

## On-Site Treatment of Infectious Waste Khayelitsha District Hospital (KDH)

### GGHH Agenda Goals

- Waste

### Hospital Goal

- Reduce total infectious waste sent to landfills
- Reduce the impacts of health care waste on public health.

### Progress Achieved

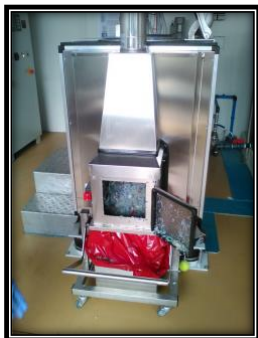
- KDH has invested R 2 mil to procure a new waste management technology system, but this was already covered by the savings that the treatment of waste on site produced. showed a saving of approximately **R 899 338.50** for 2018/2019 fiscal year.
- By treating our HCRW on site, the hospital has been able to reduce the volume of waste sent to the landfill by 70%.
- The final product of the treated HCRW has been transformed to a sterilized unrecognizable compound that is not harmful to public/environmental health when disposed at landfills.

### The Issue

Since the hospital was commissioned in 1 August 2011 with a capacity of 260 beds, the number of patients and services have expanded at a fast rate, resulting in the HCRW generation to increase year after year. Aside from potential savings, the storage space for HCRW and hygiene risks often posed a threat when the service provider could not deliver containers or was unable to collect the waste. This all contributed to the hospital exploring new technology to manage their waste.



**Sustainability Strategy Implemented** In 2014, a whole new world unfolded for the Western Cape Department of Health (WCDoH) understanding the importance of reducing their environmental footprint and impacts on public health. KDH was the first public hospital in the Western Cape, South



Africa to engage in testing new technology to treat infectious waste on site. During 2016 the WCDoH had a negative experience when the service provider appointed to transport and treat HCRW encountered problems at their plant and for a few months resulted in hospitals not having their waste collected which posed a serious health risk to the hospital, the clients and surrounding community. The Department of Transport and Public Works (DTPW) came on board and agreed to run a pilot project at KDH with the intention to adopt new treatment technology in the future. The new system installed at KDH uses heat-friction method to treat the waste. First, it shreds the HCRW content until it is unrecognizable, after which the heat friction increases the temperature to 150C, which kills all pathogens and renders it sterile and safe to dispose. After

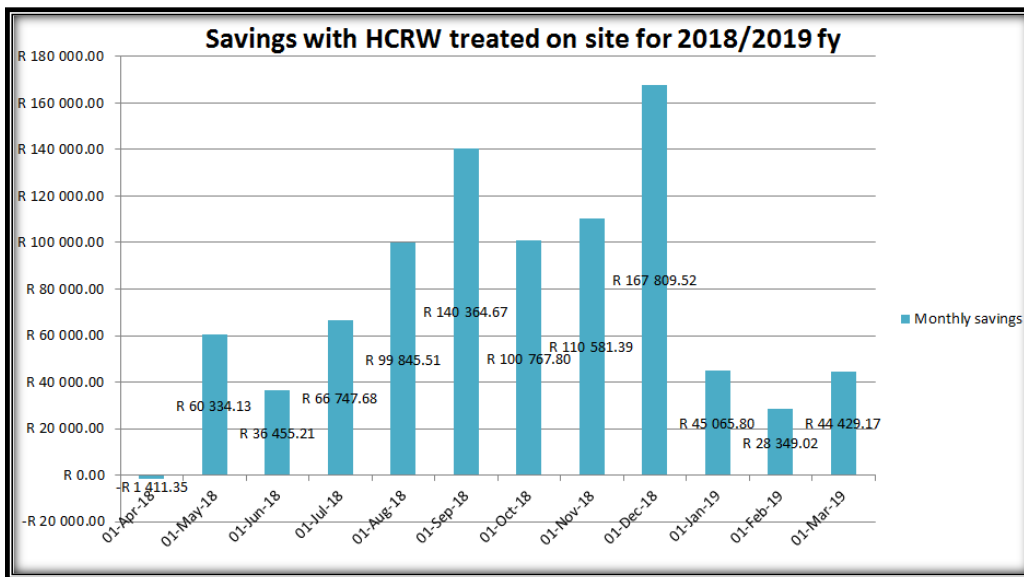
treatment, the HCRW is classified as Class C, Type 3 waste.

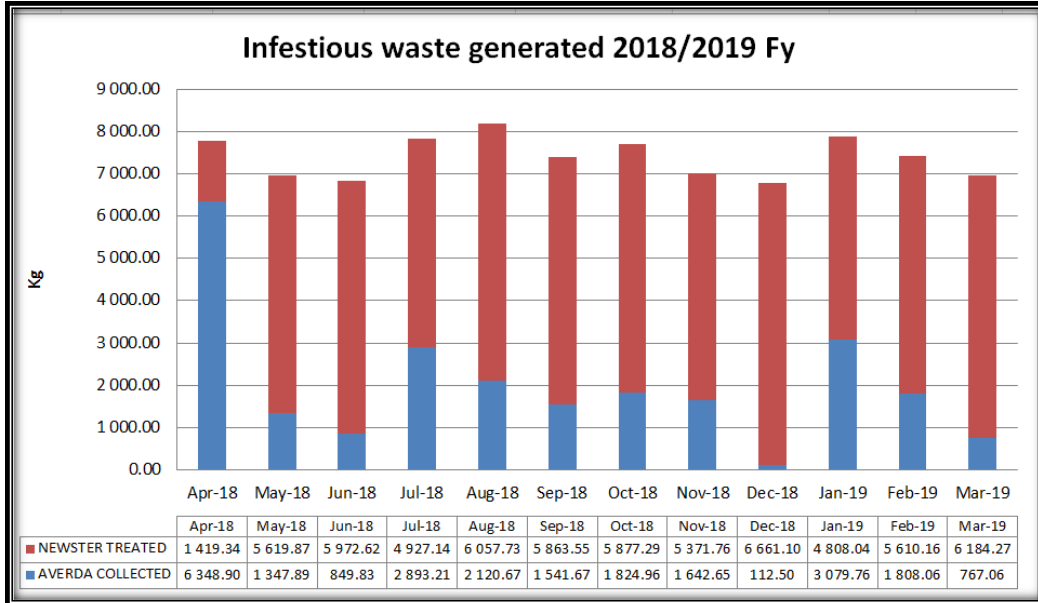
### Implementation process

Dr Laura Angeletti-du Toit, Chief Director of Infrastructure and Technical Management (DTPW) provided the funding to procure new technology and a formal tender process was initiated. Alloro Africa (Pty) Ltd was the successful bidder and the Newster NW 10 system was procured and installed December 2016. During 2017, our monthly HCRW generated averaged about **6939.34 kg** for infectious waste and **453.16kg** for sharps. KDH received the system, but no funding was available for staff to run the system. The only available solution at that time was to make use of the administrative intern program and 4 interns were appointed and trained to operate the system. However, KDH was not prepared for the operational changes that the new technology required. It took some time before all obstacles were sorted out including supply chain orders, storage space, staffing and the implementation of a new 50L bin collection system in the wards.

Despite all efforts, the system was not used to its full capacity due to the turnover of interns applying for permanent posts and the staff that were in place were not very dedicated to the project as it was unpleasant working with the raw HCRW coming from the wards. When the staffing contracts expired 31 Mar 2018, KDH outsourced the staffing and maintenance to Alloro Africa (Pty) Ltd and there was an immediate difference in results. All the issues related to staffing, repairs and services were something of the past and the savings increased drastically.

Today, the machine is working to its full capacity and a process is ongoing to procure a 2<sup>nd</sup> system, as the hospital has increased its waste generation since the implementation in 2016. As we are exceeding the capacity of the machine, a 2<sup>nd</sup> machine is needed to eliminate the backlog that occurs when the system is down due to service or breakdown, which forces the hospital to revert back to the old waste boxing system as backup plan and that shrinks our savings margin. Our savings for the period 1 April 2018 to 31 Apr 2019 was **R 899 338.50** for treating infectious and sharp waste on site. Our PDE monthly average is **12096.69** for 2018/2019 fy and measured against the average monthly infectious waste generated of **7392.50kg**, it results in the average generation of **0 .611kg** of infectious waste per patient.





### Tracking Progress

The appointed Waste Manager keeps detailed data on all HCRW collected by the Service provider, as well as capturing the data of each cycle (input weight, duration, output weight, cycle status) for the Newster system. A comparison was done in terms of actual cost for the treatment of HCRW on site that includes energy, PPE's, chemicals, transport, bags, maintenance and staffing. The stats were also used to calculate what the expenditure would have been if we continued to use the Government service provider collection method compared to treating all waste on site. Conclusion is that the new technology is very effective and efficient to dispose HCRW safely.



New waste trolleys for wards



New re-usable bins for transport of waste

It is equally beneficial for the hospital w.r.t savings and it completely eliminates the health risks. Another benefit is that although the weight of the end product did not decrease, the volume of the treated waste that is transported to the landfill decreased about 70 %.

### Challenges and lessons learned

It is advisable that when a facility plans to treat waste on site, that they first make provision to replace the cardboard boxes for infectious waste with a smaller pedal action bin and procure large plastic containers for the safe transport of the red bags to the treatment room. KDH started with the treatment system and soon the storage area was filled with empty used waste boxes that had to be shredded by hand and packed into clean waste boxes, sealed and labeled in order for the service provider to collect it, as the system could not take the whole cardboard box. KDH had to order 50L red bags for all the wards to ensure the red bags fit into the cloding chamber of the Newster system

and 80 micron green bags were ordered for the treated waste, but these items were not part of the government tender. A skip rental contract had to be implemented to transport the waste to the landfill. As KDH outsourced all cleaning staff for non-clinical areas, there was never a need to procure PPE's and chemicals ourselves and suddenly we had to procure these basic items. Furthermore maintenance/ servicing of the system was also problematic as our workshop was not equipped or comfortable to manage the new system and supply chain red tape interfered with the treatment process. It is recommended that the tender process for new technology should include the system, maintenance, staffing, PPE's and chemicals to ensure a smooth implementation process.

### Next Steps

KDH will procure a 2<sup>nd</sup> Newster system in the future and the objective for KDH is to start with segregation such as implementing contracts for paper and cardboard recycling, as this remains a challenge for the Western Cape Department of Health.

### Demographic information

Ms Grace Mashaba is currently the acting CEO of Khayelitsha District Hospital (KDH) since 1 September 2018. Dr Anwar Kharwa was the previous CEO. KDH is a Secondary Care hospital with a bed capacity of 360 beds. It is a level 1 plus services, which means that the hospital renders a basic level of care for uncomplicated cases such as surgical, Obstetrics, Outpatients, Allied Health. However, the hospital does render a level 2 service for internal medicine and Obstetrics. The hospital renders a support to 1 Community Health Clinic and 3 Community Day Clinics within the Khayelitsha/ Eastern Substructure namely Khayelitsha Site B (CHC), Michael Maphongwana CDC, Nolongile site C CDC, Mfuleni CDC. The population in Khayelitsha was approximately 400 000 (2011) and has increased drastically since. The hospital building has a floor area of 22,712 m<sup>2</sup> built on 11.95 Hectares. It has a trauma unit and Overnight ward, 4 theatre rooms, Maternity ward, Antenatal ward, and post-natal ward, pediatric ward, male and female medical and surgical wards, Outpatient - and Allied health department. It also utilizes 1 ward for a male mental health unit for 72-hour observations that is situated within the surgical wards. Our radiology department renders an Ultrasound, radiography and CT scan service. KDH has an approved staff establishment of 645 posts of which 604 posts are filled. 40 posts (6.3%) are vacant and in the process of being filled. Our PDE monthly average is 12096.69 for 2018/2019 FY.

### Links

Newster systems for waste

[http://www.newstergroup.com/healthcare\\_waste\\_hcw](http://www.newstergroup.com/healthcare_waste_hcw)

<http://www.newstergroup.com/video>

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### Key persons involved in the implementation of the new system:

- Waste classification tests and analysis report.
  - Dr Neels Barnardt (MSc -Anal Chemistry; PhD –Geochemistry)  
Enviro Services
- Tests verified by
  - Dr WAJ Meintjies (MBChB; DOM; FCPHM (SA) Occ Med; MMed (Pcc Med).

Stellenbosch University/ Tygerberg Academic Hospital

- Others informed of tests:
  - Prof Shaneen Mehtar (MBBS, FRC Path(UK); FC Path (SA), MD (Eng)  
Stellenbosch University/ Tygerberg Academic Hospital
  - Prof Shauna Costley (PhD-Microbiology)  
Nat. Dept. of Environmental Affairs
  - Dr Laura Angeletti-du Toit (PhD; Pr Arch; Eur Ing)  
DTPW- Infrastructure and Technical Management
  - Mr Eddy Hanekom (Dir: Waste Management)  
Dept Environmental Affairs and Dev. Planning
- Accreditation Certificates issued by
  - Pathcare Group INC (M0518)
  - Bemlab (Pty) Ltd (T0654)
  - Biograde CC (T0574)

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