

An aerial photograph of a tropical beach. The water is a vibrant turquoise color, transitioning to a lighter, milky white near the shore. The sand is a bright, clean white. In the foreground, there are several large, dark, jagged rocks protruding from the water. The sky is a clear, deep blue with a few wispy white clouds near the horizon.

Integrated Solid Waste Management Plan

**Commonwealth of the Northern
Marianas Islands
Municipality of Rota**

FY 2023- 2026

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Introduction

The Municipality of Rota recognizes the importance of properly managing solid waste in an environmentally responsible manner. This Integrated Solid Waste Management Plan aims to improve hazardous waste containment, increase staff training, implement waste separation, work towards zero waste goals, and better understand hazardous waste generation through data collection. It was developed by the Office of the Mayor of Rota and the Department of Public Works to supplement the initial Comprehensive Integrated Solid Waste Management Plan drafted by the Inter-island Solid Waste Management Taskforce. Successfully implementing these programs will reduce pollution, increase recycling, minimize waste sent to the landfill, and protect public health and the environment.

Landfill Permitting Action Plan

Rota will comply w/ BECQ rules regarding solid waste management. An action plan to support anticipated requirements might include the following next steps:

1. Evaluate existing landfill conditions
 - Conduct engineering assessment of infrastructure, operations, environmental controls
 - Identify areas that need improvement to meet permit standards
2. Research permit requirements
 - Solid Waste Disposal Act, CNMI regulations for solid waste facilities
 - EPA standards for municipal solid waste landfills
 - Permitting process and timeline, application forms
3. Make necessary upgrades, (examples that might be included)
 - Improvements to landfill cover, liners, leachate collection
 - Possible Installation of groundwater monitoring wells, gas control systems
 - Strengthening of record keeping and waste screening protocols
4. Complete permit application
 - Describe site conditions, surrounding area, waste volumes/types
 - Detail operations, environmental controls, monitoring plans

- Submit engineering plans, technical specifications, etc.
- 5. Agency review process
 - CNMI Bureau of Environmental and Coastal Quality - inspection, comment period
 - EPA - evaluation of application materials, request for revisions
 - Modify plans based on agency feedback
- 6. Permit public hearing
 - Notify public, provide comment period per regulations
 - Hold public meeting, address any concerns raised
- 7. Obtain permit
 - Receive final solid waste disposal permit
 - Pay required fees, post-performance bond
- 8. Construct permitted landfill
 - Build or upgrade to permitted design specifications
 - Install all required environmental control systems
- 9. Pass final inspections
 - Verify site meets all permit conditions
 - Correct any deficiencies, re-inspect if needed
- 10. Begin permitted operations
 - Train employees on permit requirements
 - Implement waste screening, monitoring, record keeping
 - Schedule regular agency inspections to maintain permit compliance

Following this action plan will ensure the Rota landfill meets all regulatory requirements and obtains necessary permits to operate legally. The process will improve the landfill's environmental protections and management practices.

Rota Recycling Program

To reduce waste and environmental impact, Rota will implement a comprehensive recycling program for plastics, metals, paper, and cardboard, and support ongoing composting efforts addressed further under "Zero Waste" initiatives. Recycling bins will be distributed to all households, schools, and businesses to facilitate separation of these materials. Informational campaigns will educate the community on how and why to recycle.

Curbside collection trucks will pick up bagged and segregated recyclables on established routes, taking them to a central facility for sorting and processing. Here, plastics will be shredded, cleaned, and baled to specification for remanufacturing. Metals like aluminum and steel will be separated using magnets and screened to remove impurities. Paper and cardboard will be bundled and compressed into dense cubes. All materials will be processed at a permitted recycling / environmental education center. Opportunities to maximize economic benefits for the community including metal redemption and materials reuse will continue to be explored.

To supplement local processing, certain metals and other high-value materials will be exported abroad. Arrangements with international scrap metal dealers will be made to extract Rota's waste metals like copper, iron, and brass for recycling markets in Asia. Hard-to-recycle plastics may also be shipped overseas where advanced facilities can effectively reuse the materials in new products.

Rota's recycling program will not only reduce landfill waste, but also generate revenue, create jobs, and support environmental sustainability. The program provides a model for resource conservation that aligns with Rota's vision for a green, zero waste community. With proper infrastructure and commitment, recycling can greatly benefit the island environmentally and economically.

Curbside Garbage Collection Program

To provide convenient and equitable waste management services, Rota will implement a curbside trash collection program available to all households. On scheduled collection days, residents will be instructed to leave bagged garbage in covered bins at the edge of their property by 7AM on the scheduled pick-up day.

Trash trucks will traverse established routes to empty curbside bins. Drivers will return bins to the proper locations after disposal. Collected refuse will be transported to Rota's sanitary landfill for safe containment.

This curbside collection system will increase community participation in proper waste disposal. Not all residents have the means to haul trash themselves to the landfill. Providing pick-up access eliminates unsafe or improper dumping. It also reduces litter from exposed or spilled garbage in neighborhoods.

Educational campaigns will inform the public about curbside procedures, schedule, and waste reduction techniques. The service will be subsidized for low-income households to ensure equitable participation.

Rota's curbside collection program promotes public health and environmental conservation. Keeping trash contained and disposed of properly will result in cleaner streets and prevent contamination. The system uplifts the community while meeting the goal of responsible waste management.

Na'gatbo Luta Waste Separation Program

A community Waste Separation Program will be launched to assist with separating recyclables and hazardous waste from general trash at the source. Educational campaigns, sorting bins, and collection schedules will help residents and businesses appropriately separate their waste. This will increase the capture rate for recyclables and minimize hazardous materials sent to the landfill.

Zero Waste Management Plan

Rota will work toward a goal of achieving zero waste through reducing consumption, increasing recycling and composting, and encouraging sustainable product design. A zero-waste educational campaign will promote refuse, reduce, reuse, recycle principles in schools, businesses, and households. Economic incentives will be explored to increase recycling and reuse. Lifecycle analyses will identify products and processes that generate excessive waste. The zero-waste program aims to eventually eliminate the need for landfill disposal.

Green Waste Reintegration Program

A Green Waste Reintegration Program will be established to collect and recycle green waste from landscaping, agriculture, and forestry activities. Collected green waste such

as yard trimmings, leaves, branches, and wood debris will be processed into mulch, compost, or woodchips at the existing composting facility. These reclaimed organic materials will then be utilized as natural fertilizers, soil amendments, and ground cover at the Rota Fruit Park Agroforestry Project.

Reintegrating green waste back into the environment will complement the Rota Fruit Park's goals of demonstrating sustainable agroforestry practices. Community volunteers, farmers, and visitors will be educated on the cyclical process of harnessing green waste as a valuable resource. Diverting green waste from the landfill reduces waste volume while supporting the Fruit Park's mission of ecological agriculture and permaculture. The Green Waste Reintegration Program exemplifies the circular economy principles of reuse and regeneration that are key to Rota's zero waste goals.

Plan to Build a Transfer Station on the Island of Rota

The Island of Rota is a beautiful and unique place with a rich history and culture. However, the island also faces a number of challenges, including a growing population and increasing waste generation. In order to address these challenges, the Rota Department of Public Works (DPW) is proposing to build a transfer station on the island.

Benefits of a Transfer Station

A transfer station would provide a number of benefits to the community of Rota, including:

- **Reduced waste disposal costs:** A transfer station would allow Rota to consolidate its waste and transport it to our main landfill. This would reduce the number of trips that DPW trucks need to make to the landfill, which would save the department and the community money on fuel and labor costs.
- **Improved environmental protection:** A transfer station would help to reduce the risk of pollution by preventing waste from being illegally dumped on the island. It would also help to conserve natural resources by reducing the amount of waste that needs to be incinerated.
- **Enhanced community health:** A transfer station would help to improve community health by reducing the number of pests and rodents that are attracted to waste. It would also help to reduce the spread of disease.
- **Importance of a Transfer Station in the Context of US Climate Change Laws**

The Biden administration has made climate change a top priority. In order to address climate change, the administration has set a goal of reducing greenhouse gas emissions by 50-52% below 2005 levels by 2030.

One of the ways to reduce greenhouse gas emissions is to reduce waste. Waste disposal contributes to greenhouse gas emissions in a number of ways, including:

- Landfills release methane, a potent greenhouse gas, as organic waste decomposes.
- Incineration releases carbon dioxide, another greenhouse gas.
- Transportation of waste to landfills and incinerators releases carbon dioxide.

A transfer station would help to reduce greenhouse gas emissions by reducing the amount of waste that needs to be landfilled or incinerated. It would also help to reduce the amount of fuel that is used to transport waste.

Landfill Facility and Equipment Upgrades

Nature-based Solutions

To extend the lifespan of Rota's landfill in an eco-friendly manner, various nature-based solutions will be implemented.

On-site composting operations will process organic waste into nutrient-rich soil used for daily landfill cover and closure cap. Microbial compost will aid decomposition of buried refuse while nurturing vegetation on closed landfill sections.

Evapotranspiration soil covers will be installed, using layered soils and native plants to filter rainwater. This natural system prevents infiltration of liquids, reducing leachate production. Plants also capture airborne emissions.

Strategically planted trees, shrubs and groundcover around the landfill perimeter will contain dust and debris. The vegetative buffer also prevents soil erosion while integrating the site aesthetically into the surrounding landscape.

Landfill gas extraction wells and pipes will collect methane emissions for flaring or energy recovery, preventing its release into the atmosphere. Gas collection contributes to Rota's renewable energy portfolio.

These ecological engineering techniques allow Rota's landfill to operate more sustainably for two decades or longer. While reducing environmental impacts, they also restore natural habitat and beneficial uses to the site. The solutions exemplify Rota's commitment to balance resource recovery, conservation and community needs.

Building with Waste Pilot Project

A Building with Waste Pilot Project will explore repurposing hard-to-recycle waste into construction materials. Technologies such as compression molding can transform plastic bags and films into interlocking blocks. Paper, textiles, and other fibers can be mixed with adhesives to form composite boards. Glass and ceramics can be crushed into aggregates to replace gravel or sand. These waste-derived building materials will be tested by constructing retaining walls, drainage ditches, and small structures at the landfill site. If successful, the project can be expanded to reuse substantial amounts of waste while benefiting the local community. Information gained can guide implementation of waste-to-construction programs globally. The project exemplifies the circular economy in action by giving new life to discarded resources.

Hazardous Waste Containment Facility

A secure and typhoon-resistant Hazardous Waste Containment Facility will be constructed to provide long-term storage of hazardous waste generated on Rota. This facility will safely contain hazardous materials such as batteries, lightbulbs, paints, pesticides, and other toxic substances. Proper storage will prevent these materials from contaminating soil and water resources. The facility will be engineered to withstand Rota's frequent typhoons.

Heavy Equipment Investment and Maintenance Plan

Investing in heavy equipment such as articulated dump trucks, excavators, loaders, bulldozers, and compacters will greatly benefit the Department of Public Works' solid waste operations. Heavy equipment improves efficiency in handling, sorting, and compacting solid waste. Specific benefits include:

- Increased processing capacity at the solid waste facility through the use of loaders, excavators, and bulldozers to quickly move and consolidate waste.

- Improved waste density and landfill space utilization by utilizing compacters to reduce waste volume.
- Enhanced sorting of waste streams like metals, tires, glass, plastics through grapple and magnetic attachments on excavators and loaders.
- Reduced operational costs by decreasing manual labor requirements and allowing one operator to perform multiple functions.
- Improved safety for solid waste personnel by minimizing direct contact with waste.
- Lower equipment maintenance costs compared to relying on a fragmented fleet of older machines.

Investing in a standardized fleet of integrated heavy equipment will maximize productivity and efficiency in Rota's solid waste operations. Options for the most cost-efficient and environmentally friendly alternatives including consideration of leases and possibility of renewably charged use of reclaimed diesel fuel will be assessed. Grants to support the phase-out of older and poorly performing machinery and partnerships with NMTech to support training in operations and maintenance will be pursued. The equipment investment and maintenance plan will provide the necessary machinery to implement the various waste management programs outlined in this Integrated Solid Waste Management Plan.

Training and Data Collection

Training Program for Solid Waste Staff

A comprehensive training program will be implemented to educate Rota's Department of Public Works Solid Waste Division staff on hazardous waste identification, sorting, and processing procedures. Trainings will cover waste classification, safe handling protocols, use of personal protective equipment, and hazardous waste storage and transport. Properly trained staff will be able to correctly identify and divert hazardous waste for proper disposal

Hazardous Waste Data Collection Survey

A hazardous waste data collection survey will be conducted to quantify and characterize the types and volumes of hazardous waste currently generated on Rota. The survey will collect data on hazardous waste from households, businesses, facilities, and other sources. Understanding hazardous waste generation rates and composition will inform

management infrastructure needs and assist in measuring progress towards waste reduction goals. Annual surveys will monitor trends over time.

This Integrated Solid Waste Management Plan aims to comprehensively improve Rota's systems for managing hazardous waste and solid waste as a whole. Implementing these strategic programs will promote public health, environmental protection, natural resource conservation, and sustainability on Rota.