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AN INNOVATIVE SOLUTION:

THE TOWN OF CORTLAND,ILLINOIS
WASTEWATER RECLAMATION AND REUSE SYSTEM

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BACKGROUND INFORMATION

- Cortland IL, Population ~ 3000 PE, 60 miles west of Chicago
- Outsourced wastewater treatment to neighboring Dekalb,IL
- Dekalb WWTP unable to accommodate wastewater beyond 3000 PE
- Study of “Alternatives for new WWTP” based on IEPA guidelines
- IEPA recommended a non discharge system for Cortland
- Sheaffer International responded to a 2003 RFP by Cortland, Sheaffer selected as design engineers
- 2006 IEPA Granted a construction and operation permit
- 2007 construction of plant completed under design build contract, by Sheaffer International

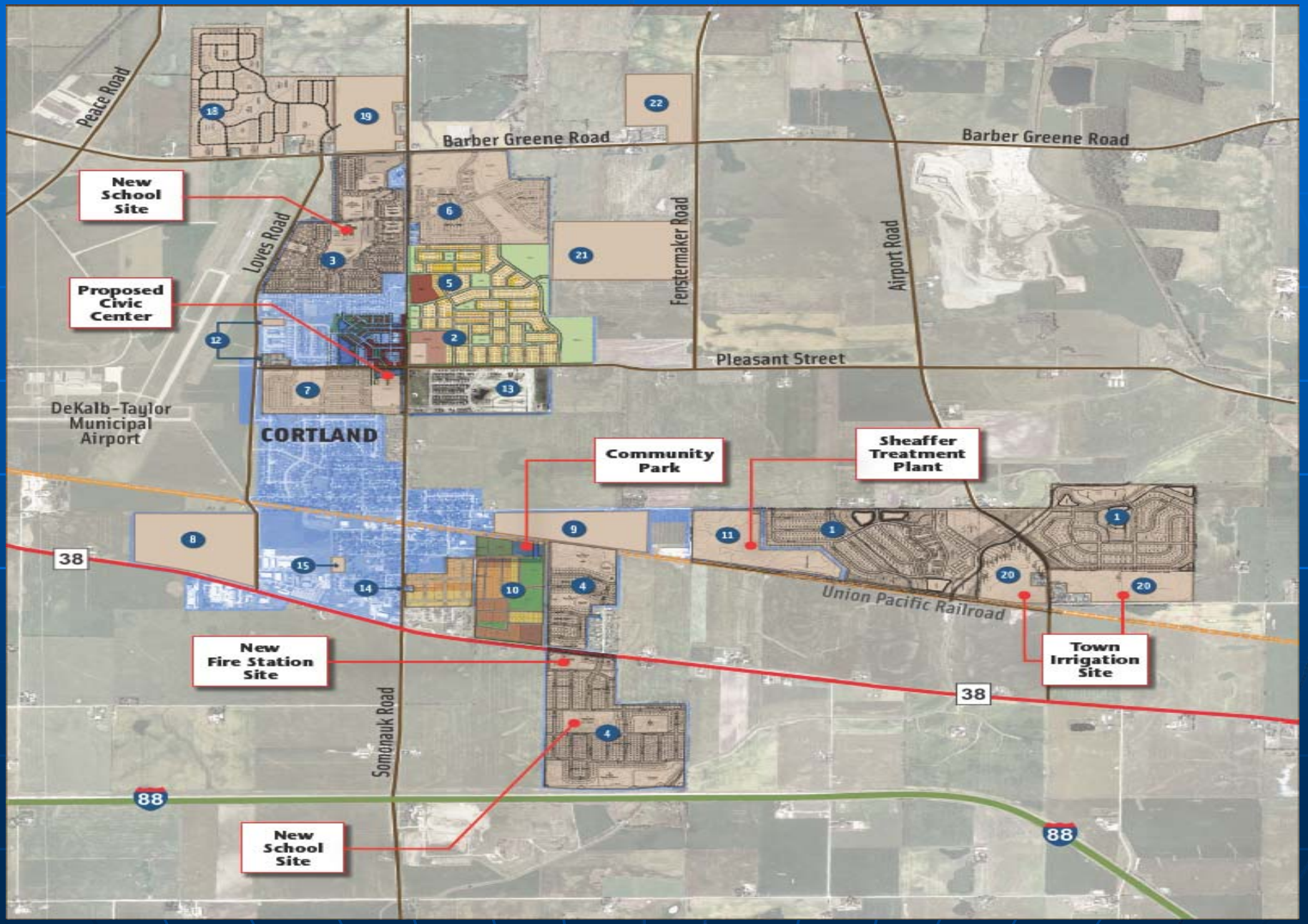
SUMMARY OF CORTLAND,IL RECLAMATION SYSTEM

- Design average flow of 1.5 MGD, current flow 300,000 gpd
- First municipal reuse system in Illinois, non discharging plant
- Treated wastewater used for agricultural irrigation and residential green space irrigation
- New treatment plant construction funded by developers, no cost to town

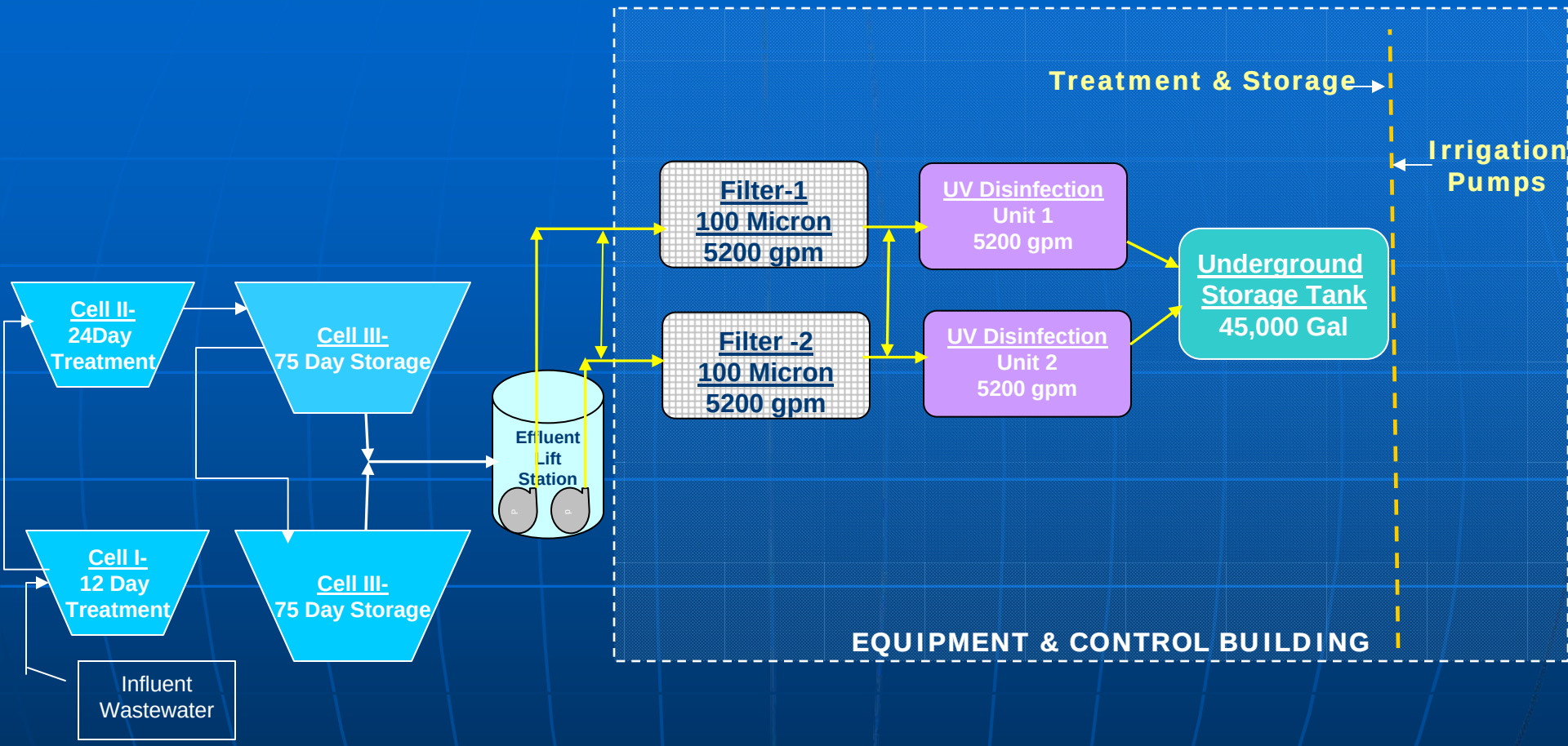
PLANNING AND OVERVIEW

- Existing town has roughly 1000 homes
- Approximately 3500 more homes in planned new developments
- A collection system runs through town to collect wastewater from existing homes, and future homes
- An irrigation force main has been built to take treated wastewater from the plant, back to irrigation sites scattered across town
- Each housing developer (by town ordinance) shall provide green space corridors for irrigation of treated wastewater
- Each development in town is planned with enough green space area to irrigate the equivalent of their wastewater

TOWN OF CORTLAND



WASTEWATER TREATMENT-PROCESS OVERVIEW



- Daily average flow 1.5 MG, 150 day Winter Storage
- Effluent Water Quality
  - 10mg/L BOD (Avg)
  - 10 mg/l TSS (Avg)
  - 10 mg/l TN (Avg)

IRRIGATION SYSTEM- DESIGN CRITERIA

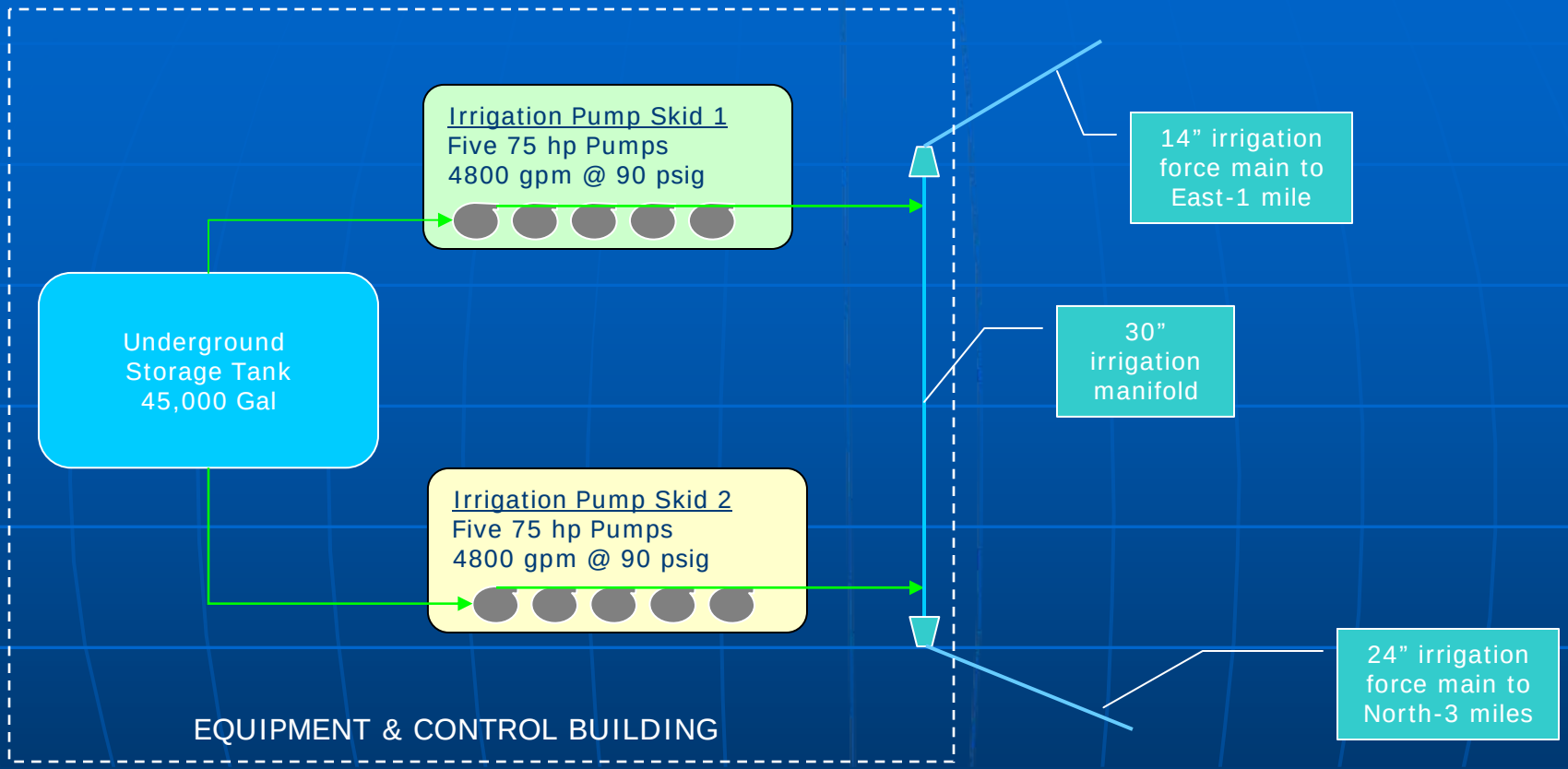
- 3”/ week max application rate (IEPA)
- Soil type, characteristics taken into consideration
- Nutrient balance, based on nutrients (N & P) in treated wastewater and nutrient uptake of crop/grass
- Application rate is generally nutrient limited
- Min 4’ of separation to groundwater
- Climatic conditions (max 22 mph wind, rain)
- Setbacks to property lines, wells, etc
- Agricultural irrigation permitted anytime, unrestricted residential irrigation allowed between dusk and dawn

✓ Most irrigation areas designed at ~ 2”/week average application rate

IRRIGATION PROCESS OVERVIEW AND COMPONENTS

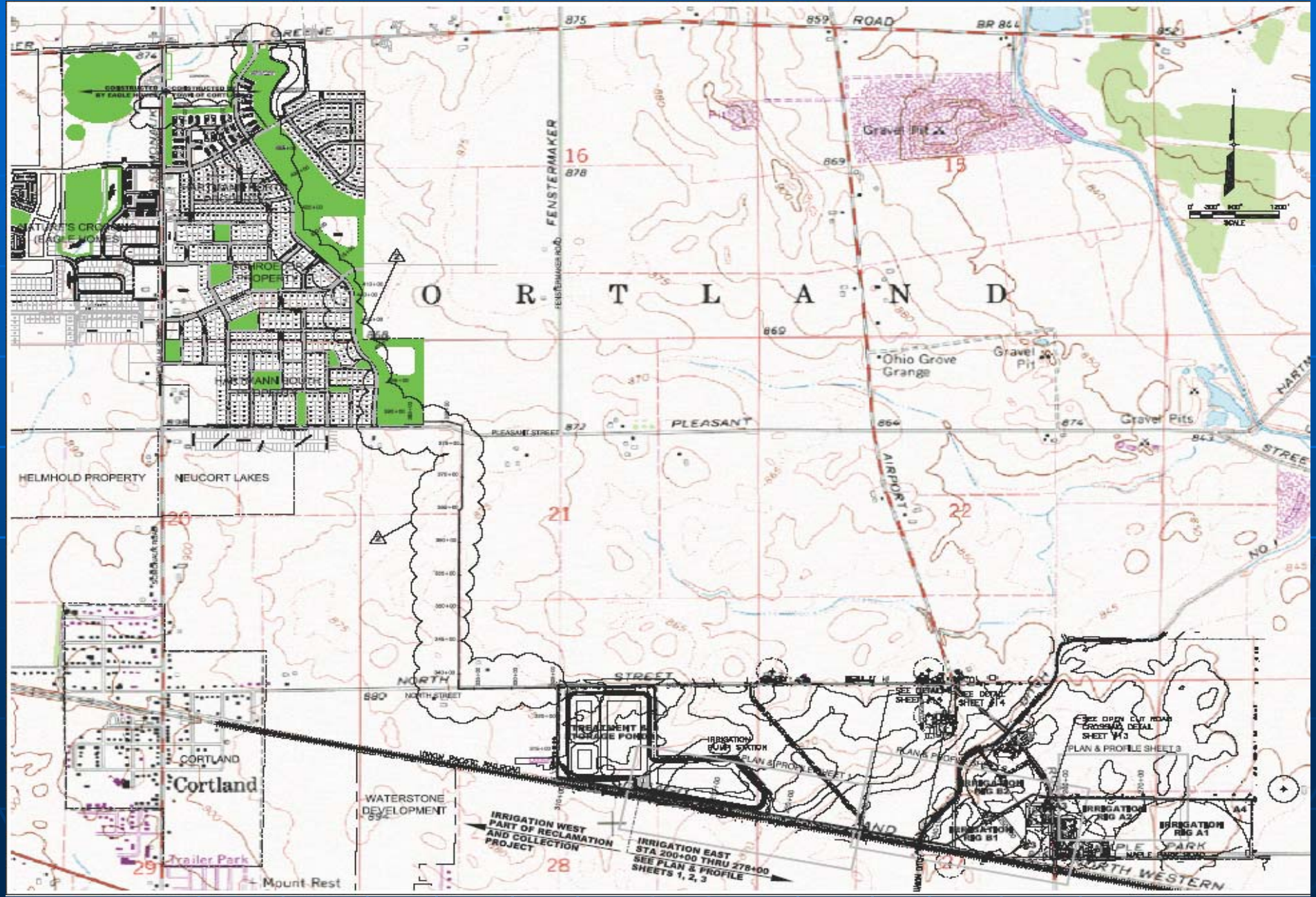
- Irrigation Pumps (Watertronics vertical turbine pumps)
- Irrigation force main (C 905 pipe)
- Irrigation equipment
  - Agricultural irrigation (Valley Center pivot rigs & big guns)
  - Residential/ green space (Hunter sprinklers)
- Irrigation Controllers (TUCOR two wire controllers)
  - Telemetry (Firetide 5.2 GHz wireless mesh network)

IRRIGATION PUMPS AND FORCEMAIN



- Staged irrigation pumps, VFD's maintain 90 psig line pressure
- Irrigation pumps always on "AUTO" mode
- Irrigation force main always pressurized with treated wastewater
- Remote irrigation controllers initiate irrigation

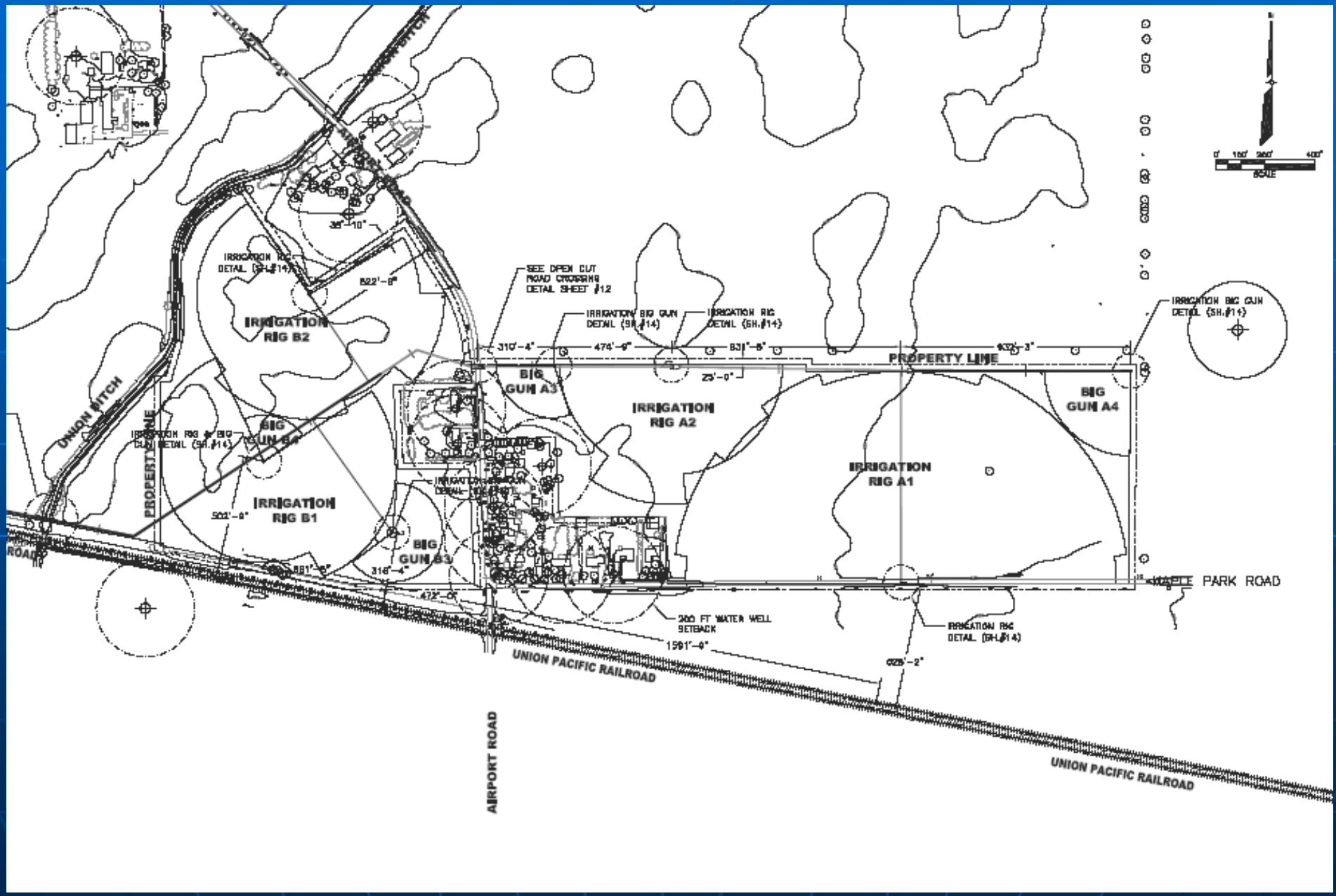
ROUTING-IRRIGATION FORCEMAIN IN TOWN



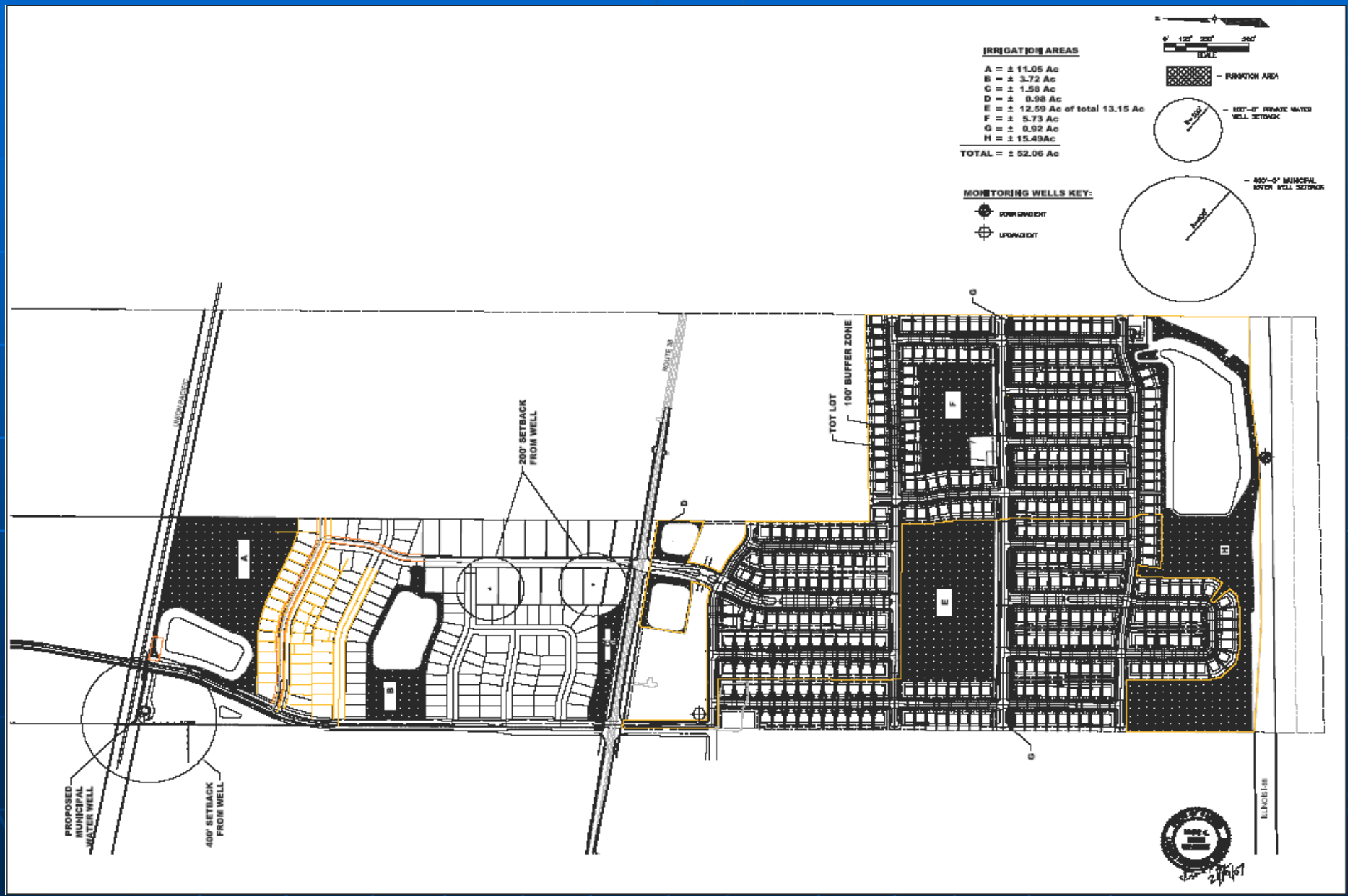
IRRIGATION EQUIPMENT-TOWN IRRIGATION SITE

- ~ 80 acres of agricultural irrigation site
- Mostly corn with winter cover crop (for non human consumption)
- Four (4) Valley center Pivot rigs
- Four (4) Nelson Big guns
- Stand alone irrigation controller, with flow meter, weather station and telemetry

LAYOUT-TOWN IRRIGATION SITE



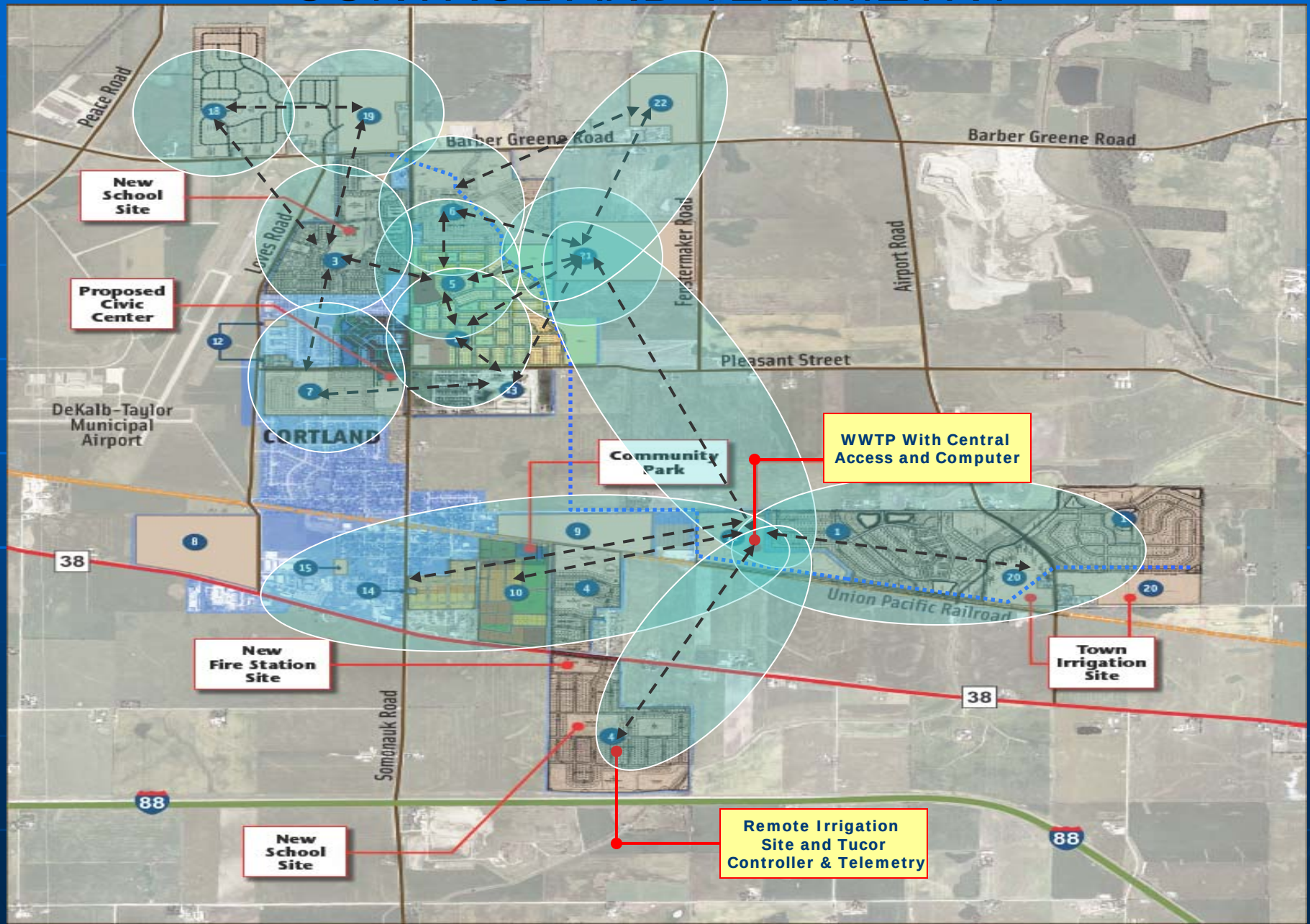
GREEN SPACE IRRIGATION LAYOUT



TOWN-WIDE IRRIGATION CONTROL SETUP

- Each remote irrigation site has a local irrigation controller, flow meter, weather station and telemetry
- Remote irrigation controllers at each site programmed to run based on hrs/day for the permitted application rate with automated alarm limits
- All remote irrigation sites within town are accessible from the WWTP through the town wide Firetide 5.2 GHz wireless mesh network
- Self forming and self healing mesh network
  - Mesh can also be used for public Wi-Fi access, video, and audio applications
- All remote irrigation controllers can be accessed from
  - Local Controller interface
  - PC at WWTP connected to a Firetide Hotport Node
  - Anywhere in the world, with access to high speed internet

SCHEMATIC OF TOWNWIDE IRRIGATION CONTROL AND TELEMETRY



ADVANTAGES AND BENEFITS OF RECLAMATION

- No discharge of wastewater to rivers & streams, reduces loading to surface waters
- Recycles nutrients (N & P) in wastewater as fertilizers to crops, grass
- Helps conserve potable water resources
  - Using treated wastewater for landscape irrigation and other uses, conserves potable water
  - Saves high quality water for high quality needs
- Groundwater recharge
- Promotes sustainable and green developments
  - Communities designed with dedicated green spaces, and more open space
  - Long term cost savings and improved water resource management, especially in arid areas

QUESTIONS/COMMENTS?