

# Wauconda Wastewater Treatment Plant NPDES Permit

## Table of Contents

Agency Decision .....	2
Hearing Record .....	3
Background of Permit Modification.....	4
Discharge History .....	4
Public Hearing.....	5
Coliform Bacteria .....	5
Disinfection Exemption Modification for Current Permit .....	6
Local Government Meeting – December 10, 2003.....	6
Response to Comments, Questions and Concerns	
1. NPDES Permit.....	7
2. Water Quality .....	13
3. Nutrients .....	15
4. Flooding Potential.....	17
5. Fiddle Creek Watershed .....	20
6. Endangered/Sensitive Fauna and Natural Resources .....	22
7. Alternatives to Discharge to Fiddle Creek .....	25
8. Private Wells, Local Recharge, Geology .....	27
9. Antidegradation Analysis .....	29
10. Stream Monitoring.....	34
11. Radium from Public Water Supply .....	35
12. Wauconda Sand and Gravel Superfund Site .....	37
Acronyms.....	40
Distribution of Responsiveness Summary .....	41
Who Can Answer Your Questions .....	41

**ILLINOIS ENVIRONMENTAL PROTECTION AGENCY**

IN THE MATTER OF: )  
WAUCONDA WASTEWATER TREATMENT PLANT )  
APPLICATION FOR NPDES PERMIT MODIFICATION )  
FOR EXPANSION ) File #395-03  
PERMIT NUMBER IL0020109 )

**AGENCY DECISION**

On August 23, 2004, the Illinois Environmental Protection Agency (Illinois EPA or Agency) approved the Wauconda National Pollutant Discharge Elimination System (NPDES) permit modification for expansion of the wastewater treatment plant. Permit Number IL0020109 has an expiration date of November 30, 2005.

After receiving comments and conducting further studies, the following changes were made to the draft permit to further protect the environment:

- The permit issued in November 2000 contained a condition requiring the village of Wauconda to evaluate and report on the appropriateness of a federal pretreatment program. Wauconda produced the information and the U.S.EPA advised the Agency that Wauconda was not required to develop a pretreatment program. In December 2003, this condition was removed from the permit. However, the Agency has required annual submission of an updated industrial user survey so that the Agency and the U.S. EPA may have current information to reevaluate whether a pretreatment program is warranted in the future. The December 2003 modification also removed the disinfection exemption.
- The Agency included nutrient control requirements in the permit in the form of a monthly average phosphorus concentration of 1 mg/L effective upon completion of the phase 1 expansion. This provides additional assurance that the expanded discharge will be protective of water quality.
- The Agency added a special condition to the permit to study the dissolved oxygen profile of Fiddle Creek and the possible effects of nutrients downstream from the outfall. The study includes monitoring before and after the plant expansion and includes evaluation of the effectiveness of phosphorus removal equipment once it is installed. The purpose of the study is to further characterize the conditions of Fiddle Creek. It will provide information to confirm the adequacy of the permit conditions. The study condition enables the Agency to reopen the permit and add additional controls if warranted.
- Dissolved oxygen (DO) limits have been added to pages 3 and 4 of the permit for the expanded facilities.

## HEARING RECORD

Due to circumstances beyond Agency control, the required public hearing notice was not published in the local newspaper with the result that the hearing originally scheduled for August 26 was changed to Tuesday, September 9, 2003. Beginning July 25, 2003, the entire public hearing notice was published thrice (July 25, August 1 and 8) in the *Wauconda Leader*. The public hearing notice was mailed on July 23, 2003, to persons on a service list maintained by the Illinois EPA. The notice was mailed to local legislators, county and municipal officials, environmental organizations and interested citizens. The public hearing notice was posted on the Illinois EPA website, <http://www.epa.state.il.us>. *Prairie Rivers Network* carried the public hearing notice on their listserv. Residents near the treatment discharge point at Fiddle Creek helped promote the public hearing through distribution of fliers, posting of signs and on their website at [www.savefiddlecreek.com](http://www.savefiddlecreek.com). The public hearing was announced in the *Wauconda Leader* (8-1-03), *Waukegan News Sun* (8-8-03), *Daily Herald* (8-8-03), *Barrington Courier-Review* (8-14-03), *Wauconda Leader* (8-15-03) and the *Waukegan News Sun* (9-7-03). The Illinois EPA prepared and mailed an issue information fact sheet on September 5 to all persons for whom the Agency had a mailing address.

The public hearing was convened on Tuesday, September 9, 2003, at 6:30 p.m. in the Wauconda Township Hall, 505 West Bonner Road, Wauconda. Due to the large number of participants, the hearing was recessed and moved to the Wauconda High School on North Main Street. An Illinois EPA representative remained at the township hall until 8 p.m. to direct participants to the high school. An announcement and map with directions to the high school was also posted on the township hall door. Two hundred persons representing municipalities, news media, citizens, consultants, county officials and environmental interests attended the hearing. A court reporter prepared a transcript of the public hearing which was posted on the Illinois EPA website on October 8, 2003. Newspaper articles about the hearing were printed in the *Daily Herald* (9-10-03), the *Barrington Courier-Review* (9-11-03) and the *Wauconda Leader* (9-12-03).

The hearing record was scheduled to close on October 9, 2003, but because of the great interest expressed by members of the public and local officials, Illinois EPA Director Renee Cipriano extended the hearing record until October 31, 2003. The hearing record extension was published on the Agency website and in the *Waukegan News Sun* (10-13-03).

While the hearing record was open, the Agency recorded 53 exhibits.

## **BACKGROUND OF PERMIT MODIFICATION**

The village of Wauconda, 101 North Main Street, Wauconda, in Lake County, Illinois, proposes to expand the existing treatment plant design average flow discharge of 1.4 million gallons per day (MGD) to 1.9 MGD during phase 1 and to 2.4 MGD in phase 2. The design maximum flow will increase from 4.0 MGD to 5.963 MGD (phase 1) and then to 7.93 MGD (phase 2). The treatment plant at 302 Slocum Lake Road will continue to discharge into Fiddle Creek (at North Anderson Road) which is classified as a general use stream and eventually connects to the Fox River. The need for expansion is based on projected growth in the community.

The Illinois EPA has made a determination to modify the existing NPDES permit for discharge into waters of the state in accordance with 35 Ill. Adm. Code Subtitle C (*Water Pollution*) and the federal Clean Water Act.

## **DISCHARGE HISTORY**

The Wauconda WWTP originally discharged to Bangs Lake Drain Creek (sometimes called Slocum Creek), which flows into Slocum Lake, exits through the Slocum Lake Drain and joins the Fox River. Beginning in the mid 1970s, however, it was evident that the WWTP discharge was causing high levels of phosphorus in Slocum Lake. In 1977, the Illinois Pollution Control Board (Board) granted Wauconda a variance from the phosphorus standard in order to have time to resolve the problem. In 1983 the Board terminated the variance, whereupon the discharge was moved away from Slocum Lake to its present location in Fiddle Creek. (Fiddle Creek has previously been designated in Wauconda's NPDES permit and other Illinois EPA documents as "an unnamed tributary to the Fox River" or "Wauconda Creek;" however, the permitted discharge point has been the same since 1983).

Fiddle Creek is a complex combination of wetlands and manmade drainage ditches adjacent to the Saddlewood, Lakewood and Twin Farm Subdivisions. According to the drainage district, the ditch was dug about 1905. Additional work was done in 1960 and 1997. Ostensibly, the original purpose of the drainage district was to drain the wetlands for agricultural development. The Lake County Forest Preserve District (LCFPD) owns 2,600 lineal feet of Fiddle Creek which constitutes the northern boarder of the 517-acre Fox River Preserve. The creek joins Slocum Lake Drain before entering the Fox River just south of Fox River Valley Gardens. Distance from Wauconda outfall at Anderson Road to the Fox River is approximately 2.4 miles.

## **SEPTEMBER 9-10, 2003, PUBLIC HEARING**

Hearing Officer Mike Roubitchek opened the hearing September 9, 2003, at 6:30 p.m. in the Wauconda Township Hall, recessed the hearing, then reconvened in the Wauconda High School.

Attorney Lisa Moreno discussed the relevant issues.

Illinois EPA Permit Engineer Don Netemeyer explained the NPDES permit.

Comments and questions were received from the audience.

Hearing Officer Mike Roubitchek closed the hearing on Wednesday, September 10, 2003, at 1:15 a.m.

Illinois EPA personnel were available before, during and after the hearing to meet with elected officials, news media and concerned citizens.

### **COLIFORM BACTERIA**

Coliform levels can vary dramatically based on the time of day a sample was taken, sunlight, the time of year, environmental factors, wildlife populations and human disturbances. Sources of coliform in Fiddle Creek may include the WWTP discharge, septic tanks, domestic animals and wildlife. Fecal coliform levels will usually rise after a rainfall event because the rain washes animal waste from the adjoining watershed into the creek.

For example, on July 24, 2003, Illinois EPA collected water samples in Fiddle Creek upstream from the treatment plant and at the WWTP outfall pipe itself, with the following results for fecal coliform (upstream to downstream):

- 1) approximately 600 feet upstream of the WWTP outfall-- 10,000 colonies/100 mL;
- 2) approximately 75 feet upstream of WWTP outfall-- 2100 colonies/100 mL;
- 3) at the WWTP outfall pipe-- 50 colonies per 100 mL.

## **DISINFECTION EXEMPTION MODIFICATION FOR CURRENT PERMIT**

Since 1990, the Wauconda WWTP has had a year-round disinfection exemption from treating wastewater discharged to Fiddle Creek. At the September 2003 public hearing and ensuing open record on the NPDES modification for expansion, the Agency received numerous comments and letters on the disinfection topic. On November 13, 2003, the Illinois EPA issued a press release announcing that Wauconda had requested termination of its current disinfection exemption. The NPDES notice of modification was published for 30-day review on November 28, 2003. On December 30, 2003, the Agency approved the modification of the NPDES permit that withdraws the year-round disinfection exemption. This approved modification is separate from the modification to expand the treatment capacity of the Wauconda WWTP.

## **WAUCONDA WASTEWATER LOCAL GOVERNMENT MEETING**

On December 10, 2003, Illinois EPA Director Renee Cipriano hosted a meeting in Mundelein, Illinois. The 33 participants represented:

- Barrington Area Council of Governments
- Village of Lake Barrington
- Cuba Township
- Lake County Forest Preserve District
- Village of Wauconda
- Village of Island Lake
- Wauconda Township
- Lake County Board
- Stormwater Management Commission
- Slocum Drainage District
- Lake County Health Department
- Illinois EPA

This gathering of local governments was suggested during the NPDES public comment period. This meeting provided an additional forum for officials to discuss environmental concerns that were pertinent to the wastewater treatment plant expansion permit modification and the Fiddle Creek watershed.

## RESPONSE TO COMMENTS, QUESTION AND CONCERNS

### 1. NPDES PERMIT

1. Special Condition number five specifies that “The effluent alone or in combination with other sources, shall not cause a violation of any applicable water quality standard outline in 35 Ill. Adm. Code 302.” Despite this condition, the NPDES permit contains no stream monitoring requirements. The NPDES permit should require Wauconda to monitor Fiddle Creek.

**Data obtained by neighboring parties and made available to the Agency during the Public Comment period suggest that at times the stream experiences dissolved oxygen concentrations below the currently applicable state water quality standard. This information is limited; the extent to which it is representative of normal stream conditions and its relationship to the Wauconda discharge is unknown. To address this matter fully, the Agency is adding a special condition requiring the facility to collaborate and participate in cooperation with the Agency in a study to characterize the dissolved oxygen profile and study possible nutrients impacts in Fiddle Creek in the vicinity and downstream of Outfall 001 before and after the expansion. The Wauconda permit will contain a re-opener clause to allow additional controls upon the facility operation should there be an ongoing dissolved oxygen problem attributable either partially or wholly to the Wauconda discharge. While it is possible that additional flow from this facility may actually be beneficial to the DO regime of the system, this matter will be evaluated in concert with the additional required monitoring.**

2. The Agency sent out a letter to the regulated community in July 2002 explaining the requirements of Part 302.105(c)(2)(B). Attachment A to this same letter specifically requires the discharger to address compliance with the Illinois Groundwater Protection Act and a discussion of the impact of the project on the receiving water. Wauconda has not met these requirements.

**Please refer to Section 8. PRIVATE WELLS, LOCAL RECHARGE, GEOLOGY.**

3. Wauconda receives industrial waste streams from a variety of industries. Many of the constituents that are going into the treatment facility are not being tested for. There are volatile organic compounds, semivolatiles, base neutral acids (BNAs), metals, phenols, oils, grease, BOD, COD, TSS, boron, radium and radon. Wauconda should be required to test for these substances.

**On July 31, 2000, the Agency analyzed the data that the Wauconda STP was required to provide that included: arsenic, barium, cadmium, chromium (hexavalent), chromium (total), copper, cyanide (WAD), cyanide (total), fluoride, iron (total), iron (dissolved), lead, manganese, mercury, nickel, oil, phenols, selenium, silver and zinc. In addition, the Agency collected four additional samples for some of the above parameters and also sampled: magnesium, potassium, beryllium, cobalt, strontium, calcium, sodium, aluminum, boron and vanadium. These parameters are selected based on potential for contaminants to pass through the treatment process and be discharged in the effluent. The Agency performed these analyses to determine if any of the above parameters had a reasonable potential to exceed water quality standards. As a result of these analyses, only copper was identified as having a reasonable potential to exceed water quality standards and therefore a copper discharge limit was included in the permit as a water quality standard. All of the other parameters did not have a reasonable potential to exceed water quality standards, therefore, no monitoring beyond the routine monitoring is appropriate. The permit requires routine monitoring of metals twice prior to the expiration of the permit. This practice is consistent with recommended federal guidance.**

**The proposed NPDES permit also requires routine monitoring of CBOD, TSS, and copper. Monitoring for organic compounds is not usually required at this type of facility. Potential for these substances to be found in the effluent is remote.**

4. Were communities downstream of the outfall notified of the public hearing?

**In July 2003, the public hearing notice was mailed to the Lake County Board Chairman and State's Attorney, Congressman Mark Beaubien, Senator Bill Peterson, Fox River Grove, Fox River Valley Gardens, Hawthorn Woods, Island Lake, Lake Barrington, North Barrington, Tower Lakes, Wauconda, the townships of Wauconda and Cuba, Slocum Lake Drainage District, the Northeastern Illinois Planning Commission, the Lake County Forest Preserve District, the Lake County Health Department and to over 100 concerned citizens. Information about the permit hearing was published in at least five local newspapers prior to September 9, 2003.**

5. How can the Illinois EPA decision on this permit be appealed?

**The Illinois Environmental Protection Act (Act), 415 ILCS 5/1 et. seq., sets forth two types of appeals regarding NPDES permits. Section 40(a) of the Act, 415 ILCS 5/40(a), provides that the applicant may appeal the Illinois EPA's decision, to deny or to grant a permit with conditions, by filing a petition with the Board within 35 days after the date on which the Illinois EPA serves its decision on the applicant. Section 40(e) of the Act, 415 ILCS 5/40(e), provides that third parties may initiate an appeal of the permit by filing a petition with the Board within 35 days of the date of issuance of the Illinois EPA's decision. The third party petition must include: (1) a**

**demonstration that the petitioner raised the issues during the public notice period, the comment period or during the public hearing for the NPDES permit; and (2) a demonstration that the petitioner will be impacted by the permitted facility. Both types of appeals are governed by the procedural rules set forth in 35 Ill. Adm. Code 105, available at [www.ipcb.state.il.us](http://www.ipcb.state.il.us).**

6. Special condition 11 of the NPDES application requests information on the industrial survey. Question F-12. Remediation Waste. “Does the treatment works currently or has it been notified that it will receive waste from remedial activities?” Wauconda answered N/A. Are there criminal penalties for filing a false NPDES application?

**Yes. Section 44(j)(4) and (5) of the Act, 415 ILCS44(j)(4) and (5) provides that it is a Class A misdemeanor to knowingly make a false statement in an NPDES permit application. This section sets out criminal penalties. Civil penalties are also statutorily available.**

7. If as a result of public input, the Agency makes changes to the permit, will the Agency conduct another public hearing?

**Subsequent to the public hearing the Agency conducted follow-up meetings with various parties to clarify issues raised at hearing, solicit additional technical data and professional expertise. Parties contacted included technical professionals from various state and local government agencies as well as the permittee and its technical consultants. Consultation was sufficient to provide information necessary to accurately address all issues raised during public participation and allow proper final action on the permit.**

8. Suspended solids can impair any type of UV disinfection system. Furthermore, small amounts as low as 0.03 ppm of iron and 0.05 ppm of manganese will cause staining of the quartz sleeves that enclose the UV bulbs further reducing its usefulness.

**The permit requires disinfection of the discharge irrespective of selected technology. The permit further contains a dechlorination requirement should the village select chlorination as the technology to disinfect.**

9. The proposed UV system will be in addition to the standard chlorination of wastewater. Chlorination will not eliminate suspended solids. If a UV disinfection system is installed, the Illinois EPA should tighten the permit standards to require that the discharged water is clear.

**Currently the system disinfects by chlorination. The proposed expansion will utilize UV technology. The system must be sufficient to consistently meet permit limits with whatever special design features or backup chlorination capabilities are necessary.**

10. On page 10 of the NPDES application, vinyl chloride is listed with an asterisk. The asterisk indicates “not believed to be present.” This is contrary to the Conestoga-Rovers report on the Wauconda landfill.

**On September 18, 2003, Wauconda sampled their influent and effluent for organics. Most organic parameters in the influent (including vinyl chloride) were not detected. All organic parameters in the effluent (including vinyl chloride) were not detected. The Agency also sampled the effluent on June 21, 2004. Only one organic compound, Bis (2-ethylhexl) phthalate, was detected and it was well within the acceptable human health and aquatic life criteria.**

11. The Illinois EPA, in granting this permit, is also aiding and abetting the violation of Lake County and Wauconda zoning ordinances which state that a property owner cannot in any way divert water from their property to other properties. Wauconda still insists on sending its water outside the village, no matter what its quality. I urge the Illinois EPA to amend the modified NPDES permit, and require Wauconda to keep its treated effluent inside village limits.

**The approval of an NPDES permit does not relieve the applicant from the obligation of complying with any applicable federal, state, county, township or community regulations. The Wauconda WWTP pipe discharges onto property within the village of Wauconda.**

12. Recent legislation allows the Illinois EPA to consider previous violations in order to deny a permit. How will Wauconda’s previous violations affect the Illinois EPA review of the permit modification?

**The NPDES permit as issued will ensure compliance with the Act and applicable regulations. Senate Bill 1379 amended Section 39(a) of the Act, 415 ILCS 5/39(a), to provide that the Illinois EPA may consider prior adjudications of non-compliance with the Act by the applicant where the violations involved a release of a contaminant into the environment. The Illinois EPA may impose reasonable permit conditions specifically related to the applicant's past compliance history. The conditions must be necessary to correct, detect or prevent non-compliance. Effluent limitations are established pursuant to Section 39(b) of the Act, 415 ILCS 5/39(b).**

13. The permit modification should be denied because the WWTP cannot control odors from the plant. Both the Wauconda middle and grade schools are located only about one block

from the WWTP. On some days the smell is so bad that children vomit and have to be sent home.

**The Agency is aware of the odor problems in general. Odor management is a common operational consideration at all municipal wastewater treatment facilities. The Agency routinely addresses odor control through both the design and operational aspects of each facility and is doing so in this case. Plant expansions and upgrades provide an opportunity to address known chronic odor sources that may be attributable to design limitations of the current facility. To minimize odor from the facility, sludge storage tanks and a portable belt press are used instead of the drying beds. This should limit the odor coming from the plant to the infrequent times when the belt press process is occurring.**

14. The village of Lake Barrington requested the Illinois EPA to continue the public comment period for a minimum of 60 days after the hearing.

**The comment period was extended and additional communication relative to status of issues raised during public comment period and continuation of Agency review has been provided to various local entities, including Lake Barrington.**

15. The WWTP should be monitored on a more stringent schedule by an independent agency; no self-monitoring.

**Consistent with the design and intent of the NPDES program under federal law, facility compliance is monitored and assured by a combination of self-reporting and independent oversight by the state designated NPDES authority, IEPA.**

16. A physical barrier should be required to prevent the WWTP from ever discharging into the Bang's Lake Drain which flows to Slocum Lake.

**Discharge from this facility is not tributary to Slocum Lake, even under high flow or flood conditions of Fiddle Creek.**

17. The NPDES permit should require a 50 percent reduction for fecal coliform.

**Effective December 30, 2003, the Agency required the wastewater treatment plant to disinfect its effluent. The disinfection results in coliform levels significantly lower than those referenced in the question.**

18. On September 19, 2000, Wauconda adopted an ordinance establishing a Pretreatment Program. It has completed a survey and compiled a list of the non-residential users in the

village. However, it appears that Wauconda has not implemented and enforced the program. The proposed modifications to the NPDES permit should include provisions for Wauconda to provide monthly reports to the Agency, demonstrating its compliance with its Pretreatment Program. Recent events at the treatment plant, including a spill from the plant digester, have demonstrated an urgent need to implement an approved Pretreatment Program consistent with 35 Ill. Adm. Code Part 310.

**In a letter dated August 3, 2001, it was the United States Environmental Protection Agency's determination that a Pretreatment Program consistent with 35 Ill. Adm. Code Part 310 was not warranted at this time. However, the intermediate permit modification of December 30, 2003, Special Condition 8 was modified for the permittee to update Wauconda's industrial survey on a continuing basis with annual submission to this Agency.**

19. The hearing officer indicated that he was unable to compel Wauconda to answer questions at the hearing. This decision, the failure to take testimony under oath and the refusal to permit any cross-examination violated the procedural due process of the residents.

**This is an informational hearing under the NPDES regulations with no specific mandated participation by the applicant. It is a hearing on the Agency's proposed action. However, based upon the hearing and comments, the Agency requested further information from the applicant, which the applicant provided. Based upon the information, the Agency included its final permit conditions.**

## 2. WATER QUALITY

1. Wauconda should improve their wastewater treatment facility in order to comply with the water quality standards already required by the existing NPDES permit. This warrants action regardless of the modified NPDES Permit being issued by Illinois EPA.

**The Agency certainly agrees with and allocates significant staff and other resources to both assist and oversee high quality operation and compliance of all permitted facilities in Illinois. This includes a professional operators certification program requirement contained within the Wauconda permit as Special Condition 2.**

2. The sole water quality data referenced in the 2003 antidegradation assessment is a September 15, 1993, facility stream survey by the Illinois EPA. This survey found “fair environmental conditions in Wauconda Creek with minor impact from the Wauconda STP (sewage treatment plant) discharge.” This survey identified elevated levels of conductivity, nitrate plus nitrite, phosphorus, sodium, potassium, boron, strontium, and oil, downstream of the Wauconda outfall. Despite the Agency findings, not one of these contaminants was evaluated under the antidegradation assessment.

**These parameters were determined to be elevated compared to concentrations upstream of the discharge. The concentrations of these parameters, as measured in the effluent of the Wauconda discharge were typical of domestic wastewater throughout the state. These parameters did not violate water quality standards and there is no reason to believe that an increased discharge will increase the concentration of these parameters. The increase was slight and well under levels that would suggest environmental or public health significance.**

3. It was stated that these CBOD limits in the draft permit are the lowest legally possible. That is simply false as a matter of law. Under 40 CFR 144, there shall be no discharge which may cause or contribute to a violation of state water quality standards. If this discharge of CBOD will cause or contribute to a violation of the state dissolved oxygen limits, the Agency is required to set it as low as is necessary to avoid that violation of the dissolved oxygen standard. And if that’s two or three, that’s too bad for Wauconda. They have to meet that limit to avoid the violation of state water quality standards.

**The antidegradation assessment correctly stated that “Biochemical oxygen demand (BOD) permit limits will be set at the most stringent effluent standards present in 35 Ill. Adm. Code 304.120.” The Agency could lower the permit limit if it otherwise would “cause or contribute to a violation of water quality standards.” However, the Agency has determined that lowering the NPDES permit limits is not necessary for this discharge since it is believed that this effluent will not cause or contribute to a violation of water quality standards. Should the supplemental stream monitoring**

**specified in Special Condition 17 identify any additional controls or restrictions appropriate for this facility the permit will be re-opened accordingly.**

4. Because state and federal regulations require that no permit be issued if the discharge will cause or contribute to a violation of water quality standards, this permit may not be issued.

**This statement alludes to the alleged violation of the DO water quality standard. This permit will continue to regulate BOD and ammonia, which are both indicators of oxygen using contaminants. The permit will also include DO limits. The Agency believes that these requirements will ensure that the effluent will not cause or contribute to water quality violations. In addition, the Agency has incorporated a monitoring condition in the permit as issued.**

### 3. NUTRIENTS

1. If the Illinois EPA were to issue a modified NPDES permit for increased effluent discharge, we recommend that the Illinois EPA add nutrient (phosphorus and nitrogen) monitoring in the modified permit, incorporating this into Pages 2, 3 and 4 of the modified permit and Special Condition 6A.

**There is an existing program for sewage treatment plants to monitor for phosphorus and nitrogen. These facilities were chosen in order to gather data on the current discharge of nutrients at a variety of sizes and types of plants. The Agency does not believe that additional data collection from this facility will further the data gathering needs of the Agency. However, the NPDES permit will have a phosphorus limit of 1.0 mg/L as a monthly average and appropriate phosphorus monitoring to demonstrate compliance.**

2. If Fiddle Creek remains the discharge location the expanded plant after a thorough analysis of alternatives, then under both the impaired waterway regulations and antidegradation regulations the following should be added:
  - a. Limit the pounds per day of TSS, BOD<sub>5</sub> and ammonia to the limits contained in the existing NPDES permit (e.g., no net increase), and
  - b. Require full phosphorus and total nitrogen removal.

**The receiving stream for this facility is not on the current Section 303(d) list of impaired waterways. The Agency does not believe that limiting the pounds per day of TSS, BOD<sub>5</sub> and ammonia is warranted in this instance. The antidegradation assessment concluded that an increase in BOD/TSS loading would not result in diminished use of the receiving stream. The NPDES permit will have a phosphorus limit of 1.0 mg/L as a monthly average and appropriate phosphorus monitoring to demonstrate compliance.**

3. The antidegradation assessment states that nutrients are deferred until “state standards” are adopted. The analysis goes on further to note that “some fraction of the phosphorus will be absorbed by the biota. The remaining phosphorus will remain in the stream continuum.” Fiddle Creek discharges into the Fox River in a segment identified by Illinois EPA as DT22. This 8.15 mile stretch of the Fox is identified as impaired due to the following causes, among others: nutrients, inorganic nitrogen (nitrates), siltation, pathogens and suspended solids. Allowing Wauconda to increase the level of nutrients discharged will adversely affect the Fox River.

**The Section 303(d) list identifies nutrients and specifically inorganic nitrogen (nitrates) as a cause of impairment. It does not list phosphorus as a cause of impairment. After review of the distance from the impaired section of the Fox River and the size of the discharge, the Agency has concluded that the increased discharge**

**will not have a significant impact on the Fox River. Further, after the expansion is complete with the phosphorus removal requirements in the permit, a net reduction of phosphorus loading will occur.**

4. Data presented by the consultants indicate excessive concentrations of nutrients in Fiddle Creek. The presentation at the hearing by the village of Wauconda further indicated a nutrient problem, when the representatives mentioned that the total suspended solids concentration was very high in their instream samples due to an algal bloom. This testimony suggests that the Wauconda WWTP is contributing to a violation of the narrative standard against offensive conditions in Fiddle Creek. Furthermore, many of these nutrients would persist instream and contribute to the existing nutrient impairments in the Fox River.

**Based on the data provided by Huff and Huff, Inc., V3 and Bonestroo Devery & associates, it appears that daily oxygen concentrations vary widely, suggesting that algal populations in Fiddle Creek are moderate or higher than some other northern Illinois streams. This is a common occurrence in many streams that pass through wetlands or exhibit physical and habitat characteristics typical of a wetland environment. None of the studies were sufficient to: a) fully characterize the daily oxygen profile; b) determine whether it was indicative of a healthy or deteriorated wetland/stream environment; c) attribute the conditions to Wauconda's discharge; or d) any other influence upon the system. Additional monitoring will be required of Wauconda through Special Condition 17 of the permit as issued and through a reopener clause supplemental controls will be applied if appropriate.**

5. Fiddle Creek should be identified as an impaired waterway for nutrients, both phosphorus and nitrates plus nitrites, organic enrichment (low DO) and for pathogens (fecal coliform). Once identified, then the federal regulations for impaired waterways must be followed.

**The Agency disagrees with the comment and has not listed Fiddle Creek as impaired. While information brought to the Agency as part of this permitting activity warrants and will be given additional follow up attention, the Agency has not concluded at this time that Fiddle Creek is in an impaired condition. In light of the physical and habitat nature of the system, it is presumptive to assert impairment and particularly presumptive to attribute specific chemical constituents and bacterial concentrations as causes of impairment.**

6. Fiddle Lake is shown on the 1861 map. Doesn't that make it a naturally occurring waterway that should be granted 303(d) status?

**Fiddle Creek's status as a natural or modified drainage system is not a factor in determining impairment status. See answer to previous question.**

## 4. FLOODING POTENTIAL

A number of local citizens have expressed concerns that the increased discharge will have an impact on the flooding potential of Fiddle Creek and the marsh area. It is the Agency's opinion that during periods of heavy precipitation, the discharge from the WWTP would be minimal when added to the multi-millions of gallons of floodwaters in Fiddle Creek. Furthermore, issues of water quantity and flooding potential come under the jurisdiction of the Lake County Stormwater Management Commission (SMC). The Agency understands from a letter dated June 13, 2003, from the Executive Director of the Lake County SMC that Wauconda has applied for a watershed development permit for the proposed additional effluent discharge and floodplain construction within Fiddle Creek, and that the related engineering analysis would demonstrate adequate downstream capacity and would be tied to the Flood Insurance Study. Also, the Agency understands that Wauconda will work with the SMC wetland specialist on the design of the outfall so that the additional effluent discharge could potentially improve the functionality of the receiving stream and wetland.

1. The stimulated plant algal growth along Fiddle Creek has impeded the carrying capacity of the creek during flood conditions. While this flooding does not impact Wauconda, it impacts the downstream communities.

**“Eighty of the 180 homes in the Williams Park subdivision, located on the southern shore of Slocum Lake, were built in the floodplain of the lake. As a result, the subdivision has been flood-prone for decades. Beginning in 1999, the Lake County SMC and the Federal Emergency Management Agency pooled grant funding to initiate a voluntary buyout of the flood-prone homes. Twenty-four homes were purchased and demolished during the initial \$2 million phase from 1999-2000, and the demolition of 23 additional homes at a cost of \$1,780,000 occurred in 2001. Under terms of the grant funding obtained for the project, vacant properties must remain deed-restricted as open space in order to alleviate some of the flood problems for the remaining properties.” (2001 Summary Report of Slocum Lake prepared by Lake County Health Department.) It is unfortunate that homes south of Slocum Lake were built in a flood plain. The Agency encourages all parties to continue to remove homes from flood prone areas and to discourage future building in such areas.**

2. Wauconda should work with the Slocum Lake Drainage District in maintaining the carrying capacity of this waterway and financially supporting the maintenance program.

**It is not within the authority of the NPDES program to require Wauconda to financially support the maintenance program of the Slocum Lake Drainage District. As noted in the introductory paragraph for FLOODING POTENTIAL, the Lake County SMC has jurisdiction of water quantity and flooding issues. The Agency understands that Wauconda has applied for a watershed development permit for the proposed additional effluent discharge and floodplain construction within Fiddle Creek.**

3. What effect would a worst-case scenario of a 100-year flood plus an 8 million gallon per day discharge have on the Fiddle Creek watershed and nearby residents?

**The Bonestroo, Devery & Associates, Facility Planning Report Update of March 2002, includes Attachment E, “Hydrologic/Hydraulic Evaluation of Discharge from Watershed Treatment Plant Expansion on Fiddle Creek.” Table E-1 predicts that during a 100-year storm, the addition of 7.93 MGD plus WWTP overflows would increase the surface water elevation in the vicinity of the Saddlewood Subdivision residences by 0.03 feet (less than ½ inch). In response to comments, Bonestroo, Devery & Associates, performed a more extensive evaluation of the hydraulic model. The addition of 7.93 MGD during a 1-year 12-hour storm event would increase the water elevation in the vicinity of the fen by 0.22 feet (2.88 inches).**

4. A resident from Lakeland Estates reportedly commented that part of his lot was under water for two years.

**Maps provided by Lake County SMC show that Lakeland Estates property owners adjacent to Fiddle Creek own part of the adjoining wetlands. Wetlands by definition are wet.**

5. The proposed increase in flow to Fiddle Creek from 1.4 million gallons per day (MGD) to 7.93 MGD is significant. We do not believe that Wauconda has adequately demonstrated that the receiving waters have sufficient hydraulic capacity to accept this increased flow without contributing to flooding of downstream segments during wet weather flows. The village needs to consider the possibility that, under these conditions, flood waters may become contaminated with inadequately treated wastewater.

**As mentioned in the BACKGROUND OF PERMIT MODIFICATION on page 4, the current facility has a design average flow of 1.4 MGD and will expand to 1.9 MGD during phase 1 and to 2.4 MGD in phase 2. The design maximum flow will increase from 4.0 MGD to 5.963 MGD during phase 1 and to 7.93 MGD in phase 2. As noted in question 3 of this section, according to the hydraulic modeling, the addition of 7.93 MGD during a 1-year 12-hour storm event would increase the water elevation in the vicinity of the fen by 0.22 feet (2.88 inches).**

6. Wauconda should provide appropriate documentation, such as Federal Emergency Management Administration (FEMA) flood maps identifying the flood plain and flood prone areas. Wauconda should also conduct a risk assessment to determine the potential risk to public health under wet-weather conditions. Because downstream wetlands would be affected by a wet-weather flow increase, the village should include U.S. Army Corps of

Engineers or Lake County Advance Identification maps to delineate sensitive wetland areas.

**The Lake County SMC has prepared FEMA flood maps and Advance Identification maps and continues to work with Wauconda.**

## 5. FIDDLE CREEK WATERSHED

1. Is there an upstream to Fiddle Creek east of Anderson Road?

**According to the Illinois State Geological Survey Barrington and Wauconda topographic maps, the present Fiddle Creek drainage extends approximately one mile east of Anderson Road. The Bonestroo, Devery & Associates, Facility Planning Report update of March 2002, includes Attachment E, "Hydrologic/Hydraulic Evaluation of Discharge from Wastewater Treatment Plant Expansion on Fiddle Creek" includes a letter dated March 5, 1991, stating that the watershed area upstream of Anderson Road (east) was determined to be 0.45 square miles.**

2. Can the Illinois EPA allow discharge of effluent to a wetland without approval from the Corps of Engineers?

**The Agency sends a request to the Corps of Engineers for an evaluation on every application that the Agency receives. The Agency requested this evaluation on May 19, 2003 and has received no comment from the Corps of Engineers. The Corps of Engineer's involvement is limited to determination of impacts to navigation and anchorage.**

3. The area has abundant Indian archeological artifacts and the University of Wisconsin has done excavation in the Fiddle Creek wetlands area (the Lake Barrington area has had a wealth of Indian artifact discoveries). Will unfound sites be either washed away or covered in sediment with the additional discharge?

**According to the report from Bonestroo Devery and Associates, the increase discharge volume will result in a relatively small incremental increase in flow elevation in the receiving stream. This negligible increase should have a minimal, if any, impact on archeological artifacts in and around Fiddle Creek and associated wetlands.**

4. There are all kinds of wildlife that call the wetlands their home including deer, turkey, coyote, egrets and herons. What will the increased outflow and toxins do to their habitat?

**No effect is expected from the expansion authorized in this permit upon the wildlife inhabiting the area. During low flow stream conditions there may be some slight beneficial effect to local wildlife.**

5. Wauconda should find another place to discharge wastewater, such as the Fox River, that will not threaten the health and safety of residents, threaten our aquifers or degrade the environment.

**The Illinois EPA does not have the authority to designate a specific discharge location. The Agency is required to review the application submitted for compliance with applicable regulations. Please refer to Section 8 PRIVATE WELLS, LOCAL RECHARGE, GEOLOGY for further information on groundwater. Please refer to Section 7 ALTERNATIVES to DISCHARGE to FIDDLE CREEK for information on the alternatives that were evaluated, including a direct discharge to the Fox River.**

6. The Illinois EPA should post the entire Slocum subwatershed which is downstream of Anderson Road as a health hazard.

**The Agency reiterates its willingness to assist the Lake County Health Department in addressing potential health issues within the Slocum area. However, not only is declaration of a health hazard beyond Agency authority, assertion of such a condition is unfounded.**

7. The expansion permit should be reviewed as a watershed issue and not simply as the expansion of a treatment plant.

**The Agency has repeatedly committed to work with local officials and organizations desiring to create a watershed plan.**

8. Fiddle Creek no longer meets the exemption requirement of 35 Ill. Adm. Code Part 378. Fiddle Creek should be considered “protected water” as described in 35 Ill. Adm. Code 302.209(a)(2).

**Although Wauconda has been disinfecting its discharge for a long time, that practice became an enforceable permit requirement in January 2004.**

## 6. ENDANGERED/SENSITIVE FAUNA and NATURAL RESOURCES

1. The wetlands on LCFPD property include a fen. Fen communities evolve under unique alkaline conditions provided by soils and groundwater. Our preliminary survey found 64 native species in the complex. It is relatively high quality and many species are regionally rare, such as Swamp Thistle, Royal Fern and Swamp Saxifrage. The increased effluent flow rate (in Phases 1 and 2) will cause bank full flow events in Fiddle Creek to occur more frequently than existing conditions. This will increase nutrient loads to the wetland complex, potentially adversely affecting the integrity of the wetland complex. Increased nutrient loading to the wetland may allow competitively aggressive species, such as reed canary grass, cattails and phragmites, to expand in coverage at the expense of more rare species currently found on the property. Wauconda should prepare an ecological risk assessment to evaluate the effects of increased flows, groundwater changes and higher nutrient wasteloads on the wetland communities of the LCFPD property before a modified NPDES permit is issued by Illinois EPA.

**The Agency consulted with the Department of Natural Resources (IDNR) on the wetland issue including the fen. The IDNR had two comments/concerns for the wetland/fen issues. Their first concern was the adverse effects of nutrient loading, especially phosphorus. This issue was addressed by including a phosphorus limit and supplemental stream assessment in the NPDES permit, which will reduce nutrient loading to the wetland. Their second concern was the effects of hydraulics in the area of the fen. The Agency asked Bonestroo Devery & Associates to assess the impacts of the expanded facility. The supplemental information was provided on June 3, 2004. In compiling the input data for the preliminary hydraulic/hydrologic model, it was noted that the flood insurance study for the Slocum Lake Drain, which has a confluence with Fiddle Creek 1500 feet upstream of Roberts Road, has a backwater elevation from the Fox River that would cause an out-of-bank condition on the east-west leg of Fiddle Creek at the 10-year flood frequency even if there were no discharge into Fiddle Creek. The HEC-1 model along with a water surface profile determination using HEC-RAS, indicates that during a normal dry weather day, when Fiddle Creek is conveying primarily the wastewater treatment plant effluent, an out-of-bank condition does not occur for either the current flow conditions or proposed conditions. The analysis included five scenarios:**

- i) no discharge from the WWTP,
- ii) discharge from the WWTP at the current Design Average Flow (1.4 Million Gallons per Day (MGD)),
- iii) discharge from the WWTP at the existing Design Maximum Flow (4.0 MGD),
- iv) discharge from the WWTP at the proposed Design Average Flow (2.4 MGD), and
- v) Discharge from the WWTP at the proposed Design Maximum Flow (7.93 MGD).

**The worst case of those five scenarios is with the WWTP discharge at the proposed Design Maximum Flow (7.93 MGD). Comparing the worst case to the no impact case**

(i.e. no discharge from the WWTP) results in a difference in stream flood stage from a one year, 12-hour storm event of 0.22 to 0.24 feet. During larger storm events, the change in water elevation because of the Wauconda discharge would result in an even smaller incremental change in water elevation.

In addition to the determination that during dry weather flow there are not any out-of-bank conditions and the additional flow of the Wauconda WWTP discharge having a minimal effect on the water elevation during storm events, the NPDES permit includes a phosphorus limit of 1.0 mg/L.

Given these factors, the Agency does not believe an ecological risk assessment is warranted.

2. Environmental disturbances, including nutrient enrichment, have a detrimental effect on wetland plant communities. As a result of increased nitrogen and phosphorus loadings, plant species composition in a wetland often shifts. Plants that grow in highly disturbed areas tend to be weedy and are adapted to disturbance. Slower growing and more conservative species are replaced by plant species that take advantage of the excess nutrients and grow rapidly. Native species tend to decline in these situations; this decline can be correlated with the severity of the habitat change. Invasive and weedy species, such as cattails, common reed and reed canary grass have a competitive advantage in a degraded environment and can spread rapidly in nutrient enriched areas. Those three invasive species are common in Fiddle Creek wetlands.

In June of 1982, Mr. Gerald Bade of the USF&WS Rock Island Field Office visited the site of the proposed discharge point of the re-direction of the flow of Bangs Lake Creek to bypass Slocum Lake to the Fox River just south of May Street in Fiddle marsh. The field visit determined that, in this location the wetland was dominated by Willows (*Salix* sp.) and Cottonwoods (*Populus deltoids*) with an understory of Reed canary grass (*Phalaris arundinacea*). This is consistent with the current marsh complex with the exception of Cattail (*Typha* sp.) dominated portions of the marsh that are more centrally located and were not analyzed during the June 1982 site visit. In February 1983, Dr. Glenn R. Guntenspergen PH.D., of the University of Wisconsin – Milwaukee, conducted a vegetation survey of the Fiddle Creek marsh as a part of the 1983 Baxter & Woodman study. This survey classified a portion of the wetland as palustrine, persistent emergent wetland dominated by cattail (*Typha* spp.) and river bulrush (*Scirpus fluviatilis*). It also states that the area where the drainage ditch turns from south to west is dominated by reed canary grass, *Phalaris arundinacea*. On February 26, 2002, August 6, 2003, and September 23, 2003, Bonestroo, Rosene, Anderlik & Associates completed preliminary vegetation surveys of the Fiddle Creek marsh complex determining that the vegetative composition of the marsh was consistent with the conditions in 1982 and 1983. Therefore, the nutrients, provided by the Wauconda discharge, relocated to Fiddle Creek in 1983 have not changed the wetland plant community. As mentioned in Section 3 NUTRIENTS, the NPDES discharge permit will have a phosphorus limit of 1.0 mg/L as a monthly average.

**Therefore, the loading of nutrients to the watershed from the Wauconda discharge will decrease.**

3. Wauconda's wastewater discharge has had an impact on the wetland quality of the Fiddle Lake area. Wauconda, working in close cooperation with local groups, such as Citizens for Conservation, should develop a wetland management plan for maintaining and hopefully improving the wetland area. Implementation of this wetland management plan should be funded by Wauconda under the antidegradation requirement of "benefiting the community-at-large."

**Fiddle Creek and affiliated wetlands are affected not only by the Wauconda discharge but also by numerous local activities, not the least of which are the channel improvements made to the creek itself several years ago. The matter at issue with this permit application is the potential effect (particularly if determined to be detrimental) of the proposed increased discharge. That matter is addressed in Question and Answer # 2 above. While the Agency certainly is not opposed to Wauconda participating in and supporting watershed and wetlands management initiatives with the greater community, it is not an appropriate to mandate such as a permit condition.**

## 7. ALTERNATIVES to DISCHARGE to FIDDLE CREEK

1. The alternatives analysis in the antidegradation assessment is inadequate. It seems as though the only alternative analyzed was the purchase of, and application to land. Analyses and exploration must be conducted for additional alternatives including, at a minimum, applying wastewater to lands which the village would not need to purchase (for example, requiring developers to set aside land that could be used for water reuse), applying wastewater to lands during only a portion of the year, discharging to a different location, installing nutrient removal systems, and installing more advanced treatment to achieve a no-net-increase of pollutant loads.

**Bonestroo Devery & Associates provided supplemental information on June 3, 2004. The supplemental information reevaluated the purchase of, and application to land, application to the Stonewall Orchards golf course and other discharge locations; no feasible alternatives were found. The purchase of, and application to land was cost prohibitive. The Stonewall Orchards golf course was contacted again and reaffirmed that they are not interested in pursuing spray irrigation. The supplemental information examined discharging to alternative waterbodies including Mutton Creek/Island Lake, Bangs Lake, Gangs Lake Drain/Slocum Lake and the Fox River. Discharge to lakes are not a feasible alternative since they have the potential to cause greater long-term water quality impacts than the current discharge location. The Fox River was not a feasible alternative since it is currently on the Section 303(d) list.**

2. If wastewater is as clean as claimed by Wauconda, then the wastewater can be discharged to Bangs Lake.

**Because lakes are more prone to excessive plant and algal growth, the Agency prefers to keep discharges from entering lakes whenever practicable.**

3. NPDES stands for National Pollutant Discharge Elimination System. When Congress passed the Clean Water Act in 1972, they thought that what we were going to be doing was eliminating discharges, not continually increasing them over time. It's supposed to be an elimination system. We are supposed to be looking constantly for alternatives that will allow us to eliminate discharges, not increase them.

**While both the NPDES program and the antidegradation policy within state water quality standards support the Clean Water Act's goal to eliminate discharge of pollutants into navigable waters, the focus of those programs is reduction of parameters in concentrations that are detrimental to the navigable water; neither dictates the elimination of reclaimed wastewater discharges. The presumption that all discharges and all chemical constituents within those discharges are detrimental and**

**contrary to the national goal is an incorrect interpretation and misrepresentation of the Clean Water Act.**

## **8. PRIVATE WELLS, LOCAL RECHARGE, GEOLOGY**

1. Some of the residences near Fiddle Creek rely upon private wells for their water supply and there is concern that the past, current and future discharges of the Wauconda WWTP could contaminate their wells.

**The Illinois EPA's Division of Public Water Supplies, Groundwater Section has reviewed data on private wells including the geological information concerning the aquifers from which these wells obtain water. Based on this information, the Agency has concluded that contamination from the Wauconda discharge is unlikely.**

**The Agency has assessed existing hydrogeologic information for the segment of Fiddle Creek starting just up stream of the Wauconda WWTP discharge (east of Anderson Road) and ending at the confluence of Fiddle Creek with the Fox River. The information reviewed included geologic maps, private well boring records and private well sampling data. This review concentrated on the data available for the area within 1,000 feet of Fiddle Creek. Data were also assessed for portions of the watershed beyond 1,000 feet.**

**The eastern portion of the area beginning at the discharge location on Fiddle Creek and continuing to the confluence of Fiddle Creek and the Slocum Lake Drain, is mapped as having a low geologic susceptibility (ISGS 1984). The low geologic susceptibility area is characterized as having "Uniform, relatively impermeable silty or clayey till at least 50 feet thick with no evidence of interbedded sand and gravel." Well logs (ISGS, 2004) within this area generally indicate this low permeability layer is in place, though at some well locations it is less than 50 feet thick.**

**In the western portion of the area, from the confluence of Fiddle Creek with the Slocum Lake Drain to the Fox River, Fiddle Creek flows through an area mapped as having a high geologic susceptibility to surficial contamination. The high geologic susceptibility area is characterized as having "Thick permeable, sand and gravel within 20 feet of the land surface." (ISGS 1984). While the area with high geologic susceptibility generally contains thick sand and gravel sequences, well logs (ISGS, 2004) within this area generally indicate this area contains less permeable material near the surface at most well locations.**

**Fiddle Creek and the associated wetlands are located in topographically low areas. Topographically low regions are generally areas where groundwater discharges to the surface. Therefore, it is more likely that groundwater in the vicinity of Fiddle Creek would tend to be discharging to the creek. Given the low permeability of the surficial material found in the eastern portion of the area, the movement of water between Fiddle Creek and the shallow groundwater would appear to be limited in this area. In the western portion of the area the potential for communication between Fiddle Creek and shallow groundwater would be greater.**

**The limited nature of communication between the creek and shallow groundwater appears to be confirmed by the fact that the LCHD records show no fecal coliform positive sample results for private wells within 1000 feet of Fiddle Creek over the past 12 years. In addition Wauconda has committed to working with the LCHD to conduct limited sampling of private water wells in the area, concentrating on water wells where records indicate the highest potential for contamination. However, it should be noted that improper well construction, damage to, or flooding of well casings might allow the entry of contaminants (found in surface waters or in sewage from individual wastewater disposal systems) into a well. Shallower wells, especially those with little or no impermeable material between the aquifer and the surface, are also potentially more susceptible to these surface contaminants. Illinois EPA has conferred with the Illinois State Water Survey (ISWS) and the LCHD on this matter and both the ISWS and the LCHD are in general agreement with this assessment.**

**ISGS 1984. Plate 1, *Potential for Contamination of Shallow Aquifers from Land Burial of Municipal Wastes*, from the Illinois State Geological Survey Circular 532, Potential for Contamination of Shallow Aquifers in Illinois, by Richard C. Berg, John P. Kempton, and Keros Cartwright, 1984.**

**ISGS, 2004. Well records. Illinois State Geologic Survey, Urbana Illinois**

**Lake County Health Department, 2004, private well sample results**

2. If these private wells are at risk. Wauconda should be requested to provide alternative water supplies.

**Available information does not indicate that the private wells near Fiddle Creek are at risk. For further information on groundwater near Fiddle Creek please refer to the above question.**

3. How many private wells in the Fiddle Creek area were tested in the last two years?

**For the period of September 9, 2001, through September 9, 2003, the LCHD tested 20 wells in the Fiddle Creek area; none of these wells showed contamination.**

**If during the last year your well was tested by someone other than the LCHD and found to be contaminated, you should contact Larry Mackey at the Lake County Health Department, 847-356-6222. Public health recommends that private wells be tested annually for fecal coliform and nitrates.**

## 9. ANTIDegradation ANALYSIS

**There are two fundamental constructs inherent to the Antidegradation Regulations as adopted by the Board: i) maintenance (protection) of environmental existing uses; and ii) allowance of additional parameter loading only when necessary to accomplish social and economic goals of the community at large. Maintenance of existing uses is to a great extent assured through application of other applicable water quality standards. Additional steps may be in order if a stream or system is known to support a particularly sensitive or vulnerable use. With respect to the balancing the benefits of an increased constituent loading to a stream versus achievement of other important social and economic goals of the state and local community at large, it is not the Agency's intent nor does the Agency believe it was the Board's intent that antidegradation goals require individual justification of land use and land development projects. Basic property rights are a fundamental component of Illinois law and social framework of the state. The extent that land use and land development are restricted is clearly within the realm of county and local zoning authorities, not the state environmental authorities (Agency and Board). To that effect an increased discharge resulting from the increased wastewater associated with additional property development meets the test of important social and economic goals of the community at large. The Agency's role and practice in such situations is not whether the development is proper, but what are the proper wastewater management and disposal practices required to avoid or minimize stream loading increases. The Agency does this through facility planning and treatment/disposal alternatives analysis. Clearly any alternatives considered must, at a minimum, be sufficient to meet all other applicable water quality and discharge standards. Beyond that, comparison of various alternatives and weighing cost and operational complexities against anticipated incremental loading to the stream constitutes the nature and substance of Agency antidegradation reviews.**

1. The proposed dissolved oxygen (DO) limit of 6 mg/L is not currently being met at the outfall or downstream. We question if it will meet the proposed DO requirement in the future. On August 28, 2003, DO concentrations downstream were as low as 3.3 mg/L. We attribute such violations of water quality standards to the village's existing discharge. Further, these observations bring the Agency's Antidegradation Assessment into question. Increased biochemical oxygen demand (BOD) and nutrient wasteloads to the stream will degrade already low DO concentrations. This is a significant concern to the biotic communities in Fiddle Creek and the adjacent wetland complex.

**See response to Section 3 NUTRIENTS question and answer # 5**

2. Under Part 302.105(a), existing uses as of November 28, 1975, must be maintained and protected. "An action that would result in the deterioration of the existing aquatic community, such as a shift from a community of predominantly pollutant-sensitive species to pollutant-tolerant species or loss of species diversity," is considered degradation. As Wauconda's existing discharge to Fiddle Creek occurred in the 1980s, or after November

28, 1975, any antidegradation analysis should properly be based on pre-Wauconda discharge conditions to Fiddle Creek.

**See response to Section 6 ENDANGERED/SENSITIVE FAUNA and NATURAL RESOURCES question and answer # 3.**

3. The antidegradation analysis has certainly not determined that an “increased pollutant loading will benefit the community at large.” Clearly the community at large includes the citizens in the Fiddle Creek watershed not just the developers that have reached some agreement with Wauconda for new, high-density developments.

**Benefits to the community at large include: providing jobs associated with the new anticipated construction; providing homes to a growing community; a tax base for the community; and an environmental improvement when subsurface discharges at individual homes are not built. This satisfies the requirement of providing a benefit to the community at large.**

4. The Agency’s stated policy in its July 2002 memo to the regulated community stated “the degradation must be held to the smallest amount practically achievable and such justification must be fully justified by the benefits of the project.” No such justification was presented by Wauconda or the Agency. In addition, the public involvement process contemplated by the Agency in this same memo has been absent to date.

**As stated in the preface to this section, the facility expansion is needed to accommodate additional municipal wastewater treatment associated with anticipated community growth within the context of locally developed land use planning and zoning. The focus of antidegradation review is to determine the appropriate management and disposal practices for the anticipated additional wastewater. The discharge location and treatment alternatives have been thoroughly reviewed; however, the need for the project is a direct result of local development decisions.**

5. The Agency’s antidegradation analysis (the February 20, 2003 memorandum by Jeff Hutton) was completed without a single water quality or sediment sample being collected over the previous ten years. Therefore, this shows that the Agency has not adequately examined the Fiddle Creek Watershed.

**The initial analysis was based on water quality data from prior years. As an outgrowth of the public comment period, supplemental data was provided by public commenters. Subsequently, the Agency conducted monitoring activities. This supplemental information was sufficient for the Agency to complete its assessment and finalize the terms and conditions of the permit.**

6. Perhaps the most significant finding in the Agency's antidegradation assessment is, "Ammonia and dissolved oxygen standards will not be exceeded by this discharge." This finding is made despite the absence of dissolved oxygen data from Fiddle Creek.

**The permit as issued includes dissolved oxygen discharge limits and supplemental monitoring requirements to address potential problems within Fiddle Creek and determine any culpability of this discharge should Fiddle Creek exhibit DO deficiencies, and require any additional controls that may be warranted.**

7. Analyses of groundwater impacts is totally absent from the antidegradation assessment.

**Please refer to Section 8. PRIVATE WELLS, LOCAL RECHARGE, GEOLOGY.**

8. The impact on the Fox River, from the increase in both total nitrogen and phosphorus is not addressed at all in the antidegradation assessment. However, the antidegradation assessment notes "The proposed project will result in improved effluent quality..." As there are no changes in BOD<sub>5</sub> and TSS concentration limits, and both the BOD<sub>5</sub> and TSS load limits will increase as well as the nutrient loadings, this statement is suspect.

**Due to the size of the facility and distance from the Fox River, the Agency made the determination that this discharge would not have a measurable impact on the Fox River. Also, the statement "The proposed project will result in improved effluent quality..." is referring to the areas that will be developed regardless of the expansion. The Agency is stating that treatment at the expanded plant will be of better quality than the individual systems that will need to be installed if the expansion is not completed. Additionally, new facilities usually perform better than the older facilities they replace due to new technologies and optimally performing equipment.**

9. The Agency should conduct an antidegradation analysis to assess the effect of the current 1.4 MGD has on the Fiddle Creek Watershed and also to assess the effect of the proposed 2.4 MGD on the watershed.

**The antidegradation policy applies to proposed new loadings not to existing permitted activities. The groundwater aspects of this review are addressed in Section 8 of this Summary.**

10. The assessment does not assure that existing uses of the downstream waters will be protected. Testimony presented at the hearing demonstrated that an important downstream existing use is a high quality wetland which can be degraded by excess nutrient loading.

**The high quality wetland referred to in this question is the fen located downstream of the discharge. See response to Section 6 ENDANGERED/SENSITIVE FAUNA and NATURAL RESOURCES question and answer #1.**

11. The Illinois EPA should deny the permit modification because Wauconda and the Illinois EPA failed to meet the requirements of Illinois Antidegradation Policy.

**The Agency has revisited all the major issues raised under public comment, modified the draft permit accordingly and the NPDES permit as issued reflects its final action.**

12. Wauconda's Antidegradation Assessment indicated that the receiving stream has a 7Q10 flow of 0 cfs (cubic feet per second) and is classified as a 'General Use' water. However, this evaluation was based on a 1993 stream survey. We do not believe that it is advisable or appropriate to rely on data generated ten years ago. The surrounding area has experienced a significant growth in residential development since 1993 (that is the reason for the proposed plant expansion). The Antidegradation Assessment needs to evaluate future conditions, and Wauconda should be required to prepare a new stream survey in order to satisfy the requirements of 35 Ill. Adm. Code 302.104.

**Additional information received during to the public comment period enabled the Agency to undertake significant follow-up evaluation, including both supplemental information requests from the applicant and consultation with technical associates in other government agencies. Each issue raised has been reassessed, reaffirming many aspects of the original draft permit and in other instances motivating modification or addition to the permit. The net and result is the final NPDES permit as issued and explained within this responsiveness summary.**

13. At the public hearing, the village of Barrington and Cuba Township alleged that Wauconda's Antidegradation Assessment was deficient. Lake Barrington's consultant identified several deficiencies that we believe need to be addressed in a new Antidegradation Assessment. For example, Wauconda's Antidegradation Assessment indicated that "...the treated domestic waste that characterizes this proposed effluent would be similar to other treated effluents of purely domestic origin." This statement is inconsistent with its own user survey, which identifies a significant number of non-residential users, including a landfill and industrial facilities.

**The comment that, "...the treated domestic waste that characterizes this proposed effluent would be similar to other treated effluents of purely domestic origin" is not entirely accurate. It should have indicated that there was an industrial component and landfill leachate but that the proposed additional flow would consist mostly of effluent from purely domestic origin. The industrial waste component of this discharge is a small fraction of the total wasteload of the effluent and is not significant. The Agency has also sampled the effluent on June 21, 2004. The results**

**of the Agency sampling corroborated the Wauconda samples in that neither vinyl chloride nor benzene was detected.**

## 10. STREAM MONITORING

1. Because of the lack of water quality data on Fiddle Creek, Huff & Huff, Inc. collected stream samples at three locations downstream of the Wauconda outfall. Dissolved oxygen at the Anderson Road site was below the 5.0 mg/L water quality standard on four out of five occasions. All other downstream sampling locations showed low levels of DO which violate water quality regulations. Clearly dissolved oxygen water quality violations routinely occur on Fiddle Creek. Fecal coliform levels ranged from 300 to 3,650 cfu (colony forming unit) per 100 mL. The fecal coliform levels at all stations exceeded the water quality standard of 200-cfu/100 mL geometric mean and the maximum of 400-cfu/100 mL. The nitrate concentrations were above the criteria utilized by Illinois EPA to identify a potential cause of use impairment in streams. This Illinois EPA criteria is based upon nitrate levels exceeding 7.8 mg/L in one (1) sample in the most recent three years. Similarly, according to Illinois EPA criteria, one total phosphorus result greater than 0.61 mg/L in the most recent three years is sufficient to list phosphorus as a potential cause of use impairment. The Fiddle Creek phosphorus concentrations also exceed this criteria. DO levels in Fiddle Creek are such that the stream would also be listed for use impairment due to DO levels. From this recent stream monitoring by Huff & Huff, Inc. it is clear that Fiddle Creek should be included in the Agency's 303(d) list of impaired waterways and the federal regulations for impaired waterways must be followed.

**In order to be listed on the Section 303(d) list, the Agency must determine if a stream is currently degraded. This is accomplished by examining the biology of the receiving stream by using biological indices for macroinvertebrates (MBI) and fish (IBI). If the Agency determines that the receiving stream is biologically impaired, the Agency then looks for causes and sources of the impairment.**

**There are no water quality standards for nitrates or phosphorus. The guidelines for these substances used by the Agency in Section 305(b) and Section 303(d) assessments are only for streams where biological impact is documented. Low dissolved oxygen levels or high nutrient levels are not necessarily caused by WWTP discharge. However, the NPDES permit will have a phosphorus limit of 1.0 mg/L as a monthly average and requires the facility to collaborate and participate in cooperation with the Agency in a study to characterize the dissolved oxygen profile and study possible nutrients impacts in Fiddle Creek in the vicinity and downstream of Outfall 001 before and after the expansion.**

**The disinfection exemption was removed in the December 2003 permit modification. Therefore, Wauconda is not, nor will be, a significant contributor to the fecal coliform in the wetland. However, it should be noted that there are other sources of fecal coliform in the watershed such as failing septic tanks, domestic animals and wildlife.**

## 11. RADIUM FROM PUBLIC WATER SUPPLY

Many of the deeper drinking water wells (greater than 500 feet below the land surface) in the northern third of Illinois are drawing water from the Mount Simon and Cambrian-Ordovician aquifers which have naturally occurring radium. According to the Wauconda Water Supply operator, one of the five current wells draws water from an aquifer that contains radium-226. The standard for radium in finished drinking water established under the federal Safe Drinking Water Act (and adopted as Illinois law) is 5 picocuries/liter. The Wauconda drinking water plant uses an ion-exchange softener to treat for radium. The waste from the softener is discharged into the Wauconda sewer collection system. The Agency understands that the three new deep wells near Liberty Lakes to be used as a drinking water source for Wauconda all contain radium. The water from these wells will also be subject to the 5 picocuries/liter standard for drinking water.

1. The impact of the discharge of the radioactive alkaline earth metal element radium 226 on the ability of Fiddle Creek to meet the existing 1 picocuries/liter water quality standard must be addressed before the water plant ion exchange regenerate process can be permitted to be discharged to Fiddle Creek.

**Radium 226 was evaluated prior to authorization of state construction permit number 2003-HB-4649. The Agency concluded that radium 226 would not be in sufficient quantity to exceed water quality standards. However, the state construction permit incorporated monitoring of radium 226 as a condition of the permit. Monitoring will consist of three 8-hour composite samples of influent and effluent and will be reviewed by the Agency upon completion of the data collection.**

2. The sludge that the Wauconda WWTP land applies contains radium. Can the Illinois EPA require Wauconda to test for radium?

**The Agency's assessment concluded that the application of the sludge will be within Illinois Department of Nuclear Safety's screening criteria and therefore acceptable. However, to verify this, the permittee has been required to test for radium for its sludge in cooperation with the Department of Nuclear Safety and this Agency pursuant to 35 Ill. Adm. Code 391.420(f). Reporting is required on a semi-annual basis.**

3. The Illinois EPA should require Wauconda to monitor for radioactive isotopes for the purpose of providing historical data in baseline readings for use in future regulatory situations.

**The Agency has required some monitoring of radium in the influent and effluent “see question and answer # 1 above” and for sludge “see question and answer # 2 above.”**

4. The wetland ecosystem cannot ingest or buffer alpha and beta radiation nor radium-226 and radium-228 particulate.

**There are no known harmful effects to the environment caused by these substances. According to the U.S. Environmental Protection Agency, “Alpha radiation is only a concern if radium is taken into the body through inhalation or ingestion.”**

## 12. WAUCONDA SAND AND GRAVEL SUPERFUND SITE

The Wauconda Sand & Gravel Superfund Site, located west of Garland Road approximately one block north of Bonner Road, is a former sanitary landfill (1941-1978) that reportedly accepted a small quantity of industrial wastes. It has a leachate collection system and a clay cap. This is a federal superfund site that is regulated by the U.S. EPA. The site also has an Illinois EPA industrial water pollution control permit (issued to the Wauconda Task Group) that allows the discharge of an average of 4,000 gallons per day of leachate from the collection system to the Wauconda WWTP. Permit number 2001-EP-3444 was renewed on June 8, 2001, for five years. As a condition of its permit, the Wauconda Task Group is required to submit quarterly leachate sample results to the Agency for boron, iron, total dissolved solids and ammonia. They are also required to submit annual sample results for 11 metals, volatile organic compounds, pesticides, base/neutrals, cyanide, oils and grease, phenols, oxygen-demand compounds and total suspended solids.

1. The draft NPDES Permit includes routine monitoring for only one heavy metal, copper. As the Wauconda sewage treatment plant receives contaminated groundwater from a federal superfund site and industrial wastewater, monthly testing for volatile organic compounds and heavy metals should be added to the monitoring requirements.

**On July 31, 2000, the Agency analyzed metal data for the Wauconda WWTP. The Agency performed a reasonable potential analysis to determine if any of the metals had a reasonable potential to exceed water quality standards. As a result of this analysis, copper was identified as having a reasonable potential to exceed water quality standards and copper was limited in the permit at the water quality standard. All other parameters did not have a reasonable potential to exceed water quality standards; therefore, no monitoring beyond the routine monitoring is necessary. The permit requires routine monitoring twice during each permit cycle of the following constituents: arsenic; barium; cadmium; chromium (hexavalent); chromium (total); copper; cyanide (WAD); cyanide (total); fluoride; iron (total); iron (dissolved); lead; manganese; mercury; nickel; oil; phenols; selenium; silver; and zinc.**

**Volatile organic compounds are removed by WWTP processes. The Agency confirmed no elevated volatile organic compounds after treatment. Thus, limits or monitoring requirements for this class of substances are not needed.**

2. Reference to Special Condition 8. Why is pretreatment not required before the Superfund leachate is discharged to the Wauconda WWTP?

**The pretreatment program for industrial waste is administered by U.S. EPA and facilitated by Illinois EPA. U.S. EPA informed the Wauconda WWTP by letter dated August 3, 2001, that pretreatment of industrial waste was not required.**

3. The Conestoga-Rovers Associates (CRA) consulting firm is required to submit quarterly reports of the leachate sample to the Illinois EPA. Which unit at Illinois EPA reviews these reports? Has CRA been in violation of permit 2001-EP-3444?

**Routine reporting such as mentioned in the question is reviewed and overseen by the Bureau of Water's Field Operations Section and the Compliance Assurance Section. The data received indicates that the leachate will not interfere with the treatment process and will not cause a violation to the water quality standards in the receiving stream. Furthermore, there have been no violations of permit # 2001-EP-3444 in the last five years.**

4. Wauconda has an ordinance requiring pretesting and treatment of industrial waste. The Illinois EPA should request U.S. EPA to mandate pretreatment of industrial waste.

**While circumstances do not warrant a federally mandated pretreatment program, Wauconda has a rigorous sewer use program for monitoring industrial users and has recently retained additional staff to monitor and oversee those industries that are subject to the ordinance.**

5. Does Wauconda have an ordinance that in any way limits the amount or type waste from the Wauconda Landfill?

**Wauconda has an ordinance which limits the concentration of pollutants from discharges from industrial sources which includes the Wauconda landfill.**

6. Previous reports from CRA state the presence of vinyl chloride and benzene. The WWTP should be monitoring their effluent for these substances.

**On September 18, 2003, Wauconda sampled their influent and effluent for organics. Some organic parameters (but not vinyl chloride and benzene) were detected in the influent. No organic parameters (including vinyl chloride and benzene) were detected in the effluent. The Agency has also sampled the effluent on June 21, 2004. The results of the Agency sampling corroborated the Wauconda samples in that neither vinyl chloride nor benzene was detected.**

7. What chemicals from the superfund site are being concentrated in the Fiddle Creek sediment?

**On September 18, 2003, Wauconda sampled their influent and effluent for organics. Some organic parameters (but not vinyl chloride and benzene) were detected in the influent. No organic parameters (including vinyl chloride and benzene) were detected in the effluent. The Agency has also sampled the effluent on June 21, 2004. Again, Agency samples agreed with the earlier sampling done by the village. Organic chemicals from the superfund site are not being concentrated in the Fiddle Creek sediment.**

## ACRONYMS

Agency	Illinois Environmental Protection Agency
BOD	Biological Oxygen Demand
CFR	Code of Federal Regulations
DMRs	Discharge Monitoring Reports
DO	Dissolved Oxygen
Illinois EPA	Illinois Environmental Protection Agency
Illinois PCB	Illinois Pollution Control Board
LCFPD	Lake County Forest Preserve District
MGD	Million Gallons per Day
mg/L	Milligrams per Liter
mL	Milliliter; one part per million; 100 mL is the normal sample size and equals about one-half cup.
NPDES	National Pollution Discharge Elimination System
ppm	Parts per Million
SMC	Lake County Stormwater Management Commission
STP	Sewage Treatment Plant
TSS	Total Suspended Solids
UV	Ultraviolet
WWTP	Wastewater Treatment Plant
303(d)	Federal Clean Water Act, Section 303(d)
305(b)	Federal Clean Water Act, Section 305(b)

## DISTRIBUTION OF RESPONSIVENESS SUMMARY

An announcement that the permit decision and accompanying responsiveness summary is available on the Agency website was mailed in August 2004, to all who registered at the hearing, to all who sent in written comments and other interested parties. Printed copies of this responsiveness summary are available from Bill Hammel, Illinois EPA Office of Community Relations, e-mail: <Bill.Hammel@epa.state.il.us> or phone 217-785-3924.

### WHO CAN ANSWER YOUR QUESTIONS

#### Illinois EPA NPDES Permit for Wauconda Treatment Plant Expansion:

Illinois EPA NPDES technical decisions.....Don Netemeyer .....	217-782-0610	
Legal questions .....	Connie Tonsor.....217-782-5544	
Water quality.....	Scott Twait .....	217-782-3362
Public hearing of September 9-10, 2003.....	Mike Roubitchek.....	217-782-5544
Industrial Pretreatment – Village of Wauconda.....	Cathy White .....	847-526-9610
Wauconda Landfill Superfund Site – U.S. EPA.....	Mike Joyce .....	312-353-5546
Odor Issues – Illinois EPA .....	Chris Kallis .....	847-294-4000
Private Wells – Lake County Health Department...Larry Mackey.....	847-356-6222	
Flooding-Stormwater Management Commission		
Watershed Development Permit .....	Mike Warner .....	847-918-5260
Wetlands.....	Joe Hmielski.....	847-918-5250
Wastewater Treatment Plant – Wauconda .....	Betty Harrison.....	847-526-9610
Radium Issues – Illinois EPA .....	Blaine Kinsley.....	217-782-0610

The public hearing notice, the hearing transcript, an area map, the NPDES Permit and this responsiveness summary are available on the Illinois EPA website: [www.epa.state.il.us](http://www.epa.state.il.us)

Scroll down one-half page and click on: *See also: Public Notices*

In upper right corner, click on: *2003*

Click on: *? 2003 NPDES Permit and Hearing Notices*

Scroll down to: *Village of Wauconda Wastewater Treatment Plant-Expansion*

BH:DGN:WaucondaFinal.doc.