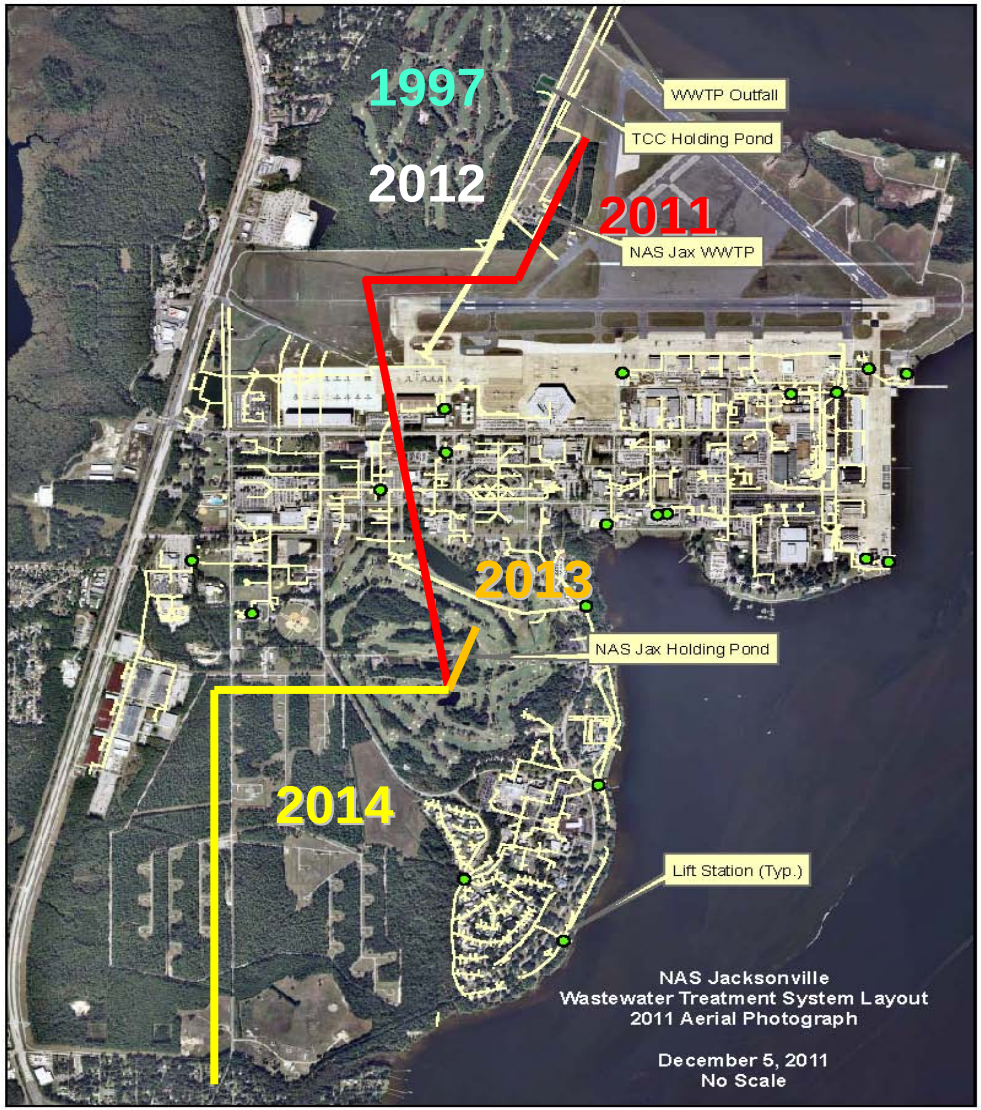
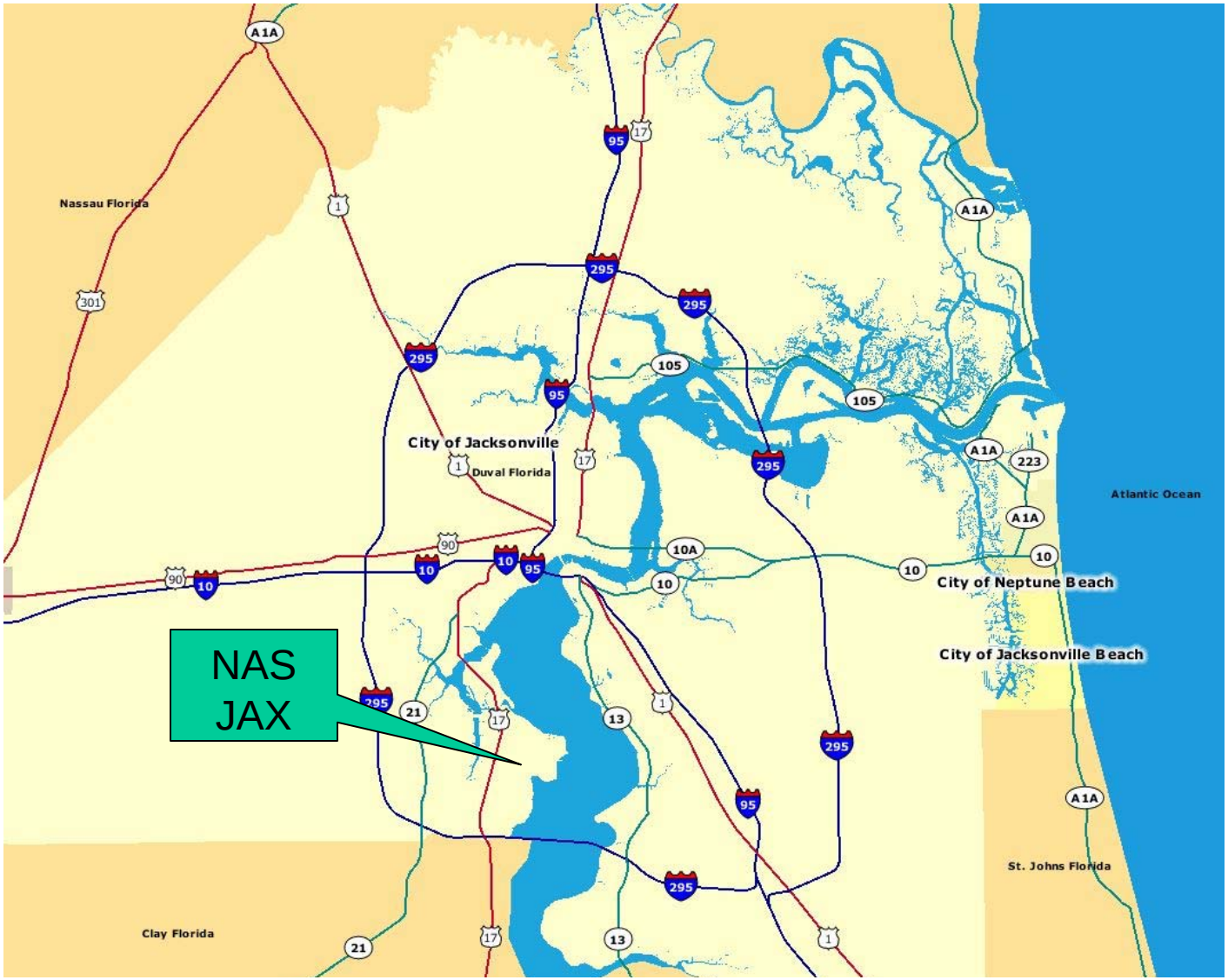
NAS Jacksonville Wastewater Reuse Project

- **State of Florida Operating Permit**
  - **$4.2 M** wastewater reuse project (4.2 miles of reuse piping) with zero discharge to St Johns River by 2014 using Navy funding ($2.2M) and State grants to City of Jacksonville ($2M) Project will eliminate 315 MGY discharge to river and 48 MGY withdrawal from Floridan Aquifer.
  - Station will connect to City treated wastewater discharge to reuse up to 1 MGPD to stabilize plant operations in 2013

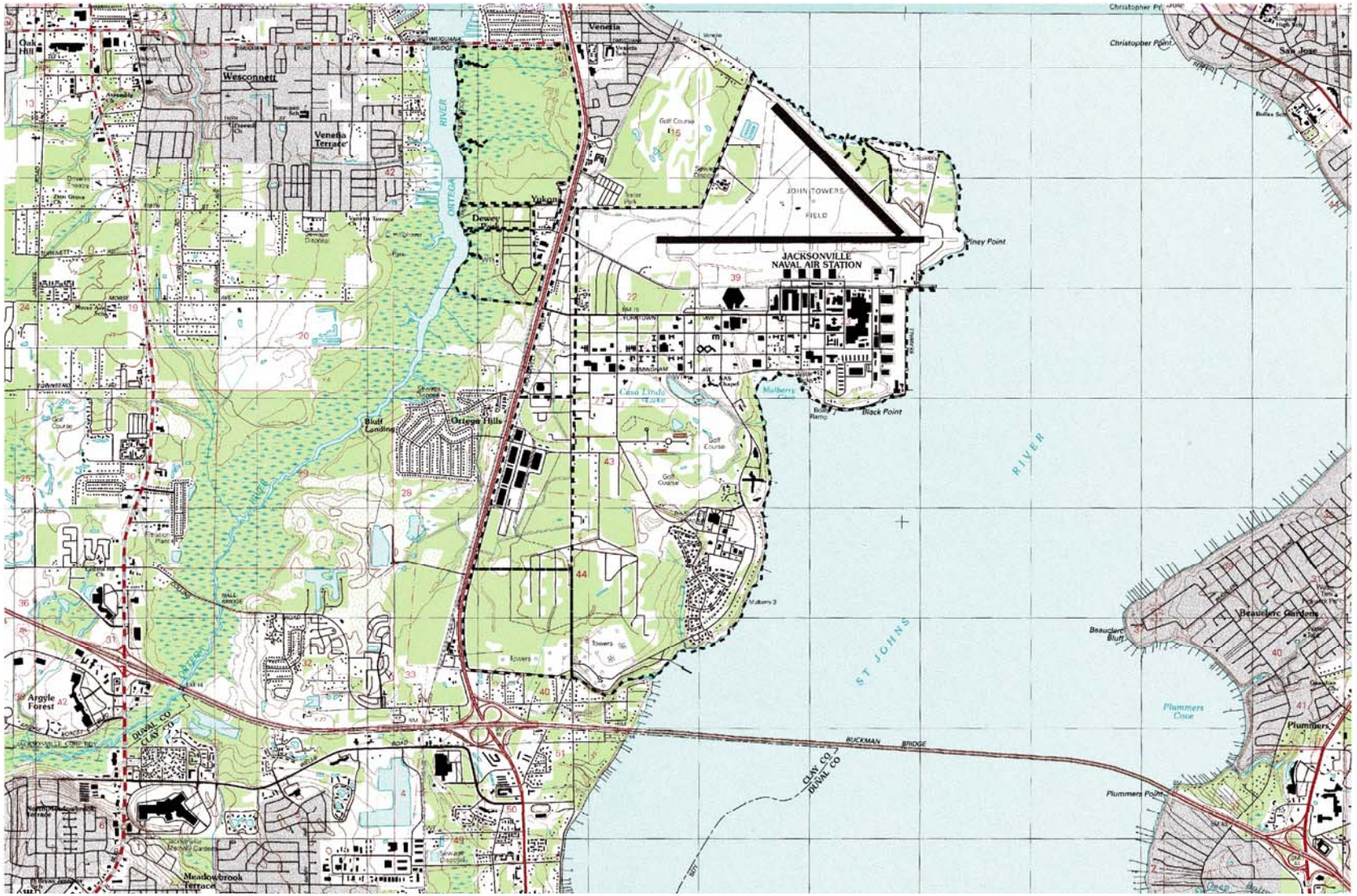
- **State of Florida Aggregate Permit for NAS JAX and NS Mayport**
  - Must reduce nitrogen discharge 66,000 lb/yr by Oct 2015. NAS JAX reuse will eliminate 54,000 lb/yr. NS Mayport must reduce 12,000 lb/yr.



NAS Jax/Jacksonville



USGS Map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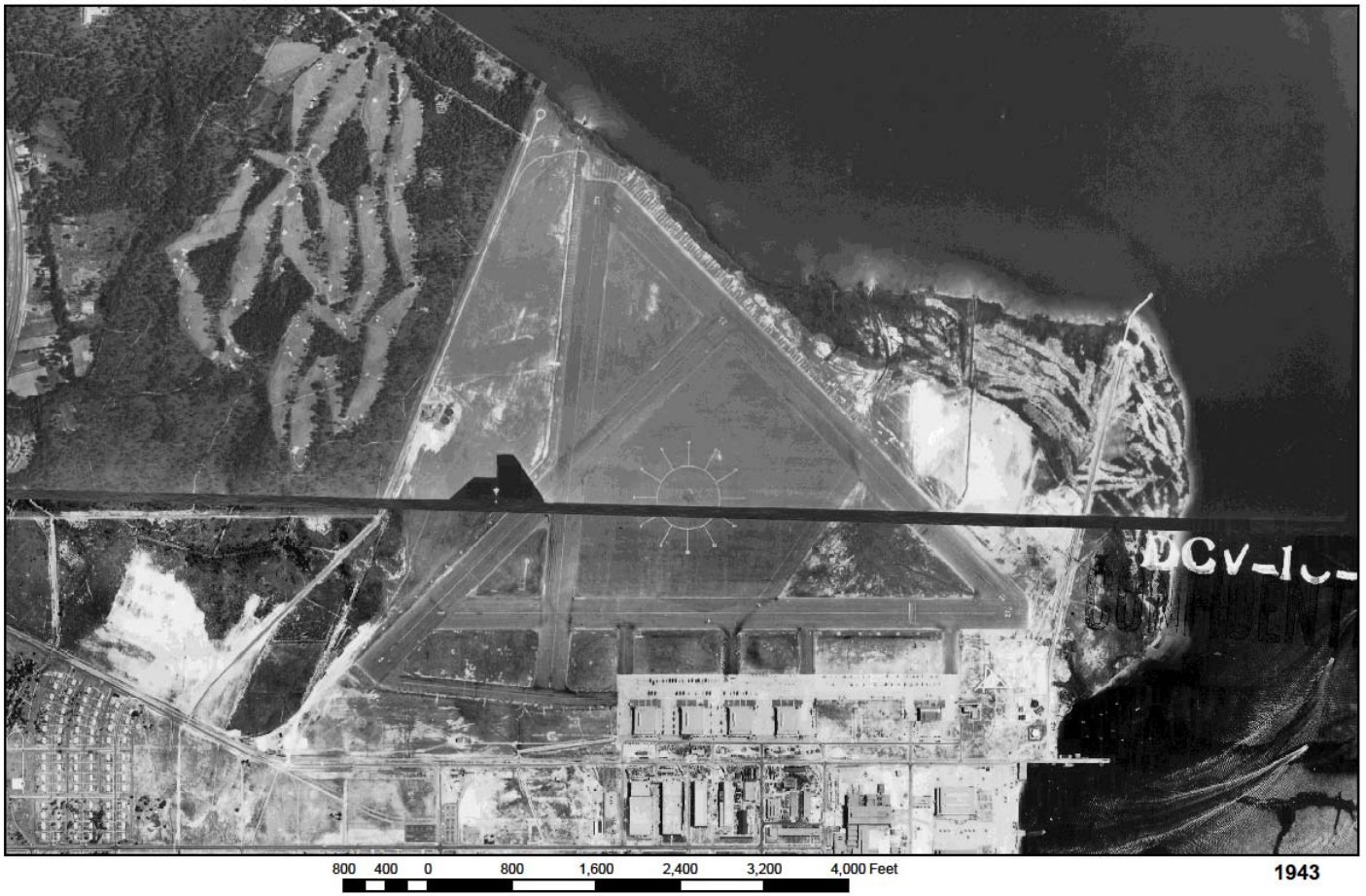
NAVAL AIR STATION
JOHN TOWERS
FIELD
Venetia
Wesconnett
Venetia Terrace
Dewey Park
Yukon
Oak Hill
Bluff Landing
Ortega Hills
Argyle Forest
Meadowbrook Terrace
Black Point
Piney Point
Christopher Point
San Jose
Beauclerc Gardens
Plummers Point
Plummers Cove
RIVER
ST JOHNS
ORTEGA
BUCKMAN
BRIDGE
DUVAL CO
CLAY CO

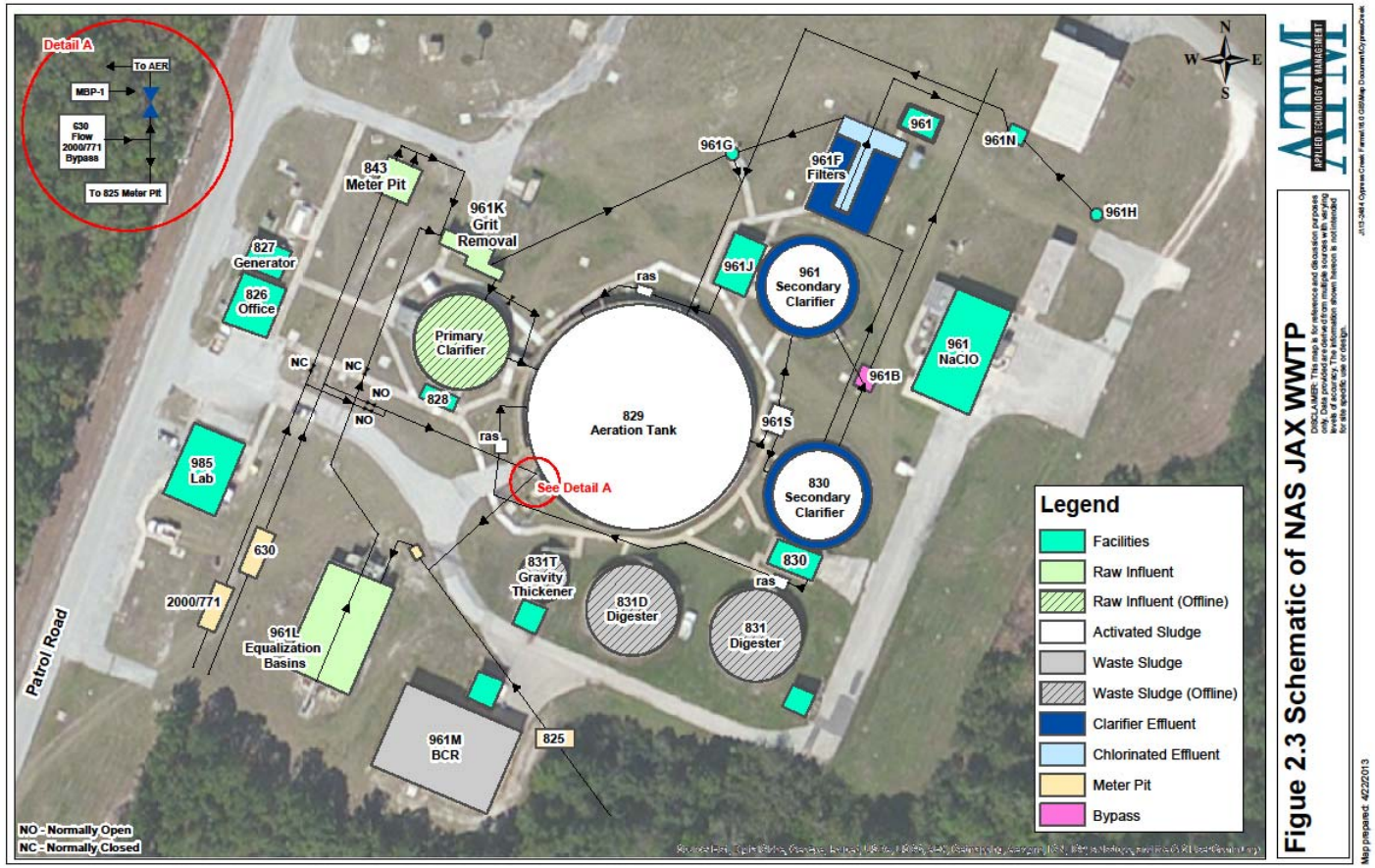
NAS Jax North

NAS Jax South

NAS Jax 1943



NAS Jax WWTP

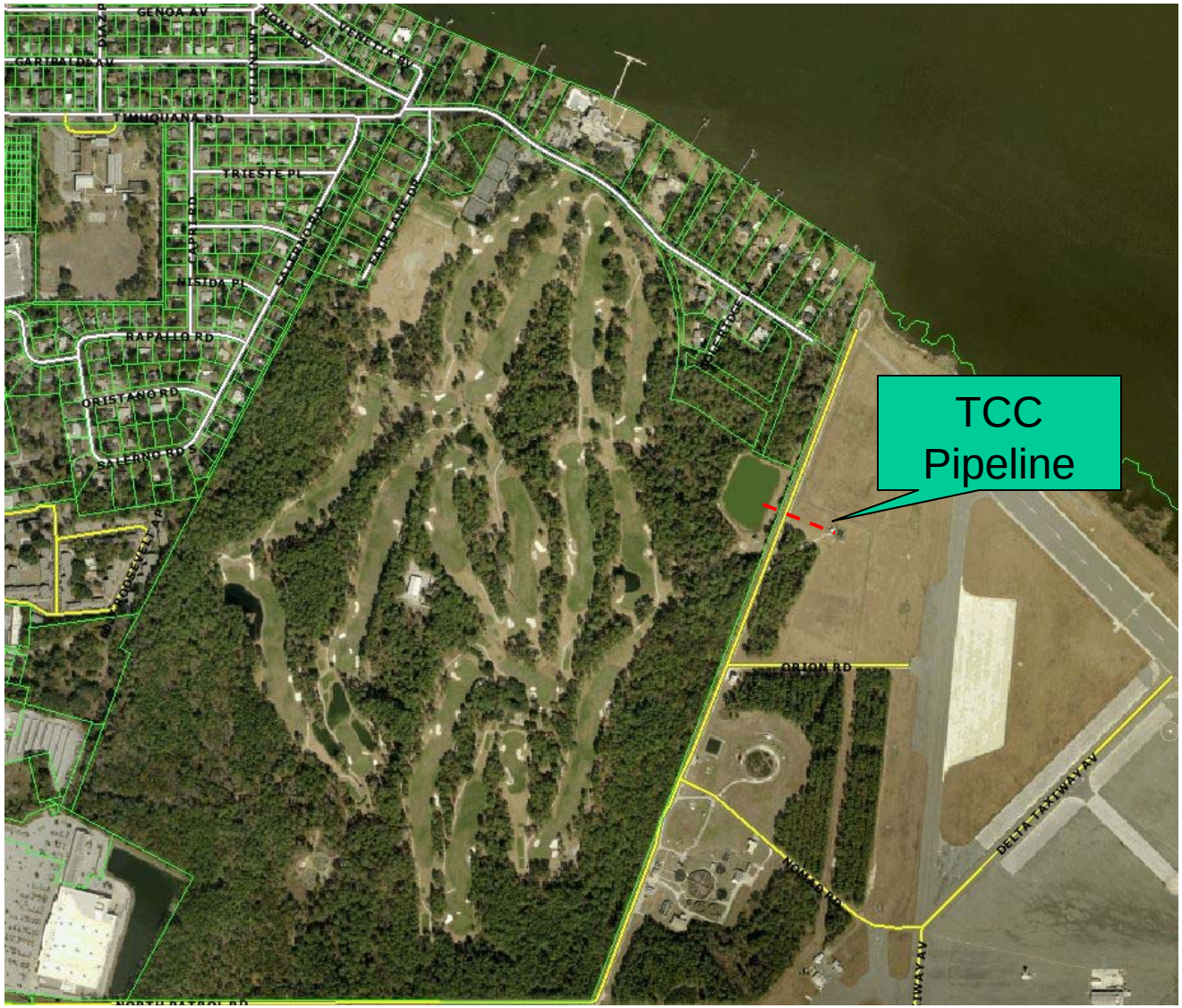

Detail A
To AER
MBP-1
630 Flow 2000/771 Bypass
To 825 Meter Pit
843 Meter Pit
961K Grit Removal
827 Generator
826 Office
Primary Clarifier
NC
NC
NO
NO
828
829 Aeration Tank
ras
See Detail A
985 Lab
630
2000/771
961L Equalization Basins
831T Gravity Thickener
831D Digester
831 Digester
961M BCR
825
Patrol Road
961G
961F Filters
961
961N
961H
961J
961 Secondary Clarifier
961 NaClO
961B
961S
830 Secondary Clarifier
830
ras
ras
N
W
E
S
Legend
Facilities
Raw Influent
Raw Influent (Offline)
Activated Sludge
Waste Sludge
Waste Sludge (Offline)
Clarifier Effluent
Chlorinated Effluent
Meter Pit
Bypass
NO - Normally Open
NC - Normally Closed
ATM
APPLIED TECHNOLOGY & MANAGEMENT
Figue 2.3 Schematic of NAS JAX WWTP
DISCLAIMER: This map is for reference and discussion purposes only. Data provided are derived from multiple sources with varying levels of accuracy. Information shown hereon is not intended for site specific use or design.
Map prepared: 4/22/2013

Wastewater Influent

WWTP Bar Screen

WWTP Discharge Since 1992

Timuquana Country Club Pond Const. 1996



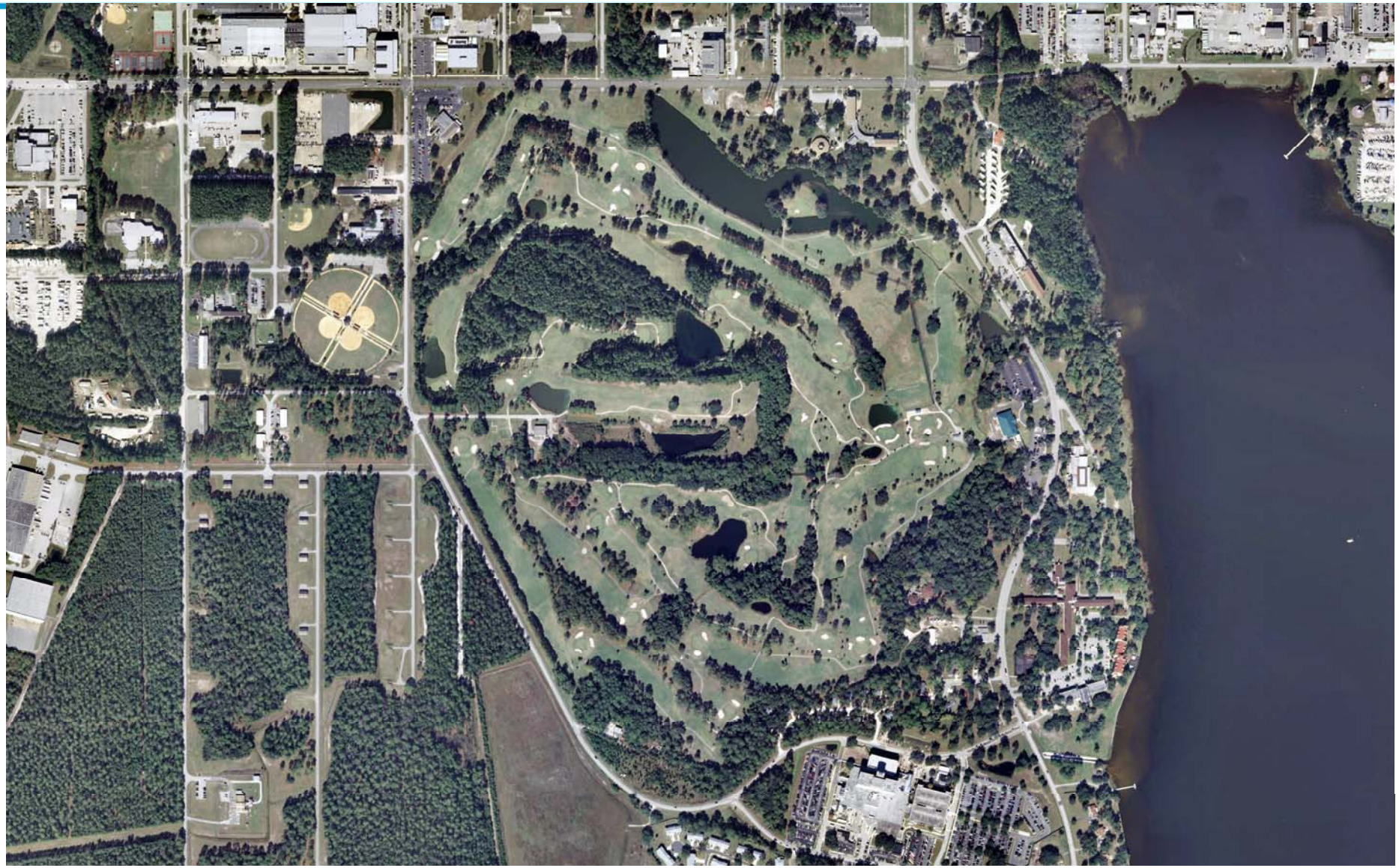
Effluent Reuse Monitoring

TMDL Agg. Permit

- **TMDL Aggreagate Permit**

	Agg. Permit	NAS Jax	NS Mayport
2009 Aggregate Nit. Load	92,464	54,412	38,052
NAS Jax TCC Reuse		-9,887	
NAS Jax Reuse		-17,760	
NAS Jax Forested Irrigation		-26,765	
NS Mayport Required Reduction to Meet Allocation			-12,347
Subtotal	25,705		
Allocation	25,705		

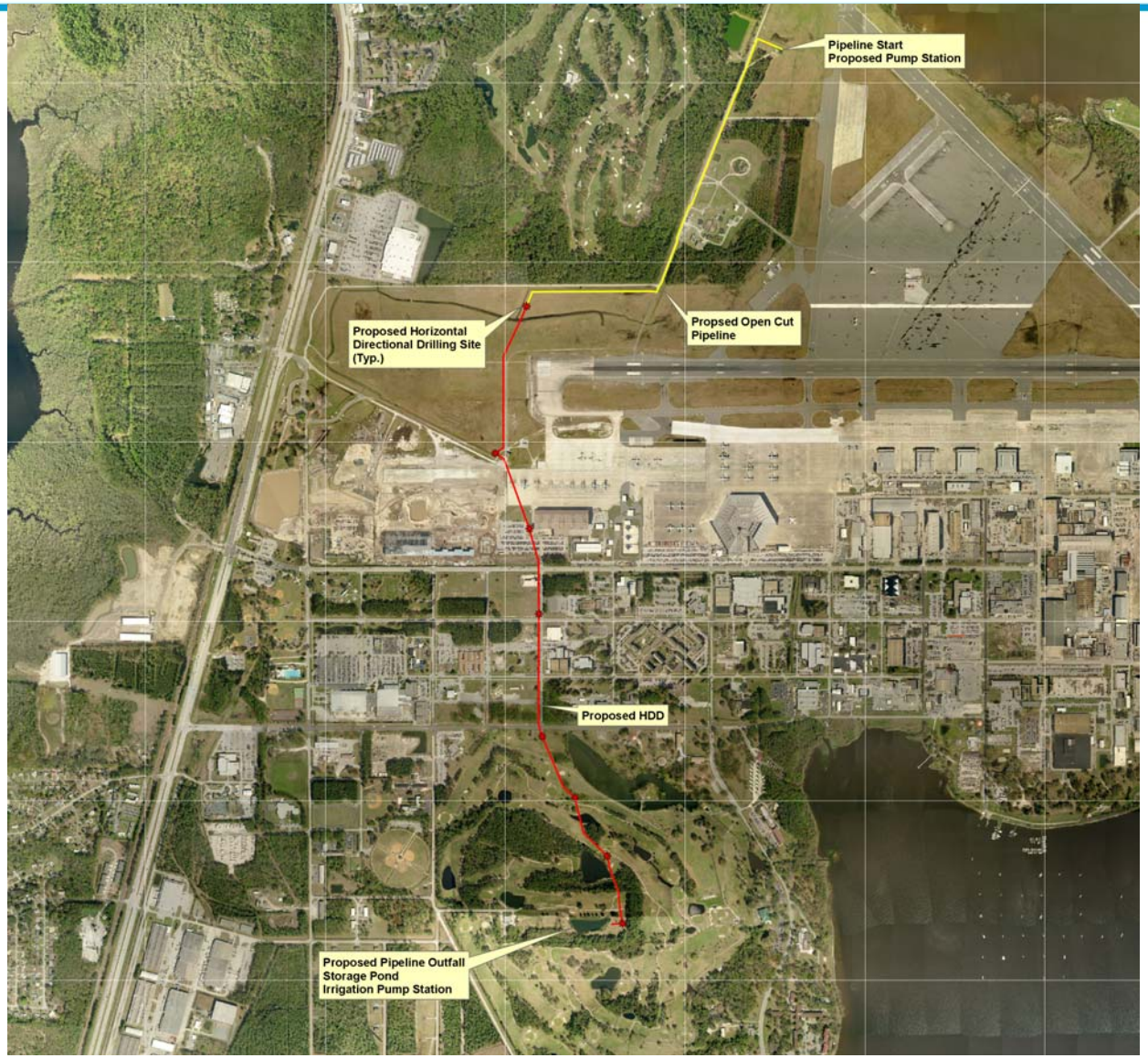
NAS Jax Golf Course



Pipeline to NAS Jax Golf Course

Pipeline/Irrigation Options

Pipeline Route



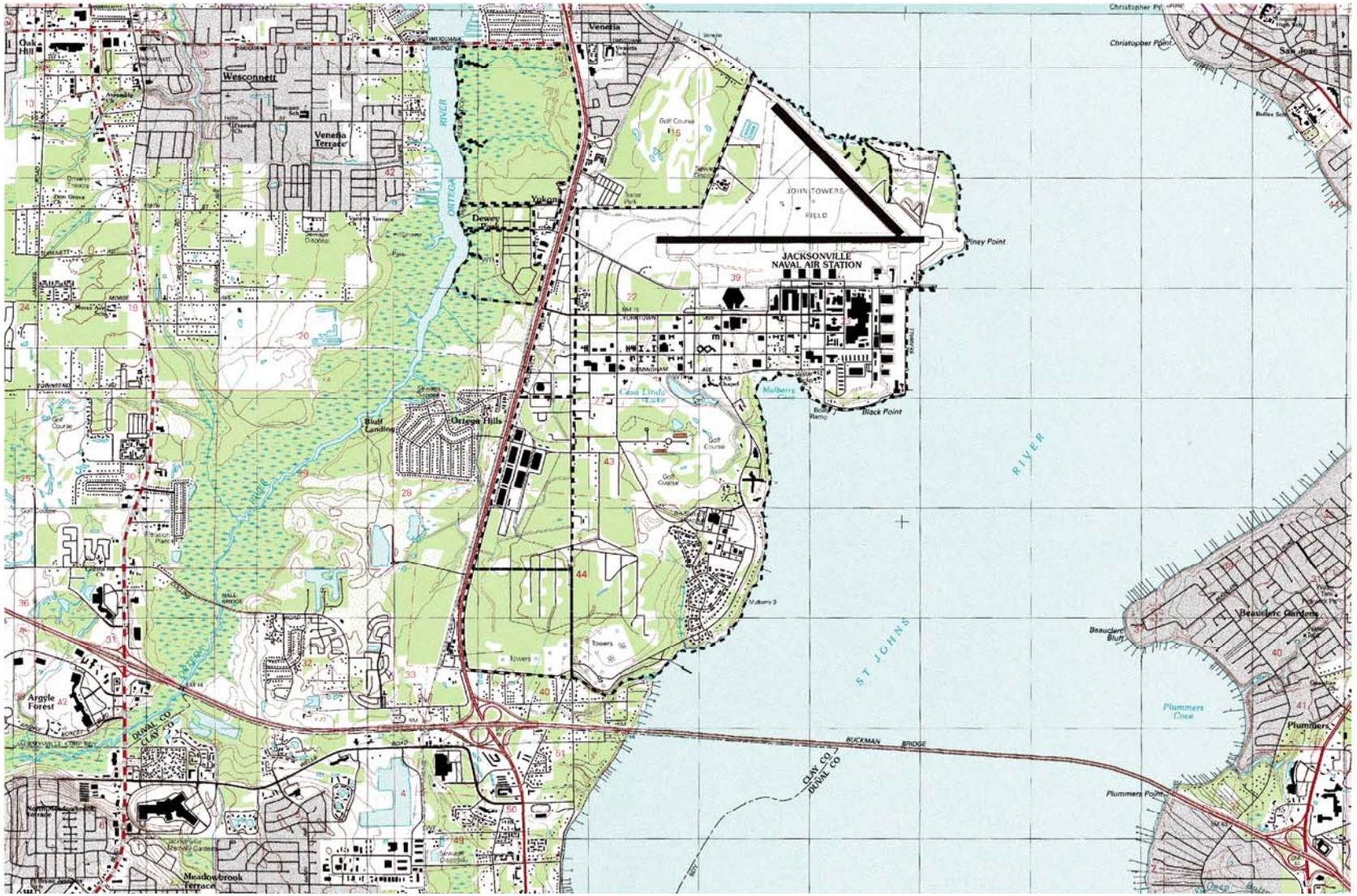
New Effluent Reuse Pumps

NAS Jax 2-Acre Holding Pond

Irrigation Pump Station

New Irrigation Pumps

USGS Map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Plummers Point
Plummers Cove
RIVER
ST JOHNS
ORTEGA
BUCKMAN
BRIDGE
DUVAL CO
CLAY CO

Weapons Storage/Antenna Farm

Soils Investigation

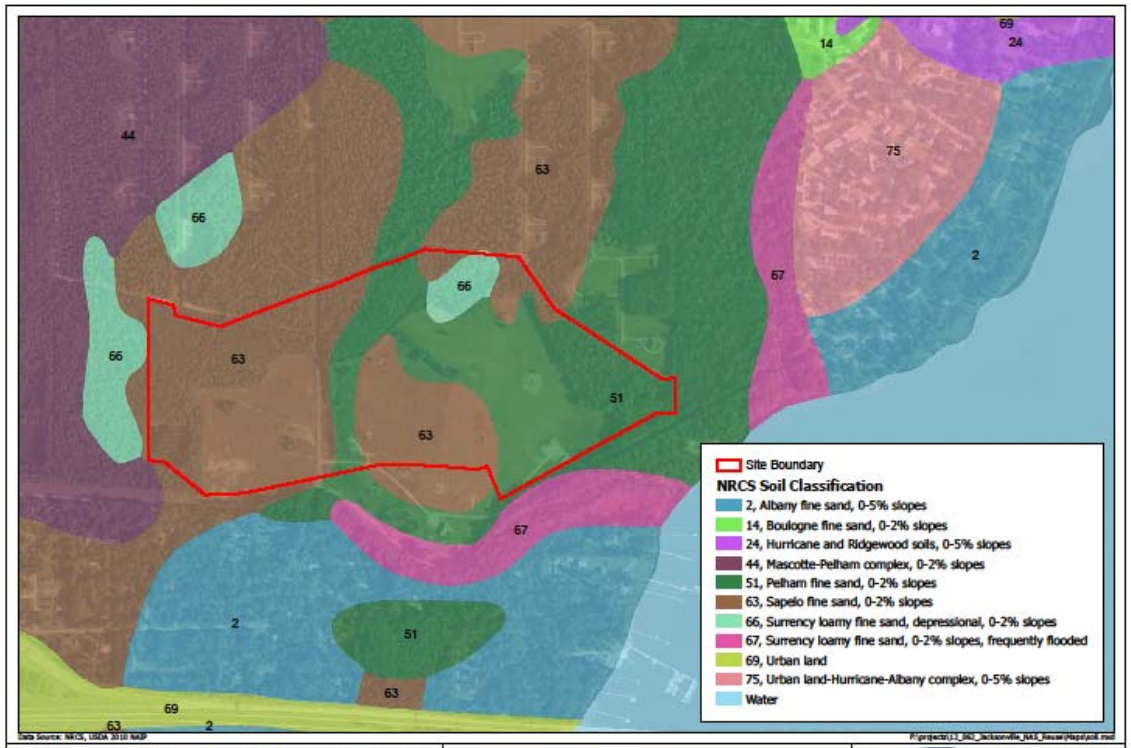


Figure 3. Published soil survey mapping, Jacksonville NAS reclaimed wastewater land application system expansion, Duval County, Florida.

Hydraulic Loading Rate

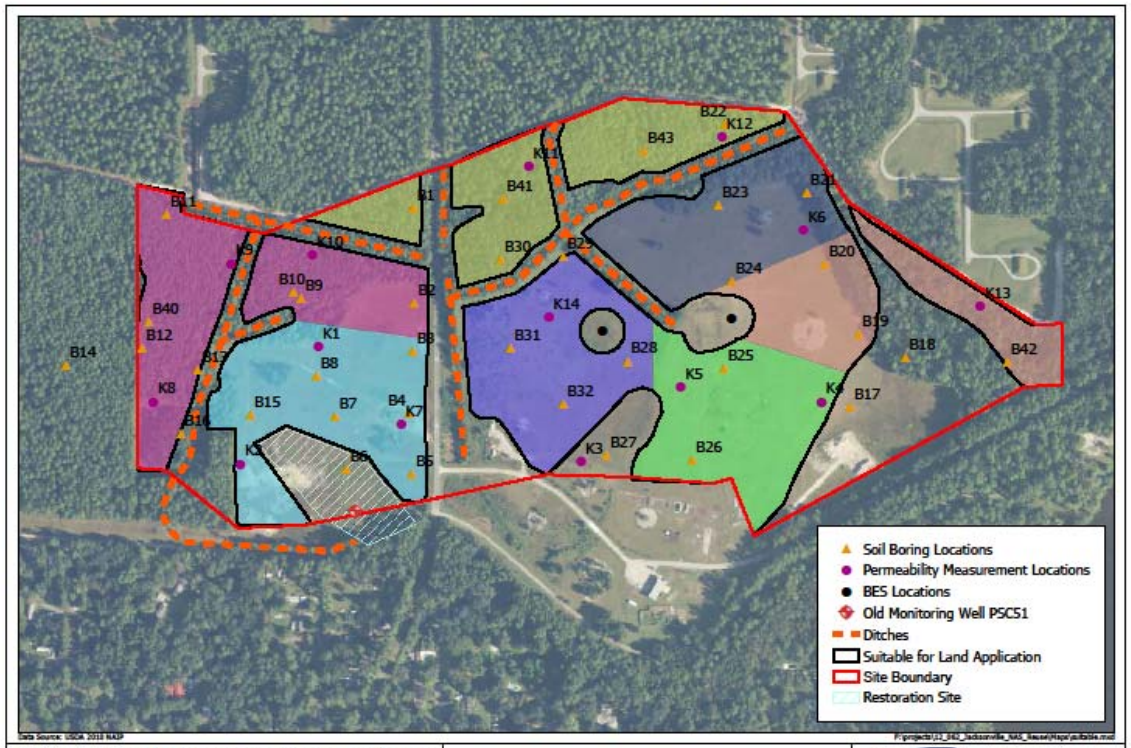


Figure 4. Area suitable for spray irrigation, Jacksonville NAS reclaimed wastewater land application system expansion, Duval County, Florida. Note - shading indicates separate spray fields.

Hydraulic Loading Rate

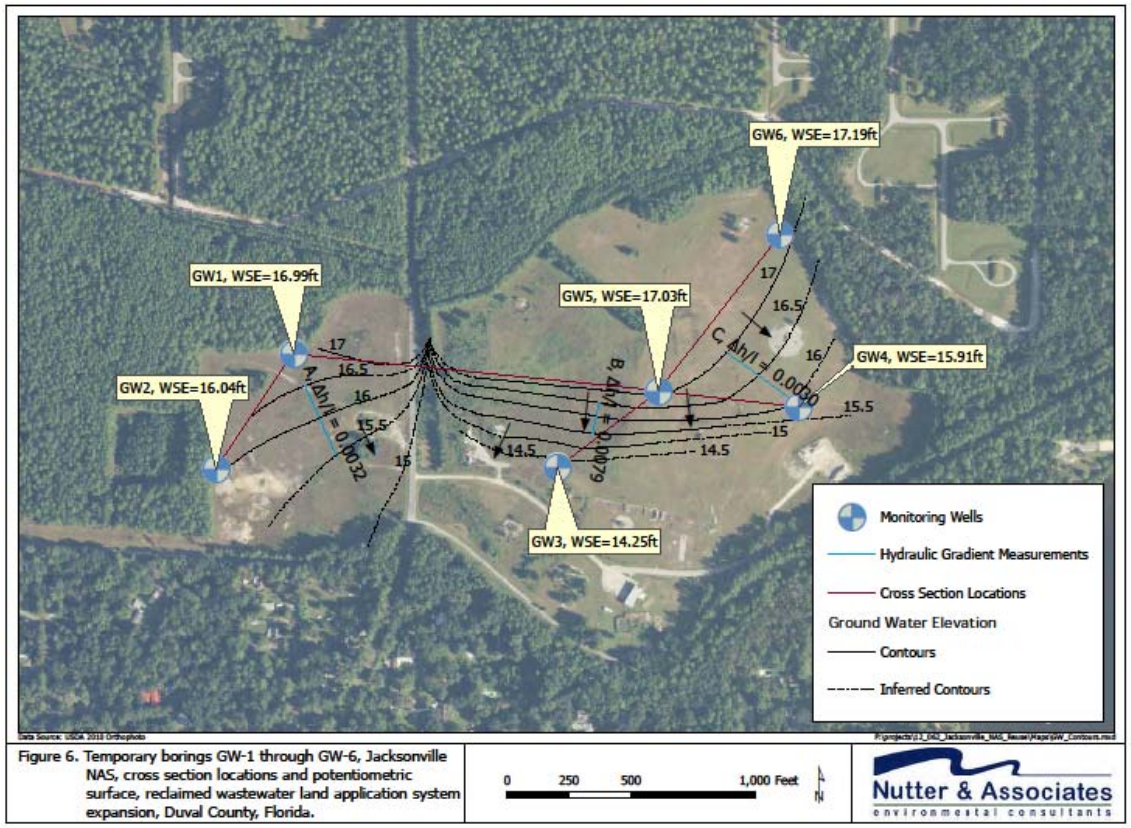


Figure 6. Temporary borings GW-1 through GW-6, Jacksonville NAS, cross section locations and potentiometric surface, reclaimed wastewater land application system expansion, Duval County, Florida.

Groundwater

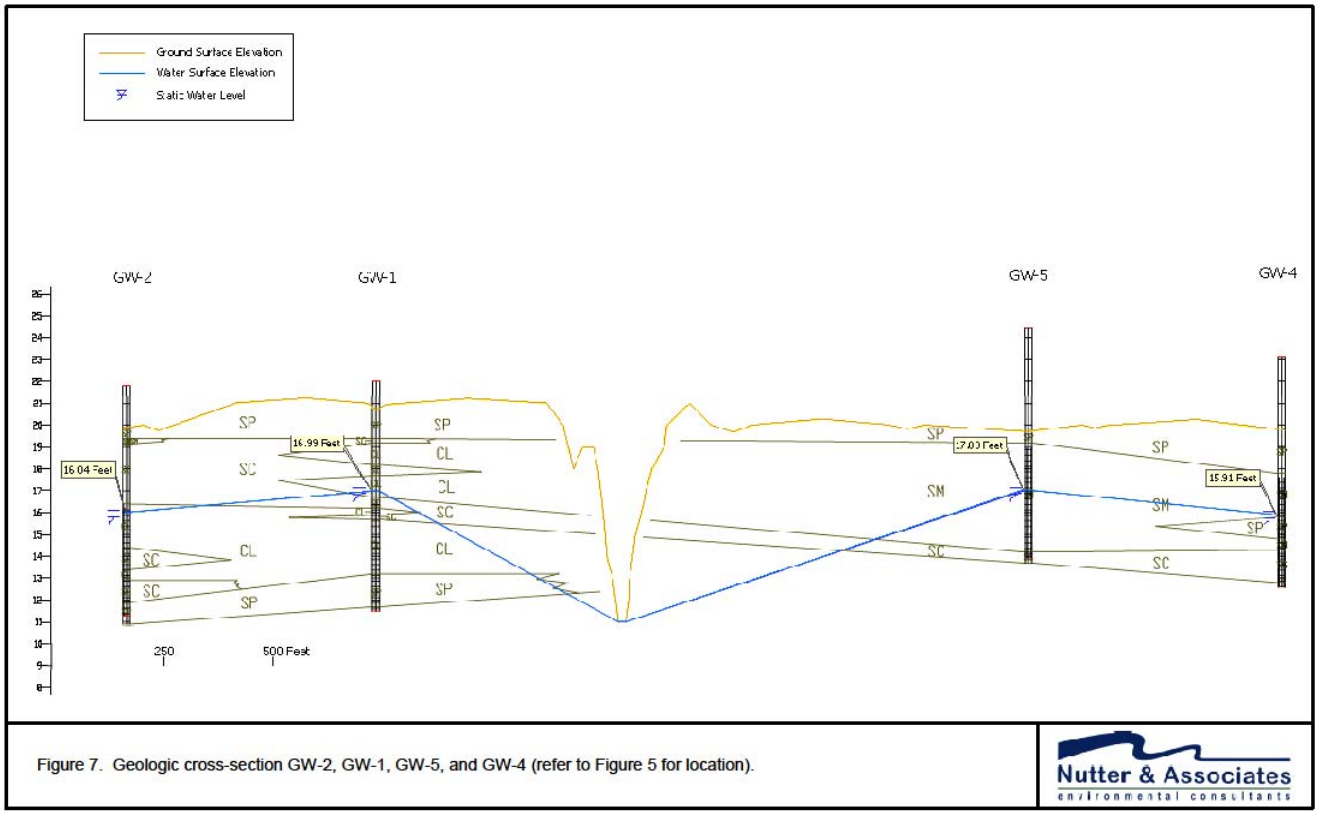


Figure 7. Geologic cross-section GW-2, GW-1, GW-5, and GW-4 (refer to Figure 5 for location).

Nutter & Associates
environmental consultants

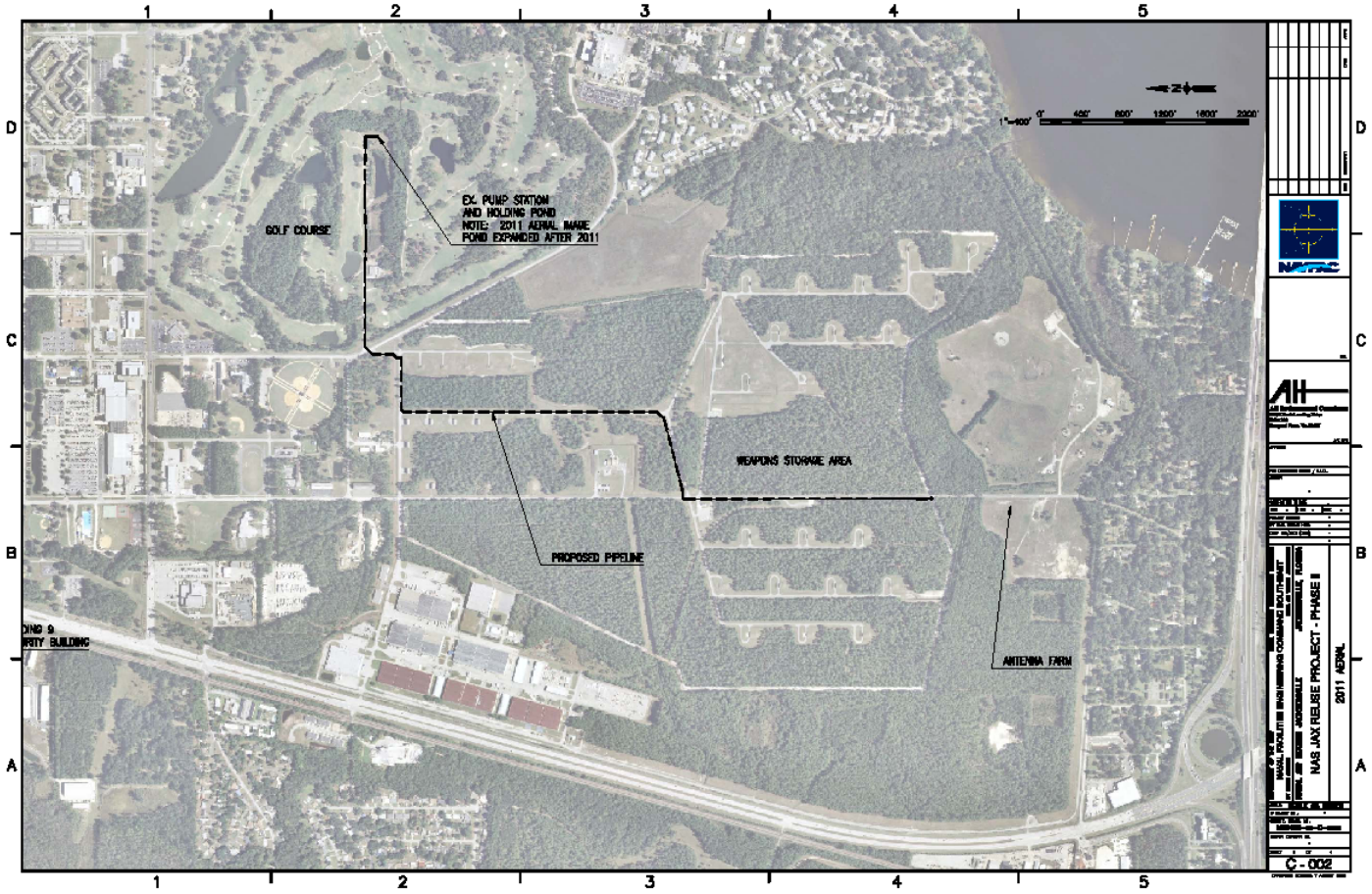
Irrigation Loading Rate

Table 8. Monthly hydrologic budget, NAS reclaimed wastewater land application system expansion site.

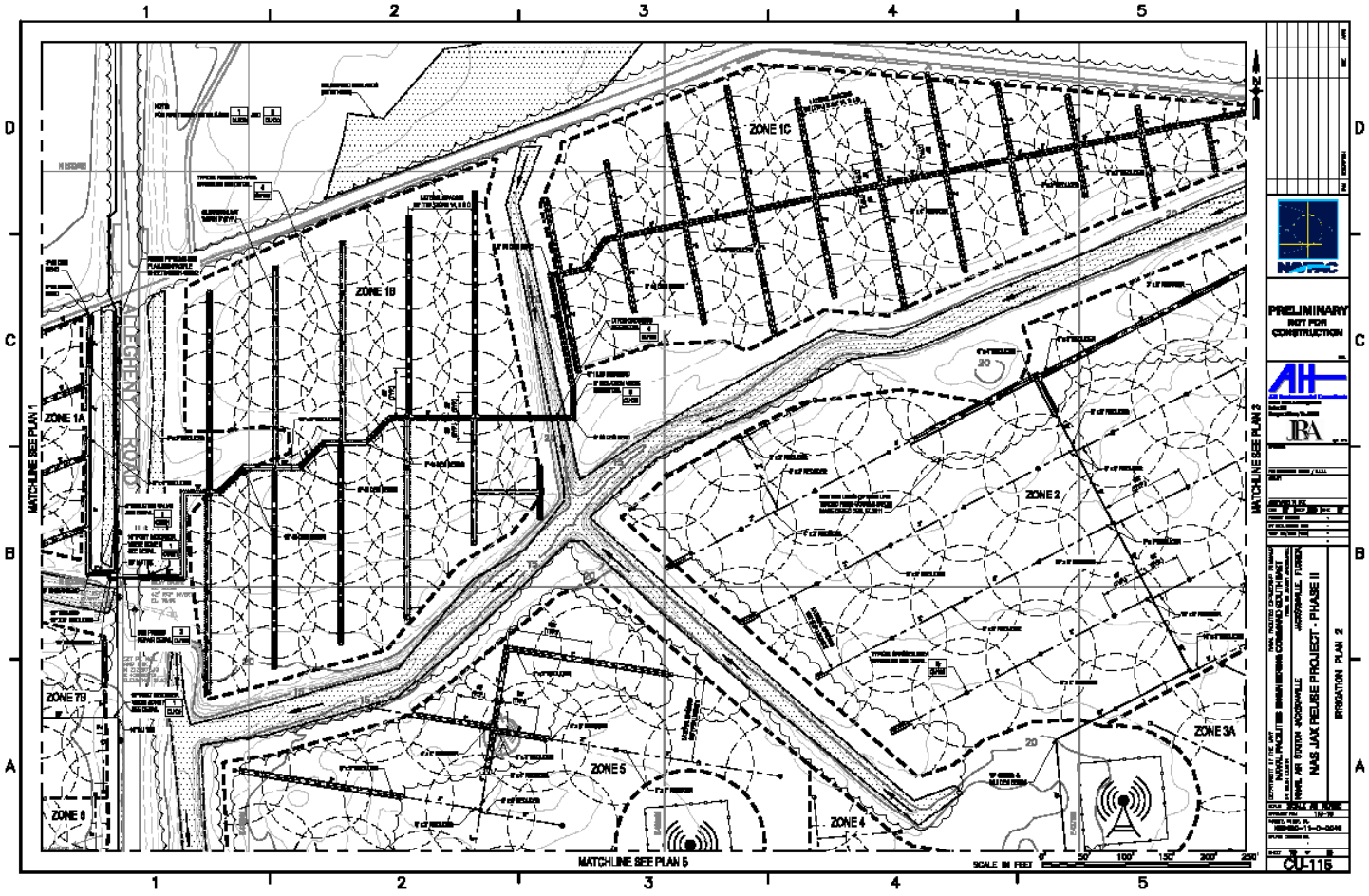
Month	Design ET [1]	Design Precipitation [2]	Percolate [3]	Soil & ET Loss [4]	Design Irrigation [5,6,7]		
	in/mo				in/mo	in/wk	gals/day
Jan	0.8	4.5	7.0	7.7	3.2	0.7	196,948
Feb	1.0	5.0	6.3	7.3	2.2	0.6	152,344
Mar	1.9	5.5	7.0	8.8	3.3	0.8	205,255
Apr	2.9	4.2	6.7	9.6	5.5	1.3	345,788
May	4.7	5.2	7.0	11.7	6.5	1.5	398,542
Jun	6.1	7.8	6.7	12.8	5.0	1.2	315,390
Jul	6.9	8.3	7.0	13.9	5.6	1.3	341,358
Aug	6.4	10.0	7.0	13.4	3.4	0.8	205,764
Sep	5.0	10.5	6.7	11.7	1.2	0.3	77,980
Oct	3.1	6.2	7.0	10.0	3.8	0.9	233,857
Nov	1.6	3.1	6.7	8.3	5.3	1.2	333,445
Dec	0.9	3.9	7.0	7.9	3.9	0.9	241,919

[1] Thornthwaite Potential Evapotranspiration calculated from climate data, Jacksonville NWS No. 081358 (1948-2011)
[2] 5-year monthly precipitation calculated from climate data, Jacksonville NWS No. 081358 (1948-2011)
[3] Percolate (in/mo) = Design permeability 0.17 (in/hr) x 24 (hr/day) x drainage factor 5.5 (%) x (days/mo)
[4] Soil & ET Loss (in/mo) = Design ET (in/mo) + Percolate (in/mo)
[5] Design Irrigation (in/mo) = Total loss (in/mo) - Design Precipitation (in/mo)
[6] Design Irrigation (in/wk) = Design Irrigation (in/mo) / (wks/mo)
[7] Design Irrigation (gals/day) = Design Irrigation (in/wk) x (ft/12 in) x 43,560 (sq ft/ac) x 70 (ac.) x 7.48 (gals/cu ft) x (wk/7 days)

Forested Irr. Pipeline



Antenna Farm Irrigation



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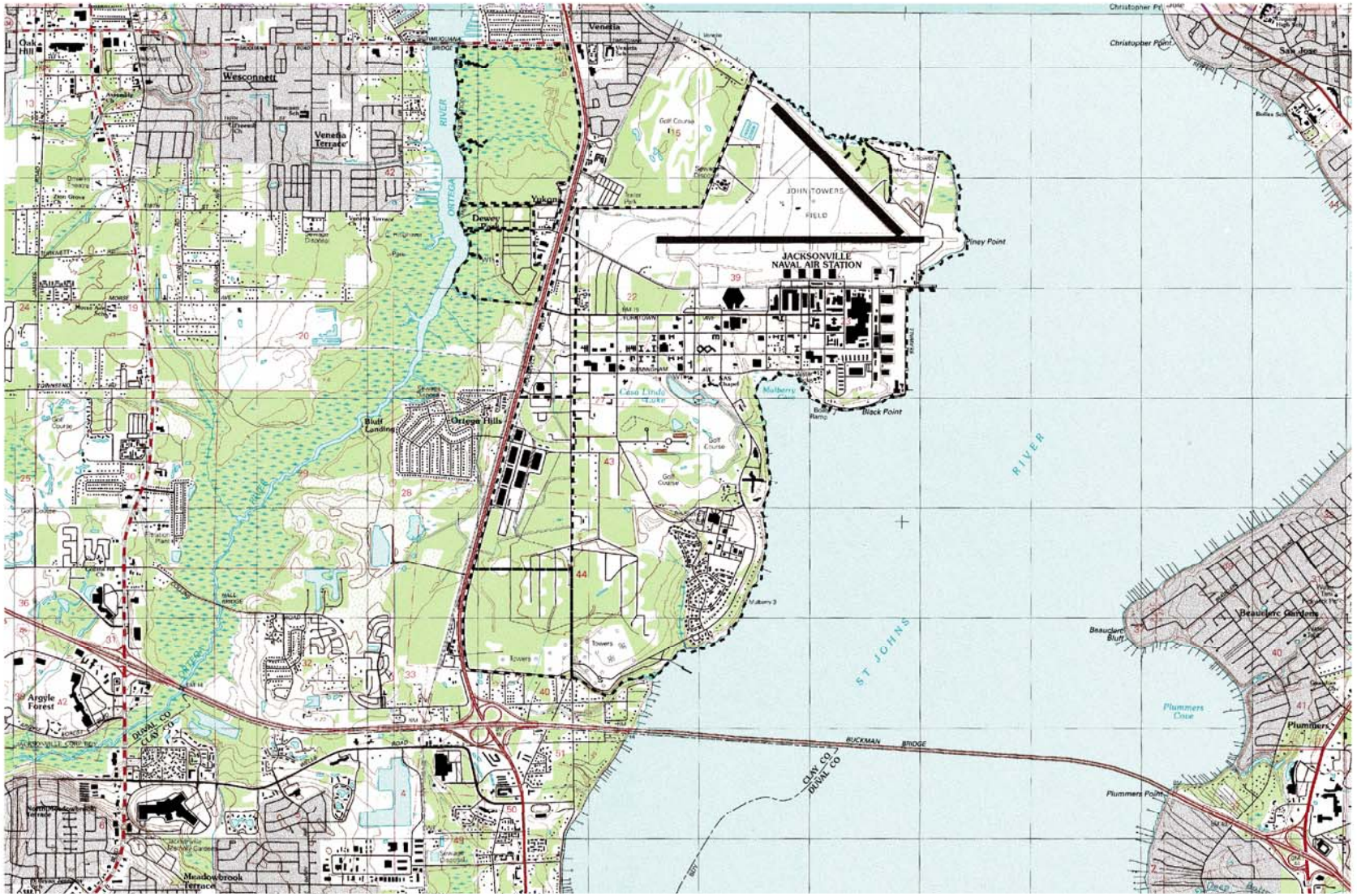
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