



Veolia ES Technical Solutions

Solvent Reclaim Presentation for Colorado
Association for Recycling, June 7th, 2010

Andy Jung, CHMM 303-884-4541

NORTH AMERICA
TECHNICAL SOLUTIONS

www.VeoliaES.com



Agenda

- Why Recycle Solvents?
- Reclaim Strategies
- Technical Discussion
- Capabilities
- Limitations
- 2010/11 Outlook

Why Recycle?

- Meet compliance objectives (exit RCRA)
- Meet organizational objectives (helps control cost vs. virgin chemicals)
- Corporate responsibility (Sustainability Goals)
- Reduce long-term costs (Often reclaimed solvents are less expensive than virgin solvents from petroleum products. This is more pronounced when you factor in other costs such as drilling, transporting, refining, etc.)

Reclaim Strategies

- Direct reuse – material is used in place of virgin raw material – exits RCRA
- Toll recycling – waste is refined to customer specification and returned for use in place of virgin raw material
- Recycling/recovery – waste is refined to market specifications and offered for 3rd party sale

Existing Reclaim Facilities



- 4 FACILITIES (CA , CO , OH , NJ)
 - 14 Total Process Units
 - 5 Thin Film Evaporators
 - 7 Columns
 - 1 Molecular Sieve Dryer
 - Operates 24/7
 - Over 10 million gallons/year
 - Receives & Ships by
 - Drum/Tote
 - Tank Truck
 - Rail Car

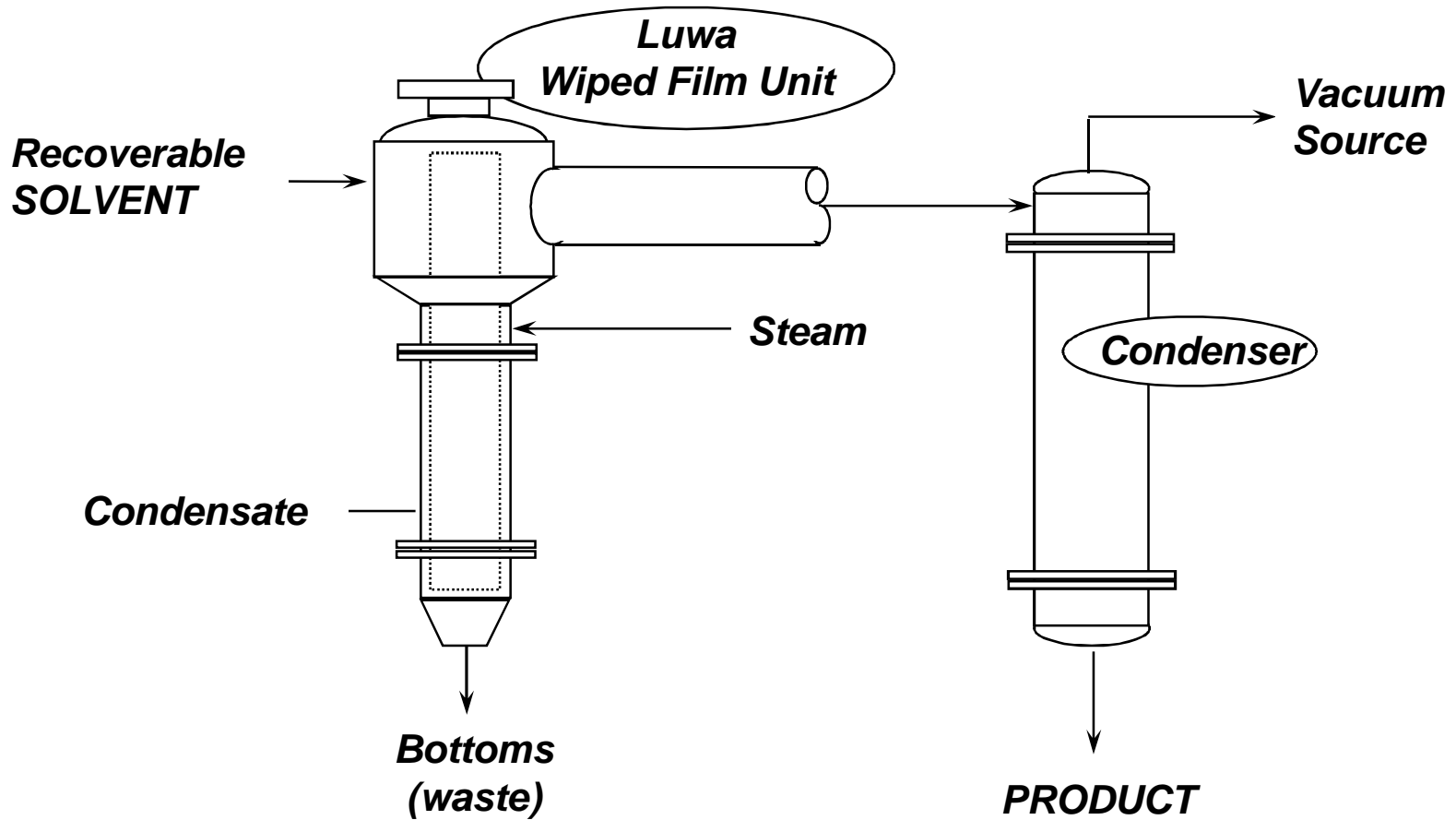


Technical

- **THIN FILM EVAPORATOR -**
 - Can separate solvents with large differences in boiling points
 - Spinning blades force a thin film onto heated walls



Wiped Film Distillation (aka Thin Film, Luwa)



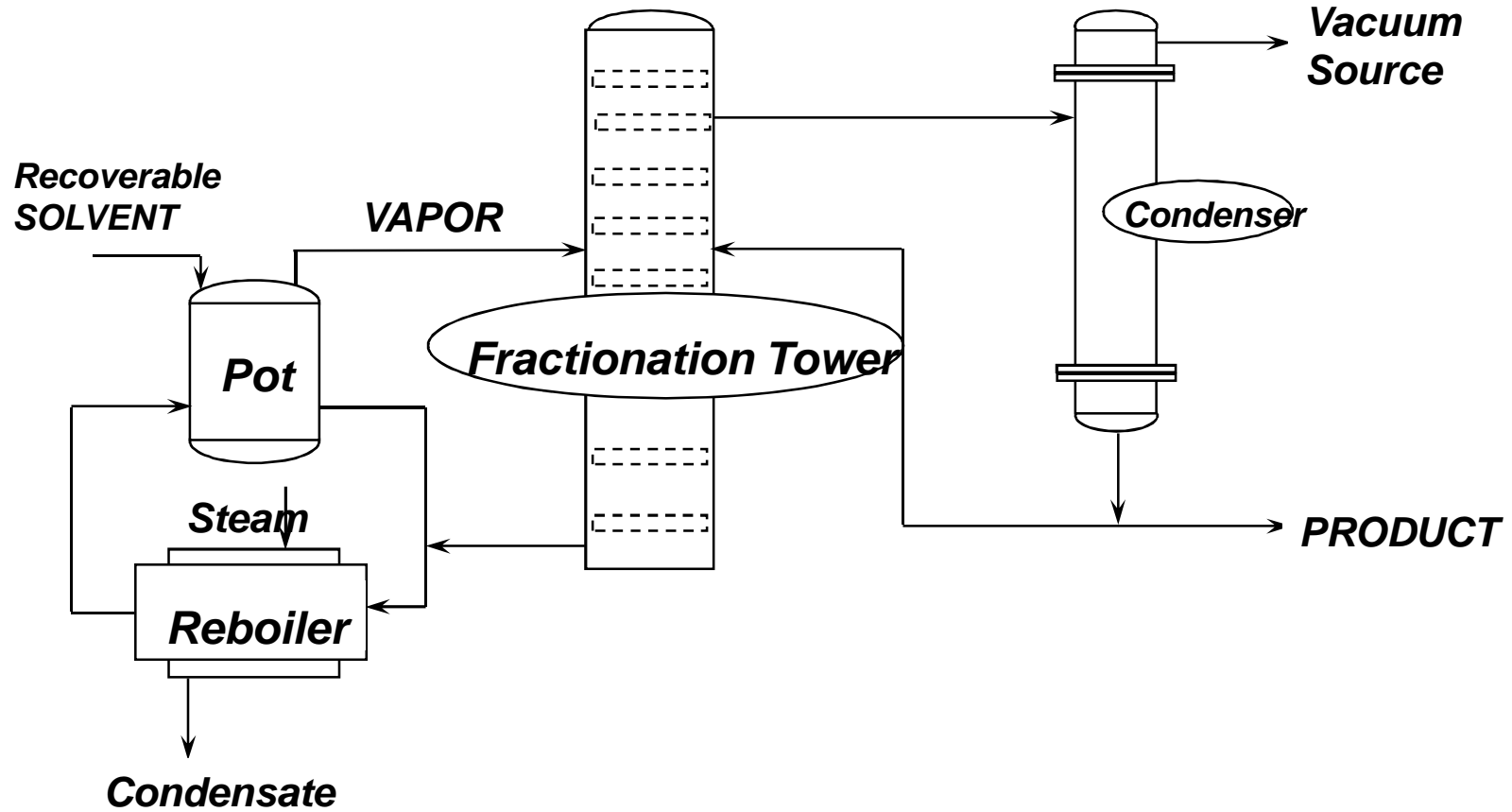
Technical

- **DISTILLATION COLUMN**

- **SEPARATE SOLVENTS OF SLIGHTLY DIFFERENT BOIL POINTS**
 - Solvents of different BP's separated as they pass through plates of different temperatures
 - Azusa, CA, 42 Plates. 1,000 GPH



Fractionation

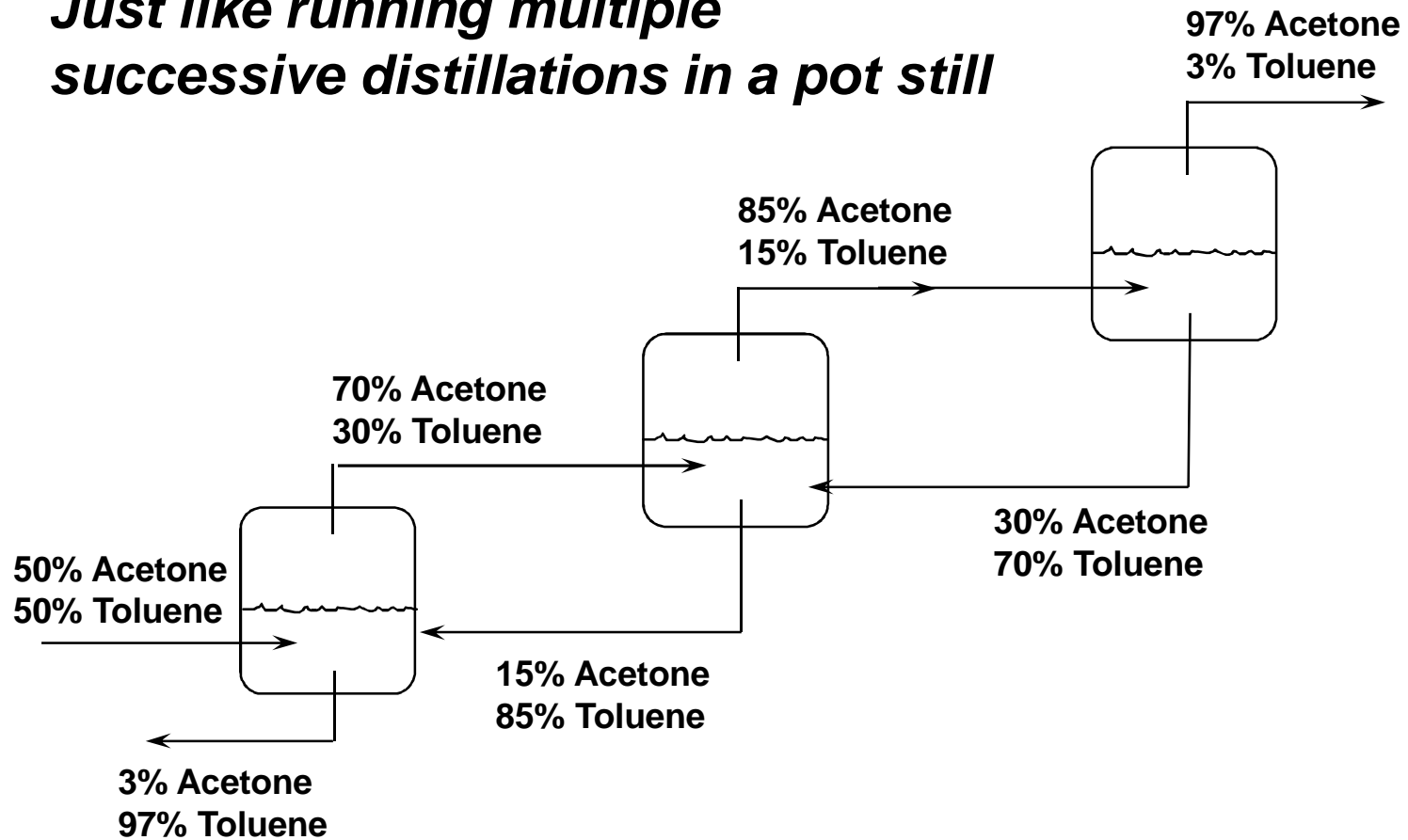




YOUR PARTNER FOR A CLEANER ENVIRONMENT

Fractionation

Just like running multiple successive distillations in a pot still



Technical



- **Lombard, IL R&D Lab**
 - Fully equipped Process Development & Research Laboratory
 - GC/MS & GC
 - Glass Fractionating Columns
 - Other lab scale processing equipment
 - Automatic Titration System
 - Adding equipment to satisfy growing needs

Veolia Recycle Capabilities



- **EXISTING PRODUCT LINES** - NMP , Methylene Chloride , Sulfolane, Acetone , MEK, THF, Acetates, Glycol Ethers
- **Toll Solvent Projects**
- **Large Continuous Solvent Streams** (drums, tanker truck, rail car)
- **NON SOLVENT PRODUCT LINES** - Mercury articles, PCB Ballasts, Precious Metals, Transformers, Copper, Lead, Zinc

Limitations

- Distillation Throughput Capacity (gpm)
- Tank Capacity (can limit new product lines)
- Waste Stream Characteristics (complexity , economics, etc.)
- Specification (waste or product)
- End Markets

2010/11 Outlook



- Chemical prices will rise if crude oil rises making solvent reclaim more attractive
- The benefits of toll projects will enable companies to reduce chemical purchasing costs
- Increased interest in exiting RCRA/ meeting Corporate Sustainability Goals will also drive increased interest in solvent recycling



Turning waste into a resource

- Andy Jung, CHMM
- 303-884-4541
- Andy.Jung@veoliaes.com

VEOLIA
ENVIRONMENTAL
SERVICES