#40

Water Supply Capacity and New Green Drinking Water Treatment Plant Sites

City of Austin

City Council Meeting

April 27, 2006

Austin Water Utility

Overview

1) System Overview: – Water Supply Capacity – Water Demand
2) Assessment and condition of Green WTP
3) Options for additional capacity
4) Schedule

Capacity of Austin's Water System

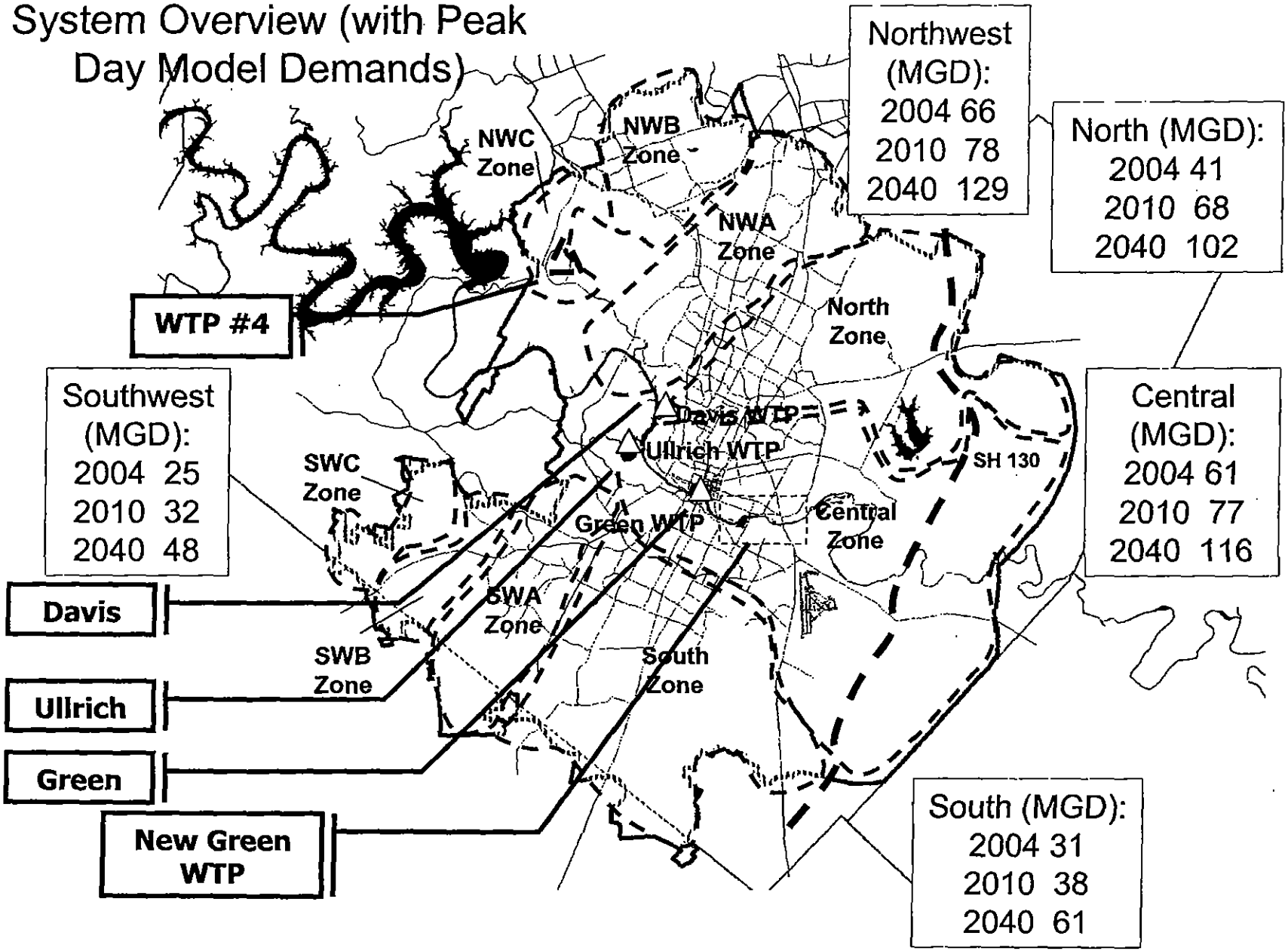
- Treatment and Production:
  ~260 MGD

- Historical peak day pumpage:
  ~247 MGD (9/26/05)

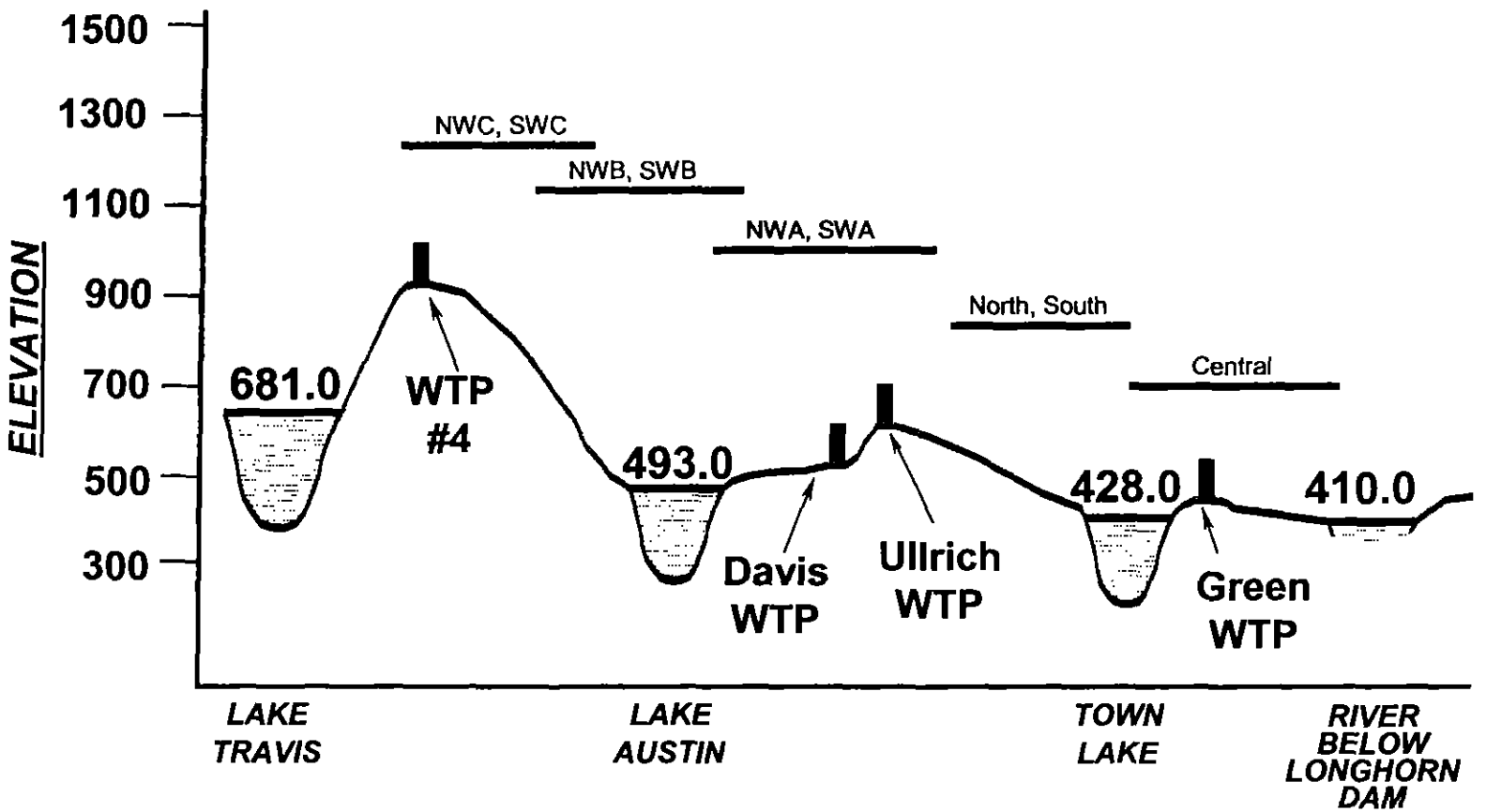
- Average pumpage:
  ~141 MGD (FY 04/05)

1) System Overview: Water Supply Capacity

System Overview (with Peak Day Model Demands)



Austin Water Supply System



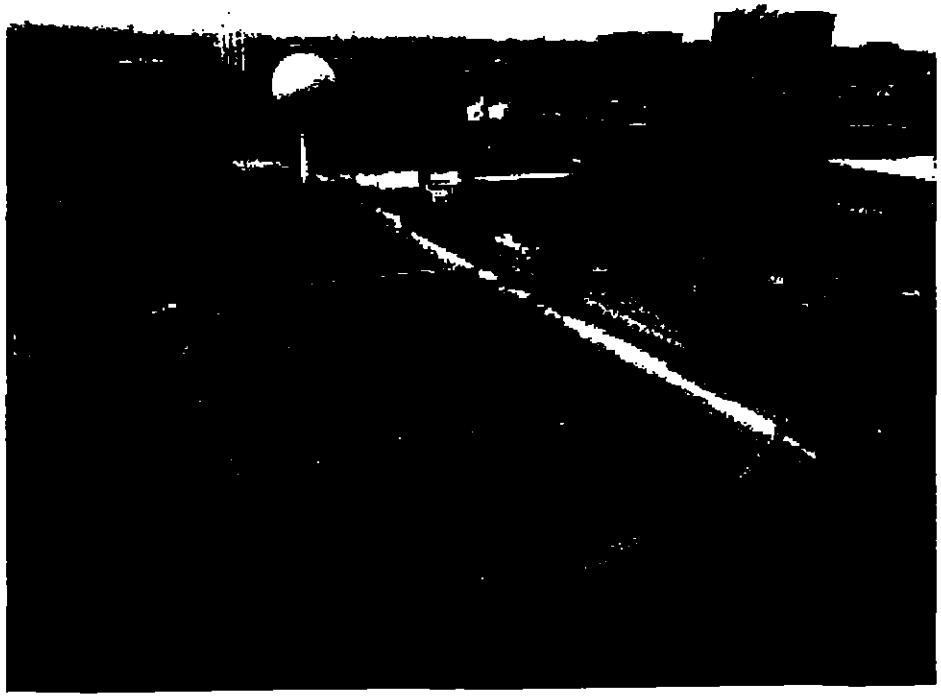
Green WTP

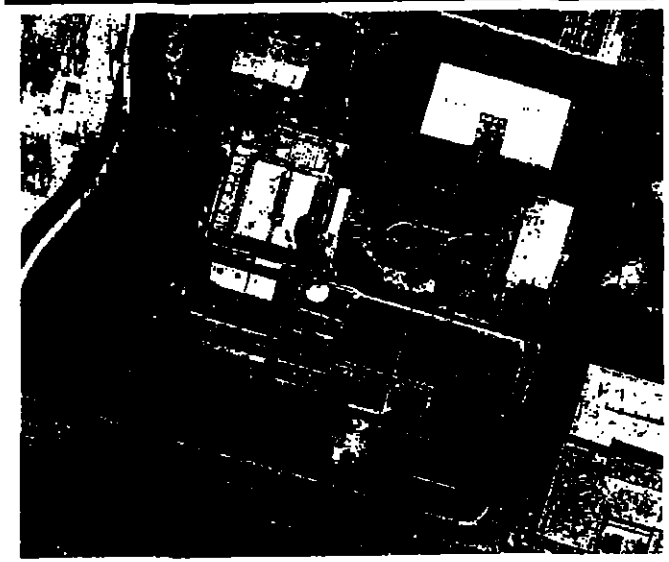
- Capacity:
  - 42 MGD design capacity
  - 35 MGD recent maximum capacity
  - 17.6 MGD FY 04/05 average
- Oldest Austin WTP 1924*
- Plant replacement under development
- Water source is Town Lake
- Acreage for facilities: ~6 acres

* Plants are typically designed to last 50 years

1) System Overview: Water Supply Capacity

Green Water Treatment Plant

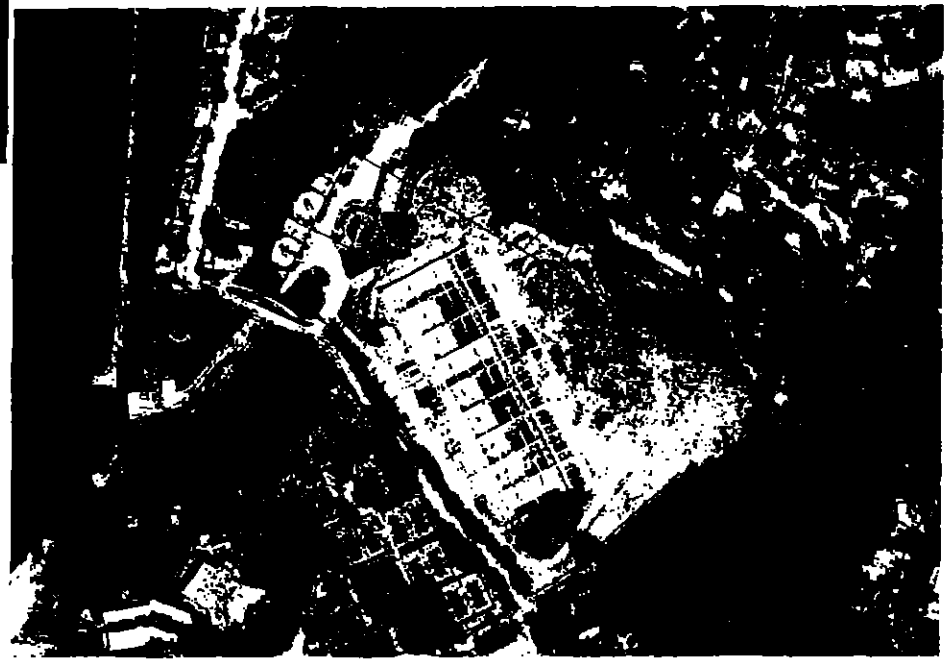




Davis WTP

- Existing Capacity: 118 MGD
- Currently undergoing improvement program to upgrade electrical system and other components
- Original Construction 1954
- Water source is Lake Austin
- Acreage for facilities: ~ 22 acres

Davis Water Treatment Plant



Ullrich WTP

- Existing Capacity: 100 MGD
- Original Construction 1969
- Water source is Lake Austin
- Currently under major expansion to 167 MGD
- Acreage for facilities: 38 acres

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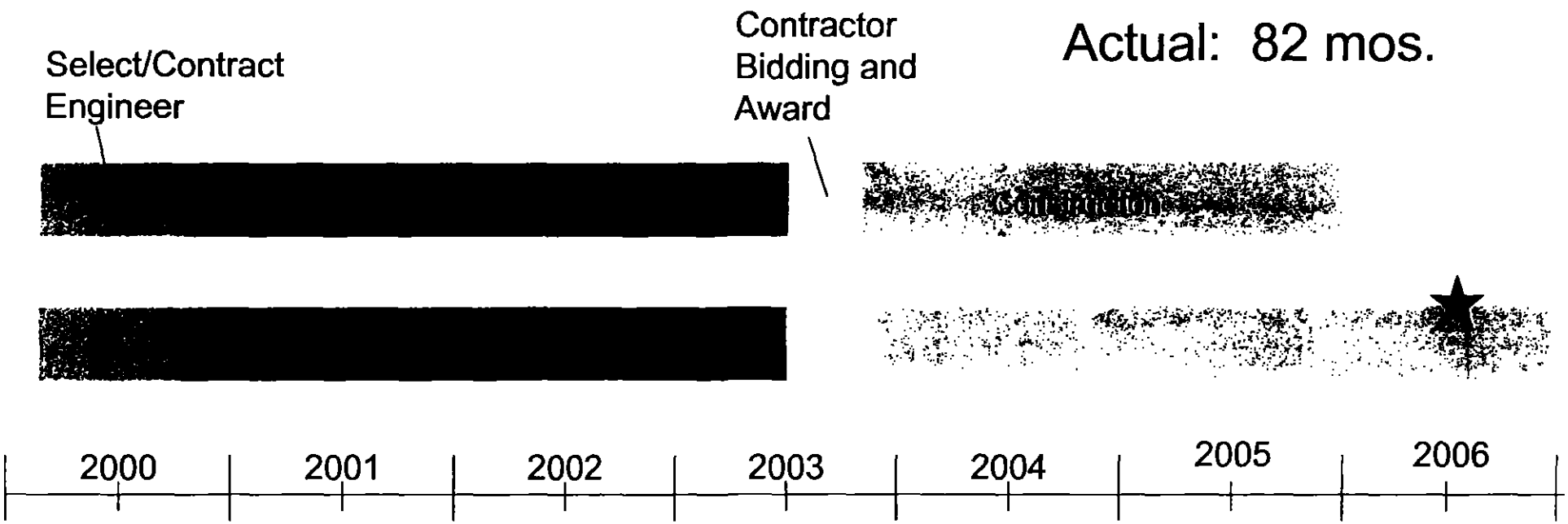
Ullrich WTP Expansion Schedule

Project Completion

Planned: 70 mos.

Actual: 82 mos.

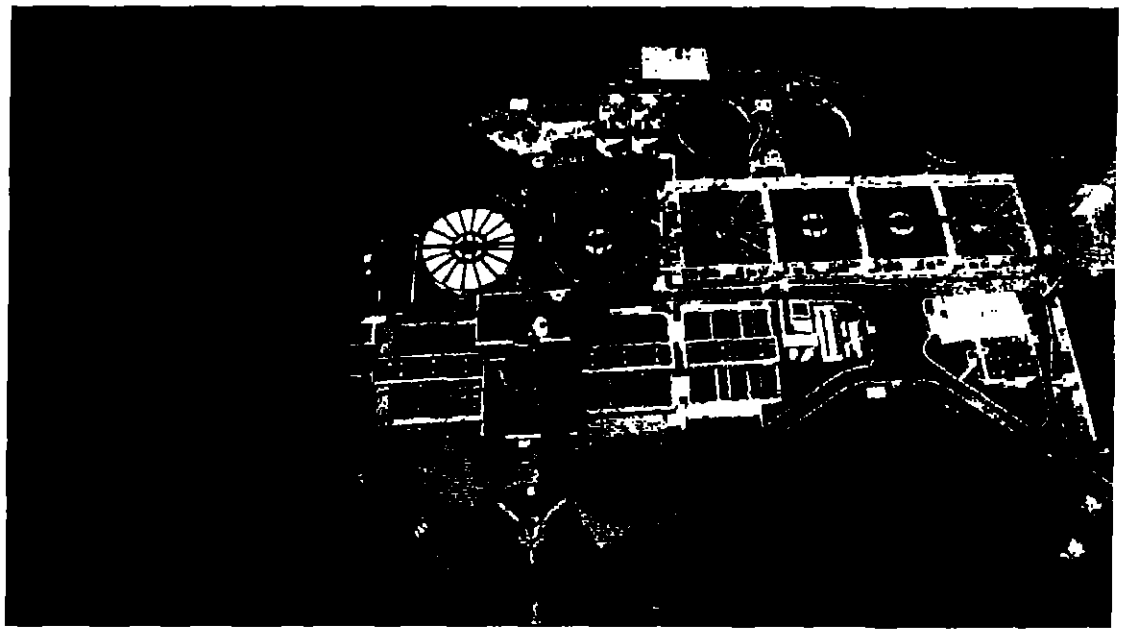


★ Substantially Complete

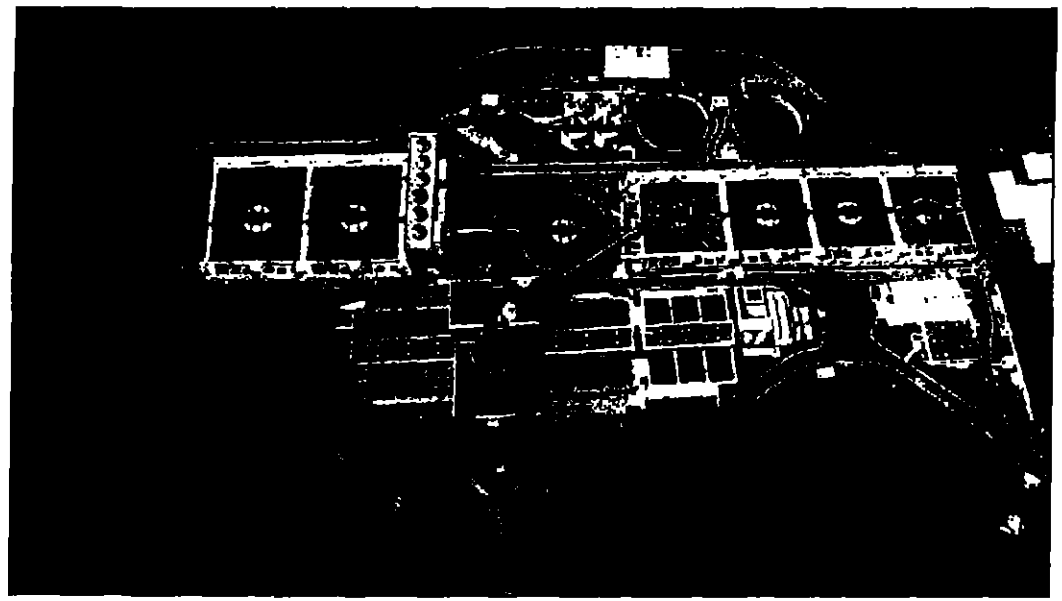
1) System Overview: Water Supply Capacity

Ullrich Water Treatment Plant

1) System Overview: Water Supply Capacity



Ullrich Water Treatment Plant
at 100 MGD



Conceptual View of Ullrich
Water Treatment Plant
Expanded to 167 MGD
(Construction project
currently underway)

Water Demand/Conservation Analysis

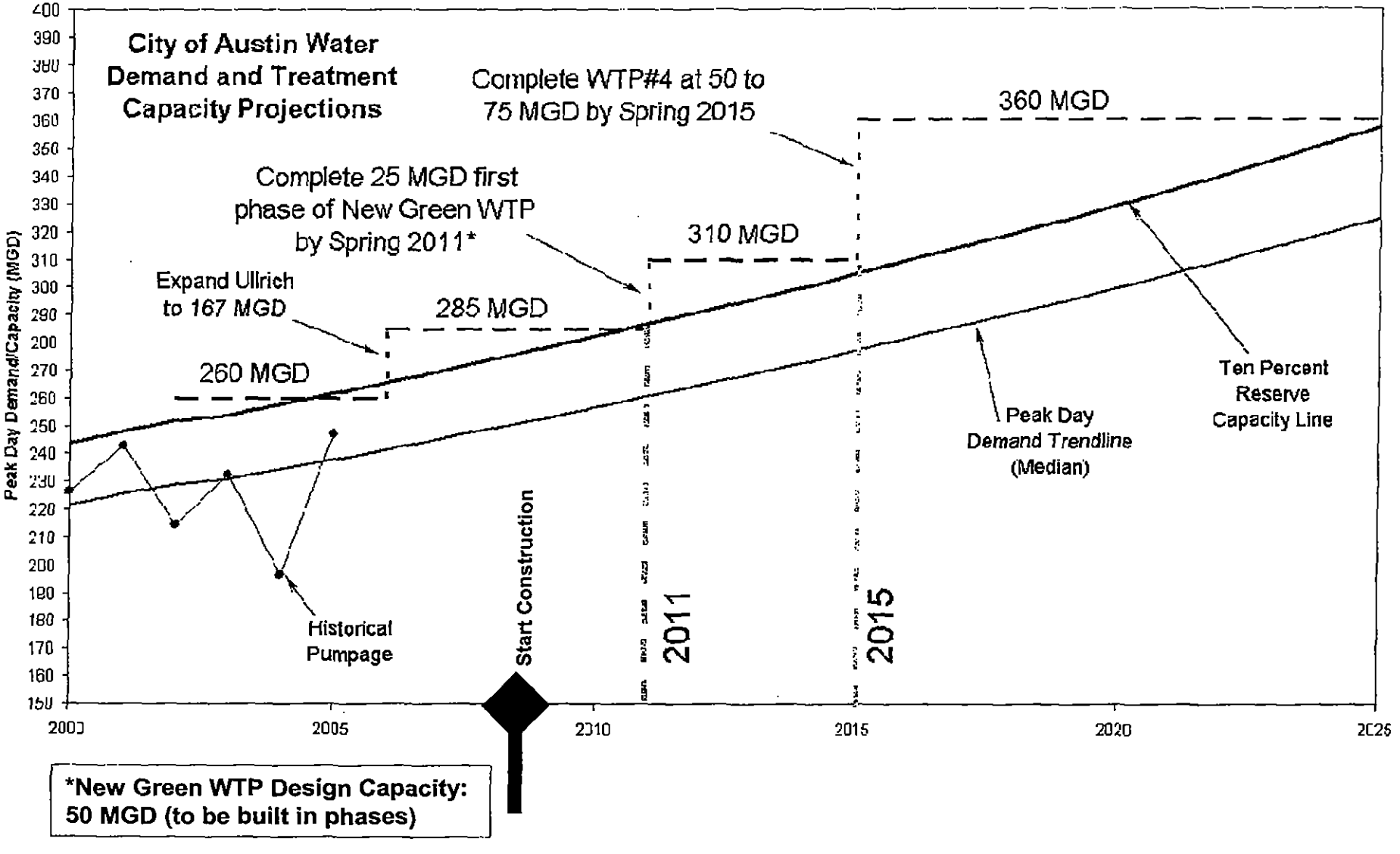
- Initial task of 20-month study
- Evaluate AWU demand projection methodology
- Compare AWU demands to other Texas water utilities
- Evaluate impact of advanced conservation and reuse on capacity needs

Water Demand Analysis

- Revised projection methodology
  - Average day demand projection reduced by 8%
  - Peak day demand projection unchanged
- Projections include continuation of current water conservation efforts
- Next capacity block needed in 2011
- AWU peak day per capita demands in line with other Texas water utilities

1) System Overview: Water Demand

Peak Day Demand Projection



***New Green WTP Design Capacity: 50 MGD (to be built in phases)**

Overview

1) System Overview: – Water Supply Capacity – Water Demand
2) Assessment and condition of Green WTP
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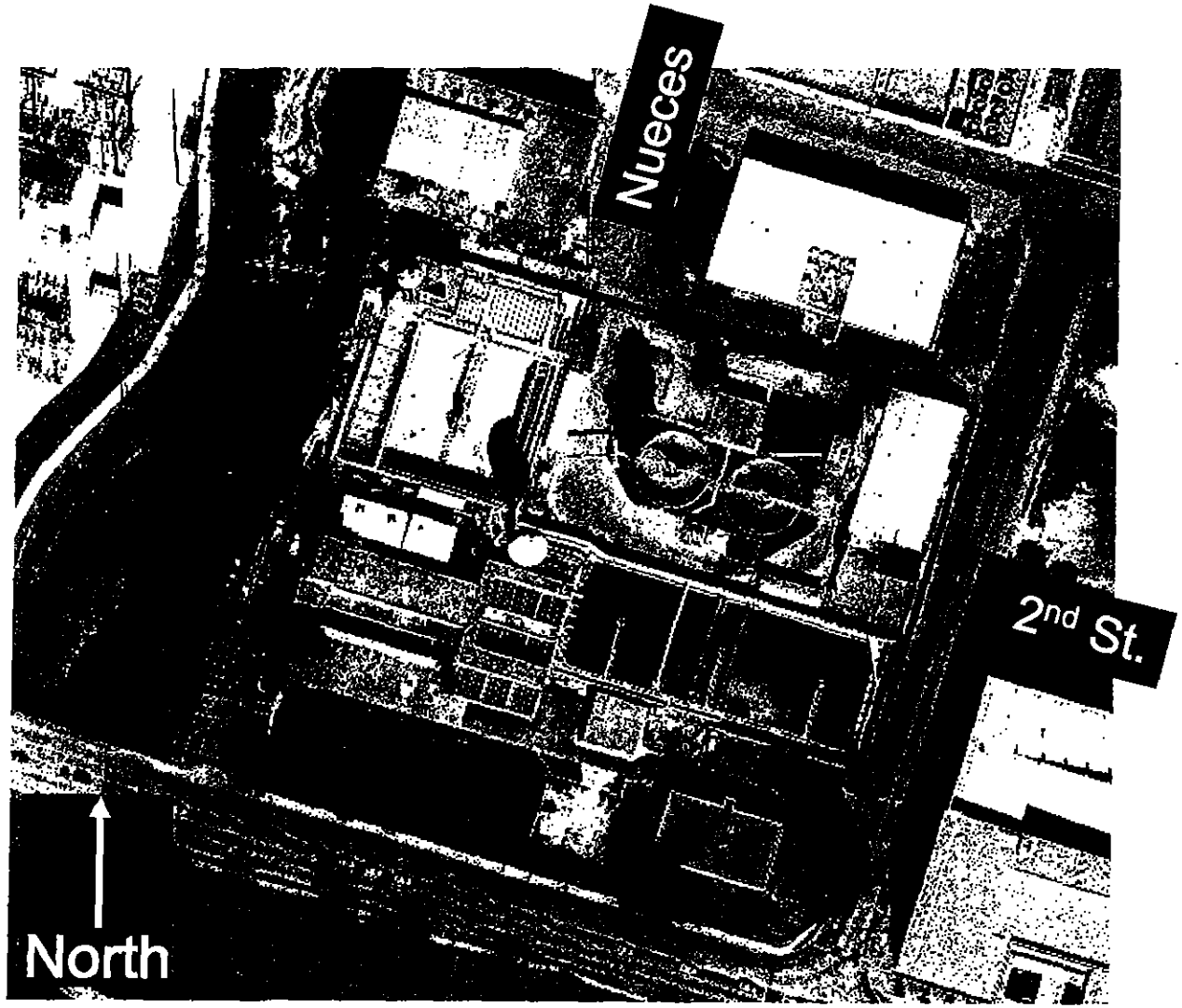
2) Assessment and condition of Green WTP

Condition of Existing Green WTP



- Originally constructed in 1924
- Modified six times
- 1998 modifications to keep plant operating until 2003
- Functionally obsolete

Existing Green WTP Key Condition Issues

- Plant operating at reduced capacity levels
- Condition of Structures
- Limited Space/Buildings Stacked
- Maintenance
- Security

Condition of Existing Green WTP

- Existing facility has immediate needs

Failure of retaining wall along Shoal Creek; WTP structures at risk

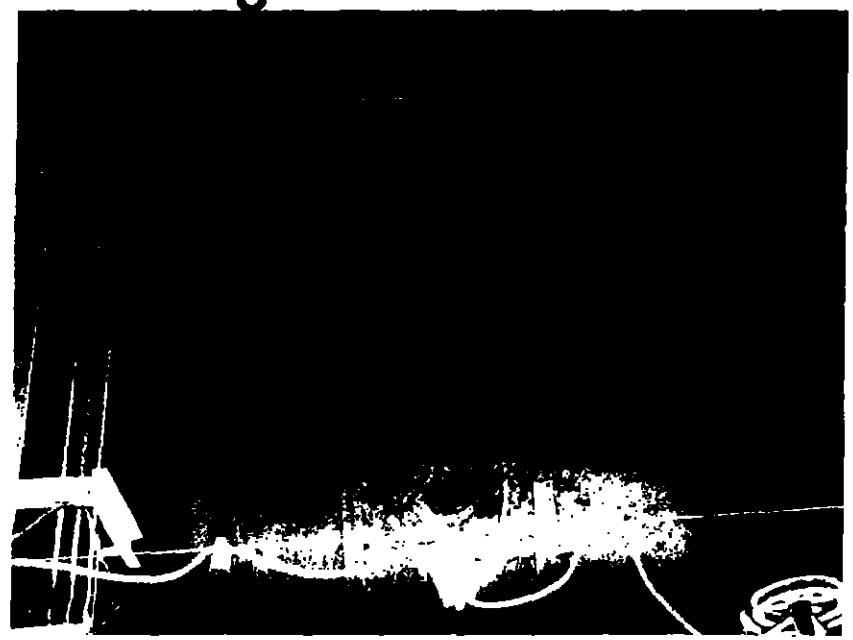
Concrete Deterioration under Chem Feed Bldg

Condition of Existing Green WTP

- Spare parts not available; space limits don't meet current safety requirements, impede maintenance, prevent replacement

Intake screens have limited functionality

Distribution pumps no longer manufactured



Overview

1) System Overview: – Water Supply Capacity – Water Demand
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Capacity Options Considered

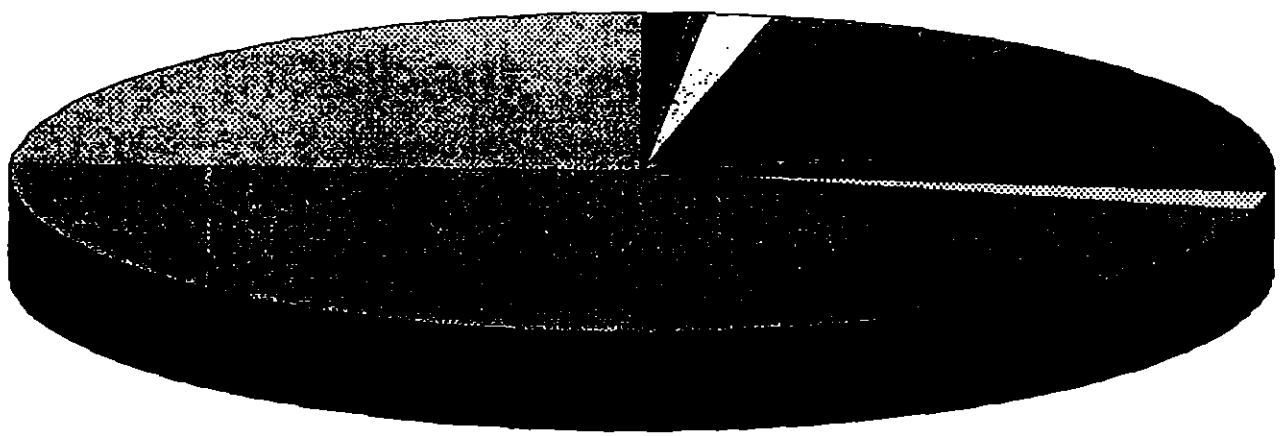
- Increased conservation and reuse
- Purchase groundwater (Carrizo-Wilcox Aquifer)
- Local groundwater wells (Edwards Aquifer)
- Build WTP capacity:
  - Existing Green WTP site
  - Ullrich WTP (expansion)
  - Davis WTP (expansion)
  - WTP #4
  - Decker Lake
  - New Green WTP
    - Alternate sites (4 additional sites considered)

Increased Conservation and Reuse

- Description: Focus on Peak Day demand reduction via conservation and reuse
- Pros
  - Potentially delays capital investments
  - Extends resources
- Cons
  - Significant short-term savings requires mandatory restrictions and enforcement
  - Uncertain savings and customer participation
  - Significant funding requirements
  - Construction delay risks

To significantly delay construction of new capacity would require mandated conservation programs and increased water reclamation funding and use

Potential Conservation Measures Evaluated to Achieve 20 MGD Savings



- Efficient PRSVs
- Large Prop. Audit
- 5th Res. Tier
- MF Submetering
- Customer PRVs
- Utility PRVs
- SF Retrofit
- 5-day Water Cycle
- Turfgrass Rebate
- Winter Leak Det.
- MF/ICI Retrofit
- ICI Water Budget

Potential Reuse Savings

- Assume 100% connection of potential reclaimed customers
- Significant uncertainties concerning customer participation
- Could reduce peak day demand by approximately 11 MGD
- Requires investment of $35 million and 6 years of project construction

Purchase Groundwater

- Description: Proposed treated Carrizo-Wilcox Aquifer groundwater supply project
- Pros
  - Supply diversification
  - Delay raw water payment trigger
  - Potential for long-term added capacity
- Cons
  - Water quality and compatibility/blending issues
  - Timing and cost uncertainties
  - Concerns about aquifer "mining", environmental impacts, drought tolerance, and impact on existing wells
  - Long-distance supply line

Potential long-range supply option, continue to explore and evaluate the costs, risks, and benefits.

Local Groundwater

- Description: Develop Wells in Edwards Aquifer
- Pros
  - Maintains link to aquifer
  - Low cost
- Cons
  - Limited supply
  - Environmental concerns
  - Does not address capacity needs
  - Water compatibility issues
  - Not drought tolerant
  - Potential to impact other water wells

Does not provide supply capacity to meet projected needs

Build WTP Capacity

- Existing Green WTP site
- Ullrich WTP (expansion)
- Davis WTP (expansion)
- WTP #4
- Decker Lake
- New Green WTP
  - Alternate sites (4 additional sites considered)

3) Options for additional capacity

New WTP – Site Factors Considered

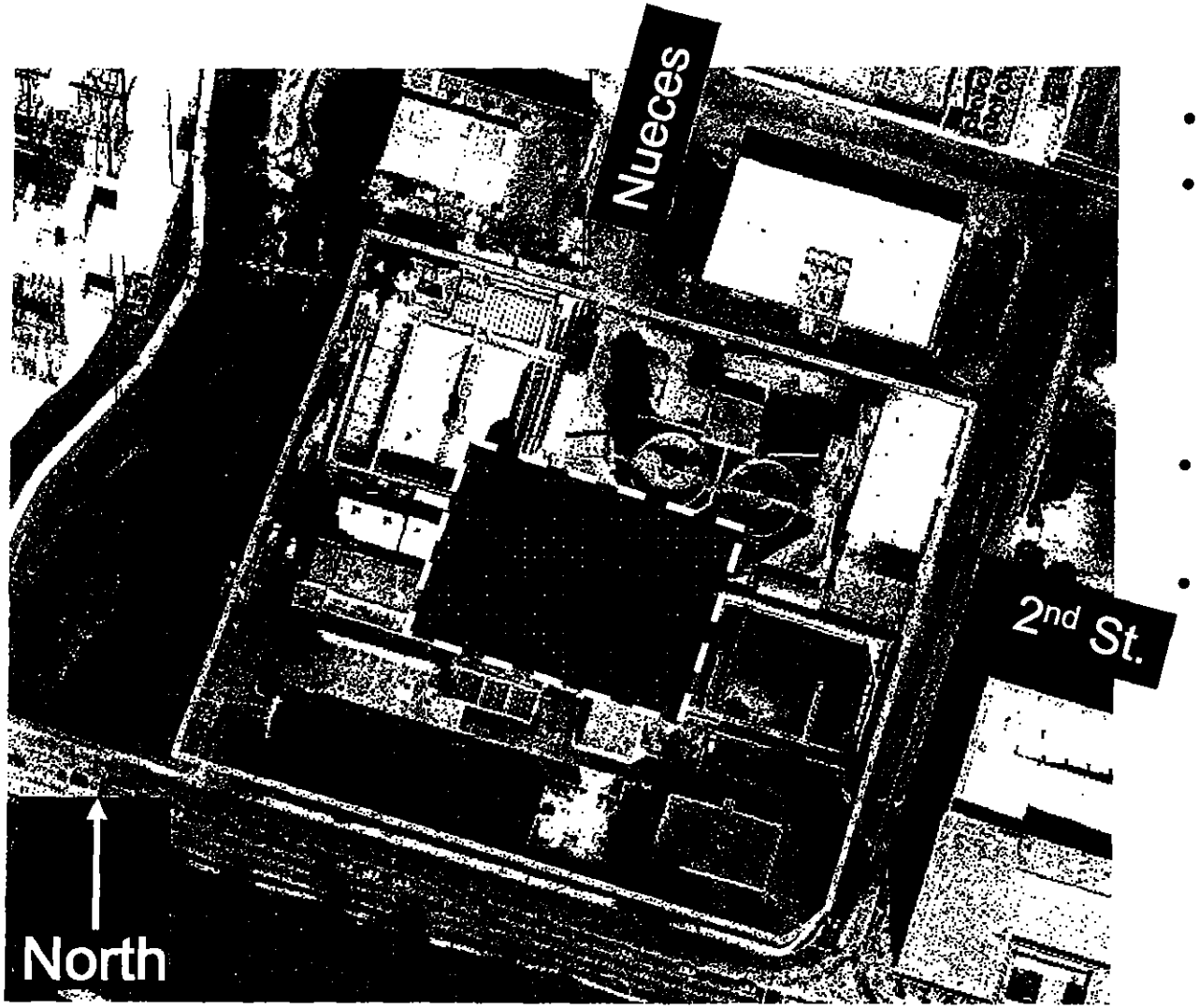
- Schedule
- Cost
- Security
- Public/Neighborhood uses
- Environmental considerations
- Impact on City Preferred Development Corridors
- Compatibility with existing infrastructure
- Water treatment plant considerations, including water quality, water quantity, plant accessibility, etc.
- Water pipelines (Conveyance – intake and transmission)
- Permits and regulatory

Existing Green WTP

- Description: Existing downtown ~6 acre site
- Pros
  - City-owned
- Cons
  - Schedule Risks
  - Plant Layout Limitations
  - Maintenance issues
  - Lack of Security Buffer Area

Small site does not provide supply capacity to meet projected demands

Existing Green Drinking WTP Site



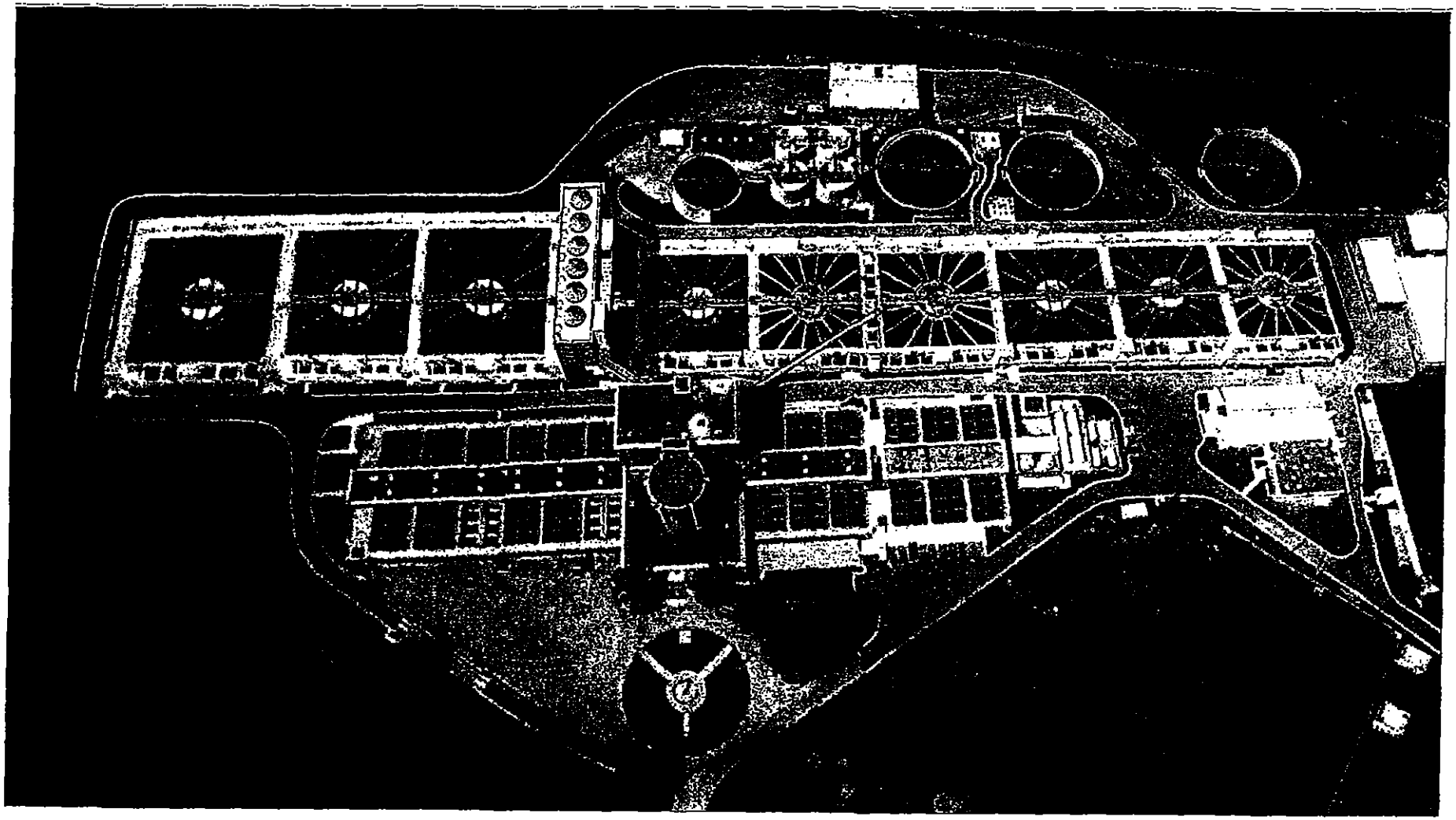
- ~6 acres
- 150-ft security buffer zone reduces usable space to ~1 acre (as shown)
- Acreage not sufficient for project
- Limited space:
  - Site has fixed boundaries
  - No room for water storage

Ullrich WTP Expansion Options

- Description: Expand existing Ullrich WTP
- Pros
  - City-owned
  - Existing plant site
- Cons
  - Already at design capacity
  - Intake and transmission are at maximum capacity
  - Limited site, but may support ~225 MGD
  - Expansion would be into adjacent city's jurisdictional area
  - Additional capacity expansion would require major infrastructure and system improvements

Level of project complexity (schedule impact) and expected costs would prevent on-time completion (Year 2011)

Conceptual View of Ullrich WTP Expanded to 225 MGD



Davis WTP Options of Expansion

- Description: Expand existing Davis WTP
- Pros
  - City-owned
  - Existing plant site
- Cons
  - Limited site, no room for expansion
  - Already at pumping capacity
  - Limited accessibility for maintenance and construction

Aging plant with no room to expand and could not meet schedule

WTP #4

- Description: Located northwest; will draw water from Lake Travis; projected to be completed by summer of 2015 to meet water demand needs
- Pros
  - Water elevation minimizes energy use
  - Greatest source water quality consistency
  - Supply reliability and diversity
  - Favorable location to meet system needs
- Cons
  - Project has complicated intake structure and raw water conveyance system, will require longer project schedule

Schedule will not meet Spring 2011 deadline

Decker

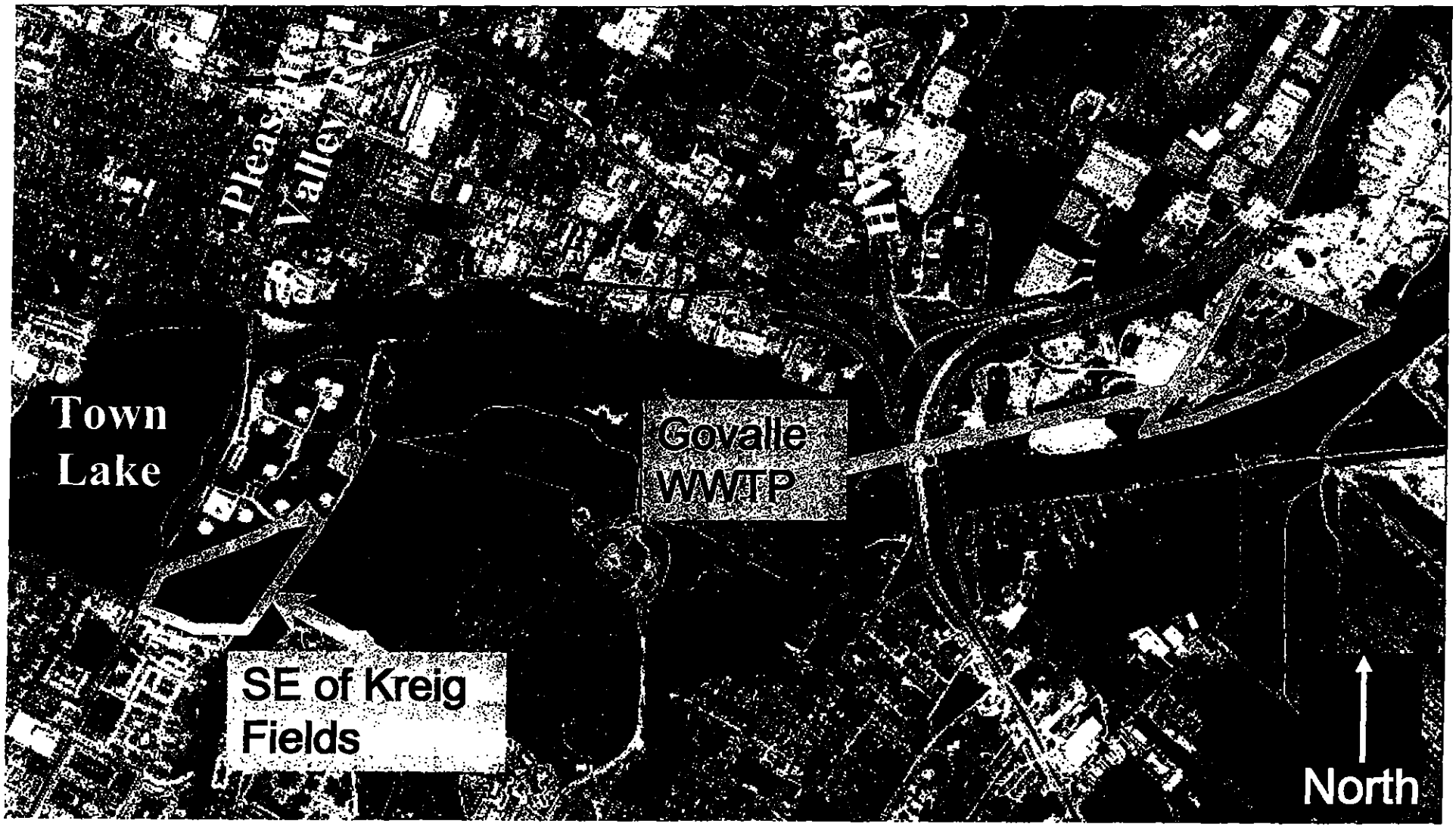
- Description: Located northeast; power plant cooling lake
- Pros
  - Located close to SH 130 corridor
- Cons
  - Water Quality concerns:
    - Low flow through shallow lake
    - Hydrilla and concern about taste and odor issues
  - Parkland (Ch. 26 process required)
  - Competing uses with Austin Energy
  - Temperature and brine issues
  - A new intake upstream of WWTP outfalls required

Multiple issues identified, additional study required, schedule will not meet Spring 2011 deadline

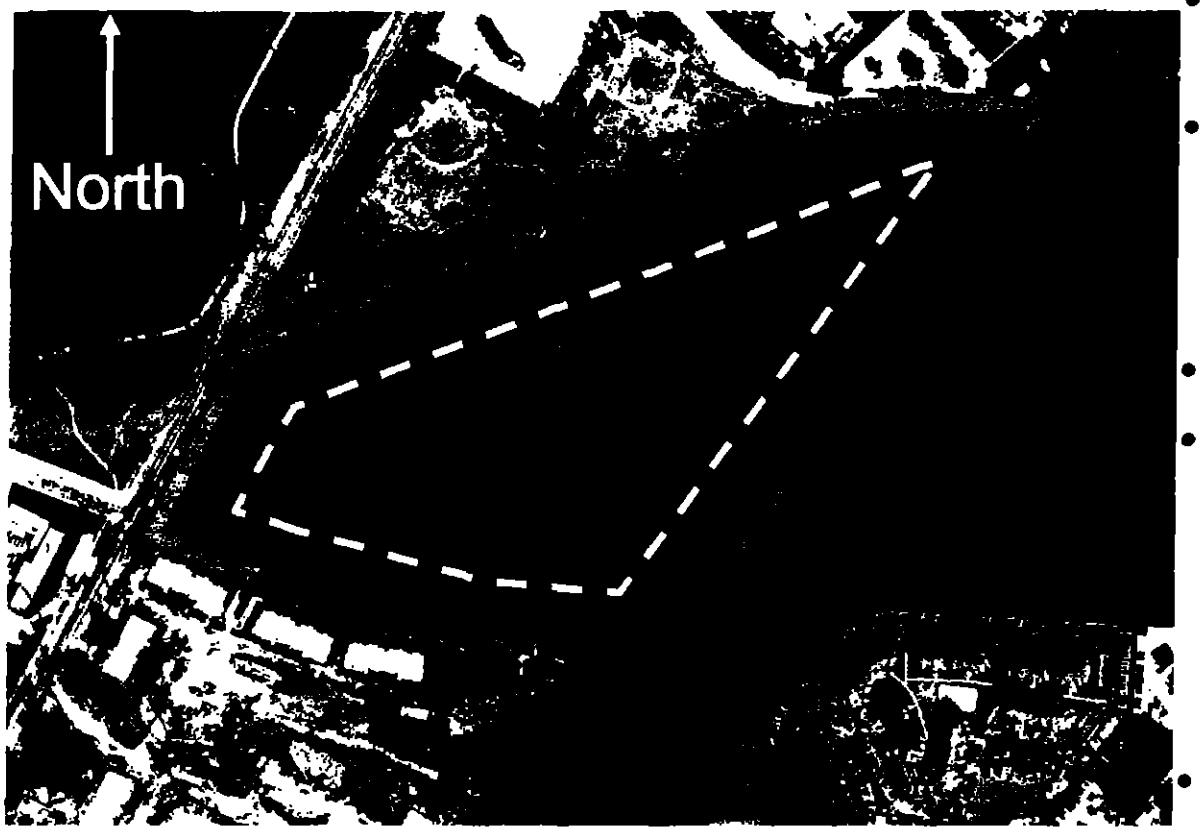
New Green WTP Sites

Three of the five potential sites evaluated are City-owned

Two are shown here in addition to the existing Green Drinking WTP location

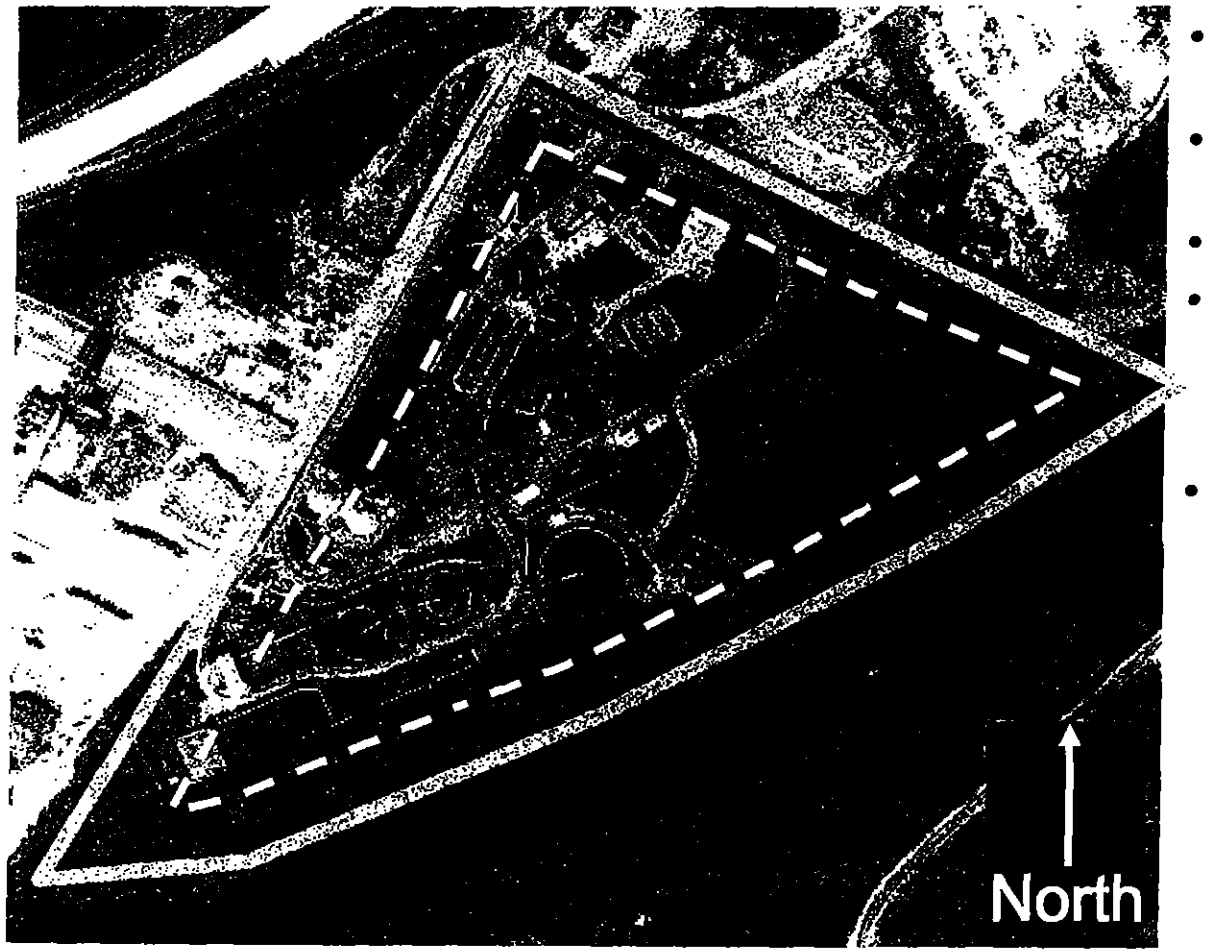


Southeast of Kreig Fields



- Undeveloped parkland parcel
- Access via Lakeshore Blvd extension into Colorado River Park at Pleasant Valley Rd
- ~30 acres
- Pros
  - Secure location; City-owned; room for 50+ MGD, close proximity to intake and Town Lake; meets 2011 time schedule
- Cons
  - Neighborhood concerns; uses park space, is partially in floodplain

Govalle Wastewater Treatment Plant Site



- WWTP facility scheduled for decommissioning
- WWTP access at HWY 183 and Airport Road
- ~40 acres
- Pros
  - Secure location; access, City-owned; room for 50+ MGD
- Cons
  - Schedule to decommission and remediate; requires flood wall construction (6-9 months USACE permitting); requires distribution system improvements; length of raw water line from Town Lake

Private Parcel #1

- ~40 - 50 acres; east of Longhorn Dam
- Currently used for commercial/industrial
- Pros
  - Secure location; room for 50+ MGD; not in floodplain; access, minimal impact to parks, due to pipeline/tunnel construction, limited neighborhood impacts
- Cons
  - Long length of raw water line from Town Lake; requires distribution system improvements; City must acquire; may not be willing seller

Private Parcel #2

- ~40 - 50 acres; east of Longhorn Dam
- Pros
  - Secure location; room for 50+ MGD; not in floodplain; access; minimal impact to parks, due to pipeline/tunnel construction; limited neighborhood impacts
- Cons
  - Long length of raw water line from Town Lake; requires distribution system improvements; City must acquire; may not be willing seller

New Green WTP Alternate Sites - Key Distinguishing Factors

	SE of Kreig Site	Govalle WWTP	Private Parcel #1	Private Parcel #2
Approximate percent higher compared to lowest construction cost SE of Kreig Site*	0% 50 MGD phased	4% 50 MGD phased	7% 50 MGD phased	4% 50 MGD phased
Advantages	•Fastest construction schedule •Closest proximity to source •Lowest construction cost	•Limited conflicting land use for site	•Limited conflicting land use for site •Not in floodplain	•Limited conflicting land use for site •Not in floodplain
Disadvantages	•Use of parkland •Floodplain •Chapter 26 process for plant and intake	•Existing WWTP decommissioning and demolition first required •Added raw water pipeline cost •Floodplain (flood wall required)	•Added raw water pipeline cost •Land acquisition required •May not have willing seller	•Land acquisition required •Added raw water pipeline cost •May not have willing seller

*Based on 50 MGD plant cost in one phase with two 25 MGD trains, in 2008 dollars, conventional treatment process, includes raw water pipeline, intake and pump station, treated water transmission mains, and, where applicable, land purchase and mitigation.

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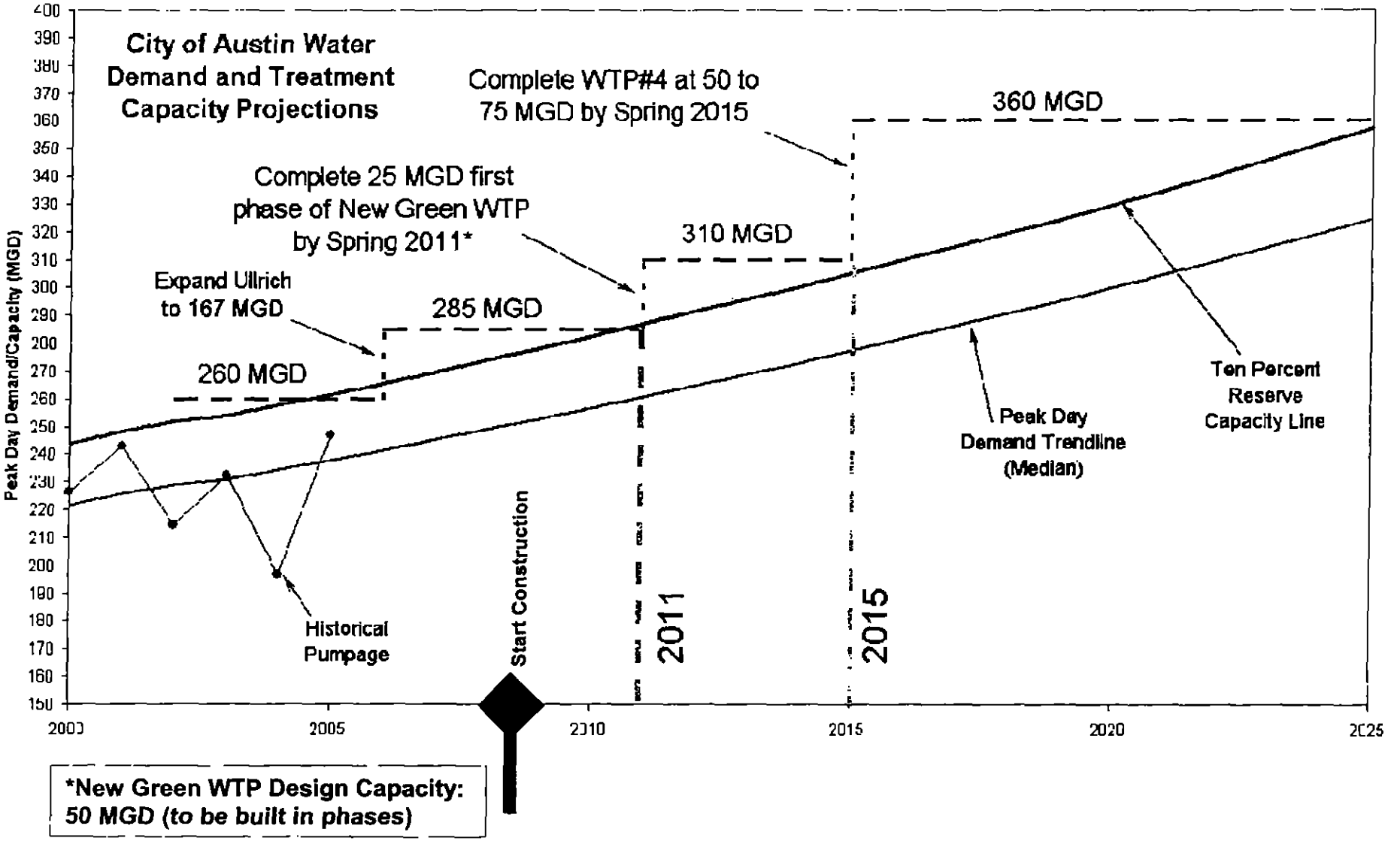
Peak Day Demand Projection



New Green WTP – Schedule

Task	Time
Land Acquisition (concurrent)	8 months
Select and Contract with Engineer	4 months
Preliminary Design	6 months
Detailed Design	18 months
Permitting/Regulatory (concurrent)	9 months
Contractor Bidding and Award	5 months
Construction	25 months
Startup and Contract Closeout	4 months
Duration	62 months

62 months is 5 years 2 months, which is June 7, 2011

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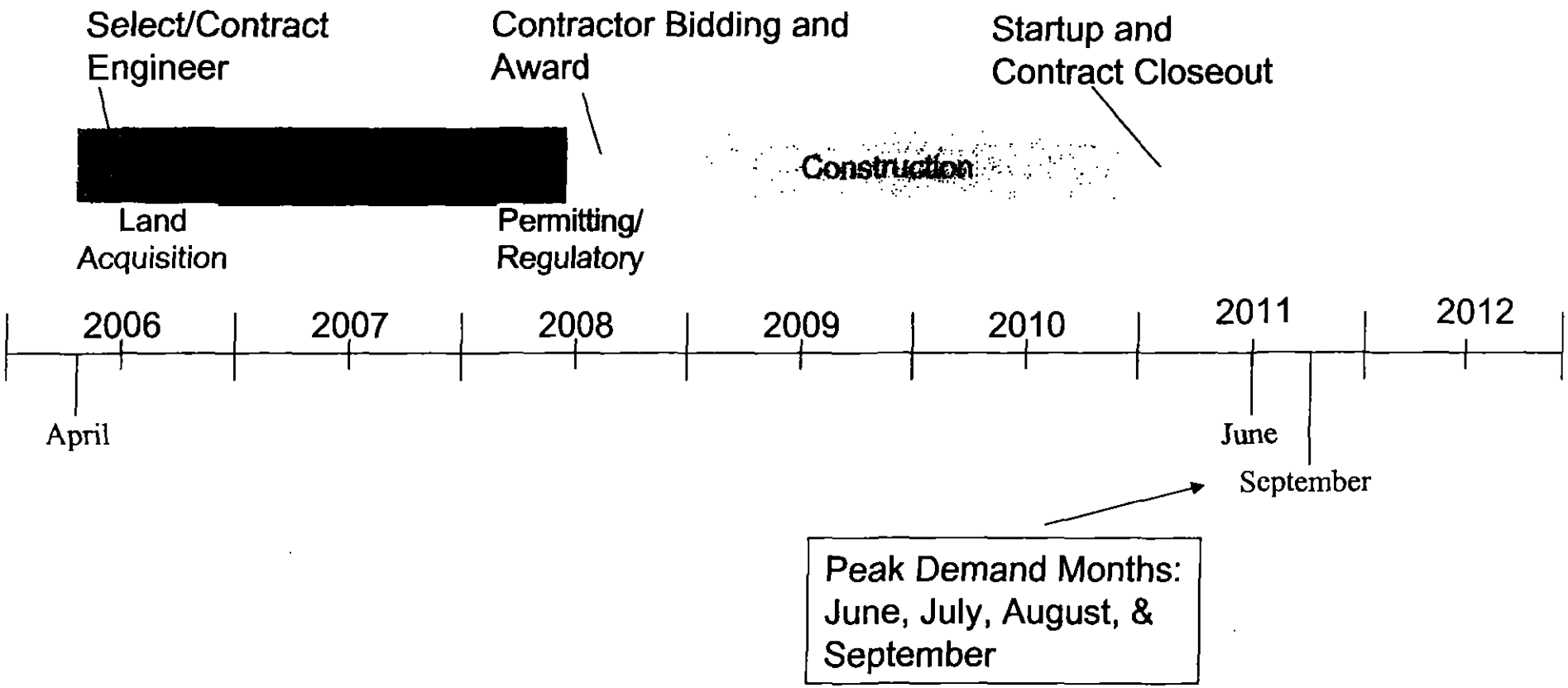
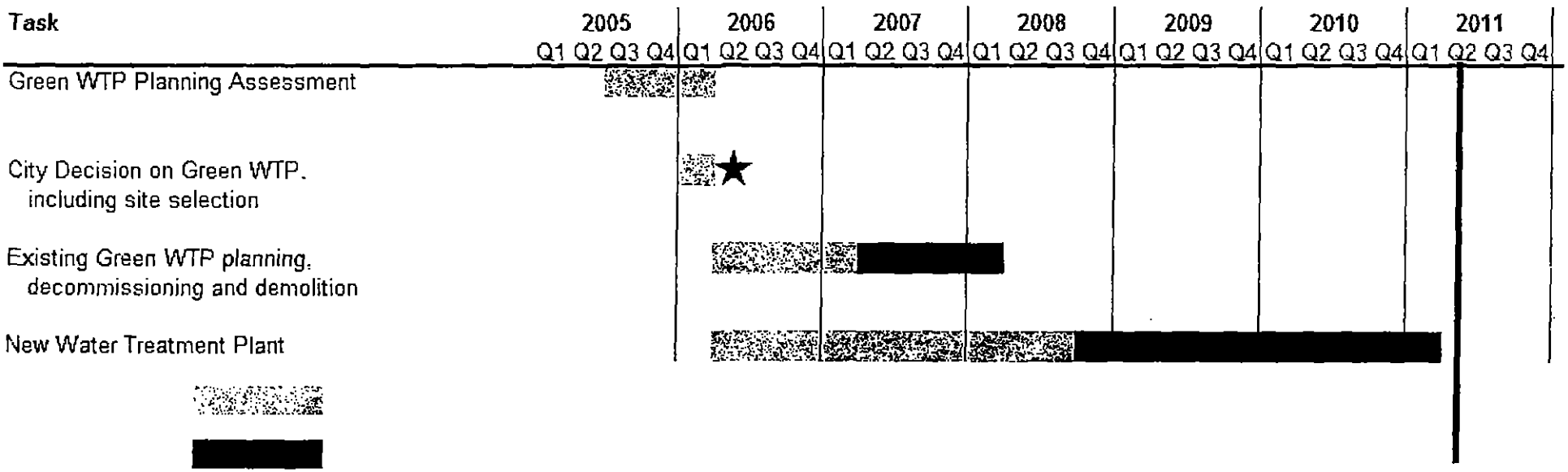
New Green WTP – Schedule



Green WTP– Proposed Schedule

- City Decision on Green WTP by early 2006☆
- Existing Green WTP ready for decommissioning by early 2007, pending completion of Ullrich WTP and Seaholm Redevelopment-related improvements
- New drinking water treatment plant operational between 2010 and 2011



Next Steps

• Issued New Green WTP RFQ	April 18
• Issue Green WTP Decommissioning	Immediate
• Council Vote on Selection of Engineer	June 22
• Contracting for Engineering Services	July
• Start Preliminary Design	August
• Chapter 26 process for intake and related facilities	Early 2007
• Start Detailed Design	Early 2007
• Start Construction	Mid/Late 2008
• Complete New Green WTP	Early 2011