

# OUR AGING INFRASTRUCTURE

## A History of New Orleans Storm Water Drainage



NEW - ORLEANS

Image From The Historic New Orleans Collection

# New Orleans - In The Beginning

- Settled by the French in early 1700's
- Inhabitants struggled with water problems from the beginning.

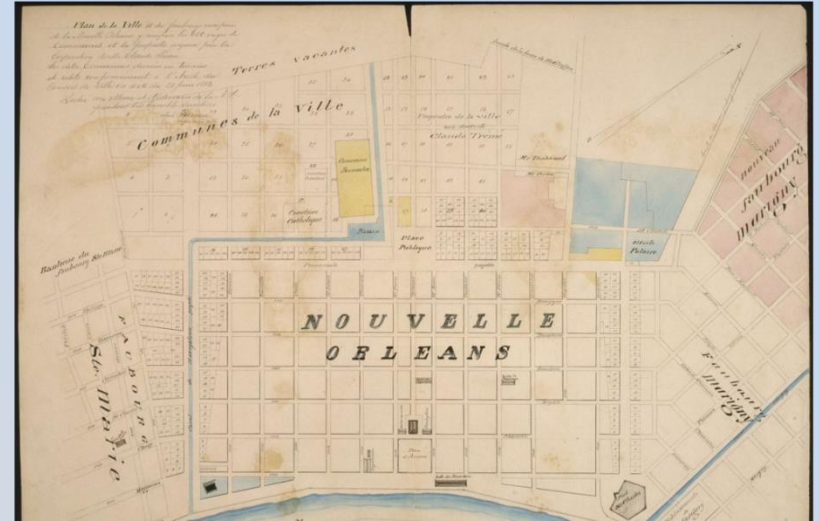
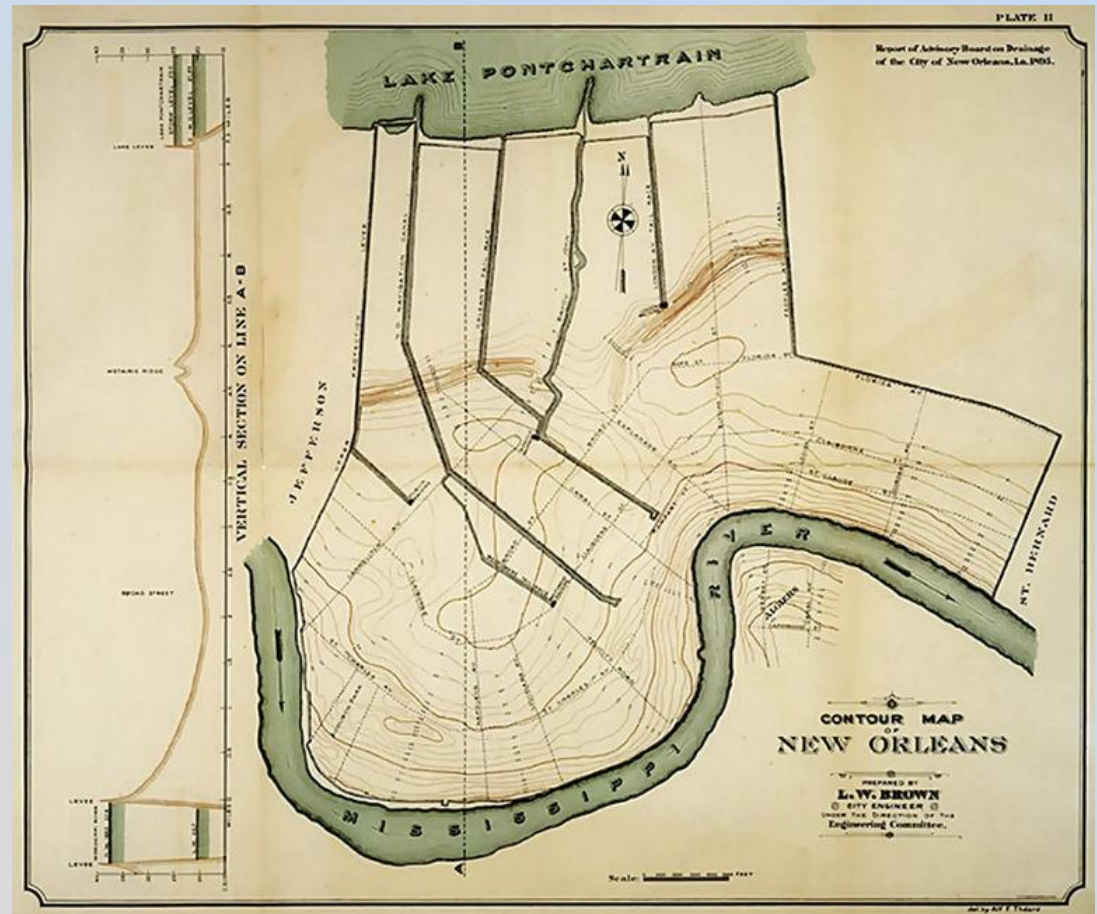


Image From The Historic New Orleans Collection

*“... a place of a hundred wretched hovels in a malarial wet thicket of willows and dwarf palmettos, infested by serpents and alligators”* Pierre Francois Xavier de Charlevoix (1721)

# 1895 Drainage Advisory Board Report

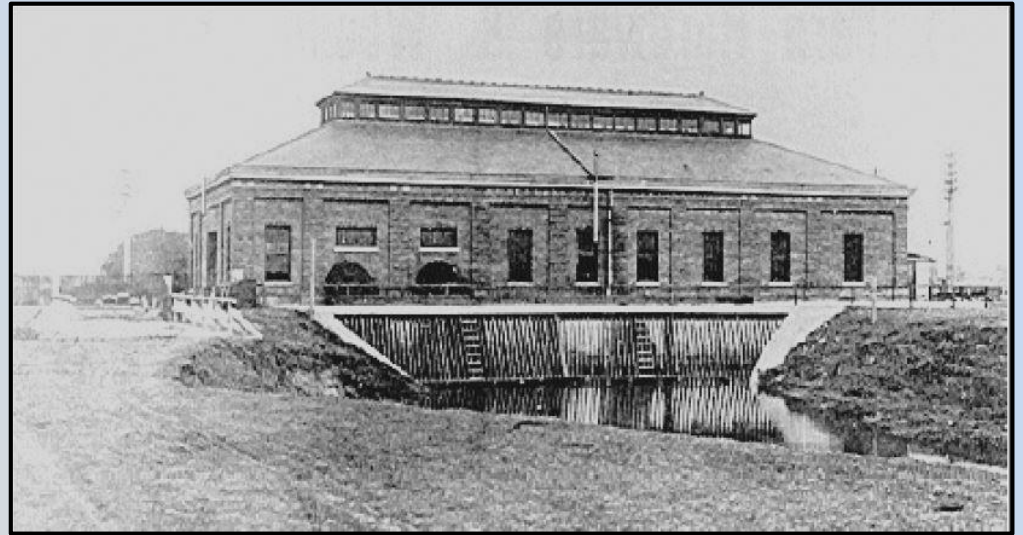
- Advisory Board formed in 1893, issued their Report in 1895
- Construction of projects recommended by the Board began in 1896
- In 1903, the Drainage Commission was merged with the Sewerage and Water Board
- By 1905, almost 40 miles of canals constructed and 6 drainage pumps installed.



Contour map of New Orleans, 1895 (New Orleans Public Library)

# Building the System

- By 1915, eleven Baldwin Wood Screw Pumps powered by electric motors had been installed.
- By 1925, pumping capacity increased to 13,000 cfs.
- Death rates due to water borne/mosquito related diseases dropped drastically.
- Property values increased.
- City rapidly expanded northward into the lower lands bordering Lake Pontchartrain.

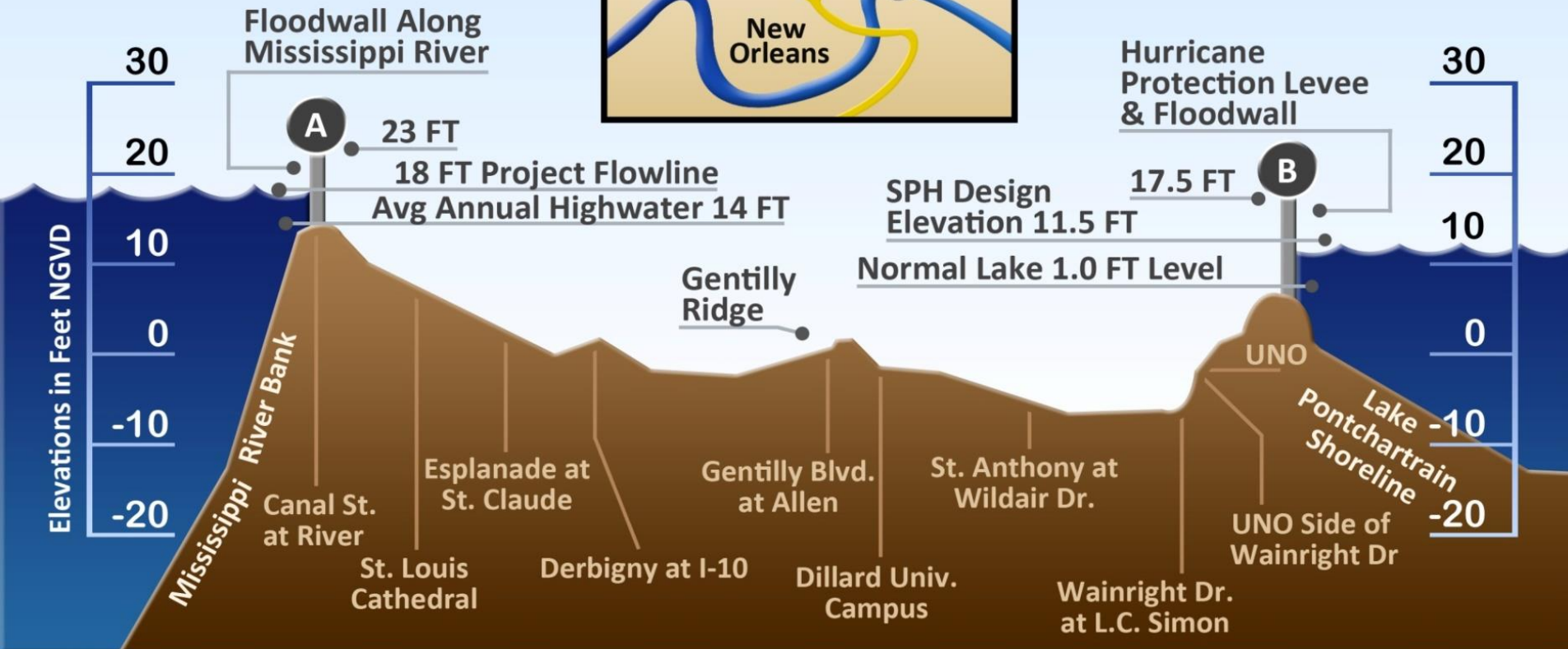
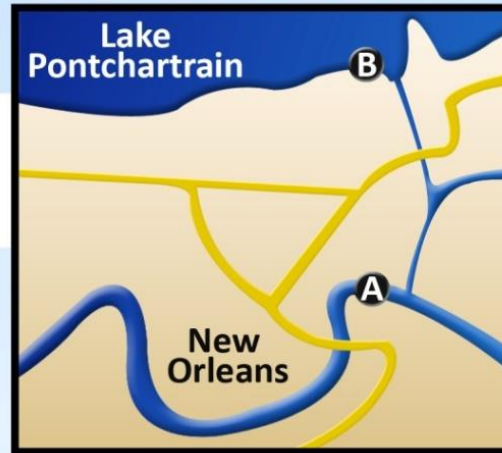


Drainage Pumping Station No. 3 as constructed in 1909  
Image from Wikimedia Commons

The incredible success of the drainage system was world renowned.

# Land Subsidence and Levees

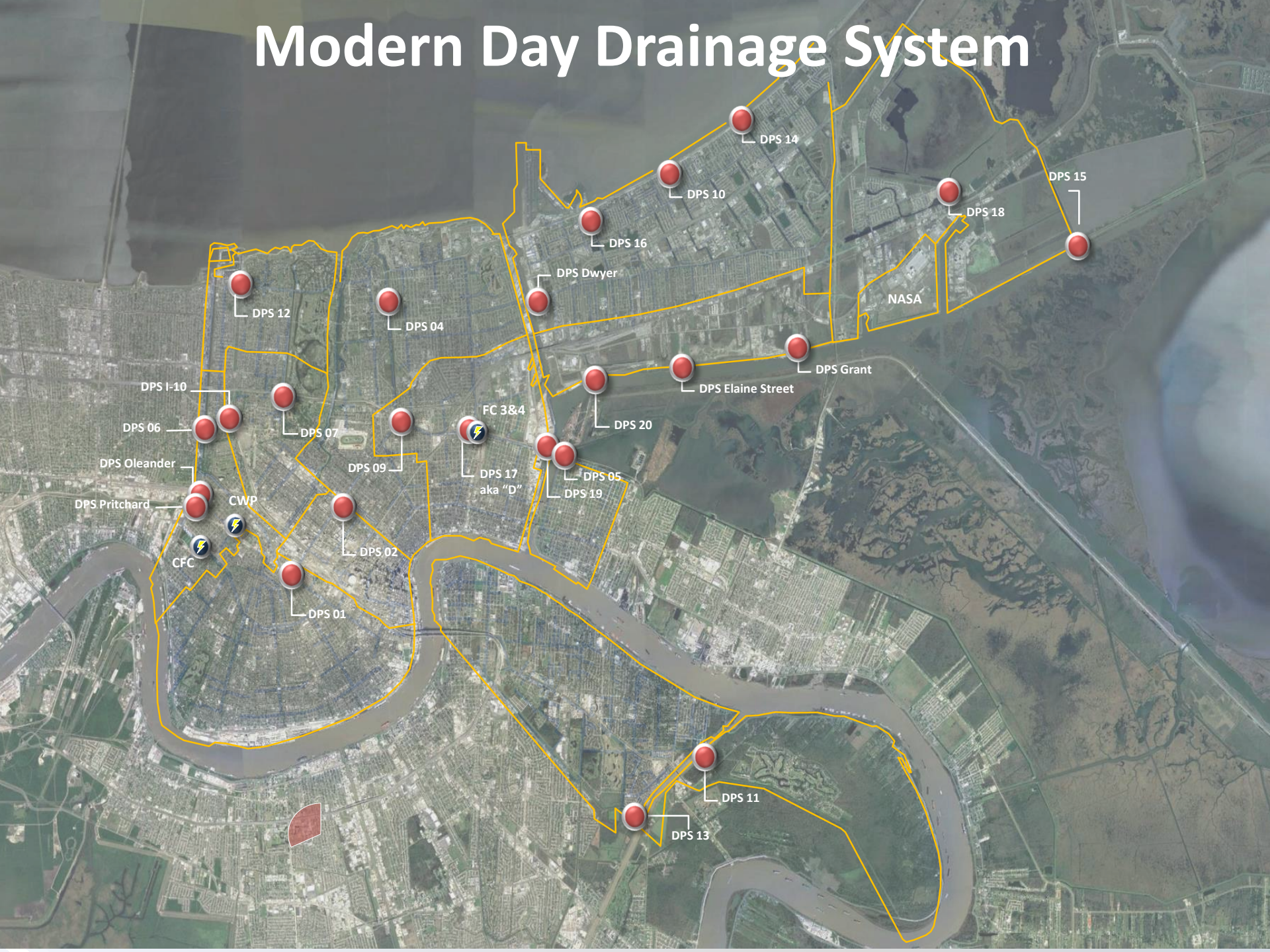
## New Orleans Area Map



## City of New Orleans Ground Elevations

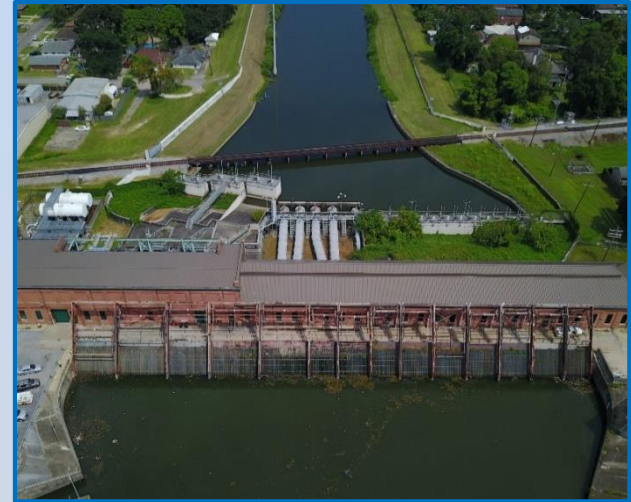
From Canal St. at the Mississippi River to the Lakefront at U.N.O.

# Modern Day Drainage System



# Modern Day Drainage System

- 150 miles of covered canals
- 100 miles of open canals
- 24 major drainage pumping stations
  - 99 Major Drainage Pumps
  - 21 Dry Weather Pumps
  - Total Pumping Capacity >50,000 cfs
- Approx. 50,000 acres drained



Drainage Pumping Station No. 6



Drainage Pumps with 25 Hz Motors

# Modern Day Drainage System

- Power Plant and Power Distribution System
  - 5 Turbines
  - 5 Frequency Changers

UNIT	YEAR	MW	PRESEDENTIAL TERM
TG1	1909	6	Roosevelt
TG3	1929	15	Hoover
TG4	1915	20	Wilson
TG5	1958	20	Eisenhower



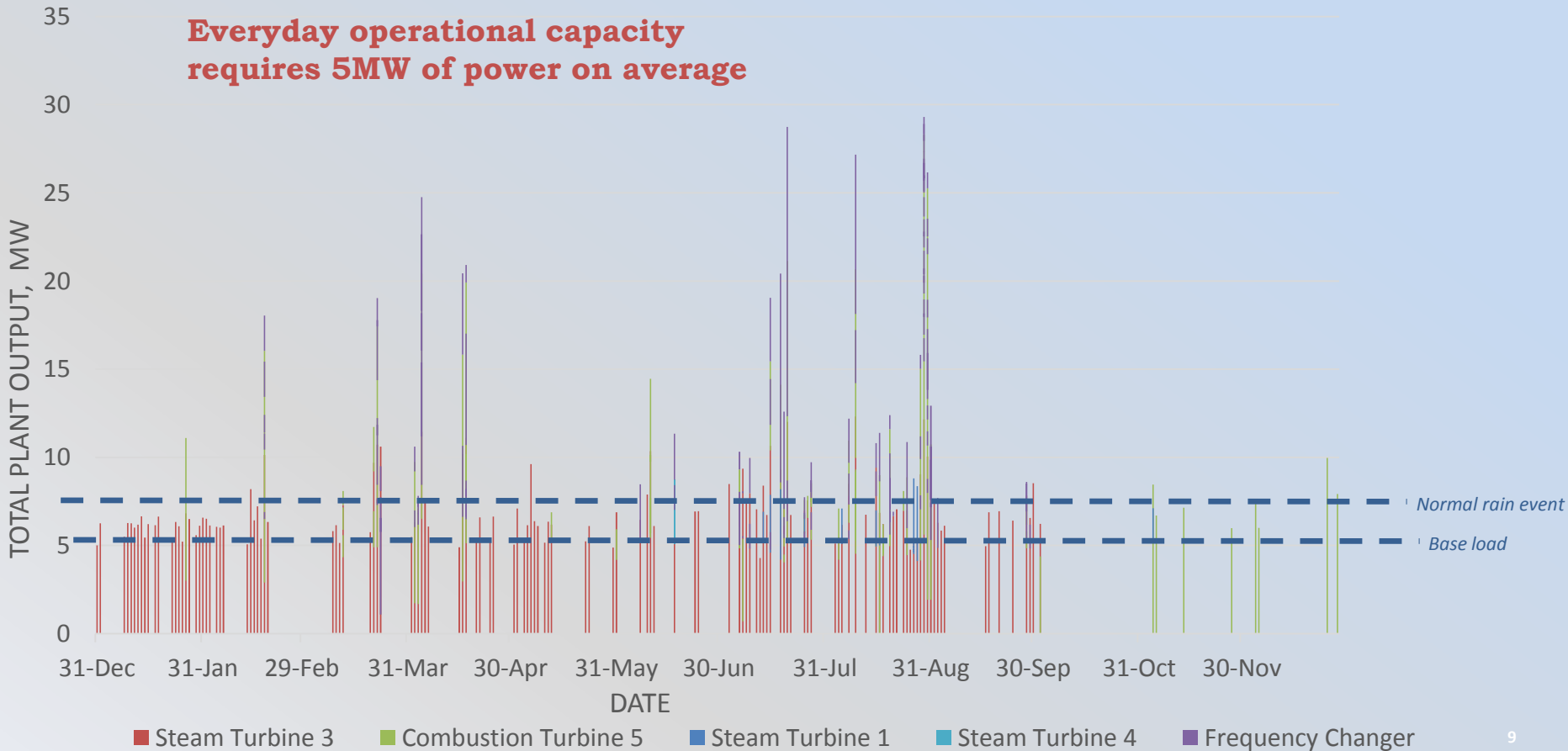
25 Hz Turbine Generator (20 MW)



60 Hz – 25 Hz Frequency Changer 8



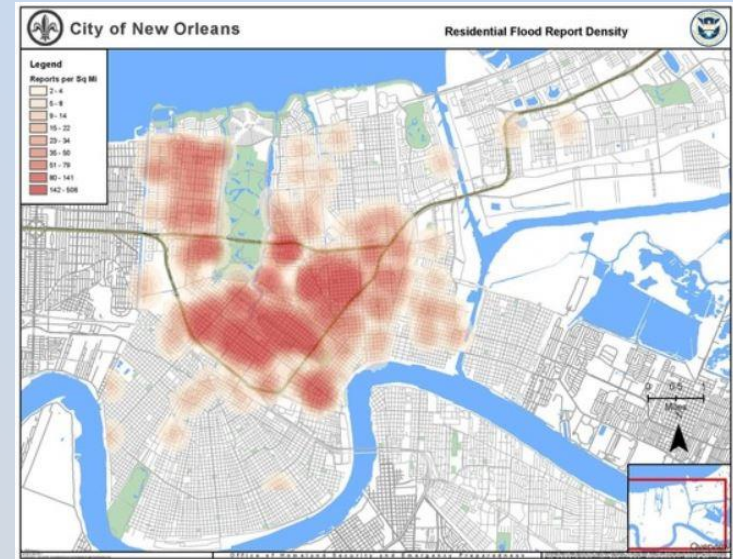
# 25 Hz Power Output in 2012



# August 5, 2017

## 9" Rainfall in 3 Hours

- Significant flooding in portions of the City
- Exposed significant weaknesses in the Drainage System
  - Only 1 of 4 25 Hz Turbine Generators in service
  - 18 Drainage Pumps out of service for maintenance issues
- City Declared Emergency



# Emergency Initiatives

- Achieve System Stability
  - Repair pumps
  - Address staffing shortages
  - Address Power Shortage
- Maintain Readiness
- Begin Planning Process



Turbine Generator 5 Repairs



Pump and Motor Repairs



EMD 25 Hz Generator

# Current Status

- Drainage Pumps
  - 97 out of 99 Major Drainage Pumps in service
  - 98% of total nameplate capacity
- Power Generation
  - All Turbines Operational
  - More than 70 MW of 25 Hz power generation capabilities



Drainage Pumps with 25 Hz Motors



Turbine Generator 4

# Planning For The Future

- Maintain System Stability and Readiness
  - Fill staff vacancies
  - Improve O&M activities
- Develop and Execute Infrastructure Modernization Master Plan
- Identify New Funding Sources