Mixed Waste Processing... When Dirty is Not Dirt

Presented by:
Bob Brickner, Executive Vice President
Gershman, Brickner & Bratton, Inc.

Presented at:
For the Maryland Recyclers Network and SWANA
The Maritime Institute, Linthicum, MD
June 25, 2015
GBB – Quality – Value – Ethics – Results

- Solid Waste Management and Technology Consultant established in 1980 (35 years ago!)
- Independent & Helping Clients Turn Problems into Opportunities
  - Proud to be a sustaining sponsor of MRN
  - [www.gbbinc.com](http://www.gbbinc.com)
Historical “Dirty MRF’s” --- We Get It!
(But the past is prologue*!)

RIP Slide from: Michael Timpane Presentation at the NERC Conference in Wilmington, DE on April 8, 2015

* Prologue: An Introductory Act or Event
Waste Processing and Recovery.....Always Evolving (MRF’s that have Ceased Operations, by Year)

Source: Government Advisory Associates
ReCommunity August 27 2014 Press Release

• Title: ReCommunity says recycling quality must improve ---
  "...says non-conforming materials are inundating facilities nationwide"

Jeff Fielkow, Chief Sales and Marketing Officer published a "QUALITY ALERT"!
Note: They operate 32 S-S MRF’s (13% of US total)!
Examples of S-S Contamination Issues

- Food Waste & Vegetation
- Contaminated Material & Food Waste
- ONP Screen Jammed w/Plastic Waste
- Household Trash, Electronics and Hoses

Source: ReCommunity
Therefore:

- Are not many of the current S-S MRF’s operating, rightly or wrongly, as MWPF?
Recent GBB Waste Sort...By the Numbers

- Spring 2015 GBB Week-Long Waste Sort Findings
  City in NC with a S-S recycling collection program
  - Single Stream Recyclables Carts averaged 22% Trash
  - Trash Carts contained 25% Recyclables
Susan Kneiss, President of the National Waste & Recycling Association...NWRA is the trade association that represents the private sector solid waste and recycling industry

- On Earth Day, she took part in 27 media interviews
- “It is evident that we have reached a crossroads in recycling, where the rising costs to our industry of providing this service must be balanced with our goal of building on the progress our industry has made to better our environment through effective recycling programs”.
Susan Kneiss, President of NW&RA ...continued

• In my discussions with reporters from across the country, it was amazing to me to hear just how surprised so many of them were about the true cost of recycling. Too many Americans think that recycling is free and are under-informed about their role in making recycling both ecologically and economically sound, ...

Note: Underlining added by Bob Brickner for emphasis
So I ask you: What is the Problem?

- EPA Annual Recycling Numbers Flat
- State’s keep increasing Recycling Goals/Mandates
- Too Much Garbage in S-S Recyclables
- Too many Recyclables Still in Garbage
- Citizen’s Need to be Continually Educated
- Recyclables Collection Costs are Very Expensive
- Recyclable Material Markets are Volatile (Low $ now)
- Recycling is NOT Free!
- Corporate “Agendas” are Everywhere (Is the tail wagging the dog?)
Now many large “Public” waste companies, and some smaller Private paper companies, involved in the MRF sector want their stockholders’ dividends and corporate earnings guaranteed... mainly on the backs of the public sector just trying to do the right thing!
“We don’t own collection trucks, landfills or paper mills because if we did, our decisions would not be based solely on maximizing recovery and revenue for communities.”

ReCommunity presentation at NERC recycling conference in Wilmington DE on April 7, 2015. Slide was titled: No Conflicts: A “Pure Play” Model.
Recycling is Indeed Not Free

- GBB’s most current example of the real costs for curbside S-S recycling...from the curb setout, collection, processing at the S-S MRF through commodity sales (with a little material rebate $)
- What was the cost to the City of 65,000 setouts for the S-S program: “Total Cost Per Ton Recycled”?
  - A. $ 40/ton recycled
  - B. $ 75/ton recycled
  - C. $130/ton recycled
  - D. $250/ton recycled
Market Pricing for OCC over 10+ Years

OCC Pricing Averages

- Regional Average
- National Average

13-Dec-2002 to 13-Dec-2014
Review of Certain MWPF Projects

- Alternative Conversion Technologies
- City of Edmonton (Enerkem Project)
- Athens Disposal (Los Angeles, CA)
- Mustang Fuel (Santa Barbara, CA)
- Monterrey CA (BHS project)
- Covanta (City of Indianapolis IN)
- van der Lind Recycling (Troy, VA)
- New Providence, Bahamas
- ECUA/Escambia Co. FL
- EU & MBT Projects (over 200 examples)
- IREP (City of Montgomery AL)
Gasification & ACT’s need upfront MWPF

• Product: Syngas for production of electricity, chemicals/fuels (ethanol)
• Feedstocks: MSW and biomass
• Plasma gasification: also requires MWPF (Like Alter NRG technology @ 1,000 TPD Tees Valley UK projects)
Review of City of Edmonton MWPF Project (w/Enerkem ACT Project)

- Developed By: City of Edmonton / Enerkem
- Processing and additional Recyclables removed and then Shredded RDF to Enerkem Gasifier for Methanol/Ethanol Production (Grand Opening was April 15, 2014)
- Equipment: Vecoplan about 40 TPH design
- One primary feed line then splits into 2 materials recovery and processing lines for final product sizing
MWPF Project: Sun Valley CA (LA Area)
Athens Disposal

- Privately Owned/Operated Project
- MWPF – 1,500 TPD (300,000 TPY)
- 80,000 Sq. ft. Building
  w/200kw rooftop solar
- 70 TPH Bulk Handling Systems Equipment (BHS) Processing and Recovery System
- Capital Price: Est. $50 Million
- Opened: October 12, 2014

Photo: Athens Website
MWPF: County of Santa Barbara, CA Project

- Selected Developer - Mustang Renewable Power Ventures LLC -- to be D/B/O
- MWPF – 800 TPD (250,000 TPY)
- Est. 90,000 TPY of Recyclable Materials (36%)
- AD Facility - 73,600 TPY (from MWPF & SSO)
- Landfill now expected to last until 2036, extended closing from 2026 (current estimate of closure)
- Currently in the EIR Review
Monterrey CA Regional Waste Management District
(includes Pebble Beach and Carmel-by-the-Sea)

- Current Disposal Fee: $51.75/Ton for District Waste
- Planned/Evaluated MRF Improvement Plan for 6 years
  - O&O 40 TPH C&D MRF in 100,000 sq. ft. building since 1996
- RFP for New MWPF: Combination Facility (2 lines @ 40 TPH)
  - (1) 80,000 TPY of Mixed Waste and 16,000 TPY of S-S;
  - (2) 70,000 TPY C&D Line
- Diversion Rate of 2 Finalists: 65% - 68%
- Selected Equipment – BHS ($13 million for the 2 lines)
  - Mixed Waste to be 55-60% (w/organics) and commingled S-S at 95%
- Recommendation Approved: May 8, 2015
- Expected Full Operation: August 2016
MWPF Project: City of Indianapolis IN

• Developer: Covanta (Advanced Recycling Center)
• Capital Investment: $45 Million by Covanta
• MWPF Feedstock: City Residential MSW
• Produce: Recyclables (Claim 80-90% Recovery of Paper, Cardboard, Plastics and Metals) with remaining as <1” Fines to Landfill & the Residue as WTE Feedstock
• Technology: Van Dyk Recycling Solutions – 45 TPH System
• Recently, court judgment was against 2 paper companies + private citizen who sued the City of Indianapolis over the project (decision came down on April 6, 2015)
Privately Owned and Operated (MSW since Nov. 2009)
Stated: “Our goal is 100% recovery of the recyclables”
Has 400 TPD MWPF & a 400 TPD C&D System
Processes MSW and S-S; looking to add AD to RNG in future
Building 18,000 sq. ft. (very compact!)
Pre-Sort off floor and initial conveyor
Principal equipment:
- McCloskey Bag Breaker – Trommel Screen
- Machinex OCC screen
- Sherbrooke OEM fiber screen
- BloApCo Air Fans suction of film plastics and other items for QC
- CP (MSS optical sorter) for 3-grade plastic separation (other plastic grades done manually)
- Eriez – Fe metals & Dings – Eddy Current for Non-Fe
- 2 Product balers and Compactor for Residue
- Return loop conveyors -- ability to re-process initial residue 3 times!
MWPF: New Providence– Bahamas

• 1st State-of-the-art MWPF in the Caribbean Islands
• Selected Developer – Renew Bahamas
• Location: Adjacent to the 500,000 TPY New Providence landfill
• 2 Lines @ 40 TPH (80 TPH System) – 1st line installed
• Began Operations: May 28, 2015
• 125,000 sq. ft. facility footprint
• Equipment Supplier: Machinex
• Name: Harold Road Product Recovery Facility (PRF)
MBT = Mechanical, Biological Treatment (Major MWPF in Europe that includes AD)

• “The number has increased by almost 60 per cent to more than 330 plants between 2005 and 2011.

Source: “The European Market for Mechanical Biological Treatment Plants” ecoprog GmbH. December 1, 2011
MWPF: Central Scotland (between Edinburg and Glasgow)

- Developer: Levenseat Renewable Energy LTD
- MWPF Feedstock: 275,000 TPY MSW
- Produce: Recyclables and RDF for Gasifier
- Technology: Machinex – 45 TPH System
- To Produce 110,000 TPY of RDF for Outotec Gasifier (old Energy Products of Idaho Fluidized Bed Technology)
Infinitus MWPF
City of Montgomery Alabama
Montgomery Alabama Facility Site Layout
Project Security Agreements for Debt

- “Waste Feedstock Supply Agreement” dated June 4, 2013 between the Company and Solid Waste Disposal Authority of the City of Montgomery (MSWDA) With a “Support Agreement” of June 4, 2013 between City and MSWDA
- “Direct Payment Agreement” dated June 1, 2013 between the City, MSWDA and the Trustee for 25 years - $233,333/Month which equals the minimum tip fee payments
- MSWDA pays the initial tip fee of $28/ton and supplies a minimum of 100,000 TPY
Technology --- System

- 82,000 sq. feet facility on 14.5 acres [Design Builder for Building Costs about $5.8 Million and Site Costs about $2.2 million]
- Design at 185,000 TPY by BHS (designed to operate 312 DPY for 11.5 Hours/Day) -- [Design Builder for Equipment Costs about $15.1 million]
- BHS Process Guarantee is a minimum of 30 TPH with maximum operational capacity of up to 225,000 TPY (but Infinitus anticipates it can do 35 TPH)
- General Contractor- Conlon Company (had fixed price) with 323 days construction w/$10,000/day late penalty
- O&M Contract with ZWE is for 10 years
MWP Facility & Stated Goals...
Noted at April 2014 Grand Opening Event

- From Groundbreaking to Grand Opening was 9 Months!
- Mayor said: 80% recycle, 20% landfill
- Steve Miller (BHS) said 35 TPH with Phase 1 at 60% Material Recovery and “up to 80% in a later phase” w/AD!
IREP MWPF Acceptance Test Dates:  
May 5-9, 2014

<table>
<thead>
<tr>
<th>Independent City Testing Group:</th>
<th>CDG Environmental Engineers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acceptance Test Results:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Processing Rate of MWPF:</strong></td>
<td>32.36 TPH</td>
</tr>
<tr>
<td><strong>Confirmed Overall Waste Diversion:</strong></td>
<td>Above 60%</td>
</tr>
<tr>
<td><strong>Constituent Recovery Rates During Test:</strong></td>
<td></td>
</tr>
<tr>
<td>Plastics</td>
<td>96%</td>
</tr>
<tr>
<td>Mixed Paper</td>
<td>95%</td>
</tr>
<tr>
<td>OCC</td>
<td>97%</td>
</tr>
<tr>
<td>Tin/Steel</td>
<td>94%</td>
</tr>
<tr>
<td>Aluminum Cans</td>
<td>90%</td>
</tr>
</tbody>
</table>

IREP Facility is located in City of Montgomery, Alabama

Note: Data released at the REW Conference in San Jose CA in October, 2014
ADVANCED MIXED MATERIALS RECOVERY FACILITY
Recyclables...Include

- Mixed Paper
- OCC
- Tin/Steel Cans
- Aluminum Cans
- Scrap Metal
- HDPE (natural & colored)
- LDPE (film Plastic)
- PET
- Mixed Plastics & Aseptic Containers
Front Side – Administrative Area
Transition of Opened Bags onto the Elevating Conveyor
Separation of the Tipping Area from the Processing Area
Nihot Single Drum Separator
Main and Secondary Sort Lines (Chutes Lead to Bunker Below)
2-Dimensional Large, Incl. OCC “Up”
Live Floor Storage Bin for Recyclables
Infeed up to Fiber/Plastic Baler
2-D Fiber vs. 3-D Container Separator Screens
Initial Optical Sort – Film Plastic from Paper
Residue Loadout Area and Organics Conveyor to Outside
Organics Conveyor Outside to Composting Pad (Phase 2 to AD Units and RNG Production ?)