

Water Utility Vulnerability and Risk Assessment: The Titusville Example

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Outline

- Municipal Water Systems Background
- Generalized Threat
- RAM-W
- The Titusville Area
- City of Titusville Water Utilities
- Conclusions

Water Systems as Targets

- 64,000 systems serve communities >1000
- None designed against conventional attack
- Some inherent “Hardness”
- Congress reacted to September 11, 2001
- SNL’s Risk Assessment Methodology –
Water Utilities or RAM-W_{SM}
 - Approved and Accepted Nationwide

Generalized Threat

- Al-Qaeda changing
 - Smaller teams
 - Less central direction
 - Shorter planning/operational cycles
 - Expanded its target set
- Bomb technology well developed
- Chemical/biological attack established fact

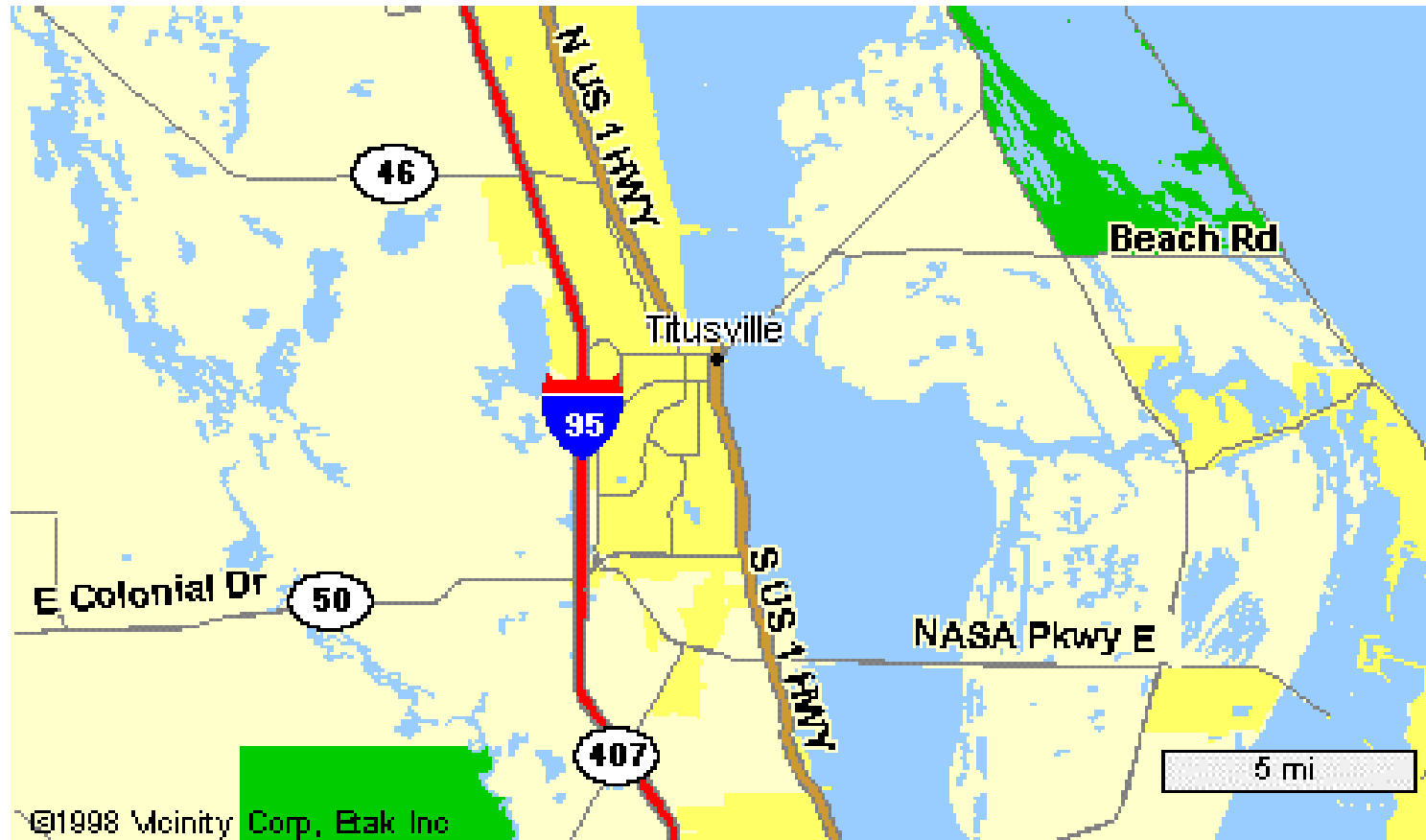
- Risk Assessment Methodology – Water Utility
 - Sandia National Labs developed
 - One of a set of standard analytical tools
- RAM-W accepted by EPA and the American Waterworks Association as the method
- DoD gave EPA \$90M in FY02 to pay for analyses:
 - \$54M for large systems
 - \$20M for small to medium systems
 - More for FY03 - tied to Homeland Defense

- Four steps once you know who is the threat and how much damage could cost to repair:
- How well does the system detect a problem?
 - Poisoning;
 - Breaks; etc.
- How well can the system verify an attack?
- Will the system delay the attack?
 - Barriers
 - Latency in raw-to-purified water processing, storage, and distribution

- How long does it take for the system to respond to attack?
 - Own personnel
 - Law enforcement and emergency services
 - Engineering support
- If these four factors are good enough, attack may be deterred
- In any case, attack effects are mitigated



Titusville, Florida





Titusville, Florida

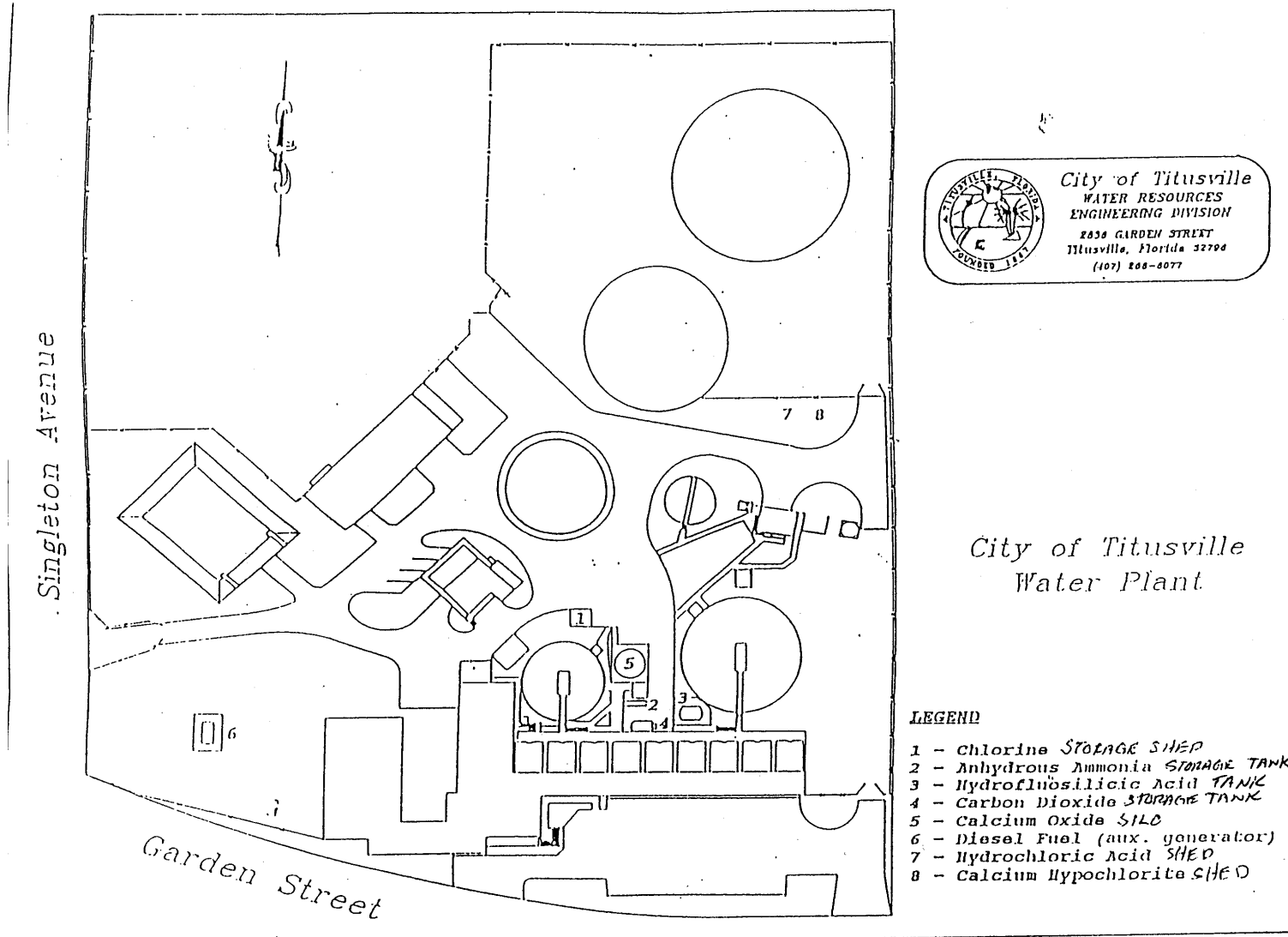
- Geography and Geology
 - City sits astride N-S coastal ridge between the Indian River (lagoon) and the St. Johns River
 - Soil is sand atop coquina rock
 - Elevations reach 65 feet above MSL
 - Surficial aquifers tapped for water
- Located between Orlando and Cape Canaveral/Kennedy Space Center



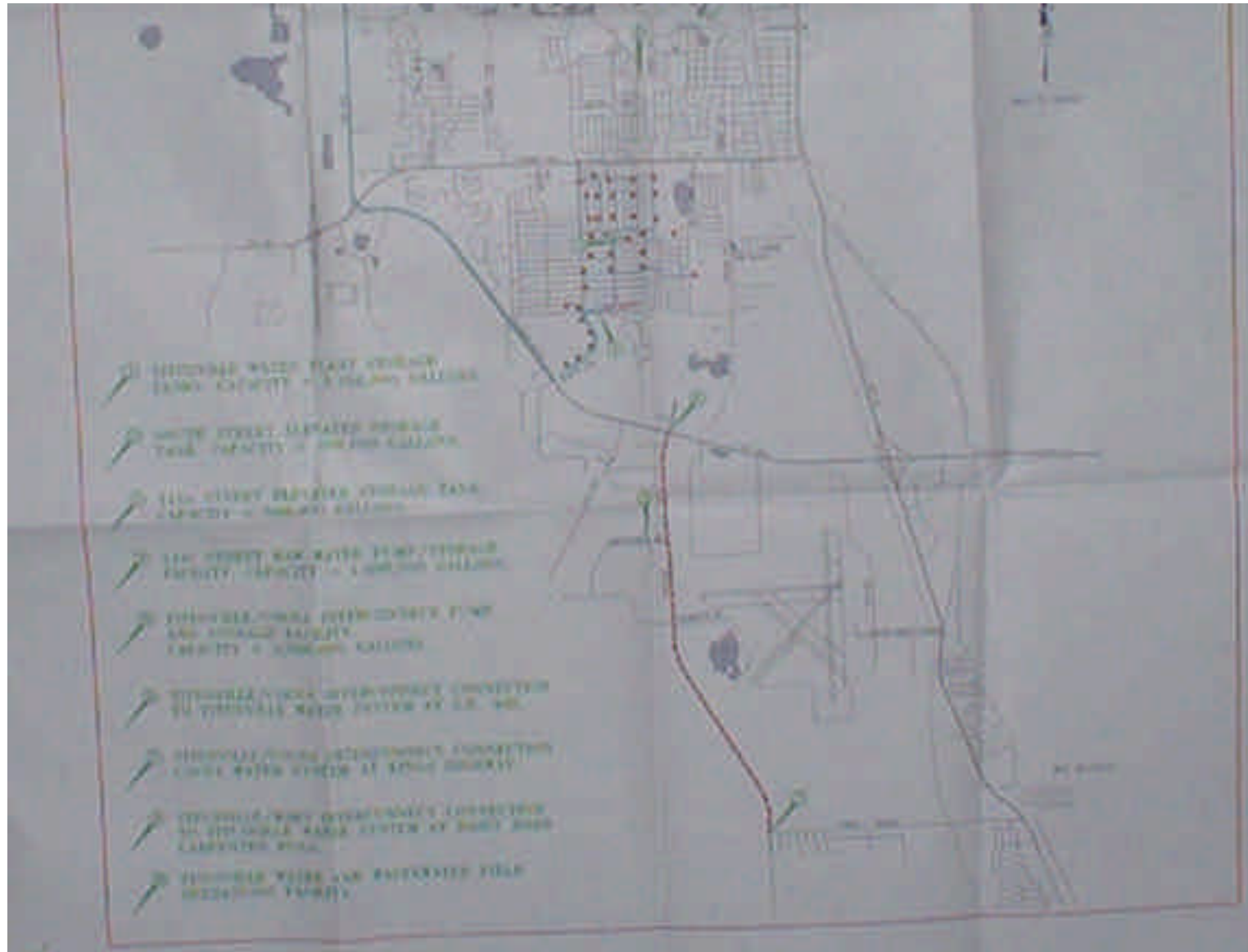
Titusville, Florida

- History
 - County seat, oldest city in Brevard County
 - Mostly HUB Zone
 - Mostly small industries
 - Bedroom community for KSC
 - Offices and some manufacturing for space industry on South side
 - Development/redevelopment on upswing

The Water Plant



South Well Field



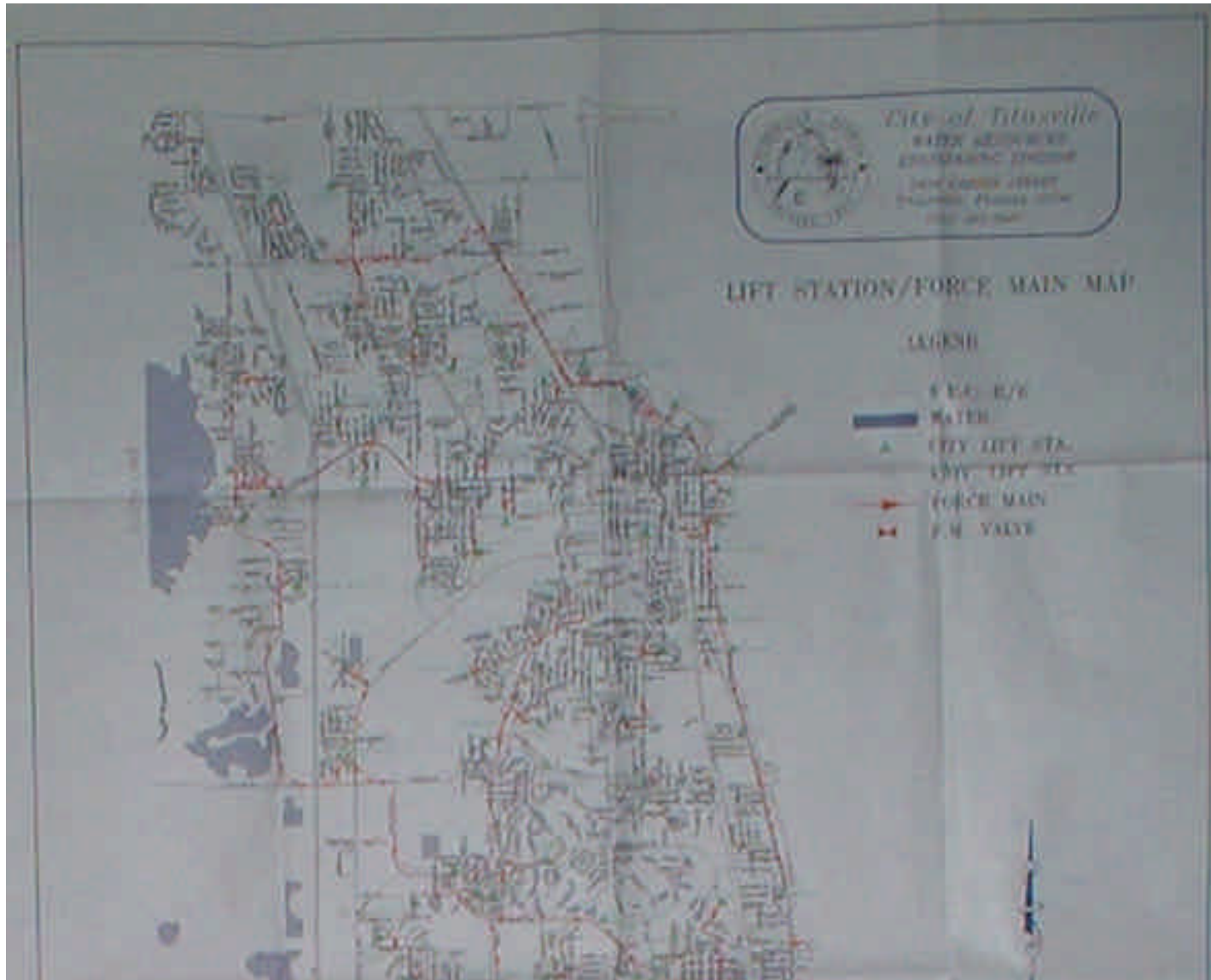
North Well Field



South Lif



North Lif



Conclusions

- Likely scenarios:
 - Large-scale bomb attack on Main Plant
 - RPG attack against various facilities
 - Poisoning *via* wells or pipelines
- Countermeasures:
 - Convert vehicle fleet to diesel
 - Landscape changes in front
 - Improve fences and gates
 - Wired intrusion alarm system
 - Relocate chemical tanks behind berms