



## Wastewater Committee

Date: April 7, 2010

CMAP Water Quality Review #: 10-WQ-005

Applicant: Illinois American Water Company

Re: The Illinois American Water Company has submitted a request to expand its Valley Marina Water Reclamation Facility from a daily average flow of 0.25 mgd to 0.42 mgd. The facility is currently operating above its design capacity and existing equipment is at the end of its useful life. The proposed area is located in Unincorporated Oswego, Kendall County.

### COMMITTEE ACTION REQUESTED

Based on the policies and recommendations of the *Areawide Water Quality Management Plan for Northeastern Illinois*, the *Illinois Water Quality Management Plan*, local government and agency comments, comments received from various interested and affected parties, and staff's analysis, staff recommends a Committee recommendation of "*Non Support*" for the proposed amendment request.

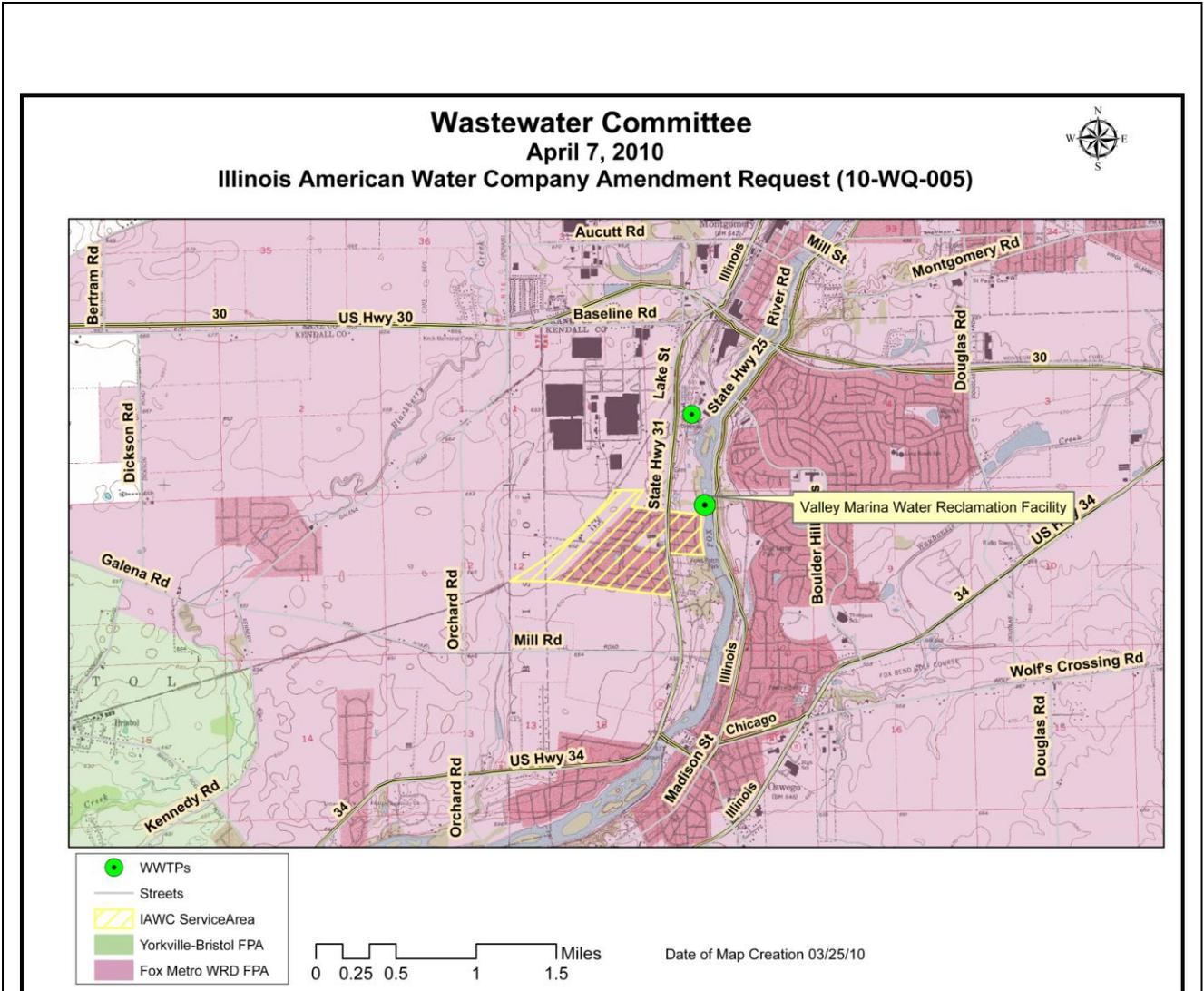
### Recommendations

- IAWC's should provide the same quality of effluent as the Fox Metro Water Reclamation District (FMWRD) by doing one of the following: maintain concentration levels comparable to FMWRD for BOD, TSS and ammonia comparable to FMWRD or continue negotiations with FMWRD to send its influent to the district for wastewater treatment service.
- The USEPA recommends 0.1 mg/L for total phosphorus in flowing waters and a limit of 0.05 mg/L for total phosphorus in streams that enter lakes. Therefore, the IAWC should meet a phosphorus effluent limit concentration not to exceed 1 mg/L.
- IAWC should pursue the Village of Oswego's interest in obtaining effluent for landscape and irrigation purposes.
- Kendall County should update its stormwater management ordinance so that nonpoint source protections are comparable to CMAP's model ordinances.

**Important Note:** CMAP is the designated areawide water quality planning agency and the advisory comprehensive regional planning agency for northeastern Illinois. Therefore, CMAP needs to act as a consensus builder by promoting sound planning principles and practices. Though not specifically required by the Illinois Environmental Protection Agency (IEPA), Criteria Nos. 6 – 9 specifically address CMAP's regional role and promote sound planning.



Map of WRF Area





## RELATIONSHIP TO RECOMMENDED CRITERIA FOR FACILITY PLAN AMENDMENTS

Illinois American Water Company (IAWC) owns and operates the Valley Marina Water Reclamation Facility (WRF) in Kendall County which serves a specific service area within the Fox Metro Water Reclamation District (FRWRD) Facility Planning Area near Oswego, IL in unincorporated Kendall County. This area consists of a 0.35-square-mile area within the FMWRD FPA. The service area includes moderately developed residential areas with a light commercial area.

IAWC also owns and operates three Water Reclamation Facilities (WRF) that serve the Citizens Utilities Company FPA in northeastern Will County, Illinois. The facilities include the Derby Meadows facility, the Chickasaw Hills facility, and the Oak Valley facility.

IAWC's Valley Marina WRF is currently operating above capacity for its design average flow and design maximum flow. Existing equipment is also at the end of its useful life. Expansion of the existing WRF is required to maintain compliance and allow full build-out of the service area.



Below is a summary and analysis of the proposed amendment application with regards to these criteria.

Review Criteria and Staff Analysis	Results
<p>1. <i>“The proposed facility amendment must be designed to meet the State of Illinois water quality standards for the receiving waters and the appropriate discharge standards or must receive a variance from the Illinois Pollution Control Board.”</i></p>	<p><b>Inconsistent</b></p>
<p>IAWC’s wastewater reclamation facility (WRF) discharges into segment IL-DT-38 of the Fox River and segment IL-DT-03 downstream of the River. Segment IL-DT-38 has a 7-day, 10-year low flow of 152 cubic feet per second (cfs).</p> <p>The Fox River is a multi-purpose resource that contributes critical habitat for wildlife, provides potable water supplies and receives and assimilates pollutants from point and non-point sources. The River is classified as a General Use stream, is impaired for aquatic life use and has a biological rating of “C”. The Illinois Department of Natural Resources considers this segment of the Fox River to have enhanced and/or unique aquatic life. As such, the River is subject to enhanced Dissolved Oxygen (DO) standards.</p> <p>Potential causes of impairment include total suspended solids (TSS), total phosphorus, dissolved oxygen (DO) and fecal coliform, sedimentation/siltation, polychlorinated biphenyls and pH. Impairment sources include urban runoff from stormwater sewers, atmospheric deposition, municipal point sources, dam or impoundment and combined sewer overflows.</p> <p>IAWC’s WRF operates under NPDES Permit No. IL0031551, which expires on December 31, 2014. The facility utilizes a two single-stage activated sludge process and is equipped with chlorination/dechlorination facilities and sludge drying beds. The proposed request includes an expansion from an average daily flow of 0.25 million gallons per day (mgd) to 0.42 mgd. Current plant capacity of the plant is 0.25 mgd and the design maximum flow capacity is 0.625 mgd. Actual 12-month average flows from the WRF measured 0.39 mgd at the end of July 2009 which exceeds current plant capacity. Illinois EPA recommends the WRF be added to its critical review list. The facility is not listed on Illinois EPA’s restricted status list.</p> <p>Twelve-month average influent pollutant loadings at the end of July 2009 totaled 358 lb/day of BOD and 314 lb/day TSS loadings. These result in per capita Biochemical Oxygen Demand (BOD) and TSS loadings of 0.22 pounds per capita per day. These figures are somewhat high compared to typical values in older communities and reflect an impact of sludge drying bed drainage loadings and commercial loadings.</p> <p>Future influent waste loadings include: BOD 386 lb/day; TSS 341 lb/day; total nitrogen 128 lb/day; and total phosphorus 26 lb/day respectively. IAWC plans to hold its annual mass limits the same as its current NPDES permit and are as follows:</p>	



Parameter	Load Limits lbs/day DAF (DMF)		Concentration Limits MG/L	
	Monthly Average	Daily Maximum	Monthly Average	Daily Maximum
Flow (mgd)		0.42		
CBOD5	88 (281)	--	25	--
Suspended Solids	105 (338)	--	30	--
Dissolved Oxygen				
March-July	---		--	5.0 minimum
August-February	---		6.0 minimum	4.0 minimum
pH	Shall be in the range of 6 to 9 standard units.			
Fecal Coliform	Daily maximum shall not exceed 400 per 100 mL.			
Chlorine Residual			0.35	
Ammonia Nitrogen				
March-May / Sept.-Oct.	12 (37)	30 (96)	3.3	8.5
June-August	5.3 (17)	21 (68)	1.5	6.0
Nov. - Feb.	14 (45)	52 (168)	4.0	14.9

Illinois EPA may, at some future date, impose new ammonia NPDES limits at 1.5 mg/L in the summer and 4.0 mg/L in the winter. If new limits are imposed, the expanded WRF would be required to nitrify and the mass of effluent ammonia discharged will be decreased by 80 percent or more. Effluent aeration facilities will be installed to ensure year-round compliance with the new permit limits. Redundancy will be provided within the treatment plant process with backup pumps, parallel oxidation ditches, and multiple clarifiers.

Point source contributions to the Fox River largely include nutrient-related impairments including phosphorus, nitrogen and low dissolved oxygen. As such, IAWC's treatment process should include some measurable standard to remove nitrogen and phosphorus. The USEPA recommends 0.1 mg/L for total phosphorus in flowing waters and a limit of 0.05 mg/L for total phosphorus in streams that enter lakes. Therefore, the IAWC should meet a phosphorus effluent limit concentration not to exceed 1 mg/L.

Illinois anti-degradation rules are critically important to ensure protection of water quality and prevent unnecessary deterioration of waters of the state. However, IAWC did not conduct an antidegradation analysis for the request since it plans to hold its annual mass limits the same as its current NPDES permit. As proposed, the WRF will increase over current permitted levels in loadings of ammonia, from 18 lbs/day to 30 lbs/day in the spring and fall and from 31 lbs/day to 52 lbs/day in the winter. Pursuant to Illinois law, any proposed increase in pollutant loadings requiring a modified or renewed NPDES permit must meet Illinois' antidegradation regulations. No increase in pollutant loadings is permissible unless "all technically and economically reasonable measures" to avoid or minimize the pollutants are



incorporated into the treatment facility. (35 Ill. Adm. Code 302.105(c)(2)(B)(iii)) As such, antidegradation rules apply in this instance.

IAWC's WRF serves a specific service area within the Fox Metro Water Reclamation District (FMWRD) FPA. As such, FMWRD operates a regional facility and is required to meet a higher level of treatment than a smaller plant. (Letter Dated March 10, 2010 from Walter E. Deuchler Associates Inc.) IAWC's proposed NPDES effluent concentration limits for expansion are two times greater than FRWRD's existing permit limits and would introduce twice the amount of mass loading than if the flow received treatment at FMWRD. The following table compares NPDES Effluent Limits of both FRWRD and IAWC:

Parameter	Valley Marina	Valley Marina	Valley Marina	FMWRD	FMWRD	FMWRD
	Average Monthly (mg/L)	Average Weekly (mg/L)	Daily Maximum (mg/L)	Average Monthly (mg/L)	Average Weekly (mg/L)	Daily Maximum (mg/L)
CBOD	25	40		10		20
TSS	30	45		12		24
Ammonia Nitrogen						
March-May/Sept.-Oct.	3.3		8.5	1.5	3.8	4.4
June-Aug.	1.5		6.0	1.5		3.2
Nov.-Feb.	4.0		14.9	2.0		4.4

IAWC argued, in a letter dated March 19, 2010, that FMWRD has more stringent limits in its permit "due to its treatment plant design flow being more than one-fifth (20 percent) of the Fox River low flow." Furthermore, FMWRD's treatment facility is over 1.0 mgd and considered a major treatment plant with more stringent permitting guidelines while IAWC is 0.4 percent of the Fox River low flow.

Though staff acknowledges IAWC's argument, FMWRD operates a regional facility and is required to meet a higher level of treatment than a smaller plant. (Letter Dated March 10, 2010 from Walter E. Deuchler Associates Inc.) Therefore, the quality of discharged effluent is of better quality from an environmental perspective.

IAWC indicated its preference to wait before agreeing to more stringent limits until the Fox River Study Group, whose ultimate objective is to preserve and enhance water quality in the Fox River by developing a Total Maximum Daily Load limit for the waterbody is complete. The Fox River however is part of a concerted effort by various stakeholders to enhance the River's water quality. As such, expansion of IAWC's WRF should be scrutinized to complement efforts of the Group. Staff recommends that IAWC provide the same quality of



<p>effluent as the Fox Metro Water Reclamation District (FMWRD) by doing one of the following: maintain concentration levels for of BOD, TSS and ammonia comparable to FMWRD or continue negotiations with FMWRD to send its discharge to the district for wastewater treatment service.</p> <p>IAWC's collection system has significant infiltration/inflow (I/I) during wet weather events. A cause of I/I includes the subsurface hydrology in the area, which is loose river gravel allowing for a higher water table and groundwater flows. Manhole rehabilitation was performed in 2000 to address I/I issues. To date, IAWC has performed televising and \$250,000 has been allocated for the systems flow metering, modeling, and rehabilitation in 2010.</p> <p>Biosolids management proposed for the expansion includes pumping biosolids to the FMWRD collection system. This would require a new pumping station, force main and metering manhole.</p> <p><b>Recommendations</b></p> <ul style="list-style-type: none"> <li>○ IAWC's should provide the same quality of effluent as the Fox Metro Water Reclamation District (FMWRD) by doing one of the following: maintain concentration levels comparable to FRWRD for BOD, TSS and ammonia comparable to FMWRD or continue negotiations with FMWRD to send its effluent to the district for wastewater treatment service.</li> <li>○ The USEPA recommends 0.1 mg/L for total phosphorus in flowing waters and a limit of 0.05 mg/L for total phosphorus in streams that enter lakes. Therefore, the IAWC should meet a phosphorus effluent limit concentration not to exceed 1 mg/L.</li> </ul>	
<p>2. <i>"The population and employment for which the proposed amendment is designed must fall within the twenty year forecast most recently adopted by the Commission for the facility planning area or the Commission may agree to adjustments within the regional forecast total."</i></p>	<p><b>Consistent</b></p>
<p>The applicant estimates that by the year 2033 there will be a total population equivalent of 1665 persons in 423 households. The existing service area includes 224 acres in 411 households with a total population equivalent of 1613. This forecast shows virtually no increase in population for the service area. This figure is consistent with the endorsed CMAP forecasts.</p>	
<p>3. <i>"The applicant must demonstrate that the unit of local government granting zoning to the project formally accept financial responsibility for the wastewater treatment system in the event of a system malfunction or failure. Such acceptance must be in the form of a resolution from the unit of government granting zoning."</i></p>	<p><b>Consistent</b></p>
<p>IAWC is a privately owned facility. The Illinois Commerce Commission (ICC) has statutory jurisdiction over IAWC and its Valley Marina WRF. As such, it is not required to demonstrate that Kendall County would accept financial responsibility in the event of system malfunction or failure.</p> <p>Historically, financial reports and reserves are used as a basis to ensure that a utility company had adequate financial resources to assure continued success for the facility. IAWC's Capital</p>	



<p>Investment Management Committee committed to financially support the expansion request in a letter dated March 24, 2010.</p>	
<p>4. <i>“The proposed amendment should not reduce the effectiveness of the water quality improvement strategy contained in the original plan, either for point or non-point source control.”</i></p>	<p><b>Inconsistent</b></p>
<p><b>Point Source Impacts</b> (See analysis under Criterion #1)</p> <p><b>Nonpoint Source Impacts</b></p> <p>The request is subject to Kendall County’s nonpoint source protection ordinances which have provisions for stormwater management, soil erosion and sediment control, and floodplain management. The ordinance does not have provisions for stream and wetland protection. The applicant asserts that current stream and wetland protection measures are handled in other ordinances and that the request will not result in modification of any lake, stream, wetland or floodplain area. Following an examination of Kendall County’s ordinances, Staff did not find protective measures handled in other ordinances for the following:</p> <p><b>Section 2: Soil Erosion and Sediment Control</b></p> <ul style="list-style-type: none"> <li>○ There is no mention that limits sediment to deliver to pre-disturbance levels specifically.</li> <li>○ There are not explicit site design requirements for sediment control measures.</li> </ul> <p><b>Section 4: Stream and Wetland Protection</b></p> <ul style="list-style-type: none"> <li>○ The ordinance does not protect the beneficial functions of streams, lakes and wetlands from damaging modifications, including filling, draining, excavating, damming, impoundment and vegetation removal.</li> <li>○ The ordinance does not prohibit the modification of high quality, irreplaceable wetlands, lakes and stream corridors.</li> <li>○ The ordinance does not prohibit watercourse relocation or modification except to remedy existing erosion problems, restore natural conditions, or to accommodate necessary utility crossings; and require mitigation of unavoidable adverse water quality and aquatic habitat impacts.</li> <li>○ The ordinance does not discourage the armoring of channels and banks unless natural vegetation and gradual bank sloping are inadequate to prevent soil erosion.</li> <li>○ The ordinance does not discourage culvert crossings of streams unless necessary for allowing access to a property.</li> <li>○ The ordinance does not discourage on-stream impoundments unless public interest and environmental mitigation criteria are met.</li> <li>○ The ordinance does not require adequate mitigation measure for approved wetland water body modification, including 1.5 to 1 acreage replacement for destroyed wetland, maintenance and monitoring for at least 5 years, and full</li> </ul>	



<p>restoration of natural wetland or waterbody functions.</p> <p>Currently, Kendall County is in the process of updating its stormwater ordinance since it is currently only applicable to unincorporated portions of the county.</p> <p>The Illinois Department of Natural Resources EcoCAT indicates the presence of the state-endangered greater redhorse and state threatened riverhorse found in the Fox River.</p> <p><b>Recommendation</b></p> <ul style="list-style-type: none"> <li>○ Kendall County should update its stormwater management ordinance so that nonpoint source protections are comparable to CMAP’s model ordinances.</li> </ul>	
<p>5. <i>“The proposed amendment should not adversely affect the cost-effectiveness of the Areawide Water Quality Management Plan for meeting water quality standards in the facility planning areas as a whole.”</i></p>	<p><b>Consistent</b></p>
<p>IAWC evaluated several wastewater alternatives but the initial examination did not explore the concept of land application. Wastewater alternatives included the following:</p> <ul style="list-style-type: none"> <li>● Alternative 1: Construct one new 0.42 package plant and maintain both existing package plants totaling \$3,816,000.</li> <li>● Alternative 2: Build two new 0.21 mgd package plants totaling \$3,889,000.</li> <li>● Alternative 3: Build two new oxidation ditches with BNR totaling \$4,210,000.</li> <li>● Alternative 4: Renovate existing package plants and add a third plant totaling \$3,600,000.</li> <li>● Alternative 5: Pump influent flow from Valley Marina to FMWRD for treatment and disposal totaling \$10,754,000.</li> </ul> <p>Alternatives 2, 3, and 4 were not selected since they were not cost effective and lacked sufficient treatment including BOD and phosphorus removal, nitrification and denitrification.</p> <p>Alternative 5 supports CMAP’s concept of regionalization. The <i>Water Quality Management Plan Amendment Process and Procedures</i> manual, Appendix V, which provides procedures for determining compliance with point source management policies, recommends applicants examine regionalization as a treatment option and discourages small conventional treatment plant discharges which often experience failure.</p> <p>FMWRD’s publicly owned treatment plant has a capacity of 42 mgd located 1 mile N-NE of the service area. Costs associated with this alternative totaled \$10,754,000. However, FMWRD believed these costs were skewed and connection actually totals \$10,504,000. (Letter from Walter E. Deuchler Associates, Inc. dated March 29, 2010) The applicant dismissed this alternative since it was not cost effective and fees, treatment technologies, and collection system options would be dictated by FMWRD.</p>	



While IAWC's selected alternative is more cost-effective, effluent concentration limits for its WRF are more than two times greater than FMWRD's existing permit limits. (Letter from Walter E. Dechler Associates, Inc. dated March 29, 2010). Therefore, FMWRD's system achieves lower daily loads of BOD, TSS and ammonia than the Valley Marina Facility. As such, staff recommends that IAWC consider upgrading its technological alternative to achieve a similar or better result thereby protecting water quality in the Fox River.

Requests from IAWC to explore effluent reuse opportunities were denied by local park districts. However, the Village of Oswego expressed interest in obtaining effluent for landscape and irrigation purposes. IAWC remains committed to pursuing this option. Treated effluent will also be reused on site for cleaning and irrigation. Effluent cannot be used for fire suppression purposes despite requests from environmental advocacy groups since it is too low to serve as a fire suppression water supply. (Letter from Strand and Associates dated March 26, 2010)

Total anticipated costs for the applicant's proposed facility are \$4,642,000 and includes the following :

Wastewater Treatment Plant	\$3,257,000
Sludge Handling Facilities	\$801,000
Inspection/Construction Management	\$350,000
Project Management Design	\$234,000
Total Cost	\$4,642,000

Total Estimated Annual O, M & R costs are \$1,709,000. The project will be funded in its entirety by the IAWC through its parent company, American Water. User charges will be determined in accordance with regulations by the ICC. Costs were not provided for solids handling and disposal.

**Recommendations**

- o IAWC should pursue the Village of Oswego's interest in obtaining effluent for landscape and irrigation purposes.

6. *"The proposed amendment should have the endorsement of the designated management agency for wastewater treatment and substantial support by the municipalities within the affected facility planning area."*

**Inconsistent**

IAWC provided documentation endorsing its support of WRF expansion.

IAWC's WRF serves a specific service area within the Fox Metro Water Reclamation District (FPA) near Oswego, IL in unincorporated Kendall County. This area consists of a 0.35-square-mile area within the FMWRD FPA.



<p>Walter E. Deucher Associates, Inc. submitted a letter dated March 10, 2010 on behalf of the FMWRD. The letter states effluent discharged from the proposed WRF would “introduce more than twice the mass loadings (in per pounds per day) than if the same flow was treated at FMWRD. As such, FRWRD requests that IAWC be required to meet the same NPDES concentration limits as its treatment plant since both discharge to the Fox River and their respective outfalls are within one mile of each other.</p>	
<p>7. <i>“The proposed amendment should not adversely affect adjoining units of government.”</i></p>	<p><b>Consistent</b></p>
<p>No comments have been received in support of or in opposition to IAWC’s request from adjoining units of government.</p>	
<p>8. <i>“The proposed amendment should be consistent with other county and regional or state policies, such as the Governor’s Executive Order #4 on the preservation of agricultural land.”</i></p>	<p><b>Consistent</b></p>
<p>IAWC’s service area includes moderately developed residential areas with a light commercial area.</p> <p><b><u>Illinois Department of Agricultural Protection</u></b></p> <p>The Illinois Department of Agriculture submitted a letter of no objection for the amendment request.</p> <p><b><u>Kendall County</u></b></p> <p>Kendall County requests that IAWC’s final site plan be submitted to the Kendall County Planning, Building and Zoning Committee. (Email from Kendall County to Dawn Thompson dated Wednesday, March 10, 2010)</p> <p><b>Recommendations</b></p> <ul style="list-style-type: none"> <li>• Submit IAWC’s final site plan to the Kendall County Planning, Building and Zoning Committee for review.</li> </ul>	
<p>9. <i>“Consideration will be given to evidence of municipal or county zoning approval and commencement of development activity prior to Areawide Water Quality Management Plan adoption in January 1979.”</i></p>	<p><b>Not Applicable</b></p>