

Michigan Water Use  
Water Resources  
APES

Directions: Examine the documents outlining the different ways water is used within the State of Michigan. As you examine each of these documents, answer the associated questions in complete sentences and showing all mathematical calculations.

Water Withdrawals for Public Water Supply (2006)

1. What are some of the uses associated with this study? Please delineate clearly between public water uses and private water uses.
2. Where is Michigan ranked in terms of public water withdrawals? Where does the entire Great Lakes Basin rank in terms of water withdrawals in the nation?
3. What does it mean that water is “consumed?” Can water ever actually be consumed?
4. What is a watershed? How many watersheds are present in Michigan? Which water basins are withdrawn from the most (top 5)? Where are they located?
5. What are the top 5 counties in terms of total amount of water withdrawn? Where are they located? What percentage of total water withdrawals do they account for?
6. What are the top three counties withdrawing from the Great Lakes? Surface Water? Ground Water?

Water Withdrawals for Thermoelectric Power Generation (2006)

1. What is thermoelectric power? How is water used in the generation of thermoelectric power?
2. Describe the three different types of cooling systems and when they are used.
3. How many nuclear power plants does Michigan have? Where are they?
4. What are the top five counties withdrawing water for electricity production? What percentage of the total water withdrawn do they consume?
5. Compare the top five counties for thermoelectric related water withdrawals and for public water withdrawals. What similarities and differences do you see? Why do you think these similarities or differences are present?
6. What percentage of the water for thermoelectric power is withdrawn from the Great Lakes? Surface Water? Ground Water?

Water Withdrawals for Agricultural Irrigation (2006)

1. What benefits does the study outline that support agricultural irrigation?
2. What factors impact the amount of water use for agricultural irrigation? Explain.
3. Which farms were included in this study? What problems could that pose?
4. Which counties withdrawal the most water for irrigation? Where are they located?
5. What was the largest irrigated crop in Michigan? What was it used for? What were the rest of the top five?
6. What does (D) mean in the tables? What is the reason behind not providing this information? What percent of counties are given this designation?

### Water Withdrawals for Golf Course Irrigation (2004)

1. What irrigation methods are used in golf courses? Explain them.
2. What factors impact the amount of water used to irrigate golf courses?
3. What is the application efficiency of sprinkler systems? Why is this the most common form of water application? What would be a better way to address this?
4. How many golf courses are in Michigan? What percentage of them are irrigated?
5. Which county has the most golf courses in Michigan? What percentage of the total amount of water withdrawn for golf courses do it consume?
6. Which basin has the most water withdrawn from it for golf courses? Where is it located?

### Water Withdrawals for Self-Supplied Industrial Manufacturing (2004)

1. How is water used in manufacturing? What industries use it?
2. Where does the Great Lakes Region rank in terms of water withdrawn for industrial purposes? Why is this?
3. Where is the majority of water withdrawn for industrial purposes? Which basins are impacted by this? Is this expected? Why?
4. What are the top five counties for water withdrawal for industry? What percent of the total industrial water withdrawals do they contain?
5. Rank the top 10 industries in terms of water withdrawal in Michigan. What percentage of the total industrial water do they withdrawal individually and combined? Are there any surprises in this list? Explain.
6. Why do you think this data contains information about the number of employees?

### Water Withdrawals for Major Uses (2004)

1. Summarize Figure 1. Explain why thermoelectric power generation dominates water usage. Propose some suggestions that could decrease this.
2. What are the top five counties in terms of total water withdrawals? Where are these counties located? Why are these counties withdrawing so much water (analyze individually)?
3. What are the basins with the largest water withdrawals in the state? Where are they located? Compare these basins with the counties examined in question two. Explain any similarities or differences.