.7	19	89	12	0.5
MINONG, VILLAGE OF	35939	802	771221	1.59	0.7	22	163	1	4.7
MINONG, VILLAGE OF	35939	802	830602	2.72	0.5	28	60	7	0.5
MINONG, VILLAGE OF	35939	802	860519		0.5	2	88	9	0.5
MINONG, VILLAGE OF	35939	802	821203	4.07	0.68	2	59	7	0.5
MINONG, VILLAGE OF	35939	802	850523	1.5	0.55	14	84	10	0.5

FACILITY NAME	PERMIT NO.	WELL	DATE	NOX	ORG	CL	TDS	SO4	NH3
MINONG, VILLAGE OF	35939	802	820721	2.66	0.62	1	99	7	0.5
MINONG, VILLAGE OF	35939	802	840607	4.97	0.5	6	59	6	0.5
MINONG, VILLAGE OF	35939	802	820521	1.47	2.1	1	61	10	0.5
MINONG, VILLAGE OF	35939	802	851210	1.7	0.5	2	149	5	0.5
MINONG, VILLAGE OF	35939	802	861202	2	0.5	8	85	3	0.5
MINONG, VILLAGE OF	35939	802	841129	2.58	0.5	6	129	5	0.5
MINONG, VILLAGE OF	35939	802	820416	0.02	1.8	2	140	6	2.8
MINONG, VILLAGE OF	35939	803	771221	0.05	1.9	48	192	1	0.3
MINONG, VILLAGE OF	35939	803	840607	0.29	0.5	2	64	5	0.61
MINONG, VILLAGE OF	35939	803	851210	0.1	0.5	1	79	5	0.5
MINONG, VILLAGE OF	35939	803	841129	0.06	0.5	2	72	4	0.5
MINONG, VILLAGE OF	35939	803	820521	0.05	0.92	2	42	6	2.8
MINONG, VILLAGE OF	35939	803	850523	0.28	0.5	2	74	3	0.5
MINONG, VILLAGE OF	35939	803	821203	0.17	0.5	2	87	5	2.2
MINONG, VILLAGE OF	35939	803	870605	0.1	1	4	69	17	0.5
MINONG, VILLAGE OF	35939	803	831122	0.04	0.5	3	78	3	0.74
MINONG, VILLAGE OF	35939	803	861202	0.1	1.1	3	99	14	0.5
MINONG, VILLAGE OF	35939	803	820721	0.01	0.5	1	128	4	2.5
MINONG, VILLAGE OF	35939	803	820416	0.91	0.5	1	172	10	0.5
MINONG, VILLAGE OF	35939	803	830602	0.02	0.5	3	73	7	1.3
MINONG, VILLAGE OF	35939	803	860519		0.7	4	72	14	0.5
MINONG, VILLAGE OF	35939	804	860519		0.8	57	58	7	0.5
MINONG, VILLAGE OF	35939	804	850523	0.01	0.5	1	43	4	0.5
MINONG, VILLAGE OF	35939	804	831122	0.02	0.5	1	51	4	0.5
MINONG, VILLAGE OF	35939	804	840607	0.08	0.5	1	33	4	0.5
MINONG, VILLAGE OF	35939	804	820416	0.03	50	1	10	3	0.5
MINONG, VILLAGE OF	35939	804	841129	0.04	0.5	1	41	2	0.5
MINONG, VILLAGE OF	35939	804	820721	0.01	0.5	0.1	106	4	0.5
MINONG, VILLAGE OF	35939	804	851210	0.1	0.5	1	35	4	0.5
MINONG, VILLAGE OF	35939	804	830602	0.03	0.5	1	74	7	0.5
MINONG, VILLAGE OF	35939	804	861202	0.1	0.5	1	140	6	0.5
MINONG, VILLAGE OF	35939	804	820521	0.04	0.98	1	42	4	0.5
MINONG, VILLAGE OF	35939	804	771221	0.04	0.6	13	82	1	0.9
MINONG, VILLAGE OF	35939	804	821203	0.1	0.5	1	49	4	0.5
MINONG, VILLAGE OF	35939	804	870605	0.1	0.5	1	42	10	0.5
MOUNT CALVARY	35963	101	791020	0.31	0.7	280	396	129	0.1
MOUNT CALVARY	35963	101	830411	0.38	1	16	456	76	0.1
MOUNT CALVARY	35963	101	831005	0.14	1	16	652	84	0.1
MOUNT CALVARY	35963	101	810421	0.008	1.5	16	440	90	0.1
MOUNT CALVARY	35963	101	840412	0.8	1	25	676	74	0.1
MOUNT CALVARY	35963	101	800422	0.22	1.1	20	464	68.5	0.1
MOUNT CALVARY	35963	101	841016	0.1	2	21	644	74	0.1
MOUNT CALVARY	35963	101	790424	0.4	0.8	18	675	110	0.1
MOUNT CALVARY	35963	101	850416	0.92	3	17	560	104	0.1
MOUNT CALVARY	35963	101	780302	0.1	0.47	11.8	496	70	0.1
MOUNT CALVARY	35963	101	851016	0.77	1	12	528	95	0.1
MOUNT CALVARY	35963	101	821020	0.35	1	16	540	105	1
MOUNT CALVARY	35963	101	860428	0.99	1	10	568	156	0.1
MOUNT CALVARY	35963	101	801023	0.14	0.9	14	412	75	0.1
MOUNT CALVARY	35963	101	860923	2.1	1	13	568	112	0.1
MOUNT CALVARY	35963	101	780328	0.1	0.57	14	440	112	0.1
MOUNT CALVARY	35963	101	870324	0.49	1	10	604	92	1
MOUNT CALVARY	35963	101	811021	0.101	21.6	2	776	49	0.1
MOUNT CALVARY	35963	101	780104	0.08	0.78	14.4	42	84	0.1
MOUNT CALVARY	35963	101	820414	0.01	1	14	568	50	1
MOUNT CALVARY	35963	101	870914	1	2	17	492	93	0.1
MOUNT CALVARY	35963	102	870914	0.09	2	270	780	14	7.1
MOUNT CALVARY	35963	102	791020	1.1	0.8	290	704	28	0.1
MOUNT CALVARY	35963	102	790424	0.11	0.8	132	785	110	0.1
MOUNT CALVARY	35963	102	870324	0.1	3	220	896	9	5.5
MOUNT CALVARY	35963	102	811021	0.335	38.2	260	880	31	10
MOUNT CALVARY	35963	102	840412	1.5	4.9	71	976	78	5.8
MOUNT CALVARY	35963	102	810421	0.045	5.1	260	824	80	0.1
MOUNT CALVARY	35963	102	850416	0.29	5	145	832	38	2.2

FACILITY NAME	PERMIT NO.	WELL	DATE	NOX	ORG	CL	TDS	SO4	NH3
MOUNT CALVARY	35963	102	801023	1.75	3.4	230	956	42	4
MOUNT CALVARY	35963	102	860428	0.06	1	165	970	116	4.3
MOUNT CALVARY	35963	102	800422	0.1	0.8	290	912	40	3.5
MOUNT CALVARY	35963	102	830411	0.07	10.4	220	968	44	5.6
MOUNT CALVARY	35963	102	831005	0.15	8.2	225	872	30	8
MOUNT CALVARY	35963	102	780104	0.004	1.1	226	570	92	8.1
MOUNT CALVARY	35963	102	820414	0.018	16	330	1052	43	6.3
MOUNT CALVARY	35963	102	851016	0.05	1	300	704	25	11.3
MOUNT CALVARY	35963	102	780328	0.2	1.9	249	972	83	9.8
MOUNT CALVARY	35963	102	821020	0.43	1	280	1136	5.5	11.5
MOUNT CALVARY	35963	102	860923	0.15	1	230	756	14	4.1
MOUNT CALVARY	35963	102	841016	0.1	2	284	908	25	12
MOUNT CALVARY	35963	102	780302	0.1	0.93	230.5	1000	72	9.7
MOUNT TELEMARK LOD	60640	801	811124	0.07	0.37	1	145	10	0.5
MOUNT TELEMARK LOD	60640	801	840801	0.37	3.1	1	190	11	0.49
MOUNT TELEMARK LOD	60640	801	830119	0.89	0.5	3	183	9	0.5
MOUNT TELEMARK LOD	60640	801	820308	0.39	0.5	4	162	11	0.5
MOUNT TELEMARK LOD	60640	801	860625	1.2	0.5		160	16	0.1
MOUNT TELEMARK LOD	60640	801	840112	1	0.28	1	250	18	0.01
MOUNT TELEMARK LOD	60640	801	850604	0.34	0.1	1	120	11	0.1
MOUNT TELEMARK LOD	60640	801	830630	1.2	0.11	1	150	8	0.01
MOUNT TELEMARK LOD	60640	801	861110	0.4	0.5	1	150	9	0.1
MOUNT TELEMARK LOD	60640	801	841218	0.5	0.33	1	200	10	0.1
MOUNT TELEMARK LOD	60640	801	851121	0.31	0.1	1	150	9.3	0.1
MOUNT TELEMARK LOD	60640	801	830119	1.11	0.5	2.7	178	6.4	0.1
MOUNT TELEMARK LOD	60640	802	851121	0.27	0.2	1	110	11	0.9
MOUNT TELEMARK LOD	60640	802	830630	0.05	1.3	43	300	13	2.2
MOUNT TELEMARK LOD	60640	802	861110	0.2	0.5	14	200	9	2.1
MOUNT TELEMARK LOD	60640	802	830119	0.5	0.3	36	264	19	5.3
MOUNT TELEMARK LOD	60640	802	850604	0.22	0.7	1	150	17	1.9
MOUNT TELEMARK LOD	60640	802	830119	0.52	0.5	35	270	20	6.3
MOUNT TELEMARK LOD	60640	802	840801	0.05	8.4	29	380	9	9.6
MOUNT TELEMARK LOD	60640	802	820308	0.7	0.9	57	323	23	6
MOUNT TELEMARK LOD	60640	802	860625	0.92	0.5	1	200	6	0.4
MOUNT TELEMARK LOD	60640	802	840112	0.09	3.3	25	150	20	4.4
MOUNT TELEMARK LOD	60640	802	841218	0.06	1.6	1	170	12	4.1
MOUNT TELEMARK LOD	60640	802	811124	0.01	1.2	54	359	25	5.8
MOUNT TELEMARK LOD	60640	803	830119	0.5	0.1	0.5	124	6.5	0.1
MOUNT TELEMARK LOD	60640	803	830630	0.34	0.09	5	150	11	0.02
MOUNT TELEMARK LOD	60640	803	860625	0.29	0.5	1	130	10	0.1
MOUNT TELEMARK LOD	60640	803	830119	0.31	0.5	1	131	7	1.4
MOUNT TELEMARK LOD	60640	803	850604	0.32	0.6	1	110	9.7	0.1
MOUNT TELEMARK LOD	60640	803	820308	0.33	0.5	1	132	12	0.5
MOUNT TELEMARK LOD	60640	803	840801	0.18	1.5	1	22	11	0.09
MOUNT TELEMARK LOD	60640	803	811124	0.2	0.5	1	130	10	0.5
MOUNT TELEMARK LOD	60640	803	851121	0.62	0.2	1	170	9.2	0.1
MOUNT TELEMARK LOD	60640	803	840112	0.26	0.01	1	68	26	0.08
MOUNT TELEMARK LOD	60640	803	841218	0.35	0.33	1	140	9.2	0.1
MOUNT TELEMARK LOD	60640	803	861110	0.3	0.5	1	140	8	0.1
MUSCODA, VILLAGE O	60615	101	860923	0.42	1.31	36.7	181	14	8.12
MUSCODA, VILLAGE O	60615	101	850326	0.07	1.51	80	320	3.4	9.55
MUSCODA, VILLAGE O	60615	101	811027	0.05	0.43	94.8	359	6	25.37
MUSCODA, VILLAGE O	60615	101	820427	0.6	2.2	113.5	386	6	20
MUSCODA, VILLAGE O	60615	101	771115	6.42	0.21	83	300	10	6.79
MUSCODA, VILLAGE O	60615	101	821019	0.06	2.06	50	360	5	16.7
MUSCODA, VILLAGE O	60615	101	780426	0.73	0.95	95	365	9	6.33
MUSCODA, VILLAGE O	60615	101	830412	0.17	2.9	83.8	304	2	13.6
MUSCODA, VILLAGE O	60615	101	790427	1.47	1.6	65	336	12	9.52
MUSCODA, VILLAGE O	60615	101	831101	2.77	2.51	74.4	313	2	8.79
MUSCODA, VILLAGE O	60615	101	800409	0.21	0.05	118	471	7.5	58.2
MUSCODA, VILLAGE O	60615	101	840522	1.68	0.81	66	273	9.6	4.88
MUSCODA, VILLAGE O	60615	101	810421	1.79	1.91	123.5	532	6	27.4
MUSCODA, VILLAGE O	60615	101	841009	1.23	0.31	57.7	212	6.5	4.54
MUSCODA, VILLAGE O	60615	101	771213	2.88	0.53	83	320	8.5	3.5

FACILITY NAME	PERMIT NO.	WELL	DATE	NOX	ORG	CL	TDS	SO4	NH3
MUSCODA, VILLAGE O	60615	101	851008	0.02	1.88	99	354	7.8	15.62
MUSCODA, VILLAGE O	60615	101	791009	1.04	1.12	129	478	5	15.2
MUSCODA, VILLAGE O	60615	101	860318	0.03	1.96	94	408	3.9	13.16
MUSCODA, VILLAGE O	60615	101	771018	7.31	0.29	89	407	10	9.38
MUSCODA, VILLAGE O	60615	101	801009	0.35	3.4	118.5	459	6.5	14.6
MUSCODA, VILLAGE O	60615	101	781010	0.08	7	82	273	7	5.32
MUSCODA, VILLAGE O	60615	101	870311	1.1	0.02	22.6	157	14.1	5.3
MUSCODA, VILLAGE O	60615	102	771018	0.27	0.16	1	132	19	0.28
MUSCODA, VILLAGE O	60615	102	820427	0.38	0.09	2	74	13	0.02
MUSCODA, VILLAGE O	60615	102	771115	0.6	0.05	2	42	16	0.13
MUSCODA, VILLAGE O	60615	102	821019	0.02	0.18	0.5	64	12	0.05
MUSCODA, VILLAGE O	60615	102	780426	0.76	0.2	5	84	13	0.08
MUSCODA, VILLAGE O	60615	102	830412	1.39	0.5	1.5	50	8	0.05
MUSCODA, VILLAGE O	60615	102	870311	0.06	0.09	1.2	65	10.4	0.26
MUSCODA, VILLAGE O	60615	102	831101	0.3	0.7	44	80	5	0.05
MUSCODA, VILLAGE O	60615	102	791009	0.83	0.03	2.2	75	12	0.16
MUSCODA, VILLAGE O	60615	102	840522	21.6	0.05	1	86	10	0.17
MUSCODA, VILLAGE O	60615	102	801009	0.62	0.37	0.7	79	11.5	0.05
MUSCODA, VILLAGE O	60615	102	841009	0.24	0.2	1	20	9.1	0.05
MUSCODA, VILLAGE O	60615	102	811027	0.14	0.05	1	60	13	1
MUSCODA, VILLAGE O	60615	102	850326	0.36	0.13	0.5	104	10.1	0.05
MUSCODA, VILLAGE O	60615	102	781010	0.18	0.11	2	101	28	0.34
MUSCODA, VILLAGE O	60615	102	851008	0.2	0.03	1	96	11.4	0.06
MUSCODA, VILLAGE O	60615	102	800409	1.33	0.07	6	133	18.8	0.1
MUSCODA, VILLAGE O	60615	102	860318	0.06	0.41	1	89	14.9	0.06
MUSCODA, VILLAGE O	60615	102	771213			2	75	15.5	0.98
MUSCODA, VILLAGE O	60615	102	810421	0.29	0.09	1	92	11	1.65
MUSCODA, VILLAGE O	60615	102	790427	0.48	1	2	118	14	0.25
MUSCODA, VILLAGE O	60615	102	860923	0.04	0.22	1.5	63	12	0.28
NEW AUBURN VILLAGE	30635	601	871013	0.8	0.5	40	161	20	0.5
NEW AUBURN VILLAGE	30635	601	860409	2	0.5	41	116	98	0.5
NEW AUBURN VILLAGE	30635	601	850107	0.01	1.4	3	365	6	0.5
NEW AUBURN VILLAGE	30635	601	861014	0.1	0.5	1	291	7	0.5
NEW AUBURN VILLAGE	30635	601	850319	0.01	0.51	1	119	1	0.5
NEW AUBURN VILLAGE	30635	601	850205	0.11		1	66	4	0.5
NEW AUBURN VILLAGE	30635	601	851002	0.47	0.69	41	60	2	0.24
NEW AUBURN VILLAGE	30635	601	870413	0.4	1.1	25	68	22	0.5
NEW AUBURN VILLAGE	30635	602	850319	0.01	0.5	1	117	3	0.5
NEW AUBURN VILLAGE	30635	602	860409	0.3	0.5	1	72	12	0.5
NEW AUBURN VILLAGE	30635	602	871013	0.1	0.5	2	61	6	0.5
NEW AUBURN VILLAGE	30635	602	861014	0.9	0.5	40	88	26	0.5
NEW AUBURN VILLAGE	30635	602	850205	0.27		1	70	4	0.5
NEW AUBURN VILLAGE	30635	602	850107	0.26	1.4	3	210	4	0.5
NEW AUBURN VILLAGE	30635	602	851002	0.14	0.27	17	68	1	0.13
NEW AUBURN VILLAGE	30635	602	870413	0.1	0.7	3	260	7	0.5
NORTHERN MORAINE U	60879	203	770325	4.6	0.17	206	660	43	0.1
NORTHERN MORAINE U	60879	203	841016	2	1.2	195	756	18	0.1
NORTHERN MORAINE U	60879	203	840507	6.3	4	192	712	31	2
NORTHERN MORAINE U	60879	203	780525	3.6	0.56	149	680	39	0.1
NORTHERN MORAINE U	6·879	203	830425	1.1	1	170	644	27	0.2
NORTHERN MORAINE U	60879	203	790611	1.2	2.5	120	1212	41	0.01
NORTHERN MORAINE U	60879	203	801029	0.4	0.78	200	672	34	0.1
NORTHERN MORAINE U	60879	203	861007	7.5	1	190	696	33	0.2
NORTHERN MORAINE U	60879	203	810528	1.25	0.79	190	796	34	0.1
NORTHERN MORAINE U	60879	203	851106	2.57	2	185	700	29	0.1
NORTHERN MORAINE U	60879	203	770117	0.3	0.11	63.9	500	48	0.1
NORTHERN MORAINE U	60879	203	811119	45	1.1	180	676	28	0.1
NORTHERN MORAINE U	60879	203	821005	6	1	260	684	37	1
NORTHERN MORAINE U	60879	203	820525	3.9	3.5	220	900	30	1
NORTHERN MORAINE U	60879	203	791024	1.6	1.4	176	696	36.5	0.1
NORTHERN MORAINE U	60879	203	771006	2.2	1.5	142	590	44	0.1
NORTHERN MORAINE U	60879	203	850507	4.1	3.7	164	672	33	0.3
NORTHERN MORAINE U	60879	203	860512	8.9	1	192	782	32	0.3
NORTHERN MORAINE U	60879	203	781025	5.3	88	499	628	42	0.1

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NORTHERN MORAINE U	60879	203	770222	4.62	0.39	263	892	50	0.1
NORTHERN MORAINE U	60885	204	800532	43.17	3.8	334	804	38.5	0.1
NORTHERN MORAINE U	60879	205	810528	1.1	0.56	172	768	32	0.1
NORTHERN MORAINE U	60879	205	861007	8.3	1	180	736	32	0.1
NORTHERN MORAINE U	60879	205	850507	3.2	3.6	154	652	27	0.4
NORTHERN MORAINE U	60879	205	821005	9.9	1.2	200	764	38	1
NORTHERN MORAINE U	60879	205	830425	0.76	1.9	180	648	24	0.1
NORTHERN MORAINE U	60879	205	781025	2.4	0.9	156	696	40	0.1
NORTHERN MORAINE U	60879	205	840507	5.8	1.6	149	628	26	0.4
NORTHERN MORAINE U	60879	205	791024	13.2	1.4	200	808	41.5	0.1
NORTHERN MORAINE U	60879	205	841016	0.4	2.4	181	716	24	0.1
NORTHERN MORAINE U	60879	205	801029	1.1	1.4	200	660	35	0.1
NORTHERN MORAINE U	60879	205	780525	2.2	1	170	632	35	0.1
NORTHERN MORAINE U	60879	205	811119	3.3	7.7	190	688	28	0.1
NORTHERN MORAINE U	60879	205	851106		3	168	626	27	0.4
NORTHERN MORAINE U	60879	205	770222	1.41	1.12	305	800	48	0.1
NORTHERN MORAINE U	60879	205	860512	7.4	2	156	676	31	0.3
NORTHERN MORAINE U	60879	205	800528	0.36	0.8	260	892	37.5	0.1
NORTHERN MORAINE U	60879	205	770325	3.5	0.17	199	730	26	0.1
NORTHERN MORAINE U	60879	205	820525	5	1.3	180	852	24	1
NORTHERN MORAINE U	60879	205	770117	1.82	0.26	280.5	980	50	0.1
NORTHERN MORAINE U	60879	205	790611	0.1	2.8	160	964	20	0.01
NORTHERN MORAINE U	60879	205	771006	1.5	1.5	114	540	26	0.1
OSSEO CITY	25046	601	860914	0.64	0.19	1.5	42	10.2	0.06
OSSEO CITY	25046	601	851016	0.71	0.85	1	43	13.6	0.36
OSSEO CITY	25046	601	841128	1.15	0.03	1.2	67	9.6	0.06
OSSEO CITY	25046	601	860515	0.42	0.07	1.5	53	11.4	0.39
OSSEO CITY	25046	601	840920	0.8	0.26	1	74	11.69	0.11
OSSEO CITY	25046	601	850523	0.3	0.54	1	73	16.8	0.11
OSSEO CITY	25046	601	841029	1.61	0.03	1	54	14.1	0.06
OSSEO CITY	25046	601	870513	0.36	0.65	8.9	5.1	11.7	0.1
OSSEO CITY	25046	602	851016	3.5	0.7	20	125	11.2	0.14
OSSEO CITY	25046	602	841128	0.22	0.03	1.2	69	13.9	0.06
OSSEO CITY	25046	602	860914	11.5	0.36	29.9	179	25.5	0.39
OSSEO CITY	25046	602	850523	1.12	31	1	76	14.5	0.06
OSSEO CITY	25046	602	840920	0.18	0.11	1	76	15.3	0.17
OSSEO CITY	25046	602	860515	0.14	0.15	45.3	16	26.6	0.22
OSSEO CITY	25046	602	841029	0.32	0.22	1	70	13.4	0.06
OSSEO CITY	25046	602	870513	7.47	0.09	1.8	139	18.8	10.4
PARDEEVILLE WATER	21644	101	861110	3.9	1.24	103	547	22	0.26
PARDEEVILLE WATER	21644	101	860530	5	0.21	70.5	450	12.8	0.014
PARDEEVILLE WATER	21644	101	870508	4.47	0.86	20	343	7	0.04
PARDEEVILLE WATER	21644	101	851010	4.2	0.75	38	180	14	0.07
PARDEEVILLE WATER	21644	102	860530	0.518	2.8	133.9	558	17.3	0.34
PARDEEVILLE WATER	21644	102	851010	0.53	0.21	120	240	10	0.23
PARDEEVILLE WATER	21644	102	861110	0.37	0.21	176	658	35	4.89
PARDEEVILLE WATER	21644	102	870508	0.98	1.96	63	448	19	0.44
PITTSVILLE WATER A	20494	701	861023	0.2	0.4	24	310	9.5	0.6
PITTSVILLE WATER A	20494	701	840627	0.33	0.3	24.5	134	10	0.131
PITTSVILLE WATER A	20494	701	840501	0.372	2.8	11.5	202	6	0.06
PITTSVILLE WATER A	20494	701	851211	5.1	0.4	30	300	15	0.11
PITTSVILLE WATER A	20494	701	831128	12.3	0.233	85	326	15	0.643
PITTSVILLE WATER A	20494	701	841210	0.05	2.8	10	130	7.1	2.8
PITTSVILLE WATER A	20494	701	850806	0.11	0.31	20	170	12	0.01
PITTSVILLE WATER A	20494	701	860611	5.8	0.5	33	140	14	0.9
PITTSVILLE WATER A	20494	701	870602	5.79	21.9	40	203	15	0.52
PITTSVILLE WATER A	20494	702	840501	0.108	1.6	28	612	10	0.156
PITTSVILLE WATER A	20494	702	861023	5.4	0.5	110	330	13	0.1
PITTSVILLE WATER A	20494	702	860611	3.3	0.5	14	84	18	0.1
PITTSVILLE WATER A	20494	702	831128	0.21	0.015	36	230	8	0.455
PITTSVILLE WATER A	20494	702	851211	3.9	0.43	18	140	15	0.067
PITTSVILLE WATER A	20494	702	870602	2.22	25.1	82	234	14	0.06
PITTSVILLE WATER A	20494	702	840627	12.01	0.6	35.5	352	5	0.054
PITTSVILLE WATER A	20494	702	841210	5.3	0.69	0.2	160	13	0.1

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PITTSVILLE WATER A	20494	702	850806	18	0.51	25	180	15	0.28
PITTSVILLE WATER A	20494	703	840627	11.23	0.68	3	524	12	0.102
PITTSVILLE WATER A	20494	703	851211	12	0.44	22	150	14	0.056
PITTSVILLE WATER A	20494	703	860611	8.3	0.6	17	150	18	0.1
PITTSVILLE WATER A	20494	703	841210	8.6	0.1	17	200	9.8	0.1
PITTSVILLE WATER A	20494	703	861023	6.3	0.5	22	120	18	0.7
PITTSVILLE WATER A	20494	703	870602	3.91	19.9	12	112	15	0.05
PITTSVILLE WATER A	20494	703	850806	7.6	0.87	19	220	12	0.13
PITTSVILLE WATER A	20494	703	840501	5.346	0.48	38	238	22	0.096
PITTSVILLE WATER A	20494	703	831128	12.3	0.015	21	4968	9	1.915
PLAINFIELD, VILLAG	60062	401	841105	0.48	4.95	1.5	262	3	0.09
PLAINFIELD, VILLAG	60062	401	830914	0.966	0.424	2.5	246	10	0.252
PLAINFIELD, VILLAG	60062	401	860512	5.9	0.84	12	436	14	0.25
PLAINFIELD, VILLAG	60062	401	851210	4	4	8	305	380	0.25
PLAINFIELD, VILLAG	60062	401	870429	6.3	0.17	2	422	13.86	0.02
PLAINFIELD, VILLAG	60062	401	850523	0.401	0.35	4	458	9	0.12
PLAINFIELD, VILLAG	60062	401	820601	4.15	1.46	17	456	3.4	2
PLAINFIELD, VILLAG	60062	401	820701	1.52	1.46	14	272	3.8	2.34
PLAINFIELD, VILLAG	60062	401	830614	0.118	0.352	1.5	11.5	9	0.384
PLAINFIELD, VILLAG	60062	401	820524	4.5	5.9	36	444	7.8	0.18
PLAINFIELD, VILLAG	60062	401	861027	11.71	0.11	1	286	0.19	0.19
PLAINFIELD, VILLAG	60062	401	821101	2.218	0.128	19.9	224	12	0.612
PLAINFIELD, VILLAG	60062	402	820601	1.49	0.94	11	246	1.9	0.18
PLAINFIELD, VILLAG	60062	402	860512	16	1.67	14	122	13.5	0.69
PLAINFIELD, VILLAG	60062	402	870429	0.51	0.16	0.51	110	7.72	0.02
PLAINFIELD, VILLAG	60062	402	861027	0.596	0.07	3	294	75	0.22
PLAINFIELD, VILLAG	60062	402	841105	0.294	0.585	1.5	186	8	0.03
PLAINFIELD, VILLAG	60062	402	820524	1.73	2	10	344	2.2	0.57
PLAINFIELD, VILLAG	60062	402	830614	0.156	0.432	3.5	370	5	0.108
PLAINFIELD, VILLAG	60062	402	821101	2.217	0.128	17.9	142	5	0.072
PLAINFIELD, VILLAG	60062	402	830914	1.449	0.544	5.5	218	6.5	0.024
PLAINFIELD, VILLAG	60062	402	851210	4.6	4.2	9	154	43	0.25
PLAINFIELD, VILLAG	60062	402	850523	0.202	0.15	2	578	5	0.12
PLAINFIELD, VILLAG	60062	402	820701	0.455	1.08	7	158	1	0.88
SAUK-PRAIRIE SEWER	60534	101	840406	21.9	0.33	9.6	402	43.4	0.1
SAUK-PRAIRIE SEWER	60534	101	820729	13.9	1.08	23.8	416	35.3	0.18
SAUK-PRAIRIE SEWER	60534	101	820630	15.9	1.6	28.8	416	37	0.14
SAUK-PRAIRIE SEWER	60534	101	830928	14.8	2.79	11.7	416	58.7	0.15
SAUK-PRAIRIE SEWER	60534	101	860425	32.2	0.05	18.6	459	58.8	0.11
SAUK-PRAIRIE SEWER	60534	101	830520	15.3	1.3	21.3	528	57.7	11
SAUK-PRAIRIE SEWER	60534	101	850509	22	1.1	15.9	464	38.2	0.1
SAUK-PRAIRIE SEWER	60534	101	870428	25.2	1	12.6	460	52.6	0.03
SAUK-PRAIRIE SEWER	60534	101	861006	23.2	0.05	16	452	39.8	0.05
SAUK-PRAIRIE SEWER	60534	101	840919	36.6	0.2	17.4	464	35	0.17
SAUK-PRAIRIE SEWER	60534	101	851007	2.2	0.25	14.4	422	45.4	0.09
SAUK-PRAIRIE SEWER	60534	101	820827	12.4	1.2	24	414	39.9	0.1
SAUK-PRAIRIE SEWER	60534	102	820827	0.7	0.5	177	748	1	18.4
SAUK-PRAIRIE SEWER	60534	102	820630	0.15	9.3	168	700	1	17.4
SAUK-PRAIRIE SEWER	60534	102	851007	0.2	1.4	357	447	32.8	35.5
SAUK-PRAIRIE SEWER	60534	102	840406	0.2	3.7	189	922	57.8	41
SAUK-PRAIRIE SEWER	60534	102	870428	0.05	0.4	184	715	27.8	7.3
SAUK-PRAIRIE SEWER	60534	102	840919	0.37	2.7	176	640	19.1	31.3
SAUK-PRAIRIE SEWER	60534	102	860425	0.2	2.7	166	649	30.2	19.4
SAUK-PRAIRIE SEWER	60534	102	830520	0.1	8.4	190	760	13.4	33.5
SAUK-PRAIRIE SEWER	60534	102	830928	0.38	0.4	175	746	1	34.7
SAUK-PRAIRIE SEWER	60534	102	820729	0.43	0.1	238	688	1	18.9
SAUK-PRAIRIE SEWER	60534	102	861006	0.05	1	167	625	62.9	29.4
SAUK-PRAIRIE SEWER	60534	102	850509	0.2	0.1	172	690	19.1	11.1
SHELL LAKE SEWAGE	20095	801	870427	0.12	0.54	27.8	288	10.6	1.46
SHELL LAKE SEWAGE	20095	801	820621	0.22	0.28	11.5	206	18	
SHELL LAKE SEWAGE	20095	801	820524	0.28	0.36	21.5	224	20	0.03
SHELL LAKE SEWAGE	20095	801	841001	0.1	0.34	2	140	4	0.39
SHELL LAKE SEWAGE	20095	801	851028	0.35	0.56	4	185	1	0.25
SHELL LAKE SEWAGE	20095	801	831003	17.3	1.37	27	432	20	0.28

FACILITY NAME	PERMIT NO.	WELL	DATE	NOX	ORG	CL	TDS	SO4	NH3
SHELL LAKE SEWAGE	20095	801	860505	0.043	0.31	4.1	37	1	0.6
SHELL LAKE SEWAGE	20095	801	821004	3.08	1.37	27.5	204	21	0.03
SHELL LAKE SEWAGE	20095	801	861014	0.07	0.26	19.2	158	1	0.15
SHELL LAKE SEWAGE	20095	801	840410	0.76		33	365	29	
SHELL LAKE SEWAGE	20095	801	850415	2.13	0.81	29	355	22	0.42
SHELL LAKE SEWAGE	20095	801	830425	0.2	0.78	28	275	28	0.03
SHELL LAKE SEWAGE	20095	801	820423	0.36		8	158	19	0.17
SHELL LAKE SEWAGE	20095	802	841001	0.87	0.87	41	390	29	0.1
SHELL LAKE SEWAGE	20095	802	831003	4.12	0.05	16	298	22	51
SHELL LAKE SEWAGE	20095	802	830425	0.48	0.34	8	128	19	0.03
SHELL LAKE SEWAGE	20095	802	861014	0.14	1.05	34.5	394	22.4	0.15
SHELL LAKE SEWAGE	20095	802	821004	0.39	0.25	7.5	63	12.5	0.14
SHELL LAKE SEWAGE	20095	802	851028	0.05	1.04	44	470	28	1.04
SHELL LAKE SEWAGE	20095	802	820621	0.22	0.25	9	172	10.5	0.03
SHELL LAKE SEWAGE	20095	802	840410	1.76		25	310	18	
SHELL LAKE SEWAGE	20095	802	820524	0.31	0.11	8	130	14	0.03
SHELL LAKE SEWAGE	20095	802	860505	0.68	0.62	29.9	226	14.6	0.2
SHELL LAKE SEWAGE	20095	802	870427	0.54	0.68	37.9	332	17.6	0.16
SHELL LAKE SEWAGE	20095	802	850415	1.43	0.67	26	285	19	0.1
SHELL LAKE SEWAGE	20095	802	820423	0.03	0.87	18.5	240	20	1.12
SHELL LAKE SEWAGE	20095	803	831003	1.04	0.3	1	102	6	0.14
SHELL LAKE SEWAGE	20095	803	850415	1.4	0.87	35	290	23	0.1
SHELL LAKE SEWAGE	20095	803	841001	1.82	0.34	265	345	21	0.1
SHELL LAKE SEWAGE	20095	803	820423	0.59	1.4	10.5	173	20	0.03
SHELL LAKE SEWAGE	20095	803	840410	2.94		25	360	22	
SHELL LAKE SEWAGE	20095	803	861014	0.07	0.26	35.3	375	22.2	0.15
SHELL LAKE SEWAGE	20095	803	830425	0.11	0.39	1	79	7	0.56
SHELL LAKE SEWAGE	20095	803	851028	0.54	0.54	34	400	19	0.05
SHELL LAKE SEWAGE	20095	803	821004	0.08	0.4	10.5	118	8	0.78
SHELL LAKE SEWAGE	20095	803	870427	0.22	0.39	51.6	384	18.4	0.15
SHELL LAKE SEWAGE	20095	803	820524	0.06	0.16	23.5	300	20	1.32
SHELL LAKE SEWAGE	20095	803	860505	0.43	0.2	34.9	245	16.4	0.2
SHELL LAKE SEWAGE	20095	803	820621	0.08	0.51	9.5	216	12	0.95
SOLON SPRINGS, VIL	61115	801	841211	0.01	0.08	2	96	3	0.1
SOLON SPRINGS, VIL	61115	801	830601	0.01	0.1	1	64	3	0.1
SOLON SPRINGS, VIL	61115	801	800115	0.01	0.17	4	65	1	0.1
SOLON SPRINGS, VIL	61115	801	821026	0.01	0.1	4	178	3	0.1
SOLON SPRINGS, VIL	61115	801	861201	0.16	0.06	2	94	1	0.1
SOLON SPRINGS, VIL	61115	801	820520	0.01	0.09	1	134	1	0.1
SOLON SPRINGS, VIL	61115	801	851115	0.01	0.13	1	89	1	0.1
SOLON SPRINGS, VIL	61115	801	811028	0.01	0.07	1.6	4.9	1	0.1
SOLON SPRINGS, VIL	61115	801	840626	0.01	0.1	2	92	3	0.1
SOLON SPRINGS, VIL	61115	801	810507	0.01	0.1	1	76	1	0.1
SOLON SPRINGS, VIL	61115	801	870519	0.22	0.35	1	99	1	0.1
SOLON SPRINGS, VIL	61115	801	801203	0.01	0.1	1	68	1	0.1
SOLON SPRINGS, VIL	61115	801	850717	0.02	0.1	1	86	1	0.1
SOLON SPRINGS, VIL	61115	801	860603	0.15	0.16	1	87	1	0.1
SOLON SPRINGS, VIL	61115	801	831115		0.09	1	105		0.1
SOLON SPRINGS, VIL	61115	801	800610	0.01	0.05	1	57	1	0.1
SOLON SPRINGS, VIL	61115	802	800610	0.01	0.15	2	30	3	0.1
SOLON SPRINGS, VIL	61115	802	841211	0.01	0.17	2	28	3	0.1
SOLON SPRINGS, VIL	61115	802	800115	0.01	0.15	2	40	3	0.1
SOLON SPRINGS, VIL	61115	802	860603	0.1	0.3	1	26	2	0.1
SOLON SPRINGS, VIL	61115	802	861201	0.16	0.39	2	14	1	0.1
SOLON SPRINGS, VIL	61115	802	840626	0.03	0.27	2	32	3	0.1
SOLON SPRINGS, VIL	61115	803	810507	0.04	0.14	1	47	1	0.1
SOLON SPRINGS, VIL	61115	803	821026	0.01	0.12	5	86	108	0.1
SOLON SPRINGS, VIL	61115	803	830601	0.01	0.1	1	51	117	0.1
SOLON SPRINGS, VIL	61107	803	790829			42	210	1	0.1
SOLON SPRINGS, VIL	61115	803	820520	0.01	0.14	1	94	128	0.1
SOLON SPRINGS, VIL	61115	803	860603	0.13	0.23	1	59	43.8	0.1
SOLON SPRINGS, VIL	61115	803	811028	0.01	0.14	1.6	34	1	0.1
SOLON SPRINGS, VIL	61115	803	850717	0.01	0.1	1	62	81	0.1
SOLON SPRINGS, VIL	61115	803	801203	0.02	0.1	1	46	1	0.1

FACILITY NAME	PERMIT NO.	WELL	DATE	NOX	ORG	CL	TDS	SO4	NH3
SOLON SPRINGS, VIL	61115	803	840626	0.01	0.15	1	60		0.1
SOLON SPRINGS, VIL	61115	803	800610	0.01	0.09	1	55	1	0.1
SOLON SPRINGS, VIL	61115	803	861201	0.13	0.08	2	37	25	0.1
SOLON SPRINGS, VIL	61115	803	800115	0.01	0.1	1	40	1	0.1
SOLON SPRINGS, VIL	61115	803	841211	0.01	0.39	2	66	93	0.1
SOLON SPRINGS, VIL	61115	803	851115	0.01	0.2	1	58	84	0.1
SOLON SPRINGS, VIL	61115	803	831115		0.08	1	57	50	0.1
SOLON SPRINGS, VIL	61115	803	870519	0.17	0.27	2	36	26	0.1
SOLON SPRINGS, VIL	61115	804	800115	0.01	0.13	1	66	34.4	0.1
SOLON SPRINGS, VIL	61115	804	840626	0.01	0.16	1	40		0.1
SOLON SPRINGS, VIL	61115	804	841211	0.01	0.14	2	40		0.1
SOLON SPRINGS, VIL	61115	804	801203	0.02	0.1	1	53		0.1
SOLON SPRINGS, VIL	61115	804	860603	0.23	0.27	1	38		0.1
SOLON SPRINGS, VIL	61115	804	821026	0.01	0.12	5	92	7	0.1
SOLON SPRINGS, VIL	61115	804	810507	0.06	0.18	1	37		0.1
SOLON SPRINGS, VIL	61115	804	800610	0.01	0.18	1	34	3	0.1
SOLON SPRINGS, VIL	61115	804	861201	0.23	0.09	2	18		0.1
SOLON SPRINGS, VIL	61115	805	850717	0.01	0.1	1	58		0.1
SOLON SPRINGS, VIL	61115	805	801203	0.01	0.1	1	51		0.1
SOLON SPRINGS, VIL	61115	805	810507	0.08	0.14	1	41		0.1
SOLON SPRINGS, VIL	61115	805	831115		0.07	1	44		0.1
SOLON SPRINGS, VIL	61115	805	811028	0.01	0.1	1	46		0.1
SOLON SPRINGS, VIL	61115	805	851115	0.21	0.09	1	49		0.1
SOLON SPRINGS, VIL	61115	805	820520	0.01	0.12	1	90		0.1
SOLON SPRINGS, VIL	61115	805	800610	0.01	0.05	1	45		0.1
SOLON SPRINGS, VIL	61115	805	870519	0.2	0.24	2	22		0.1
SOLON SPRINGS, VIL	61115	805	800115	0.01	0.17	1	68		0.1
SOLON SPRINGS, VIL	61115	805	830601	0.01	0.1	1	42		0.1
SPOONER SEWAGE TRE	21067	801	851030	0.06	0.05	37	305	90	14.1
SPOONER SEWAGE TRE	21067	801	860508	0.07	0.68	46	295	10	8.32
SPOONER SEWAGE TRE	21067	801	820511	0.62	2.3	34	260	30	11
SPOONER SEWAGE TRE	21067	801	861105	0.71	0.6	41	250	21	8.8
SPOONER SEWAGE TRE	21067	801	821117	0.14	1.48	35	250	25	12.6
SPOONER SEWAGE TRE	21067	801	870519	0.05	1.4	50	260	6	7.2
SPOONER SEWAGE TRE	21067	801	831024	0.28	0.5	39	134	8	5.18
SPOONER SEWAGE TRE	21067	801	800221	0.03	0.16	59	368	48	0.01
SPOONER SEWAGE TRE	21067	801	841106	24	0.1	30	575	23	8.34
SPOONER SEWAGE TRE	21067	801	800617	0.04	1.75	48	284	14	0.35
SPOONER SEWAGE TRE	21067	801	800115	0.17	0.04	1.5	108	13	0.04
SPOONER SEWAGE TRE	21067	801	801210	0.03	1.33	50	278	19	0.83
SPOONER SEWAGE TRE	21067	801	830517	0.03	1.54	38	230	22	6.55
SPOONER SEWAGE TRE	21067	801	810513	0.31	0.5	43	268	14	0.59
SPOONER SEWAGE TRE	21067	801	850521	0.64	1.4	39	435	6	20
SPOONER SEWAGE TRE	21067	801	840529	0.1	1.06	31	112	9	2.8
SPOONER SEWAGE TRE	21067	801	791126	0.51	0.04	0.5	46	6	0.04
SPOONER SEWAGE TRE	21067	801	811116	3.02	1.01	42.5	238	24	1.01
SPOONER SEWAGE TRE	21067	802	861105	0.05	0.1	44	260	32	16
SPOONER SEWAGE TRE	21067	802	800221	0.01	0.38	60.5	412	50	0.01
SPOONER SEWAGE TRE	21067	802	820511	0.34	1.09	45.5	380	20	9.94
SPOONER SEWAGE TRE	21067	802	800115	0.33	1.03	55.5	302	63	0.03
SPOONER SEWAGE TRE	21067	802	810513	0.17	0.84	39	342	38	0.45
SPOONER SEWAGE TRE	21067	802	791126	0.31	0.24	1	54	10	0.07
SPOONER SEWAGE TRE	21067	802	850521	0.1	0.7	40	440	8	11.5
SPOONER SEWAGE TRE	21067	802	840529	0.1	1.23	37	230	11	4.4
SPOONER SEWAGE TRE	21067	802	860508	0.05	0.1	62	435	24	17.1
SPOONER SEWAGE TRE	21067	802	851030	0.05	0.05	45	280	20	12.9
SPOONER SEWAGE TRE	21067	802	800617	0.01	1.16	40	296	20	0.1
SPOONER SEWAGE TRE	21067	802	831024	0.2	0.82	37	215	11	5.96
SPOONER SEWAGE TRE	21067	802	841106	0.36	0.5	41	315	7	11.9
SPOONER SEWAGE TRE	21067	802	830517	0.03	1.12	52	395	34	8.18
SPOONER SEWAGE TRE	21067	802	801210	0.04	1.02	49	308	45	1.46
SPOONER SEWAGE TRE	21067	802	811116	0	0.51	40	248	44	0.92
SPOONER SEWAGE TRE	21067	802	870519	0.05	1.4	44	320	3	13.4
SPOONER SEWAGE TRE	21067	802	821117	0.03	0.53	41	310	30	9.3

FACILITY NAME	PERMIT NO.	WELL	DATE	NOX	ORG	CL	TDS	SO4	NH3
SPOONER SEWAGE TRE	21067	803	851030	0.05	0.11	46	225	12	0.16
SPOONER SEWAGE TRE	21067	803	821117	1.71	0.53	24	144	23	0.03
SPOONER SEWAGE TRE	21067	803	791126	0.05	0.29	7.5	120	7	0.07
SPOONER SEWAGE TRE	21067	803	830517	1.15	0.36	27	122	13	0.03
SPOONER SEWAGE TRE	21067	803	810513	0.87	0.17	9	118	6	0.25
SPOONER SEWAGE TRE	21067	803	801210	0.35	0	5	86	8	0.25
SPOONER SEWAGE TRE	21067	803	820511	1.93	0.16	27	206	18	0.06
SPOONER SEWAGE TRE	21067	803	831024	0.92	0.03	32	220	13	0.36
SPOONER SEWAGE TRE	21067	803	861105	0.11	0.25	36	210	19	0.1
SPOONER SEWAGE TRE	21067	803	800617	0.05	0.27	2.5	76	8	0.01
SPOONER SEWAGE TRE	21067	803	870519	0.05	0.23	41	238	23	0.1
SPOONER SEWAGE TRE	21067	803	840529	0.1	0.14	37	120	17	0.1
SPOONER SEWAGE TRE	21067	803	811116	2.07	0	24.8	138	13	0
SPOONER SEWAGE TRE	21067	803	850521	0.2	0.56	43	340	11	0.1
SPOONER SEWAGE TRE	21067	803	860508	0.05	0.31	35	210	17	0.41
SPOONER SEWAGE TRE	21067	803	800221	0.05	0.03	2	92	8	0
SPOONER SEWAGE TRE	21067	803	800115	0.09	0.39	3	76	8	0
SPOONER SEWAGE TRE	21067	803	841106	0.1	0.1	40	188	15	0.1
SPOONER SEWAGE TRE	21067	804	821117	1.96	0.33	5.5	104	15	0.03
SPOONER SEWAGE TRE	21067	804	850521	0.42	0.22	3	215	5	0.1
SPOONER SEWAGE TRE	21067	804	820511	3.25	0.03	7.5	153	10	0.36
SPOONER SEWAGE TRE	21067	804	800221	0.35	0.02	0	100	10.5	0.04
SPOONER SEWAGE TRE	21067	804	831024	0.03	0.03	3	116	6.5	0.2
SPOONER SEWAGE TRE	21067	804	800115	0.48	0.01	0.5	58	10	0.1
SPOONER SEWAGE TRE	21067	804	811116	2.49	0	6.5	184	1	0.14
SPOONER SEWAGE TRE	21067	804	791126	0.66	0.44	1	56	9	0.04
SPOONER SEWAGE TRE	21067	804	801210	0.31	0.34	6	114	11	0
SPOONER SEWAGE TRE	21067	804	870519	0.05	0.4	31	260	12	0.13
SPOONER SEWAGE TRE	21067	804	841106	0.1	0.1	4	94	13	0.64
SPOONER SEWAGE TRE	21067	804	861105	0.49	0.22	28	265	13	0.09
SPOONER SEWAGE TRE	21067	804	840529	0.5	0.11	1	44	9	0.1
SPOONER SEWAGE TRE	21067	804	860508	0.05	0.41	28	298	14	0.45
SPOONER SEWAGE TRE	21067	804	800617	0.3	0.22	2.5	86	13	0
SPOONER SEWAGE TRE	21067	804	810513	0.53	0.28	2	134	6	0.17
SPOONER SEWAGE TRE	21067	804	830517	1.74	0.28	2	96	8	0.06
SPOONER SEWAGE TRE	21067	804	851030	0.57	0.23	2	66	6	0.08
TURTLE LAKE, VILLA	25631	801	850618	0.72	1.6	4	187	6	0.5
TURTLE LAKE, VILLA	25631	801	851120	0.68	0.5	1	167	8	0.5
TURTLE LAKE, VILLA	25631	801	851118	0.58	0.5	1	166	8	0.5
TURTLE LAKE, VILLA	25631	801	870310	0.5	0.5	1	184	10	0.5
TURTLE LAKE, VILLA	25631	801	841112	0.84	1.7	2	188	13	0.5
TURTLE LAKE, VILLA	25631	801	860924	0.6	0.5	2	185		0.5
TURTLE LAKE, VILLA	25631	801	850325	0.23	0.79	2	181	9	0.5
TURTLE LAKE, VILLA	25631	801	870629	1.1	0.5	4		6	0.5
TURTLE LAKE, VILLA	25631	801	860616	0.5	0.5	1	176	10	0.5
TURTLE LAKE, VILLA	25631	801	861202	0.5	0.5	2	156	8	0.5
TURTLE LAKE, VILLA	25631	801	851001	0.67	0.69	3	177	11	0.51
TURTLE LAKE, VILLA	25631	802	801203	0.1	0.8	51	794	150	8
TURTLE LAKE, VILLA	25631	802	801125	0.02	0.8		222	125	7.7
TURTLE LAKE, VILLA	25631	803	801203	0.02	0.8	36	1144	180	11
TURTLE LAKE, VILLA	25631	803	801125	0.02	2	38	756	150	11
TURTLE LAKE, VILLA	25631	804	801203	0.1	0.8	57	408	10	1.8
TURTLE LAKE, VILLA	25631	804	801125	0.1	0.7	60	912	14	3.3
TURTLE LAKE, VILLA	25631	805	860616	0.1	1.1	22	463	8	1.8
TURTLE LAKE, VILLA	25631	805	870629	0.1	2	26	461	20	2.1
TURTLE LAKE, VILLA	25631	805	801125	0.1	0.5	26	386	28	2.5
TURTLE LAKE, VILLA	25631	805	860924	0.1	0.8	21	441	5	2.8
TURTLE LAKE, VILLA	25631	805	841112	0.05	1.1	1	484	14	3.2
TURTLE LAKE, VILLA	25631	805	861202	0.1	0.7	23	496	10	2.6
TURTLE LAKE, VILLA	25631	805	851120	0.1	1.5	22	484	7	2.1
TURTLE LAKE, VILLA	25631	805	850618	0.03	0.6	1.	426	6	3
TURTLE LAKE, VILLA	25631	805	851001	0.1	1.1	21	468	8	3.7
TURTLE LAKE, VILLA	25631	805	801203	0.02	0.5	24	518	16	3.1
TURTLE LAKE, VILLA	25631	806	801125	0.02	0.5	23	523	20	0.11

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TURTLE LAKE, VILLA	25631	806	801203	0.02	0.4	19	566	14	0.02
TURTLE LAKE, VILLA	25631	807	801125	0.13	0.6	12	412	50	0.02
TURTLE LAKE, VILLA	25631	807	801203	0.02	0.4	11	222	50	0.02
TURTLE LAKE, VILLA	25631	808	801125	0.09	0.5	10	244	60	0.1
TURTLE LAKE, VILLA	25631	808	801203	0.02	0.9	10	346	47	0.04
TURTLE LAKE, VILLA	25631	809	851001	0.4	0.6	2	193	12	0.5
TURTLE LAKE, VILLA	25631	809	861202	2.4	0.5	5	154	10	0.5
TURTLE LAKE, VILLA	25631	809	860616	1.4	0.5	2	123	9	0.5
TURTLE LAKE, VILLA	25631	809	870629	4	0.5	6	149	11	0.5
TURTLE LAKE, VILLA	25631	809	860924	2.1	0.5	4	135	10	0.5
TURTLE LAKE, VILLA	25631	809	801203	0.43	1	2	310	26	0.02
TURTLE LAKE, VILLA	25631	809	851120	0.45	0.5	2	187	6	0.5
TURTLE LAKE, VILLA	25631	809	841112	14	1.9	4	176	10	0.5
TURTLE LAKE, VILLA	25631	810	801125	0.08	0.2	2	1.89	11	0.02
TURTLE LAKE, VILLA	25631	810	801203	0.08	0.2	2	98	14	0.02
TURTLE LAKE, VILLA	25631	811	860616	0.1	0.5	31	413	15	0.5
TURTLE LAKE, VILLA	25631	811	861202	0.1	0.5	40	398	12	0.5
TURTLE LAKE, VILLA	25631	811	841112	0.02	73	1	334	12	50
TURTLE LAKE, VILLA	25631	811	870629	0.1	0.5	35	412	11	0.5
TURTLE LAKE, VILLA	25631	811	851120	0.1	0.5	29	409	15	0.5
TURTLE LAKE, VILLA	25631	811	850618	0.05	0.5	4	365	14	0.5
TURTLE LAKE, VILLA	25631	811	801213	0.02	0.4	20	76	16	0.11
TURTLE LAKE, VILLA	25631	812	801213	0.02	0.2	24	450	25	0.03
TURTLE LAKE, VILLA	25631	813	801213	0.02	0.2	13	260	15	0.13
TURTLE LAKE, VILLA	25631	813	860616	0.1	0.5	31	328	14	0.5
TURTLE LAKE, VILLA	25631	813	801125	0.03	0.2	7	350	40	0.09
TURTLE LAKE, VILLA	25631	813	861202	0.1	0.6	31	356	28	0.7
TURTLE LAKE, VILLA	25631	813	850618	0.01	0.5	21	254	3	0.5
TURTLE LAKE, VILLA	25631	813	841112	0.06	0.92	23	224	1	0.5
TURTLE LAKE, VILLA	25631	813	851120	0.1	0.55	27	293	8	0.5
TURTLE LAKE, VILLA	25631	813	870629	0.1	0.5	31	352	39	0.5
TURTLE LAKE, VILLA	25631	814	841112	0.68	1	36	433	12	0.5
TURTLE LAKE, VILLA	25631	814	860924	0.7	0.5	36	334	14	0.5
TURTLE LAKE, VILLA	25631	814	850618	0.81	0.5	34	315	12	0.5
TURTLE LAKE, VILLA	25631	814	861202	0.9	0.5	38	360	13	0.5
TURTLE LAKE, VILLA	25631	814	851120	0.81	0.58	39	332	14	0.5
TURTLE LAKE, VILLA	25631	814	851001	0.67	0.62	37	331	14	0.5
TURTLE LAKE, VILLA	25631	814	860616	0.8	0.5	32	346	14	0.5
TURTLE LAKE, VILLA	25631	814	870629	0.8	0.5	40	313	13	0.5
TURTLE LAKE, VILLA	25631	817	860616	0.9	0.5	45	328	11	0.5
TURTLE LAKE, VILLA	25631	817	841112	0.24	0.58	8	378	12	0.5
TURTLE LAKE, VILLA	25631	817	850618	0.4	0.5	7	319	8	0.5
TURTLE LAKE, VILLA	25631	817	861202	0.5	0.5	14	349	11	0.5
TURTLE LAKE, VILLA	25631	817	870629	0.3	0.5	14	398	11	0.5
TURTLE LAKE, VILLA	25631	817	851120	0.65	0.51	8	332	13	0.5
TURTLE LAKE, VILLA	25631	818	851001	0.1	2.7	33	356	27	1.7
TURTLE LAKE, VILLA	25631	818	860924	0.1	0.5	34	413	14	1
TURTLE LAKE, VILLA	25631	818	850618	0.03	0.5	18	369	11	1.9
TURTLE LAKE, VILLA	25631	818	861202	0.1	0.7	38	453	39	1
TURTLE LAKE, VILLA	25631	818	851120	0.1	0.6	39	489	38	1.3
TURTLE LAKE, VILLA	25631	818	841112	0.04	0.78	3	481	1	1.2
TURTLE LAKE, VILLA	25631	818	860616	0.1	0.5	42	480	25	1
TURTLE LAKE, VILLA	25631	818	870629	0.1	0.5	40	426	56	0.7
TURTLE LAKE, VILLA	25631	819	851120	0.84	0.5	4	171	9	0.5
TURTLE LAKE, VILLA	25631	819	860616	0.9	0.5	8	143	7	0.5
TURTLE LAKE, VILLA	25631	819	841112	0.92	1.6	4	480	9	1.6
TURTLE LAKE, VILLA	25631	819	861202	1	0.5	3	148	8	0.5
TURTLE LAKE, VILLA	25631	819	870629	1.1	0.5	7	166	6	0.5
TURTLE LAKE, VILLA	25631	819	850618	0.81	0.5	3	141	5	0.5
UNITY, VILLAGE OF	60526	701	851108	0.04	0.98	112	600	14.1	0.15
UNITY, VILLAGE OF	60526	701	840510	0.18	1.06	99.5	410	65	0.04
UNITY, VILLAGE OF	60526	701	841120	0.58	0.66	116.8	388	32	0.04
UNITY, VILLAGE OF	60526	701	850523	0.18	1.13	102	470	8.9	0.04
UNITY, VILLAGE OF	60526	701	831213	0.44	0.66	115.5	515	47.5	0.22

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UNITY, VILLAGE OF	60526	701	860509	0.04	0.62	103	428	9.8	0.11
UNITY, VILLAGE OF	60526	701	840314	0.04	0.76	110	145	17	0.04
UNITY, VILLAGE OF	60526	701	840214	0.15	0.95	108	610	20.5	0.04
UNITY, VILLAGE OF	60526	701	870520		0.48	117	3218	6	
UNITY, VILLAGE OF	60526	701	861107	0.15	0.44	115	440	4.9	0.07
UNITY, VILLAGE OF	60526	702	840510	0.69	0.84	3.2	185	72.5	0.04
UNITY, VILLAGE OF	60526	702	851108	0.33	1.86	3.5	325	23.8	0.15
UNITY, VILLAGE OF	60526	702	840314	1.57	0.62	7	420	98	0.04
UNITY, VILLAGE OF	60526	702	850523	0.22	1.53	3	125	16.9	0.04
UNITY, VILLAGE OF	60526	702	870520	0.5	0.14		246	16	0.5
UNITY, VILLAGE OF	60526	702	841120	1.35	0.62	6.2	476	44	0.04
UNITY, VILLAGE OF	60526	702	860509	0.26	0.77	1.5	124	18.6	0.11
UNITY, VILLAGE OF	60526	702	861107	0.44	0.44	2.5	148	17.1	0.04
UNITY, VILLAGE OF	60526	702	831213	1.86	0.58	9.5	215	65	0.11
UNITY, VILLAGE OF	60526	702	840214	1.64	0.95	6.5	380	50	0.04
WAUSAUKEE WATER &	60011	401	830405	0.17	1	160	672	7	0.7
WAUSAUKEE WATER &	60011	401	850612	0.24	3.6	105	588	12	3.4
WAUSAUKEE WATER &	60011	401	870508	1.9	1	79	508	18	15
WAUSAUKEE WATER &	60011	401	810413	0.01	1	64	480	44	0.1
WAUSAUKEE WATER &	60011	401	831005	0.01	1	90	316	7	0.85
WAUSAUKEE WATER &	60011	401	810217	0.02	0.3	64	456	32	0.4
WAUSAUKEE WATER &	60011	401	821018	0.5	1.9	110	604	27	1
WAUSAUKEE WATER &	60011	401	851113	0.14	1	125	512	38	5.8
WAUSAUKEE WATER &	60011	401	820420	0.17	66	88	684	14	1
WAUSAUKEE WATER &	60011	401	860623	0.19	1	89	620	49	2.5
WAUSAUKEE WATER &	60011	401	841017	0.1	1	142	692	1	0.7
WAUSAUKEE WATER &	60011	401	810113	0.13	5.9	140	552	31	0.1
WAUSAUKEE WATER &	60011	401	801216	0.1	1.5	52	181	22	0.1
WAUSAUKEE WATER &	60011	401	840404	0.02	1	85	617	10	0.5
WAUSAUKEE WATER &	60011	401	811012	1.9	16	70	686	23	0.4
WAUSAUKEE WATER &	60011	401	861111	0.05	1	85	636	23	5
WAUSAUKEE WATER &	60011	402	861111	0.05	1	9	328	7	1.5
WAUSAUKEE WATER &	60011	402	811012	9	18	20	276	15	1.8
WAUSAUKEE WATER &	60011	402	810413	0.02	1.5	12	256	1	1.8
WAUSAUKEE WATER &	60011	402	810217	0.03	0.6	14	344	4	1.1
WAUSAUKEE WATER &	60011	402	810113	0.05	3.7	100	312	1	0.8
WAUSAUKEE WATER &	60011	402	820420	0.11	4	10	376	8	1.7
WAUSAUKEE WATER &	60011	402	851113	0.06	5	45	400	10	1.2
WAUSAUKEE WATER &	60011	402	821018	0.07	2.7	10	320	12.5	2.6
WAUSAUKEE WATER &	60011	402	841017	0.1	1	53	396	1	2.5
WAUSAUKEE WATER &	60011	402	870508	57.6	1	15	288	4	1.1
WAUSAUKEE WATER &	60011	402	860623	0.14	7	16	312	6	0.8
WAUSAUKEE WATER &	60011	402	830405	0.07	1	76	184	12	2
WAUSAUKEE WATER &	60011	402	801216	0.014	0.4	20	472	1	2.2
WAUSAUKEE WATER &	60011	402	850612	0.09	7	30	292		1
WAUSAUKEE WATER &	60011	402	840404	0.22	7.3	14	376	5	1.1
WAUSAUKEE WATER &	60011	402	831005	0.04	10	6	584	5	0.31
WAUSAUKEE WATER &	60011	403	810413	0.01	0.4	42	252	1	5.8
WAUSAUKEE WATER &	60011	403	811012	0.014	0.04	0.2	420	1	5.8
WAUSAUKEE WATER &	60011	404	811012	0.074	0.03	0.2	180	11	0.1
WAUSAUKEE WATER &	60011	404	810413	0.7	0.3	2	420	11	0.1
WAUTOMA, CITY OF	60178	401	821109	2.09	2.05	38.5	348	16	1.68
WAUTOMA, CITY OF	60178	401	810506	2.56	0.8	35.5	500	17	1
WAUTOMA, CITY OF	60178	401	811109	0.22	1.03	40	344	13.5	1.12
WAUTOMA, CITY OF	60178	401	771017	3.65	0.12	42	650	24	2.8
WAUTOMA, CITY OF	60178	401	820506	2.6	1.7	44	346	15	3.53
WAUTOMA, CITY OF	60178	401	780523	8.9	0.39	37	360	23	0.05
WAUTOMA, CITY OF	60178	401	770815	0.78	8.1	23	439	30	5
WAUTOMA, CITY OF	60178	401	790509	2.05	0.9	34	337	22	0.05
WAUTOMA, CITY OF	60178	401	830512	4.95	0.45	38	332	10	2.63
WAUTOMA, CITY OF	60178	401	800512	9.45	1.22	40	348	25	0.7
WAUTOMA, CITY OF	60178	401	841105	0.09	0.68	26	266	12	2.07
WAUTOMA, CITY OF	60178	401	861017	0.12	1.35	37.9	271	7.1	4.34
WAUTOMA, CITY OF	60178	401	850514	0.13	0.97	40.5	238	14.2	5.66

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WAUTOMA, CITY OF	60178	401	781118	6.3	1.06	35	354	18	2.69
WAUTOMA, CITY OF	60178	401	851022	0.25	0.54	16	217	10	2.63
WAUTOMA, CITY OF	60178	401	801107	1.23	1.5	42	341	20	4.7
WAUTOMA, CITY OF	60178	401	791107	0.66	0.81	40.7	369	58	2.18
WAUTOMA, CITY OF	60178	401	771024	3.7	0.21	38.58	346	24	1.54
WAUTOMA, CITY OF	60178	401	860512	0.05	1.51	41.6	273	7.2	4.93
WAUTOMA, CITY OF	60178	402	770815	1.125	6.7	46	426	28	5
WAUTOMA, CITY OF	60178	402	851022	0.03	0.9	35	277	11.3	0.22
WAUTOMA, CITY OF	60178	402	860512	0.05	0.92	35.4	225	13.4	1.6
WAUTOMA, CITY OF	60178	402	771017	0.71	0.1	52	484	24	1.6
WAUTOMA, CITY OF	60178	402	861017	7.8	1.03	33.7	344	15.9	1.82
WAUTOMA, CITY OF	60178	402	811109	0.51	0.19	40.5	386	24	2.52
WAUTOMA, CITY OF	60178	402	810506	6.26	0.6	42.8	500	26	2.4
WAUTOMA, CITY OF	60178	402	821109	3.61	1.77	39.8	450	15	0.28
WAUTOMA, CITY OF	60178	402	801107	2.49	0.34	39	376	15	0.11
WAUTOMA, CITY OF	60178	402	841105	0.06	0.03	27.2	296	15	0.06
WAUTOMA, CITY OF	60178	402	800512	0.98	0.68	36	334	27	0.28
WAUTOMA, CITY OF	60178	402	780523	10.25	0.5	48	376	24	0.05
WAUTOMA, CITY OF	60178	402	791107	0.81	0.67	43.7	337	20	0.3
WAUTOMA, CITY OF	60178	402	820506	4.27	2.46	42	500	30	0.28
WAUTOMA, CITY OF	60178	402	790509	0.65	0.34	39	328	25	0.05
WAUTOMA, CITY OF	60178	402	850514	1.04	0.82	29.5	247	18.4	0.112
WAUTOMA, CITY OF	60178	402	830512	3.02	0.39	42	331	12	0.17
WAUTOMA, CITY OF	60178	402	771024	0.87	0.2	52.08	441	26	0.2
WAUTOMA, CITY OF	60178	402	781118	9.5	0.39	43	394	20	0.1
WAUTOMA, CITY OF	60178	403	781118	4	0.62	43	376	17	0.1
WAUTOMA, CITY OF	60178	403	791107	0.96	0.76	41.7	350	19	0.1
WAUTOMA, CITY OF	60178	403	790509	0.91	0.78	39	352	25	4.26
WAUTOMA, CITY OF	60178	403	841105	6.63	1.95	40.1	378	23	0.78
WAUTOMA, CITY OF	60178	403	820506	3.23	1.68	36	388	17	0.05
WAUTOMA, CITY OF	60178	403	780523	4.28	0.67	48	384	20	0.05
WAUTOMA, CITY OF	60178	403	821109	1.38	1.31	39.8	455	13	0.05
WAUTOMA, CITY OF	60178	403	771017	2.35	0.2	40	394	21	0.7
WAUTOMA, CITY OF	60178	403	830512	0.46	0.39	42	328	9	1.29
WAUTOMA, CITY OF	60178	403	800512	3.16	1.36	36	324	25	0.34
WAUTOMA, CITY OF	60178	403	861017	0.03	1.34	34.6	291	18.1	1.18
WAUTOMA, CITY OF	60178	403	810506	1.86	0.6	46.5	550	20	0.4
WAUTOMA, CITY OF	60178	403	850514	1.29	0.83	27.7	241	17.3	1.46
WAUTOMA, CITY OF	60178	403	770815	2.4	7	47	402	24	5.3
WAUTOMA, CITY OF	60178	403	851022	0.02	0.29	36	197	9	2.04
WAUTOMA, CITY OF	60178	403	801107	0.71	1.4	38	340	18	0.05
WAUTOMA, CITY OF	60178	403	771024	3.64	0.05	43.84	347	21	0.16
WAUTOMA, CITY OF	60178	403	811109	0.56	0.73	41	335	17.5	0.11
WAUTOMA, CITY OF	60178	403	860512	0.41	0.91	39.2	325	29.5	1.51
WILD ROSE, VILLAGE	60071	401	821104	2.12	1.96	0.2	138	8	0.5
WILD ROSE, VILLAGE	60071	401	820714	2.39	1.36	1		8	0.05
WILD ROSE, VILLAGE	60071	401	811116	4.6			144		0.86
WILD ROSE, VILLAGE	60071	401	831103	2.76	1	0.7	154	3	0.05
WILD ROSE, VILLAGE	60071	401	850524	1.16	0.16	1	161	6	0.06
WILD ROSE, VILLAGE	60071	401	851105	0.43	0.31	67	103	10.3	0.06
WILD ROSE, VILLAGE	60071	401	860519	28	0.55	87.5	217	25.4	0.41
WILD ROSE, VILLAGE	60071	401	830505	1.5	1	1	65	7	0.05
WILD ROSE, VILLAGE	60071	401	861027	6.31	0.47	1.1	426	7.5	0.06
WILD ROSE, VILLAGE	60071	401	820910	3.9	0.84	1	123	5	0.05
WILD ROSE, VILLAGE	60071	401	841017	1.46	0.22	0.1	141	5.7	0.06
WILD ROSE, VILLAGE	60071	401	870513	1.75	0.18	33.6	137	5.5	0.47
WILD ROSE, VILLAGE	60071	401	860804	26.2	0.47	42.2	490	18.3	0.06
WILD ROSE, VILLAGE	60071	401	820805	1.98	0.56	1	85	9	0.05
WILD ROSE, VILLAGE	60071	402	850524	0.51	0.27	1	67	10.8	0.06
WILD ROSE, VILLAGE	60071	402	820714	0.99	0.38	1.5	43	16	0.05
WILD ROSE, VILLAGE	60071	402	820805	1.13	0.1	2	143	19	0.05
WILD ROSE, VILLAGE	60071	402	860519	0.32	0.03	1.5	193	11.9	0.06
WILD ROSE, VILLAGE	60071	402	820910	1.07	0.93	1	160	9	0.05
WILD ROSE, VILLAGE	60071	402	870513	0.32	0.05	1.8	153	9.3	0.14

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WILD ROSE, VILLAGE	60071	402	821104	0.72	1.4	0.7	122	13	0.5
WILD ROSE, VILLAGE	60071	402	841017	0.44	0.17	0.1	173	9.1	0.06
WILD ROSE, VILLAGE	60071	402	830505	1.2	0.6	1	194	3	0.05
WILD ROSE, VILLAGE	60071	402	811116	0.05			146		1.8
WILD ROSE, VILLAGE	60071	402	831103	0.75	0.9	0.6	175	4	0.05
WILD ROSE, VILLAGE	60071	402	851105	0.34	0.13	1	125	9.3	0.06
WILD ROSE, VILLAGE	60071	402	861027	0.42	0.47	1	156	9.1	0.06
WINTER VILLAGE OF	60089	801	840611	81	0.5	12	92	5	0.5
WINTER VILLAGE OF	60089	801	870504	0.5	0.5	13	103	6	0.3
WINTER VILLAGE OF	60089	801	860710	0.4	0.7	12	81	7	0.5
WINTER VILLAGE OF	60089	801	840807	0.54	1.2	12	103	6	0.5
WINTER VILLAGE OF	60089	801	860106	0.04	0.5	11	83	6	0.5
WINTER VILLAGE OF	60089	801	850611	0.5	0.5	13	88	4	0.5
WINTER VILLAGE OF	60089	801	870128	0.4	0.5	16		7	0.5
WINTER VILLAGE OF	60089	802	860710	0.1	2.7	25	216	13	0.5
WINTER VILLAGE OF	60089	802	840807	0.09	0.82	12	154	6	0.5
WINTER VILLAGE OF	60089	802	850611	50	1.4	16	168	4	0.01
WINTER VILLAGE OF	60089	802	860106	0.04	50	22	159	15	57
WINTER VILLAGE OF	60089	802	840611	0.01	0.5	17	159	5	0.5
WI-DVA VETERANS HO	60411	401	781108	1.03	2.1	16	140	19	0.52
WI-DVA VETERANS HO	60411	401	860616	0.4	0.4	24	150	16	1.1
WI-DVA VETERANS HO	60411	401	861201	1	0.1	18	248	12	2.8
WI-DVA VETERANS HO	60411	401	821130	0.44	1.5	69	352	28	0.7
WI-DVA VETERANS HO	60411	401	870527	1.2	0.4	14	132	12	3.2
WI-DVA VETERANS HO	60411	401	840724	0.4	0.7	11	120	11	0.2
WI-DVA VETERANS HO	60411	401	810615	1.6	0.8	2	740	22	1.4
WI-DVA VETERANS HO	60411	401	850617	1.6	0.3	11	198		0.3
WI-DVA VETERANS HO	60411	401	801117	0.35	1	2	74	12	4.2
WI-DVA VETERANS HO	60411	401	851217	0.1	0.3	11	74	10	1.4
WI-DVA VETERANS HO	60411	401	800623	3		2	102	10	3.9
WI-DVA VETERANS HO	60411	401	830601	2.6	0.8	36	244	25	0.1
WI-DVA VETERANS HO	60411	401	791119	1.2	1.1	2	68	10	2.5
WI-DVA VETERANS HO	60411	401	820607	0.04			300	2.8	0.15
WI-DVA VETERANS HO	60411	401	841211	0.1	0.6	9.5	88	9.7	0.6
WI-DVA VETERANS HO	60411	401	820607	0.04					
WI-DVA VETERANS HO	60411	401	790625	5.9	0.8	2	122	10	0.38
WI-DVA VETERANS HO	60411	402	810615	0.18	1.65	16	365	16	0.75
WI-DVA VETERANS HO	60411	402	850617	0.1	0.3	85	382	27	2.5
WI-DVA VETERANS HO	60411	402	820607	1.47			395	28	0.15
WI-DVA VETERANS HO	60411	402	841211	17.2	0.6	78	382	30	0.2
WI-DVA VETERANS HO	60411	402	830601	6.4	1.3	11	152	25	0.1
WI-DVA VETERANS HO	60411	402	801117	0.19	0.7	5	82	8	0.71
WI-DVA VETERANS HO	60411	402	870527	0.1	0.3	97	350	22	0.3
WI-DVA VETERANS HO	60411	402	800623	0.03	1.7	5	64	7	0.84
WI-DVA VETERANS HO	60411	402	860616	0.1	1	95	356	24	0.2
WI-DVA VETERANS HO	60411	402	791119	1.92	1.2	4	112	11	0.018
WI-DVA VETERANS HO	60411	402	821130	0.44	1.5	51	236	29	0.7
WI-DVA VETERANS HO	60411	402	790625	1.95	0.2	2	112	9	0.04
WI-DVA VETERANS HO	60411	402	861201	0.1	0.6	14	186	1	0.6
WI-DVA VETERANS HO	60411	402	840724	3.1	1.4	41	178	18	0.9
WI-DVA VETERANS HO	60411	402	851217	0.1	0.4	94	316		1.3
WI-DVA VETERANS HO	60411	402	781108	0.71	0.8	18	148	18	0.94
WI-DVA VETERANS HO	60411	403	781108	0.05		11	136	11	0.02
WI-DVA VETERANS HO	60411	403	810615	0.03	0.58	12	295	4	0.02
WI-DVA VETERANS HO	60411	403	801117	0.05	0.5	10	146	4	0.04
WI-DVA VETERANS HO	60411	403	850617	0.1	1	14	204	1.6	0.1
WI-DVA VETERANS HO	60411	403	800623	0.08	1.2	12	138	4	0.03
WI-DVA VETERANS HO	60411	403	840724	0.1	1.1	14	146	1.7	0.2
WI-DVA VETERANS HO	60411	403	791119	0.16	2.4	14	166	7	0.08
WI-DVA VETERANS HO	60411	403	821130	0.03	0.27	13	206	1	0.13
WI-DVA VETERANS HO	60411	403	790625	0.03	1.5	12	192	12	0.04
WI-DVA VETERANS HO	60411	403	860616	0.1	0.2	14	120	1.6	0.1
WI-DVA VETERANS HO	60411	403	861201	0.1	0.3	100	448	15	0.1
WI-DVA VETERANS HO	60411	403	830601	0.2	1.8	15	184	1	0.2

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FACILITY NAME	PERMIT NO.	WELL	DATE	NOX	ORG	CL	TDS	SO4	NH3
WI-DVA VETERANS HO	60411	403	841211	0.1	0.4	12	142	2.1	0.2
WI-DVA VETERANS HO	60411	403	820607	0.03			370	29	4.4
WI-DVA VETERANS HO	60411	403	870527	0.1	0.3	14	123	2.6	0.1
WOODVILLE VILLAGE	60097	601	840418	4.34	0.6	21	284	10	0.5
WOODVILLE VILLAGE	60097	601	851106	4.3	0.5	12	249	22	0.5
WOODVILLE VILLAGE	60097	601	870401	4.2	0.5	20	284	10	0.5
WOODVILLE VILLAGE	60097	601	860416	6.5	0.6	37	344	33	0.5
WOODVILLE VILLAGE	60097	601	841116	5.56	0.83	30	383	11	0.5
WOODVILLE VILLAGE	60097	601	840223	3.89	0.5	11	252	10	0.5
WOODVILLE VILLAGE	60097	601	850418	6.3	0.75	36	338	14	0.5
WOODVILLE VILLAGE	60097	601	861119	7.4	0.9	35	354	11	0.5
WOODVILLE VILLAGE	60097	602	840418	4.58	0.5	16	270	24	0.5
WOODVILLE VILLAGE	60097	602	860416	4	0.5	40	336	17	0.5
WOODVILLE VILLAGE	60097	602	840223	4.16	0.75	21	268	20	0.5
WOODVILLE VILLAGE	60097	602	861119	0.6	0.6	28	251	11	0.5
WOODVILLE VILLAGE	60097	602	841116	3.59	0.85	21	291	15	0.5
WOODVILLE VILLAGE	60097	602	870401	4.4	1	24	289	12	0.5
WOODVILLE VILLAGE	60097	602	851106	4.3	0.5	44	337	23	0.5
WOODVILLE VILLAGE	60097	602	850418	4.7	0.55	26	290	13	0.5
WOODVILLE VILLAGE	60089	802	870504	0.6	0.5	30	255	6	0.1
WOODVILLE VILLAGE	60089	802	870128	0.1	0.5	23		8	0.6