



# Wastewater Treatment Process



## Wastewater Treatment Process

### 1. Industry

- Contributes about 20 million gallons of wastewater per day
- Waste stream is stronger than residential

### 2. Anaerobic Reactors

- Processes 2 million gallons per day of select industrial wastewater
- Organic matter is removed from the waste stream by microorganisms

### 3. Methane Gas

- Microorganisms produce methane gas as a byproduct
- Gas helps fuel the incinerator and excess is flared

### 4. Residential & Commercial

- Cedar Rapids, Hiawatha, Marion, Palo, Robins and Linn County residents and businesses contribute about 25 million gallons of wastewater per day
- Wastewater comes from showers, clothes and dish washers, sinks, toilets, and other commercial operations

### 5. Bar Screen

- Removes large items to protect downstream processes

### 6. Main Lift

- Pumps wastewater from the collection system to the treatment process

### 7. Primary Settling

- Waste solids settle to the bottom and are removed

### 8. Secondary Treatment – Biological

- Wastewater trickles over plastic media where organic matter is removed from the waste stream by microorganisms

### 9. Advanced Treatment – Biological

- Additional organic matter is removed from the waste stream by microorganisms

### 10. Settling Basin

- Excess microorganisms settle to the bottom and are removed

### 11. Advanced Treatment – Ammonia Removal

- Ammonia is removed from a portion of the waste stream by microorganisms

## **12. Settling Basin**

- Excess microorganisms settle to the bottom and are removed

## **13. Chlorine Disinfection**

- Potentially harmful bacteria is killed by adding chlorine

## **14. Dechlorination**

- Excess chlorine is removed from the treated effluent to minimize the impact on aquatic life

## **15. River Diffuser**

- Treated effluent is added to the river through multiple outlets to minimize the impact on aquatic life

## **16. Waste Solids – Thickening**

### **17. Belt Filter Press – Dewatering**

- About 65 percent of the water is removed from waste solids resulting in a thick, dirt-like substance

### **18. Biological Solids - Thickening**

### **19. Biological Solids – Gravity Belt Thickening**

### **20. Cell Wall Destruction with Temperature and Pressure (LPO)**

- Cell walls are destroyed, releasing the liquid stored inside the microorganisms that make up the biological solids

### **21. Centrifuge Dewatering**

- About 60 percent of water is removed from the biological solids by high speed rotation

### **22. Solids Blending**

- Waste solids are mixed with biological solids to produce a nutrient rich, dirt-like substance, called biosolids

### **23. Solids Disposal**

- 120 tons or more of biosolids produced each day
- Disposed of onsite through incineration, or offsite through landfilling or land application