

Number

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SOLID WASTE MANAGEMENT

Republic of Palau

Manual for Beverage Container Deposit Fee Program

WRITTEN BY BOTH

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1. Background

One of the main impacts of tourism and infrastructure is the disposal of solid waste in Palau. And one of Palau's most visible forms of pollution is the dumping of beverage containers throughout the island. In 2005, a survey showed that eleven (11) million aluminum cans are imported into Palau annually, not to mention other beverage containers such as, plastics, glass, etc. **These containers are recyclable and should not be dumped in landfills as our landfills are over capacity and sites for landfills are limited. In 2008, the national landfill (M-dock landfill) was projected to reach its capacity in 2013.**

Availability of funds appropriated annually to solid waste management was inadequate, however, the recycling law created a recycling fund designed to sustain the recycling program and its 3R activities. Accordingly, **the recycling fund is projected as a sustainable financial mechanism for solid waste management in the Republic.**

Brief History:

The recycling program was first introduced by the Senate Committee on Youth Affairs and Social Welfare during the Seventh Olbiil era Kelulau. The recycling program passed its final readings on October 10, 2006 by the Senate and on October 17, 2006 by the House of Delegates. The President of the Republic then approved it on October 22, 2006.

The law states that this Act shall take effect upon its approval by the President, or upon its becoming law without such approval. However, during this time, the solid waste management office, under the Bureau of Public Works-national government was just in its second year of operation and lack capacity and resources to implement the recycling program. In addition, the solid waste management office was in the middle of a 3 year project with JICA, a Project for Solid Waste Management Improvement in Palau, and Koror State Solid Waste Office was also a counterpart. This Project had three outputs, (1) to develop a national solid waste management plan, (2) to rehabilitate existing disposal site (M-dock landfill), and (3) to train personnel of relevant agencies.

Therefore, a decision was made to hold the implementation of the recycling program until personnel from relevant agencies are trained through the JICA project which ended in 2008. In addition, Koror State was in the process of establishing its own recycling programs including the construction of recycling facility which is now known and became the initial redemption center for the implementation of the recycling program.

Several events took place before full implementation of the recycling program as follows:

- In 2009, President of the Republic of Palau approved and signed the Beverage Container Recycling Regulations mandated by the law.
- In March 2011, the Attorney General's (AG's) Office and Customs Office held a workshop with the Ministry of Public Infrastructure, Industries and Commerce and all stakeholders including major importers of beverage containers to review the law and its contents.
- In April 2011, the Customs Office started the collection of the deposit fee.
- In October 2011, Memorandum of Understanding (MOU) between Ministry of Public Infrastructure, Industries & Commerce and Ministry of Finance and Koror State Government was adopted to make the recycling facility of Koror State Government a initial Redemption Center for the recycling program.

- In October 2011, after six months of fee collection, the redemption center opened its doors to the public.
- In July 2012, the Ministry of Public Infrastructure, Industries and Commerce (MPIIC) awarded a service contract to Palau Waste Collection Company to buy the redeemed containers from the government and export off island for final treatment.

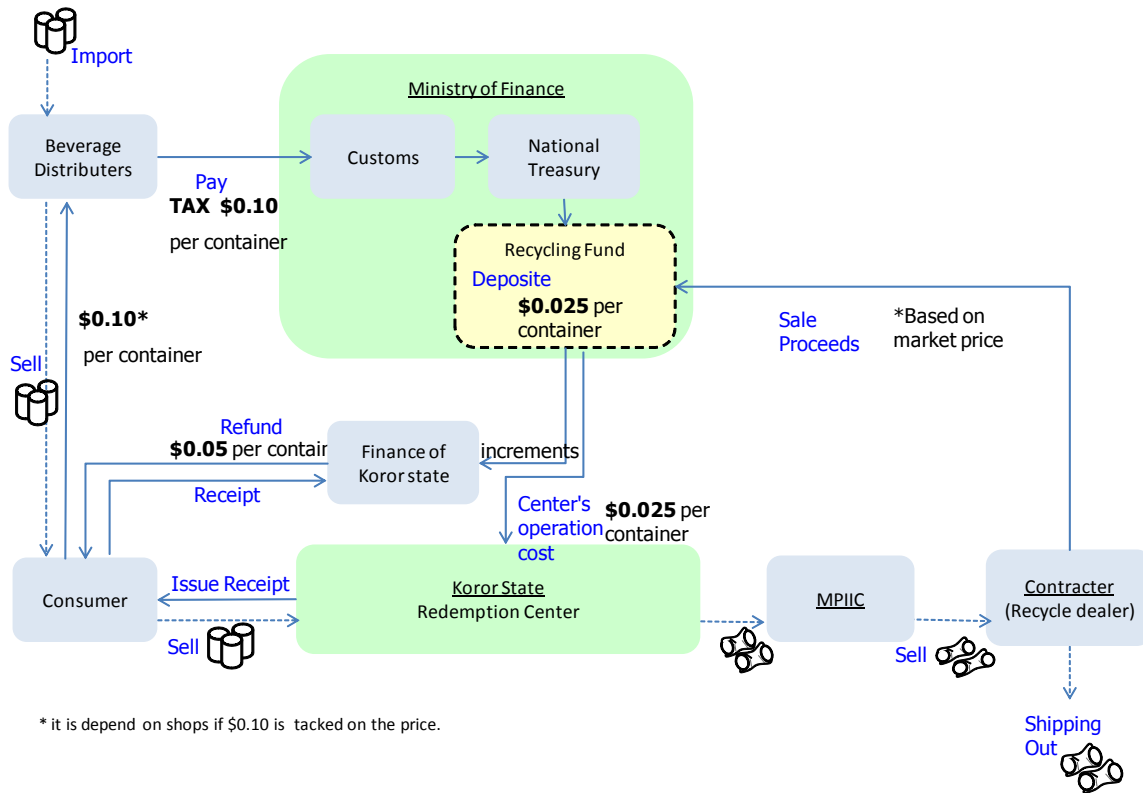
Now, the recycling program is in full operation.

2. Feasibility Study

The financial feasibility study was not done by any agencies. However, when the Bill for the recycling program was introduced by the Senate Committee on Youth Affairs and Social Welfare, a deposit fee on beverage container was set at \$0.15 per container. By going through the process of lawmaking, the Committee solicited comments from the general public including environmental agencies of the government and all were favorable comments. However, many of the public comments did suggest that the deposit beverage container fee was set too high at \$0.15 and recommended reducing it to \$0.10.

Based on the recommendations from the public, the Committee agreed to lower the deposit fee to \$0.10 per beverage container and also agreed to split the fee between the program participants as follows: \$0.05 to the consumers who recycle as redemption, \$0.025 maximum to the redemption center(s), and \$0.025 minimum retained by the government as the recycling fund.

3. Overview of the Program



4. Responsibility of Concerned Organizations

The agencies involved in the Deposit Program in Palau are shown below;

Name of organization	Responsibility
Ministry of Public Infrastructure, Industries and Commerce (MPIIC)	Implementation of the recycling program Approve and monitor redemption center(s) Export or find ways to export redeemed containers
Ministry of Finance (MOF)	Management and maintenance of fund Monitoring of Fund Collection of deposit fee by the Customs Office under MOF
Koror State Government	Operation of the Redemption Center

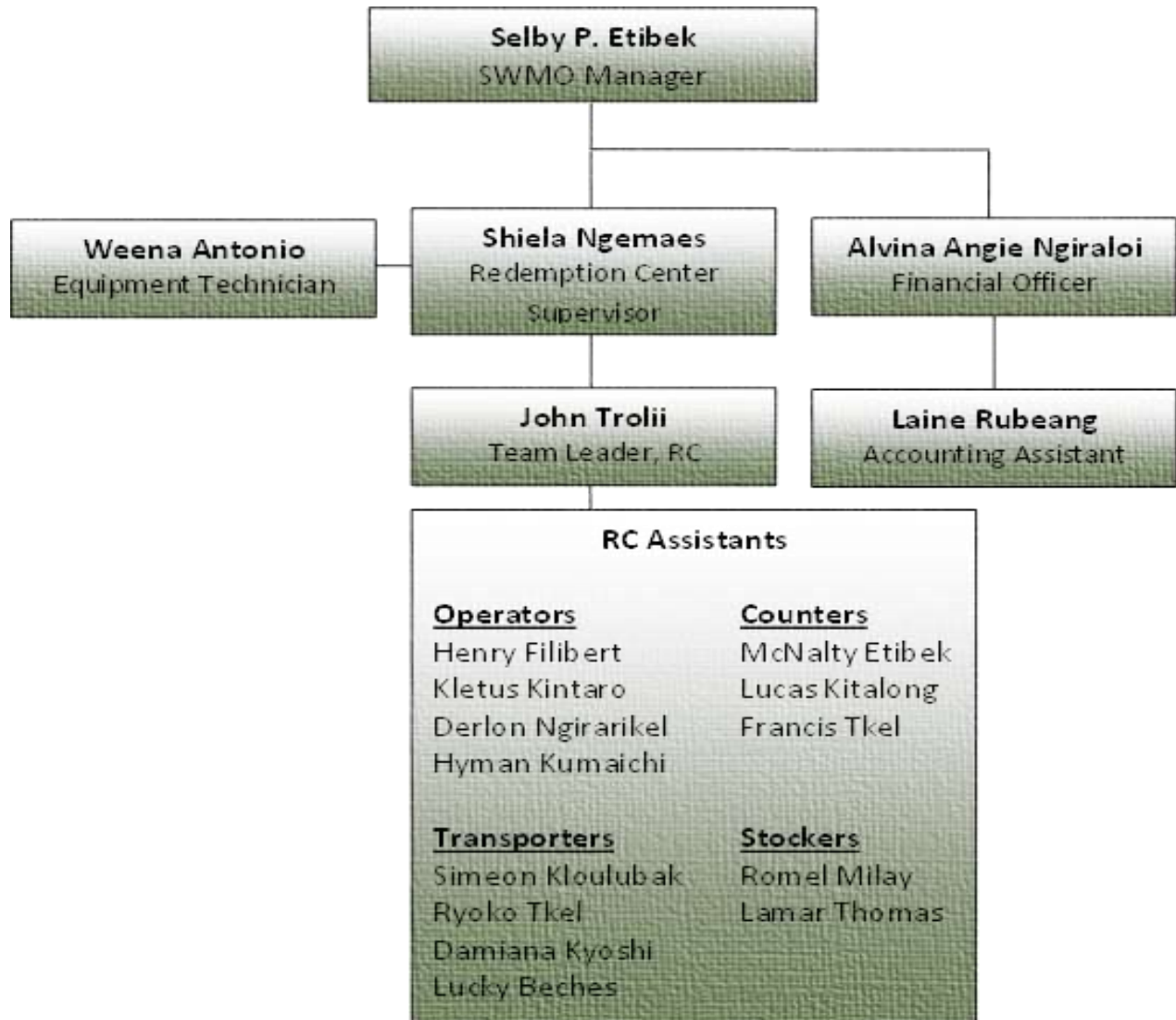
5. Law and Regulations of the Program

The following law and regulation were developed, and Memorandum of Understanding was adapted subsequently as needed.

- **The Republic of Palau Public Law (RPPL No. 7-24):**
 - Establishing a recycling program for the Republic of Palau, establishing a beverage container deposit fee, creating a recycling fund, and for other related purposes.
 - RPPL 7-24 places responsibility for differing aspects of the national beverage container recycling program on two Ministries of the National Government, the Ministry of Public Infrastructure, Industries and Commerce (MPIIC), and the Ministry of Finance (MOF).
- **Beverage Container Recycling Regulations:**
 - These regulations assign respective duties responsibilities over the beverage container recycling program to both MOF and MPIIC.
- **Memorandum of Understanding (MOU):** between Ministry of Public Infrastructure, Industries & Commerce, and Ministry of Finance, and Koror State Government (KSG).
 - Ministry of Finance will advance funds to KSG for redeeming the beverage containers while retaining the \$0.025per container redeemed as compensation.
 - Before exhaustion of the fund by KSG, KSG will submit proof of refunds paid to MOF and request for additional funds.
 - KSG will operate the redemption center under the directives of MPIIC.

6. Staff Arrangement and Responsibility

The Redemption Center consists of a total of 18 employees, under the Solid Waste Management Office Manager, who are assigned to different sections and job duties. Below are the employees and their respective positions and general responsibilities.



Info.(example)

Total number of handled/redeemed containers at the center per month
2.7 million in September 2012

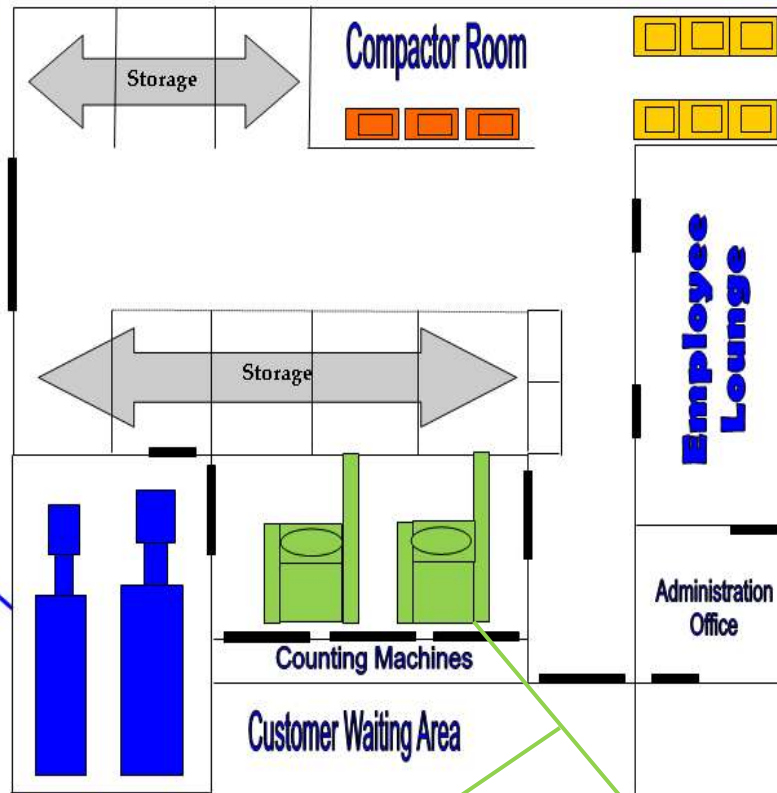
7. Outline (Design) of the Redemption Center



Compactor



Glass Bottle Crushers

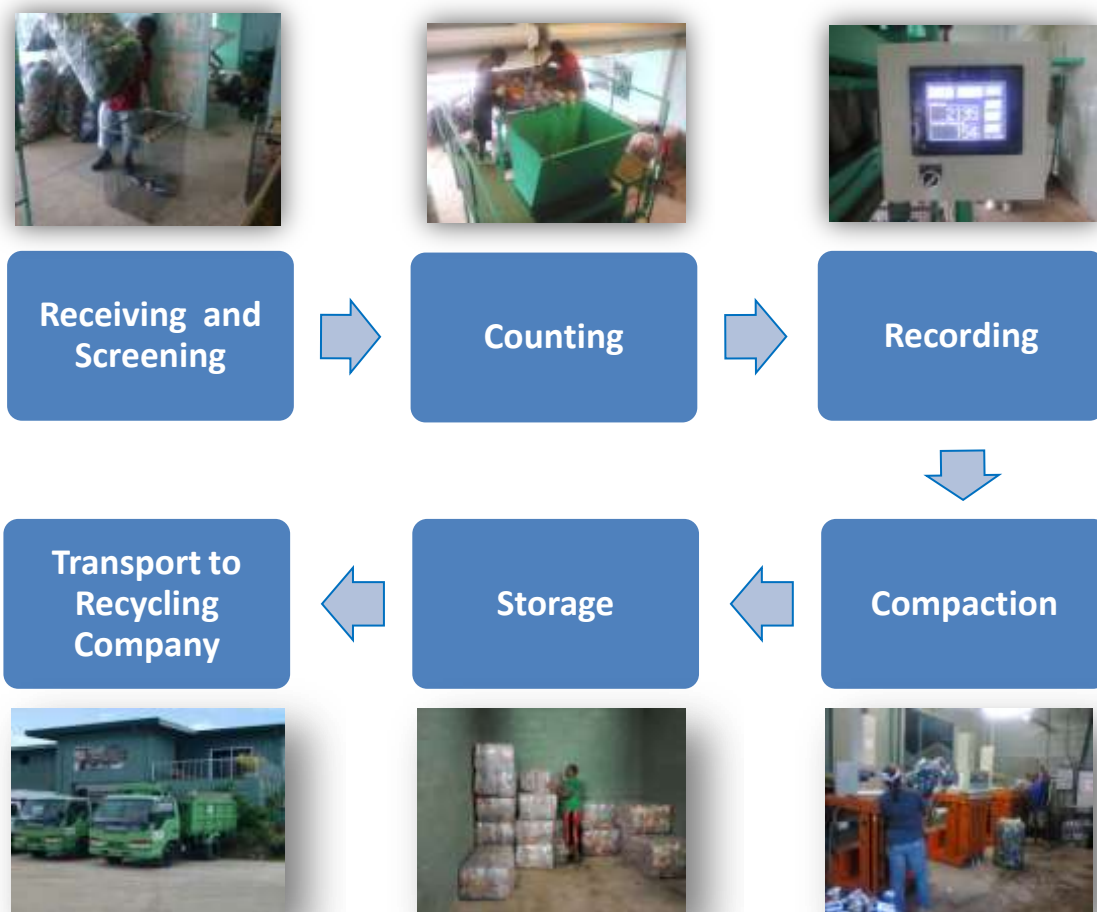


8. Schedule of Daily Operation

Daily Operation Routine is as shown below;

Time	Activity	Who
7:30	Equipment and Personnel Preparations	All staff
8:00	Commence Operations	All staff
11:00	Clean up	All staff
11:30	Lunch Break	All staff
12:30	Equipment and Personnel Preparations	All staff
13:00	Commence Operations	All staff
16:00	Clean up and secure equipment's and facility	All staff
16:30	End of work day	

9. Operational Flow



10. Counting Method

Initially, the counting of containers was done manually. This method required many counters in order to speed up the process. In this case, ten workers were used to count containers for the whole day. This was a physically demanding task and it was later changed to lessen the workload for the workers as well as increase efficiency in other areas of the operation.

The current counting methods being employed is mechanical counting along with manual counting. **Manual counting is only employed when counting glass bottles and tetra packs/ army packs (juice pouches and cartons). Mechanical counting is specifically used for counting aluminum cans, metal cans and plastic/PET bottles.** This method requires at least three personnel to operate. Two counting machines have been commissioned by Morimoto Corporations of Japan with designs created by Koror State Government via Mr. Katsuo Fuji, SWM Consultant. Each of these counting machines has the capability to count as much as 26 aluminum or metal cans per second and 14 PET bottles per second. The counting is done by laser beams and sensors, where once a container interrupts for an instance the contact between the beam and the sensor then the counting is engaged.

It should be noted that this upgrade in the counting method is made possible through the financial mechanism provided by this program.

11. Accounting

Refund Procedures:

Redeemable slip is issued to customer at the Redemption Center after counting

Customer submits redeemable slip to Koror State Treasury

Refund is distributed to customer in cash at the time of submission if refund amount is below \$50.00.

Refund amounts over \$50.00 will be printed as checks and issued at the end of the work week (Friday)



Following is an example of the Redeemable Slips issued to customers at the Redemption Center

 <p>Koror State Government P.O. Box 118 Koror, Republic of Palau 96940</p>		Tel No: (660) 488-8076/488-8077 Fax: (660) 488-8078 Email: ksgswm@palau.net.com
Department of Public Works Solid Waste Management Office		DATE: _____ NO: _____
Customer: _____		
Redeemable Items:		
_____ Cans (# of cans x \$0.05) \$ _____	_____ Pet Bottles (# of p. bottles x \$0.05) \$ _____	
_____ Glass (# of bottles x \$0.05) \$ _____	_____ Others (# of others x .05) \$ _____	
_____ Tetra Pac/Army Pack (# of tetra/army pack x .05) \$ _____		Total Amount: \$ _____
Issued By: <u>Alvin Angelo Njardin</u> SWMO Financial Officer	Customer Signature: _____	
"Thank You for Keeping Palau Clean!!!"		

12. Facility and Equipments (Capitol Cost)

There were three Phases to invest the facility.

Facility	Description	Cost (US\$)	Funding
1 st Phase	Construction of Machine Room to house compactors and storage spaces	\$30,000.00	KSG
2 nd Phase	Construction of additional storage spaces and Administration offices	\$110,000.00	KSG
3 rd Phase	Construction of receiving & counting platform and supply storage room	\$30,000.00	KSG
4 th Phase	Construction of Glass Bottle Crusher Room and Roofing of customer waiting area	\$30,000.00	KSG
Total Cost of Facility		\$200,000.00	

The following table shows the machines list installed.

Machine Name	Purpose of the Machine	Description	Cost (US\$)	Funding
Single Compactors (3 ea.)	Used to compact/bale cans and bottles to reduce volume	Orwak	\$10,000.00 ea. Total: \$30,000.00	\$26,270.00 (Japan Government Grant) \$3,730.00 (KSG)
Multi-Chamber Compactors (2 ea.)	Used to compact/bale cans and bottles to reduce volume	Orwak	\$14,000.00 ea. Total: \$28,000.00	KSG
Needle Equipped Compactor	Specifically used for compacting PET and Plastic Bottles	Orwak	\$17,000.00	KSG
Glass Bottle Crusher (Small)	Used to crush and sand glass products	Glass Aggregate Co.	\$37,735.00 (Used)	Japan Government Grant
Glass Bottle Crusher (Big)	Used to crush and sand glass products	Glass Aggregate Co.	\$89,000.00 (Brand New)	KSG
Counting Machines (2 units)	For counting Cans and Plastic Bottles	Morimoto Corp.	\$32,500 ea. Total: \$65,000.00	KSG
Electric Forklift	Used to stock bales and transport other equipment's and supplies	NBK Corp.	\$46,000.00	KSG
Industrial Roof Fans (2 ea.)	For circulation of fresh air into the center	NBK Corp.	\$7,000.00 ea. Total: \$14,000.00	KSG
Solar Panel	Renewable Energy to reduce electricity cost	SANYO	\$86,000.00	UNCCD Grant
Weighing Scale	Used to weigh and record incoming and outgoing recyclable materials	NBK Corp.	\$8,000.000	KSG
Total Cost of Equipment's			\$420,735.00	

**Total Investment into Redemption Center:
\$620,735.00 including Donations**

13. Reporting

Data's are recorded daily during operation of all equipment's and machinery.

Types of reports:

- Equipment Reports – Records of each machine's operation and maintenance. This report includes daily operational hours, number of treated materials produced, maintenance checks (equipment and component conditions including repair and replacement parts request if applicable).
- Daily report on redeemed materials – This report is prepared daily for verification and is used to monitor the program's fund. These reports are also compiled at the end of each month to compare redemption rate vs. monthly importation.
- Supervisors Report – This report is submitted and presented during a regularly scheduled supervisors meeting that takes place each month. This report covers operational procedures evaluation, employee evaluations, and requests pertaining to operational needs.
- Outgoing Report – This report is prepared for record keeping and monitoring of the weight of recyclable materials being exported through the Beverage Container Deposit Fee Program.

These reports are very crucial as they can identify flaws within the operations. Through identification of weak points and flaws within the operations, it makes it possible to further improve and strengthen the program through amendment of the law and regulations as well as adjustments to operational procedures.

14. Training

Newly hired employees are required to go through what is called “**fundamental or basic training**”. This training is usually conducted by the Recycling Center Chief Operator, Recycling Center Supervisor and the Consultant. It is basically an orientation in which the trainees are briefed on the basic information's on work procedures, equipment operation and maintenance procedures, and the law and regulations governing the Beverage Container Deposit Fee Program. Newly hired personnel are to be in training for the full extent of their 3 months probationary period.

Other trainings:

1. General training on Safe Operation and Maintenance of Equipment's

- By request from KSG-SWMO.
- Conducted by Mr. Eugene Uehara, certified by U.S Department of Interior (DOI)
**Employees whose job duties require them to operate forklifts, loaders and trucks must attend this training.*

2. Work Zone and Personal Safety Training

- Conducted through Palau Community College
- By U.S Federal Program (MAP) Maintenance Assistance Program. (Mr. Don Hanser, Coordinator and Mr. Johnny Kintaro, Instructor).

15. Awareness and Promotion

Before commencement of the program:

Because this program was introduced and necessitated through enactment of National Law, it was seen as essential to hold televised public hearings to explain the reason for the 0.10 cent tax increase on imported beverage containers and present the intentions and overview of the program. These televised public hearings were the first efforts in promoting and raising awareness for this program.

After commencement of the program:

After the appointment of the Koror State Recycling Center as the initial National Redemption Center, the Koror State Solid Waste Management Office took on the role of promoting and raising awareness for the program by disseminating information's through paid advertisements (Television talk shows and commercials, Newspaper ads, and Radio talk shows). Also through initiation of the Community Workshop Program, information's were presented to local communities firsthand through interactive presentations, informational brochures and handouts. The effort to promote and raise awareness for the program is ongoing as long as the program is operational. It is also important to continue this effort as there may be necessary modifications to be made to improve the program. Example of improvements: amendments or addendums to the law and regulations, operation schedule and refund procedures.

This program can be easily promoted because of the incentive which it provides.

16. Challenges Experienced

There are many challenges that have been faced in regards to the operations of the Redemption Center. Some of the challenges experienced are very difficult to resolve once the program is operational. For instance, **the calculations of existing beverage containers on hand before the actual commencement of the program.** This is critical as it will determine the grace period in which to collect tax and build up funding which in turn will determine the financial sustainability of the program. In this case, 6 months was the allotted period for tax collection and after one year of operation it was deemed necessary to implement a monthly limitation on the rate of redemption to sustain the fund. **Another challenge is weather. This is an external condition which cannot be fixed. For example, towards the end of 2012 Super Typhoon Bopha barely struck Palau and tore off the roof of the National Redemption Center and put a halt to the operations.**

As mentioned previously, counting method was a challenge in the beginning of the operations as human errors became a factor due to exhaustion. This method is also very difficult to monitor as there are many counters. **The lack of an effective monitoring system for this counting method can have a devastating impact as inaccurate counting can take place.** This is why counting machines have been employed to do the majority of this task.

Another challenge faced was the underestimation of the redemption rate in the beginning of the program. This ultimately led to shortage of capacity in human resource, equipment's and facility. This challenge prompted the Government of Koror State to expand its Solid Waste Management Office into its current state; from less than 20 employees to now employing more than 50, and more than a million dollars of investment into its facilities and equipment's. And this is all made possible through the financing mechanism to which this program and its governing law and regulations provide.

17. Exporting the Redeemed Containers

The Ministry of Public Infrastructure, Industries & Commerce, as the responsible agency, the Ministry may, from time to time, delegate or contract out the administration of the recycling program to other governmental agencies of the national government, state governments or private companies; PROVIDED that the ultimate responsibility and authority for the recycling program shall rest with the Ministry of Public Infrastructure, Industries & Commerce (Source RPPL 7-24 §4).

MPIIC decided to use a private contractor for exporting the redeemed beverage containers for the following reasons:

- Recycling companies already exist in Palau.
- Experience in exporting recyclable materials.
- These companies have the capacity in terms of tools, equipments, personnel, facilities and know how.

Hence, MPIIC went through the process of bidding out a service contract to interested parties and the bid was awarded to Palau Waste Collection Company based on qualifications.

The Contractor shall perform the following services:

- Buy redeemed containers from the National Government.
- Be responsible for picking up compressed and redeemed containers from the Redemption Center at their own expense.
- Ship out of Palau compressed and redeemed containers (aluminum, plastics, and metals) **within six (6) months** after pick up from Redemption Center at its own expense.

18. Plans to improve

Recommendations for improvement of the recycling program of Palau:

- Amend the law to include all sizes of beverage container. Existing law only calls for 32 oz. and lower.
- Existing law exempt milk and dairy derived products. Need to include them as there are many milk products in aluminum/ metal cans and glass bottles.
- Need to revise the Beverage Container Recycling Regulations to fit the needs of the operation of the Redemption Center and the overall recycling program.
- Need to create a better monitoring system for the import- redeemed- export amount of beverage containers to monitor the amount of import vs. export so that we can understand the effectiveness of the program and make improvements as necessary.

19. Tips: Steps to Start Program

Steps to start recycling programs;

- 1. Data collection:**
 - a. Survey of waste generation rate
 - b. Composition of waste
 - c. Survey of imported goods
- 2. Make a decision on what kind of waste is recyclable based on the survey and choose a program that is attainable.**
- 3. Feasibility study:**
 - a. What amount of deposit fee should be imposed on the recyclable items? Is the amount adequate to sustain the program?
 - b. Check the price in the recycling market.
 - c. Agencies involved in the program should have capability implementing such program. For example, they must have the right equipments, program for collection of fee, way for exporting and personnel capacity.
- 4. Make a proposal to the leadership.**

The following items should be considered during the planning;

	ITEMS TO CONSIDER	ONE PROPOSAL
Target Item	Reference Law and Regulation	Must pass a Law Develop regulations according to Law
	Target items as objects of the deposit	Choose which items to target
	Restriction of the target items	It is best not to limit the size or product types of target items
Deposit	\$ of deposit or tax of the item	Should be set when doing financial feasibility
	How many months required to collect deposit fee before starting refund	3 months, 6 months or 1 year. It depends on your data of imported goods.
	Training to be considered	Must hold workshops for implementing agencies importers/ distributors of the target items to assure them of the program purpose and fees involved.
	Training to Staffs of office of Custom	Must hold workshops for staffs who are responsible for collecting deposit in the office of Custom
	Program/System at Office of Custom	Any agency responsible for collection of deposit fee should have capacity to perform the task.
	Deposit of container imported	Any container imported through any port, airport or by postal package shall be paid.
	Empty container imported for the purpose of exporting	Shall pay deposit fee and off-set the fee at the time of export
	Plastic pellet imported for the purpose of exporting	Shall pay deposit fee and off-set the fee at the time of export
	Time to pay the deposit fee	Before release the product. It is best not to allow releasing all products in the container until the deposit is paid even tax for other product is paid.
	Monitoring and Reporting by the responsible agency	Responsible agency of collecting deposit should record and share the data among involved agencies at least monthly base.

OPERATION BY KOROR STATE GOVERNMENT

Fund	Creation of recycling fund	% of deposit fee should be used to create a recycling fund as financial source for Solid waste management.
	Account of recycling fund	The fund should have separate account from other funds.
	Purpose of the fund	The law should specify the use of fund. The fund should be used for solid waste activities.
	Monitoring and Reporting by the responsible agency	Responsible agency for managing the funds should record and share among involved agencies at least monthly basis.
Refund	\$ of refund	Should be set when doing financial feasibility
	How many months from passing the law to start refunding	Shorter is better to avoid accumulation of untaxed items to be redeemed.
	Rule of refund	1 refund per container
	Condition of container to be redeemed	Should be clean, empty and not pressed or pretreated from a recycling company.
	Counting method	Double monitoring should be taken to prevent double counting.
	Responsible agency for refund	Redemption center under the monitoring of the agency which manages the deposit fee.
Redeemed containers	Sales and export of redeemed containers	Recycling program should support local recycling companies, thus, the implementing agency should contract out to the private company to buy and export the redeemed containers.
	Monitoring	Implementing agency should monitor the amount redeemed, sales and export of the containers.
Redemption center	Creation of the redemption center	The law should call for a redemption center and the responsible agency.
	Redemption center operation	Operation plan should be approved by the responsible agency. Redemption center could be government agency or private contractor.
	Operation cost of the redemption center	The center should receive \$ per container redeemed for compensation (operation cost).
	For outer islands or community in the distant	(Item to consider)
Other	Report	Annual Report should be prepared at end of each fiscal year by the responsible agency.
	Monitoring/ Audit	Responsible agencies and activities concerning recycling program shall be audited at least once a year by the Public or Private Auditor.
	Roles of the redemption center	Refund \$ per container Recording of redeemed containers
	Roles of implementing agency(s) according to law	Example, MOF- management of deposit fee, monitoring of funds, check financial reports from redemption center and collection of deposit fee. MPIIC- implementation of the program, approve and monitor the redemption center(s), and export or find ways to export redeemed containers.



Thank you very much for taking the time to read this manual.
Please contact Solid Waste Management, Bureau of Public Works or
Koror State Solid Waste Management Office for any queries
regarding the information's presented in this educational manual.

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This is an educational manual created with the experiences of the Solid Waste Management, Bureau of Public Works, MPIIC and Koror State Solid Waste Management Office to educate and help those who wish to start a container deposit fee program as a form of solid waste management activity. We sincerely hope it will benefit you.