



UNIVERSITI  
MALAYA

2022

# UM WASTE

# MANAGEMENT REPORT 2022

*Serving the Nation. Impacting the World.*



THE GLOBAL GOALS

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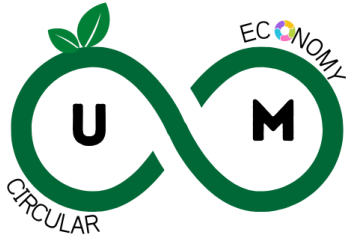
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1. Some data covers a different range of data collection period due to several reasons: institutional operations data from official bills and data collection on site (on which some are affected by several factors such as renovation works).
2. This report mainly covers data representing the year 2022-2023, however some data reported inclusive of longitudinal initiatives carried out since its respective inception/implementation on campus.

**This report, is prepared and published in 2023, and belongs to UM Zero Waste Campaign (UM Circular Economy Living Lab) and the Department of Development and Estate Maintenance (JPPHB) UM, under the purview of UM Sustainability and Development Centre (UMSDC).**

## CIRCULAR ECONOMY AND WASTE MANAGEMENT IN UNIVERSITI MALAYA



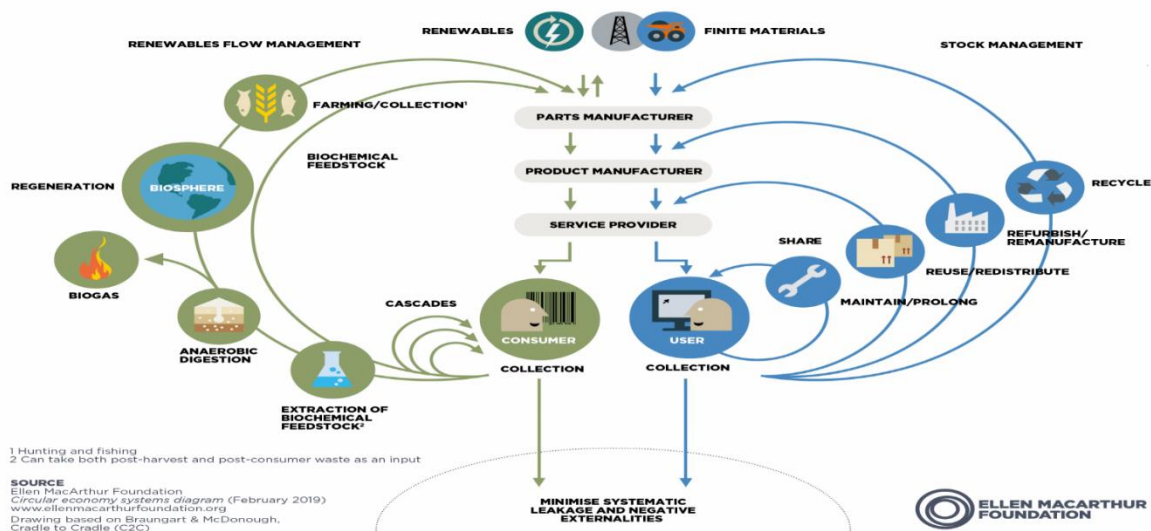
In general, Circular Economy (CE) keeps materials, products, and services at their highest utility and value, in circulation for as long as possible. A CE model reduces material use, redesign materials, products, and services to be less resource intensive and recaptures 'waste' as a resource to generate new materials, products and even services. Enabling CE is also an urgent mitigation and adaptation measure to address the climate crisis.

It is the vision of UM Sustainability and Development Centre (UMSDC) to enhance CE within the Universiti Malaya campus by proactively addressing the impact of material flow on campus and our immediate communities. With the track record of the pioneer UM Living Lab model – UM Zero Waste Campaign (UMZWC) since its establishment in 2009 - the UM Circular Economy Living Labs Grant will be introduced as a transformative action research intervention to create a more integrated, inclusive, and low carbon campus waste management system in UM. This will then lead to the enhancement of circular economy ecosystem in the UM campus and beyond.

### UM Circular Economy Concepts include the following, but not limited to:

- Eliminate waste and pollution
- Supply chain management
- Re-use and upcycling
- Recycling in an environmentally feasible manner
- Utilizing feasible and innovative technologies
- Retain and prolong material and product circulation
- Public awareness and engagement
- Best practices and policy recommendation on circular economy

Circular economy intervention is an important strategy for mitigating climate change and materials recovery while also contributing to cost-effective natural resource optimization. UMSDC believes that the Circular Economy, when designed in a thoughtful and inclusive manner, has promising potential to protect the environment, enhance economic performance, and elevate social justice especially in benefitting the vulnerable groups.



**Figure 1: Circular Economy System**

[Source: Ellen MacArthur Foundation - Circular economy systems diagram (February 2019)]

## **DEPARTMENT OF DEVELOPMENT AND ESTATE MAINTENANCE (JPPHB)**

The Department of Development & Estate Maintenance or Jabatan Pembangunan & Penyelenggaraan Harta Benda (JPPHB) coordinates Universiti Malaya's efforts to preserve the comfort of its staff, students, and all users of the university's facilities. By forming an effective, committed, and dynamic property management system, we execute the university's development projects competently at minimal cost.

JPPHB provides the following services:

1. Management of engineering services
2. Building and compound maintenance
3. Indoor & outdoor engineering facilities
4. Indoor & outdoor transportation systems
5. Estate management
6. Renovation works
7. Development projects

## **UM ZERO WASTE CAMPAIGN (UMZWC)**



With the growing number of universities, the population of each campus is significant and generates waste that causes adverse impacts on the environment. It is estimated that waste from all academic institutions amounted to approximately 1,500 tonnes per day, which represents 5-10% of the total waste generated in Malaysia. Universities worldwide are embracing the move toward sustainability, including UM as the premier university in Malaysia which set an agenda for sustainable development goals since the year 2009. Universiti Malaya Zero Waste Campaign (UMZWC) is one of the university's longest and most consistent sustainability living labs, it is developed to spearhead the development of a sustainable waste management model in the campus and ultimately achieve the status of a zero-waste campus. UMZWC has the following goal and objectives:

### **Goal**

To achieve a campus with zero waste to landfill with the development of an integrated and sustainable waste management model

### **Objectives**

- To develop policy and innovation systems to divert solid waste (non-hazardous) from disposal in landfills for resource and energy recovery.
- To streamline recycling activities and strategize efforts to increase the recycling rate.
- To create awareness and inculcate the best practices of waste separation at source among the campus communities.
- To form a strategic partnership with various stakeholders to develop an integrated waste management system.

The Universiti Malaya Waste Management Report 2022, co-prepared by JPPHB and UMZWC, under the purview of UM Sustainability and Development Centre (UMSDC) serves the following key purposes:

1. **Assessment:** It evaluates the current state of waste management practices within Universiti Malaya to identify strengths and weaknesses.
2. **Compliance:** It ensures adherence to local, national, and international waste management regulations and standards.
3. **Sustainability:** The report aims to outline strategies for sustainable waste reduction and management within the university, aligning with environmental conservation goals.

4. Efficiency: It provides recommendations to optimize waste collection, disposal, and recycling processes for cost-effectiveness and resource efficiency.
5. Awareness: The report may raise awareness among the university community about the importance of responsible waste management and promote a culture of waste reduction and recycling.
6. Benchmarking: It can serve as a benchmark for future assessments, helping track progress in waste management efforts over time.

Overall, the Universiti Malaya Waste Management Report 2022 plays a crucial role in guiding the university's efforts to manage waste responsibly and sustainably.

01

Recycling  
Program for  
University Waste

02

Paper and Plastics  
Reduction  
Program on  
Campus

03

Total Volume  
Organic Waste  
Produced

04

Total Volume  
Organic Waste  
Treated

05

Organic Waste  
Treatment

06

Total Volume  
Inorganic Waste  
Produced

07

Total Volume  
Inorganic Waste  
Treated

08

Inorganic Waste  
Treatment

09

Total Volume  
Toxic Waste  
Produced

10

Total Volume  
Toxic Waste  
Treated

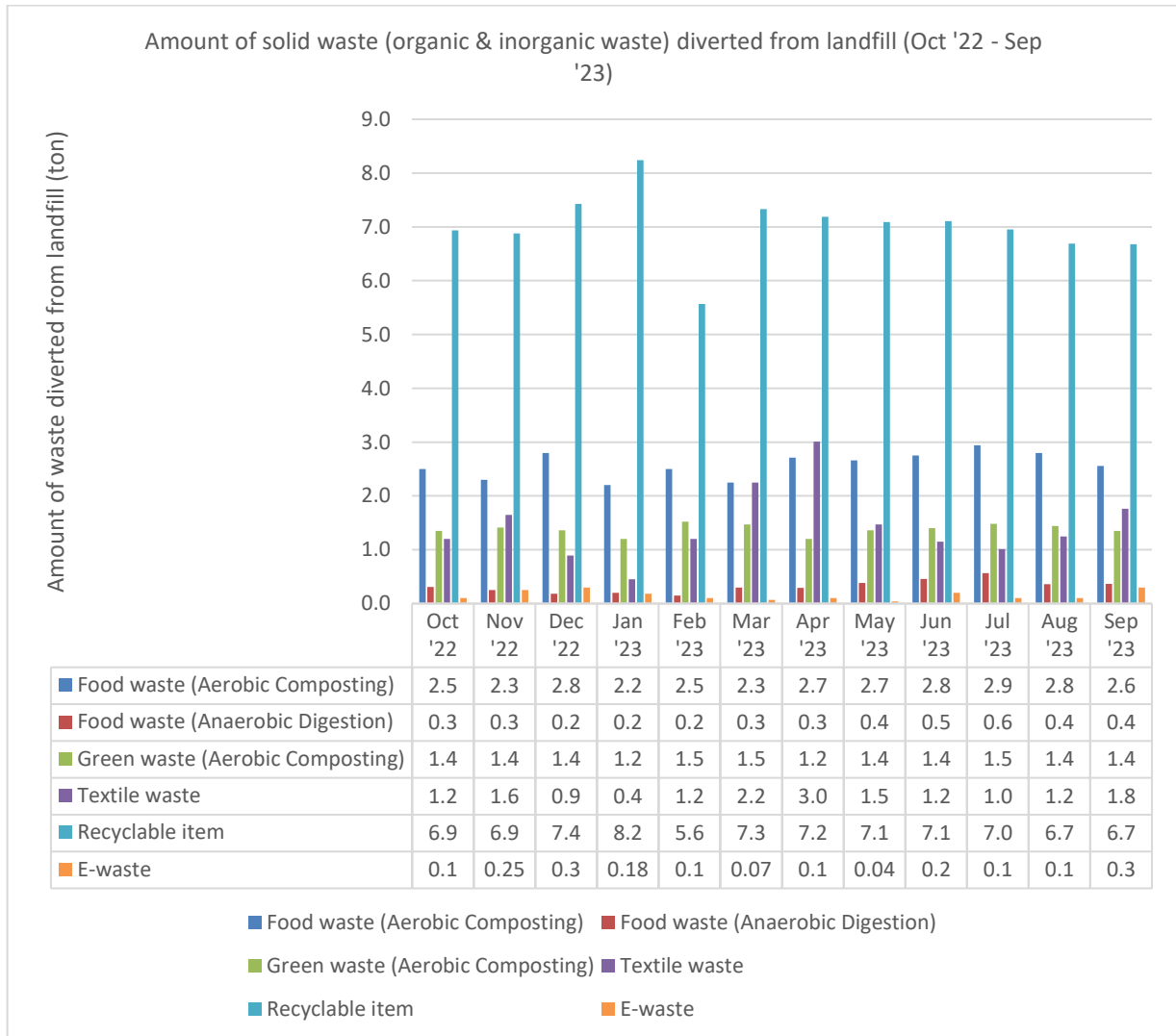
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Sewage Disposal



## 1.1 RECYCLING PROGRAM FOR UNIVERSITY WASTE

Universiti Malaya has introduced many channels for recycling on campus.



**Figure 2:** Summary of waste diversion by recycling program in Universiti Malaya (Oct '22 – Sep '23)

**Table 1:** Tangible saving from recycling program in Universiti Malaya (Oct '22 – Sep '23)

No.	Scope	Unit	
1	Total energy saved	534,861.60	kwh
2	Total diesel saved	710.73	kg
3	Total chemical fertilizer consumption avoided	3,255.00	kg
4	Total new products avoided due to recycling effort (applicable to papers, plastics, aluminium, metals, textiles)	76,400.00	kg
5	Total mileage of freight truck avoided	10,678.00	km
6	Expected revenue	32,550.00	RM
7	Disposal cost saving	33,454.50	RM
8	Waste avoided from disposed at landfill	122,900.00	kg

**Table 2:** Intangible saving from recycling program in Universiti Malaya (Oct '22 – Sep '23)

No.	Scope	kgCO2-eq
<b>Direct carbon emission</b>		
1	Waste avoided from disposed at landfill	92,729
2	Total mileage of freight truck avoided	5,161
<b>Sub-Total</b>		<b>97,891</b>
<b>Indirect carbon emission</b>		
1	Total energy saved	413,473
2	Total diesel saved	320
3	Total chemical fertilizer consumption avoided	8,920
4	Total new products avoided due to recycling effort (applicable to papers, plastics, aluminium, metals, textiles)	105,805
<b>Sub-Total</b>		<b>528,518</b>
<b>Total Carbon Avoided</b>		<b>626,409</b>

**Recycling initiatives carried out in UM:**

- (a) Sets of retrofitted recycling bins placed inside office buildings and residential colleges. The recycling bins came in 3 types of common solid waste produced in office / class and residential colleges which are paper, plastic and other waste. The idea of placing those recycling bins inside buildings is to make it easier for students and staffs to practise recycling.
- (b) 16 sets of recycling bins were located around the main road of UM campus. This set of recycling bins came in 4 types of common solid waste produced by campus community which are paper, plastic & aluminium, glass, and general waste. The idea of placing those recycling bins on the main road of UM campus is to encourage whoever walks by to separate their solid waste into the correct category, but most importantly, the reason is to make it easier for whoever wants to do recycling.
- (c) Set of recycling bins in bigger size is placed at UM Zero Waste Campaign (UM ZWC) site (in UM Waste Transfer Station). This facility acts as drop off point for UM community who has a bulky recyclable or



larger capacity of recyclables that cannot fit into the standard recycling bins provided inside the buildings and on the main road of UM campus.

- (d) Intelligent Recycling Centre is a recycling centre where every recyclable deposited in the machine will gain some green points and can use the points to redeem a variety of UM Zero Waste Campaign (UM ZWC) rewards deals from food and beverages at UM cafeterias to stationary such as laptop bag, USB Drive and more to enjoy greater savings.
- (e) Monthly recycling program in collaboration with local waste management company, Alam Flora sdn bhd. This program managed to get the crowd as the program offers a great deal where they don't just buy back our recyclables but also there will be another incentive – Petronas Mesra points. With those Petronas Mesra points people can redeemed a variety of Petronas rewards deals from fuel to food and beverages and so many other items offered in Petronas Mesra shop. The promotional materials (poster) were blasted on campus email before program to get the crowd of UM community in this recycling program.
- (f) Recyclable collection by UM waste contractors is a daily basis kind of activity. The contractors will do the solid waste segregation at UM Waste Transfer Station on every trip of waste collection from the whole UM campus
- (g) There are 8 Used Clothes and Shoes recycling bins placed around UM campus. This initiative is a result from partnership with local NGO, LifeLine Clothing (LLC) that aims to reduce textile waste from going to landfill.
- (h) Recycling of food waste and green waste. Food waste is collected from café and canteen's kitchen while green waste is collected around UM campus which then will be composted at UM Zero Waste Campaign (UM ZWC) composting site.
- (i) Recycling of food waste using anaerobic digester. This Waste-to-Energy machine gives out liquid fertilizer and biogas as the end product. The liquid fertilizer is used back in composting as 'catalyst' to nourish the compost pile and the biogas is used in cooking.
- (j) Upcycling of old tyres into recycling bins: Initiative by Department of Physics (Faculty of Science) that upcycle old tyres into recycling bins and rewarded the cleaners that involve in recyclable collection in the building.
- (k) Installation of "Preloved Donation Thru" bins in 10 Residential Colleges. This initiative is targeting the issue of textile waste at the end of semester as students are ending their study in campus and we found that there is a lot (more than 2 tons) of textile waste dumped in UM waste disposal site. Hence, this bin is located at every residential college to create a more convenient excess to "textile recycling bin" for the students.
- (l) Separation of food waste in events / programs conducted in UM campus: This initiative is to educate the UM community about Separation At Source (SAS) as it is the key to a successful recycling.
- (m) Precious plastic project by Universiti Malaya community: Universiti Malaya students and staff were invited to create anything from plastic bottle cap.
- (n) UM old bus restoration into Airbnb: The converted UM bus is one of the oldest buses on campus. We finally decided on the lodging to generate some income for our campus environmental activities. The bus can also be used for environmental education classes, hosting meetings, mini birthday celebrations/gatherings and more.



(a) Retrofitted recycling bins placed at office building and residential colleges in UM campus



(b) 16 sets of recycling bins placed at the main road of UM campus



(c) Recycling bins placed at UM Zero Waste Campaign site (UM Waste Transfer Station)



(d) UM Intelligent Recycling Centre (UM IRC)



Having a spring cleaning at your home or office?

## BRING YOUR RECYCLABLES TO US & GET REWARDED!

**JOIN US IN UM - ALAM FLORA '3R ON WHEELS' PROGRAM**

**29 MARCH 2021, MONDAY**  
9 am - 1 pm  
at Parking Area,  
Kompleks Perdana Siswa (KPS)

THE REWARD WILL BE IN CASH AND PETRONAS MESRA POINTS WILL BE CREDITED TO YOUR ACCOUNT  
P.S: Don't forget to bring your Petronas Mesra card!

In conjunction with Earth Day 2021 celebration with theme "Restore Our Earth", come and show your commitment by supporting our 3R on Wheels program!

## BRING YOUR RECYCLABLES & GET REWARDED!

**JOIN US IN UM ZERO WASTE CAMPAIGN (UM ZWC) - ALAM FLORA '3R ON WHEELS' PROGRAM**

**26 APRIL 2021, MONDAY**  
10 am - 12 pm  
at Parking Area,  
Kompleks Perdana Siswa (KPS)

THE REWARD WILL BE IN CASH AND PETRONAS MESRA POINTS WILL BE CREDITED TO YOUR ACCOUNT  
P.S: Don't forget to bring your Petronas Mesra card!

FOR ANY INQUIRIES, CONTACT 03-7961 4435

**JOM KITAR SEMULA!**  
Nikmati insentif wang tunai dan mata ganjaran PETRONAS Mesra dengan menjual barangan kitar semula

JENIS BARANGAN & HARGA		TARIKH:	
✓ Surat habar	RM1.30/Kg	✓ CPU	RM5.00/Unit
✓ Majalah	RM0.25/Kg	✓ Monitor	RM4.50/Unit
✓ Kertas hitam putih	RM0.30/Kg	✓ Laptop	RM1.50/Unit
✓ Kotak	RM0.35/Kg	✓ Server	RM1.00/Unit
✓ Kertas komputer	RM0.20/Kg	✓ Penebuk	RM2.00/Unit
✓ Aluminium	RM2.00/Kg	✓ Televisyen	RM4.00/Unit
✓ Tin	RM0.30/Kg	✓ Scavener	RM1.00/Unit
✓ Plastik	RM0.40/Kg	✓ Mesin Faks	RM1.50/Unit
✓ Telapak	RM0.25/Kg	✓ Pesti sejuk	RM4.50/Unit
✓ Minyak masak terpakai	RM1.10/Kg	✓ Mikrowaves	RM3.00/Unit
✓ Lain-lain	RM0.20/Kg	✓ Vacuum	RM1.50/Unit
		✓ Robot Kerela	RM1.00/Kg

\*Harga boleh bertukar kepada harga semasa

TARIKH: **26 APRIL (ISNIN)**  
TEMPAT: **Ruang Pakir Kompleks Perdana Siswa (KPS)**  
MASA: **10.00 PAGI - 12.00 TENGAHARI**

#um2wastemanagement #sustainability #SDW

(e) Monthly recycling & buyback program



(f) Recyclable collection by UM waste contractors



(g) Collection of used clothes and shoes in collaboration with NGO, LifeLine Clothing (LLC)



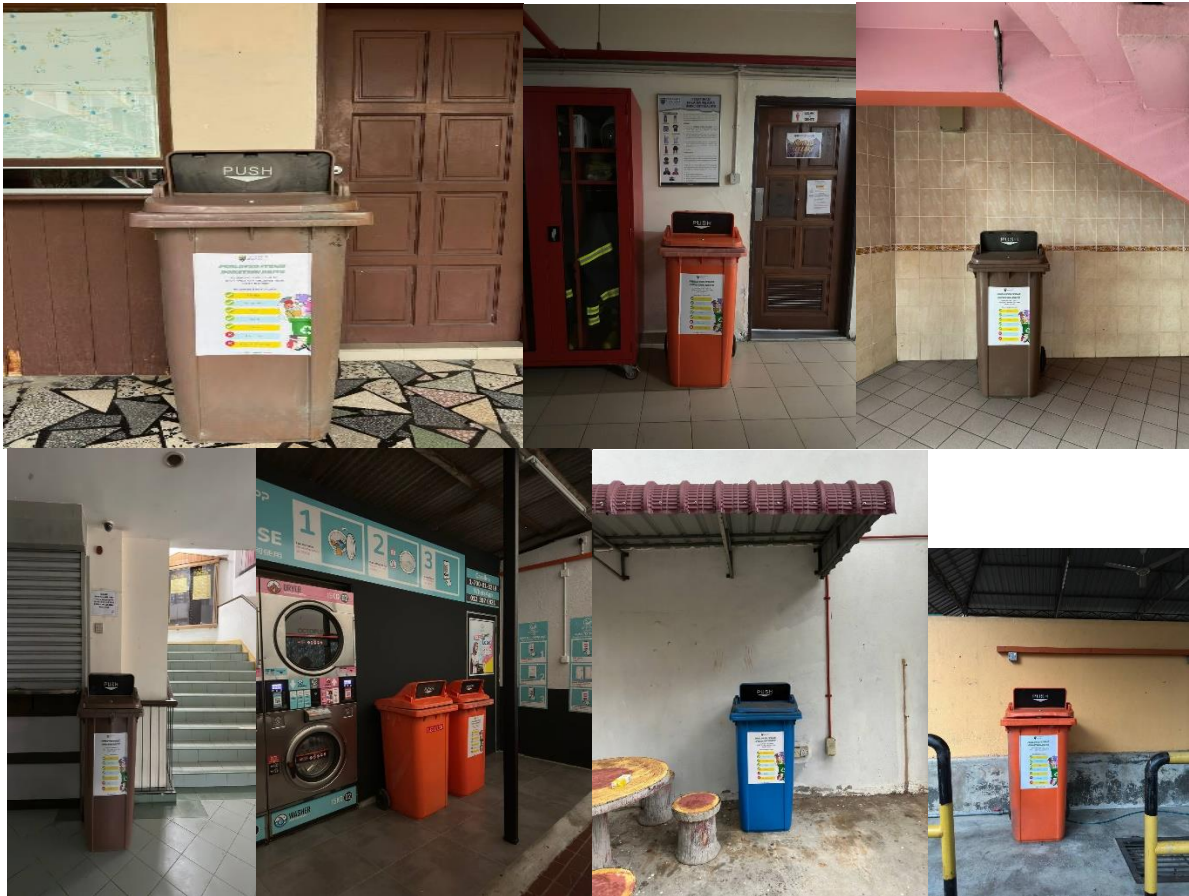
(h) Composting – Organic waste (food waste & green waste) recycling



(i) Anaerobic digestion – Waste-to-Energy from the recycling of food waste



(j) Upcycling of old tyres into recycling bins





(k) Installation of "Preloved Donation Thru" bins in 10 Residential Colleges



(l) Separation of food waste in events / programs conducted in UM campus





(m) Precious Plastic project: Upcycling of plastic bottle cap



From this:



To this:



(n) Upcycling project: Conversion & restoration of old bus into airbnb



Recycling Campaign at RIMBA Ilmu Botanic Garden (Universiti Malaya, Malaysia)

Recycling Campaign is also supported at the RIMBA Ilmu Botanic Garden. This forest garden located at the epicenter of the university provides a recycling point in order to educate and promote visitors to be responsible visitors. In return, visitors are also taught to practice waste separation at source.



Women clothes at Lestari Shop

Front view of the shop

Lestari Shop is OPEN!



Weighing and record

Interior

Recycle Bins at the Recycling Centre



Children Clothes



Men clothes at Lestari Shop



Necktie



Banner to promote recycling activities

Exterior view of RC

Welcome to RC!

Kami kongsiakan jemputan daripada pihak Akademi Pengajian Islam Universiti Malaya (APIUM) bersempena Hari Gotong-Royong Perdana UM pada 6 Oktober 2021 (Rabu):

**KEMPEN KITAR SEMULA UM - ALAM FLORA 3R ON WHEELS: APIUM GO GREEN**



**JOM KITAR SEMULA!**  
Nikmati insentif wang tunai dan mata ganjaran PETRONAS Mesra dengan menjual barangan kitar semula

PROGRAM:  
**KUTIPAN BARANGAN KITAR SEMULA 3R ON WHEELS BERSAMA AKADEMI PENGAJIAN ISLAM, UM**

TEMPAT: RUANG PARKIR, BLOK D AKADEMI PENGAJIAN ISLAM, UNIVERSITI MALAYA (APIUM)

TARIKH: 6 OKTOBER 2021 MASA: 10.00 PAGI - 12.00 TENGAH HARI

**JENIS BARANGAN & HARGA**

✓ Suratkhobar	RM0.30/Kg	✓ CPU/Mesin Fotostat	RM5.00/Unit
✓ Majalah	RM0.25/Kg	✓ Monitor	RM4.00/Unit
✓ Kertas hitam putih	RM0.30/Kg	✓ Komputer Riba	RM4.00/Unit
✓ Katak	RM0.35/Kg	✓ Server	RM15.00/Unit
✓ Kertas campur	RM0.20/Kg	✓ Pengimbas/Faks/Kamera	RM1.00/Unit
✓ Aluminium	RM2.00/Kg	✓ Televisyen	RM4.00/Unit
✓ Tin	RM0.30/Kg	✓ Scanner	RM1.00/Unit
✓ Plastik	RM0.40/Kg	✓ Mesin Faks	RM1.00/Unit
✓ Tetrapak	RM0.25/Kg	✓ Peti sejuk	RM4.00/Unit
✓ Minyak masak terpakai	RM1.50/Kg	✓ Mikrowav/Vacuum	RM1.00/Unit
✓ Lain-lain	RM0.20/Kg	✓ Wayar Campur/CD-Rom UPS	RM0.70/Kg
		✓ Bateri Kereta	RM1.00/Kg
		✓ Mesin Basuh	RM4.00/Unit
		✓ Smart/Normal Phone	RM5.00/Kg
		✓ Penghawa Dingin	RM15.00/Unit

\*Harga belian tertakluk kepada harga semasa

#jomrawatbumi #sustainability #beyondwastemanagement #3ROW  
Sebarang pertanyaan, sila hubungi: Cik Farah Diana (011-3785 2717)

**Integrated Recycling Campaign at Academy of Islamic Studies via Imarah Green Project of UM Eco-Surau APIUM (Universiti Malaya, Malaysia)**

Another new recycling campaign initiatives is manned by UM Living Labs (Imarah Green Project at Academy of Islamic Studies aim to promote and educate which eventually transform the role of Surau (Musolla) of Academy of Islamic Studies UM to incorporate a greener and sustainable practices). Features: Recycle Bins at the Recycling Centre and the launch of LESTARI Shop (Sustainable Shop) to resell preloved and reusable items at a lower price, on which the sales will be used to sustain the Imarah Green Project and for charity purposes in a long run. This project also actively creates recycling program on special day events such as Hari Gotong Royong Universiti Malaya and Hari Gotong Royong Akademi Pengajian Islam UM (APIUM).

Facebook page of Ijarah Eco-Friends Surau APIUM: <https://www.facebook.com/imarahecofriends/>  
<https://www.instagram.com/imarahecofriends/>



**UNIVERSITI OF MALAYA MEDICAL CENTRE**  
 Hann Juang Chai -hychai@ummc.edu.my-

**Submission of UM Monthly Recycling Activities Reporting - Faculty of Medicine**  
 3 messages

**FAIZATUL LELA BINTI JAFAR** -fela@um.edu.my- 2 March 2020 at 11:56  
 To: [ecocampus@um.edu.my](mailto:ecocampus@um.edu.my)  
 Cc: Prof Sumiani Yusoff -sumiani@um.edu.my, Manizamirah Azlan -manizamirah@gmail.com-, [hey.muddin@gmail.com](mailto:hey.muddin@gmail.com), WAN YUSOFF BIN WAN SULAIMAN -wanys@um.edu.my-, Hann Juang Chai -hychai@ummc.edu.my-

Assalamualaikum dan Salam Sejahtera,

Dear Secretariat,

On behalf of the Faculty of Medicine, I am pleased to submit the information/data on recycling activities for the month of January and February 2020 for your further action.

Thank you

Best Regards,  
**Faizatul Lela Jafar**  
 Occupational Safety & Health Unit  
 Faculty of Medicine  
 Scientific Officer (Biosafety Officer)  
 Institutional Biosafety & Biosecurity Committee (IBBC)  
 University of Malaysia  
 Office No: 03-79677509  
 HP No: 019-6045523

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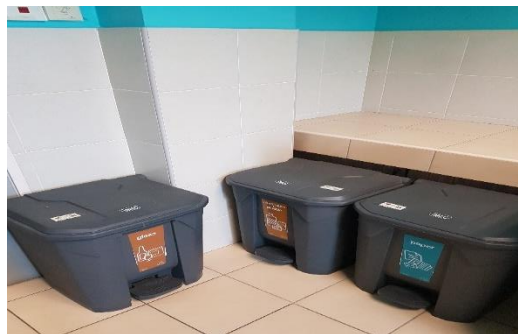
**BORANG KITAR SEMULA - FOM 2020.docx**  
 141K

**heyamuddin che haran** -heyamuddin93@gmail.com- 2 March 2020 at 17:16  
 To: **FAIZATUL LELA BINTI JAFAR** -fela@um.edu.my-,  
 Cc: **ECCOCAMPUS ADMINISTRATOR** -ecocampus@um.edu.my-, Prof Sumiani Yusoff -sumiani@um.edu.my-,  
 Manizamirah Azlan -manizamirah@gmail.com-, WAN YUSOFF BIN WAN SULAIMAN -wanys@um.edu.my-,  
 Hann Juang Chai -hychai@ummc.edu.my-

Wassalamu'alaikum,

Terima kasih atas data yang diberikan. Dibawah saya lampirkan borang kitar semula yang terkini untuk digunakan

**Faculty of Medicine UM & UM Medical Centre (PPUM)**



**Recycling bins at UM Bursar Department of Chancellory UM**



Official reporting communication through UMInfo platform on Top 5 Contributors to Recycling Campaign in UM

**Recycling Campaign conducted campus wide at PTJ level (Universiti Malaysia, Malaysia)**

## 1.2 PAPER AND PLASTICS REDUCTION PROGRAM ON CAMPUS

### Enforcement: "Banning of single use plastic by phases"

**3**

UNIVERSITI MALAYA

اوپن یونیورسٹی مالایا

UM.G/G7/2019/haf/NAS(2)  
25 Februari 2019

**PROFESOR DR. SUMIANI YUSOFF**  
Pengerusi, Sekretariat Eko-Kampus UM & Living Labs  
Pejabat Sekretariat Eko-Kampus UM,  
Aras 6, Kompleks Pengurusan Penyelidikan & Inovasi,  
Universiti Malaya

YBhg. Prof,

**MOHON SOKONGAN PELAKSANAAN LARANGAN PENGGUNAAN PLASTIK 'SINGLE-USE' DAN PENGASINGAN SISA MAKANAN DI UNIVERSITI MALAYA**

Dengan hormatnya saya merujuk kepada surat YBhg. Prof. Ruj. UM.TNC(2)/ECOCAMPUS/604 bertarikh 15 Februari 2019 berkenaan perkara di atas.

2. Pihak kami mengambil maklum perkara tersebut berkaitan inisiatif larangan penggunaan plastik 'single-use' dan pengasingan sisa makanan selaras dengan maklumat Universiti Malaya (UM) untuk mencapai Pembangunan Kelestarian (Development Sustainability) secara menyeluruh.

3. Sehubungan itu, pihak kami akan menambahkan maklumat dan syarat am di dalam dokumen-dokumen perolehan berkaitan perkhidmatan premis makanan kepada pengusaha premis makanan di Universiti Malaya yang dilantik.

4. Cadangan penambahan maklumat dan syarat am bagi Dokumen Sebutarga, Surat Tawaran & Dokumen Perjanjian adalah seperti di **LAMPIRAN 1**. Mohon maklumbalas lanjut pihak YBhg. Prof. sekiranya terdapat tambahan maklumat atau cadangan pindaan sekiranya ada sebelum kami menggunakan terma berkenaan.

Sekian, terima kasih  
Yang benar,  
**NOR AIZAH SUMBADI**  
Ketua Penolong Bendahari  
Bahagian Perolehan

S.k Timbalan Bendahari  
Bahagian Pengurusan Pembayaran & Kewangan Staf

JABATAN BENDAHARI  
Universiti Malaya, 50603 Kuala Lumpur, MALAYSIA  
03-7967 3268 Faks 03-7967 5567

**UM MANAGEMENT SUPPORT:  
PROCUREMENT DIVISION, BURSAR, UM  
(25 FEBRUARY 2019)**

**4**

UNIVERSITI MALAYA

اوپن یونیورسٹی مالایا

PROFESOR DR. FAISAL RAFIQ MAHAMUD ADIKAN  
Timbalan Naib Canselor (Pembangunan)

26 Mac 2019

Seperti di lampiran

Dato' / Prof. / Dr. / Tuan / Puan

**PELAKSANAAN DASAR LARANGAN PENGGUNAAN PLASTIK 'SINGLE USE' DAN PENGASINGAN SISA MAKANAN DI SEMUA KAFETERIA / PREMIS MAKANAN DI UNIVERSITI MALAYA.**

Dengan hormatnya saya merujuk berkaitan perkara di atas.

2. Dimaklumkan, pihak JPPHB dan Pihak Sekretariat *Eco-Campus* komited dalam melaksanakan dasar Kerajaan ke arah 'Malaysia Roadmap Towards Zero Single-Use Plastics 2018-2030'. Oleh yang demikian, dilampirkan inisiatif yang dirangka untuk mendukung dasar tersebut.

NO.	INISIATIF	PIC	LAKSANA
1.	FASA 1 - Larangan penggunaan straw plastik di semua kafeteria dan premis makanan di Universiti Malaya.	PTJ Bertanggungjawab	1/4/2019
2.	FASA 1 - Saranan dan sokongan amalan penggunaan bekas makanan dan minuman yang dibawa sendiri untuk tujuan pembungkusan makanan ( <i>Tapaw</i> ) melalui Minggu Haluansiswa dan UMInfo.	PTJ Bertanggungjawab	1/4/2019
3.	FASA 1 - Mengeluarkan arahan / memasukkan dalam kontrak kantin kepada pengusaha kantin supaya menyediakan tong sisa makanan dan melaksanakan pengasingan sisa makanan.	PTJ Bertanggungjawab	1/4/2019
4.	FASA 1 - Galakkan penggunaan plastik pembungkus makanan mesra alam. (biodegradasi / beg kertas) melalui Minggu Haluansiswa dan UMInfo.	PTJ Bertanggungjawab	1/4/2019
5.	FASA 1 - Promosi penggunaan 'Zero Plastic' dan lain-lain promosi berkaitan kepada pelajar melalui Minggu Haluansiswa dan UMInfo.	PTJ Bertanggungjawab	Berterusan
6.	FASA 1 - Mengadakan program khas melibatkan pelajar bagi promosi 'Zero Plastic' di kantin-kantin.	PTJ Bertanggungjawab	Berterusan
7.	FASA 2 - Penguatkuasaan denda bagi pengusaha yang menggunakan pembungkus makanan plastik bukan dari jenis mesra alam.	PTJ Bertanggungjawab	1/1/2020
8.	FASA 2 - Penguatkuasaan denda bagi pengusaha yang tidak melaksanakan pengasingan sisa makanan.	PTJ Bertanggungjawab	1/1/2020

**UM TOP MANAGEMENT SUPPORT:  
DEPUTY VICE-CHANCELLOR  
(DEVELOPMENT)UM  
(26 MARCH 2019)**

1

**Campaign: "Awareness advertisement to reject the use of 3 major plastic waste"**

**Campaign: "Refuse the single use plastic straw at cafeteria"**



2

Seleraku is feeling motivated. Just now

Bermula Isnin 18 Mac, kafe Seleraku tidak akan menyediakan straw minuman untuk pelanggan, demi menyahut saranan pengurangan sisa plastik, dan menyokong inisiatif EcoCampus Universiti Malaya.

#taknakstraw #sayNOtoplastic



3

Campaign: "Plastic-free in UM Medical Centre"



4

Campaign: "Students campaign against single use plastic"



5

Precious Plastic project by Universiti Malaya community & UM Water Warriors



6

### Recycling competition



7

### Campaign: "Do not print this email"

[EUROPA Awards for Sustainability 2018] Calling for nomination Inbox x

**MOHD FADHLI BIN RAHMAT FAKRI** <mfadhli@um.edu.my>  
to ZEEEDA, SUGUMARAN, Aftan, Aslan, Benjamin, Nurul, tankairan, AIREEN

Dear all,

I'm writing you this email in order to get an updated information of your projects to collectively nominate our senior UM Living Labs available at: <https://www.euroawardsmalaysia.eu/>.

However, **all UM nominations will be processed by us (UMCIC and UM Eco-Campus Secretariat Office)**. Both, Dr. Lee Ch decided that UM will go for 2 categories this year: **Best Innovation in Sustainability & Best Environmental Impact**.

Hence, **please fill up the nomination template that we have created for you** (please do not submit the nomination via online your behalf).

FYI, all nominations will be processed collectively as a group nominations under UM as applicant. **Please return the complete for evidence can be emailed together with the complete form.**

Your cooperation is highly appreciated. **Please do not hesitate to contact me via whatsapp (017-2262586) for any urgent**

I'm 'practically' not available as we are in the middle of collating + analyzing data for UJ GreenMetric and assisting UMCIC for IJEM some time to visit UM booth from 17-20 October 2018 (due to budget constraint, this year we only have a 3 x 3 normal booth) but at: <https://www.ijem.my>

Thanks.

**MOHD FADHLI BIN RAHMAT FAKRI**  
UM Eco-Campus Secretariat Office &  
UM Sustainable Campus Secretariat Office (UM-SCSO)

Please consider the environment before printing this email



<https://www.um.edu.my/about-um/umiqua/sustainability@um>  
<http://umsdan.strikingqv.com>

8

**Paper-Savings & Printing Policy**

### Campaign: "Reused paper for printings"



9

**Reusable Bags from Banner & Bunting Materials to reduce plastic usage in campus**





10



11

**“Scheduled ‘No Plastic Bag’ Day at Cafeteria/Grocery Shop & Scheduled ‘No Plastic Bag’ Day with option: Charge per plastic at Residential College’s cafeteria**



Hand-dryer



QR Code Attendance

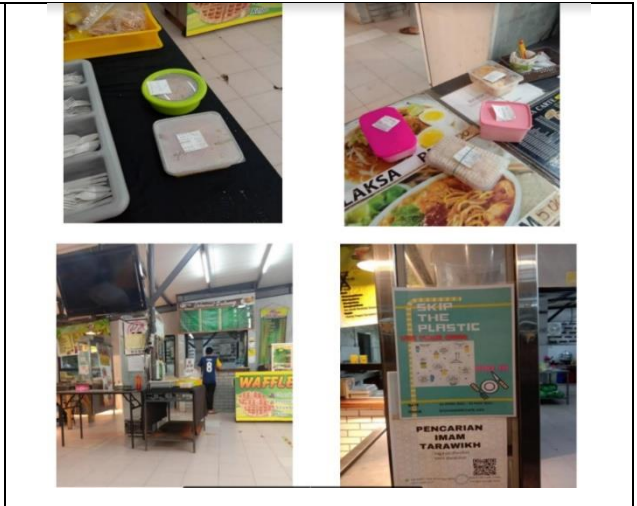


E-Voting System for Campus Election

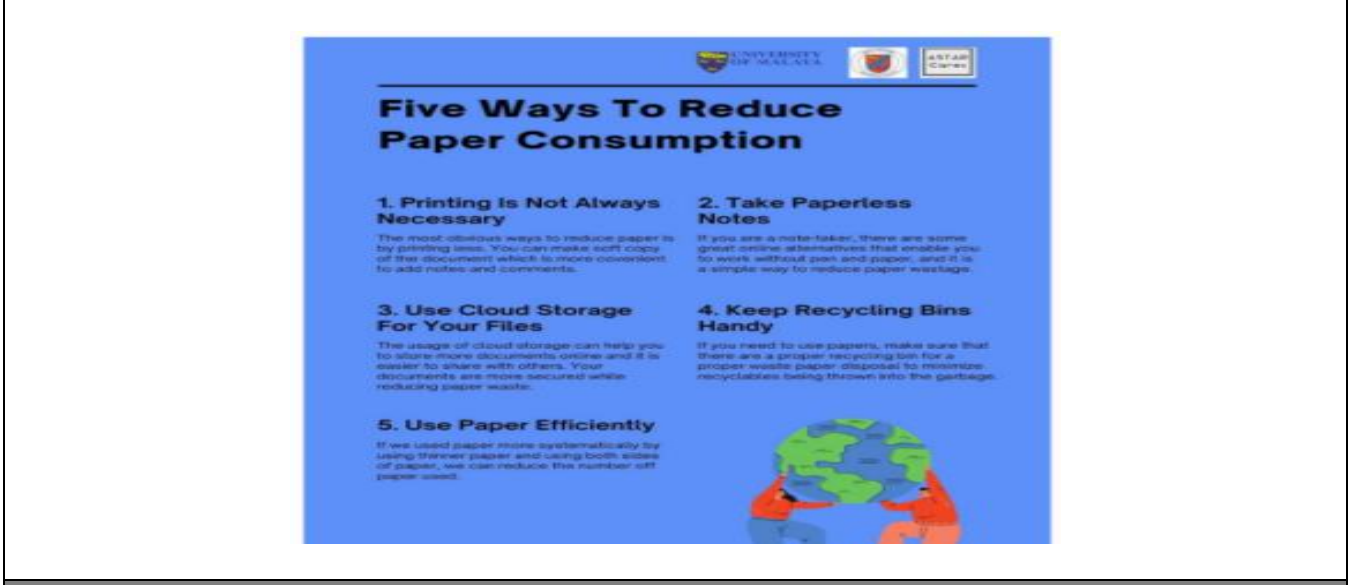




16



17



18



19

**Programs to Reduce the Use of Paper and Plastic in Campus (Universiti Malaya, Malaysia)**

**Description of Program to Reduce the Use of Paper and Plastic on Campus:**

1. **Enforcement: “Banning of single use plastic by phases”:** Enforcement from UM top management by introducing an enforcement to ban single use plastic by phases to UM community
2. **Campaign: “Awareness advertisement to reject the use of 3 major plastic waste”:** Advertisement that helps to increase awareness among UM community about banning the use 3 major type of plastic waste

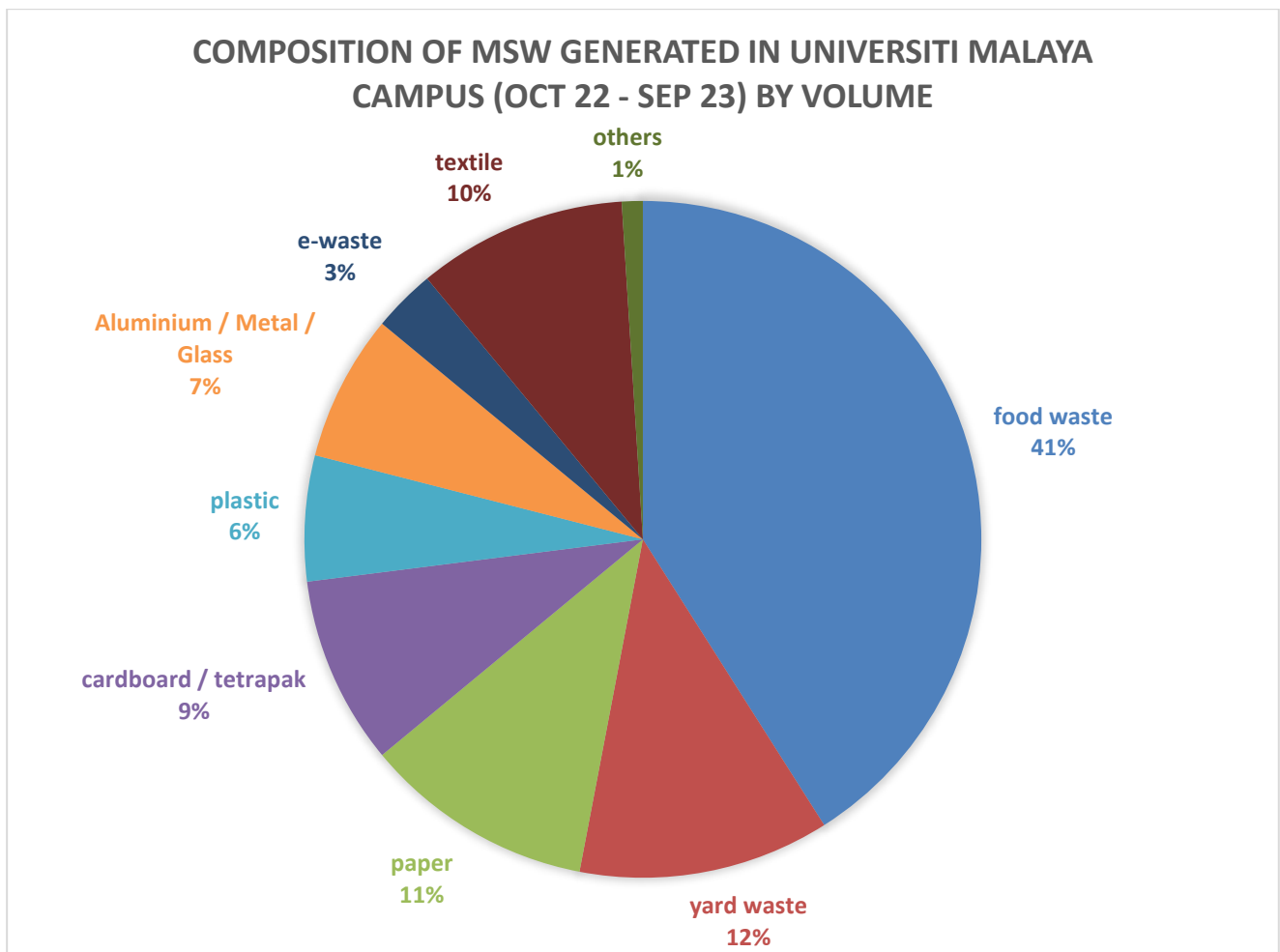
3. **Campaign: “Refuse the single use plastic straw at cafeteria”:** A campaign at cafeterias in UM campus to support UM effort in reducing the use of plastic. Some cafeterias use paper straw as an alternative to the banning of plastic straw and some cafeterias simply stop providing straw.
4. **Campaign: “Plastic-free in Universiti Malaya Medical Centre”:** A campaign to encourage visitors to reduce the use of plastic. A few buntings and wall posters were located around Universiti Malaya Medical Centre
5. **Campaign: “Students campaign against single use plastic”:** Volunteers with different backgrounds (some are students, some are staff) creatively create their own awareness poster and went to potential location such as cafeterias where most of plastic waste is generated
6. **Precious plastic project by Universiti Malaya community:** Universiti Malaya students and staff were invited to create anything from plastic bottle cap.
7. **Recycling competition:** The competitions were opened to all UM community. It highlights the importance of recycling awareness attitude and creates innovative idea of waste recycling effort.
8. **Campaign: “Do not print this email”:** to reduce the paper usage for printings, only important and official documents/emails should be printed
9. **Campaign: “Reused paper for printings”:** paper savings initiative by encouraging users to reused papers for printing
10. **Paper-Savings & Printing Policy:** this policy is intended to encourage savings on printing and paper expenses (double sided printing, print in draft-mode, only print important documents, reused papers for unofficial documents)
11. **Reusable Bags from Banner & Bunting Materials to reduce plastic usage in campus:** encourage campus community to reduce single-use plastic bags by adopting upcycled bags from event banners and bunting materials. More and more campaign to use e-banner instead of printed version are encouraged for events in UM
12. **Scheduled ‘No Plastic Bag’ Day at Cafeteria/Grocery Shop:** Campus community are encourage to practice a day without plastic at cafeteria / grocery shop for example: minimizing the usage of food/drink packagin. However, some cafeterias provide alternative by charging the customers 20 cents per plastic
13. **Hand-dryer:** Alternative for campus community to reduce the use of paper-tissue at washrooms.
14. **QR Code Class Attendance:** This initiative have been practiced at several faculties: Faculty of Engineering & Faculty of Computer Science and Information Technology (FCSIT) in order to reduce paper-based attendance.
15. **E-Voting System:** The online voting system have been practiced in UM for campus students election in order to reduce paper usage
16. **UM joined Plastic Disclosure Project by UNEP and Ministry of Environment & Water (KASA)**
17. **Skip the Plastic Campaign at UM Residential Colleges Cafeteria:** Students and staff are encouraged to bring their reusable food container, certain cafeteria is offering discounts for take away with reusable food / drink containers.
18. **Paper Consumption Reduction Campaign by 1<sup>st</sup> Residential College**
19. **No plastic straws campaign at Cafeteria of 4<sup>th</sup> Residential College:** 50 cents will be charged if customers require paper straw as alternative. This is collaborative program with 2 respective cafeteria vendors: Cafeteria De Daun and Cafeteria Tok Gajah located at 4<sup>th</sup> Residential College to support the banning of single use plastics on campus.

### 1.3 TOTAL VOLUME ORGANIC WASTE PRODUCED

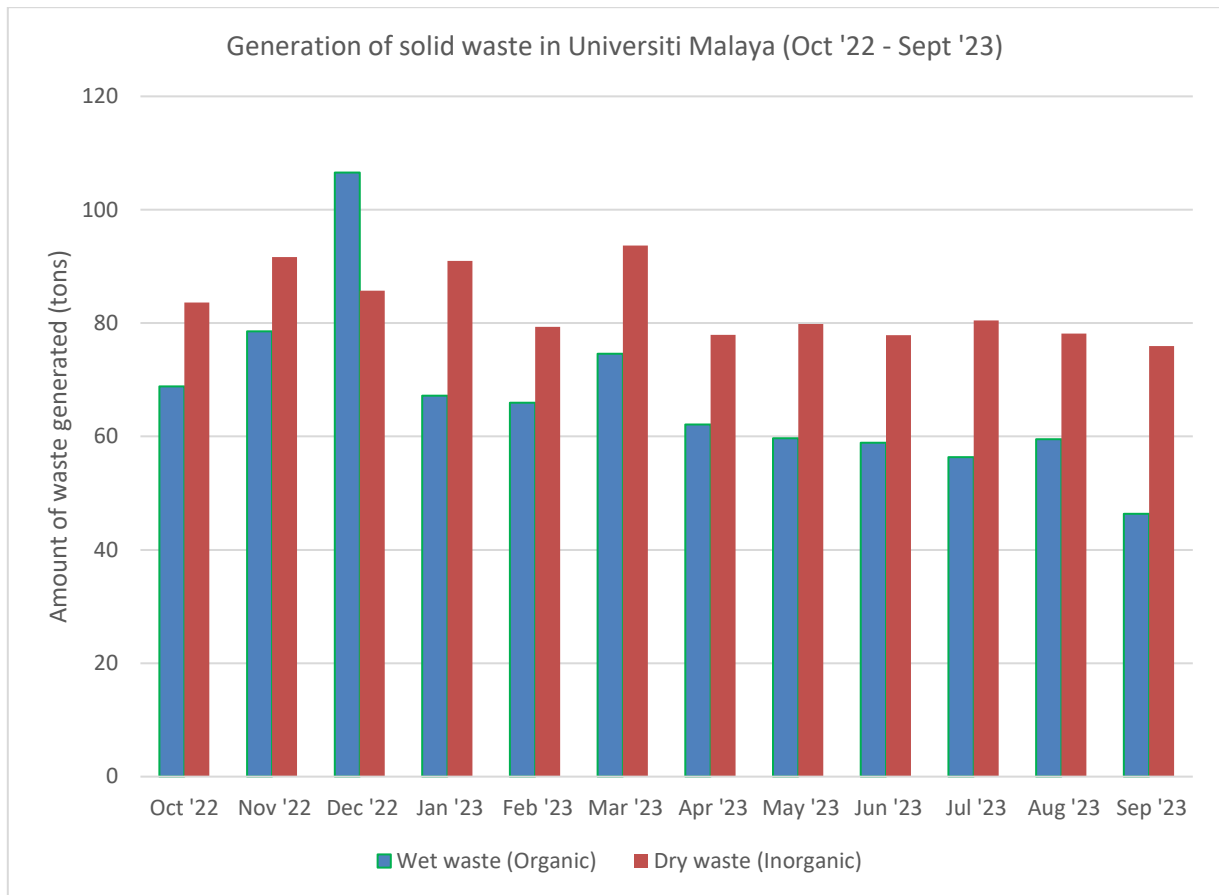
It is reported that from October 2022 until September 2023, Universiti Malaya (UM) has generated 800 tons of organic waste that comprises of 400 tons of food waste, 180 tons of green waste, and 220 tons of wood waste. Figure 3.3.1 shows the trend of organic waste generated in UM. July until September 2023 shows a great decline in waste generation due to the semester break (absence of students in campus).

**Table 3:** Type of Organic Waste in UM

Type of organic waste	Total Produced (ton)
Food waste	400
Green waste	180
Wood waste	220



**Figure 3:** Composition of solid waste in Universiti Malaya by volume



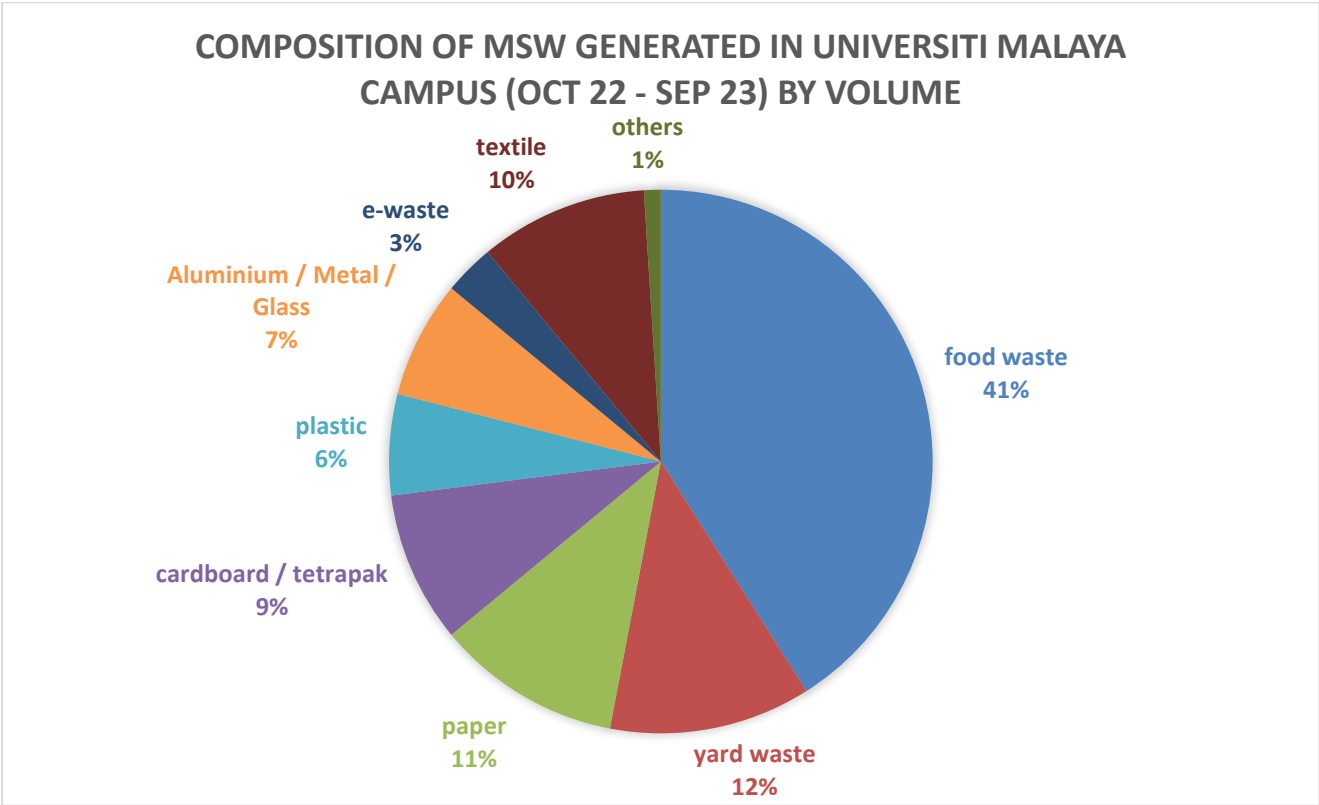
**Figure 4:** The trend of organic waste generated in Universiti Malaya

#### 1.4 TOTAL VOLUME ORGANIC WASTE TREATED

**Table 4:** Type of Organic Waste Treated in UM

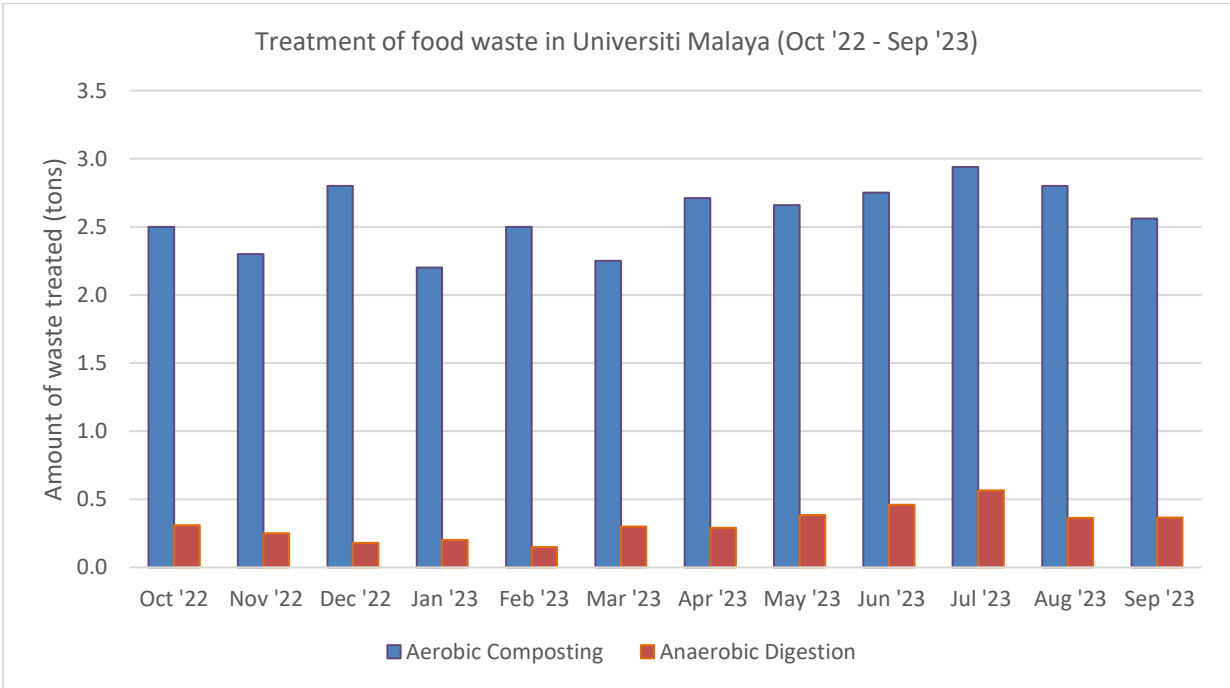
Type of waste	amount (ton)			
	total	reduced	reused	Recycled (treated)
<b>Organic</b>	800			46.5 (5.8%)
- food waste	400			34.1 (8.5%)
- leaf & branches	180			12.4 (3.1%)
- wood waste	220			0

Figure 5 shows the composition of solid waste on UM campus. Yard waste that is potentially recycled in UM campus only comprises of yard waste such as leaves and branches.



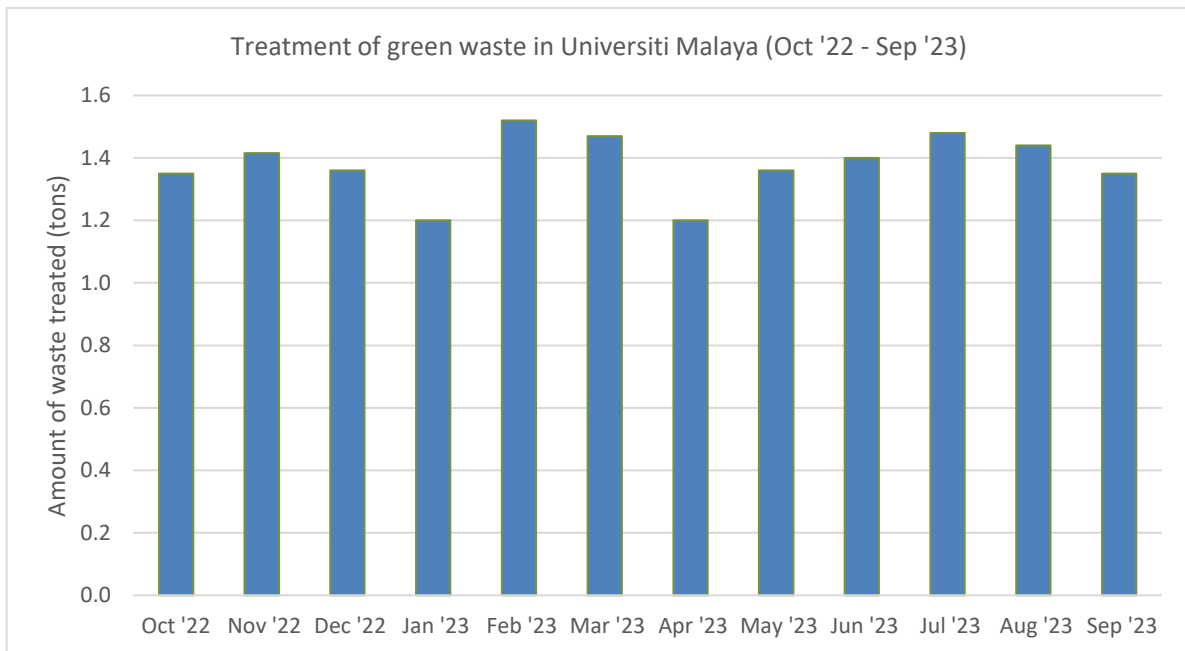
**Figure 5:** Composition of solid waste in Universiti Malaya by volume

Of the total of 400 tons of food waste produced, 34.1 tons (8.5%) is treated via Aerobic composting and Anaerobic digestion that **offsets 433,207 kgCO<sub>2</sub>-eq of carbon emission** from being released to the atmosphere. Figure 3.4.2 shows the trend of food waste treatment conducted in Universiti Malaya from October 2022 until September 2023.



**Figure 6:** Treatment of food waste in Universiti Malaya (Oct '22 – Sep '23)

Of the total of 400 tons of green waste produced, 12.4 tons (3.1%) are treated via Aerobic composting that offsets 12,414 kgCO<sub>2</sub>-eq of carbon emission from being released to the atmosphere. Figure 3.4.3 shows the trend of green waste treatment conducted in Universiti Malaya from October 2022 until September 2023.



**Figure 7:** Treatment of green waste in Universiti Malaya (Oct '22 – Sep '23)

### 1.5 ORGANIC WASTE TREATMENT

In Universiti Malaya (UM), most of food waste is generated from canteens and cafeterias. The food waste generated comes in two types; one is completely separated waste, food waste and other waste and second one is co-mingled waste. Those waste will be collected by UM contractors that in charge in UM waste collection, to send to the UM Waste Transfer Station (UM WTS) before further separated at composting site at the UM WTS. Process of waste separation (between food waste and other waste) is conducted by the contractors that are assigned at the UM WTS to handle integrated solid waste management. Food waste will be unloaded into composting pile together with garden waste collected from the whole UM campus. The composting process uses the concept of manual open-air composting which will save UM electricity while generating income to the University from the selling of bio compost produced from the composting process. Besides composting, UM also treats UM organic waste via anaerobic digestion that produce biogas and liquid fertilizer.

UM Zero Waste Campaign (UM ZWC) biowaste treatment center that located at UM WTS is the pioneer project of UM Living Lab in UM campus, with an integrated system of composting and anaerobic digestion. The composting project was initiated in year 2011 with a capacity of 3 tons of organic waste (food waste and green waste) per month and the capacity has been increasing over the years. **Currently, the capacity of organic waste that is being treated in UM is about 7-10 tons per month.** With food waste separation at source program and organized green waste separate collection, the biowaste treatment in UM becomes a local reference project for municipal biowaste recycling for its extensive credibility and performance. Since inception until now, **more than 661.11 ton of biowaste has been converted into bio compost and biogas.**







**Municipal Biowaste Treatment at Universiti Malaya by UM Zero Waste Campaign  
(Universiti Malaya, Malaysia)**

## OUR PRODUCT SPECIALTY

- 100% produced from UM food & green wastes.
- NO chemicals involved in making this product.
- Suitable for all types of plants, vegetables, fruits, & trees.
- Enrich soil content with plenty of nutrients.
- Improve plant's growth rate.
- No uncomfortable smell.
- Support conversion of UM waste to resource.
- Reduce UM environmental burden & impact.

## INSTRUCTION TO USE

- Add regular soil to UM ZWC organic compost fertilizer (using ratio regular soil 9:1 UM ZWC organic compost fertilizer) and mix it well.



### FURTHER DETAILS

**PROFESSOR DR. SUMIANI YUSOFF**  
Principal Investigator & Coordinator,  
UM Zero Waste Campaign (UM ZWC)

Hisyam: 011-16944702

Mai: 011-33440310

Fadhli: 03 - 7967 4635

Visit Universiti Malaya  
Zero Waste Campaign (UM ZWC),  
50603 Kuala Lumpur



## BAJA ORGANIK KOMPOS UM ZWC

UNIT	PRICE
1KG	RM5
15KG	RM70

# UM FOOD WASTE SEPARATION AT SOURCE PROGRAM

**BRING YOUR FOOD WASTE TO UM ZWC COLLECTION SITE**  
We accept all types of food waste

**WEIGH YOUR FOOD WASTE ON PROVIDED SCALES**  
100g = 1 Point

**SNAP A PHOTO**  
As a proof and upload it via QR code registration

**SCAN QR CODE & FILL IN THE FORM**  
For us to keep your data and update you the points via email

**SENT!**  
Points will be accumulated on every Friday at 5.00 pm via email

**BE REWARDED!**

8KG OF FOOD WASTE = 80 POINTS

10KG OF FOOD WASTE = 100 POINTS

**UNIVERSITI MALAYA**  
Contact Us

PROFESSOR DR. SUMIANI YUSOFF  
Principal Investigator & Coordinator,  
UM Zero Waste Campaign (UM ZWC)

Hisyam: 011-16944702  
Mali: 011-33440310  
Fadhli: 03-79674635

**UM ZERO WASTE CAMPAIGN**

## Food waste separation at source campaign & organic compost produced by UM Zero Waste Campaign (Universiti Malaya, Malaysia)

These initiatives not only avoiding 3,975,341 kgCo<sub>2</sub>-eq of carbon emission from being released to the atmosphere but also have been a source of income generation to the UM. UM has generated more than RM58,000 from the sale of organic compost and the training on organic waste composting and food waste anaerobic digestion.

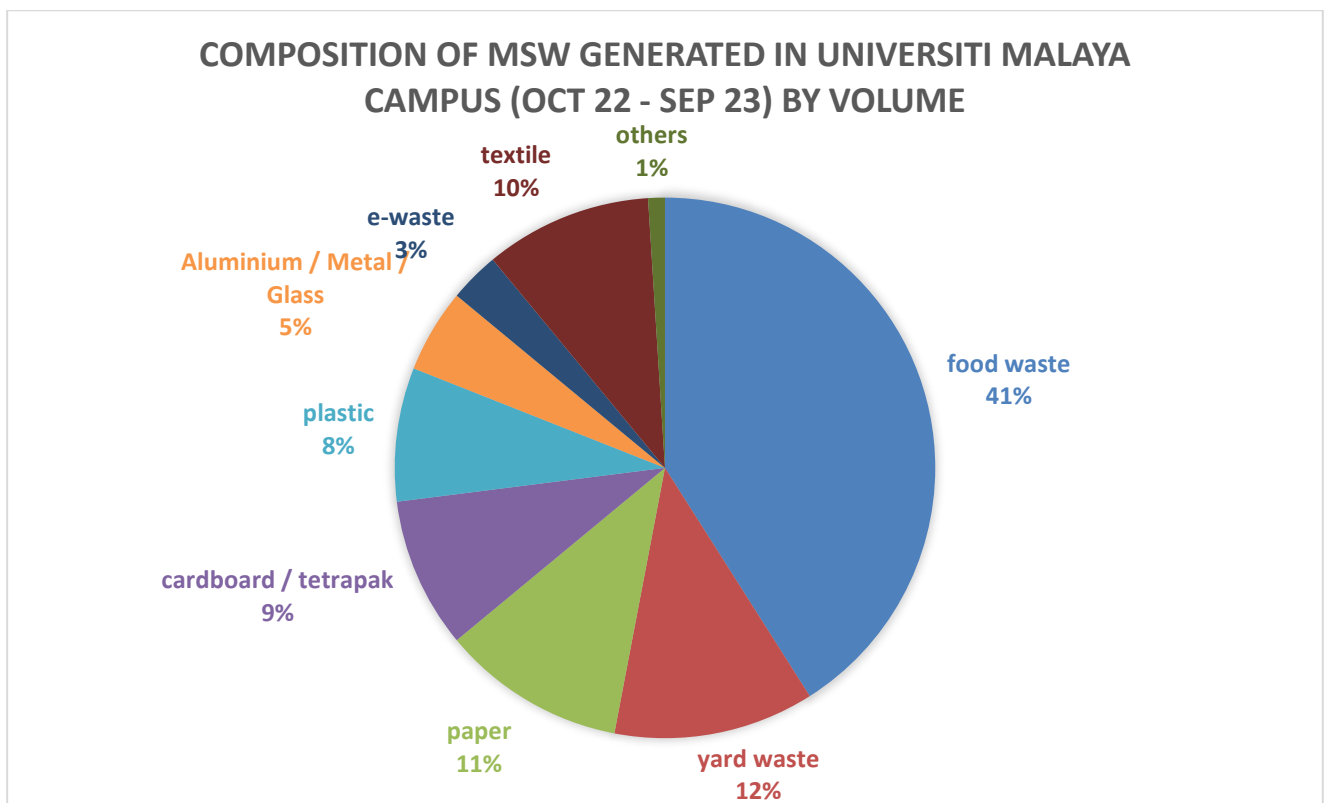
Continuous promotion / advertisement about bio compost produced from this project was blasted through campus email to increase awareness amongst students and staff about the importance of separation at source while increasing the sale of bio compost. Occasionally, this project will also organize a 'game' of food waste recycling to promote separation at source activity.

### 1.6 TOTAL VOLUME INORGANIC WASTE PRODUCED

Inorganic waste produced in Universiti Malaya campus comprises of paper (newspaper and mixed paper), plastic (PET, HDPE, PP), cardboard / tetrapak, textile, aluminium, metal, glass, e-waste, and others (mixed recyclables). Figure below shows the composition of inorganic waste produced based on waste audit conducted by researchers in UM in 2022 and 2023. Total of inorganic waste produced from October 2022 until September 2023 is 753.3 tons with an average of 62.8 tons per month.

**Table 5:** Type of Inorganic Waste in UM

Type of Inorganic Waste	Total Produced (Ton)
- paper	82.86
- plastic	60.26
- cardboard / tetrapak	67.80
- textile	75.33
- aluminium / metal / glass	77.67
- e-waste	22.60
- others	7.53



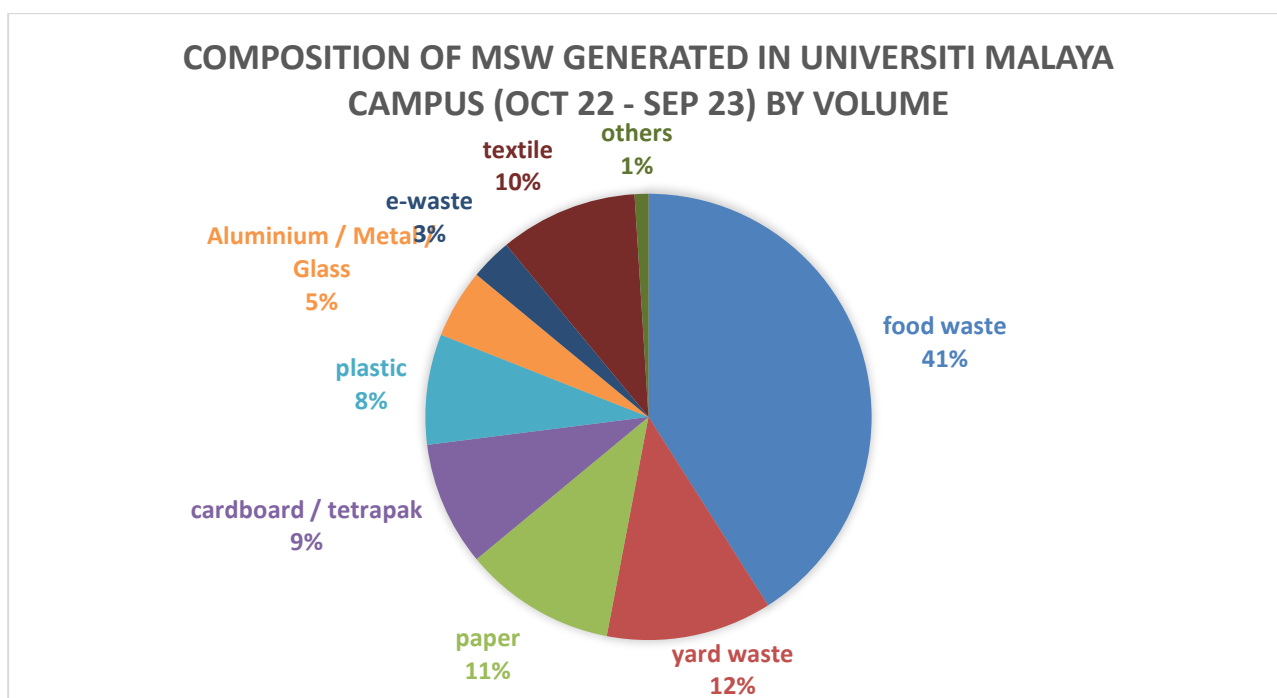
**Figure 8:** Composition of Municipal Solid Waste generated in Universiti Malaya campus (October 2022 – September 2023)

### 1.7 TOTAL VOLUME INORGANIC WASTE TREATED

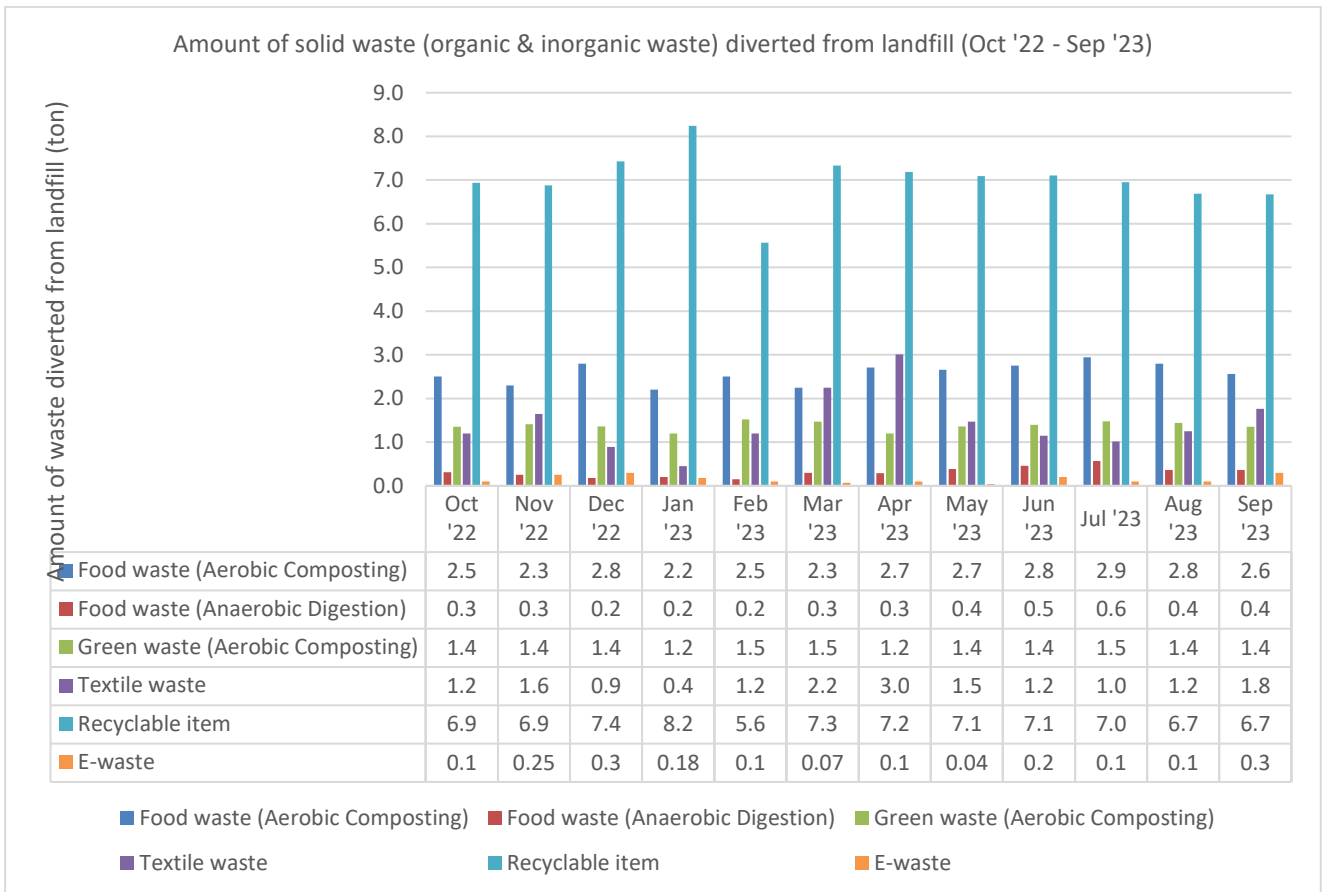
Inorganic waste produced in Universiti Malaya campus comprises of paper (newspaper and mixed paper), plastic (PET, HDPE, PP), cardboard / tetrapak, textile, aluminium, metal, glass, e-waste and others (mixed recyclables). Figure below shows the composition of inorganic waste produced based on waste audit conducted by researchers in UM in 2022 and 2023. Total of inorganic waste produced from October 2022 until September 2023 is 753.3 tons with an average of 62.8 tons per month.

**Table 6:** Total Volume of Inorganic Waste Treated in UM

Type of waste	Amount (ton)				
	total	reduced	reused	down-cycled	up-cycled
<b>Inorganic Non-Toxic</b>	<b>394.05</b>		<b>13.6</b>	<b>62.8</b>	<b>40</b>
- paper	82.86			18.63	
- plastic	60.26			13.66	
- textile	75.33		13.6		
- cardboard / tetrapak	67.80			15.39	
- aluminium / metal / glass	77.67			8.37	40
- e-waste	22.60			5.13	
- others	7.53			1.62	



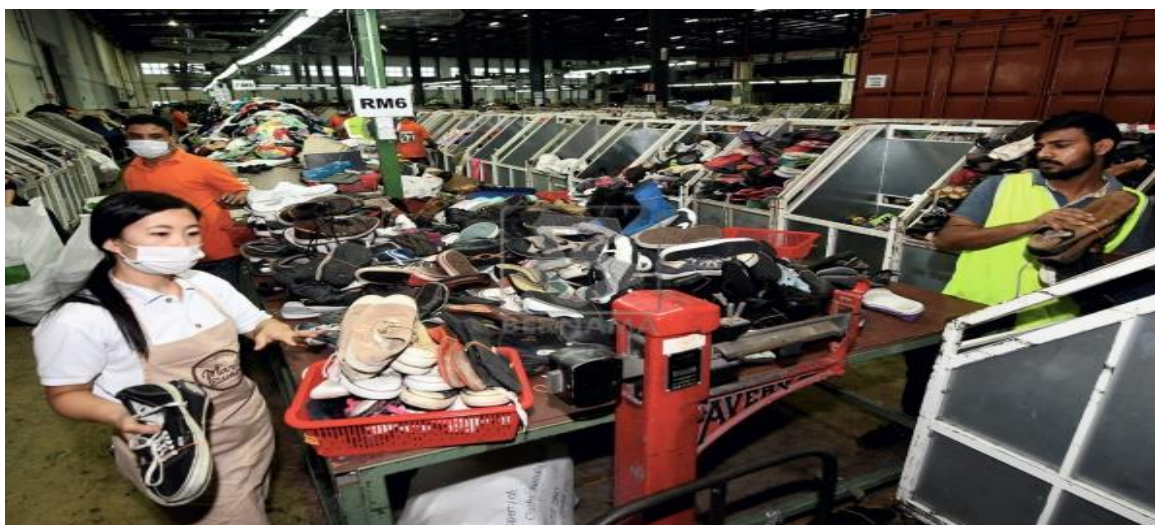
**Figure 9:** Composition of Municipal Solid Waste generated in Universiti Malaya campus (October 2022 – September 2023)



**Figure 10:** Amount of solid waste diverted from landfill (October 2022 – September 2023)

According to the report by UM Zero Waste Campaign (UM ZWC) (Figure 3.7.2), it is shown that 29.5% of inorganic waste produced is being recycled! Here's the division of the recycling of the inorganic waste produced: (a) 13.6 tons of textile waste is being reused, (b) 62.8 tons of recyclable items are being downcycled by selling those items to the recycling vendors, and (c) 40 tons of old bus in UM campus is being upcycled into Airbnb.

(a) Waste that is reused: 13.6 tons of textile waste.



(b) Waste that is downcycled: 62.8 tons of standard recyclables including paper, cardboard, tetrapak, plastic, aluminium, glass, metal and e-waste.



(c) Waste that is upcycled: 40 tons of old bus (campus bus)

From this:



To this:





## 1.8 INORGANIC WASTE TREATMENT

Universiti Malaya has introduced many channels for recycling in campus. The descriptions for each photo are as below:

- (a) There are 8 Used Clothes and Shoes recycling bins placed around UM campus. This initiative is a result from partnership with local NGO, LifeLine Clothing (LLC) that aims to reduce textile waste from going to landfill.
- (b) Precious plastic project by Universiti Malaya community: Universiti Malaya students and staff were invited to create anything from plastic bottle cap.
- (c) Organizing monthly buy-back program, placing recycling bins around campus and installing preloved donation thru to collect all the recyclable items in UM campus and down-cycled them by selling to the recycling vendor.
- (d) UM old bus restoration into Airbnb: The converted UM bus is one of the oldest buses on campus. We finally decided on the lodging to generate some income for our campus environmental activities. The bus can also be used for environmental education classes, hosting meetings, mini birthday celebrations/gatherings and more.
- (e) Upcycling of old tyres into recycling bins: Initiative by Department of Physics (Faculty of Science) that upcycle old tyres into recycling bins and also rewarded the cleaners that involve in recyclable collection in the building.

These recycling initiatives not only saved Universiti Malaya about RM 9,235.33 (USD 1938.65) of waste disposal cost but also has generated almost RM 30,056.00 (USD 6309.25) from the recyclable sale. From an environmental aspect, this initiative has reduced 255,000 kg CO<sub>2</sub> -eq of carbon emission.

**Table 7:** Price of each type of recycled waste

Types of waste	Price (RM)	Unit
<b>GENERAL WASTE</b>		
Newspaper	0.25	Kg
Magazine	0.25	Kg
Paper (Black and White)	0.30	Kg
Box	0.25	Kg
Mixed paper	0.20	Kg
Aluminium	2.30	Kg
Can	0.30	Kg
Plastic	0.35	Kg
Tetrapak	0.30	Kg
Used cooking oil	1.10	Kg
<b>ELECTRONIC WASTE</b>		
CPU	5.00	Unit
Monitor	4.50	Unit
Laptop	3.50	Unit
Sever	15.00	Unit
Printer	3.00	Unit
Television	4.00	Unit
Scanner	1.00	Unit
Fax	1.00	Unit
Refrigerator	4.50	Unit
Microwave	3.00	Unit
Car Battery	1.00	Unit

Example of communication materials in the form of posters for recycling and buyback program organized in Universiti Malaya campus on monthly basis.

**'19th RECYCLING & BUYBACK PROGRAM' IMPACT (AUGUST 2023)**

**642.8 kg**  
Total waste recycled by UM community

**RM 214.27**  
Income generation from the sale of recyclables

**1,402 kg CO<sub>2</sub>-eq**  
carbon emission avoided in August 2023 which equivalent to:

- 67 of matured Pine trees that absorb CO<sub>2</sub> in 1 year!
- OR
- 606 Liter consumption of petrol!
- OR
- 3,785 kWh consumption of electricity!

Organized by: **UM ZERO WASTE CAMPAIGN**  
In collaboration with: **UMSDC & JPPHB**

SUSTAINABLE DEVELOPMENT GOALS: 11, 12, 13, 17

**RECYCLE YOUR USED COOKING OIL**

**UMZWC Buy Back Program**  
@ Car Parking Padang C, UM  
25th October 2023  
10.00 am - 3.00 pm

**WE ARE BUYING AT**  
**RM 1.80/kg**

Sustainable Event by: **UM ZERO WASTE CAMPAIGN**, **JPPHB**, **UMSDC**

**PROGRAM KUTIPAN & BELIAN BARANGAN KITAR SEMULA**

Kumpul dan jual barang kitar semula anda kepada kami!  
Let's do something today that our future selves will thank us for

**JENIS BARANGAN & HARGA\***

Jenis barang	Harga/kg
Kertas	0.20
Surat Khabar	0.20
Kotak	0.20
Tetrapak	0.20
Minyak masak terpakai	1.80
Botol minuman (plastik)	0.10
Plastik keras	0.20
Aluminium	2.00
Tin	0.20
Besi	0.40
Sisa Elektronik	0 - 3.00

**BRING YOUR RECYCLABLES & GET REWARDED**

**JOIN US IN UM ZERO WASTE CAMPAIGN (UM ZWC)**

**'20th RECYCLING & BUYBACK PROGRAM'**

**25th OCTOBER 2023 (Wednesday)**  
10.00 am - 3.00 pm  
at UM open gym calisthenics parking area, Universiti Malaya

**EVERY RECYCLABLE WILL BE REWARDED IN CASH!**

FOR MORE INFORMATION CONTACT US:  
+03-7967 4635 / 011-33440310  
zerowastecampaign@um.edu.my

Coordinated by UM Zero Waste Campaign (UM ZWC), UM Sustainability and Development Centre (UM SDC) with support of Department of Development & Estate Maintenance (JPPHB) Universiti Malaya

SUSTAINABLE DEVELOPMENT GOALS: 11, 12, 13, 17

**JOM KITAR SEMULA!**

**PROGRAM KUTIPAN & BELIAN BARANGAN KITAR SEMULA**

**Waktu : Rabu (25 Oktober 2023)**  
**Masa : 10.00 pagi - 3.00 petang**  
**Tempat : Ruang Parkir Padang C UM (Waze: open gym calisthenics UM)**

SCAN ME FOR LOCATION

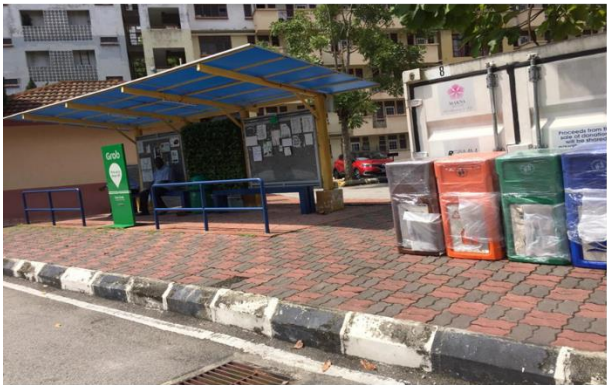
SCAN ME FOR LOCATION

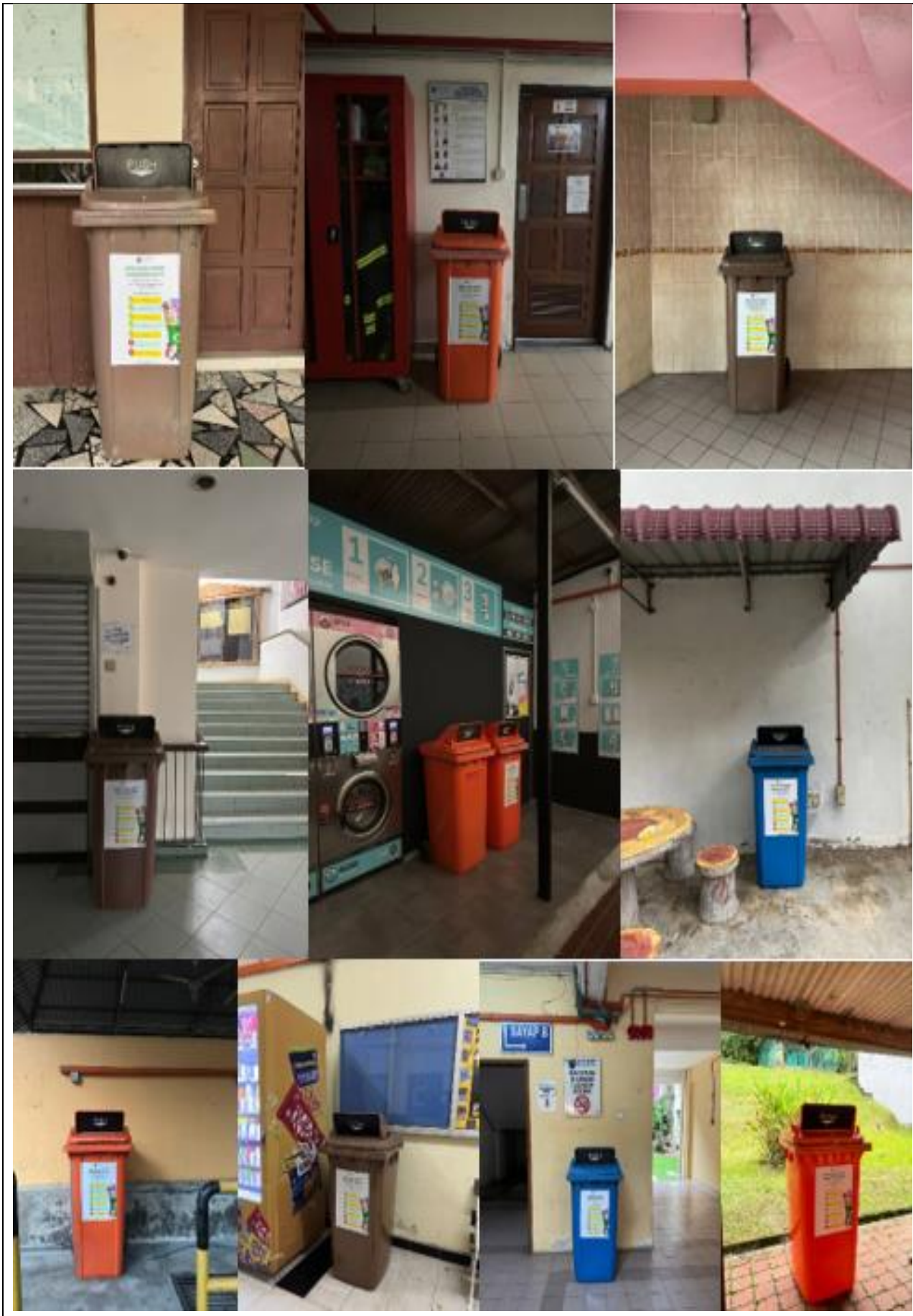
Anjuran UM Zero Waste Campaign (UM ZWC) dan Pusat Pembangunan Kelestarian Universiti Malaya (UM SDC) dengan kerjasama Jabatan Pembangunan dan Pengurusan Harta Benda (JPPHB) Universiti Malaya













**Example of Inorganic Waste Collection: Used clothes reuse/recycle, preloved donation thru, e-waste recycling, recyclable materials collection, conversion of old bus into Airbnb and upcycling of old tyres into recycling bin (Universiti Malaya, Malaysia)**



## 1.9 TOTAL VOLUME TOXIC WASTE PRODUCED

Universiti Malaya produced tonnes of toxic waste annually, and this waste can be categorised into three (3) main group:

- A. Chemical waste
- B. Clinical/ Pathogenic waste
- C. Electronic waste (e-waste)



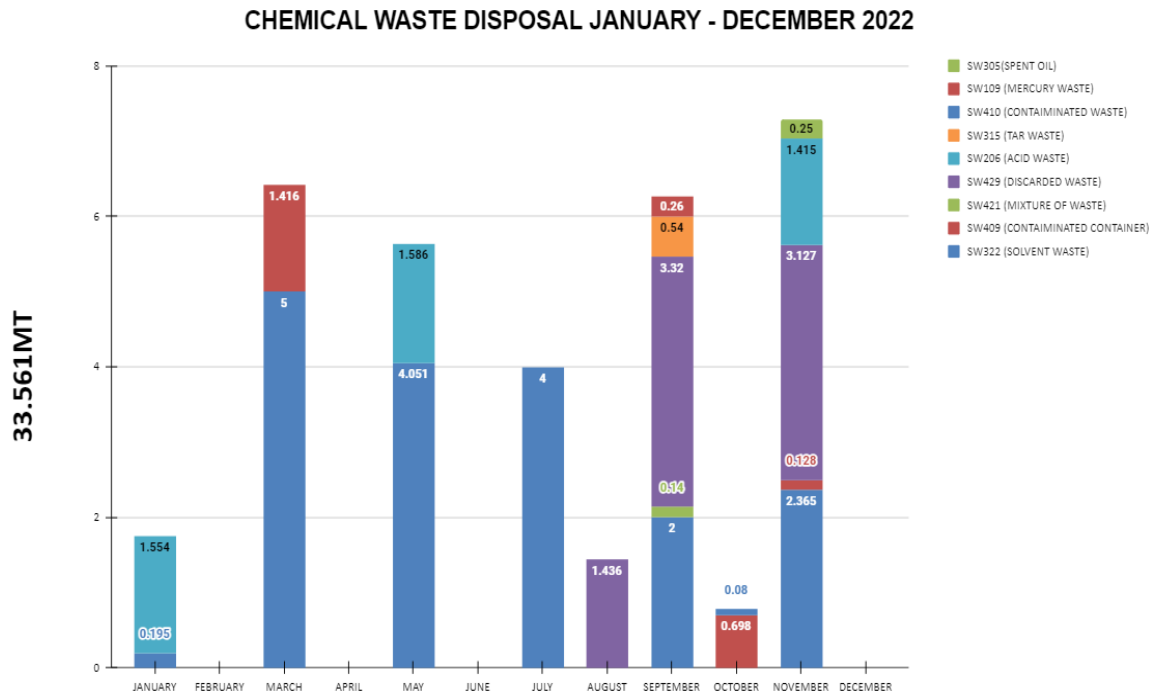
**Figure 11:** Toxic Waste Generated In Universiti Malaya (2022)

### A. Chemical Waste

Chemical waste in UM are varies based on the usage and final by-products produced in every Faculty respectively. The chemical wastes that were generated in UM can be categorized into several groups, namely:

- 1) Mercury Waste - SW109
- 2) Acid Waste - SW206
- 3) Spent Oil - SW305
- 4) Tar Waste - SW315
- 5) Solvent Waste - SW322
- 6) Contaminated Container - SW409
- 7) Contaminated Cloth/Gloves - SW410
- 8) Mixture of Chemical Waste - SW421
- 9) Expired/ Discarded Waste - SW429

In 2022, total amount of chemical waste that have been produced from Universiti Malaya was 33.561 metric tonne (MT) as shown from the graph below:



**Figure 12: Chemical Waste Generated in Universiti Malaya (2022)**

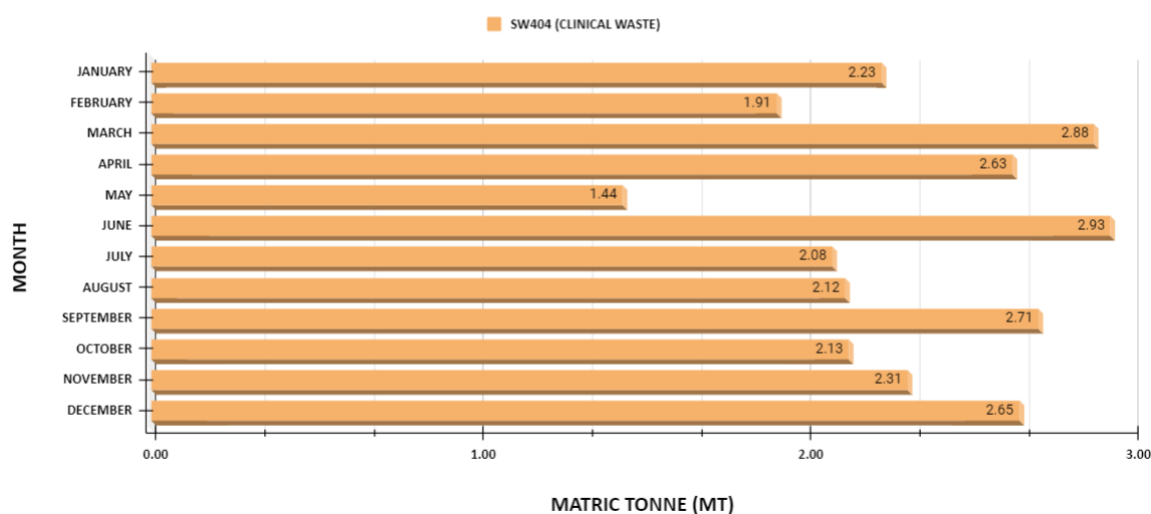
**B. Clinical/ Pathogenic waste**

Clinical waste by the definition of the Department of Environment (DOE) Malaysia is categorized as pathogenic and clinical waste and quarantined materials, and coded as SW404.

In 2022, total amount of clinical waste that have been generated from Universiti Malaya was 28.02 metric tonne (MT) as shown from the graph below:

## CLINICAL WASTE DISPOSAL JANUARY - DECEMBER 2022

28.02MT



**Figure 13:** Clinical Waste Generated In Universiti Malaya (2022)

### C. Electronic waste (e-waste)

E-waste generation come from different sources in UM. All Faculty and other Departments contribute to the amount of quantity e-waste produced. UM have categorised that e-waste into different groups, namely assets from Information & Communication Technology (ICT) facility, Electrical & Electronics (EE) facility, and laboratory facility.

The amount of e-waste produced in 2022 in UM was 18.90 metric tonne (MT). To name some examples of the e-waste generated, as listed below:

**Table 8:** Examples of E-Waste Generated in Universiti Malaya (2022)

NO.	NAME OF EQUIPMENT	SOURCE	FACULTY
1	Microwave Oven (Sanyo EM-C6787)	Laboratory Facility	Anatomy Dept. Faculty of Medicine
2	Refrigerator (S/N : H3810356RAB)		Physics Dept. Faculty of Science
3	AC Automatic Voltage Regulator (Matsunaga)		Inst. Of Ocean & Earth Sciences (IOES)
4	Scanner (HP DJ Scan 4200 815 MF)	Electrical & Electronics (EE) facility	Geography Dept. Faculty of Arts and Social Sciences
5	Dc Power Supply (GW GPS-3030)		Biomedical Eng. Dept Faculty of Engineering
6	Air-Conditioner 3.0HP (TOPAIRE)		Inst. Of Biological Sciences Faculty of Science
7	LCD Projector	Information & Communication Technology (ICT) Facility	UM ICT Dept.
8	Desktop (DELL Vostro 230)		
9	Screen Monitor 14' RGB (Model: MTC14' Color S/N: 0013600)		



**Figure 14:** Operation of E-Waste Collection And Disposal

In summary, for 2022, Universiti Malaya produced;

**Table 9:** Summary of Toxic Waste Generated in Universiti Malaya (2022)

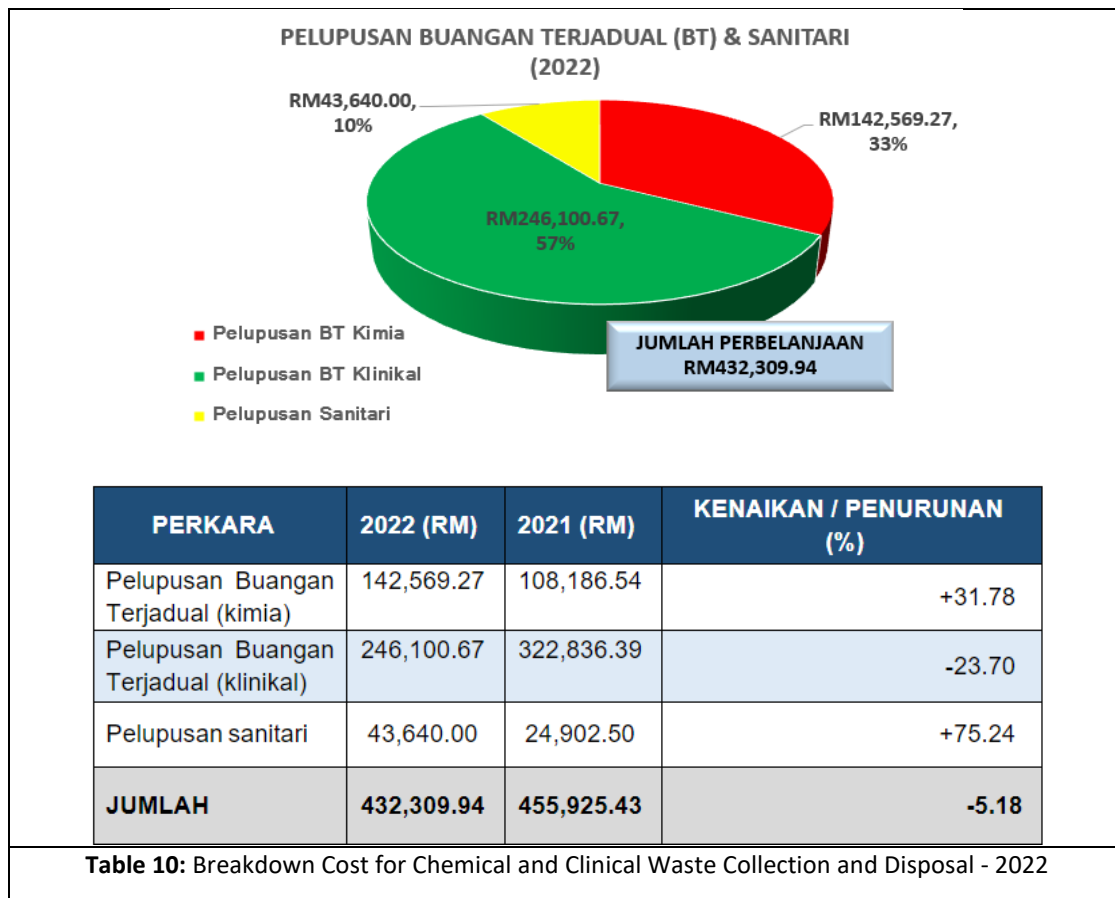
Type of Toxic Waste	Total Produced (Metric Tonne)
- Chemical Waste	33.56
- Clinical/ Pathogenic Waste	28.02
- Electronic Waste (e-waste)	18.90
<b>Total</b>	<b>80.48</b>

### 1.10 TOTAL VOLUME TOXIC WASTE TREATED (TONS)

UM has implemented scheduled waste management according to the Environmental Quality (Scheduled Wastes) Regulations 2005 enforced by the Department of Environment (DOE) Malaysia.

Scheduled waste shall be disposed of, treated, or recovered at the prescribed premise. Only licensed contractors are allowed to transport and treat or dispose of the scheduled waste. UM has disposed of the scheduled wastes at the Prescribed Premises licensed by the DOE. The appointed prescribed premise license is attached in the Appendix which is Kualiti Alam Sdn. Bhd., Riyaland Sdn. Bhd., TWT Solution Sdn. Bhd., and Famous Phase Sdn. Bhd.

Currently, Universiti Malaya handles scheduled waste by appointing a third party to arrange disposal and transportation of scheduled waste for treatment at prescribed premises. Toxipac Sdn. Bhd. is appointed for clinical waste and Zirmaz Clean Enterprise is appointed for chemical waste collection.



Management of scheduled waste (SW) is directed by the Department of Development and Estate Maintenance (Waste Technical Team) spread out in all the University Faculties and Centres. Every waste generator will produce different types of scheduled waste according to the SW Code listed under the Scheduled Waste Regulations 2005. Every Faculty and Centre is provided with:

- A temporary Waste Storage to safely store the Scheduled Waste received from the labs where they originated until they are picked up by the authorized contractors;
- A Competent Person or Trained Person, known as the Scheduled Waste Coordinator is assigned in every designated Faculty and Centre who gives instructions for waste packaging and labeling and fills documents to comply with national and international regulations.

LOKASI MAKMAL YANG TERLIBAT DENGAN PENGUMPULAN BT

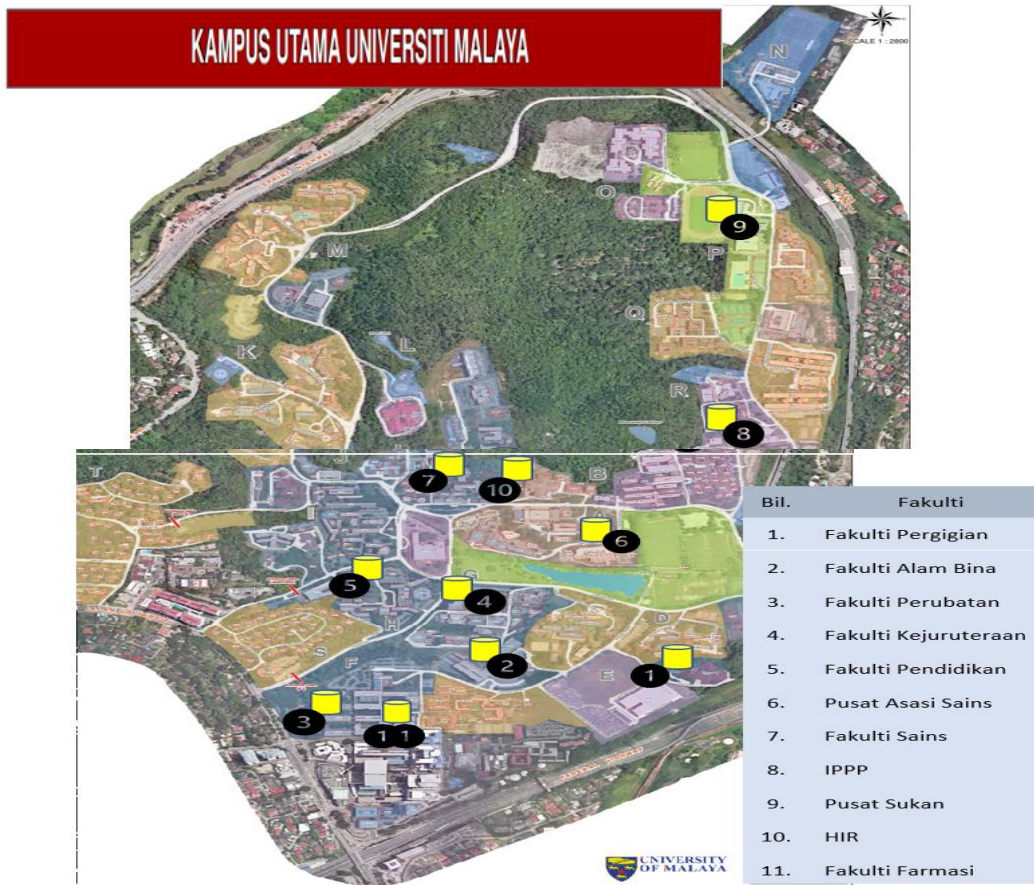


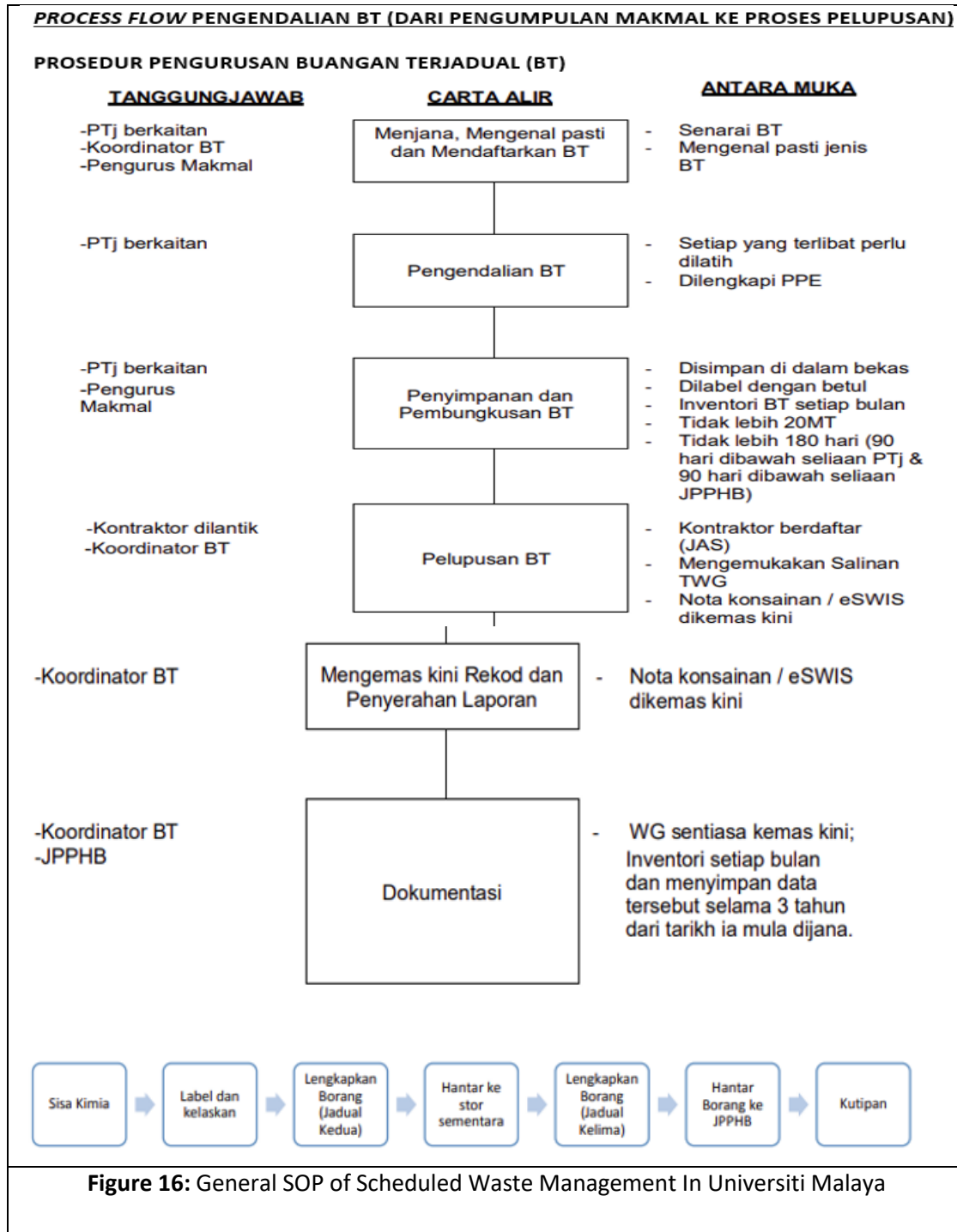
Figure 15: Location of Chemical and Clinical Waste Generator in Universiti Malaya

**BILANGAN MAKMAL YANG TERLIBAT SERTA PERINCIAN MAKLUMAT BT UNTUK SETIAP LOKASI**

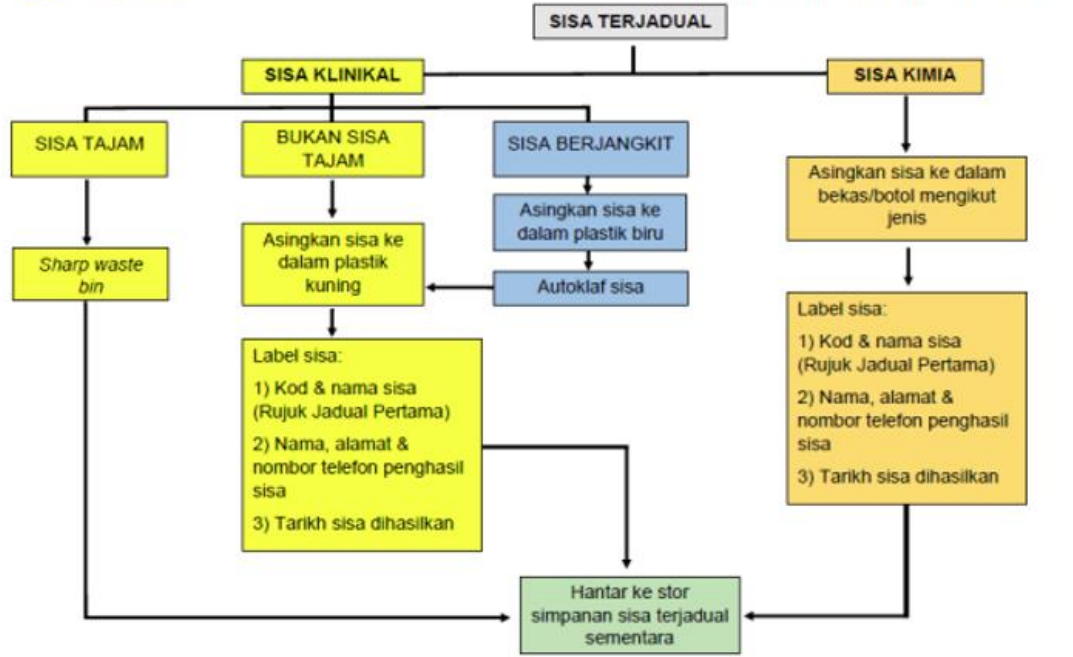
BIL.	FAKULTI	BILANGAN MAKMAL/JABATAN/STOR	JENIS SISA				
			SW206	SW322	SW404	SW409	SW410
1	PERGIGIAN	3	√	√	√	√	
2	ALAM BINA	1	√				
3	PERUBATAN	12	√	√	√		
4	KEJURUTERAAN	2	√	√	√		√
5	PENDIDIKAN	1	√	√			
6	PUSAT ASASI SAINS	2	√	√	√		
7	SAINS	9	√	√	√		
8	IPPP	2	√	√	√		√
9	PUSAT SUKAN	1		√	√		
10	HIR	1	√	√	√		
11	FARMASI	1	√	√	√		

**Table 11:** Different Type of Scheduled Waste Generated in Universiti Malaya

The operation of scheduled waste shall be based on the general Safety Operating Procedure (SOP) that is provided by the Occupational Safety & Health, Risk and Environment Centre (OSHREC) of Universiti Malaya, and this SOP will be more detailed to cater to each SW Faculty operational exercise. The general and specified Flow Chart Procedures are shown below. Besides compliance with the SOP, Universiti Malaya will ensure that the operation of the Scheduled Waste is made known to the campus community periodically through email and poster announcements of the date of collection and disposal.



PROSEDUR OPERASI STANDARD (SOP)  
PENGURUSAN SISA TERJADUAL



CARTA ALIR PENGURUSAN BUANGAN TERJADUAL (SISA KIMIA)

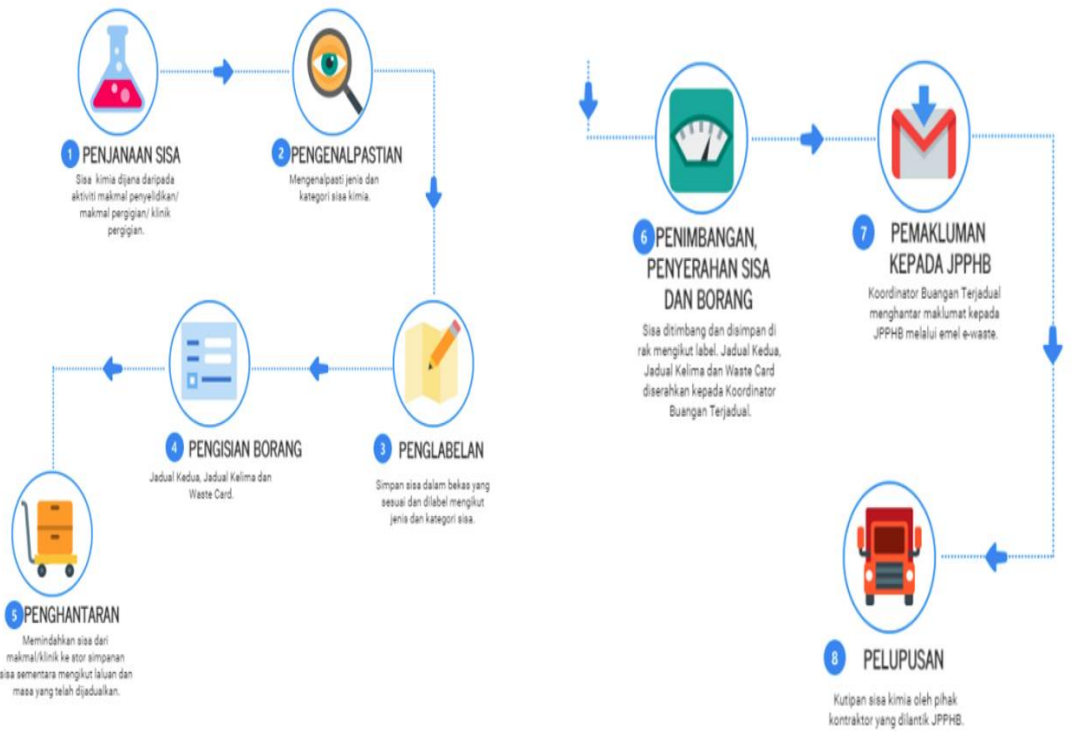


Figure 17: Example Of Specific SOP of Scheduled Waste Management in Universiti Malaya (Faculty of Pharmacy)



**Pemberitahuan Jadual Kutipan Barangan Terjadual (KLINIKAL) Universiti Malaya bagi Januari 2022**

1 message

JPPHB INFO &lt;jpphb.info@um.edu.my&gt;

Thu, Dec 30, 2021 at 4:10 PM

To: uminfo &lt;uminfo-list@um.edu.my&gt;

Cc: Hashbullishman Hashim &lt;hashbul@um.edu.my&gt;, Suhaimi Mohamed Khalis &lt;suhaimi@um.edu.my&gt;, MAJ SYED ABD AZIZ &lt;majorsyed@um.edu.my&gt;, NOOR AZRIL BIN RAMLI &lt;azrilramli@um.edu.my&gt;, ABDUL RAHMAN BIN MOHD YUNUS &lt;abdulrahmanmy@um.edu.my&gt;

Assalamualaikum dan Salam Sejahtera,

YBhg. Datuk/Dato'/Datin/Profesor/Dr/Tuan/Puan,

Dengan segala hormatnya perkara di atas adalah dirujuk.

Bersama-sama ini dilampirkan jadual Kutipan Buangan Terjadual (Klinikal) seperti berikut untuk perhatian dan makluman YBhg. Datuk/Dato'/Datin/Profesor/Dr/Tuan/Puan selanjutnya.

Sehubungan itu, jadual Kutipan Buangan Terjadual (Klinikal) adalah seperti berikut:-

Bulan	Tarikh	Masa	Kod Buangan Terjadual	Nama Buangan	Lokasi Yang Ditetapkan Oleh PTJ	Kontraktor Kutipan Buangan Terjadual	Transporter Pelupusan Buangan Terjadual
Januari	6hb, 13hb, 20hb, 27hb	9.00 pagi - 1.00 tengah hari	SW404	Buangan Terjadual Patogenik, Buangan Terjadual Klinikal atau Bahan Kuarantin	Fakulti Perubatan (Bangunan Farmasi, Blok T & AEU) Ladang Mini ISB (PHM) UMX IPPP (Makmal Infra) ISB (Blok B, Blok E, Blok Genetik & Mikrobiologi) Bangunan HIR Fakulti Kejuruteraan Klinik Kesihatan UM PASUM Pusat Sukan Fakulti Farmasi Fakulti Pergigian (Balai Ungku Aziz) Kolej Kediaman KPS	Syarikat Zirmaz Clean Enterprise	Syarikat Kualiti Alam

**Pemberitahuan Jadual Kutipan Buangan Terjadual (KIMIA) Universiti Malaya Bagi Mac 2022**

1 message

JPPHB INFO &lt;jpphb.info@um.edu.my&gt;

Tue, Mar 8, 2022 at 4:20 PM

To: uminfo &lt;uminfo-list@um.edu.my&gt;

Cc: Hashbullishman Hashim &lt;hashbul@um.edu.my&gt;, Suhaimi Mohamed Khalis &lt;suhaimi@um.edu.my&gt;, MAJ SYED ABD AZIZ &lt;majorsyed@um.edu.my&gt;, NOOR AZRIL BIN RAMLI &lt;azrilramli@um.edu.my&gt;, ABDUL RAHMAN BIN MOHD YUNUS &lt;abdulrahmanmy@um.edu.my&gt;

Assalamualaikum dan Salam Sejahtera,

YBhg. Datuk/Dato'/Datin/YBrs. Profesor/Dr/Tuan/Puan,

Dengan hormatnya perkara di atas adalah dirujuk.

Bersama-sama ini dilampirkan jadual Kutipan Buangan Terjadual (Kimia) seperti berikut untuk perhatian dan makluman YBhg. Datuk/Dato'/Datin/YBrs. Profesor/Dr/Tuan/Puan selanjutnya.

Sehubungan itu, jadual Kutipan Buangan Terjadual (Kimia) adalah seperti berikut:

Bulan	Tarikh	Masa	Kod Buangan Terjadual	Nama Buangan	Lokasi Yang Ditetapkan Oleh PTJ	Kontraktor Kutipan Buangan Terjadual
Mac	14hb,	10.00 pagi - 4.00 petang	Semua Kod kecuali SW421, SW429 dan SW430	Buangan Terjadual Kimia	Fakulti Perubatan Fakulti Farmasi Fakulti Pergigian(BUA)	Syarikat Zirmaz Clean Enterprise
	15hb,				Fakulti Kejuruteraan ISB Blok B Jabatan Fizik	
	16hb,				Jabatan Kimia HIR IPPP Fakulti Pergigian(Bangunan Baru)	

Figure 18: Email Announcement (Chemical & Clinical Waste Collection and Disposal) 2022



**Figure 19: Poster Announcement (Clinical Waste Collection and Disposal) 2022 - Monthly Collection**

Bulan	Tarikh	Masa	Kod Buangan Terjadual	Nama Buangan	Lokasi Yang Ditetapkan Oleh PTJ	Kontraktor Kutipan Buangan Terjadual
Mac	14hb,	10.00 pagi - 4.00 petang	Semua Kod kecuali SW421, SW425 dan SW430	Buangan Terjadual Kimia	Fakulti Perubatan	Syarikat Zirma Clean Enterprise
	15hb,				Fakulti Farmasi	
	16hb,				Fakulti Pergigian(BUA)	
					Fakulti Kejuruteraan	
					ISB Blok B	
					Jabatan Fizik	
					Jabatan Kimia	
					HIR	
					IPPP	
					Fakulti Pergigian(Bangunan Baru)	

Bulan	Tarikh	Masa	Kod Buangan Terjadual	Nama Buangan	Lokasi Yang Ditetapkan Oleh PTJ	Kontraktor Kutipan Buangan Terjadual
Julai	4hb,	10.00 pagi - 4.00 petang	Semua Kod namun tertakluk kepada pemeriksaan dan pematuhan terhadap peraturan yang digunapakai	Buangan Terjadual Kimia	Jabatan Kimia (Bunker)	Syarikat Zirma Clean Enterprise
	5hb,				ISB (Blok B)	
	6hb,				Jabatan Geologi	
					Fakulti Perubatan	
					Fakulti Farmasi	
					Fakulti Pergigian (BUA)	
					IPPP	
					Fakulti Kejuruteraan	
					HIR	
					Jabatan Fizik	
					Fakulti Pergigian(Bangunan Baru)	
					RASUM	

Bulan	Tarikh	Masa	Kod Buangan Terjadual	Nama Buangan	Lokasi Yang Ditetapkan Oleh PTJ	Kontraktor Kutipan Buangan Terjadual
September	26hb	10.00 pagi - 4.00 petang	Semua Kod namun tertakluk kepada pemeriksaan dan pematuhan terhadap peraturan yang digunapakai	Buangan Terjadual Kimia	Fakulti Perubatan	Syarikat Zirma Clean Enterprise
	27hb				Fakulti Farmasi	
	28hb				Fakulti Pergigian (BUA)	
					IPPP	
					ISB (Blok B)	
					ISB (Seriwik & Mikrobiologi)	
					Fakulti Kejuruteraan	
					Jab. Geologi	
					UMX	
					Jabatan Fizik	
					HIR	
					RASUM	
					Fakulti Pergigian (Bangunan Baru)	
					Jab. Kimia (Bunker)	

**Figure 20: Poster Announcement (Chemical Waste Collection and Disposal) 2022 - Quarterly Collection**

**Pemberitahuan Jadual Kutipan Buangan Terjadual (Klinikal) Bagi Jun 2023**

1 message

JPPHB INFO <jpphb.info@um.edu.my> Thu, Jun 1, 2023 at 8:50 AM  
 Cc: MOHD HUSNI BIN DIN <mohdhusni@um.edu.my>, MAJ SYED ABD AZIZ <majorsyed@um.edu.my>, ZARINA BINTI SHARIFF <zarinashariff@um.edu.my>, NOOR AZRIL BIN RAMLI <azrilramli@um.edu.my>, ABDUL RAHMAN BIN MOHD YUNUS <abdulrahmanmy@um.edu.my>, NORHISHAM BIN MAT DOMI <sham2005@um.edu.my>, MUHAMMAD ARIF BIN MOHD NAZIR <arif@um.edu.my>

Assalamualaikum dan Salam Sejahtera,

YBhg. Datuk/Dato'/Datin/Profesor/Dr/Tuan/Puan,

Dengan hormatnya perkara di atas adalah dirujuk.

Bersama-sama ini dilampirkan jadual Kutipan Buangan Terjadual (Klinikal) seperti berikut untuk perhatian dan makluman YBhg. Datuk/Dato'/Datin/Profesor/Dr/Tuan/Puan selanjutnya.

Jadual Kutipan Buangan Terjadual (Klinikal) adalah seperti berikut:

Bulan	Tarikh	Masa	Kod Buangan Terjadual	Nama Buangan	Lokasi Yang Ditetapkan Oleh PTJ	Kontraktor Kutipan Buangan Terjadual	Transporter Pelupusan Buangan Terjadual
Jun	1hb, 8hb, 15hb, 22hb, 29hb,	9.00 pagi - 1.00 tengah hari	SW404	Buangan Terjadual Patogenik, Buangan Terjadual Klinikal atau Bahan Kuarantin	Fakulti Perubatan (Bangunan Farmasi, Blok T & AEU) Ladang Mini ISB (PHM) UMXX IPPPP (Makmal Infra) ISB (Blok B, Blok E, Blok Genetik & Mikrobiologi) Bangunan HIR Fakulti Kejuruteraan Klinikal Kesihatan UM PASUM Pusat Sukan Fakulti Farmasi Fakulti Pergigian (Balai Ungku Aziz) Kolej Kediaman	Syarikat Zirmax Clean Enterprise	Syarikat Kualiti Alam

**Pemberitahuan Jadual Kutipan Buangan Terjadual Kimia Universiti Malaya Bagi Ogos 2023**

1 message

JPPHB INFO <jpphb.info@um.edu.my> Thu, Aug 17, 2023 at 10:00 AM  
 To: uminfo <uminfo@um.edu.my>  
 Cc: MOHD HUSNI BIN DIN <mohdhusni@um.edu.my>, MAJ SYED ABD AZIZ <majorsyed@um.edu.my>, NOOR AZRIL BIN RAMLI <azrilramli@um.edu.my>, MUHAMMAD ARIF BIN MOHD NAZIR <arif@um.edu.my>, ABDUL RAHMAN BIN MOHD YUNUS <abdulrahmanmy@um.edu.my>

Assalamualaikum dan Salam Sejahtera,

YBhg. Datuk/Dato'/Datin/YBrs. Profesor/Dr/Tuan/Puan,

Dengan hormatnya perkara di atas adalah dirujuk.

Bersama-sama ini dilampirkan jadual Kutipan Buangan Terjadual (Kimia) seperti berikut untuk perhatian dan makluman YBhg. Datuk/Dato'/Datin/YBrs. Profesor/Dr/Tuan/Puan selanjutnya.

Sehubungan itu, jadual Kutipan Buangan Terjadual (Kimia) adalah seperti berikut:

Bulan	Tarikh	Masa	Kod Buangan Terjadual	Nama Buangan	Lokasi Yang Ditetapkan Oleh PTJ	Kontraktor Kutipan Buangan Terjadual
Ogos	21hb	10.00 pagi - 4.00 petang	Semua kod namun tertakluk kepada pemeriksaan dan pematuhan peraturan yang digunakan	Buangan Terjadual Kimia	Fakulti Farmasi Fakulti Kejuruteraan IPPPP (IAS) UMXX	Syarikat Zirmax Clean Enterprise
	22hb				ISB (Blok B) ISB (Genetik & Mikrobiologi) Jab. Geologi Jab. Fizik	
	23hb				Fakulti Perubatan HIR Fakulti Pergigian (Bangunan Baru) Jab. Kimia (Bunkler)	

**Figure 21: Email Announcement (Chemical & Clinical Waste Collection and Disposal) 2023**

**UNIVERSITI MALAYA**

**COLLECTION AND DISPOSAL**  
CLINICAL WASTE (SW404)  
UNIVERSITI MALAYA

**JANUARY 2023**

05th 12th  
19th 26th



**WORLD GOALS**

DEPARTMENT OF DEVELOPMENT AND ASSET MAINTENANCE, UNIVERSITI MALAYA  
03 7947 3571 / 3395  
03 7947 3300 / 4407 7807 / 3311  
https://jpphb.um.edu.my

**UNIVERSITI MALAYA**

**COLLECTION & DISPOSAL**  
CLINICAL WASTE (SW404)  
UNIVERSITI MALAYA

**FEBRUARY 2023**

02nd 09th  
16th 23rd



**WORLD GOALS**

DEPARTMENT OF DEVELOPMENT & ASSET MAINTENANCE  
UNIVERSITI MALAYA  
03 7947 3571 / 3395  
03 7947 3300 / 4407 7807 / 3311  
https://jpphb.um.edu.my

**UNIVERSITI MALAYA**

**COLLECTION AND DISPOSAL**  
CLINICAL WASTE (SW404)  
UNIVERSITI MALAYA

**MARCH 2023**

2nd 9th 16th  
23rd 30th



**WORLD GOALS**

DEPARTMENT OF DEVELOPMENT & ASSET MAINTENANCE  
UNIVERSITI MALAYA  
03 7947 3571 / 3395  
03 7947 3300 / 4407 7807 / 3311  
https://jpphb.um.edu.my

**UNIVERSITI MALAYA**

**COLLECTION AND DISPOSAL**  
CLINICAL WASTE (SW404)  
UNIVERSITI MALAYA

**APRIL**

6th 13th  
20th 27th



**WORLD GOALS**

DEPARTMENT OF DEVELOPMENT AND ASSET MAINTENANCE  
UNIVERSITI MALAYA  
03 7947 3571 / 3395  
03 7947 3300 / 4407 7807 / 3311  
https://jpphb.um.edu.my

**UNIVERSITI MALAYA**

**COLLECTION AND DISPOSAL**  
CLINICAL WASTE (SW404)  
UNIVERSITI MALAYA

**MAY 2023**

8th 11th  
18th 25th



**WORLD GOALS**

DEPARTMENT OF DEVELOPMENT & ASSET MAINTENANCE  
UNIVERSITI MALAYA  
03 7947 3571 / 3395  
03 7947 3300 / 4407 7807 / 3311  
https://jpphb.um.edu.my

**UNIVERSITI MALAYA**

**COLLECTION AND DISPOSAL**  
CLINICAL WASTE (SW404)  
UNIVERSITI MALAYA

**JUNE 2022**

1st 8th 15th  
22nd 29th



**WORLD GOALS**

DEPARTMENT OF DEVELOPMENT & ASSET MAINTENANCE  
UNIVERSITI MALAYA  
03 7947 3571 / 3395  
03 7947 3300 / 4407 7807 / 3311  
https://jpphb.um.edu.my

**UNIVERSITI MALAYA**

**COLLECTION AND DISPOSAL**  
CLINICAL WASTE (SW404)  
UNIVERSITI MALAYA

**AUGUST 2023**

3rd 10th  
17th 24th  
30th



**WORLD GOALS**

DEPARTMENT OF DEVELOPMENT & ASSET MAINTENANCE  
UNIVERSITI MALAYA  
03 7947 3571 / 3395  
03 7947 3300 / 4407 7807 / 3311  
https://jpphb.um.edu.my

**UNIVERSITI MALAYA**

**COLLECTION & DISPOSAL**  
SCHEDULE WASTE CLINICAL (SW404)  
UNIVERSITI MALAYA

**DATE**

7 SEPTEMBER  
14 SEPTEMBER  
21 SEPTEMBER  
28 SEPTEMBER

**2023**

**CONTACT US**

03 7947 3571 / 3395  
DEPARTMENT OF DEVELOPMENT AND ASSET MAINTENANCE  
UNIVERSITI MALAYA  
https://jpphb.um.edu.my

**WORLD GOALS**

**UNIVERSITI MALAYA**

**COLLECTION & DISPOSAL**  
SCHEDULED WASTE CLINICAL (SW404)  
UNIVERSITI MALAYA

**DATE**

5 OCTOBER  
12 OCTOBER  
19 OCTOBER  
26 OCTOBER

**2023**

**CONTACT US**

03 7947 3571 / 3395  
DEPARTMENT OF DEVELOPMENT AND ASSET MAINTENANCE  
UNIVERSITI MALAYA  
https://jpphb.um.edu.my

**WORLD GOALS**

**Figure 22: Poster Announcement (Clinical Waste Collection and Disposal) 2023 – Monthly Collection**



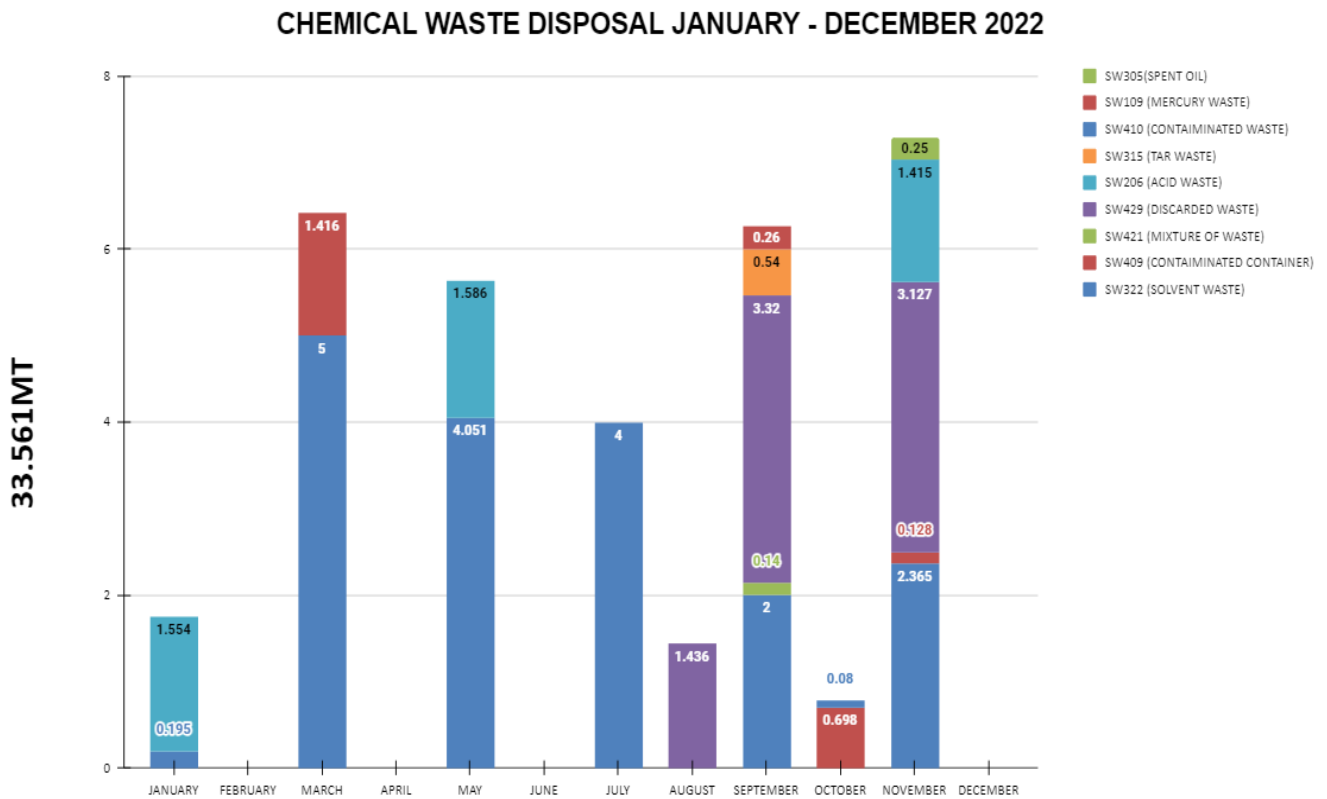
**Figure 23:** Poster Announcement (Chemical Waste Collection and Disposal) 2023 – Quarterly Collection

Scheduled Waste is managed operationally by the Department of Development & Estate Maintenance (JPPHB) with the assistance of UM Zero Waste Campaign (UM ZWC) and the supervision of the Occupational Safety & Health, Risk and Environment Centre (OSHREC) UM.

The logistic services are manned by Kualiti Alam Sdn. Bhd which covers hazardous waste transportation from UM (Zero Waste Site as the central point for the campus) to Kualiti Alam Waste Management Centre (WMC) for the next procedural stage of treatment and proper disposal.

## CHEMICAL WASTE OPERATION

In 2022, total amount of chemical waste that have been disposed from Universiti Malaya was 33.561 metric tonne (MT) as shown from the graph below:



**Figure 24:** Total Amount of Chemical Waste Disposal 2022

The chemical waste that was collected and disposed of in Universiti Malaya can be categorized into several groups, namely:

- 10) Mercury Waste - SW109
- 11) Acid Waste - SW206
- 12) Spent Oil - SW305
- 13) Tar Waste - SW315
- 14) Solvent Waste - SW322
- 15) Contaminated Container - SW409
- 16) Contaminated Cloth/Gloves - SW410
- 17) Mixture of Chemical Waste - SW421
- 18) Expired/ Discarded Waste - SW429

Below are some photos taken during the site operation (collection and disposal of chemical waste):



Figure 25: Operation Of Chemical Waste Collection and Disposal



## CLINICAL WASTE OPERATION

In 2022, total amount of clinical waste that have been disposed from Universiti Malaya was 28.02 metric tonne (MT) as shown from the graph below:

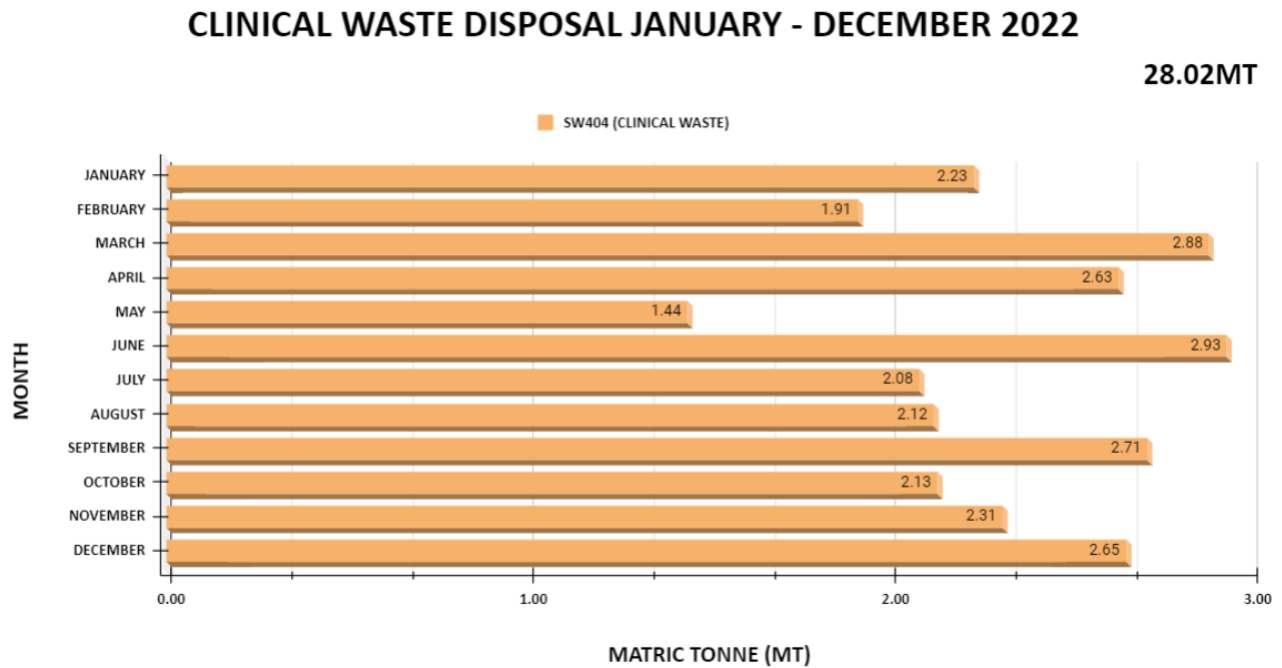


Figure 26: Total Amount of Clinical Waste Disposal 2022

Clinical waste by the definition of the Department of Environment (DOE) Malaysia is categorized as pathogenic and clinical waste and quarantined materials and coded as SW404.



Figure 27: Operation of Clinical Waste Collection and Disposal

**Table 12:** Amount of Toxic Waste in UM Treated

Type of Waste	Amount (Metric Tonne)			
	Total	Recovery/ Recycled Re-used	& Down cycled	Disposed-off/ Discarded
<b>TOXIC WASTE TREATED</b>	<b>80.48</b>			
<b>CHEMICAL WASTE</b>	<b>33.56</b>			
- Acid waste (SW206)		4.55		
- Spent oil (SW 305)			0.25	
- Solvent waste (SW322)			17.61	
- Contaminated container (SW409)		2.24		
- Contaminated rags (SW410)		0.08		
- Mercury waste (SW109)				0.26
- Tar waste (SW315)				0.54
- Mixture waste (SW421)				0.14
- Discarded/ Expired waste (SW429)				7.88
<b>CLINICAL WASTE</b>				<b>28.02</b>
<b>ELECTRONIC WASTE (e-waste)</b>		<b>18.90</b>		

Amount of toxic waste produced in 2022 (ton): 80.48

Amount of toxic waste treated (recycle/recovery/reused/downcycled/disposed of) (ton): 80.48

100% toxic waste generated in 2022 is treated as per procedure and regulation by Department of Environment (DoE) Malaysia.

Additional video of an example of the toxic waste are handled to be treated:

[Link 1](#) - [2](#) - [3](#)

## 1.11 SEWAGE DISPOSAL

Pantai 2 Sewage Treatment Plant is a project under the 10th Malaysia Plan to upgrade sewage treatment capacity in the catchment area of beach from the existing capacity of 550,000 PE to 1,423 million PE.

Catchment area covers 6,700 hectares of the New Town Sentul, Sentul Raya, part of the commercial center of Kuala Lumpur, Bangsar, Bukit Kiara recreation area, part Old Klang Road and Petaling Jaya and others including Universiti Malaya. The main sewage treatment plant is built below ground level whilst the sludge treatment facility is above the ground level, over 17 ha of land area which also includes an above ground recreational park and amenities. Pantai 2 RSTP utilizes the Advanced Anaerobic-Anoxic-Oxic (A2O) process that is effective in removing nitrogen and phosphorus in the wastewater compared to the conventional treatment system. The plant is designed for Standard A effluent discharge quality as prescribed in the Environmental Quality (Sewage) Regulations 2009.

Various elements of green technology have been incorporated into the project design Pantai 2 Sewage Treatment Plant and in between is the reuse of treated effluent (cleaning & landscaping purposes) and electricity generation through biogas engine (biogas obtained through the sludge treatment).

**Table 13:** Record of Sewage Disposal (in meter cubic and treatment fees) by Indah Water Konsortium (IWK) services for Universiti Malaya

<b>Sewage Bill 2022 (Main Campus)</b>		
<b>Month</b>	<b>Record of Sewage (Cubic Metres)</b>	<b>Bill (RM)</b>
January	156,770.58	148,827.06
February	156,770.58	148,827.06
March	156,770.58	148,827.06
April	156,770.58	148,827.06
May	162,456.72	154,228.89
June	162,456.72	154,228.89
July	162,456.72	154,228.89
August	162,456.72	154,228.89
September	162,456.72	154,228.89
October	182,415.28	173,189.52
November	182,415.28	173,189.52
December	182,415.28	173,189.52
<b>Total</b>	<b>1,986,611.76</b>	<b>1,886,021.25</b>
<b>Average</b>	<b>165,550.98</b>	<b>157,168.44</b>

## Complementary materials:

1. Annual Reports of UM Zero Waste Campaign are available: <https://www.um.edu.my/um-zero-waste-campaign>
2. UM ZWC Facebook Page and Instagram: <https://www.facebook.com/zerowastecampaignum>  
<https://www.instagram.com/zerowaste.universitimalaya/>
3. Video of Integrated Solid Waste Management in Universiti Malaya: <https://youtu.be/d5vErghREr0>  
Video of community empowering project on circular economy by UM research project – UM Zero Waste Campaign (UM ZWC) (Winner of Okayama Award 2020) : <https://www.youtube.com/watch?v=-yhYasavI8k>
4. Conversion of old bus into airbnb project:  
[https://www.airbnb.com/rooms/42907783?source\\_impression\\_id=p3\\_1697512464\\_ewXjgtap4R%2FrBLJx](https://www.airbnb.com/rooms/42907783?source_impression_id=p3_1697512464_ewXjgtap4R%2FrBLJx)
5. Indah Water Konsortium: [https://www.iwk.com.my/cms/upload\\_files/files/English%20Brochure-Pantai%20202.pdf](https://www.iwk.com.my/cms/upload_files/files/English%20Brochure-Pantai%20202.pdf)

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