Welcome to Energy from Waste Council Education Day
Introduction
Session one: Background and Project Overview

**Clifford Curtis**, P.Eng., M.Sc., MBA
Commissioner of Works

**Jim McKay**, BA (Hons)
Solid Waste Manager, Canada

**Adam Chamberlain**, BES (Hons), LLB
Partner, Certified Specialist - Environmental Law
Brief History of Garbage

“A Made-in-Durham Solution”

Clifford Curtis, P.Eng., M.Sc., MBA
Commissioner of Works
1970-1990

A Made-in-Durham Solution

• 1974 Durham Region was established
• Seven small municipal landfills uploaded to the Region
  • Brock Township
  • Oshawa
  • Scott
  • Whitby
  • Darlington
  • Scugog
  • Cartwright (Blackstock)
• All landfills except for Brock Township close
• Durham garbage to Brock West (Pickering)
• Durham begins to look at waste disposal options including energy from waste (EFW)
Early 1990’s

Garbage Wars

• Time period where landfill capacity was difficult to secure
• Whitevale (Pickering) selected site for new landfill (Durham and Toronto)
• Interim Waste Authority was established in 1990 by the Ministry of the Environment (MOE) to select three waste disposal sites in the GTA and later abandoned with a change in government.
Mid-1990’s

A Made-in-Toronto Solution

• Brock West Landfill (Pickering) closes
• Durham garbage to Keele Valley (Vaughan)
• Tipping fees climb to high of $150/tonne
• Durham participates in the Adams Mine project
• A “Willing Host” concept is introduced
Late 1990’s

Durham Waste Management Strategy

• Durham passes a “no new landfill” resolution in Durham Region
• Regional Council moves to develop a Long-Term Waste Management Strategy plan to investigate technically feasible waste reduction and disposal opportunities in an environmentally and financially responsible manner.

The main goals of the waste plan were:
• To divert at least 50 per cent of the residential waste from disposal by 2007 or earlier.
• To secure an alternate source for the disposal of residential waste, when the City of Toronto's Keele Valley Landfill Site is closed.
• To implement an integrated residential waste management system for the collection, processing and disposal of:
  • Blue Box recyclables
  • Food and yard waste compostables
  • Residual garbage waste
  • Special waste – Household Hazardous Waste (HHW), Bulky goods, E-waste
• To consider an energy-from-waste facility for the disposal of residual garbage waste.
2000-2005

Free Market Capitalism

• Keele Valley Landfill closes in 2002
• Durham garbage shipped to Pine Tree Acres Landfill in Michigan (2002-2010)
• Initiative to close Michigan border to Ontario waste announced in 2004.
• Environmental Assessment (EA) Terms of Reference was developed (2005).
• Contingency landfill capacity report prepared by GTA.
2005

A Made-in-Durham Solution

- EA Terms of Reference were developed (2005).
- Contingency landfill capacity report prepared by GTA.
- Durham waste contingency option includes directing waste to Brock Township Landfill and re-open Oshawa Landfill.
2005-2006

- Durham attempts to find interim landfill capacity.
- EA Terms of Reference approved by the MOE.
- Regional Council accepts thermal treatment of waste with energy recovery as the preferred alternative for residual waste.
2010

- Ministry completes EA review and posts for public comment.
- Minister approves Environmental Assessment with conditions.
- Host Community Agreement (HCA) signed with Clarington.
- Durham and York sign contract with Covanta.
- Michigan border closed to Ontario municipal waste.
The Planning Process

The Environmental Assessment (EA) Process
Public Consultation
Ministry Review

Jim McKay, B.A. (Hons)
Solid Waste Manager, Canada
What is an EA?

• A “decision-making process used to promote good environmental planning…promotes responsible environmental decision-making and ensures that interested persons have an opportunity to comment on undertakings that may affect them.”

• Individual EA’s are required, only for the most complex infrastructure projects.

• New Screening EA allows for a more streamlined process, however, both Councils decided given the complexity and magnitude of the project to proceed with more a comprehensive Individual EA.
The Planning Process

- The EA process consisted of:
  - Completion of the EA Terms of Reference
  - Evaluation of Technologies
  - Evaluation of Sites
  - Completion of Site and Vendor specific studies
Systems and Technologies Evaluation

- Council directive – no new landfills
- Formulation of Alternatives Disposal Systems including Mechanical, Biological (including stabilized landfill) and Thermal Treatment alternatives
- Technical and environmental studies of the alternatives
- Approved by Regional Councils in June 2006
Preferred System

At-Source Diversion: 60% to 75% Diversion

- 40% to 25%

Post-Diversion Waste

Emissions to Air, Land & Water

Thermal Treatment

- Energy
- Markets
- Recyclable Materials

Landfill

Ash/Char
Site Identification

• Suitable area screening
• Long-list identification (12 Sites)
• Short-list identification (5 Sites)
• Preferred site identification
• Technical and environmental studies of sites
• Clarington 01 approved by Regional Councils in January 2008
Preferred Site

Factors considered in facility siting:
- Existing and/or designated industrial lands
- Proximity to sensitive land uses
- Surrounding natural features
- Property size
- Proximity to airports
- Proximity to required infrastructure
- Site accessibility & impact of haul route
- Approvals and permits required
- Opportunity to use heat/electricity generated
- Social concerns

Site characteristics:
- South of the 401, ease of access for haulage
- Site size = 12.1 HA
Site Specific & Vendor Specific Studies and Assessments

- Air Quality Assessment
- Surface Water and Groundwater Assessment
- Facility Energy and Life Cycle Assessment
- Geotechnical Investigation
- Acoustic Assessment
- Visual Assessment
- Natural Environment Assessment

- Social/Cultural Assessment
- Stage 2 Archaeological Assessment and Built Heritage Assessment
- Traffic Assessment
- Economic Assessment
- Site-specific Human Health and Ecological Risk Assessment

More than 20 different companies and over 100 team members involved in completing and reviewing these reports.
Summary of Findings from EA

- Project will not compete with waste diversion
- Air emissions below standards
- Minimal truck traffic impacts
- Net energy output to grid
- Project economically viability
- Stringent compliance and monitoring standards included

- No impacts to local agricultural operations
- Minimal cumulative effects
- Minimal impacts from ash management
- No impacts to property values

Health findings to be discussed in separate presentation.
Peer Review & Agency Review

- Three levels of Peer Review – internal, external and agency
- Funding provided to Municipality of Clarington to retain peer review services ($500,000).
- Peer Reviews completed on all major technical studies (both internal and external) and findings made public.
- Comments received were addressed in EA prior to submission to MOE.
- Each agency identified their own experts to review documentation and analysis.
Public Consultation, Engagement and Education
Public Consultation

Public Engagement: 2004 to present

- 100+ public consultation series and workshops
- 513 print advertisements placed
- 271 advertisements using other sources (radio, television, bus and theatre campaigns)
- 95 public speaking engagements/presentations
Consultation

In general, there are four types or categories of parties that were consulted over the course of the Study:

– Public Liaison or Advisory Committees
  • JWMG, SLC, DEAC, DAAC

– Aboriginal Communities
  • First Nation, Métis

– Government and Agencies
  • Local, Regional, Provincial, Federal

– General Public and Stakeholders
Consultation Process

• Information provided for review
• Comments and/or questions received
• Responses developed
• Individual responses provided back
• All correspondence in Record of Consultation (RoC) and made available to public
• Can trace all comments and responses for entire project
Ministry Review and Approval

Adam Chamberlain, BES (Hons), LLB, Partner, Certified Specialist – Environmental Law
EA Approval

Options for the Minister’s decision:

• Approve the undertaking (subject to necessary conditions)
• Refuse to approve the undertaking
• Refer all or part of the decision to the Environmental Review Tribunal (ERT) for a decision
The Ministry Review

- The *Environmental Assessment Act* (the Act) requires the Ministry to prepare a “Review” of the EA that is being considered by the Minister
- This occurs prior to the Minister making a decision whether to approve the EA
- The Review is the Ministry’s evaluation of the EA
The Ministry Review

The Purpose of the Review is:

• to determine if the EA has been prepared in accordance with the approved Terms of Reference (ToR) for the EA and the requirements of the Act

• to determine if the EA provides sufficient information to allow the Minister to make a decision whether to approve the EA
Review of the EFW EA

Ministry Review - opinion on the EA

• EA followed the Terms of Reference
• EA addressed all commitments made in the ToR
• EA met all requirements of the Act
• Ministry satisfied with the level of consultation (public and Aboriginal) in preparing the EA
Review of the EFW EA

Ministry Review - opinion on the EA

- Satisfied that the EA clearly sets out issues and concerns raised by the public and Aboriginal stakeholders and how they have been addressed

- Any outstanding issues (at the time of the Review) can be dealt with by Conditions to the EA Approval
Review of the EFW EA

“The ministry is satisfied that the proposed mitigation methods and contingencies will ensure that any potential negative impacts will be minimized and managed.”
EA Approvals In General

General Comments Regarding EA Approvals

• The EA Approval is the principal environmental approval in Ontario for projects under consideration

• Sets out the Conditions of Approval that must be followed in accordance with the approved undertaking / project

• The Certificates of Approval and other permits are technical in nature and follow the EA once the Minister’s Approval for the project is granted
EA Approval of the EFW

• The EA approval provides unequivocal approval for the EFW Project
• The Minister approved the EFW project (undertaking) subject to Conditions
• The Minister considered a hearing to be “unnecessary”
• Includes 25 detailed Conditions of Approval that reflect the satisfaction described in the Ministry Review
EA Approval of the EFW

“The construction of the [EFW] will provide sufficient waste disposal capacity, as well as energy and material recovery, for the next 35 years, while ensuring protection of public health and minimizing impacts to the natural environment.”
EA Approval of the EFW

“I have also concluded that there was sufficient time and opportunities for interested members of the public, the government agencies and Aboriginal communities to comment during the EA process.”
Questions?
Session two: Technology, Design and Operation

HDR Technical Team

Covanta Team

Craig Bartlett, Manager, Waste Operations
Region of Durham

Peter McMillan, McMillan Associates Architects
Architect, Principal
MArch OAA ARQ NSAA MAA assoc.AIA MRAIC
Technical Advisors: HDR Corporation

Shawn Worster, BEng. {Mechanical}, MaSc. EM, MaSc. HSA
Associate Vice President

Bruce J. Howie, BEng., MaSc. {Chemical}
V.P., Northeast Waste Facilities Section Mgr

John D. Clark, BEng. {Mechanical}
Senior Mechanical/Process Engineer

Kirk Dunbar, BEng. {Aeronautical}
Senior Air Quality/Environmental Engineer
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<td>Alexandria/Arlington EFW Facility, VA</td>
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<td>MacArthur Resource Recovery Facility, Islip, NY</td>
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<td>Onondaga Resource Recovery Facility, NY</td>
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HDR’s Role In The Project

• Provide the Regions with EFW technology expertise and advice during Vendor Identification Process

• Development of technical requirements for EFW facility

• Technical support to the Regions during negotiations of the Project Agreement (PA) and during Certificate of Approval (CofA) negotiations

• Oversight of the design, construction and acceptance testing phases of the Project
Durham Council made the following recommendation to Works Committee Report 2008-WR-7 on January 23, 2008:

“That the Joint Waste Management Group of the Regions of Durham and York be requested to agree to protect the health and safety of the residents of Clarington and Durham by incorporating into the design and installation of the EFW facility the most modern and state-of-the-art emission control technologies that meet or exceed the European Union {EU} monitoring and measurement standards.”
Preferred Vendor Identification Process

• **Develop Technical Criteria (2008):**
  - Development of Design Specifications
  - Specification of Best Available Emissions Control Technologies that met proposed stringent emission standards
  - Development of Technical Sections of Project Agreement
  - Monitoring of process and environmental parameters with Modern Proven and Reliable Controls and Monitoring Systems
  - Promote innovative design enhancements

• **Covanta met or surpassed technical criteria and recommended as preferred vendor (April 2009)**
## Proposed Emission Standards

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<td>Particulate Matter</td>
<td>mg/Rm(^3)</td>
<td>9</td>
<td>9</td>
<td>14</td>
<td>9</td>
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<tr>
<td>Sulfur Dioxide (SO2)</td>
<td>mg/Rm(^3)</td>
<td>35</td>
<td>46</td>
<td>56</td>
<td>35</td>
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<tr>
<td>Hydrogen Chloride (HCl)</td>
<td>mg/Rm(^3)</td>
<td>9</td>
<td>9</td>
<td>27</td>
<td>9</td>
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<td>Hydrogen Flouride (HF)</td>
<td>mg/Rm(^3)</td>
<td>1</td>
<td>N/A</td>
<td>1(^*)</td>
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<td>Nitrogen Oxides (NOx)</td>
<td>mg/Rm(^3)</td>
<td>180</td>
<td>183</td>
<td>198</td>
<td>121</td>
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<td>Carbon Monoxide (CO)</td>
<td>mg/Rm(^3)</td>
<td>45</td>
<td>46</td>
<td>40</td>
<td>40</td>
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<tr>
<td>Mercury (Hg)</td>
<td>μg/Rm(^3)</td>
<td>15</td>
<td>46</td>
<td>20</td>
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<td>Cadmium (Cd)</td>
<td>μg/Rm(^3)</td>
<td>7</td>
<td>N/A</td>
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<td>Lead (Pb)</td>
<td>μg/Rm(^3)</td>
<td>50</td>
<td>N/A</td>
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<td>Dioxins/Furans (ITEQ)</td>
<td>pg/Rm(^3)</td>
<td>60</td>
<td>92</td>
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<td>Organic Matter (as Methane)</td>
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<td>Opacity</td>
<td>%</td>
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<td>N/A</td>
<td>10(^b)</td>
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<td>5(^c)</td>
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**Notes:**

\(^a\) = All concentrations are dry, corrected to 11\% \(O_2\) at 25\(^\circ\)C, 101.3 kPa.

\(^b\) = Measured on a rolling arithmetic average of 6 minutes of continuously measured data.

\(^c\) = Measured on a rolling arithmetic average of 2 hours of continuously measured data.

\(1^*\) = Contractual obligations

N/A = Not Applicable or not measured.
Design & Construction Monitoring
Design Review

Primary Objective:
Act on the Regions’ behalf to confirm that the design of the EFW facility is being performed in accordance with the Project Agreement, the Technical Specifications and Standards, and accepted industry standards.

Design Review Phase of the Project will include:
- Participate in monthly design review meetings
- Review Covanta’s basis of design & specifications
- Design submittal reviews: 25 per cent, 75 per cent & 100 per cent
Construction and Commissioning

Primary Objective:
Consult with and advise the Regions’ Project Manager and act as its representative during the construction, startup and acceptance testing of the EFW facility to confirm Covanta’s compliance with the requirements of the Project Agreement and Certificates of Approval.

Construction Monitoring Phase includes:
- Full-time resident Construction Engineer
- Review and comment on Covanta’s milestone payments
- Monitor startup and facility acceptance testing
- Substantial Completion & Final Construction Acceptance
Operations & Maintenance (O&M) Monitoring
Operations & Maintenance Monitoring

Primary Objective:
Ensure that Covanta is operating and maintaining the EFW facility in accordance with the CofA, their contractual obligations and accepted industry standards for the life of the Project Agreement (+20 Years).

O&M Monitoring includes:
- Continuous Monitoring of Compliance w/Contract and Permit Requirements
- Review of Monthly Operations & Environmental Compliance Reports
- Routine and annual 3rd party inspections of EFW facility
- Review of Covanta’s annual and 5-year projected maintenance plans and boiler outage reports
- Review of annual operating and environmental performance adjustments to service fee
- Facility Handback Requirements at End of Contract Term, including a Facility Condition Assessment Report
Environmental Monitoring
Environmental Monitoring

Primary Objective:
Ensure that the EFW facility is in compliance with the CofA emission limits and operational requirements.

Environmental Monitoring Includes:

- Continuous emissions monitoring
  - for emissions reporting to MOE
  - process control
- Hundreds of operations parameters continuously monitored (emissions, temperatures, flows, pressures, etc.) through distributed control system
- Periodic certification of continuous monitoring equipment
- Periodic stack testing by independent entity
- Ambient air, surface water and groundwater
Environmental Monitoring

**MOE Oversight of Operations:**
- Periodic reporting by facility of monitor data
- Submittal of periodic monitor certification and stack testing
- Review and approve stack testing procedures
- Option to observe stack testing
- Periodic unannounced compliance inspections

**Publically Available Compliance Information:**
- Access to all submitted reports and information
- On-site display board
- Real-time, web-based access
Environmental Monitoring

Montgomery County, Maryland
http://www.montgomerycountymd.gov/swstmpl.asp?url=/content/dep/solidwaste/facilities/rrf_cemdata.asp
Covanta Team Members

Joey Neuhoff / Project Development

Jim Schneider, PE / VP of Engineering

Robert Terramoccia / Director of Project Engineering

Warren Fisher, PE / Project Manager

Gaston Haupert / Engineering

Zenon Semanystyn / VP of Operations

Paul Ewald / Process Engineering

Beth Hurley, CIH / Health & Safety

Brian Bahor, QEP / VP of Sustainability

Sam Joshi / Environmental Engineering
An EFW facility:

1. Uses MSW as a fuel to generate electricity

2. Looks and operates like a conventional power plant with a boiler and turbine

3. Incorporates state-of-the-art emission controls including continuous monitoring equipment

The Energy-from-Waste Process
Advanced EFW Emissions Controls

‘European’ Type Dry Recirculating Flue Gas Scrubbers
- Steady state optimum neutralization of HCl/SO2
- Continuous interaction between flue gas, lime and carbon
- Maximum energy recovery

Advanced Pulse Jet Fabric Filters
- Advanced media to optimize filter cake for emissions control
- Recirculation of lime/carbon trapped on fabric filters for reused through the flue gas scrubbers
Durham/York EFW Project Overview

• Committed to building and operating a flagship in-Region EFW waste disposal solution:
  • Convert 140,000 tonnes/year of Region MSW into electricity using proven EFW and controls systems
  • Enhance waste diversion
  • Meet North America’s newest, most stringent environmental standards
  • Generate 17.5 megawatts of renewable energy 24/7 — enough to power 11,000 to 14,500 homes
  • Significantly reduce GHG emissions in Region – 1 tonne processed by EFW = 1 tonne of GHG avoided
  • Create direct/indirect local construction jobs
  • Create full-time skilled operating positions and support jobs for the life of the project
Leadership in EFW

Covanta is the world’s largest EFW operator:

- More than 4,000 professionals employed globally

- Annually converts 20+ million tonnes of waste into more than 9 million MW hrs and 9 billion lbs of steam

- Produce more than 10 per cent of U.S.’s non-hydro renewable energy

- Responsible for over 5 per cent of post recycled U.S. waste disposal

- Recipient of more than 150 awards/citations for excellence in operational, environmental and safety performance

- North America’s largest full-service permitting, design, construction, operation and maintenance provider for the EFW Industry
Operating Portfolio: North America

• 41 North American EFW facilities
• 240 TPD to 3,000 TPD
• 24 Martin EFW facilities
• 13 transfer stations
• 3 ashfills, 1 landfill
• 8 biomass facilities
• 5 landfill gas energy facilities
• 2 hydroelectric facilities
Commitment to Excellence

“We have been extremely pleased and proud of the (COVANTA’s) care and record of excellence ...” – James D. Warner, Executive Director, Lancaster County, PA Solid Waste Management Authority

“I would like to thank...Covanta for being a good neighbor and helping to keep the (recycling) program whole.” – Victor Camporine, Warren County, NJ Recycling Coordinator

“...please accept our gratitude...for operating a nationally recognized WTE plant”
– Rudy Busch, Executive Director of Keep Lee County, FL Beautiful, Inc.

“I want to congratulate Covanta Lake on the success ...in providing a renewable energy solution for Lake County ... Their innovative efforts are critical to helping...achieve a sustainable future in Florida.” – Florida State Senator Carey Baker on Covanta receiving the William C. Schwartz Industry Innovation Award
Commitment to Sustainability

Our vision for sustainability stresses the inter-relationship between environmental stewardship and making a positive contribution to society.

Covanta’s Clean World Initiative

• *Started in 2007 to permeate sustainability through all business operations*

• *Promotes R&D, community programs and operational procedures that go beyond compliance to further our sustainability performance*

• *Corporate shift from reactionary to proactive stance on the environment, sustainability and community engagement*

Corporate Sustainability Report 2009/2010

• *Presents our vision and understanding of our economic, social and environmental responsibilities*

• *CSR was named a finalist for the Ceres-ACCA North American Sustainability Reporting Awards*
Commitment to the Community

MERCURY BOUNTY PROGRAMS

STUDENT POSTER CONTESTS

PUBLIC EFW TOURS

LOCAL GREEN FAIRS

FISHING FOR ENERGY

ARBOR DAY / EARTH DAY EVENTS
Environmental Stewardship

• Technology, operating protocols, employee incentives and skilled operators result in superior environmental performance

• Typical facility operates 60-80 per cent below EPA limits

• Leadership in developing/applying new technologies (LN & VLN, Mercury Control)

• Roughly 6,000 stack tests over past 10 years resulted in 20 exceedances (our goal is ZERO)
  • 4 from mass burn, moving grate similar to Durham/York EFW

• Achievement recognized through many awards
  • USDOE, Office of Energy Efficiency and Renewable Energy Innovator Award
  • Virginia Environmental Excellence Program
  • Kapolei Outstanding Environmental Achievement Award
  • Michigan Clean Corporate Citizen Designation

Air Permit Compliance

<table>
<thead>
<tr>
<th>Year</th>
<th>Operating Hours(a)</th>
<th>Compliance %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>691,925</td>
<td>99.8</td>
</tr>
<tr>
<td>2002</td>
<td>708,796</td>
<td>99.9</td>
</tr>
<tr>
<td>2003</td>
<td>706,092</td>
<td>99.9</td>
</tr>
<tr>
<td>2004</td>
<td>717,087</td>
<td>99.9</td>
</tr>
<tr>
<td>2005</td>
<td>750,779</td>
<td>99.7</td>
</tr>
<tr>
<td>2006</td>
<td>779,591</td>
<td>99.9</td>
</tr>
<tr>
<td>2007</td>
<td>779,668</td>
<td>99.9</td>
</tr>
<tr>
<td>2008</td>
<td>848,822</td>
<td>99.9</td>
</tr>
<tr>
<td>2009</td>
<td>889,764</td>
<td>99.9</td>
</tr>
</tbody>
</table>

9-Year Average 763,614 99.9%

(a) Operating hours are for EFW combustion units
Commitment to Health & Safety

- Safety is a core value and protects the firm’s most valuable resource—our employees
  - 2010 TCIR is 51 per cent better than industry average
  - 2010 DART is 58 per cent better than industry average

- More than 30 Covanta EFW facilities have earned the STAR award, the highest national recognition given as part of OSHA’s VPP

- STEP-UP Program – launched in 2009 to accelerate continuous improvement in safety program
What makes the Durham York Energy Centre special?

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Typical</th>
<th>DY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Energy recovery</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boiler design</td>
<td>Pressure (865 psig)</td>
<td>Pressure (1,300 psig)</td>
</tr>
<tr>
<td></td>
<td>Temperature (830 deg. F)</td>
<td>Temperature (930 deg. F)</td>
</tr>
<tr>
<td>as kwh/tonne</td>
<td>450 to 700</td>
<td>&gt; 700</td>
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<tr>
<td><strong>Air Pollution Control</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOx</td>
<td>SNCR</td>
<td>SNCR + VLN</td>
</tr>
<tr>
<td>Scrubber for gas phase Emissions</td>
<td>Semidry scrubber</td>
<td>Dry recirculation scrubber</td>
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<tr>
<td>Carbon injection</td>
<td>Yes</td>
<td>Yes with recirculation</td>
</tr>
<tr>
<td>Baghouse for gas and solid phase emissions</td>
<td>Standard design with conventional media</td>
<td>New design with advanced media and cleaning system</td>
</tr>
<tr>
<td><strong>Ash and Metals Management</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metals recovery</td>
<td>Ferrous</td>
<td>Ferrous and nonferrous</td>
</tr>
<tr>
<td>Ash</td>
<td>Combined ash with conditioning</td>
<td>Dedicated pozzolan + cement process for flyash</td>
</tr>
<tr>
<td><strong>Monitoring</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuous emission monitoring</td>
<td>SO2, NOx, CO</td>
<td>SO2, NOx, CO, HCl, HF</td>
</tr>
<tr>
<td>Dioxin sampling</td>
<td>---</td>
<td>Yes</td>
</tr>
<tr>
<td>Ambient monitoring</td>
<td>---</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Waste Delivery

Craig Bartlett, Manager, Waste Operations
Region of Durham
Integrated Waste Management System

Due Diligence Mechanisms:

• Curbside collection services

• Transfer stations & waste management facilities

• Special waste events

• By-laws / enforcement
Types of Waste and Service Area

EA Condition 21

The Region will be required to ensure that all incoming waste is inspected prior to being accepted at the site to ensure that only non-hazardous municipal solid waste is being accepted.

• non-hazardous municipal solid waste
• unacceptable waste
Points of Waste Inspection / Due Diligence

- Public awareness and education
- By-law and Compliance Inspectors
- Collection truck
- Transfer station gate and tipping floor staff inspection
- EFW gate inspection
- EFW tipping floor staff inspection
- EFW waste pit crane operator
- Annual waste audits
Pre-screening and Sorting - How is non-compliant waste managed?

EA Condition 21.4

If any materials other than non-hazardous municipal solid waste are found during inspection or operation, the proponent shall ensure that management and disposal of the material is consistent with ministry guidelines and legislation.
Architectural

Peter McMillan, McMillan Associates Architects
Architect, Principal
MArch OAA ARQ NSAA MAA assoc. AIA MRAIC
DESIGN CONCEPT

1. ELEMENTS of the PLAN
   • organization
   • operation

2. CONCEPT
   • views

3. ENHANCEMENTS

4. DESIGN STATUS

5. NEXT STEPS

DURHAM/YORK REGION EFW FACILITY IN CLARINGTON

March 25 2011
1. **ELEMENTS of the PLAN**
   - organization
   - operation

2. CONCEPT
   - views

3. ENHANCEMENTS

4. DESIGN STATUS

5. NEXT STEPS
1. PARKING
2. VISITORS CENTRE
3. SCALEHOUSE
4. TIP FLOOR
5. REFUSE BUILDING
6. BOILER BUILDING
7. BAG HOUSE
8. TURBINE BUILDING
9. AIR COOLED CONDENSER
10. SWITCHYARD
11. RESIDUE STORAGE
1. ELEMENTS of the PLAN
   • organization
   • operation

2. CONCEPT
   • views

3. ENHANCEMENTS

4. DESIGN STATUS

5. NEXT STEPS
ENERGY from WASTE

Preliminary Concept ZR1

COVANTA ENERGY

NORTH EAST VIEW

CONCEPT ZR1
PRELIMINARY

ENERGY from WASTE

Stack

NORTH WEST VIEW

MAGENTA LIGHT

COVANTA ENERGY
PRELIMINARY
ENERGY from WASTE

PRELIMINARY

Durham York Energy Centre

North West View Concept ZR1

Night shot
ENERGY from WASTE

PRELIMINARY

ENERGY from WASTE

VISITORS CENTRE CONCEPT ZR1
ENERGY from WASTE

PRELIMINARY

COVANTA ENERGY

VISITORS CENTRE
CONCEPT ZR1
PRELIMINARY

ENERGY from WASTE

VISITORS CENTRE

CONCEPT ZR1

night shot

ENRGY from WASTE

VISITORS CENTRE

CONCEPT ZR1

night shot
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   • views

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4. DESIGN STATUS

5. NEXT STEPS
DESIGN ENHANCEMENTS

1. VISITORS EXPERIENCE
   • Visitors centre
   • Bridge
   • Parking forecourt

2. MASSING, CLADDING
   • Roof profile
   • Materials – metal, stone, brick
   • Windows

3. SITE ENHANCEMENTS
   • Planting
   • Lighting
   • Surface
   • Water feature

4. STACK
   • Form
   • Finish
   • Lighting
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   • Form
   • Finish, Lighting
PRELIMINARY ENERGY from WASTE

Stack

SOUTH VIEW

LADDER LIGHT Stack

COVANTA ENERGY
PRELIMINARY

ENERGY from WASTE

SOUTH VIEW

MAGENTA LIGHT Stack
1. **ELEMENTS of the PLAN**
   - organization
   - operation

2. **CONCEPT**
   - views

3. **ENHANCEMENTS**

4. **DESIGN STATUS**
   - Concept established
   - Township of Clarington engaged
   - Site plan approval design activities underway
     - Detailed site planning
     - Landscape design
     - Site servicing design
     - Code analyses

5. **NEXT STEPS**
1. **ELEMENTS of the PLAN**
   - organization
   - operation

2. **CONCEPT**
   - views

3. **ENHANCEMENTS**

4. **DESIGN STATUS**

5. **NEXT STEPS**

- SITE PLAN AGREEMENT
- DETAIL DESIGN @FNTP
- DETAILED PROJECT SCHEDULE – DESIGN & CONSTRUCTION
Questions?
Break for lunch
Session three: Implementation

**Gioseph Anello**, BASc., BA, MEng., P.Eng., PMP
Manager of Waste Planning and Technical Services

**Anthony Ciccone**, PhD, P.Eng.
Principal Air Quality and Noise
Environmental Assessment
Conditions of Approval

Gioseph Anello, BASc, BA, MEng., P.Eng., PMP
Manager of Waste Planning and Technical Services
Management & Monitoring Plans

• Ambient Air Monitoring: three years

• Emissions: Contractual
  – Stack testing: qualified independent and impartial testing agent approved by the Owner
  – Continuous Emissions Monitoring
  – Continuous Sampling: Dioxins and Furans

• Groundwater and surface water
Management & Monitoring Plans

• Communications
  – Stakeholders, public, Aboriginal communities
  – Energy From Waste Advisory Committee (EFWAC) and Integrated Waste Management Committee (IWMC)

• Noise
  – Acoustic Assessment Report

• Odour
  – Facility under Negative Pressure
  – Odour samples: Onondoga

• Emergency Response

• Complaints
Waste Diversion

• Plan and monitor progress towards 70 per cent

• Flow Control
  – Only non-hazardous municipal solid waste
  – Waste from Durham and York
  – Inspections: various levels

• Maximum 140,000 tonnes per year
EFW Operation and Performance

- Daily Site Inspections
  - Covanta and Regions

- Third Party Audits
  - HDR: design, construction and commissioning
  - Operations: independent Professional Engineer

- Daily Record Keeping
  - On-site logs
Administrative Requirements

- Reporting on compliance, plans and monitoring
- Website management: monitoring results, reports, performance
- Support to committees
- Project management
Certificate of Approval

Applications: Air&Noise Waste and Stormwater

Anthony Ciccone, PhD, P.Eng.
Principal Air Quality and Noise
Certificate of Approval

• A Certificate of Approval is a legal document issued by the Ontario Ministry of Environment that is essentially a license to construct, install and operate equipment that discharge into the environment.

• To obtain a CofA, one must demonstrate that the equipment / plant will not cause adverse impacts to the general population or the environment.

• CofA has privileges as well as obligations that the owner / operator must abide by.

• All CofAs were co-signed by the Regions and Covanta

• Regions are the Owner & Covanta is the Operator
Golder CofA Consulting Team

CofA supporting documentation was prepared by Golder Associates Ltd (www.golder.com)

Dr. Anthony Ciccone, P.Eng.
- Principal – Air Quality / Noise
- 25 yrs experience
- Responsible for the submission package to MOE

Michael Cant, B.A. (Hons)
- Senior Environmental Planner/Associate
- 23 years Waste Management experience

Pamela Russell, P.Eng.
- Senior Waste Engineer/Associate
- 20 years Waste Management experience

Paul Niejadlik, H.B.Sc., MASc (c), CEPIT
- Acoustics, Noise & Vibration Specialist
- 10 years Noise experience

Melanie Kennedy, P.Eng.
- Water Resources Engineer / Hydrologist
- 10 years experience
Environmental Protection Act

• On March 3, 2011, Applications for CofAs were submitted to the MOE; namely
  – Section 27 of the Environmental Protection Act for a Waste Disposal Site;
  – Section 9 of the Environmental Protection Act, for Air and Noise; and,
  – Section 53 of the Ontario Water Resources Act for stormwater.

• Supporting documents were based on design specification of Covanta
CofA Application - Waste

• Durham/York employ waste screening procedures so appropriate residual waste is sent to the facility

• Non-hazardous solid waste from the following sources:
  – Municipal Solid Waste (MSW) from residential sources within Durham and York Regions remaining, following at-source diversion.
  – A portion of post diversion Industrial, Commercial and Institutional (IC&I) waste traditionally managed by the respective Region at Regional waste management facilities.
  – No international waste materials generated from marinas or airports.

• Annual Throughput - 140,000 tonnes/year
CofA Application - Waste

• Residuals/Ash
  – bottom ash
  – conditioned fly ash
  – ferrous metals
  – non-ferrous metals

• Storage
  – indoor storage of material (residual, rejects, etc.)

• Transportation
  – 31 waste delivery trucks/day
  – 9 residual disposal trucks/day
CofA Application - Air

- Proponents applying for a Basic Comprehensive CofA under O.Reg 419/05

- Demonstrate compliance with O.Reg 419/05 with the submission of an Emission Summary and Dispersion Modelling (ESDM) report to MOE

- ESDM is a document that presents what emissions are released into the airshed and what their impact is, as compared to MOE Air Quality Standards

- For the Project, various scenarios were assessed including
  - Operating the Facility at 110 per cent of maximum daily throughput
  - Startup Conditions
  - Operating at 110 per cent maximum daily throughput with all ancillary equipment operating including back-up generators and silo filling
  - Potential odour during extended shutdowns

- Demonstrated that the Project will meet all ambient Air Quality Standards
  - Confirmed for cumulative concentrations (e.g. background)
Emission Controls

• NOx Reduction
  – Covanta Very Low NOx (VLN™) system
  – Selective Non-Catalytic Reduction (SNCR)

• Post Combustion Air Pollution Control Systems
  – Dry recirculation scrubber
    • Lime & carbon injection
  – Baghouse (fabric filter)
Emissions Monitoring

- Continuous Monitoring
  - Opacity, NOx, SO₂, HCl, HF, NH₃ & CO
  - Temperature (1 sec resident time at >1000°C)

- Continuous integrated dioxin/furan sampling

- Emission stack testing as prescribed in CofA
  - Appendix 1 of A-7 contaminants (i.e. > 150 contaminants) will be sampled for.
CofA Application - Odour

- Best Management Practice (BMP) included in Application

- Tipping floor under constant negative pressure
  - Does not allow indoor air to escape out.

- Odours from the Project were assessed with measurement data from an operating facility
  - Onondaga, Syracuse, NY

- Modelling assumed the plant had a hypothetical outage

- Odour BMP also an EA Condition
CofA Application - Noise

- Acoustic Assessment Report (AAR) was prepared in support of the CofA based on similar air quality operating conditions
- Noise modelling included operating equipment as well as truck traffic
- Over 50 sources of noise were addressed
- Results demonstrate compliance with day and night-time limits (i.e. 50 dBA/45 dBA)
- In general, noise levels due to the facility will be below 40 dBA
CofA Application - Stormwater

• Zero Process Water Discharge Facility
  – No discharge to Environment or Sanitary Sewer
  – Facility operates at a deficit

• Site will continue to discharge stormwater to CN Rail swale until municipal swale is constructed

• Ponds designed to contain the entire 100-year storm
  – 100 year discharge from ponds will be below the measured capacity of the CN Rail swale

• On-site Wet Ponds - Enhanced Treatment
  – 80 per cent Total Suspended Solids removal
Stormwater Ponds
Monitoring Conditions

• EA and CofA conditions for monitoring include:
  – Ambient Air Monitoring (off-site)
  – Air Emissions Monitoring (at stack)
  – Noise Monitoring (off-site)
  – Odour Management and Mitigation Monitoring (on-site/off-site)
  – Groundwater and Surface Water Monitoring (off-site)
CofA Application

• CofAs submitted to MOE - March 3, 2011
  – MOE Reference Number 9237-8EMLDW
  – Expect comments back in two - three months

• Draft/Final CofA by June 2011

• Announcement will be posted on Environmental Registry (EBR) for information
Questions?
Session four: Health

**Gregory Crooks, M.Eng., P.Eng., Principal & Air Quality Regional Discipline Leader – Canada East**

**Dr. Christopher Ollson, PhD.**
Principal & Practice Leader, Environmental Health Sciences
Stantec Consulting Ltd.

**Dr. Robert Kyle, BSc, MD, MHSc, CCFP, FRCPC, FACPM**
Commissioner and Medical Officer of Health
Durham Region Health Department
Health

Air Quality

Site Specific Human Health and Ecological Risk Assessment

International Review of Best Practices

Peer Review
Air Quality Assessment

Gregory Crooks, M.Eng., P.Eng.,
Principal & Air Quality Regional Discipline Leader
– Canada East
Air Quality Assessment Team - Stantec Consulting Ltd.

Gregory Crooks, M.Eng., P.Eng., Principal & Air Quality Regional Discipline Leader – Canada East

Michael Murphy, PhD, P.Eng., Senior Principal & Atmospheric Environment Service Area Leader

Benjamin Burkholder, B.Sc.
Team Leader

Connie Lim, B.A.Sc.
Air Quality Scientist

Arash Bina, PhD
Air Quality Engineer

www.stantec.com
Air Quality Assessment - Methodology

• The Air Quality Assessment completed as part of the Environmental Assessment included:
  – Development of emissions inventories for point and mobile sources from the facility.
  – Ambient Air Monitoring to assess current concentrations of chemicals in the air in the vicinity of the site.
  – Dispersion and deposition modelling of the facility emissions.
  – Comparison of predicted results to provincial or federal regulatory standards, objectives and guidelines.
Facility Emissions

• Data used to estimate emissions from the facility were taken from three primary data sources:
  – Guarantees provided by Covanta. Guarantees are the maximum emissions level of a particular contaminant allowed to be emitted from the facility.
  – Stack testing of one or more of the vendor’s existing facilities which use similar technologies and are representative of emissions from the proposed facility.
  – Literature data sources for other facilities including U.S. EPA emissions factors and published emissions data from other facilities.

• Emission estimation methods were conservative (i.e. over-estimated actual facility emissions)
Emissions Scenarios

- Construction Emissions
- Operational Scenarios
  - Normal operations (max continuous rating, continuous turn-down, emergency generator testing)
  - Process upsets / startup & shutdowns
- Traffic Cases
  - Baseline, on-site and off-site traffic emissions
- Decommissioning Emissions
Existing Air Quality

- Ambient air monitoring was conducted in the vicinity of the Site to measure the following key indicators of ambient air quality:
  - Criteria Air Contaminants (SO₂, NOₓ, CO, Ozone, and PM₂.₅)
  - Total Suspended Particulate (TSP) matter and metals
  - Polycyclic Aromatic Hydrocarbons (PAHs)
  - Dioxins and furans
Existing Air Quality

• Measured sulphur dioxide, nitrogen dioxide and fine particulate matter (PM$_{2.5}$) were below their air quality criteria (AQC).
• Maximum measured ozone levels were below the hourly and 8-hour average criteria, but exceeded the 24-hour criteria about 6 per cent of the time and the annual criteria.
• Measured dioxins and furans were less than 2 per cent of their AQC.
• All measured polycyclic aromatic hydrocarbons (PAHs) were well below their criteria (highest being acenaphthylene at 0.3 per cent of its AQC).
• All measured metals were well below their respective AQCs. aluminum had the highest measured ambient concentration relative to its air quality criteria at 9 per cent.
Existing Air Quality

Maximum Measured Hourly Average Ambient Concentrations (% of Air Quality Criteria)

Maximum Measured Annual Average Ambient Concentrations (% of Air Quality Criteria)

Maximum Measured 24-Hour Average Ambient Concentrations (% of Air Quality Criteria)
Existing Air Quality

24-Hour Average Ozone

Annual Average Ozone
Existing Air Quality

- Excerpts from the MOE AQ in Ontario 2009 Report
  - Overall, air quality has improved significantly over the years, especially for NO$_2$, CO and SO$_2$ - pollutants emitted by vehicles and industry.
  - Emissions of nitrogen oxides (NOx), CO and SO$_2$ continue to decrease due in part due to initiatives such as the phase-out of coal-fired generating stations, emissions trading regulations (O.Reg. 397/01 and O. Reg. 194/05), and Drive Clean emissions testing.
  - For a second year in a row, the CWS for PM$_{2.5}$ was not exceeded in Ontario
  - Transboundary influences including the U.S. account for approximately half of Ontario’s smog. Emission reductions in Ontario and the U.S. have contributed to decreases in fine particulate matter (PM$_{2.5}$) and peak ozone concentrations.
Air Dispersion Modelling - Study Area

- The Study Area for the air quality dispersion modelling was comprised of a 40 km by 30 km domain. This size domain was chosen to ensure that not only the maximum ground level concentrations due the facility would be assessed, but also lower concentration levels at greater distances from the facility.
Model Prediction Locations

- Dispersion model predictions were made over a grid of 4415 receptors covering the entire Study Area, as well as at 391 sensitive receptors (e.g. hospitals, schools, nearby residences, parks, daycares, etc.)
Dispersion Modelling

- A total of 90 contaminants of potential concern (CoPCs) were evaluated (including criteria air contaminants, dioxins and furans, PAHs, VOCs and metals).
- The US EPA CALPUFF model was used for the dispersion modelling because of its ability to account for dispersion in complex environments such as near lake shores.
- The CALPUFF model accounts for atmospheric processes including building wake effects, changes in terrain, thermal internal boundary layer effects, secondary particulate formation and thermal inversions.
Air Quality Assessment - Overview of Results

• Comparison to Ambient Air Quality Criteria, Objectives, and Standards
  – Emissions from the facility alone and in combination with existing air quality levels were assessed and compared to applicable provincial/federal criteria.
  – During normal operations, emissions from the facility in combination with existing air quality levels are predicted to meet all applicable provincial/federal air quality criteria for all contaminants (continuous operation at guaranteed emission limits).
  – During process upsets (including startup and shut-downs), emissions from the facility, in combination with existing air quality levels, are predicted to meet all applicable provincial/federal air quality criteria for all contaminants.
Air Quality Assessment - Overview of Results

- Emissions from the facility alone are predicted to be well below regulatory air quality criteria.
  - Highest criteria air contaminant (CAC) was hourly NO\textsubscript{2} at 11 per cent of its criteria.
  - Highest predicted metal concentration was 1 per cent of criteria.
  - All PAHs, VOCs, CMAs, dioxin and furans and PCBs were predicted to be < 0.1 per cent of their criteria.
Conclusions

• The air quality assessment was conducted following accepted methodologies to establish existing (baseline) conditions, conservatively estimate emissions and predict the maximum ground-level concentrations and long-term depositions of the CoPCs.

• The air quality assessment demonstrated that the facility would meet the applicable air quality criteria (with consideration given to cumulative environmental effects).

• The air quality assessment was an input to the human health and ecological risk assessment.
Site Specific Human Health and Ecological Risk Assessment

Christopher Ollson, PhD
Principal & Practice Leader, Environmental Health Sciences
Stantec Consulting Ltd.
Jacques Whitford (now Stantec Consulting Ltd.) Risk Assessment Study Team

Dr. Chris Ollson, PhD (Principal)
Dr. Tereza Dan, PhD (Senior Associate)
Ruwan Jayasinghe, M.Sc. (Senior Risk Assessor)
Mathieu Morin, M.Sc. (Risk Assessor)
Ryan Spafford, B.Sc. (Risk Assessor)
Sairin Hayes, P.Eng. (Senior Risk Assessor)
Sarah Henderson, M.Sc. (Risk Assessor)
Independent Peer Reviews of the Risk Assessment

intrinsik

Environmental & Occupational Health+Plus

SENES Consultants Limited

Ontario

Durham Region
Environmental Risk Assessment

Risk Assessment is a tool that can be used for estimating the potential for adverse effects that could arise from the emission of contaminants into the air.
Site Specific vs. Generic Risk Assessment

There are significant differences between the generic and site specific risk assessments:

<table>
<thead>
<tr>
<th>Generic Risk Assessment</th>
<th>Site Specific Risk Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generic Background/Baseline Data</td>
<td>Quantitative Analysis of Existing Conditions in the Assessment Area</td>
</tr>
<tr>
<td>Hypothetical Receptor Locations</td>
<td>Physical Receptor Locations Chosen from Within the Study Area</td>
</tr>
<tr>
<td>Generic EFW Emissions Data</td>
<td>Emissions Data from Comparable Facility Constructed by Preferred Vendor</td>
</tr>
</tbody>
</table>
Risk Assessment Framework

Problem Formulation
Are there Project-related chemicals in the environment that can adversely affect the health of people or ecological receptors? How do these chemicals come into contact with people or wildlife?

Toxicity Assessment
What amount of these chemicals is linked to environmental effects to human or ecological health?

Exposure Assessment
To what degree are people and ecological receptors exposed to these chemicals?

Risk Characterization
When predicted exposure levels are compared to exposure limits, is an increased risk predicted? If so, how do we reduce the identified risks?

Uncertainty Analysis/Validation of Data
Risk Assessment Methodology

• The risk assessment followed an internationally accepted risk assessment framework
  – Collected baseline data from various locations within the Local Assessment Area
  – Selected receptor locations based on public input, land use, location, etc.
  – Compiled a comprehensive list of chemicals of potential concern that may be emitted from the facility
Scenarios Evaluated in the Human Health and Ecological Risk Assessment

- **Baseline Scenarios**
  - Baseline Case
  - Baseline Traffic Case

- **Construction Scenario**
  - Construction Case*

- **Operational Scenarios**
  - Project Alone Case
  - Project Case
  - Process Upset Case
  - Process Upset Project Case
  - Traffic Case
  - Future Case*

- **Decommissioning Scenario**
  - Decommissioning Case*

* These Cases were only evaluated qualitatively
# Chemicals of Potential Concern

<table>
<thead>
<tr>
<th>Criteria Air Contaminants</th>
<th>Chlorinated Polycyclic Aromatics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonia*</td>
<td>Sulphur Dioxide (SO2)*</td>
</tr>
<tr>
<td>Hydrogen Chloride (HCl)*</td>
<td>Total Particulate Matter*</td>
</tr>
<tr>
<td>Hydrogen Fluoride (HF)*</td>
<td>Total PCBs (as Aroclor 1254)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Metals</th>
<th>Chlorinated Monocyclic Aromatics</th>
<th>Polycyclic Aromatic Hydrocarbons</th>
<th>Volatile Organic Compounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antimony</td>
<td>1,2-Dichlorobenzene</td>
<td>Acenaphthylene</td>
<td>Acetaldehyde*</td>
</tr>
<tr>
<td>Arsenic</td>
<td>1,2,4-Trichlorobenzene</td>
<td>Acenaphthene</td>
<td>Benzene*</td>
</tr>
<tr>
<td>Barium</td>
<td>1,2,4,5-Tetrachlorobenzene</td>
<td>Anthracene</td>
<td>Biphenyl*</td>
</tr>
<tr>
<td>Beryllium</td>
<td>2,3,4,6-Tetrachlorophenol*</td>
<td>Benzo(a)anthracene</td>
<td>Bromodichloromethane*</td>
</tr>
<tr>
<td>Boron</td>
<td>2,4,6-Trichlorophenol*</td>
<td>Benzo(a)pyrene</td>
<td>Bromoform</td>
</tr>
<tr>
<td>Cadmium</td>
<td>2,4-Dichlorophenol*</td>
<td>Benzo(e)pyrene</td>
<td>Bromomethane*</td>
</tr>
<tr>
<td>Chromium (Total)</td>
<td>Pentachlorobenzene</td>
<td>Benzo(ah)fluorene</td>
<td>Carbon Tetrachloride</td>
</tr>
<tr>
<td>Chromium (VI)</td>
<td>Hexachlorobenzene</td>
<td>Benzo(b)fluorene</td>
<td>Chloroform</td>
</tr>
<tr>
<td>Cobalt</td>
<td>Pentachlorophenol</td>
<td>Benzo(bk)fluoranthene</td>
<td>Dichlorodifluoromethane*</td>
</tr>
<tr>
<td>Lead</td>
<td></td>
<td>Benzo(g,h,i)perylene</td>
<td>1,1-Dichloroethene*</td>
</tr>
<tr>
<td>Mercury (Inorganic)</td>
<td></td>
<td>Benzo(kl)fluoranthene</td>
<td>Dichloromethane</td>
</tr>
<tr>
<td>Methyl Mercury</td>
<td></td>
<td>Chrysene</td>
<td>Ethylbenzene*</td>
</tr>
<tr>
<td>Nickel</td>
<td></td>
<td>Dibenzo(a,c)anthracene</td>
<td>Ethylene Dibromide*</td>
</tr>
<tr>
<td>Phosphorus</td>
<td></td>
<td>Dibenzo(a,h)anthracene</td>
<td>Formaldehyde*</td>
</tr>
<tr>
<td>Selenium</td>
<td></td>
<td>Fluoranthene</td>
<td>O-Terphenyl</td>
</tr>
<tr>
<td>Silver</td>
<td></td>
<td>Fluorene</td>
<td>Tetrachloroethylene*</td>
</tr>
<tr>
<td>Thallium</td>
<td></td>
<td>Indeno(1,2,3-cd)pyrene</td>
<td>Toluene*</td>
</tr>
<tr>
<td>Tin</td>
<td></td>
<td>1-Methylanthalene*</td>
<td>1,1,1-Trichloroethane*</td>
</tr>
<tr>
<td>Vanadium</td>
<td></td>
<td>2-Methylanthalene*</td>
<td>1,1,2-Trichloroethylene*</td>
</tr>
<tr>
<td>Zinc</td>
<td></td>
<td>Naphthalene*</td>
<td>Trichlorofluoromethane</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Perylene</td>
<td>Vinyl Chloride*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Phenanthrene</td>
<td>m-, p-, and o-xylene*</td>
</tr>
</tbody>
</table>

* Inhalation Only
Results of the Human Health Risk Assessment
HHRA – Exposure Assessment
Human Health Assessments

• The risks to human receptors were evaluated in two ways:
  – **Inhalation Assessment**: The risks associated with inhaled EFW air emissions
    • 309 receptor locations were evaluated for the inhalation assessment  
  – **Multi-Pathway Assessment**: The risks associated with exposure to EFW emissions through dermal contact or ingestion of exposed media
    • Dermal contact with soil, dust  
    • Ingestion of produce, agricultural products, fish and wild game as well as incidental ingestion of surface water while swimming  
    • 132 receptor locations were evaluated
Exposure Pathway used for a Local Resident
Results of the Inhalation Assessment

• Results indicate that no acute (1-hour or 24-hour) or chronic (annual) risk estimates at the maximum ground level concentration exceeded the regulatory benchmark for all Project Scenarios
Results of the Human Health Multi-Pathway Risk Assessment

• The results of the multi-pathway assessment indicate that exposure to facility-related air emissions will result in no adverse health effects to human receptors living or visiting the LRASA.
Results of the Ecological Risk Assessment
Ecological Risk Assessment Methodology

• The ecological risk assessment followed a recognized framework incorporating guidance from various sources including:
  – Ontario Regulation 153/04 Record of Site Condition Regulation, Part XV.1 of the Environmental Protection Act: Guidance Protocol (MOE, 2004)
  – A Framework for Ecological Risk Assessment (General Guidance) (CCME, 1996)
Receivers locations considered in the Ecological Risk Assessment.
Selection of Valued Ecological Components (VECs)

- Selection of VECs included consideration of wildlife species that were:
  - Indigenous to the area
  - Most likely to receive the greatest exposure to contaminant releases due to their habitat and home range
  - Representative of various levels in the food web (e.g. carnivore, herbivore, omnivore)
  - Of cultural or economic significance (e.g. wild game valued for hunting, fish important to the fisheries industry)
Ecological Receptors Considered in this Assessment: Mammals

- Muskrat
- Eastern Cottontail Rabbit
- Masked Shrew
- Meadow Vole
- Mink
- Red Fox
- White-tailed Deer
Ecological Receptors Considered in this Assessment: Birds
Ecological Receptors Considered in this Assessment: Community Receptors

- Freshwater Receptors
- Terrestrial Plants
- Benthic Invertebrates
- Terrestrial Invertebrates
Exposure Pathways

For terrestrial wildlife receptors (i.e. birds, mammals, plants, soil invertebrates), exposure may occur through the following routes:

- Direct contact with soils
- Inhalation
- Ingestion of soil, sediment, and water
- Ingestion of plants or prey species that have accumulated chemicals from the soil, and other media

For freshwater receptors (i.e., fish, benthic invertebrates), exposure may occur through the following routes:

- Ingestion of sediment
- Ingestion of aquatic prey
- Contact with sediment
- Ingestion/contact with surface water
Results of the Ecological Risk Assessment

• No undue risk was predicted for ecological receptor for any of the Project-related scenarios modeled.

• No undue risk was predicted for any Species at Risk that would be found within the area.
Ecological Risk Assessment

Conclusions

- The combination of chemical (Project emissions of COPC) and non-chemical stressors (noise, habitat alteration, water resources), are not expected to have an effect on ecological receptors in the LRASA.
Conclusion

• The site-specific risk assessment determined that the proposed Covanta facility operating at 140,000 tonnes of MSW/year could be safely operated at the Clarington 01 site without undue risk to either people or the environment.

Christopher Ollson, PhD
Principal & Practice Leader, Environmental Health Sciences
Stantec Consulting Ltd.
Study Question

“THAT staff review the best practices of environmental monitoring programs which include environmental surveillance, health surveys, biological monitoring, health studies, and any other pertinent studies as determined through the review and consultation regarding environmental monitoring programs.”

Durham Regional Council
May 28, 2008
Objective of the Study Team

“The consultant’s recommended option for an environmental surveillance program for the proposed Durham/York Residual EFW facility will be based on the fundamental tenant that the program must ensure the protection of public and environmental health.”
The Study Team

Dr. Christopher Ollson, PhD

Dr. Christofer Balram, PhD Med., MD(AM)

Kaitryn Campbell, BAH, BEd, MLIS

Mathieu Morin, M.Env.Sc.

Sarah Henderson, BA(H)

External Independent Peer Review on Behalf of the Medical Officer of Health Dr. Lesbia Smith, MD
Scientific Literature Review Results

4491 Combined Total Citations
- 990 Duplicate Citations Removed
  - 3173 Citations Removed at Tier 1 Screening
    - 139 Articles Removed at Tier 2 Screening
      - 5 Other Articles Abstracted of which 4 Were Included in Study
        - 51 Soil Studies
          - 15 Passed QC; 3 were Baseline articles
        - 40 Vegetation Studies
          - 12 Passed QC; 1 was a Baseline article
        - 50 Ambient Air Studies
          - 19 Passed QC; 4 were Baseline articles
    - 119 Environmental Monitoring Articles Abstracted
      - 2 Other Studies Rain & Snow; Surface Microlayers
        - 0 Passed QC
  - 3501 Citations Title and Abstract Review (Tier 1)
    - 328 Articles Full-Text Review (Tier 2)
      - 189 Articles Data Abstraction
        - 65 Human Biomonitoring Articles Abstracted
          - 5 Other Articles Abstracted
            - 15 Passed QC; 5 were Baseline articles
          - 39 General Population Studies
            - 25 Passed QC
          - 26 Incinerator Worker Studies
            - 11 Passed QC
Recommended
Option 1 – Chemical Emissions
Stack Monitoring and Testing

Option 1a) Compliance with Ontario MOE Guideline A-7

Option 1b) Establishment of More Stringent Stack Chemical Emissions Standards than Provided in MOE Guideline A-7

Option 1c) Inclusion of New Stack Sampling Technology for Dioxins and Furans

That a Site Liaison Committee (SLC) should be charged, in part, with review of any environmental surveillance program being undertaken for the Durham/York EFW facility.
Actual Surveillance Program Being Implemented

- Continuous stack monitoring of a number of chemicals
- Continuous stack sampling of dioxins and furans
- Based on recommendations by the Durham Medical Officer of Health
  - three years of soil testing around the facility
  - three years of ground level air monitoring
Peer Review

Dr. Robert Kyle, BSc, MD, MHSc, CCFP, FRCPC, FACPM
Commissioner and Medical Officer of Health
Durham Region Health Department
Questions?
Session five: Finance and Legal

Jim Clapp
Commissioner of Finance
Durham Region Finance Department

Matthew Gaskell BA, JD
Senior Solicitor, Region of Durham

Adam Chamberlain, B.E.S. (Hons), LLB
Partner, Certified Specialist - Environmental Law
Financial Analysis & Financing Approvals

Jim Clapp
Commissioner of Finance
Durham Region Finance Department
Financial Analysis & Approvals

   • Deloitte & Touche LLP Report; plus, Budget, Tax Impacts & Potential Financing
   • Recommend proceeding to RFP Stage

   • Based on Covanta bid & technology, PPA & HCA

3. Going Forward

• Final recommendation on waste management options - Three key parts:
  1. Assessment of disposal options
  2. Conduct economic analysis of EFW versus its Ontario Landfill Alternative (an opportunity cost analysis)
     - Discounted to 2009 Canadian dollars
     - Sensitivity analysis
     - Full life-cycle costs over 25 years (including sunk cost of land)
  3. Cash flow analysis & evaluation of potential financing & budget and property tax impacts

• Unknowns remained despite ongoing progress on various agreements
  - No vendor or technology had yet been selected by the Regions
  - PPA negotiations were ongoing
  - MOU with York was yet to be finalized
2008 Business Case: Examples of a Conservative Approach

• Tax impacts assumed no new assessment growth
  – While tonnage growth/cost impact is assumed
• No quantification of future benefits from:
  – Energy Park investments, Education Centre, emissions technology, employment
• Conservative assumptions with significant contingency amounts costed
• Revenues not inflated
• York contribution on certain costs could be higher than the business case
2009 Covanta Project Approval Report (Report 2009-COW-03)

• Based on a real Vendor submission
  – Technology and costing
  – Project Agreement includes priced-in securities and guarantees to protect Region
  – Fixed base prices and escalation factors set in a competitive environment

• Power Purchase Agreement secured with 20 years set pricing (revenues) including escalation
  – With power production guarantees by Covanta
Economic Analysis ($ 2009)

At 5% discount rate, concluded Covanta NPV was $251.1m vs. $262.3m for long-term landfill (EFW savings = $11.2m)

2008 Business Case assumed an incremental cost for EFW over landfill of $1.4m at 5% ($251.2m EFW vs. $249.8m other Ontario landfill)
## Project Capital Costs ($ 2009 millions)

<table>
<thead>
<tr>
<th>Description</th>
<th>Project Cost</th>
<th>York</th>
<th>Durham</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covanta Energy Corporation Proposal</td>
<td>$235.8</td>
<td>$50.5</td>
<td>$185.3</td>
</tr>
<tr>
<td>Projected Future Inflationary Capital Costs</td>
<td>6.3</td>
<td>1.3</td>
<td>4.9</td>
</tr>
<tr>
<td>Additional Provision for Anticipated Inflation</td>
<td>1.9</td>
<td>0.4</td>
<td>1.5</td>
</tr>
<tr>
<td>Natural Gas and Hydro One Connections</td>
<td>0.9</td>
<td>0.2</td>
<td>0.7</td>
</tr>
<tr>
<td>Technical Expertise &amp; Project Mgmnt Services</td>
<td>5.6</td>
<td>1.2</td>
<td>4.4</td>
</tr>
<tr>
<td><strong>Sub-total</strong></td>
<td><strong>$250.4</strong></td>
<td><strong>$53.6</strong></td>
<td><strong>$196.8</strong></td>
</tr>
<tr>
<td><strong>HCA / Site Servicing Costs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Architectural Enhancements</td>
<td>9.0</td>
<td>1.9</td>
<td>7.1</td>
</tr>
<tr>
<td>Energy Park Drive</td>
<td>6.2</td>
<td>1.7</td>
<td>4.5</td>
</tr>
<tr>
<td>EFW Access Road</td>
<td>1.0</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Waterfront Trail</td>
<td>0.1</td>
<td>0.0</td>
<td>0.1</td>
</tr>
<tr>
<td>Property Acquisition</td>
<td>5.7</td>
<td>-</td>
<td>5.7</td>
</tr>
<tr>
<td><strong>Sub-total</strong></td>
<td><strong>$22.1</strong></td>
<td><strong>$4.2</strong></td>
<td><strong>$17.9</strong></td>
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<tr>
<td><strong>TOTAL PROJECT &amp; SITE COSTS</strong></td>
<td><strong>$272.5</strong></td>
<td><strong>$57.8</strong></td>
<td><strong>$214.7</strong></td>
</tr>
</tbody>
</table>

### Financing - Durham Region Share

<table>
<thead>
<tr>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal Gas Tax Upfront</td>
<td>100.0</td>
</tr>
<tr>
<td>Other (Surplus Land Sale to MTO)</td>
<td>1.6</td>
</tr>
<tr>
<td>Internal Debenture (Financing from Federal Gas Tax)</td>
<td>113.1</td>
</tr>
<tr>
<td><strong>TOTAL DURHAM SHARE FINANCING</strong></td>
<td><strong>$214.7</strong></td>
</tr>
</tbody>
</table>

*Totals may not add due to rounding*
Covanta Operating Costs ($2009m)

<table>
<thead>
<tr>
<th>NET OPERATING COST SUMMARY</th>
<th>Covanta $2009m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Annual Operating Fee</td>
<td>14.70</td>
</tr>
<tr>
<td>Less: Total Annual Revenues</td>
<td></td>
</tr>
<tr>
<td>Electricity</td>
<td>(8.60)</td>
</tr>
<tr>
<td>Materials Recovery</td>
<td>(0.60)</td>
</tr>
<tr>
<td>Total Net Facility Operation Costs Shared with York</td>
<td>5.50</td>
</tr>
</tbody>
</table>

| DURHAM SHARE | 4.30 |

<table>
<thead>
<tr>
<th>OTHER ANNUAL PROJECT COSTS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Durham only Waste Haulage to EFW (100% Durham)</td>
<td>1.35</td>
</tr>
<tr>
<td>HHW Depot (100% Durham)</td>
<td>0.19</td>
</tr>
<tr>
<td>Site Liaison Committee (78.6% Durham)</td>
<td>0.02</td>
</tr>
<tr>
<td>Ambient Air Monitoring (78.6% Durham)</td>
<td>0.25</td>
</tr>
<tr>
<td><strong>Total Other Operating Costs</strong></td>
<td><strong>1.81</strong></td>
</tr>
</tbody>
</table>

| DURHAM SHARE OF TOTAL OPERATING COSTS | 6.11 |
Other Economic & Financial Considerations

- EFW option:
  - Provides a long-term local solution
  - An operating agreement with maintenance provisions
  - Operations potential beyond 25 years
  - 1,000 direct and indirect jobs during construction plus 33 skilled jobs for operations
  - Significant reduction to exposure on rising fuel costs & volatility
  - Capital investment offset by Federal Gas Tax revenues
  - Regions retain ownership management and control

- Other Ontario landfill:
  - Is exposed to capacity constraints and future shortage or price risk
  - A future of repeated short-term solutions (service & cost risk)
  - Transportation intensive with significantly greater exposure to diesel volatility and rising price
Other Considerations: Fuel Price Exposure

Ontario Diesel Fuel Price Index
Statistics Canada

(2002=100)
Financing & Budgets

• The Economic Analysis:
  – Brought the cash streams to a single point in time (apples-to-apples comparison)
  – Demonstrated that EFW is the best available waste disposal option from a long-term cost/risk perspective
    • Used conservative assumptions
    • Excluded consideration how the facility would be financed

• A Cash Flow Basis:
  – Cost streams are very different:
    – EFW has up-front capital – landfill does not
## Budget & Tax Impacts Including Approved Financing

<table>
<thead>
<tr>
<th>Year</th>
<th>Landfill</th>
<th>Covanta</th>
<th>Annual Variance</th>
<th>Cumulative Variance</th>
<th>Tax Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>13.9</td>
<td>19.4</td>
<td>(5.5)</td>
<td>(5.5)</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>14.2</td>
<td>12.2</td>
<td>2.0</td>
<td>(3.5)</td>
<td>0.04%</td>
</tr>
<tr>
<td>2015</td>
<td>14.5</td>
<td>10.6</td>
<td>3.9</td>
<td>0.4</td>
<td>-1.50%</td>
</tr>
<tr>
<td>2016</td>
<td>14.7</td>
<td>8.9</td>
<td>5.8</td>
<td>6.2</td>
<td>0.04%</td>
</tr>
<tr>
<td>2017</td>
<td>15.0</td>
<td>7.3</td>
<td>7.7</td>
<td>13.9</td>
<td>-0.36%</td>
</tr>
<tr>
<td>2018</td>
<td>15.3</td>
<td>6.6</td>
<td>8.7</td>
<td>22.6</td>
<td>0.04%</td>
</tr>
<tr>
<td>2019</td>
<td>15.5</td>
<td>5.9</td>
<td>9.6</td>
<td>32.2</td>
<td>0.07%</td>
</tr>
<tr>
<td>2020</td>
<td>15.8</td>
<td>6.1</td>
<td>9.7</td>
<td>41.9</td>
<td>-0.15%</td>
</tr>
<tr>
<td>2021 - 2025</td>
<td>89.8</td>
<td>37.4</td>
<td>52.4</td>
<td>94.3</td>
<td>0.07%</td>
</tr>
<tr>
<td>2026 - 2030</td>
<td>110.0</td>
<td>48.1</td>
<td>61.9</td>
<td>156.2</td>
<td>0.07%</td>
</tr>
<tr>
<td>2031 - 2035</td>
<td>134.5</td>
<td>55.8</td>
<td>78.7</td>
<td>234.9</td>
<td>0.07%</td>
</tr>
<tr>
<td>2036 - 2037</td>
<td>62.0</td>
<td>26.1</td>
<td>35.9</td>
<td>270.8</td>
<td>0.04%</td>
</tr>
</tbody>
</table>

### Estimated Annual Disposal Budget

### Tax Impact
Est. Annual Cash Flows (including approved financing)

- **Landfill**
- **May 2008 Business Case**
- **Anticipated Cost of Covanta Proposal**

$ Millions

Year: 2013 to 2037
Total Debt Forecast ($m) – EFW Debt Retired in 8 Years
Total Debt Payments Forecast ($m)

EFW Debt Payments over 8 Years

Forecast


All Other  EFW
Business Case: Conclusions

Durham can control its own destiny relative to the disposal of garbage:

– Landfill option means Durham faces the same disposal issue every 5-10 years (increased cost and service risk)

– EFW asset provides 25+ year solution to deal with residual waste
Going Forward

- Certificate of Approval process
- Will come back to Council as required
Questions?
Legal

Covanta Contract
Host Community Agreement
Durham/York Memorandum of Understanding/
Proposed Co-owners’ Agreement
Power Purchase Agreement

Matthew Gaskell BA, JD
Senior Solicitor, Region of Durham
EFW Project Agreements

1. Durham/Clarington Host Community Agreement (HCA) – 2010
3. Durham/York/OPA Power Purchase Agreement (PPA)
5. Durham/York Draft Co-Owners’ Agreement
1. Durham/Clarington Host Community Agreement (HCA)
Durham/Clarington Host Community Agreement (HCA) Summary

• General Provisions
  – lifespan of Facility
  – facility to 400,000 tonne/year capacity

• Commitments through HCA
  – Durham
  – Clarington
HCA Summary
Durham Commitments

• Support EFW Site Liaison Committee
• Ensure EFW will utilize:
  • state of the art emission control technologies
  • monitoring systems (24/7) for parameters determined by MOE
  • monitoring ambient air in immediate vicinity of EFW
• Consultation/consent with Clarington on:
  • on terms of Reference for new SLC
  • prior to construct transfer station for ICI waste
  • site plan approval for Facility
  • construct Energy Drive through EFW lands
• Incorporate a cash allowance ($9 million) for architectural improvements in the RFP
HCA Summary
Durham Commitments (con’t)

- Storm Water Management Facility
- EA for municipal services for Bowmanville Science Park
- Waterfront Trail construction
- Private truck access lane adjacent to CN railway
  - Facility Operator to:
    - comply with ISO 14001 (within 36 months of operation commencement)
    - implement an emergency management plan
    - provide Clarington with annual emissions report
HCA Summary

Durham Commitments (con’t)

- Waste received be consistent with EA Terms of Reference
- Screening for ICI waste
- Implement an aggressive residual waste diversion and recycling program to achieve 70 per cent diversion
- Establish a hazardous waste depot within Clarington
- Biosolids from Regional WPCP be limited to emergency basis and maximum of 10 per cent total annual tonnage
- Royalty payment of $10.00 per tonne of waste received from City of Toronto
HCA Summary
Durham Commitments (con’t)

• Bottom fly ash: stored internally, not to be disposed of in Clarington
• Guarantee a PILS payment no less than $650,000 per year
• Expropriate adjacent properties and convey part deemed surplus to Durham's requirements to Clarington
• Decommission and dismantle EFW Facility within five-years of the end of operations
HCA Summary

Clarington’s Commitments

• Municipality of Clarington agrees to:
  – be a willing host for the Facility
  – not oppose development or operation of the Facility
  – acknowledge the “public use” exemption of the Facility from compliance with the Clarington Official Plan and zoning by-law
  – expedite the review of all applications for approval
  – close and convey the existing south service road to Durham if it becomes surplus due to the construction of Energy Drive
  – promote the development of the Energy Park and
  – promote the usage of district heat and cooling provided from the Facility
2. Durham/York/Covanta Project Agreement (PA)
Durham York Covanta Project Agreement

Project Agreement

- Early Works
- Design/Build
- Operations
- Appendices
Durham York Covanta
Project Agreement

The Project Agreement (PA) consists of four components:

Part 1 - The Early Works Agreement

Part 2 - The Design Build Phase:
  • Articles 2 – 29 deal with the design and construction of the Facility and payment for same

Part 3 - The Operations Phase:
  • Articles 30 – 45, deals with the operations phase of the Facility

Part 4 - The Appendices:
  • technical and commercial requirements, conditions and guarantees that are applicable both during the construction of the Facility and its operation
Durham York Covanta Project Agreement (con’t)

• Part 1 – Early Works Agreement
  Designed as an interim contract:
  • Intended to provide the technology specific information necessary to complete the EA
  • To allow the project to proceed in advance of execution of the main Project Agreement

Scope of Work:
  • Preparation of Architectural design
  • Obtaining regulatory and municipal approvals
  • Supporting EA application process
  • Participating in public meetings
Specifically identified approvals which are the responsibility of Covanta:

- Site plan approval
- Certificates of Approval
- Approvals for electrical connections
- Conservation authority approvals
Durham York Covanta Project Agreement (con’t)

- Parts 2 and 3 of PA address the following areas:
  - Covanta commitments
    - (Articles 3,6-12,17,19,20,22-24,29-36,38,39,42-44)
  - Regional obligations
    - (Articles 2,3,5,6,14,24,31,32,37,38,40,41,44)
  - Regional oversight
    - (Articles 4,6,21,22,31,33,35-37,39)
  - Environmental compliance
    - (Articles 10,17,33-35,39,42)
  - Regional Remedies
    - (Articles 14,18,20,24-28,42)
  - Financial Matters
    - (Articles 5,13-16,18,20,27,32,37,41,44)
Durham York Covanta Project Agreement (con’t)

• Part 2 - Design-Build Phase
  Article 1 - Interpretation
  • definitions/terms through PA that apply to design build and operations phase of project

Article 2 – Regions’ Obligations
  • outlines variety of Regional rights, responsibilities and obligations during the design-build phase of the Project Agreement, including:
    – payment to Covanta when required under the PA
    – appointment of representatives for project management
    – granting Covanta access to the Facility lands
    – ensuring the provision of utilities to the Facility lands, and providing waste for testing purposes
Durham York Covanta Project Agreement (con’t)

• **Part 2 - Design-Build Phase (con’t)**
  
  **Article 3 – Approvals and Consents**
  
  - Sets out the principles to be applied throughout the Project Agreement when approvals or consents are sought by one party from the other

  **Article 4 – Examinations and Notices of Non-conformance**
  
  - Region entitled to conduct Examinations and issue Non-Conformance Notices in event of identified non-conformity

  **Article 5 – Performance of the Work**
  
  - Region to issue Notice to Proceed to Covanta upon satisfaction or waiver of conditions precedent are met
  - Issuance of Notice to Proceed triggers commencement of the project schedule for construction
Durham York Covanta Project Agreement (con’t)

• Part 2 - Design-Build Phase (con’t)

Article 6 – Scope (Design and Build Components)

• Covanta to meet the design requirements to meet Contract Documents, Guarantees, Laws and Regulations

• Region to review and comment within 20 business days on Covanta’s Project Plans at 25%, 75% and 100% completion

• Covanta to perform the Build Component of the Work (procurement, construction, training, commissioning, facility performance testing and the finishing work)

• Region to issue Acceptance Test Certificate upon successful completion of the Acceptance Test Work
Durham York Covanta Project Agreement (con’t)

- **Part 2 - Design-Build Phase (con’t)**
  
  **Article 7 - Scheduling**
  
  - Covanta to perform all Work according to the construction project schedule

**Article 8 – Quality Management**

- Covanta to implement the quality management measures applicable to the Work

**Article 9 – Occupational Health and Safety**

- Implement a health and safety plan, and
- Assume designation of “constructor” under the *Occupational Health and Safety Act*
Part 2 - Design-Build Phase (con’t)

Article 10 – Environmental Compliance
- Ensure that the Facility fully complies with the Certificate of Approval with all applicable environmental laws during the construction, and
- Implement an environmental management plan

Article 11 – Other DBO Obligations
- A variety of miscellaneous duties and obligations in relation to the performance of the design build work

Article 12 – Material Subcontracts
- Requirement to utilize only the pre-approved material subcontractors
- Subcontractors contracts to adhere to the terms of the Project Agreement
Durham York Covanta Project Agreement (con’t)

• Part 2 - Design-Build Phase (con’t)

  Article 13 – Lump Sum Price
  • Establishes lump sum price for the design and construction of the Facility
  • Sets forth the manner in which that price shall be escalated during the term of the Project Agreement

  Article 14 – Payment of Lump Sum Price
  • Requirement for the Region to pay the lump sum price to Covanta upon attainment of certain milestones

  Article 15 – Changes
  • Change order/change request process that addresses changes in scope throughout design build/operations phases

  Article 16 – Delays and Force Majeure
  • Impacts on project schedule due to force majeure events
Durham York Covanta Project Agreement (con’t)

Part 2 - Design-Build Phase (con’t)

Article 17 – Guarantees

Guarantees related to the construction of the Facility, include:

- Design and workmanship
- Quality of the equipment and other products used in the construction of the Facility
- Adhering to the performance guarantees in Appendix 19 (both the Design-Build Work and the Operations Work)
- Meet the Acceptance Test Criteria in Appendix 10
- Operate in accordance with the Performance Requirements in Article 42 and Appendix 19

Article 18 – Liquidated Damages

Provides for liquidated damages imposed in connection with various types of contractual breach, including:

- Schedule
- Performance – throughput/electrical production/residue
Durham York Covanta
Project Agreement (con’t)

• Part 2 - Design-Build Phase (con’t)

Article 19 - Insurance
• Obtain and maintain the insurance described in Appendix 20

Article 20 - Security
• Covanta’s security provided to Regions:
  – performance bond valued at 50% of the lump sum price
  – a labour and material bond valued at 50% of the lump sum price
    subsequent to the completion of the design build phase, a performance
    holdback of 5%
  – a renewable performance bond during operations of 100% of the total
    annual operating fee for one year
  – operations performance security equal to one quarter of the total
    annual operations fee
  – parent company guarantee of 50 % of the lump sum price for design-
    build issues and 30% for operations issues
  – handback security to secure the completion of any handback works

• Covanta’s security provided to Regions:
Durham York Covanta Project Agreement (con’t)

• Part 2 - Design-Build Phase (con’t)
  Article 21 – Tests, Procedures, Studies and Investigations
  • Describes tests and procedures that Covanta are required and/or may be requested to conduct
  • The right of the Region to receive copies of those test results
  • Provides for the Region’s right to perform testing including the right to install monitoring devices

Article 22 – Reports
  • Identifies various reports and information that Covanta must provide the Regions during the design-build phase
  • Establishes the Region’s right to inspect data, contract documents and the Facility

Article 23 – Construction Liens
  • Covanta’s obliged to remove any construction liens registered against the Facility
Durham York Covanta Project Agreement (con’t)

• Part 2 - Design-Build Phase (con’t)

   Article 24 – Indemnification, Limits of Liability
   • Identifies the obligations of the parties related to indemnification

   Article 25 – Termination for convenience
   • The Region may suspend or terminate the PA, without a default by Covanta on certain terms and at certain times
   • No termination for convenience during first ten years of operations other than for project abandonment

   Article 26 – Default and Remedies
   • Identifies various events which can be construed a default subject to a cure period
   • Identifies various remedies of the Regions in the event of a default by Covanta
   • Emergency situations entitle Regions to take actions or suspend the progress of the Work
   • Right to terminate in event liquidated damages cap reached
   • Default by Regions addressed including Covanta remedies
Part 2 - Design-Build Phase (con’t)

Article 27 – Termination Payments

The compensation that will be owing by the Regions in the event the PA is terminated for convenience.

For terminations for convenience related to project abandonment, compensation equal to the aggregate of:

- the value of work performed to date
- the reasonable costs of cancelling its contracts, including employment agreements, and
- demobilization costs
- for terminations for convenience after the tenth anniversary of service commencement, for reasons other than project abandonment, add a termination fee equal to a fraction of the total annual operations fee based upon the number of years remaining in the operations term.
Durham York Covanta
Project Agreement (con’t)

• Part 2 - Design-Build Phase (con’t)

Article 28 – Dispute Resolution

• Dispute resolution process:
  – Negotiation, Mediation followed by Arbitration
  – Expedited dispute resolution for matters under $250,000

Article 29 – Certain Rep’s and Warranties

• A variety of representations and warranties by Covanta regarding its knowledge concerning the matters addressed in the Project Agreement
Durham York Covanta Project Agreement (con’t)

• Part 3 - Operations Phase

Article 30 – Scope and Term of Operations

• Operate, maintain and repair Facility
• Term 20-years plus two 5-year renewal terms
Durham York Covanta Project Agreement (con’t)

• Part 3 - Operations Phase (con’t)

Article 31 – Management of the Facility

• Various commitments regarding the operation of the Facility including:
  – Operate Facility in safe, efficient, reliable manner in accordance with terms of Project Agreement, all Laws and Regulations and Certificate of Approval
  – Maintain sufficient supplies of equipment, fuels and chemicals and spare parts
  – Maintain security over and condition of Facility and Facility Lands
  – provide access to Regions and any Government authority for testing purposes
Part 3 - Operations Phase (con’t)

Article 32 – Supply of Waste

- Regions to be sole source of waste to the Facility
- Covanta paid for 140,000 tonnes of waste per year
- Failure to deliver 90% of guaranteed throughput will relieve Covanta of its electricity production guarantees
- Covanta not to be subject to performance liquidated damages in any year where average higher heating value falls outside range of 11 to 15 Mj/kg.
- Covanta and Regions to coordinate on waste flow deliveries based upon storage pit capacity
Durham York Covanta Project Agreement (con’t)

• Part 3 - Operations Phase (con’t)
  Article 33 – Operating Requirements
  • Operating hours – 24/7, waste received from 7:00 to 7:00 Monday to Friday
  • Provide safe and efficient traffic flow on site
  • Waste screening protocols
  • Recovery of ferrous and non-ferrous metals from the bottom ash
  • Management of fly ash in a manner that precludes fugitive emissions and escape of dust. All residue stored in enclosed structure
  • Facility shutdowns planned in advance with a view to being scheduled during low waste periods
  • Operate in compliance with all applicable Environmental laws
  • Regions permitted to conduct continuous emission monitoring equipment calibration audits and stack tests
Durham York Covanta Project Agreement (cont’d)

- **Part 3 - Operations Phase (cont’d)**

  Article 34 – Residue Disposal
  
  - Sale of recovered metals by Covanta and sharing of net revenue with Regions (85% Regions/15% Covanta)
  
  - Disposal of bottom and fly ash in manner so as to minimize fugitive dust
  
  - Covanta responsible for disposal of bottom and fly ash and by-pass waste
Durham York Covanta Project Agreement (con’t)

• Part 3 - Operations Phase (con’t)

Article 35 – Testing Requirements

• Covanta to arrange independent and impartial testing agent to conduct stack emissions testing and bottom ash testing
• Covanta to conduct waste discharge samples
• Regions permitted to perform periodic testing
Durham York Covanta Project Agreement (con’t)

• **Part 3 - Operations Phase (con’t)**

  Article 36 – Reporting Requirements
  
  • Reporting requirements:
    – Any interruption of normal operations
    – Monthly operating report
    – Year–end report
    – Daily reports from the SCADA system on hourly averages for parameters defined in Certificate of Approval
    – CEMS with remote computer connection for owner
    – Electronic display board with real-time emissions data and accessible web site to public
    – Outage reports
  
  • Service and Maintenance Plans (Annual, Five Year and Life Cycle)

  • Regions entitled to request additional operations data and information
Durham York Covanta Project Agreement (con’t)

• Part 3 - Operations Phase (con’t)

Article 37 – Fees

• Deals with the calculation and payment of operations fees to Covanta
  – Operating fee during start-up and shakedown period is 50%
  – Payment for Throughput in excess of 140,000 tonnes /yr. (*
    (* Note this provision is not applicable given terms of EA.)
  – Adjustments to components of Operating fee for escalation:
    » Three different factors (80%, 100% and no Adjustment)

• Revenue sharing
  – Recovery of recyclable metals (85% / 25%)
  – Beneficial reuse of residue (10% / 90%)
Durham York Covanta Project Agreement (con’t)

- Part 3 - Operations Phase (con’t)

Article 37 – Fees (con’t)

- Environmental Performance Adjustment
  - Positive or negative adjustment to operations fee of plus or minus 2% based upon environmental performance

- Service Level Adjustment
  - Positive or negative adjustment to operations fee of plus or minus 1% based upon service level performance of Facility

- Steam Generation Adjustment
  - Potential positive adjustment to operations fee as a result of exceeding electrical production guarantees in amount equivalent to 50% of additional electrical revenue generated
Durham York Covanta Project Agreement (con’t)

- **Part 3 - Operations Phase** (con’t)
  
  **Article 38 – Invoicing and Payments**
  
  - Provides detailed direction on invoicing and payments between Regions and Covanta

  **Article 39 – Records and Inspection**
  
  - Establishes data and record-keeping obligations during the operations phase of the Project Agreement
  - Commitment to permit Facility accessibility for inspections by the MOE and the Regions
  - Regions right to audit

  **Article 40 – Changes to the Operations Work**
  
  - Addressed through the change process in Article 15
Durham York Covanta Project Agreement (con’t)

• **Part 3 - Operations Phase** (con’t)
  
  Article 41 – Capital Improvements
  
  • Process for implementation of any capital improvements
  • Addresses process in the event Regions request >7.4MW thermal from Facility

  Article 42 – Operational Performance Req’ts
  
  • Various operational requirements
  • Covenants pertaining to operating in compliance with all laws and regulations
  • Notification and indemnification req’t in event of breach
Durham York Covanta Project Agreement (con’t)

• Part 3 - Operations Phase (con’t)
  Article 43 – Representations and Warranties
  • Representations and warranties re payment for labour materials and services

Article 44 – Handback requirements
  • Facility to be in a condition consistent with having been constructed and maintained in accordance with PA and all Laws and regulations
  • Handback Survey 3 years prior to end of term. Handback security posted to secure completion of handback works.
Durham York Covanta Project Agreement (con’t)

• Part 3 - Operations Phase (con’t)
  Article 45 – General
  • Miscellaneous legal provisions
Durham York Covanta Project Agreement (con’t)

• Part 4 -The Appendices
  – The Appendices address a variety of technical, construction, pricing and procurement issues
  – A brief description of each Appendix is contained within the “Cole’s Notes” for the PA
3. Durham/York/OPA Power Purchase Agreement (PPA)
Power Purchase Agreement: Overview of Terms

• Proposed Agreement between the Region of Durham and the Region of York, as the “Suppliers”, and the Ontario Power Authority as the “Buyer”
• Proposed Term: 20 Years, subject to early termination provisions
• Certain minor terms still being negotiated
• Pre-Condition: Regulation exempting the EFW Facility from Section 144 of the *Electricity Act, 1998*
Power Purchase Agreement: Overview of Terms (con’t)

1. Location of EFW Facility to be as identified in the Environmental Assessment (Clarington)
2. Regions solely responsible for the design and construction of the EFW Facility
3. Regions to own EFW Facility
4. Regions to construct and operate the EFW Facility using “Good Engineering and Operating Practices”
5. EFW Facility to meet Independent Electricity System Operator (IESO) requirements
Power Purchase Agreement: Overview of Terms (con’t)

6. Permits the generation and sale of 20 MW using fuel as set-out in the Environmental Assessment
7. EFW Facility to comply with all applicable laws
8. Fuel must be at least 90% municipal waste or other refuse derived waste annually
9. Natural gas may be used to start-up or shut-down the EFW Facility
10. Consent of the OPA required to change generating capacity from 20 MW to the fully developed 45 MW capacity
Power Purchase Agreement: Overview of Terms (con’t)

11. No change to generating component of the EFW Facility without OPA’s consent
12. No change to balance of the EFW Facility without notifying and consulting with the OPA
13. Regions to be solely responsible for the required connection agreement with distributor(s)
14. Regions to achieve commercial operation within five-years of Agreement
15. Penalty of $65 per MW multiplied by the rated generating capacity
16. Maximum penalty $47,450 per MW
17. Regions to obtain and maintain prudent levels of insurance
18. Regions to require haulers to have appropriate insurance
19. Regions to indemnify and hold OPA and the Province harmless with respect to any environmental incidents, the generation, sale and delivery of electricity, environmental attributes, and related matters, except where caused by the negligence of wilful conduct of OPA or the Province
Power Purchase Agreement: Overview of Terms (con’t)

20. Regions to qualify for and register all environmental attributes related to electricity generation

21. Regions own attributes attributable to the EFW Facility under the OETP as of Dec.19, 2008

22. OPA will own all other attributes attributable to the electricity generation

23. Regions agree not to participate in any other voluntary programs with respect to environmental attributes without the consent of OPA
Power Purchase Agreement: Overview of Terms (con’t)

24. If the Governments of Canada or Province legislate with respect to environmental attributes then parties shall agree on appropriate amendments to the Agreement

25. Contract Price for electricity is 8¢ per kWh, with 35% of this amount indexed to the CPI

26. The OPA not required to purchase electricity beyond 394,200 MW annually

27. Any financial incentives provided by any Federal, Provincial or municipal governments for generation facility shall be shared with the OPA
28. The OPA is responsible for all sales taxes, and well as its own income and corporate taxes
29. Regions responsible for all taxes with respect to the electricity generating component of the EFW Facility
30. Regions to post security in the amount of $47,500 per MW of capacity prior to commercial operation
31. Regions to post security in the amount of $20,000 per MW of capacity once in commercial operation
32. Force Majeure / “Act of God”
33. Regions jointly and severally liable
34. Agreement accounts for “discriminatory actions” and the consequences of same
4. Summary of Durham/York Memorandum of Understanding (MOU)
Summary of Durham/York MOU

• MOU dated January 25, 2009

MOU designed to:

• deal with preparation of an RFP vendor selection to implement the preferred technologies in EA
• define the processes which approvals will be obtained; and
• define the ownership model
Summary of Durham/York MOU (con’t)

• **Purpose of the MOU**
  – To recognize the partnership in the conduct of the EA process and the arrangements regarding approvals, construction, ownership and operation of the Facility
Summary of Durham/York MOU (con’t)

• MOU Partnership principles
  – Capital infrastructure servicing the Facility oversized to service maximum processing capacity
  – Cost of capital infrastructure oversized to accommodate future expansion to be shared equally including
  – Over-sizing water and sewer connections and installing tip floor for a minimum four days storage
  – Initial processing capacity of 140,000 tonnes per year, split 20,000 tonnes York, 100,000 tonnes Durham, additional 20,000 tonnes surplus owned and shared equally
Summary of Durham/York MOU (con’t)

• MOU Capital Costs
  – Facility owned, capital cost of design and construction, based upon respective shares of processing capacity. (Durham 78.6%, York 21.4%)
  – Change of law contributions shared according to percentage ownership of processing capacity
  – Neither party to sell, assign, encumber or transfer its interest without the consent of the other

• MOU Operating costs
  – York responsible for operating costs of 30,000 tonnes per year of processing capacity
  – Borrowing of unused base or surplus capacity is permitted
Summary of Durham/York MOU (con’t)

• Expansion of Facility
  – Expansion of Facility at cost of party seeking expansion
  – Upgrades to existing Facility necessitated as a result of expansion are the sole responsibility of party expanding unless they subsequently (within 5 years) become a requirement change in law, or the other party derives a financial benefit from the upgrade

• General
  – Durham lead partner in the design, construction and approval of initial Facility
  – Durham to be responsible for executing the host community agreement
Summary of Durham/York MOU (con’t)

- **Facility Management**
  - Facility managed via committee of senior staff analogous to the YDSS Management Committee
  - Management Committee to develop principles for a co-owners’ agreement and act by consensus

- **Financial**
  - Costs related to the EA are shared equally
  - Costs related to site preparation and capital costs as a result of HCA are shared according to proportionate ownership of processing capacity
  - Cost of watermain loop, storm water management pond and private truck laneway shall be shared equally

- **General Matters**
  - MOU terminates once a co-owners’ agreement is executed
  - Dispute resolution: mediation and then arbitration
5. Draft Durham/York Co-Owners’ Agreement
Draft Durham/York Co-Owners’ Agreement

• Article 2 – Capital Contributions
  Per cent of contribution by Durham (78.6%) and York (21.4%)
  – Capital infrastructure over-sized during construction in order to service processing capacity beyond 140,000 tonnes
  – Cost of the oversized components shared equally with value to be determined by cost consultant after completion of construction
  – Certain additional items of capital infrastructure caused by HCA shared equally. Otherwise HCA obligations shared according to ownership interest in processing capacity
  – Milestone payments paid up-front by Durham and York to reimburse for its percentage amount
Draft Durham/York Co-Owners’ Agreement (con’t)

• Article 3 – Ownership of Facility and Facility Lands
  – Durham and York to own facility lands equally (tenants in common)
  – York to pay Durham for a 50% ownership interest based upon appraised land value
  – Durham and York to have ownership interest in Facility based upon proportionate interest in processing capacity
  – Neither party may assign, transfer, encumber interest in Facility or Facility Lands without consent of other
  – York’s ownership interest not to exceed 50%
  – Any liabilities arising out of project shared according to proportionate ownership interest
• **Article 4 - Expansion or Upgrades of Facility**
  - Upgrade costs as result of changes in law to be shared based upon proportionate interest in processing capacity
  - Either may initiate upgrade or expansion, for own waste only, not for waste of any other municipality
  - Party expanding Facility responsible for all costs incurred, unless expansion is to benefit both co-owners in which case shared according to new proportionate interest
  - Upgrades/expansions to existing Facility required as a result of expansion, is at the cost of expanding party unless they become required within 5 yrs by a change in law or the non-expanding party derives a financial benefit
Draft Durham/York Co-Owners’ Agreement (con’t)

• **Article 5 – Entitlement to Capacity**
  – Initial Processing capacity owned 110,000 tonnes Durham, 30,000 tonnes York
  – Sharing of surplus capacity permitted to be arranged through Mgt Committee

• **Article 6 – Operating Costs and Revenues**
  – Operating fee shared based upon percentage ownership interest in processing capacity
  – Durham to pay monthly fee to Covanta and be reimbursed by York for its share
  – Each co-owner responsible for share any adjustment to operating fee (service level, environmental performance adjustments under PA)
  – Revenue shared according to proportionate share of annual operating costs
  – Damages (including liquidated damages) shared according to proportionate share
Draft Durham/York Co-Owners’ Agreement (con’t)

• **Article 7 – Delivery of Waste**
  – Each of Regions has proportionate share of daily, weekly, monthly tonnage limits in PA
  – Agreement to coordinate delivery of waste
  – Each party to compensate the other for any lost revenue (including Liquidated damages) that would have been payable if both had met their tonnage commitments
  – Deliver only solid, non-hazardous municipal waste as per Regulation 347
  – If any waste rejected at Facility, owner responsible shall be responsible for its removal and disposal
Draft Durham/York Co-Owners’ Agreement (con’t)

• **Article 8 – Management of Facility**
  – Establishment of Management Committee (Regions’ CAOs, Commissioners of Works and Finance and Regional Solicitors)
  – Decisions of Mgt Committee by consensus
  – Appointment of HDR as Owners’ consultants during the construction process

• **Article 9 – Dispute Resolution**
  – Dispute resolution by mediation and then binding arbitration

• **Article 10 – General provisions**
  – Term for 20-years from date last signed
  – MOU terminated upon execution
Questions?