Towards a Sustainable Pit Latrine Management strategy Through LaDePa technology

Dave Wilson and John Harrison
Council Resolution

- Council had approved that the pits would be emptied on a 5 year cycle
- Any additional emptying required would be to owners account
- Only VIPs would be emptied
In 2007 Ethekwini Municipality started a multi million rand VIP Pit Emptying project

- To empty approx 35 000 pit latrines
- To use labour as it is the most cost effective method of emptying the vip’s
- To dispose of the sludge in the most environmentally acceptable method
A contract was advertised

- The award was made in 2007 to a joint venture Managing Contractor to empty 35000 VIP’S in Phase 1
  - A three year contract period.
- Through the Departments Procurement Section Six Sub Contractors were selected to work as Nominated Sub Contractors.
- The subcontractors in turn employed six teams of six persons made up from local labour from the area.
Key issues with the contract

- Health and Safety
- Tools and equipment
- Removal of sludge from site.
- Disposal of sludge
Very early on, a number of major technical challenges, associated with VIP Construction Projects, were established

- Space and Access
- Pathogens
- Excess water
- Detritus
- Sludge Disposal
Envisaged sludge disposal methods

• Problems with on site burial
  – space constraints and
  – ground contamination due to pathogens

• Disposal to land fill
  – environmental problem: air space uptake
  – transport costs

• Disposal to treatment works
  – Dealt with later
Disposal to WWTW

- **Overloaded WWTW**
  - Overloaded Digesters
  - Nitrogen Load
    - Ammonia
    - Nitrification

- **Sludge**
  - No improvement
  - Dewatering

- Mobile Detritus separation screen
The Birth of LaDePa

This required some innovative thinking

And in an office in SA the LaDePa technology was hatched
Porous Steel Belt approx 16 m between pulleys.
Normal time under MWIR emitters 8 minutes

Variable speed

Rotation

Air Flow

Detritus Separators
Variable screw speed

Exhaust Heat from Genset

Medium-wave Infrared Radiators
Variable Intensity

Existing PSS Patent

Pasteurised sludge

The Machine

Inlet

Outlet
Product bagged in 30kg bags ready for distribution
Costs/staffing 12m3/day

- Cost of 2000m3/year plant R6.46 million
- Average operating cost per person = 0.5 litres/yr
- One Supervisor/plant operator
- Five general workers
Tests carried out on Sludge

- Solid capacity for processing
- Pre and post processing: Ascaris and other Helminth’s
- Npk values
1) **Top Left** lettuce and swiss chard planted without pellets after 19 days
2) **Bottom Left** lettuce and swiss chard planted with fertilizer after 19 days
3) **Below** lettuce and swiss chard planted with 3 times the fertilizer volume in pellets after 19 days
Standard Works

- Primary Sed Tanks
- Digesters
LaDePa Pelletizing Plant

- Sanitation
- Health
- Employment
- Food Security
Conclusions: LaDePa Technology

• Simple technology that addresses both the technical and environmental challenges
• Addresses political social ambitions via
  – Service provision
  – Food sustainability
  – Job opportunities
  – Land fill preservation
    • Subsistence Agriculture
• It is a low cost solution
• It is portable
Thank You