Achieving Value Through Value Engineering in Water and Wastewater Treatment Plants

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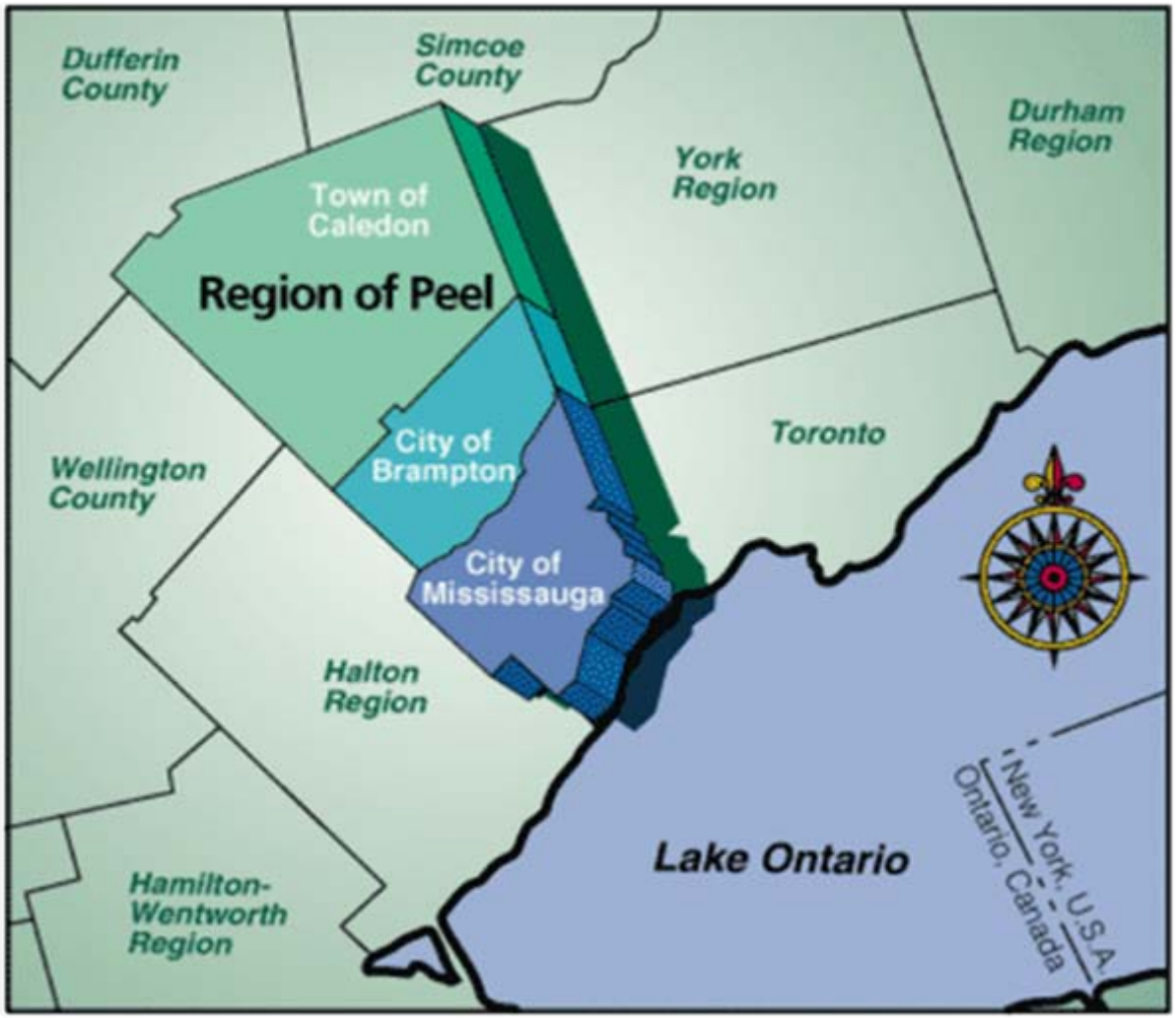
SUCCESS


Dufferin County
Simcoe County
Durham Region
York Region
Town of Caledon
Region of Peel
Toronto
City of Brampton
Wellington County
City of Mississauga
Halton Region
Lake Ontario
New York, U.S.A.
Ontario, Canada
Hamilton-Wentworth Region

Goals of Value Engineering

- Optimize the design
- Ensure all aspects of constructing, owning and operating the facilities are considered
- Ensure the appropriate treatment processes are used
- Optimize how the project is contracted/tendered
- Reduce the risks of construction

Why Does Peel Use Value Engineering?

- **Some of the successes recognized in Phase 1 Expansion;**
  - ✓ **packaging of VE workshops for all of the plants**
  - ✓ **pre qualification of VE consultants**
  - ✓ **pre purchase of equipment with long delivery times**
  - ✓ **improved accuracy of contract documents/drawings**
  - ✓ **involvement of all stakeholders**
  - ✓ **cost savings**

Why Does Peel Use Value Engineering?

- Cohesive design that addresses many difficult issues
- A multitude of complex contracts in a small footprint
- Require a rigorous review of the construction sequencing
- Promotes buy-in from the many stakeholders involved in each contract
- Helps deliver maximum benefits at the optimal life cycle costs

Value Engineering Requests for Proposals

Clarkson Wastewater Treatment Plant

- 1 Workshop - Conceptual Design All Contracts
- 1 Workshop - Preliminary Design All Contracts
- 4 Workshops - Detail Design/Constructability

Lakeview Water Treatment Plant

- 3 Workshops – Preliminary Design Reviews
- 4 Workshops – Detail Design/Constructability

Clarkson Wastewater Treatment Plant

2009

Prior to Phase 2 Expansion

Contract Highlights

Clarkson WWTP Expansion

- 200 MLD to 350 MLD
- $180 million
- 5 contracts

Value Engineering Participants

Clarkson Wastewater Treatment Plant

Owner
- Peel Region

Operations
- Ontario Clean Water Agency, OCWA

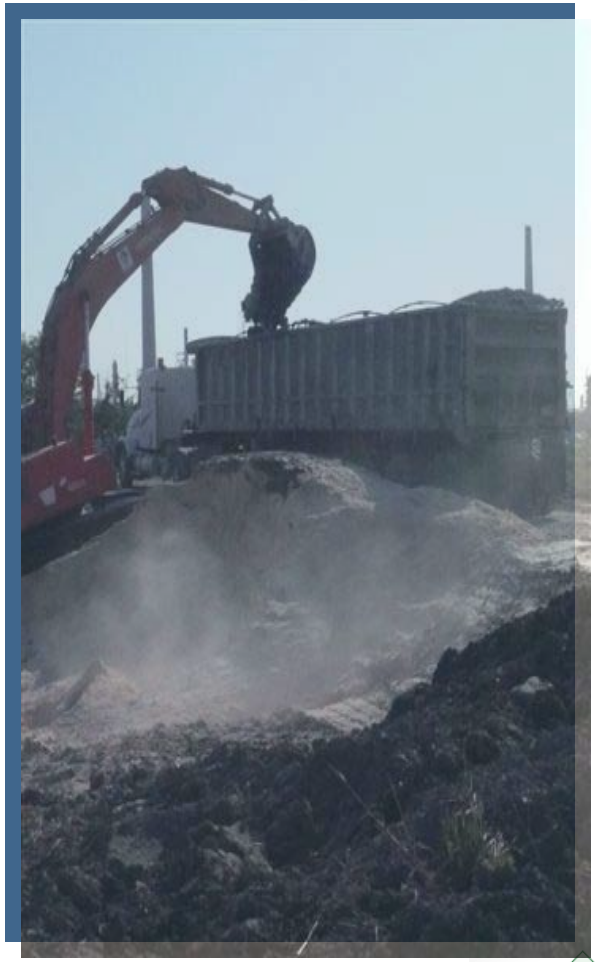
Design Team
- AECOM

Value Engineering Team
- Hatch Mott MacDonald
- Mactec

Clarkson Wastewater Treatment Plant

Contract 2-1

Site Preparation



Clarkson Wastewater Treatment Plant

Contract 2-2

Biosolids

Clarkson Wastewater Treatment Plant

Contract 2-3
LIQUIDS

Clarkson Wastewater Treatment Plant

C 2-4 Miscellaneous Contract

Tendered after all contracts

C 2-5 Co Generation

Preliminary Design Stage

Lakeview Water Treatment Plant

2009
Prior to
Phase 2
Expansion

Contract Highlights

Lakeview Water Treatment Plant

- 820 MLD to 1150 MLD
- $316 million
- 6 contracts, 3 future

Value Engineering Participants

Lakeview Water Treatment Plant

Owner
- Peel Region

Operations
- Ontario Clean Water Agency, OCWA

Design Team
- CH2MHILL

Value Engineering Team
- Hatch Mott MacDonald
- Mactec

Lakeview Water Treatment Plant

Contract 1 Administration and Maintenance Building

Lakeview Water Treatment Plant

Contract 2
Low Life Pumping Station

Lakeview Water Treatment Plant

Contract 8 Treatment Building

Lakeview Water Treatment Plant

Contract 8
Treatment
Building

Lakeview Water Treatment Plant

C – 3 **High Lift Pumping Station**
VE Constructability Review

C – 6 **OMB1 Re-Rating**
Mechanical Contract Complete

C - 9 **Standby Power**
Pre Design Stage

Advantages of Value Engineering Conceptual Design

- Obtain early consensus and focus by all stakeholders
- Formulate creative ideas
- Allow tough decisions
- Reduce time required to obtain optimal solutions

Advantages of Value Engineering Preliminary Design Stage

- Optimize the design of each individual project
- Address operational issues early in the design
- Allow sufficient time for the designer to implement changes
- Save costs by addressing unrealistic ideas

Advantages of Value Engineering Detailed Design/ Constructability

- Reduce Risk
- Ensure coordination of construction documents
- Confirmation of documents/drawings
- Construction sequencing
- Assurances to plant operations

Achievements of Value Engineering

- Third party review by an independent team of industry experts
- Contract separation
- Identified construction sequencing
- Detailed technical analysis of alternative treatment processes
- Validated prepurchase of equipment

Specific Recommendations Recognized

CLARKSON WASTEWATER TREATMENT PLANT

- Elimination of a tunnel
- Reduction in the number of Rotary Drum Thickeners (RDT) from 5 to 3
- Gas storage with Co Generation

Specific Recommendations Recognized

LAKEVIEW WATER TREATMENT PLANT

- Re-design of low lift pipe/pump alignment
- Removal of additional alum tank
- Elimination of the superstructure
- Addition of pipe chase in lieu of fill concrete

Conclusion

The VE process was and is a major contributor to the current success of Peel Regions Water and Wastewater Treatment Plant Expansions

THANK YOU

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Ontario Clean Water Agency, OCWA

QUESTIONS ?

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