

**Value Engineering  
for the  
SOUTH PEEL WATER  
AND WASTEWATER  
EXPANSION PROGRAM**

**William Fernandes, Andrew Farr,  
Howard Greenfield**



## **\$516 M PROGRAM**

### **Expand Lakeview WWTP**

392 ML/day to 448 ML/day \$270 M

### **Expand Clarkson WWTP**

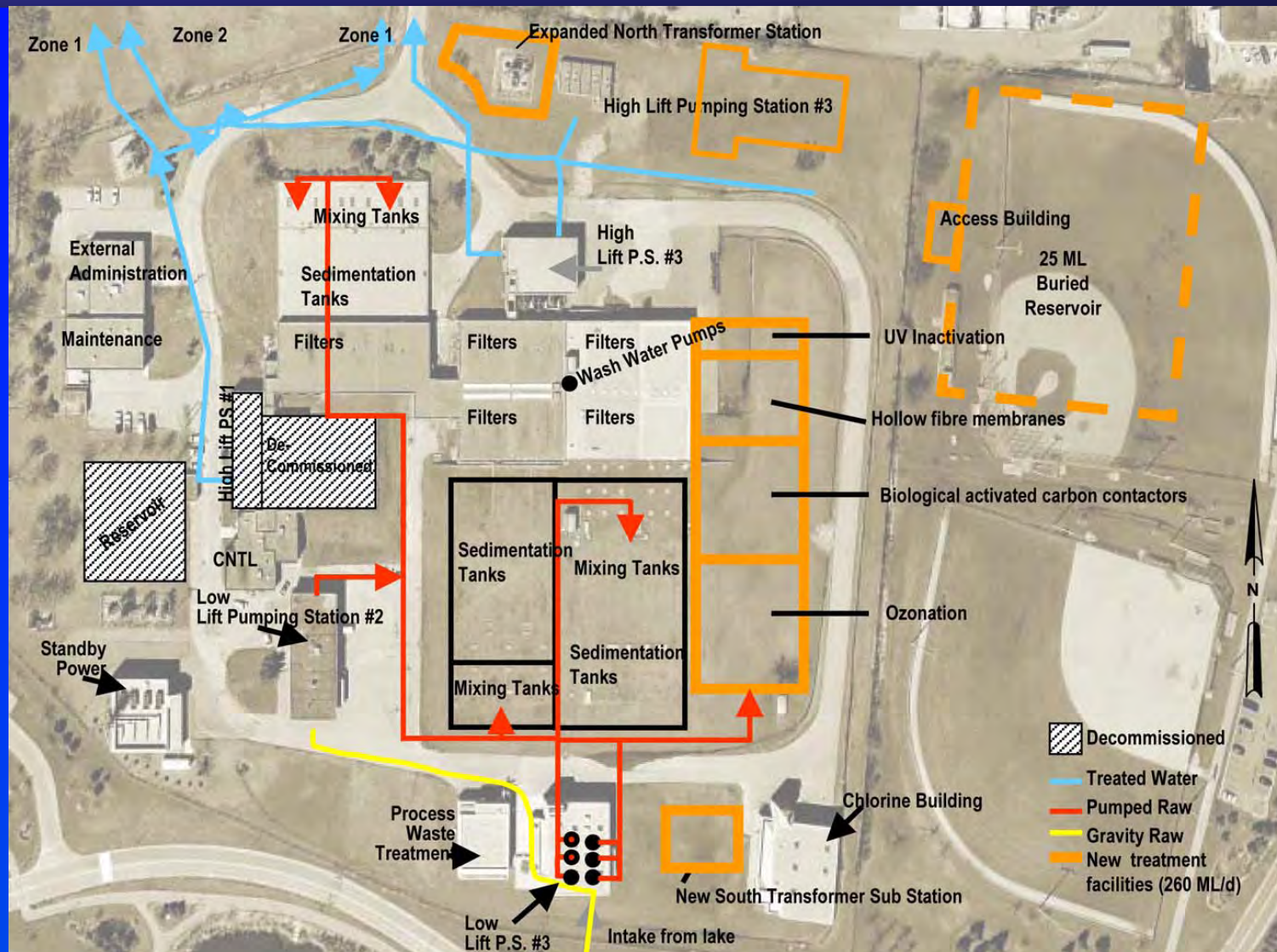
163 ML/day to 200 ML/day \$110 M

### **Expand Lakeview WTP**

560 ML/day to 820 ML/day \$136 M

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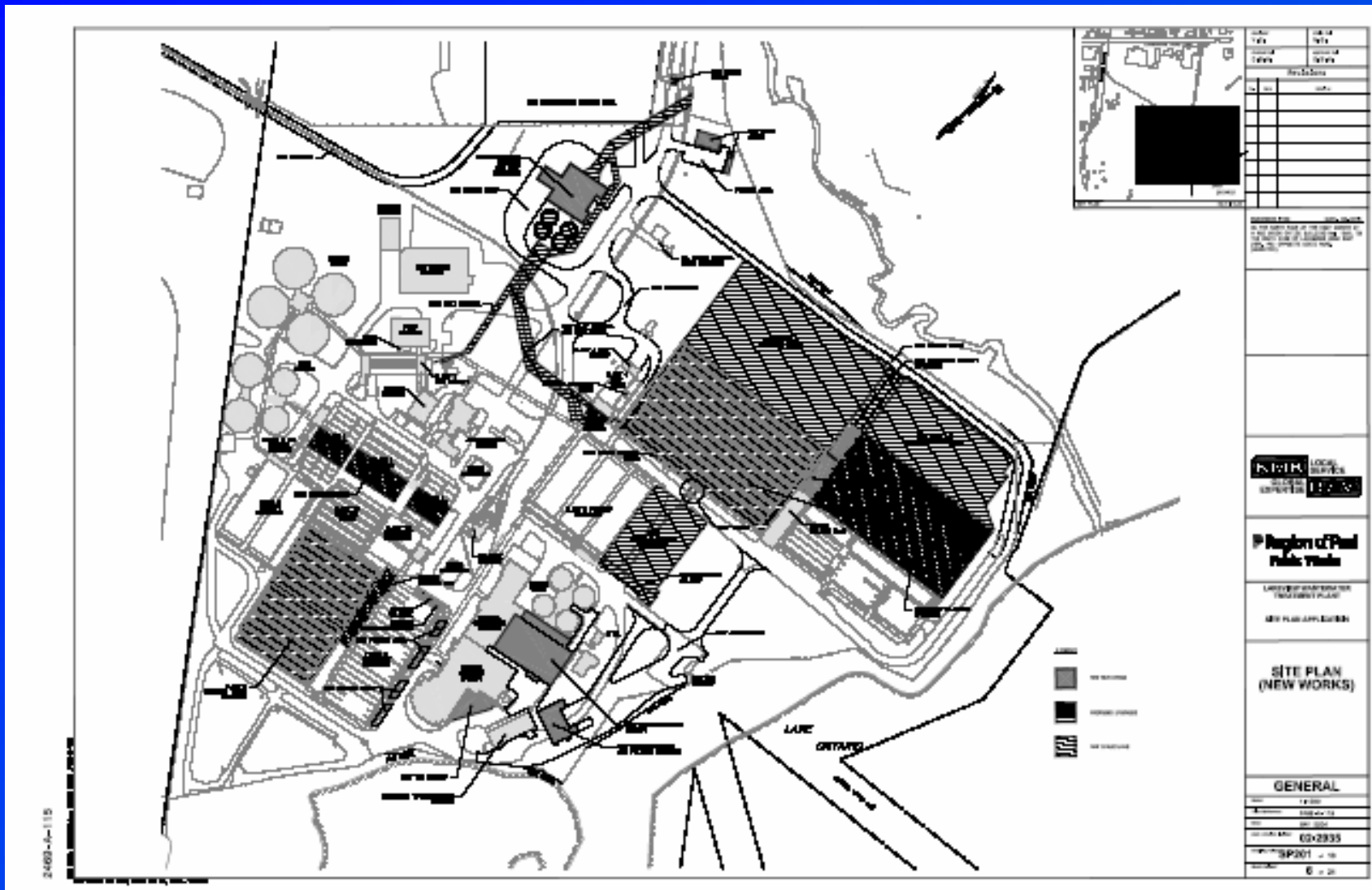


CSVA | October 25, 2004



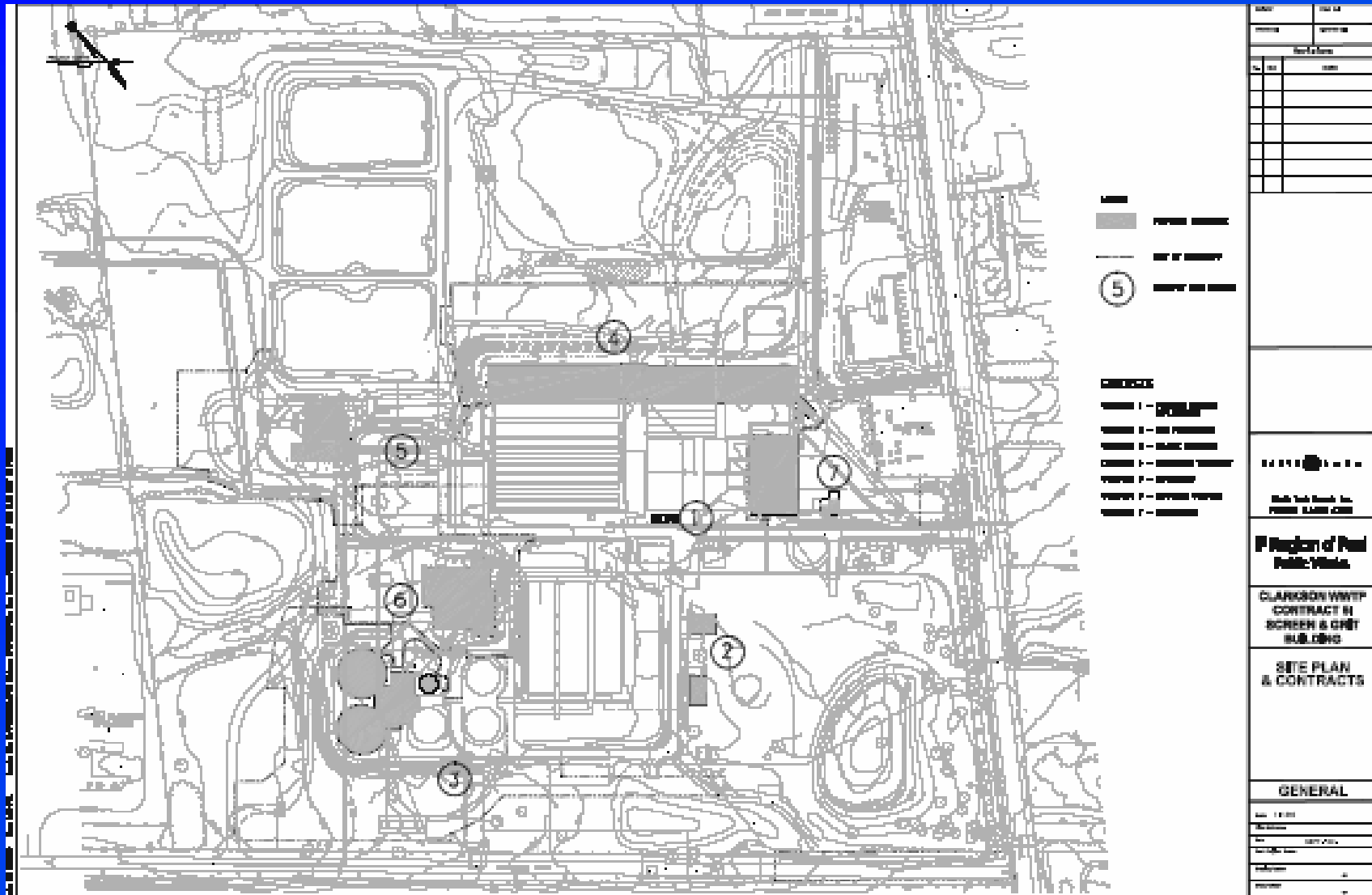
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# Program Highlights

- 4-Year Duration
- 3 Design Teams
- 21 Construction Projects

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- **Complex projects require melding design options into cohesive plan that addresses many difficult issues, provides greatest overall benefit to owner and other stakeholders**
- **Usually done by trial and error, takes lots of time**
- **VE techniques streamline this effort, help select concept that delivers maximum benefits at optimum life cycle cost**



# GOALS OF PEEL VE PROGRAM

- Ensure that appropriate treatment processes are used
- Optimize the design to minimize both capital and operating costs
- Ensure that all aspects of constructing, owning and operating the facility are considered
- Optimize how the project is contracted
- Ensure that construction runs smoothly

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## Multi-phased VE Process

- Review Total Concept for each plant and Confirm Process Selection
- Review major construction elements at Pre-Design Level
- Perform constructibility reviews on each construction project

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## Advantages of using VE process at concept stage:

- Obtain early consensus on requirements
- Help diverse stakeholders to focus on requirements
- Allow tough decisions to be made efficiently, promote buy-in from stakeholders, and
- Reduce time required to obtain optimal solution, while considering multitude of issues



## Advantages of using VE process at Pre-Design stage:

- Optimizes design of individual project elements
- Addresses operational issues early in the design
- Saves costs
- Allows sufficient time for designer to implement changes suggested without compromising schedule

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## Advantages of using VE process at 90%

### Design:

- Confirms that project can be constructed as portrayed on construction documents
- Assesses and addresses risk
- Ensures that sufficient information is provided for the contractor to bid and construct the project
- Assists in reducing requests for information, change orders and claims
- Ensures that construction documents are coordinated and interferences are minimized
- Ensures that plant operations can continue uninterrupted during construction



# PARTICIPANTS

- At concept phase, combination of design team, Region of Peel, OCWA and independent consultants
- At Pre-Design Level, combination of Region of Peel, OCWA and independent consultants
- At 90% Design Complete Level – OCWA and independent consultants

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# RESULTS

- Validation of the Region's project and water and wastewater quality goals by an independent team of industry experts prior to presentation to Council and the public
- Assisted in separating contracts to avoid the Region from becoming constructor
- Broke up contracts into manageable chunks to get more competition and better prices

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## RESULTS

- **Owner Controlled Insurance Policy (OCIP) helped the Region streamline Insurance**
- **Recommendation for pre purchase of major pieces of equipment was implemented**
- **Detailed technical analysis of alternative treatment processes allowed a good baseline for justifying the alternative selected**

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## RESULTS

- Several major technical alternatives were incorporated into the final design for the HLPS.
  - \* Saved capital dollars
  - \* Greatly improved the operability and the eventual tie-in with the existing facility
  - \* Changes included a significant modification to the High Lift Pump Station suction piping material and layout.

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## Results

- With such a tight site with restricted contractor access, identified a need for additional construction sequencing information in the contract documents
- Constructability reviews helped reduce questions during the tendering process and we had few addenda for these large projects.

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## Conclusion

*The VE process was a major contributor to the current success of South Peel's major expansion of its water and wastewater facilities*

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