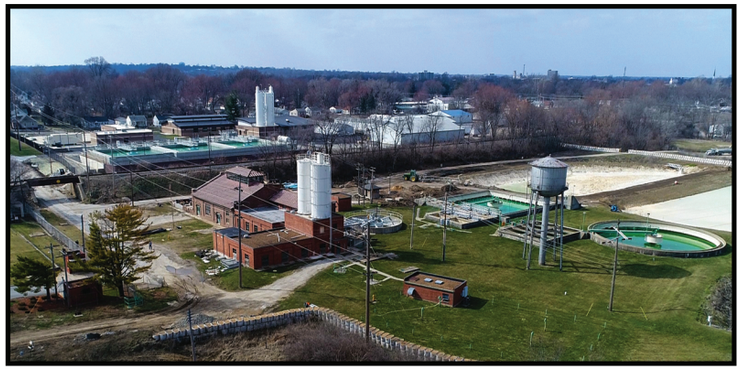
## THE JACKSONVILLE WATER TREATMENT PLANT

The dedication of the new water treatment plant in May 2018 marked the 145th year of water supply for the citizens of Jacksonville and Morgan County. The new 9.0 million gallon per day lime softening facility on Hardin Avenue replaced the City's first water filtration plant which had been in service since 1921. The new facility features proven treatment techniques such as lime softening and multi-media filtration, enhanced by the latest process control efficiency systems producing the highest quality potable water.

This treatment plant is ready to meet the demands of a growing community and boasts two water sources with the Illinois River wells and two lakes. The plant is built and permitted to effectively treat these source waters together, or separately, depending on the needs of the system. But the valuable water resources aren't taken for granted. This facility utilizes a Process Water Recycling system which returns used process water back to the head of the treatment train for re-use as part of the City's water conservation program. As you walk through the plant you will enjoy safety features and passive solar lighting which enhances indoor ambient light quality while reducing power consumption. The City of Jacksonville has a proud tradition of producing high quality drinking water which helped build a thriving community and this water treatment plant represents the next generation in the City's expansion and growth.

## NEW LOCATION - RE-PURPOSED SITE

The 1921 water treatment plant was located in a flood zone and had been threatened with flooding numerous times. After the flood of June 2011, the City was able to secure an adjacent property site out of the flood plain which allowed the original facility site to be re-purposed for use with the new plant. While the buildings and structures are removed, the property will still be used for lime storage, backwash water collection, and the Process Water Recycle system. This location allowed the new facility to be out of the flood plain while using existing water mains and a seamless transition to the new plant in February 2018.



## THE HISTORY of the JACKSONVILLE WATER SYSTEM

On June 15, 1869, the citizens of Jacksonville empowered the City Council to issue bonds for the construction of the first public water supply. From the first draw of the tap in 1873, to the first filtration treatment plant in 1921, the City endeavored to find a safe and plentiful water source to support growth in a thriving industrial community. In spite of the use of multiple lakes, ponds, and wells, including a coal mine and the first attempt at the Illinois River wells in 1907, a drought tolerate supply of sufficient volume remained elusive. After 80 years combining water sources of the area, the drought of 1953 caused a citizen's committee to take action. A pipeline to the Illinois River was the end result with construction complete in 1955. Since the "Thirst No More" celebration on the square in August of 1955, the river wells and concrete transmission main have served the City and will continue to supply the water treatment plant in the future.

As we look to the next century of water supply and treatment for the City of Jacksonville, challenges of the past tranform into future solutions. Water quality and supply challenges will be met head on by the stewards of the water system and citizens of the City to ensure this essential need is met for future generations.

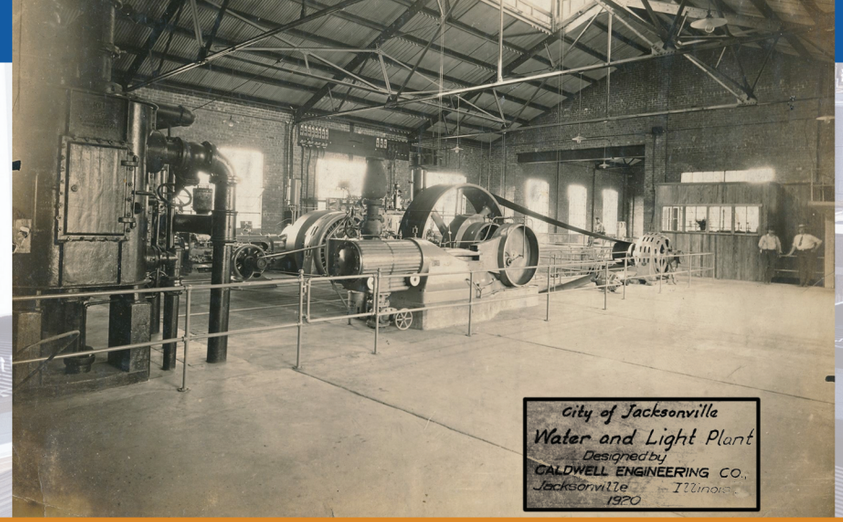
City of Jacksonville
UTILITY DEPARTMENT

City of Jacksonville
WATER TREATMENT PLANT

## OTHER FEATURES

FLOCCULATION & SEDIMENTATION BASINS

VERTICAL TURBINE PUMPS




## THE SYSTEM CONTROL CENTER

The water system control center at the water treatment plant is the center of the Supervisory Control and Data Acquisition (SCADA) system. From this location, the operators can remotely monitor and operate the wells, treatment plant, pump stations and elevated water storage tanks. The control system provides real time data analysis, historical charting and trending, and alarms to let operators know when a parameter has exceeded a desired value.

## THE TREATMENT PROCESS

**STEP 1**

**RAPID MIX & CHEMICAL ADDITION**

Lime for softening, Alum for coagulation, and Potassium Permanganate for organics oxidation are mixed here to begin the transformation to potable water. The mixed water only spends about 30 seconds in this step then it's on to the next phase.

**STEP 2**

**FLOCCULATION & SEDIMENTATION**

Charge neutralization begins in the floc chamber where organic and inorganic particles are transformed and attracted to each other forming larger particles for settling. The flocculation mixers gently circulate the water for 30 – 60 minutes allowing the particles to form heavy floc as they travel to the sedimentation basin. Once in the basin, the large floc particles slow down considerably allowing clear water to exit around the perimeter and the solids to fall to the bottom

**STEP 3**

**RECARBONATION & CHLORINATION**

The settled water exits the sedimentation basins where Carbon Dioxide is added for stability and pH adjustment. This is also begins the first steps for disinfection as chlorine is added prior to entering the filters. Fluoride is also added at this location.

**STEP 4**

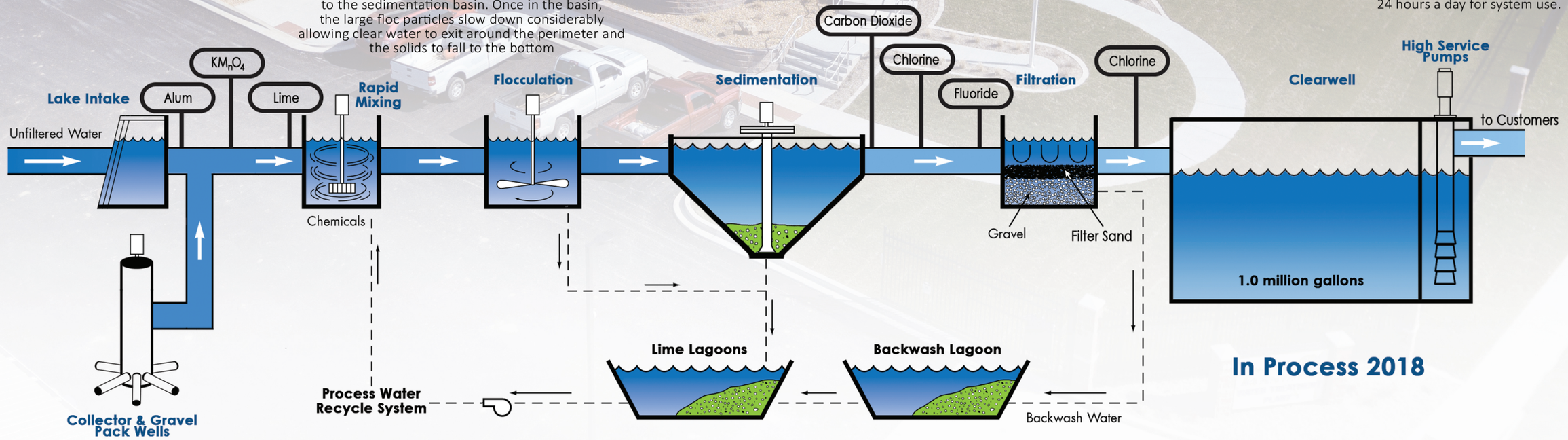
**FILTRATION**

Gravity sand filters are the finishing step in the treatment process. Settled water still contains microscopic particles which need to be removed known as Turbidity. Sand filtration can remove particles down to 0.1 micron, or lower, depending on the treatment techniques being used and specific media.

**STEP 5**

**CLEARWELL & HIGH SERVICE PUMPS**

The clearwell is the final step and holds the finished water which is ready to deliver to customers. There are two compartments, 500,000 gallons each, which can be operated in tandem or separately. Vertical turbine pumps transfer water into the system 24 hours a day for system use.




**In Process 2018**