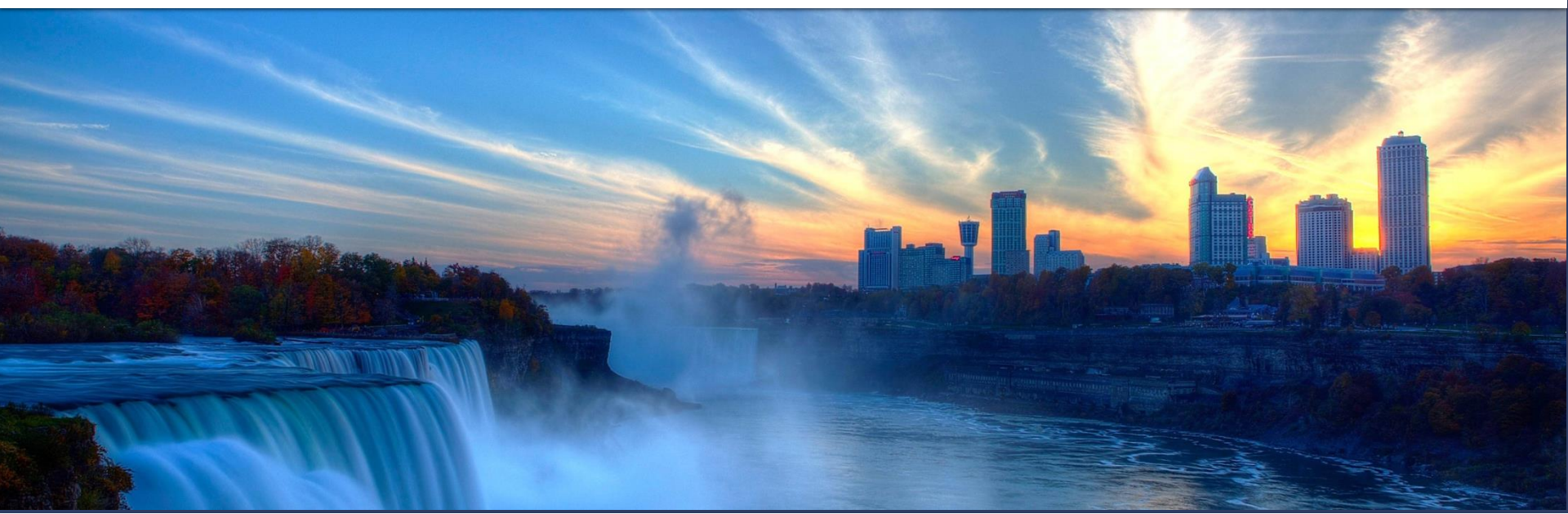


# Innovative Wastewater Treatment – Upper York Water Reclamation Centre

David Wilson, *President*  
NCE Value Engineers Inc.



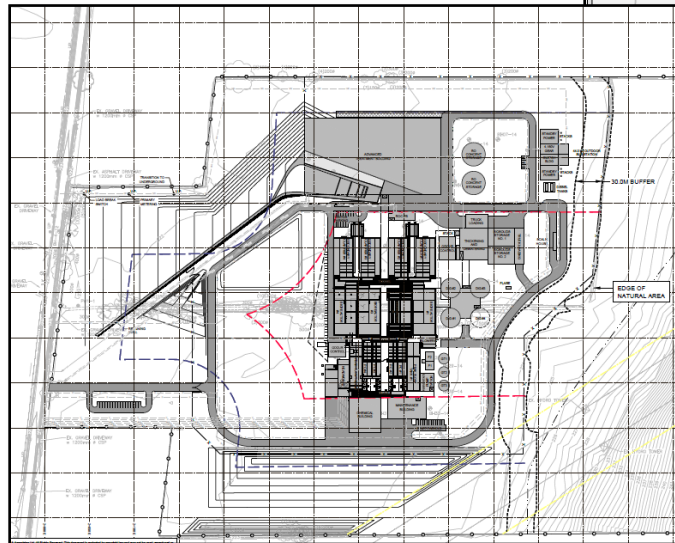
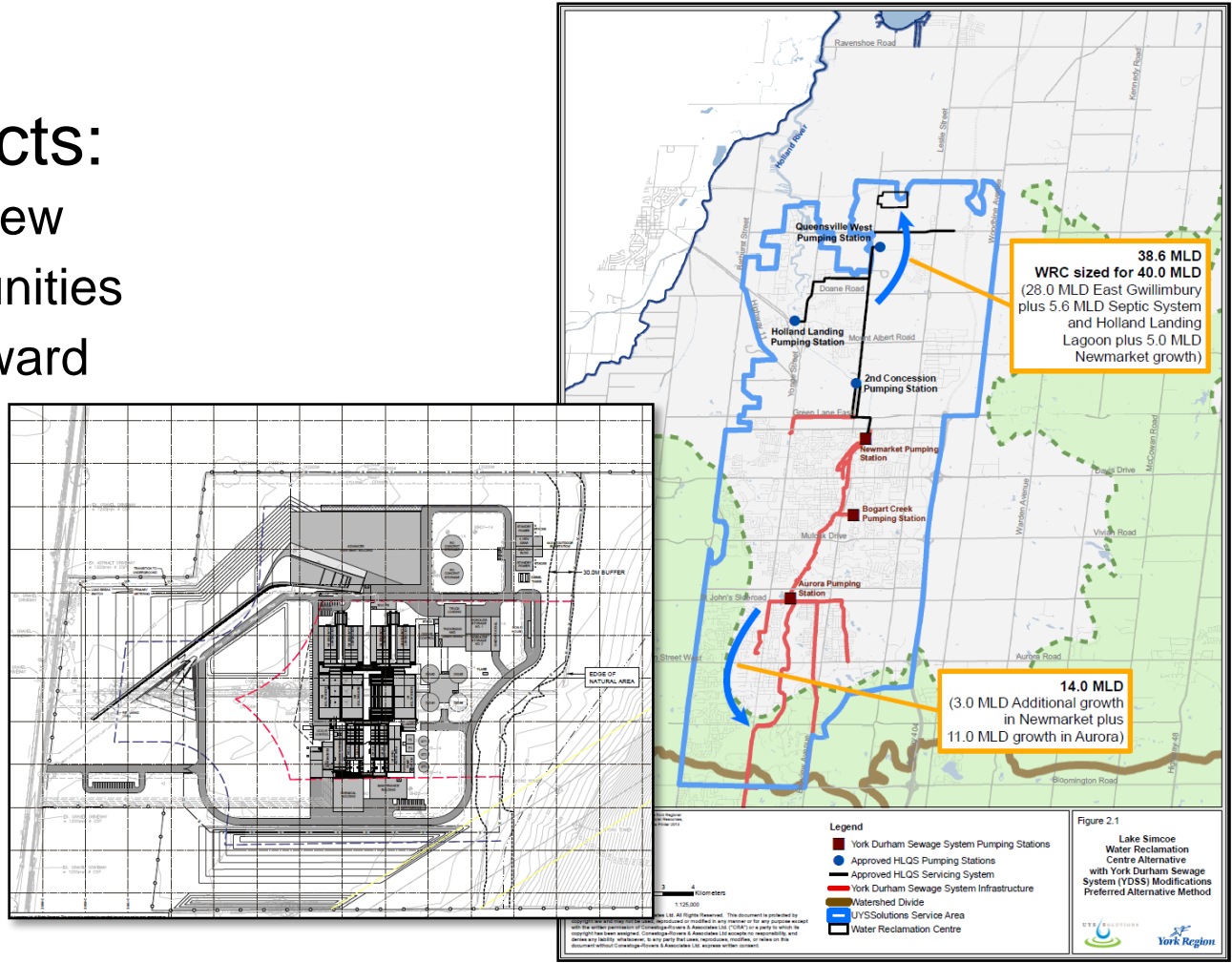
2016 Value Summit | June 5-7, 2016



# TODAY'S PRESENTATION...

## Three Aspects:

- Project Overview
- Value Opportunities
- The Path-Forward



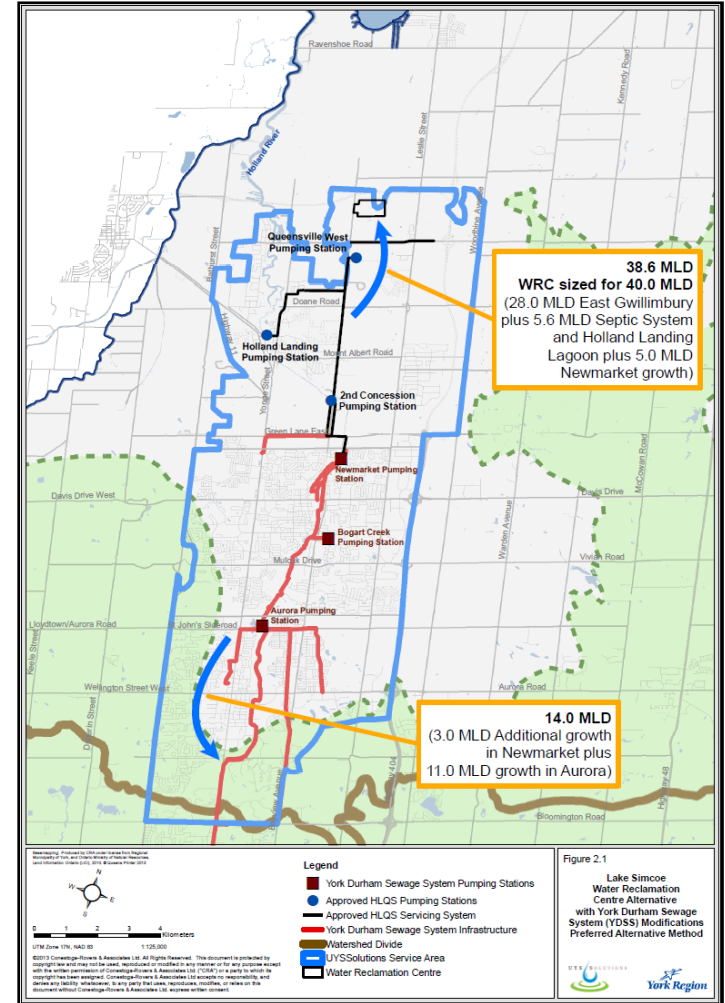
# PROJECT OVERVIEW

## Support growth in Upper York Region

- Aurora
- Newmarket
- East Gwillimbury

Treat/discharge in same watershed

Be a good neighbour

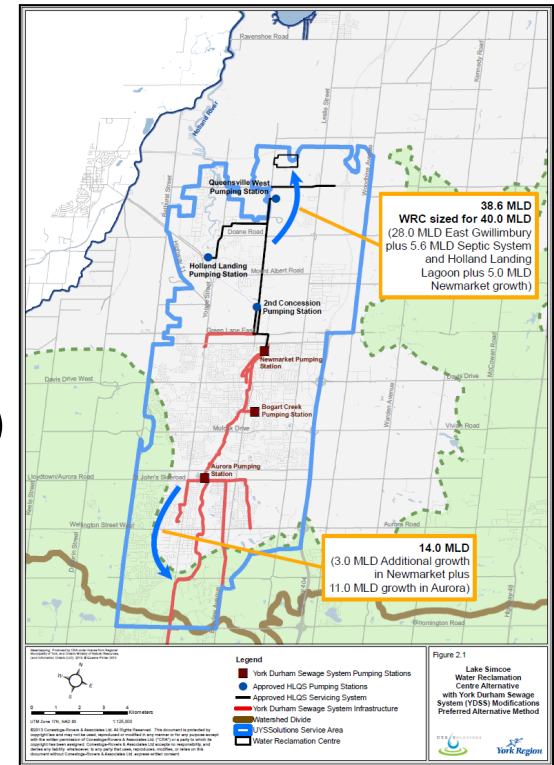


# PROJECT OVERVIEW

53 MLD design flow (2031)

Major components:

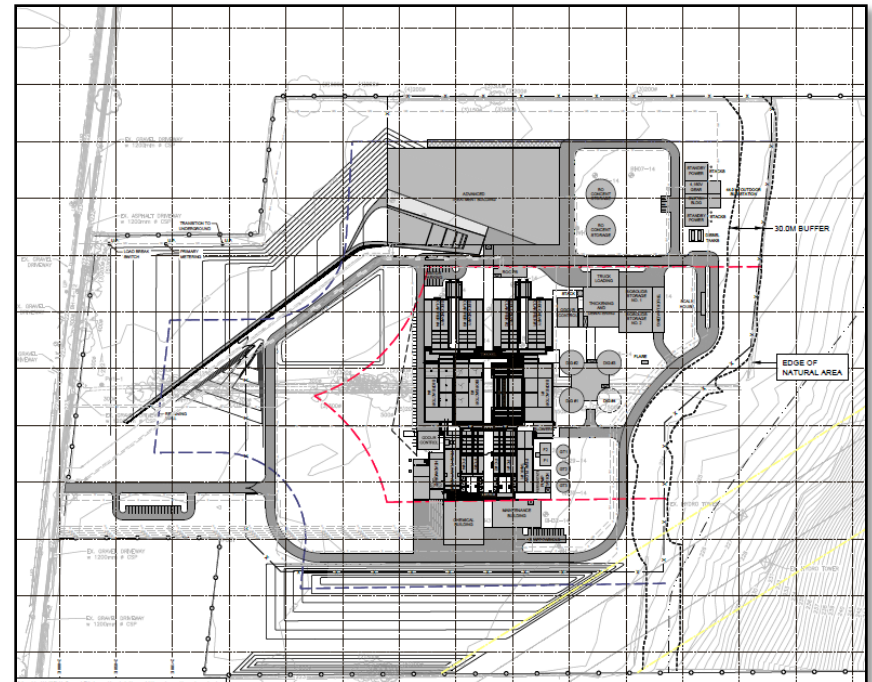
- Water Reclamation Centre (WRC)
- Modify York-Durham Sewage System (YDSS)
- Total Phosphorus Off-setting Program



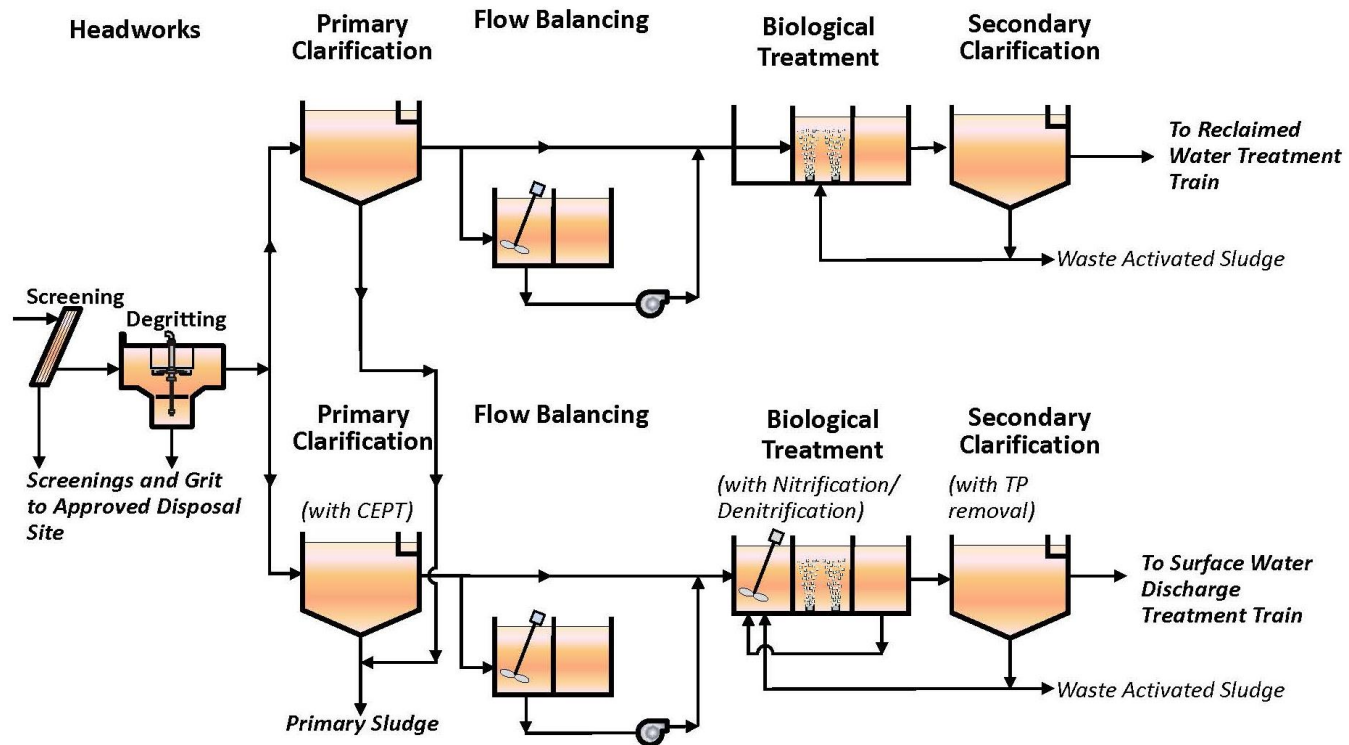
# WRC – PRODUCT OBJECTIVES

WRC can produce three different effluent streams:

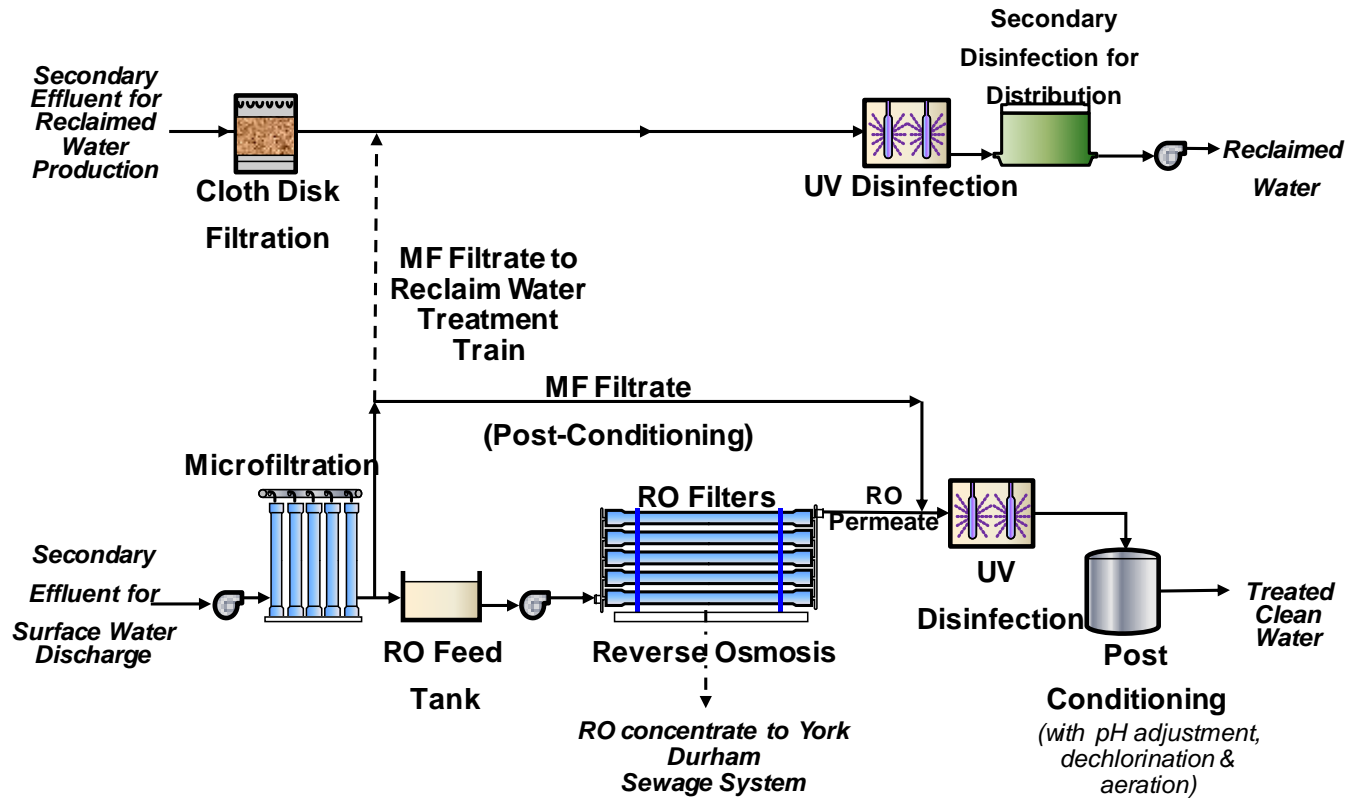
- Clean treated water for surface water discharge
- Low-nutrient reclaimed water
- Nutrient-rich reclaimed water



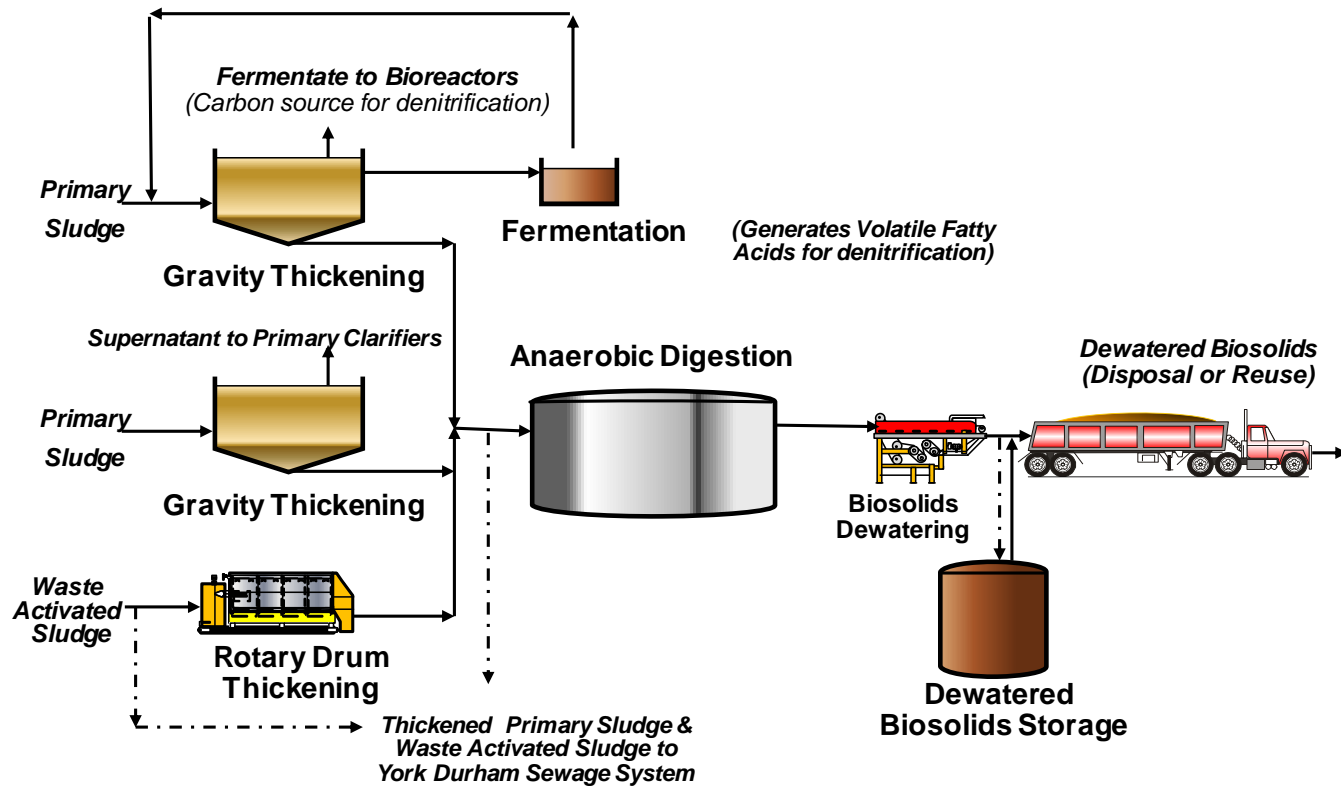
# WRC – CONVENTIONAL TREATMENT



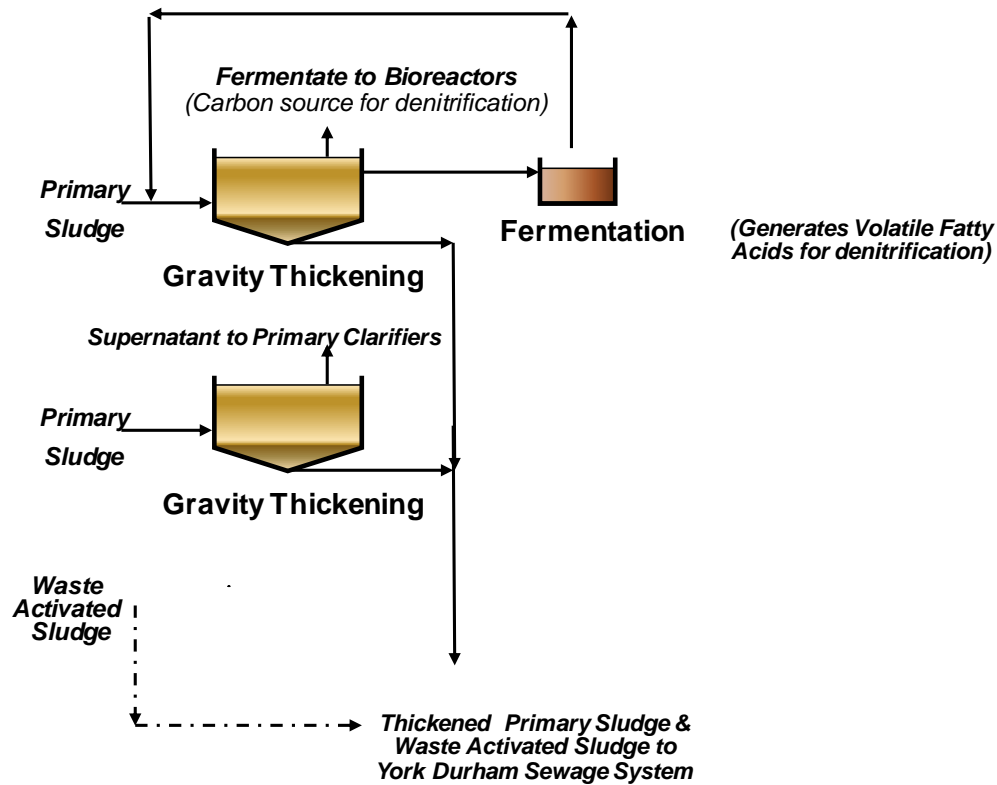
# WRC – ADVANCED TREATMENT



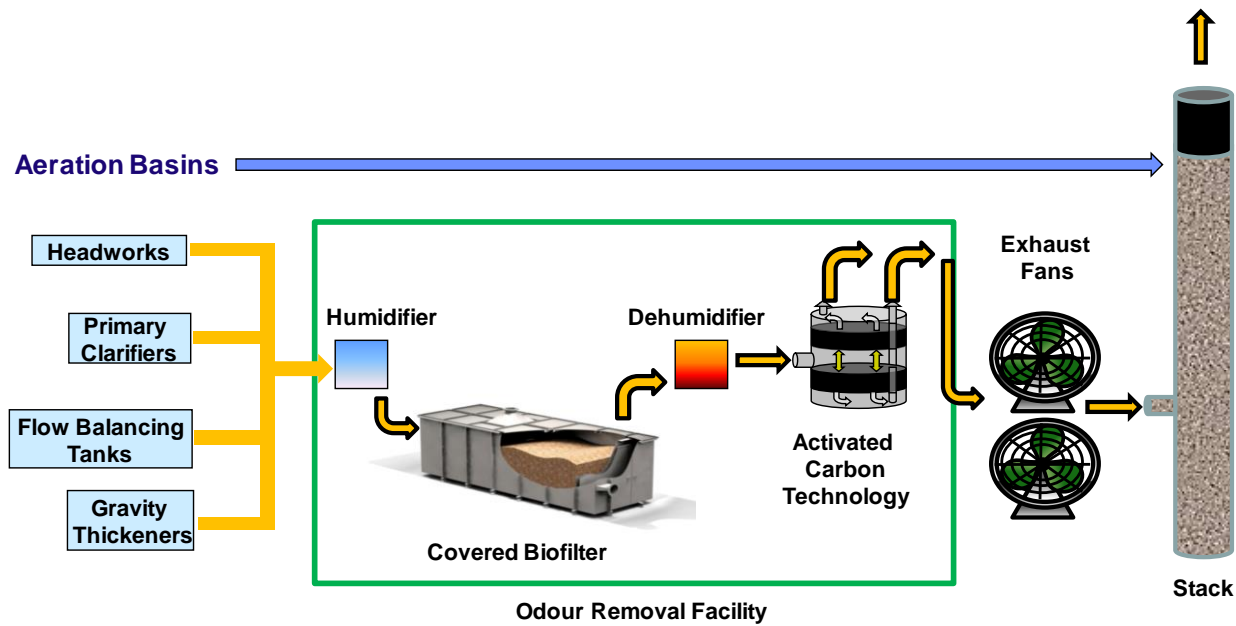
# WRC – SOLIDS HANDLING



# WRC – SOLIDS HANDLING



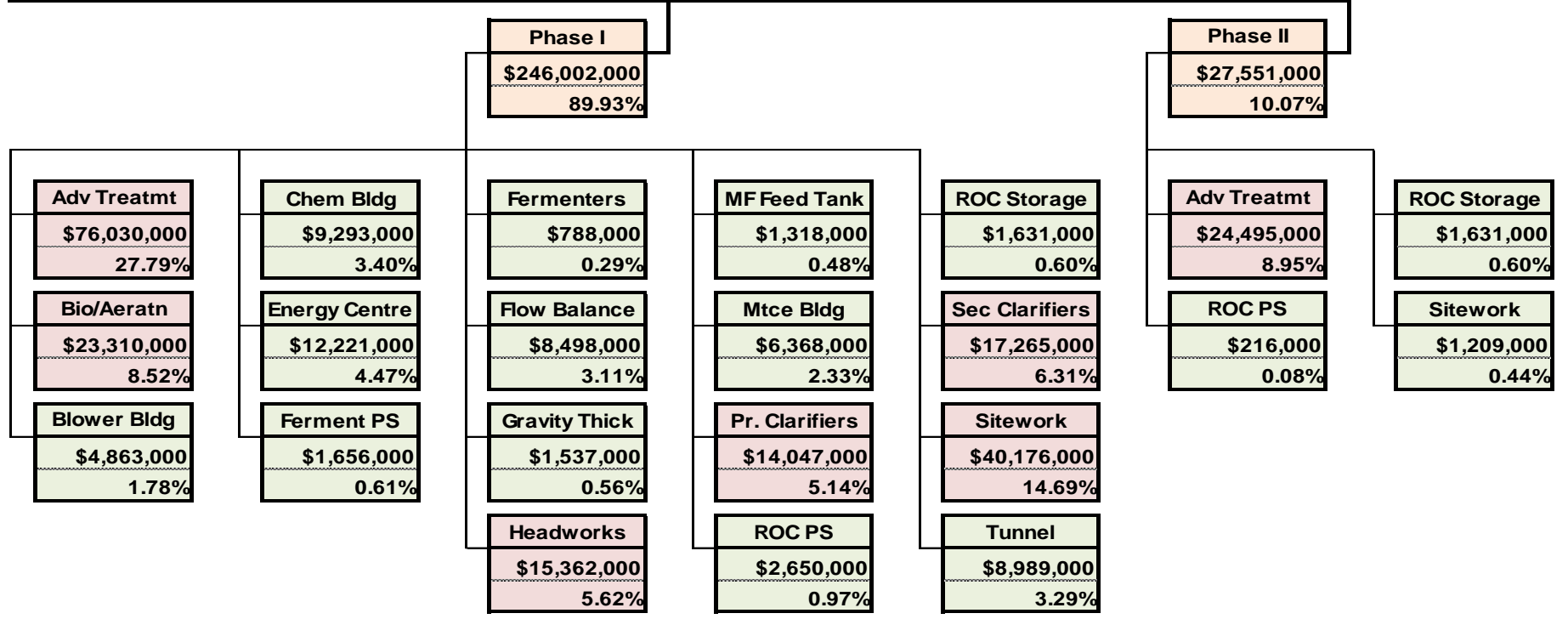
# WRC – ODOUR CONTROL



# COST MODEL

<b>Box A</b>	<b>Box B</b>	<b>Box C</b>	<b>Box D</b>	<b>Box E</b>	<b>Box F*</b>	
<b>Subtotal</b>	<b>GC/OHP/M</b>	<b>Contingency</b>	<b>Engineering</b>	<b>Escalation</b>	<b>Bid Total</b>	
\$273,553,000	\$0	\$49,240,000	\$80,698,000	\$0	\$403,491,000	
100.00%	Ax0.0%	Ax 18.0%	Ax 29.5%	Ax0.0%		

\* Incl. total markup of:  
\$ 129,938,000 or  
47.50% of subtotal cost



**Legend**

> 5% of Subtotal Construction Cost

< 5% of Subtotal Construction Cost

# KEY RISKS

Reclaimed water market does not materialize

Excess capacity

Lack of pilot data to guide design

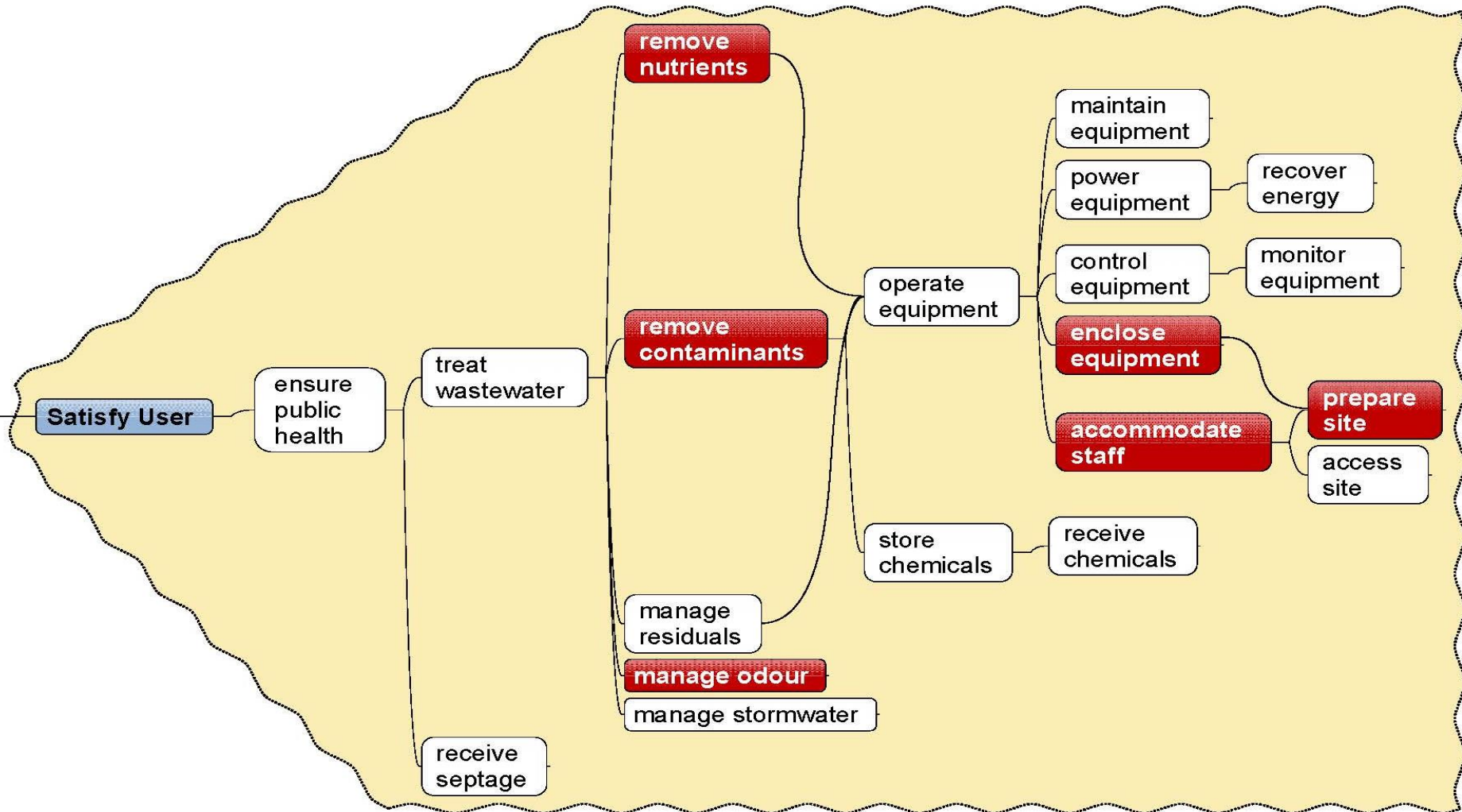
**DESIGN**

Risk	P	C	Mitigation	Contingency
CHANGE IN LEVEL OF SERVICE OBLIGATIONS TRAFFIC & RECREATION	2	3	- COMMUNICATION REGULAR WITH CITY STAFF - COMMUNICATION WITH COUNCILORS	
CHANGE IN REGION STAFF	2	1		
NEW CONSTRUCTION TECHNOLOGIES RELEASED DURING DESIGN	1	3		
UNMANAGED EXPECTATIONS - BUDGET - SCHEDULE	3	2	- OPEN COMMUNICATION BETWEEN PROJECT TEAM - MONTHLY PROJECT REPORT - UPDATED BUDGET FORECASTING	
GEO-TECH HYDRO-GEO DATA DELAYS	2	2	- START EARLY - PROPER SCHEDULED - OBTAIN BH LOGS EARLY	
LACK OF COORDINATION BETWEEN DESIGN CONSULTANTS	1	2		
LACK OF CONSIDERATION EXISTING INFRASTRUCTURE	1	3		

**CONSTRUCTION**

RISK	P	C	MITIGATION	CONTINGENCY
PUBLIC COMPLAINTS → NOISE → DUST → TRAFFIC	3	2	✓ PUBLIC RELATIONS AMBASSADOR MEETING PROVISIONAL TESTS	COLLECT & FOLLOW-UP
CONTRACTOR SAFETY CONTRACTOR WORKS IN UNSAFE MANNER	3	3	H.R.S PLAN TRAINING MONITOR 3rd PARTY SAFETY REVIEW	REPORT INCIDENT REPORTING - CORRECTIVE
PROBLEMS IN MAKING CONNECTION TO EXISTING SYSTEM	1	3		
LOSS OF ROADWAY DURING OPEN CUT	2	2	- GOOD STORAGE - GEOTECH TO CONTRACTOR	- CLOSE ROAD - BACKFILL
FAILURE TO MEET PERMIT REQUIREMENTS	2	2	- INCLUDE PERMITS IN TENDER - GOOD COORDINATION W/ APPROVAL AGENCIES	- PRO-ACTIVE CORRECTION
INCLUDE THAN EXPECTED GROUNDWATER RATES INTO SITE	2	2	- HYDRO-G - PLANNING OF PUMPING - PROPER DELTA - PROVISIONAL PERMITS - INTERFACE & PLANNING	- GRADING - SILL AND PUMP - PUMPING
CONFLICT WITH OTHER CONTRACTS (TIME/SPACE SEPARATION)	2	2		- COMMUNICATION & RESOLUTION RAMP STAFF MOB.

# CRITICAL FUNCTIONALITY



# IDEAS, IDEAS...

## Ideas

- 120 Generated
- 40 Shortlisted
- 23 Developed



The only  
bad idea  
is the one  
you didn't  
share.



We're always looking for better ways to get things done.

Call us here we can help you!

Submit your idea and you could win \$5000!

Email your ideas to: [ideas@massdot.com](mailto:ideas@massdot.com)

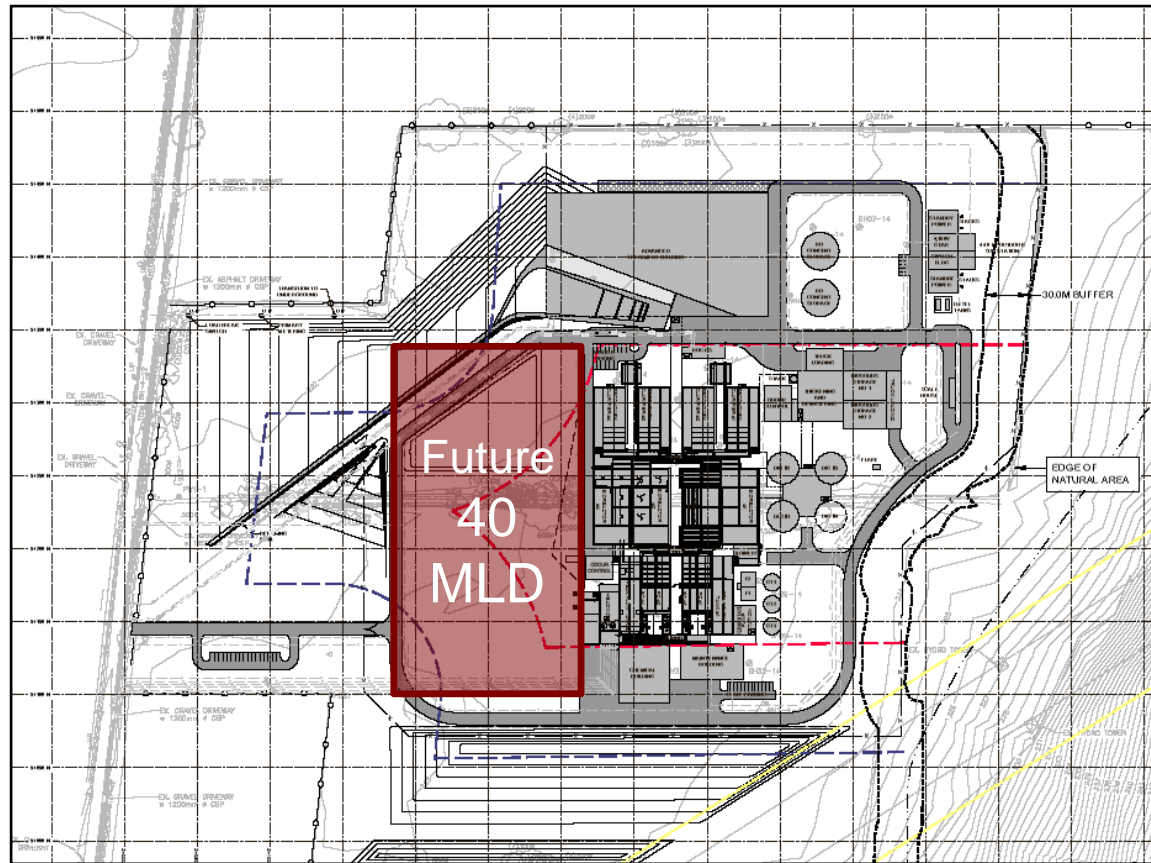
or via mail to: [ideas@massdot.com](mailto:ideas@massdot.com)

Office of Performance Management  
100 Park Plaza, Suite 4550  
Boston, MA 02116  
or via fax to: (617) 973-3163

**massDOT**

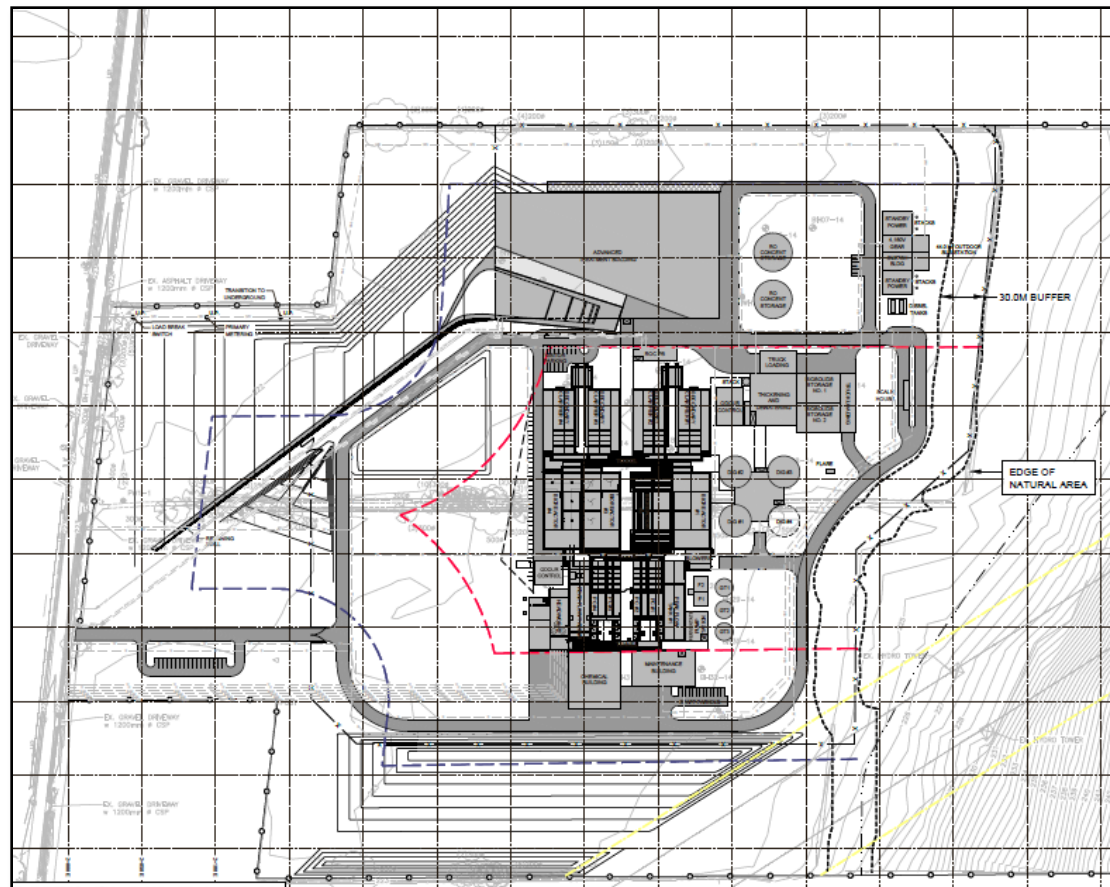
# VALUE OPPORTUNITIES

Plan ultimate campus now...



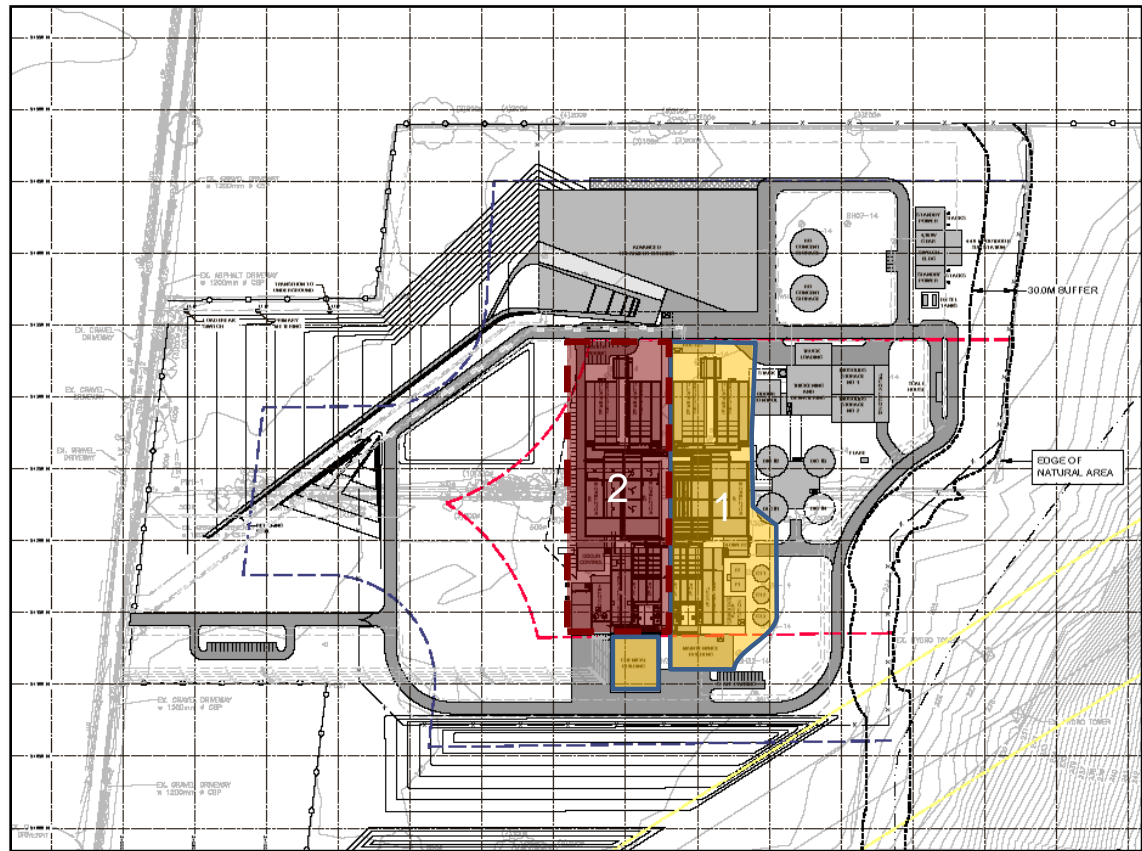
# VALUE OPPORTUNITIES

Additional  
geotechnical  
information for  
piling design



# VALUE OPPORTUNITIES

## Phase-in treatment trains







# VALUE OPPORTUNITIES

Less  
elaborate  
aesthetics



# PATH-FORWARD

Additional geotechnical information collected

Master planning of campus protects for future site needs

Region proceeded with cloth filters – can be used for pre-treatment or reclaimed water

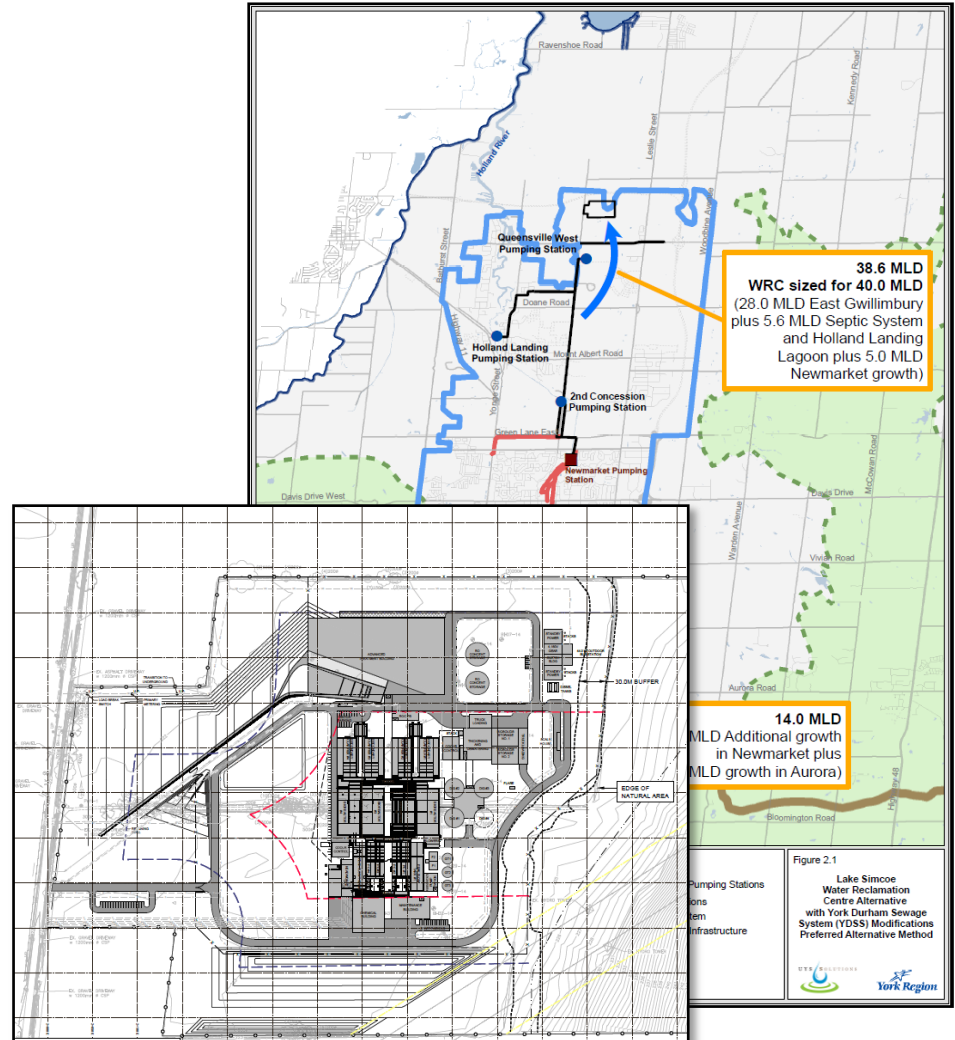
Assessment of fermentation process – more economical to purchase VFAs than build/operate now...also eliminated odour issue

# ACKNOWLEDGEMENTS

Special thanks to:

Regional Municipality  
of York

Conestoga-Rovers &  
Associates Limited



# SUMMARY...

## Three Aspects:

- Project Overview
- Value Opportunities
- The Path-Forward

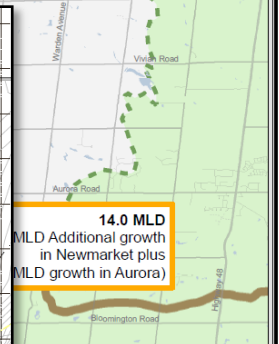
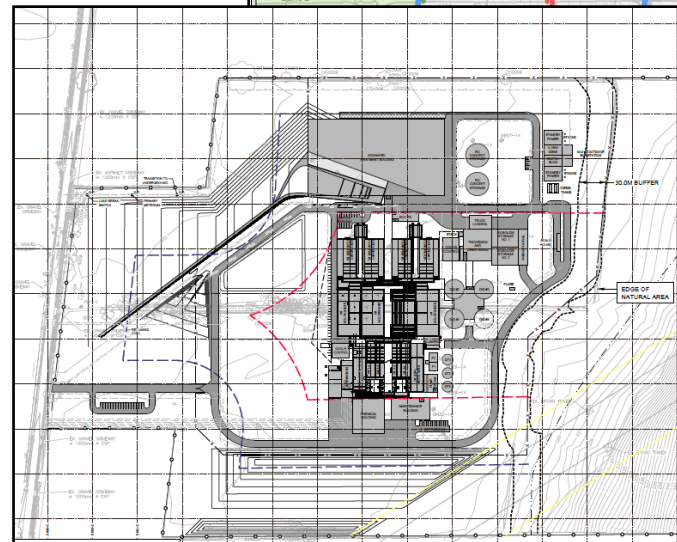
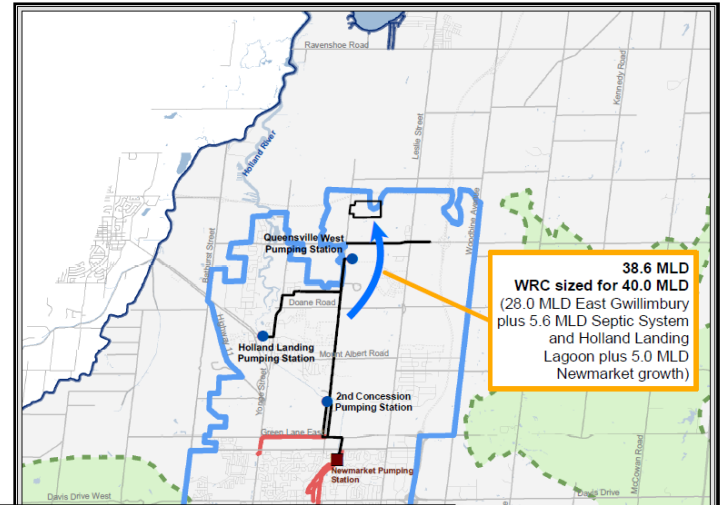


Figure 2.1  
Lake Simcoe  
Water Reclamation  
Centre Alternative  
with York Durham Sewage  
System (YDSS) Modifications  
Preferred Alternative Method

OTTAWA CONSULTANTS  
York Region

The background of the top section of the slide features a blue-tinted image of a waterfall on the left and a city skyline with several skyscrapers on the right, under a cloudy sky.

# THANK YOU

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[david.wilson@nceve.com](mailto:david.wilson@nceve.com)

NCE Value Engineers Inc.