TOWARDS SUSTAINABLE VIP SLUDGE MANAGEMENT through LaDePa
Introduction and Contents

- Phase 2 - VIPs are full
- LaDePa Machine
  - Converts VIP sludge to “pasteurised”, low grade fertiliser
- Content of Talk
Part 1 – Core Issues
Size of Problem in eThekwini

- 35000 VIPs serving 175 000 people
  - 7 000 tons sludge per year
    - (@ VIP filling rate = 40 l/h/yr)
  - Clustered in three areas
- Permanent employment
  - VIPs always filling

One machine per 10- 15 k households
Nature of Material

- Detritus,
- Pathogens,
- “Handleability”
  - Sticky, stiff, low moisture sludge
    - “Wipers” not “Washers”
    - Climate and soils
- Hand emptying
  - Too stiff to pump
Disposal Options

- High transport and disposal costs
- Permanent airspace disposal cost

**Landfill**

**Ladepa**
Non-Options for Disposal

- **WWTW (False option)**
  - False disposal
  - Loading

- **Incineration**
  - Social resistance
  - Detritus & non-combustibles
  - Complex Equipment incompatible with Municipal culture

- **Agricultural land disposal**
  - Detritus
LADEPA MACHINE
Air Flow

Inlet

Outlet

Porous Steel Belt

Rotation

Exhaust Heat from Genset

Detritus Separators
Variable screw speed

Medium-wave Infrared Radiators

Existing PSS Patent

Variable intensity

Air Flow

Inlet

Outlet

Porous Steel Belt
Variable speed

Pasteurised sludge
Containerisation
Detritus Separation
Medium-wave Infrared Radiation
Sludge “In” and “Out”

LADEPAs simple technology:
- Easy operation and maintenance
- Low capital cost and mobile:
- Short contracts
Environmental Licensing

- Requires Full Waste Licence EIA
  - (Waste Treatment Process)
- But Special Dispensation?
  - Basic Assessment?
- Below trigger for AEL
### Disposal Cost Savings (Dec 2011)

#### Disposal Cost to Landfill 7000 tons

<table>
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<tr>
<td>7000 @</td>
<td>$ 117/ton</td>
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<td>820 000</td>
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#### Treatment Income using Ladepa for 7000 tons

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<tbody>
<tr>
<td>Detritus disposal</td>
<td>20% of $820 000</td>
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<tr>
<td>Operating Cost</td>
<td>260 000</td>
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<tr>
<td>Annualised Establishment Cost</td>
<td>200 000</td>
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<tr>
<td>Maintenance and Royalty</td>
<td>240 000</td>
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<tr>
<td></td>
<td>Sub-total 860 000</td>
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<tr>
<td>Income from fertiliser sales</td>
<td>80 000</td>
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<td>TOTAL 780 000</td>
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**NOTE:**

1) Calculation does not include cost of delivery or preparation of site.
2) Establishment cost reduction on renewal.
Part 2:
Towards the Desired Outcomes:
LADEPA Contracting Model
Desired Outcomes

- **Political Objective** –
  - Municipal Service provision

- **Social Objective** –
  - Permanent low skill jobs
    - VIP emptying
    - Food gardening (Food security)
Desired Outcome (Cont.)

- **Environmental Objective**
  - Recycling of nutrients
  - Low energy consumption
    - (approx. 0.5 l/cap /yr)

- **Economic Objective** –
  - Positive financial outcome
Loose Ends

- Payment on Sludge volume (not No. VIP)
- Reason why Technology Contractor not a Nominated Subcontractor
  - Value of Technology
  - Mitigates Managing Contractor generated risk
- Model readily adapted to Franchising
- Ladepa can treat WWTW sludge
  - Can offset some of costs.
Conclusions

- **Financial saving**
- **Environmental Impact**
  - Reduced landfill
  - Recycling nutrients
- **Social Impact**
  - Increased low skills job opportunities
    - Potential permanent employment
- **Political Benefit**
  - Sustainable service delivery
The authors wish to acknowledge and thank eThewini Municipality and Particle Separation Solutions (PSS) for their support.