FINAL REPORT

January 2008

"National Implementation Plan (NIP) for the Stockholm Convention on POPS"

REPUBLIC OF THE MARSHALL ISLANDS

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LIST OF ABBREVIATIONS

ADI	Acceptable Daily Intake
BAT	Best Available Technology
BEP	Best Environmental Practice
CMICRE	College of the Marshall Islands Cooperative Research and Extension
DAFF	Department of Agriculture, Forestry and Fisheries
DDD	1,1-dichloro-2,2-bis(4-chlorophenyl)ethane
DDE	1,1-dichloro-2,2-bis(4-chlorophenyl)ethylene
DDT	Dichlorodiphenyltrchloroethane
EEZ	Exclusive Economic Zone
EPA	Environmental Protection Authority
FAO	Food and Agriculture Organization
GEF	Global Environment Facility
GEMS	Global Environment Monitoring System
GMO	Genetically Modified Organisms
HCB	Hexachlorobenzene
IARC	International Agency for Research on Cancer
IWP	International Waters Programme
LMO	Living Modified Organisms
MALGOV	Majuro Atoll Local Government
MEC	Marshalls Energy Company
MOE	Ministry of Education
MOH	Ministry of Health
MIA	Ministry of Internal Affairs
MOF	Ministry of Finance
MOFA	Ministry of Foreign Affairs
MOPW	Ministry of Public Works
MORD	Ministry of Resources and Development
NBF	National Biosafety Framework
NCC	National Coordinating Committee
NEMS	National Environment Management Strategy
NGO	Non-Government Organisation
NIP	National Implementation Plan
OEPPC	Office of Environmental Planning and Policy Coordination
PCBs	Polychlorinated biphenyls
PCDDs	Polychlorinated dibenzo-p-dioxins
PCDFs	Polychlorinated dibenzofurans
PICs	Pacific Island Countries

POPs	Persistent Organic Pollutants
RMI	Republic of the Marshall Islands
SPC	Secretariat of the Pacific Community
SPREP	Secretariat of the Pacific Regional Environment Programme (formerly South Pacific Regional Environment Programme)
TEF	Toxicity Equivalency Factors
UNCLOS	United Nations Convention on the Law of the Sea
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme

FOREWORD

It gives me great pleasure on behalf of the government and people of the Republic of the Marshall Islands, to endorse this National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants.

As a small island developing state, the Republic of the Marshall Islands faces particular vulnerabilities such as fragile ecosystems, limited supplies of fresh drinking water and limited areas of land suitable for development. For these reasons it is very important that our natural resources be protected from possible contamination by persistent organic pollutants, and other hazardous chemicals.

The Government of the Republic of the Marshall Islands is committed to ensure a safe environment for its people and future generations. The guiding principles for sustainable development are incorporated into the country's National Vision, which aims:

> "To become a country within an inter-dependant world, with an enhanced socio-economic self-reliance, an educated, healthy, productive law-abiding and God-loving people in which individual freedom and fundamental human rights are protected and culture and traditions are respected and development and environmental sustainability are in harmony."

The Stockholm Convention on Persistent Organic Pollutants (POPs) is one of many avenues by which the Government believes we can benefit in improving our quality of life by protecting human health and the environment. We therefore recognize and endorse this National Plan for Implementation of the Stockholm Convention and are committed to its obligations.

I commend the work of the National Coordinating Committee that has overseen this project, and the many organizations and individuals who have contributed to the development of the Plan. I would like to encourage the people of the Republic of the Marshall Islands to continue to participate in the implementation of the Plan, so that we can all work together towards a Persistent Organic Pollutants (POPs)-free future for the Republic of the Marshall Islands.

H.E. Litokwa Tomeing
President
Republic of the Marshall Islands

January 2008

EXECUTIVE SUMMARY

This document presents the Republic of the Marshall Islands' National Plan for the implementation of the Stockholm Convention on Persistent Organic Pollutants. The Republic of the Marshall Islands became a Party to the Convention on 27 January 2003 and the Convention entered into force globally on 17 May, 2004.

The objective of the Stockholm Convention is to protect human health and the environment from persistent organic pollutants (POPs). The convention currently covers nine POPs pesticides, two industrial chemicals (HCB and PCBs), and the dioxins and furans, which are formed as unintentional by-products in combustion processes. These chemicals are to be controlled through various actions, including prohibiting future production and use of most of the pesticides and industrial chemicals, and the application of a range of measures for the reduction of releases of the unintentional Persistent Organic Pollutants (POPs).

This Plan was developed with financial assistance from the Global Environment Facility, with the United Nations Environment Programme as Implementing Agency. The work for the project was guided by a National Coordinating Committee (NCC), which included representation from central government and non-governmental organizations. Consultation with stakeholders was an important element in the preparation of the National Implementation Plan. This was achieved through a combination of one-on-one consultations, presentations to schools and other interest groups, visits to the outer islands by members of the NCC, and national workshops.

Persistent Organic Pollutants in the Republic of the Marshall Islands

The current situation regarding persistent organic pollutants in the Marshall Islands is summarized in chapter 2 of this document along with a more general Country Profile. The key issues relating to POPs chemicals and implementation of the Convention are as follows:

POPs Pesticides

The Republic of the Marshall Islands does not intentionally produce or use any POPs chemicals, nor are there any future plans to do so. However, some POPs pesticides were used in the past, specifically DDT for malaria control. Regulations controlling the importation and use of pesticides and persistent organic pollutants were passed in 2004 and these provide for all imports of POPs to be banned. The implementation of this provision simply requires formal publication of an official notice by the Environmental Protection Authority. Given the absence of intentional production and use of POPs in the Marshall Islands, it is proposed that this action be taken in the very near future.

The only exception to this ban is DDT. The Marshall Islands has already registered its requirement under the Stockholm Convention for a use exemption for DDT. This is on the basis that the chemical may be needed some time in the future for vector control. Malaria has not been a problem here for many years but there is a significant risk that the problem may arise again in the future as a result of climate change.

A number of capacity building and awareness-raising requirements were identified in relation to pesticide use generally in the Marshall Islands. These include the need for additional training of Customs officers, RMIEPA staff, and other government personnel, in the

application of the Pesticide Regulations, and the development of capacity for identification and testing of imported products. There is also a need for education and awareness activities at the user level, including the promotion of alternative (non-chemical) methods for pest control.

PCBs

A first exercise for removing PCB oils from old transformers in the Marshall Islands was carried out by the US EPA in the mid-1990s, although this only dealt with older out-of-use equipment. Two large transformers containing PCBs were later removed in 2006 as part of an AusAID/SPREP disposal project for persistent organic pollutants. Additional testing has shown that there are up to 50 smaller PCB-transformers on the island of Ebeye, which may also need to be exported for disposal. In addition, there are unknown numbers of transformers on the outer islands which have yet to be tested for PCBs. Further action is required to finalise a PCB transformer inventory for the Marshall Islands, followed by development and implementation of a programme for removal and disposal.

No work has yet been carried out for the identification of small capacitors and other electrical equipment that could possibly contain PCBs. It is known from work done in other Pacific Island countries that some of these items will almost certainly be present in the Marshall Islands. There are no systems in place for the environmentally sound management of this type of equipment, and a complete absence of suitable disposal facilities. It is therefore proposed that a system be developed for identifying and managing PCBs in small capacitors and other equipment as they arise, and that this should include placement into safe storage, and ultimate disposal. In Jaluit, six (6) old transformers exposed by wave actions were collected and disposed off in a dig hole near the dump.

Unintentional POPs (Dioxins and Furans)

Dioxins and furans are formed and released from thermal processes involving organic matter and chlorine, and as a result of incomplete combustion or chemical reactions. A preliminary inventory of dioxin and furan releases has shown that the main sources on the Marshall Islands are the incineration of medical and quarantine wastes, the melting of lead from old batteries, cable burning, and uncontrolled burning, including landfills and backyard rubbish fires.

The Marshall Islands lacks the capacity to record, control or monitor the releases of dioxins and furans. The knowledge and application of best available techniques (BAT) and best environment practices (BEP) for new or existing sources is very limited or non existent. These measures need to be considered when any new facility is developed; for example the installation of a new incinerator for medical wastes, or possibly even municipal wastes.

The development of improved waste management systems in the Marshall Islands is a fundamental requirement for the reduction of unintentional releases from activities such as rubbish burning. This should be based around enhancing the implementation of the current and planned programmes for waste management, including improvements to the disposal systems, recycling programmes, and the promotion of alternative methods such as composting. Capacity building and public awareness programmes on POPs will also be a key focus towards the reduction in releases of dioxins and furans.

Work is also proposed for the development of emission control regulations under the Environmental Protection Act 1984. These would allow the EPA to take action in addressing other specific sources of dioxin releases, including cable burning, lead recovery, asphalt plants, and emissions from power stations and motor vehicles.

Chemical Stockpiles and Contaminated Sites

There are no known stockpiles of POPs in the Marshall Islands. However, there are a significant number of potentially contaminated sites, including those around power stations, boat and vehicle repair yards, and several 'legacy' sites from past activities, including the Pacific War. In addition, a pesticide burial site was recently identified on Majuro.

There is no expertise or capacity within the Marshall Islands for the identification, management and remediation of any of these sites. This problem has therefore been addressed through a capacity building proposal.

Implementation Plan

A priority setting and action planning workshop to address the above issues, and also the more general requirements of the Stockholm Convention was carried out in Majuro in February 2007. The outcomes from this workshop were then used in the development of the National Implementation Plan (NIP). The NIP is based around several specific strategies and action plans. The goals and objectives of each action plan reflect those of the Stockholm Convention and attempt to address the POPs issues in the Marshall Islands. The action plans are as follows:

1. Action Plan to address the intentional production and use of POPs (Article 3)
2. Action Plan to address the specific requirements for PCBs (Article 3)
3. Action Plan on measures to minimize and ultimately eliminate the unintentional production of POPs (Article 5)
4. Action Plan on measures to reduce or eliminate releases from stockpiles, wastes and contaminated sites (Article 6)
5. Action Plan to address public information, awareness and education (Article 10)
6. Action Plan to address research, development and monitoring (Article 11).

A strategy for meeting the requirements for information exchange (Article 9) and reporting requirements (Article 15) has also been developed.

The action plans have been developed in close consultation with key stakeholders. Much of the work is intended to be carried out by local personnel with assistance from international experts as and when required. This approach is intended to assist in developing local capacity for POPs management and implementation of the Convention. The plans include the following specific proposals for capacity building:

POPs Issues	Capacity Building Proposals
POPs Pesticides	• Training of government personnel, importers and users for better compliance with the pesticide regulations • Training on development of non – chemical alternatives to pesticides
PCBs	• Training on identification, removal and storage of PCBs in electrical equipment.
Dioxins and Furans	• Training on dioxin inventories and the application of BAT/BEP • Training for monitoring and enforcement of the air emission regulations
Contaminated Sites	• Training in identification, assessment and management of contaminated sites.
Monitoring	• Development of local facilities and improved access to overseas resources, as appropriate, for the monitoring of POPs and other pollutants • Staff training in sample collection techniques and the use of field test kits

The timetable for implementation of these plans is included in a detailed matrix of activities given in Annex 2. Most of the activities are intended to be carried out over the next three years, although some involve on-going commitments which will continue on for many years into the future. The total estimated cost of all the activities is US$731,000, with the breakdown between each of the different action plans as shown in the table below.

Section	Action Plan	External	Internal	Total
3.3.1	Intentional Production and Use of POPs	$29,000	$3,000	$32,000
3.3.2	Specific Requirements for PCBs	$160,000	$15,000	$175,000
3.3.3	Unintentional Production of POPs	$344,000	$16,000	$360,000
3.3.4	Stockpiles, wastes and contaminated sites	$50,000	$9,000	$59,000
3.3.5	Information exchange	$39,000	$5,000	$44,000
3.3.7	Research, development and monitoring	$55,000	$6,000	$61,000
	TOTAL	**$677,000**	**$54,000**	**$731,000**

ACKNOWLEDGEMENTS

The following people and organizations are gratefully acknowledged for their valuable contributions to the development of this First RMI - National Implementation Plan on Persistent Organic Pollutants (POPs) for the Stockholm Convention:

- We wholeheartedly want to thank all honorable Senators, Mayors, Council members, Iroij, Leroij, Alap, and the people of these selected island and atolls who hosted the piloting of the Chemical Inventory, Awareness Raising Workshops and Activities of the Project; (Majuro Atoll, Ebeye, Kwajalein Atoll, Jaluit Atoll, Wotje Atoll, Arno Atoll, Ailuk Atoll, Namdrik Atoll, Enewetak Atoll, Maloelap Atoll, Ujae Atoll, and Kili Island).Your warm traditional hospitalities and insights have enabled the project task teams to complete their assignments and indeed proved to be invaluable in the preparations, compilations, and production of this RMI- National Implementation Plans (NIPs).

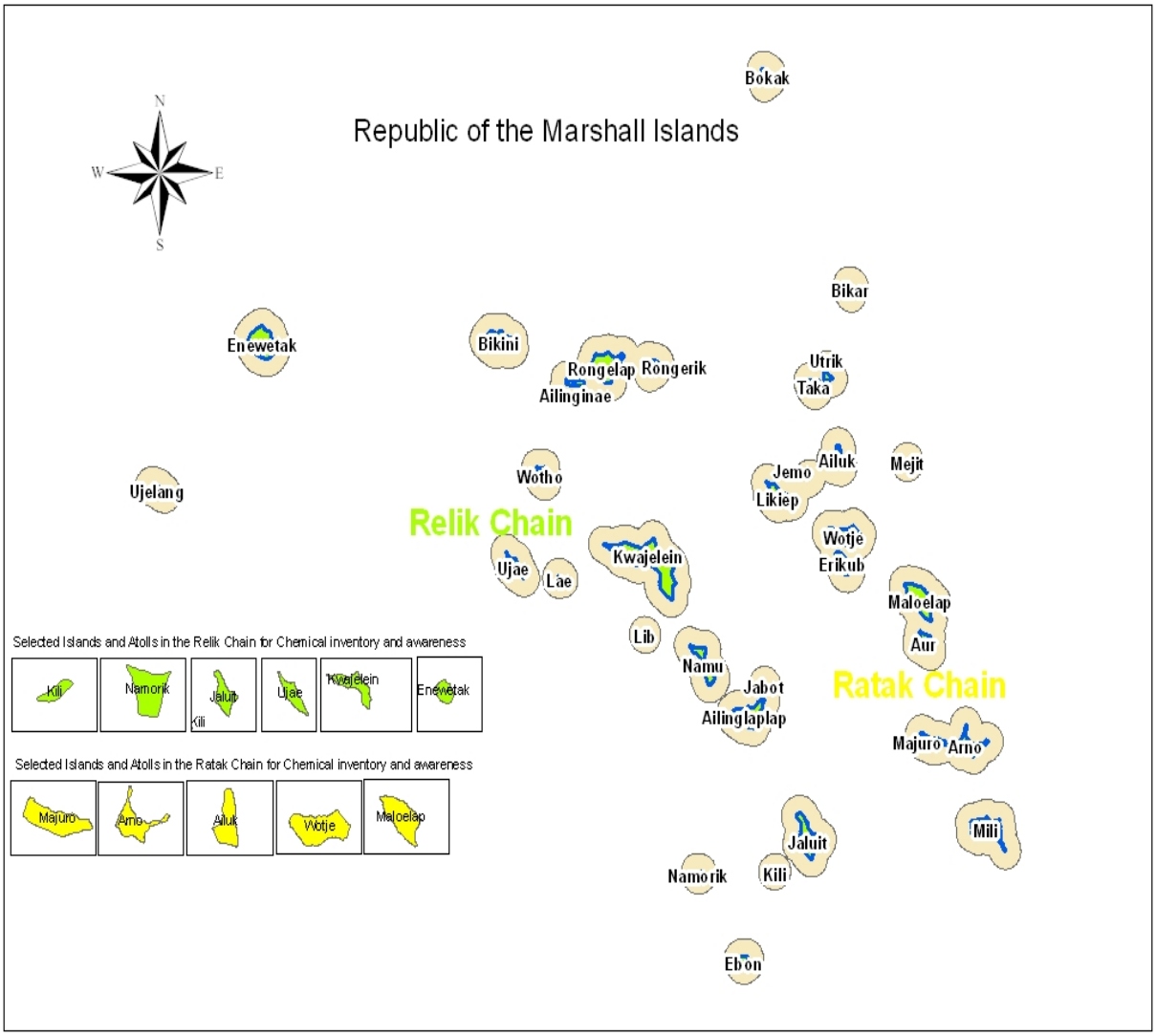
- All of us who were involved with this project are very appreciative of the great supports and assistances that were given by the offices of the United Nations Environmental Program/Global Environmental Facility in Geneva, and Nairobi, Africa. Also, we would like to acknowledge and thank our valuable partners at the Secretariat for the Pacific Regional Environmental Programme (SPREP) for their supports and assistance in the first Clean and Pick-Up efforts under the POPs in PICs Project.

- We would also like to thank each of the following who have contributed and/or participated in one way or another in the success of the project activities and implementations: Lokeben Store, Homegarden Wholesale & Retails, Majuro Ace Hardware, Formosa Stores, Bilco Store, Easy Life Store, Cost Price Mart and Store, Midtown Store, Payless Super Market, Momotaro Store, MJCC Company, Maji Store, Discount Store, Crazy Price Mart Company, Do It Best Company, Wai Wai Store, Pacific International Inc. MAP Vision Store and Wholesale, DAR Restaurant and Store, Long Island Hotel, Youth to Youth In Health, CMICRE, MORD and Laura Farmers Association.

- We immensely acknowledge and appreciate the participation of all private and public schools in Majuro, Ebeye, Jaluit, Wotje, Maloelap, Namdrik, Enewetak, Ailuk, Ujae, Arno and Kili.

- We would like to extend our appreciation to Ms. Elizabeth Harding who assisted us in the development of the Pesticides and POPs Regulations for the Marshall Islands.

MAP - 1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Selected Islands and Atolls in the Ratak Chain for Chemical inventory and awareness
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Arno
Aluk
Wotje
Maloelap

1.0 INTRODUCTION

The Stockholm Convention is a global treaty designed to protect human health and the environment from a group of chemicals known as Persistent Organic Pollutants (POPs). The convention currently covers the following twelve chemicals: aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, mirex, toxaphene, hexachlorobenzene (HCB), polychlorinated biphenyls (PCBs), polychlorinated dibenzo-*p*-dioxins, and polychlorinated dibenzofurans. The first nine of these are pesticides. HCB is also classed as an industrial chemical, as are PCBs, while the dioxins and furans are formed as unintentional by-products in combustion processes and some industrial activities. These chemicals are to be controlled through various actions, including prohibiting future production and use of most of the pesticides and industrial chemicals, and the application of a range of measures for the reduction of releases of the unintentional POPs.

Additional background information on each of the POPs is given in Annex 1.

The Convention specifies a range of measures, which are intended to help in achieving its goals. These include controls on the production, import, export, use and disposal of POPs chemicals, and measures to minimize releases of unintentional POPs. The Convention was adopted in Stockholm, Sweden on 22 May 2001, and the Republic of the Marshall Islands became a State Party on 27 January 2003.

As a Party to the Stockholm Convention, the Republic of the Marshall Islands is obligated to develop a National Implementation Plan as stated in Article 7 of the Convention:

> *"1. Each Party shall:*
> *(a) Develop and endeavor to implement a plan for the implementation of its obligations under this Convention;*
> *(b) Transmit its implementation plan to the Conference of the Parties within two years of the date on which this Convention enters into force for it; and*
>
> *(c) Review and update, as appropriate, its implementation plan on a periodic basis and in a manner to be specified by a decision of the Conference of the Parties.*
>
> *2. The Parties shall, where appropriate, cooperate directly or through global, regional and sub-regional organisations, and consult their national stakeholders, including women's groups and groups involved in the health of children, in order to facilitate the development, implementation and updating of their implementation plans.*
>
> *3. The Parties shall endeavor to utilize and, where necessary, establish the means to integrate national implementation plans for persistent organic pollutants in their sustainable development strategies where appropriate."*

The NIP provides an operational framework for securing appropriate resources to carry out the tasks or mechanisms for action on POPs. Ultimately, the NIP serves as a basis for monitoring the Marshall Islands' progress in addressing the POPs issue, and the effectiveness of the actions it has committed to for reducing or eliminating POPs use and release to the environment.

1.1 Development of the National Implementation Plan

This Implementation Plan has been prepared under an enabling activity project funded by the Global Environment Facility (GEF). The Republic of the Marshall Islands Environmental Protection Authority (RMIEPA) is the government Executing Agency for the project, and the United Nations Environment Programme (UNEP) is the GEF Implementing Agency.

The design of the project was intended to create sustainable capacity and ownership in the Marshall Islands in meeting our obligations under the Stockholm Convention, including the initial preparation of a National Implementation Plan (NIP). Within the overall objective of the Stockholm Convention, which is to protect human health and the environment from POPs, the project had the following objectives:

i. Prepare the groundwork for implementation of the Convention in the Marshall Islands;

ii. Assist the Marshall Islands in meeting its reporting and other obligations under the Convention; and

iii. Strengthen the Marshall Islands' national capacity to manage POPs and chemicals generally.

The project activities were based around the step-wise process set out in the GEF "Initial Guidelines for Enabling Activities for the Stockholm Convention on Persistent Organic Pollutants". In summary, these were:

i. Determination of coordinating mechanisms and organization of process;

ii. Assessment and strengthening of national infrastructure and capacity, adaptation of national legislation for Stockholm Convention implementation and establishment of a POPs inventory;

iii. Setting of priorities and determination of objectives;

iv. Formulation of a National Implementation Plan and specific Action Plans;

v. Endorsement of the National Implementation Plan by stakeholders.

1.1 1 Establishment of a coordinating mechanism and process organization

The Persistent Organic Pollutants (POPs) Project was implemented under the auspices of the Republic of the Marshall Islands Environmental Protection Authority (RMIEPA). A National Coordinating Committee (NCC) was established, and consisted of Government and Non-Government Stakeholders. The Committee was chaired by the General Manager of the RMIEPA and the members consisted of the following:

John Bungitak, Chairperson/General Manager of RMIEPA
Stephen Lepton, National Project Coordinator, RMIEPA
Alfreda Karben/Libby Henry, National Project Assistants, RMIEPA
Roney Arelong, Solid Wastes Officer/Member, RMIEPA
Abraham Hicking, Water Quality Division, RMIEPA
Milton Clarence, ODS Project Coordinator/Member, RMIEPA
Rina Tareo/Kino Kabua, Foreign Service Officer & Undersecretary/Members/Representatives, Ministry of Foreign Affairs
Kenny Paul, Customs Officer, Member/Representative Customs Division, Ministry of Finance

Henry Capelle/Jimmy Joseph, Members/Representatives, Ministry of Resources & Development
Jonathan Felix/Bermen Laukon, Members/Representatives, Marshall Energy Company (MEC)
Greg Karben/John Kaiko, Members/Representatives, Ministry of Public Works
Gideon Gideon, Health Educator/Member/Representative, Ministry of Education
Clary Makroro, Member/Representative, Alele Museum/Internal & Outer Islands Affairs
Lawrence Jack, Member/Representative, Majuro Atoll Local Government
Daisy Momotaro/Agnes Jibke, Member/Representatives, Women United Together Marshall Islands (WUTMI)
Nat Tuivavalagi/Jabukja Aikine, Members/Representatives, CMICRE
Adri T. Hicking/Marita Edwin, Members/Representatives, Ministry of Health

The main role of the National Coordinating Committee (NCC) was to oversee and advise on the development of the POPs project. Regular meetings were conducted to advise the members on the work being undertaken. Members of the NCC provided advice and oversaw the implementation of the project. The NCC acts as a body with sufficient political commitment to allow the successful development of the NIP.

1.1.2 Establishment of POPs inventories and assessment of national infrastructure and capacity;

The second phase in the development of the NIP was that of establishing POPs inventories and assessing national infrastructure for chemical management. The objective of this phase was to provide the necessary background information and POPs baseline to allow the Project to understand the scope of the POPs issue and to complete the NIP.

The information gathered during this phase of the work is summarized in section 2. Collection of this information allowed the identification of gaps in resources, capacity and knowledge, which could be addressed through the NIP.

1.1.3 Priority assessment and objective setting

The objective of this phase was to develop country-specific criteria for prioritizing the health and environmental impacts of POPs, by assessing the information gathered in phase two to identify areas for attention. Ultimately, the completion of this phase allowed for the setting of appropriate short- and long-term objectives for the management of POPs in compliance with the Convention.

The priority setting work was based around a 2-day workshop held in Majuro, February 2006, which was attended by members of the NCC and other invited participants. The workshop presentations included background information on the Stockholm Convention and POPs, and reviews of the background information collected under phase 2 of the project. A list of possible issues and needs was compiled through group discussions, and these items were then prioritized on the basis of some general considerations, including the following:

1. Practicality/feasibility: consider whether the task suggested is achievable.
2. Cost: consider possible associated costs both monetary and environmental.
3. Benefits: consider the benefits of undertaking the activity.
4. Long term implications: consider whether the activity can be maintained by local government/non-government bodies after funding has stopped.

5. Socio-economic: consider whether the activity will disadvantage some groups in the community.

1.1.4 Formulation of the NIP

The Marshall Islands' National Implementation Plan (NIP) has been developed in line with the UNEP document "Guidance for developing a national implementation plan for the Stockholm Convention". The NIP was initially drafted by a consultant on the basis of outline action plans developed during the priority setting workshop, and was then revised and finalised by the project team in consultation with the National Coordinating Committee (NCC).

The NIP has been designed to identify possible options for the management of POPs to meet the Marshall Islands' obligations under the Stockholm Convention. It is intended that the NIP be reviewed from time to time and updated to reflect progress with its implementation and any changes in circumstances. This is in accordance with Article 7 of the Convention.

1.1.5 Endorsement and submission of the NIP

The NIP was finalized in January 2008.

Endorsed by the President on: _____

H. E. Litokwa Tomeing
President
Republic of the Marshall Islands

Adopted by the EPA Board of Directors on: _____

Fred Pedro
Chairman
Board of Directors
Environmental Protection Authority
Republic of the Marshall Islands

Adopted by the National Coordinating Committee on: _____

John Bungitak
Chairman/National Focal Point
National Coordinating Committee
Persistent Organic Pollutants (POPs)
Environmental Protection Authority
Republic of the Marshall Islands

2.0 COUNTRY BASELINE

2.1 Country Profile

2.1.1 Geography and Population

The Republic of the Marshall Islands is a Micronesian island nation in the western Pacific Ocean, located north of Nauru and Kiribati, east of the Federated States of Micronesia and south of the U.S. territory of Wake Island. The country consists of twenty-nine atolls and five isolated islands. The most important atolls and islands form two groups: the Ratak Chain and the Ralik Chain (meaning "sunrise" and "sunset" chains). Two-thirds of the nation's population lives on Majuro, which is also the capital, and Kwajalein (Ebeye).

The 29 atolls and 5 islands of the Marshall Islands are scattered over 822,779 square miles (2,130,990 km^2) of the Central Pacific. They make up a total of 70 square miles (181 km^2))of land and are located between 4° and 19° North latitude and 160° and 175° East longitude. Twenty- two of the atolls and four of the islands are inhabited. Majuro and Kwajalein are the two most populated atolls. While some of the islands are several miles long they rarely exceed a few hundred yards in width and are often considerably narrower. Land elevations are very low, with a mean height above sea level of only 6 to 7 feet (about 2 metres). The combination of small land areas and low land elevations contribute to the ecological vulnerability of the Republic. There is concern that any change in sea-level could seriously upset the fragile balance between the land and the sea.

The temperature in the Marshall Islands ranges between 81-89°F (27-32°C) with an average rainfall of about 7 - 14 inches per month (180-360mm) on Majuro (although it can be much lower on some of the outer islands). The year-round tropical climate is conducive to aquaculture and tourism although developments of both industries have been slow.

The outer islands are sparsely populated due to lack of employment opportunities and economic development. Life on the outer atolls is generally still fairly traditional, and the nutrition of the rural population, with food mainly grown and caught, is superior that of most of the urban residents, who rely considerably on white rice.

The population of the Marshall Islands is currently estimated at about 60,000, compared to 50,840 as measured in the 1999 Census. About 68% of the total population resides on Majuro and Kwajalein Atolls. The US army also maintains a large installation (and hence expatriate population) on Kwajalein Atoll.

Improvements in the quality of life of the Marshallese people are reflected in the population trends and health statistics. Three decades of explosive growth (3.9%) between 1958– 1988 are indicative of the improved standard of living and financial prosperity at that time due to the Compact Agreement signed with the USA. In 1988 the growth rate had slumped to 3.7% and for the period between 1988 and 1999 the population growth was only 1.5%. This was partially due to decreased fertility rates (from 7.23 in 1988 to 5.71 in 1999) but primarily was the result of large scale emigration to the United States of America.

2.1.2 Political and Economic Profile

The Marshall Islands became a sovereign, independent country in October 1986, ending over 125 years of foreign control. That same year the 1945 UN Trusteeship Council Agreement under which the Marshall Islands were administered as the Trust Territory of the Pacific Islands, was terminated. With that termination the country became independent, retaining however a special political, economic and defense relationship with the United States, under what is known as the Compact of Free Association Agreement. That Agreement recognizes the RMI's self-governing status and provides for a reciprocal obligatory relationship with the United States, where the RMI allows the latter the right of strategic denial in exchange for annual payments, and receives the right of its citizens to live and work in the United States.

Over the past 20 years the RMI has successfully established itself as a fully sovereign nation within the world community. Diplomatic relations have been established with over 70 countries. The country has acceded to membership of several multilateral organizations including the United Nations, the International Monetary Fund (IMF), the World Bank, ACP/EU and regional organizations such as ESCAP, Pacific Islands Forum and Asian Development Bank. It has also acceded to many important international protocols and has established a Mission at the United Nations in New York. There are Embassies in Washington D.C., Tokyo, Japan; Suva, Fiji; and the Republic of China, as well as a Consulate-General Office in Honolulu, Hawaii.

The Republic of the Marshall Islands is a self-governing democracy in free association with the U.S. The Marshall Islands is a parliamentary democracy. The Constitution blends concepts from the American and British systems of governance. The legislative body consists of a 33 member Nitijela (Parliament) from the 24 inhabited atolls and islands, which elects the President by majority vote. Representatives to the Nitijela are elected every four years. The elected president is both the Head of State and in charge of a 10-member Cabinet of Ministers. The Nitijela meets twice annually for a total of 50 days. There is also an 11 member Council of Chiefs (Iroij) which presides over traditional and customary matters.

The Constitution ensures equal rights of all citizens, and grants visitors full protection under the law. According to a United Nations Children's Fund study on women and children the traditional system overlaps and dominates the modern system of governance. A land tenure system and traditional law is preserved by the Constitution. Legislative power is centralized: there are no provinces or states. Each inhabited atoll or island has a local government, with a mayor and council members, also elected every four years. The local government has jurisdiction over most coastal zone and marine management issues on each atoll.

History

Although they were settled by Micronesians in the 2nd millennium BC, little is known of the early history of the islands. Spanish explorer Alonso de Salazar was the first European to sight the Marshalls in 1526, but the islands remained virtually unvisited by Europeans for several more centuries, before being visited by British captain John Marshall in 1788; the islands owe their name to him.

A German trading company settled on the islands in 1885, and they became part of the protectorate of German New Guinea some years later. Japan conquered the islands in World War I, and administered them under a League of Nations mandate.

In World War II, the United States invaded the islands (1944), and they were added to the Trust Territory of the Pacific Islands (including several more island groups in the South Seas). Between 1946 and 1958 the USA tested 67 nuclear weapons in the Marshall Islands, including the largest nuclear test the US ever conducted, Castle Bravo, which resulted in the radiation poisoning of 236 Marshallese. Nuclear claims between the United States and the Marshall Islands are ongoing, and health effects still linger from these tests.

In 1979 the Republic of the Marshall Islands was established and a Compact of Free Association with the U.S. government was signed, becoming effective in 1986. The independence was formally completed under international law in 1990, when the UN officially ended the trust given to the USA.

2.1.3 Profiles of Economic Sectors

United States Government assistance is the mainstay of the economy. Agricultural production is concentrated on small farms, and the most important commercial crops are coconuts, tomatoes, melons, and breadfruit. Small-scale industry is limited to handicrafts, fish processing, and copra. The tourist industry, now a small source of foreign exchange employing less than 10% of the labor force, remains the best hope for future added income. The islands have few natural resources, and imports far exceed exports. In 1999 a private company constructed a tuna loining plant, which employed upwards of 400 people, mostly women. The plant was closed in 2005, following a failed attempt to convert it from producing tuna loins to tuna steaks, a process that requires only half of the employee base. The owners noted that the plan would not be economically viable without government largesse and a reduction below the statutory minimum wage, neither of which the government cared to provide. As the guarantor of a $2 million loan to the business, the government took control of the plant facility following its closure, and is seeking to find another operator.

In 2005 Aloha Airlines canceled its flight services to the Marshall Islands as part of its withdrawal from several markets in the region. Though other international airlines still serve Majuro, the Aloha decision was a setback in the country's hopes of increased revenues from tourism.

Under the terms of the Amended Compact of Free Association, the US will provide millions of dollars per year to the Marshall Islands (RMI) through 2023, at which time a Trust Fund made up of US and RMI contributions will begin perpetual annual payouts. Government downsizing, drought, a drop in construction, the decline in tourism and foreign investment due to Asian financial difficulties, and less income from the renewal of fishing vessel licenses have held GDP growth to an average of 1% over the past decade.

The 2007 edition of "Doing Business," prepared by the World Bank's private sector development department, has declared the Marshall Islands to be the world's "Best Performer" for its ease and low expense in hiring and firing employees. By the same token, the study also gave the Marshall Islands extremely low ratings for its protection of investors and contract enforcement.

Prior to 2007, the Marshall Islands was among the handful of countries not obliged to abide by the core labour standards (elimination of forced labour, child labour and discrimination, and respect for freedom of association and right to collective bargaining) as required of ILO members. But, very

recently on the 3rd of July 2007, Republic of the Marshall Islands became the 181 member state to the convention.

The United States also maintains the U.S. Army's Ronald Reagan Ballistic Missile Defense Test Site on Kwajalein Atoll. It is an important aspect of the Marshallese economy, as the Marshallese landowners receive rent for the base, and a large number of Marshallese are currently employed at the base. Majuro Atoll has also benefited from foreign assistance. The main airport was built by the Japanese (during World War II), and the only tarmac road of the capital was built with the generous contribution of the Government of the Republic of China (Taiwan) and the United States.

2.1.4 Environmental Overview

The Marshall Islands government has been concerned for many years with the issue of climate change. The physical characteristics of the islands would give any visitor a clear indication as to why this is so. The Marshall Islands lie in open ocean and the islands are generally very close to sea level. The vulnerability to waves and storm surges is at the best of times precarious. Although the islands have by no means been completely free from weather extremes, they are more frequently referred to in folklore as "jolet jen Anij" (gifts from God). The sense that the Marshall Islands was a God-given sanctuary away from the harshness of other areas is therefore part of the socio-cultural identity of the people. However, given the physics of wave formation and the increasing frequency and severity of storms, the relative safety that the islands have historically provided is now in jeopardy.

The reefs of the Marshall Islands are among the most pristine in the Indo-Pacific, having suffered minimal damage from bleaching, destructive fishing techniques, and sedimentation. However, signs of unsustainable resource exploitation are apparent, including the past extirpation of the largest giant clams, and the ongoing reduction of reef shark, grouper, and Napoleon wrasse populations. In addition, localized outbreaks of crown-of-thorns starfish (COTS) and coral disease, principally on the capital atoll of Majuro, are ongoing. Another concern is the growing, unregulated exploitation of reef fish for the local markets.

The environmental conditions in the urban centers of Majuro and Ebeye have deteriorated due to overcrowding, poor solid waste management, unregulated dumping of debris and liquid wastes in lagoons, the absence of properly managed waste sites, indiscriminate littering, and dumping of old machinery. This situation has had an adverse impact on human health, for example by affecting drinking water. The government has been working with the Asian Development Bank in planning essential steps to improve the environment and to develop an overall environmental protection plan.

Waste Disposal, Water Supply and Sanitation

Solid waste disposal on Majuro is currently done by landfill. The only controlled site is an area of reclaimed land which extends directly into the marine environment, with only minimal measures taken to protect against water pollution.

There is an active aluminium can recycling system on the island, and recycling programmes for other wastes are currently being developed. Waste oil produced by the power plants station is burned in a small incinerator on Majuro.

Hospital wastes are disposed by burning in an incinerator, while small quantities of quarantine wastes are disposed by burning on open ground.

Most of the sewage on Majuro is piped to a treatment plant. Septic tanks are used in non-reticulated parts of the island, however for many areas of most outer atolls there is no effective sewage treatment or disposal.

Water sources for the Marshall Islands include a mixture of rainwater, groundwater and water from desalination and reverse osmosis plants. Normal rainfall is capable of providing sufficient water, either collected directly or by recharging the groundwater resources, however rainfall is not consistent from year to year and the islands are subject to periodic droughts, especially during *El Nino* events. The main supply of drinking water on Majuro is a large rainwater collection system at the airport, although many homeowners augment this supply with roof collection.

2.2 Institutional, policy and regulatory framework

2.2.1 Environmental policy, sustainable development policy and general legislative framework.

The guiding principles for sustainable development in the Marshall Islands are incorporated into the countries National Vision[1], which aims to:

> " become a country within an inter-dependant world, with an enhanced socio-economic self-reliance, an educated, healthy, productive law-abiding and God-loving people in which individual freedom an fundamental human rights are protected and culture and traditions are respected and development and environmental sustainability are in harmony."

The RMI has entered into a Compact of Free Association with the United States. Title 1 of the Compact pledges 'to promote efforts to prevent or eliminate damage to the environment and biosphere and to enrich understanding of the natural resources of the Marshall Islands'. In addition, under the Compact the US is required to adhere to the standards enshrined in the US National Environmental Protection Act when conducting any activities in RMI. In return, RMI is required to develop and enforce comparable environmental standards for their own activities.

RMI has established a national Environmental Protection Authority, which is an independent authority legislatively linked to the Office of the President and fully funded by the RMI government. The EPA Board of Directors governs broad policy directions. The EPA is charged with a wide range of environmental tasks under the National Environmental Protection Act (1984) including:

- the study of the impact of human activities on natural resources;
- the prevention of degradation or impairment of the environment;
- the regulation of individual and collective human activity in such a manner as to ensure to the people safe, healthful, productive and aesthetically and culturally pleasing surroundings; and

[1] Vision 2018. The Strategic Development Plan Framework, 2003-2018, Republic of the Marshall Islands, June 2001

- the treatment of important historical, cultural and natural aspects of the nation's culture and heritage, maintaining at the same time an environment which supports multiplicity and variety of individual choice.

2.2.2 Roles and responsibilities of ministries, agencies and other governmental institutions involved in POPs life cycles.

The key agencies and organizations with responsibilities relevant to Persistent Organic Pollutants (POPs) management are summarized below.

Division of Agriculture, Ministry of Resources and Development (MRD):
The Division of Agriculture has broad-ranging responsibilities in relation to agricultural development, and this includes the promotion and use of pesticides. They are also responsible for border control (quarantine) activities designed to prevent the importing of unwanted diseases and pests.

As the primary government organization responsible for Agriculture, Fisheries, Energy, Trade and Investment in the Marshall Islands, the Ministry of Resources and Development will promote and assist the development of these sectors in a sustainable and productive manner, through activities which foster sustainable food production, provide alternative energy resources and income-generating opportunities for the people of the Marshall Islands. Respect for the environment will be a top priority and special focus will be given to the outer-island communities in developing their agricultural, energy and economic sectors.

The Ministry of Resources and Development was established in 1979 under the Constitution of the Republic of the Marshall Islands. The portfolio of the Ministry has undergone several changes during its history. Primarily responsible for development of the economy through promoting agriculture, fisheries, investment and trade and energy development, the Ministry has also been responsible for tourism and public works in the past. In 1997 The Marshall Islands Marine Resources Authority was established by an Act and mandated with the management of all marine resources in the Republic of the Marshall Islands. In 1997 The Marshall Islands Visitors Authority was created to focus on development of the tourism industry in the Marshall Islands.

While these remain the two greatest opportunities for economic development and export, the sectors within the Ministry remain critical for economic development of the young nation of the Marshall Islands. In 1997 through the ADB-led public sector reform program, the Ministry of Public Works was incorporated into the Ministry of Resources & Development. It was subsequently separated out again in 2000.

Lands and survey, planning and zoning functions and labor functions were also part of the Ministry in the past. The Ministry has evolved over the years to its current set of responsibilities.

There are several key pieces of legislation relating to the Ministry of Resources and Development. Title 8, Chapter 1: Quarantine Restrictions- "Animal and Plant Inspection Act" requires the Chief of Agriculture (within the Ministry of R&D) to issue regulations pertaining to quarantine, and to monitor and enforce those regulations and the Act. This describes the core function of the Animal and Plant Protection Unit within the Ministry. Quarantine Regulations existed subsidiary to this law.

Title 8, Chapter 2: "Export Meat Inspection Act" requires the Chief of Agriculture to inspect all meat for export. Title 8, Chapter 3: "Endangered Species Act" requires the Secretary of Resources

and Development to promulgate, monitor and enforce regulations regarding endangered species in the RMI. Again, no such regulations are in existence. Consideration should be given to coordinating with other agencies, in particular the Environmental Protection Authority to amend and/or implement the Act as required. The implementation of this act is critical to the conservation of the Marshall Islands' biodiversity.

Title 35, Chapter 3: "Alternative Energy Fund Act of 1989" provides for a revolving fund for the development, marketing and operation of alternative energy systems, and as such is to be utilized by the Energy Services unit of the Ministry (although the fund itself is administered by the Ministry of Finance).

Title 11, Chapter 14: "Agricultural Supplies Account Act 1979" provides for a fund for the purchase of Agricultural supplies, to be administered by the Minister and Ministry of Resources and Development. Many other business related laws are relevant to the Ministry, in that the Ministry provides guidance to investors on how to comply with those laws. The staff in the Ministry needs to become familiar with the relevant business and investment-related laws and regulations.

The Agriculture Services division has lab equipment, but all of it is in storage or has been given to the CMI/ Land Grant program at Arrak. Today, R&D collaborates with CMI Land Grant and relies on their research.

There needs to be a strategic approach to Human Resource Development and Capacity-building within the Ministry. In the future, it will be important to have degree-qualified people working in the technical areas of Agriculture, Fisheries, Trade and Investment and in Energy.

Professional needs: Agriculturists; Economist / International Trade/ Business Management; Public Policy and Planning; Human Resource Management; and Access to highly specialized professions such as entomologists and veterinarians.

Additionally, because of the Ministry's key role in intermediary capacity building, there will need to be professional level people in Agriculture Extension who are well-versed in participatory techniques.

In response to the ongoing needs for Capacity Building and Human Resource Development, the Ministry has developed a Strategic Program to address Human Resource Issues in a consistent manner, with an eye on recruiting and retaining a higher level of skill and competence.

Several programs need to focus on providing services to farmers with an emphasis on development of skills in agriculture and in basic business planning and marketing of produce- including identifying what types of crops to grow post-harvest handling and food safety. Another major issue is providing this customer group with access to credit for tools, seeds, and etc. All programs will rely heavily on the Agriculture Extension trips, leveraging these Outer-island visits to provide a broader range of services.

Ministry of Health (MOH):

The Environmental Health Section has responsibilities relevant to the protection and management of public health. Consequently, their roles also assist with the protection of the environment.

The aim of the RMI government is to provide equity of access to a satisfactory system that promotes good health at a low cost. The pursuit of these four objectives - good health, low cost,

equity and satisfaction-through the country's health system is constrained by the history, culture, and resources of the nation. National resources can be a particularly binding constraint and this gives rise to the special nature of the relationship between the degree to which these objectives are attained and health financing.

The RMI Constitution mandated the Ministry of Health (MOH) to provide "reasonable and necessary" health care to all citizens. However, a clearer and more specific Mission Statement has been adopted by the MOH.

The Mission Statement builds on the Constitutional Mandate and expands on it to provide policy direction. This mission statement expresses the need for collaboration in health between the government and the community. By government this means a wide variety of government departments, at all levels, working together in inter-sectoral cooperation, and by the community it means all social groups including families and individuals. This is an appropriate application of the Primary Health Care approach which this government adopted a number of years ago with the motto of ***"Our Health, Our Shared Responsibility".***

The Primary Health Care approach is based on the well established and well proven premise that the most effective as well as cost-effective health interventions are those pursued by individuals and families for the prevention of health problems before they arise. The prevalence of many life-style related diseases will diminish only when the population is educated and motivated to change behavior.

The mission statement gives MOH the basis for setting priorities in allocating the available resources. The MOH mission statement is:
"To provide high quality, effective, affordable and efficient health services to all peoples of the Marshall Islands, through a primary health care program to improve health status and build the capacity of each community, family and individual to care for their own health. To the maximum extent possible, the Ministry of Health, pursues these goals using the national facilities, staff and resources of the Republic of the Marshall Islands. "

The hospital is one of the main chemical users in the Marshall Islands, with chemicals being used in the radiology section as well as test reagents in the laboratory.

Republic of the Marshall Islands Environmental Protection Authority (RMIEPA):
The RMIEPA has broad powers to protect the environment. Its statutory responsibilities include the study of the impact of human activities on natural resources, the prevention of degradation or impairment of the environment, and the regulation of human activities to ensure safe and healthy surroundings. EPA is granted oversight authority for waste management and is responsible for the issuance of Solid Waste Disposal Facility permits and for monitoring public and private landfills. RMI's Solid Waste Regulations provide minimum standards for the design, construction, operation and maintenance of solid waste collection, storage and disposal systems. Over the past few years, financial difficulties have resulted in the landfills being poorly managed, with no leachate control and infrequent compaction or covering.

Marshall Energy Company (MEC):
The Marshalls Energy Company provides power to more than 3,295 houses in the Marshall Islands capital city of Majuro Atoll. With Majuro's power requirements being met through the additional

megawattage of the new plant, many distribution improvements completed during the late 1990s and early 2000s. These improvements were the results of greater efforts focused on the outer islands expansion. In 2001, 2002, and 2003, within these three years, MEC expanded its capabilities and established power plant facilities on Jaluit, Wotje, Rongrong in Majuro Atoll, and Namdrik Atoll.

Marshalls Energy Company employed more than 117 people in Majuro and Jaluit with additional of 30 people in Wotje, Namdrik, and Rongrong. The Marshalls Energy Company is responsible for maintaining all of the country's power generation capabilities and electrical equipment

Liquid Propane Gas is also processed and produced locally for sale, and is one of the MEC's energy businesses that help to subsidize power costs to local customers. The other subsidized item is the sale of fuels to the fishing boats. The average monthly household electrical bill in Majuro is between $80 and $100.

Ministry of Public Works (MOPW):
The Ministry of Public Works is mandated for maintenance of the Government infrastructure project including resurfacing of coral compacted airstrips, road, solid waste management, tendering of development projects assessment of government facilities and management of architectural and engineering works in the Republic of the Marshall Islands.

The Ministry of Public Works- solid waste management is working with the new company which is Majuro Atoll Waste Company that has been established by the Government. Under the new company, assign for all the operations at the Majuro Landfill, overseeing the waste collection across Majuro, coordinating the exportation of recyclable to other countries for processing and also supervising the processing of Medical Waste at the Ministry of Health's incinerator which will be constructed at the landfill site.

The Solid Waste Management Section within the Ministry of Public Works is geared with these objectives; to ensure proper management of the landfill, and to cover and compact the landfill daily as required and make passage to landfill site manageable. Also to secure the area around the landfill to prevent waste from being blown off across the above and make available cover materials for daily operation.

Division of Customs, Ministry of Finance (MOF):
The Customs Division at the Ministry of Finance works closely with quarantine officers from the Ministry of R&D, and other agencies and port of entry authorities who are responsible for the inspection of all imports that require permits and licenses.

Ministry of Education (MOE):
The Ministry of Education is one of the RMI government ministries that oversee the overall primary responsible for the Education of the Marshallese people. For the School year 2006 – 2007, total enrolled in the 119 Primary and Secondary Schools is 14, 857 in the private and public. (See table E.1a below).

Table E. 1a Summary: Primary & Secondary School

	Number of Schools	*Tchr*	*Boys*	*Girls*	*Total*	*ST Ratio*
PUBLIC	81	824	5759	5422	11181	14
PRIVATE	38	483	1830	1846	3676	8
TOTAL	119	1307	7589	7268	14857	11

Health Education Division, (MOE):
It is envisioned that the Republic of the Marshall Islands will have healthier, happier, and more economically self sufficient citizenry. The Health Education office is committed to upgrade the health and nutritional status of the Marshallese by providing health and nutrition education that will produce citizens who are generally healthy, economically more self-sufficient and responsive to the needs of their communities and the country in general.

Health Education in the Elementary School shall aim to improve the health and nutrition status of Marshallese children through intensified health and nutrition activities in the classrooms and in the communities.

The Health Education Office is comprised of two priority tasks that serve the needs of the students and teachers in the public schools and private school as well. National Health Education curriculum has six standards:

a) Personal Health and Fitness
b) Emotional and Mental Health
c) Nutrition
d) Prevention and Control of Diseases
e) Safety and First Aid
f) Substance Use, Abuse, and Prevention
g) School Health Program under HIV/AIDS project that is funded by Centers for Disease Control and Prevention (CDC), and Youth Risk Behavior Survey (YRBS).

Health Education Curriculum standards and benchmarks:

- Curriculum Standards and Benchmarks have been implemented in all the schools in the Republic at both public and private schools from Kindergarten through eighth grades.
- As member of the special project at Environmental Protection Agency (EPA) ideas presented throughout the project have been integrated into the curriculum standards and Benchmarks.
- Almost every summer time in June or July of each year, the Health Education Office staff conduct staff development training on health education curriculum with classroom teachers and principals.
- The health education office provides curriculum training at orientation for newly hired classroom teachers each year.
- The Health Education office staff visit outer islands schools twice a year to monitor how the curriculum is implemented. Majuro schools are also monitored.
- Marshall Islands Standardize Achievement Test (MISAT I, II, III) for grade 3, 6, and 8 is administered every year in March, April and May. This is to test the national curriculum, health has integrated in each subject areas that are tested, English; Marshallese; and Mathematics. MISAT III is the eight grade test that tested the curriculum and used as RMI public high school entrance test.

College of the Marshall Islands, Cooperative Research and Extension (CMICRE)
CMICRE, sometimes referred to as the CMI Land Grant Program, has five technical units: Agriculture, Aquaculture, Water Quality, Food and Nutrition, and 4H (Youth Issues). The agriculture unit is involved in research, extension (community works, training, publications) and teaching at CMI.

CMICRE has great interest in POPs for a variety of reasons but mainly in relation to agriculture and water quality. Out of the 12 POPs chemicals covered in the Stockholm Convention, nine of them are pesticides (aldrin, chlordane, DDT, dieldrin, endrine, heptachlor, HCB and mirex) and are therefore of direct interest to agriculture and they may also contaminate the environment including water quality.

From an agricultural viewpoint, pests include any living organism that could reduce the yield or quality of crops. The main agricultural pests in RMI include insects, weeds, plant pathogens (virus, bacteria, fungus and nematodes), vertebrates (rats, birds, etc), and snails and slugs. Pesticides are chemicals that could be used to control pests and these include weedicides, insecticides, fungicides, nematicides, etc. for the control of weeds, insects, fungi, nematodes, etc, respectively.

One area of interest to CMICRE is to explore, try out or develop non-chemical means of pest control (together with the development of non-chemical fertilizers). The non-chemical methods of pest control include traditional control, cultural control, and biological control.

2.2.3 Relevant International Commitments and Obligations.

The Marshall Islands is a Party to the following international agreements relevant to Persistent Organic Pollutants (POPs).

Stockholm Convention on Persistent Organic Pollutants:
The Marshall Islands became a Party to this Convention on 27 January 2003, and is now working on its implementation through the development of this National Implementation Plan.

Basel Convention
The Republic of the Marshall Islands is a party to the Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal 1989. This agreement aims to achieve the environmentally sound management of hazardous wastes through the reduction in trans-boundary movements to the minimum consistent with

- Environmentally sound and efficient management.
- Treatment and disposal as close as possible to the source of generation.
- Minimisation of generation.

The Basel Convention is of particular importance to the Marshall Islands when considering disposal of POPs and other hazardous wastes by export to treatment facilities in other countries.

Montreal Protocol
This agreement provides for the global elimination of substances such as CFCs, which are known to cause ozone depletion. The Protocol has been implemented in the Marshall Islands through the

Ozone Layer Protection Act, 2004. The import control provisions included under these regulations are similar to those that would be required for POPs pesticides and PCBs.

Convention for the Protection of the Natural Resources and Environment of the South Pacific Region (SPREP Convention)

The Marshall Islands is a party to this convention and a member country for the related Pacific Regional Environment Programme. The work of the programme Secretariat (SPREP) covers a wide range of environmental issues, including nature conservation and biodiversity, coastal management, climate change, waste management and pollution prevention. Some of the SPREP activities most relevant to POPs are as follows:

- "POPs in PICs" Project (identification, packaging, transport and disposal of POPs wastes)
- The development/implementation of national hazardous waste management strategies; and
- Regionally-based Assessment of Persistent Toxic Substances (with UNEP).

2.2.4 Description of Existing Legislation and Regulations addressing POPs.

Existing legislation relevant to the Stockholm Convention is discussed below.

2.2.4.1: National Environmental Protection Act 1984

The NEPA Act is the pre-eminent legal instrument for the control of pollution in the Marshall Islands. Pollution is broadly defined as '*any direct or indirect alteration of the physical, thermal, chemical, biological, or radioactive properties of any part of the environment by the discharge, emission or deposit of wastes so as to affect any beneficial use adversely or to cause a condition which is hazardous or potentially hazardous to public health, safety or welfare, or to animals, birds, wildlife, aquatic life or to plants of every description'*. The Act provides for the issuance of cease and desist orders for the purpose of pollution control. The orders are implemented using a four-tiered system involving notification, counseling and public hearings. The Act also provides for the forced cleanup of a polluted area by the polluter.

Under the Act, the RMIEPA has broad powers to regulate with respect to:

- primary and secondary drinking water;
- pollutants;
- pesticides and other harmful chemicals;
- hazardous waste, including the storage and disposal of nuclear and radioactive waste;
- the treatment of important historical, cultural and natural aspects of the nation's heritage;
- any other aspects of the environment which may be required.

Regulations passed or proposed under the Act include the following:

Solid Waste Regulations, 1989 (+ 1994 amendment)
Toilet Facilities and Sewage Disposal Regulations, 1990
Environmental Impact Assessment Regulations, 1994
Pollutant Discharge Elimination System Regulations (draft)
Pesticides and POPs Regulations, 2004
Ozone Layer Protection Regulations, 2004
Marine Water Quality Regulations, 1992

Public Water Supply Regulations, 1994
Air Quality Regulation (soon to be drafted)

Adequate enforcement of environmental regulations is a pervasive problem in the Republic of the Marshall Islands. While the RMIEPA's devolved powers are flexible and strong, they often face technical and financial difficulties in implementing them.

An Environmental Impact Assessment (EIA) is required for any government project in which there is or may be an environmental impact. However, the wording is vague as to what types of proposals require an EIA and very few have been undertaken. The (NEPA) Act also sets out some of the necessary content of an EIA, although the degree of detail required is not clearly specified. There is also no distinction between the requirements for small and large-scale projects.

2.2.4.2: Pesticides and Persistent Organic Pollutants Regulations 2004:

The Pesticide Regulations allow partial control over the use and licensing of pesticides in RMI. The controls are based around a listing of "Restricted" pesticides. Permits are required by anyone wishing to import, purchase or use any of the pesticides on the restricted list. There is also a more general requirement for importers to notify the EPA prior to receipt of any shipments.

Pesticide importers are required to submit a 'notice of intent' before the arrival of any pesticides, regardless of whether they are restricted or not. EPA officers are required to inspect and release incoming pesticide cargoes.

There is a provision under the regulations for banning specific pesticides. The implementation of this provision simply requires public notification by the RMIEPA Board. This has not yet been done for the POPs pesticides (or PCBs), although the Customs and EPA staff are nominally applying such a ban. This situation should be formalized by publication of the relevant notice.

2.2.4.3: Marine Water Quality Regulations 1992:

RMI's Marine Water Quality Regulations prescribe standards for maintaining designated water quality and uses. The regulations provide for a permitting system (the Pollutant Discharge Elimination System) for the discharge of any waste to marine waters. There are also requirements for the preparation of Spill Prevention Control and Countermeasure Plans for fuel and oil storage facilities.

2.2.4.4: Solid Waste Regulations 1989:

The Solid Waste Regulations have a number of general requirements regarding methods of disposal of solid wastes, and also covered hazardous wastes. The operators of any process likely to produce hazardous wastes are required to submit a waste management plan for prior approval by the RMIEPA. Waste generators are required to adopt all practical measures to minimize waste quantities, including reuse and recycling. Methods for the disposal of waste oil must be approved by the RMIEPA.

2.2.4.5: Customs Act 1989:

An Act to provide for the imposition of import duties on goods imported into the Republic of the Marshall Islands and for matters connected wherewith. Under this law the custom has control of all goods imported to the RMI. The custom has control of all ports of entry within the Republic. All aircraft and vessel entering the Republic must obtain clearance from custom. Copy of manifest and bills of lading must be filed with the custom on entry of vessel and aircraft.

2.2.4.6: Health Act:

The Health Act is an Act for the health, safety and welfare of the people of the Republic of the Marshall Islands through establishment of health services, and control of sanitation, and related matters. The Secretary of Health shall either personally or by his/her duly authorized representatives maintain and improve health and sanitary conditions, minimize and control communicable disease, establish standards of medical and dental care and practice, encourage scientific investigation in the field of health, supervise and administer all government-owned hospitals, sanitariums, clinics, dispensaries and such other medical and dental facilities as are or may be established throughout the Republic of the Marshall Islands.

2.2.4.7 Marshall Islands Marine Resources Authority Act 1988:

This act empowers the Marshall Islands Marine Resources Authority to conserve, manage, and control the exploration and exploitation of all living resources in the Fishery Waters, seabed, and subsoil thereunder. The authority may make regulations respecting to conservation, management and protection of fish and other aquatic organisms in the Fishery Waters, respecting the operation of any fishing vessel which may enter the Fishery Waters, respecting the pollution of Fishery Waters.

2.2.4.8 Ozone Layer Protection Regulations 2004:

These regulations are promulgated by the Republic of the Marshall Islands Environmental Protection Authority under the National Environmental Act 1984 to establish a system of control over the importation, exportation, manufacture and sale of ozone depleting substances by persons within the Republic of the Marshall Islands, in accordance with the Republic's commitments under the Montreal Protocol on Substances that Deplete the Ozone Layer and the Vienna Convention for protection of the ozone layer.

2.2.5 Key approaches and procedures for POPs chemicals and pesticide management including enforcement and monitoring requirements.

The Marshall Islands does not manufacture, import or use any of the POPs chemicals and pesticides covered by the Stockholm Convention, although quantities of PCBs are still present in the country as a result of past imports and use. The regulations for control of POPs pesticides and PCBs are already in place, but a number of relatively simple steps are still needed to give full effect to the regulations. In addition, there is a need for capacity building amongst government personnel to ensure that the provisions can be adequately monitored and enforced.

Unintentional production of POPs occurs in the Marshall Islands through activities such as waste incineration and rubbish burning, and as emissions from a variety of processes. Most of these releases are subject to the general controls available through the National Environmental Protection Act, but the capacity for identification and estimation of releases of unintentional POPs is

extremely limited, and there is also only limited understanding of the requirements for best available techniques and best environmental practices (BAT/BEP). In addition, new regulations will be required for the application of BAT/BEP controls.

2.3 Assessment of the POPs issue in the country.

2.3.1 Assessment with respect to Annex A, part I chemicals (POPs Pesticides)

The Republic of the Marshall Islands does not intentionally produce or use any POPs pesticides, nor are there any future plans to do so. However, some POPs pesticides were used in the past, especially DDT for malaria control. The Pesticides and POPs Regulations 2004 allow for controls on the importation and use of pesticides, including a ban on all imports of POPs. The implementation of this provision simply requires formal publication of an official notice by the Board of the Environmental Protection Authority. Given the absence of intentional production and use of POPs in the Marshall Islands, it is proposed that this action be taken in the very near future.

The information available on imports and use of pesticides generally, is very limited, but it appears that the overall quantities are very low. One of the more significant importers of pesticides is the Taiwanese demonstration farm in the village of Laura, Majuro Atoll. Some information has been obtained on the quantities of pesticides used at the farm. However, there are concerns that other undeclared materials are being brought into the country, through the use of diplomatic channels. A similar problem exists with information on chemical imports and use at a fish processing plant.

Many of the imported pesticides do not contain written instructions in English or Marshallese. Consequently, many of the applicators have little knowledge regarding the toxicity or correct dosage of the chemicals they are using. There is clearly a need for better provision of this information, as well as general education and awareness activities at the user level. This should include the promotion of alternative (non-chemical) methods for pest control.

A number of capacity building and awareness-raising requirements were identified in relation to pesticide use generally in the Marshall Islands. These include the need for additional training of Customs officers, EPA staff, and other government personnel, in the application of the pesticide regulations. There is also a need to develop the capacity for identification and testing of imported products.

2.3.2 Assessment with respect to Annex A, part II chemicals (PCBs)

In 1994 the US Environmental Protection Agency undertook a clean-up of PCB transformers in the Marshall Islands. Oil from the transformers was analyzed for PCB content and the contaminated oils were removed from the Marshall Islands, along with contaminated soils, at a cost of approximately $1 million. The empty transformer cases were crushed and buried in a concrete-lined pit on Majuro.

This US exercise was mainly directed at the older out-of-use transformers, and other in-use equipment was left in place. Two large transformers containing PCBs were later removed in 2006 as part of an AusAID/SPREP disposal project for persistent organic pollutants. Additional testing, as part of the POPs project, has shown that there are up to 50 smaller PCB-transformers on the island of Ebeye, which may also need to be exported for disposal. In addition, there are unknown

numbers of transformers on the outer islands which have yet to be tested for PCBs. Further action is required to finalise a PCB transformer inventory for the Marshall Islands, followed by development and implementation of a programme for removal and disposal.

No work has yet been carried out for the identification of small capacitors and other electrical equipment that could possibly contain PCBs. It is known from work done in other Pacific Island countries that some of these items will almost certainly be present in the Marshall Islands. There are no systems in place for the environmentally sound management of this type of equipment, and a complete absence of suitable disposal facilities. It is therefore proposed that a system be developed for identifying and managing PCBs in small capacitors and other equipment as they arise, and that this should include placement into safe storage, and ultimate disposal.

2.3.3 Assessment with respect to Annex B chemicals (DDT)

DDT is known to have been used in the Marshall Islands in the past, including through extensive aerial spraying in the 1940s during the Pacific War. There has been no such use for many years, because malaria is no longer a problem. However, there are concerns that the problem could arise again in the future, as a result of climate change. As a result, the Marshall Islands has already registered its requirement under the Stockholm Convention for a use exemption for DDT.

2.3.4 Assessment of releases from unintentional production of Annex C chemicals (PCDD/PCDF, HCB and PCBs)

Dioxins and furans are formed and released from thermal processes involving organic matter and chlorine, and as a result of incomplete combustion or chemical reactions. The following preliminary inventory of dioxin and furan releases was prepared using the standardized UNEP toolkit for identification and quantification of dioxin and furan releases. It must be emphasized that these results are based on very preliminary estimates of most of the activity data.

Table 2.1: Summary of Annual Dioxin and Furan Releases for the Marshall Islands

	Source Categories	**Annual Releases (mg TEQ/a)**				
Cat.		Air	Water	Land	Products	Residue
1	Waste Incineration (medical and quarantine)	160.0	0.0	0.0	0.0	0.8
2	Ferrous and Non-Ferrous Metal Production	50.4	0.0	0.0	0.0	0.0
3	Power Boilers and Home Cooking	23.2	0.0	0.0	0.0	0.0
4	Production of Mineral Products	0.25	0.0	0.0	0.0	0.0
5	Transportation and Stationary Generators	0.84	0.0	0.0	0.0	0.0
6	Uncontrolled Combustion Processes	17.2	0.0	0.0	0.0	13.2
7	Production of Chemicals and Consumer Goods	0.0	0.0	0.0	0.0	0.0
8	Miscellaneous	8.4	0.0	0.0	0.0	0.0
9	Disposal/Land filling	0.0	0.0	0.0	0.0	0.0
1-9	**Total**	**260.3**	**0.0**	**0.0**	**0.0**	**14.0**

As shown in the table, the main sources of dioxin and furan releases for the Marshall Islands are the incineration of medical and quarantine wastes, ferrous and non-ferrous metal production (specifically, the melting of lead from old batteries, and cable burning), uncontrolled combustion processes (landfill fires and backyard rubbish burning) and miscellaneous (burning of wood for fish smoking).

The Marshall Islands lacks the capacity to properly record, control or monitor the releases of dioxins and furans. The knowledge and application of best available techniques (BAT) and best environment practices (BEP) for new or existing sources is very limited or non existent. These measures need to be considered when any new facility is developed; for example the installation of a new incinerator for medical wastes, or possibly even municipal wastes.

Work is also needed for the development of emission control regulations under the Environmental Protection Act 1984. These would allow the EPA to take action in addressing other specific sources of dioxin releases, including cable burning, lead recovery, asphalt plants, and emissions from power stations and motor vehicles.

2.3.5 Information on the state of knowledge on stockpiles and contaminated sites

There are no known stockpiles of POPs in the Marshall Islands. However, there are a significant number of potentially contaminated sites, although no formal exercise for identification and assessment has ever been undertaken. These include sites associated with power stations, boat and vehicle repair yards, and several 'legacy' sites from past activities, including the Pacific War. In addition, two pesticide burial sites were recently identified in Majuro and Arno research farms.

There is no expertise or capacity within the Marshall Islands for the identification, management and remediation of any of these sites.

2.3.6 Summary of future production, use and releases of POPs

There is no present and envisaged future need for any of the POPs chemicals in the Marshall Islands. In addition, it is expected that future releases of unintentional POPs will be gradually reduced in response to the measures proposed in section 3 of this Plan.

2.3.7 Existing programmes for monitoring releases and environmental and human health impacts.

The extent to which pollution in the Marshall Islands includes POPs is not known, because there are no facilities, nor the capacity, for this type of monitoring. The only two published studies on POPs levels are those carried out by external researchers, as summarized below.

In 1979 an air sample was taken in Enewetak as part of a US research programme concerning organochlorine compounds[2]. While analysis showed that levels of organochlorine compounds in the Marshall Islands sample were quite low compared to the air over or near continental land masses, they were nevertheless significantly higher than in the sample taken from the more southerly island location of American Samoa. The analysis included hexachlorobenzene, chlordane, DDT, dieldrin and PCBs.

In 1996 a further US scientific study included Marshall Islands in a global survey designed to track the movement of organochlorine pesticides around the world, thousands of kilometers from the site of application[3]. As in many other remote locations tested, organochlorine pesticide concentrations were found in tree bark taken from the Marshall Islands.

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2 Atlas, E. & Giam, C.S., 1981. Global transport of organic pollutants: Ambient concentrations in the remote marine atmosphere. Science, 211: 163-165.

3 Staci. L. Simonich and Ronald A. Hites, 1995. Global Distribution of Persistent Organochlorine Compounds. Science, September 29.

2.3.8 Current level of information, awareness and education among target groups

The National Coordinating Committee (NCC) for the Persistent Organic Pollutants (POPs) had been tasked and assigned its members to carry out outer island visits to conduct POPs Awareness & Education Presentations, including the POPs chemical inventories. These outer island visits were made and visited by assigned task teams composed of NCC and RMIEPA representatives.

In 2004 – 2007, there were only 10 outer islands including the Capital City of Majuro visited with the most populated ones had received more than one visits. Islands visited were Rong-rong Is. in Majuro Atoll, Jaluit Atoll, Ebeye, Kwajalein Atoll, Wotje Atoll, Namdrik Atoll, Maloelap Atoll, Arno Atoll, Ailuk Atoll, Ujae Atoll, and Kili Island.

We noted that by using this appropriate approach of engaging our stakeholders (NCC) and the assigned task teams on the outer islands, the POPs awareness raising activities were effective and lead to communities becoming more engaged and involved in inventory development and collection of chemicals because they are more aware of the dangers/risks/hazards that are posed by these chemicals.

Using this integrated approach in the development of our national inventory, addressed not just POPs chemicals but also included other hazardous chemicals and materials such as non-POPs obsolete pesticides and spent batteries, and more importantly the chemical management aspects as well. In this case, this approach employed in the Marshall Islands in which members of NCC have varied functions so they used the opportunity of the island visitations to talk, present, and shared their concerns, and views about aspects of environmental management, and other important expertise such as water quality management and marine protected area management.

Most of the outer island visits conducted by the assigned task teams were equipped with necessary communication tools to be use in their awareness and inventory tasks, such as copies of POPs pamphlets & brochures in local language and POPs Power-point Presentation on CDs, including digital cameras and PCBs test kits. Below are few of the photos taken by the task teams.

The POPs School Awareness and Education Presentations at Jaluit and Ujae Atoll

Jaluit High School

St. Joseph Secret Heart School

Ujae Public Elementary School

The POPs Community Awareness and Education Presentations at Jaluit, Maloelap,

Jaluit, Jaluit Community

Maloelap

Arno, dioxin & furan survey

The POPs Inventories of chemicals and drinking water tanks samplings at Ujae, Wotje, & Ebeye


Water sampling in Ujae Atoll


Wotje Atoll


Testing of 20 + transformers in Ebeye

All trip reports were made on power-point presentations and presented to NCC members during their regular meetings. RMIEPA has a 30 minutes radio program on the RMI public radio station and these events were also channeled to general public through radio messages and announcements.

2.3.9 Relevant activities of non-governmental stakeholders.

Women United Together Marshall Islands (WUTMI):

The primary mission of WUTMI is to serve as the voice of women in the Marshall Islands, with the primary goal of supporting and strengthening of Marshallese women and families. Some of the services and activities that WUTMI provides are:

* Providing technical support in the areas of governance, programme development, formulation and implementation toward its membership through consultations and group sessions.
* Sponsoring or conducting workshops to promote awareness about health, education, and environmental issues.
* Identify women's issues and concerns which could be integrated into programmes.
* And also to providing counseling sessions in areas such as early childhood development, substance abuse, domestic violence and others.

2.3.10 Overview of technical infrastructure for POPs assessment

The technical infrastructure for environmental monitoring and research in the Marshall Islands is extremely limited, and there is no capability for any such work in relation to POPs chemicals. The EPA has a small water testing laboratory which is currently only equipped to perform the most basic of tests. There are no chemical research facilities in place.

2.3.11 Identification of impacted populations or environments

There is no information available on the impacts of POPs on the population of the Marshall Islands, or on the environment other than the international studies noted in 2.3.7 above.

2.3.12 Details of any relevant system for the assessment and listing of new chemicals.

There is an existing system for assessment and listing of new chemicals in the Marshall Islands.
The RMIEPA Task Force conduct a pesticide and other products inventory in the wholesalers and the small stores through out the Majuro community. The results of these inventories confirm that all wholesalers companies including small stores are importing and selling out restricted and prohibited pesticides, and other hazardous chemicals. In order to enforce the Pesticides and POPs Regulations effectively a new system of importing assessment for these chemicals must be in place with new listing of chemicals as described below.

1. All Restricted Pesticides and other hazardous chemicals must be banned from importing into RMI by the importers, wholesalers, and stores in anywhere in the Republic.
2. All prohibited Pesticides including 12 POPs chemicals must not be imported into or enter into the Republic of the Marshall Islands.
3. All other pesticides, and hazardous chemicals with valid labels that contained instructions written in English or Marshal lese with EPA numbers, and marked with the signal word "Caution" all are allowed for importers and companies to import into RMI with a valid Permit obtained from the office of the RMIEPA.
4. Restricted Pesticides and hazardous chemicals can be imported into RMI by a Certified Applicator with a valid Permit obtained from the RMIEPA. All Restricted Pesticides and hazardous chemicals are only for use by a certified applicator, and are not, and must not for sale or trade within RMI.

As a result of the pesticides inventories taken at the importers and companies in Majuro, some of the new pesticides and chemicals have been imported recently into RMI and are described below with their photos:

Listing of New Pesticides and other Products (Restricted, Prohibited for import, use, and sale)

1. Black Cat Mosquito Coils (Label written in Chinese)

These are misbranded pesticides, which are prohibited or banned from importation into RMI.

2. Black Cat Sprayer in Can (Label written in Chinese)

3. Colder Mosquito Coil in box (Label written in Chinese) **Prohibited and Banned Pesticides**

Banned/ProhibitedPesticides

4. Easy Off Oven Cleaner in Sprayer can (Label and Marked POSION)

Restricted Pesticides

5.Oven Grill Cleaner in can (Label and Marked DANGER)

Restricted Pesticides

6. Restricted Pesticides:

a. ORTHO – Permethrin (Ants Killer)
b. TERRO – Permethrin (Ants Killer)
c. Combat – Fibronal (Roach Killer)
d. Combat – Fibronal (Ants Killer)
e. Cypermethrin – (Ants & Roach Killer)
f. Permethrin – (Mosquito Fogger)
g. Pyethrin – (Flowers and Vegetables insect Sprayer)
h. Pyrethrin (Rose & Flowers Insect Sprayer)
i. Cyfluthrin – (Tempo WP)
j. Cypermethrin – (Demon WP)
k. Pyremethrin – (PT565 Spray)
l. Fibronal – (Termitor)
m. Permethrin – (Roach and Flea Fogger)
n. Resmethrin – (Insect Killer)
o. Chlorpyrrifos – (Roach Bait)
p. Chlorpyrifos – (Nest Killer)
q. Avermectin B10.05%

2.3.13 Details of any relevant system for the assessment and regulation of chemicals already in the market.

There is no legislation that covers storage, handling and disposal of chemicals already in the market and hence there is no system in place for regulating such activities. In respect to storage and disposal, recommendations on safe practices have been made to the various importers and retailers. For the wider public, awareness of these issues needs to be encouraged and maintained.

3.0 STRATEGY AND ACTION PLAN ELEMENTS OF THE NATIONAL IMPLEMENTATION PLAN

3.1 Policy Statement

The Government of The Republic of the Marshall Islands is committed to ensure a safe environment for its people and future generations. The guiding principles for sustainable development in the Marshall Islands are incorporated into the countries National Vision, which aims to:

> "become a country within an inter-dependant world, with an enhanced socio-economic self-reliance, an educated, healthy, productive law-abiding and God-loving people in which individual freedom an fundamental human rights are protected and culture and traditions are respected and development and environmental sustainability are in harmony."

The Stockholm Convention on Persistent Organic Pollutants (POPs) is one of many avenues in which the Government believes the Republic of the Marshall Islands can benefit in improving quality of life by protecting human health and the state of its environment. Therefore, the Government of the Marshall Islands and its people recognize the importance of this National Plan for Implementation of the Stockholm Convention and are committed to its obligations.

3.2 Implementation Strategy

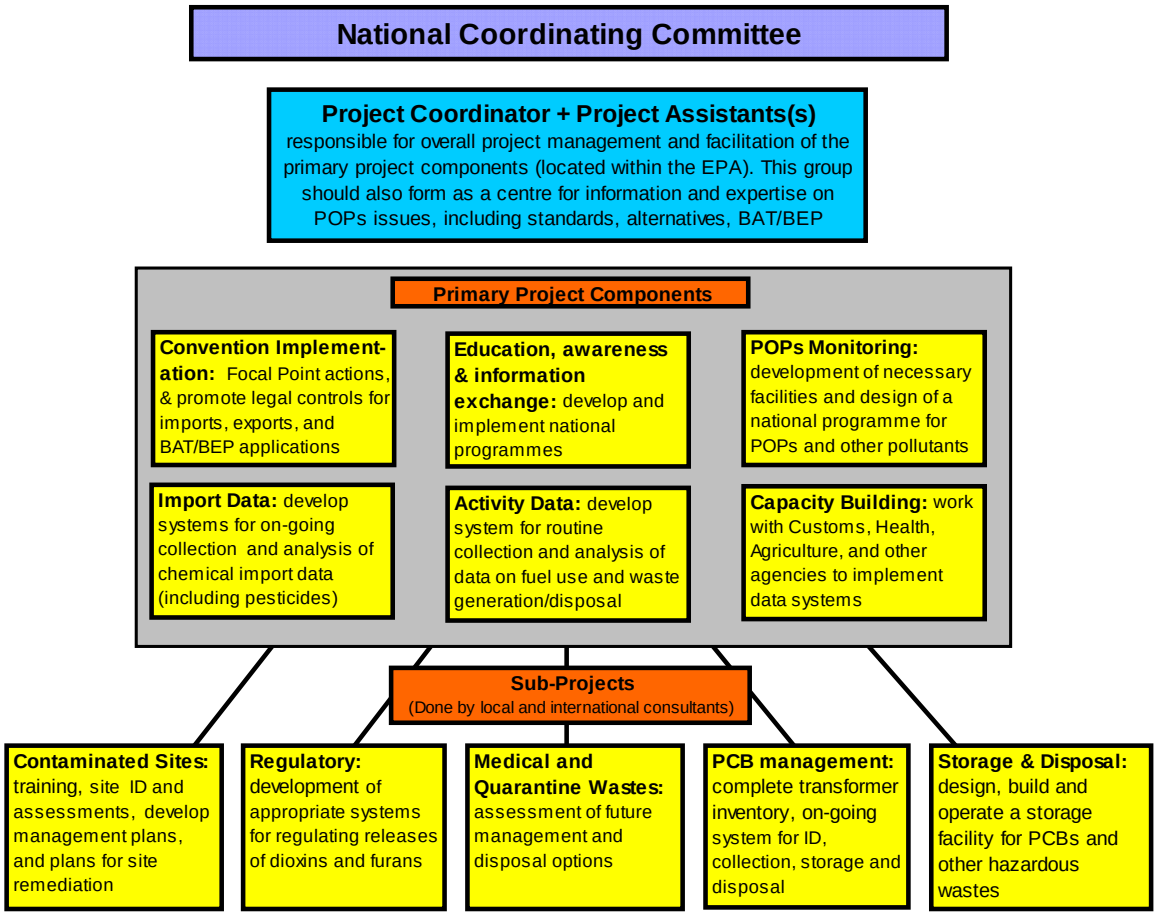
The execution of the National Implementation Plan will be coordinated by the Environmental Protection Authority, which has primary responsibility for environmental issues and strategies in the Marshall Islands. The joint participation of many other government agencies will ensure the success of the NIP and it is envisaged that the Plan will be integrated into the activities of each Department without adding to their workload.

The RMIEPA will be responsible for monitoring progress with implementation of the NIP and for Convention reporting. The National Coordinating Committee (NCC) will be responsible for overseeing the implementation of all the action plans. They will monitor the progress of these plans to ensure that they are successfully implemented within the given timeframe.

A proposed management and project structure for implementation of the NIP is shown in Figure 2 below. Detailed activity plans, timelines and cost estimates for each of the project components and sub-components are given in sections 3.3 below, and the overall resource requirements for these are summarized in section 3.5. Additional funding will also be required to establish the core project management team (Project Coordinator and Project Assistant), and to support the work of the National Coordinating Committee. Most of the funding for the programme will need to be obtained from external donor sources.

The prioritization of suitable management options to address the requirements of the Stockholm Convention was undertaken during a stakeholder consultation in February 2007. The proposed options will be implemented according to the detailed work plans in the following sections.

Fig 2. A Proposed Structure for Management of Activities under the National Implementation Plan



3.3 Activities, Strategies and Action Plans

The National Implementation Plan consists of the following specific strategies and action plans each targeting aspects of the Convention requirements.

1. Action Plan to address the intentional production and use of POPs Pesticides.
2. Action Plan to address the specific requirements for PCBs.
3. Action Plan on measures to minimize and ultimately eliminate the unintentional production of POPs.
4. Action Plan on measures to reduce or eliminate releases from stockpiles, wastes and contaminated sites.
5. Action Plan to address public information, awareness and education.
6. Action Plan to address research, development and monitoring.

3.3.1 Action Plan to address the Intentional Production and Use of POPs Pesticides (Articles 3 and 4, Annexes A and B).

3.3.1.1 Context and Analysis of Issue

Under Articles 3 and 4 of the Convention, Parties are required to undertake measures to reduce or eliminate releases from intentional production and use of POPs chemicals as listed in Annexes A and B of the Convention, and regulate any trade in these POPs with both Parties and Non-Parties.

The Marshall Islands does not intentionally produce or use any POPs pesticides, nor are there any future plans to do so. However, some POPs pesticides were used in the past, especially DDT for malaria control. The Pesticides and POPs Regulations 2004 allow for controls on the importation and use of pesticides, including a ban on all imports of POPs. This ban has not yet been applied.

The Marshall Islands has already registered its requirement under the Stockholm Convention for a use exemption for DDT. This is on the basis that the chemical may be needed some time in the future for malaria control.

Issues have been identified with the provision of official information regarding some pesticide imports, especially those that are brought into the country in support of foreign aid-related activities. In addition, some imported pesticides do not contain written instructions in English or Marshallese. And some common consumer items, such as mosquito coils, have been found with no product information at all.

A number of capacity building and awareness-raising requirements have been identified in relation to pesticide use generally in the Marshall Islands. These include the need for additional training of Customs officers, EPA staff, and other government personnel, in the application of the pesticide regulations. There is also a need to develop the capacity for identification and testing of imported products. There is also a need for general education and awareness activities at the user level. This should include the promotion of alternative (non-chemical) methods for pest control.

3.3.1.2 Goals and Objectives

Goal: To prohibit the intentional production and use of POPs pesticides, with the exception of DDT, and to take steps to improve the controls of future imports and use of other pesticides in the Marshall Islands.

Objective 1: To formally ban the importation, production, and use of POPs pesticides in the Marshall Islands, with the exception of DDT, by December 2009.

Objective 2: To take action, including amendments to the pesticide regulations if necessary, to ensure better provision of product information and user instructions, by December 2010.

Objective 3: To build capacity amongst government agencies, importers and users for better compliance with, and monitoring and enforcement of, the pesticide regulations, by December 2010.

An additional objective, to build capacity within the RMIEPA for monitoring and analysis, will be addressed under the action plan for Research, Development and Monitoring.

3.3.1.3 Implementation Strategy

A detailed list of activities required for this work and a list of proposed performance indicators is given in Annex 2 (Table A1). As indicated, the key steps include:

- Action on the publication of an official ban notice by the RMIEPA Board of Directors.
- Consultations to identify and agree on changes to the regulations followed by promulgation of the changes, and subsequent education and awareness activities.
- Completion of a training-needs analysis, followed by consultant recruitment and training delivery.

As shown, it is expected that the work can be completed within the next 2 years.

3.3.1.4 Resources Needed

The financial resources required for this action plan are summarized in Table 3.2 (see section 3.5). The programme is estimated to be completed within the next 2 years (24 months). The majority of this work will require external donor funding, with a contribution, largely "in kind", from the government of the Marshall Islands. Such contribution will include office space and staff remuneration and some other operating costs at approximately 10% of the total estimated costs for this programme. Monitoring of this programme will be in accordance with the performance indicators identified in the table.

3.3.2 Action Plan to address the Specific Requirements for PCBs (Annex A, Part II)

3.3.2.1 Context and Analysis of Issue

The specific requirements for PCBs under Annex A, Part II, of the Convention are as follows:

- Production is to be eliminated.
- Use of PCBs in equipment, such as transformers and capacitors, is to be eliminated by 2025 and until then is permitted only in a manner that prevents or minimizes human exposure and release into the environment.
- Import and export of PCBs is prohibited, except for the purpose of environmentally sound waste management.
- Parties are required to work towards the environmentally sound management of PCB wastes as soon as possible, but no later than 2028.

A first exercise for removing PCB oils from old transformers in the Marshall Islands was carried out by the US EPA in the mid-1990s, although this only dealt with older out-of-use equipment. Two large transformers containing PCBs were later removed in 2006 as part of an AusAID/SPREP disposal project for persistent organic pollutants. Additional testing has shown that there are up to 50 smaller PCB-transformers on the island of Ebeye, which may also need to be exported for disposal. In addition, there are unknown numbers of transformers on the outer islands which have yet to be tested for PCBs. Further action is required to finalise a PCB transformer inventory for the Marshall Islands, followed by development and implementation of a programme for removal and disposal.

No work has yet been carried out for the identification of small capacitors and other electrical equipment that could possibly contain PCBs. It is known from work done in other Pacific Island countries that some of these items will almost certainly be present in the Marshall Islands. There are no systems in place for the environmentally sound management of this type of equipment, and a complete absence of suitable disposal facilities. It is therefore proposed that a system be developed for identifying and managing PCBs in small capacitors and other equipment as they arise, and that this should include placement into safe storage, and ultimate disposal.

3.3.2.2 Goals and Objectives

Goal: To identify all current holdings of PCBs in the Marshall Islands, and to ensure their safe storage and eventual disposal in an environmentally sound manner.

Objective 1: To finalise a PCB transformer inventory for the Marshall Islands, by November 2009.

Objective 2: To have systems in place for identifying and managing PCBs in small capacitors and other electrical equipment by June 2010.

Objective 3: To design and develop suitable facilities for the safe storage of PCB-containing equipment and other hazardous wastes, by June 2010.

Objective 4: To set up on-going systems for the removal and disposal of PCBs in an environmentally sound manner by June 2011.

3.3.2.3 Implementation Strategy

The detailed work plan (Annex 2, Table A2) gives a detailed breakdown of the activities needed to achieve the above objectives in order to fulfill the specific requirements for PCBs under the Stockholm Convention. The plan includes lists of key contributors, an indicative timeframe, performance indicators, and estimates of costs and resources needed to conduct the activities.

As indicated, the key steps in the plan include:

- Field work by the EPA to identify and test all remaining untested transformers,
- Engagement of a consultant to conduct training and assist in developing a system for identification, removal and storage of PCB capacitors and other related materials,
- Engagement of a consultant and local contractors for the design and construction of a storage facility for PCBs and other hazardous wastes,
- Periodic exercises for the export and disposal of transformers, capacitors and other related equipment and wastes.

The estimated timeframe for the initial implementation of the action plan is 3 years, although there will be an on-going requirement for storage and export/disposal activities for many years beyond that time.

3.3.2.4 Resources Needed

It is expected that this work plan will be implemented within three years, preferably by the end of 2011, although the collection of capacitors and other equipment containing PCBs, and the associated disposal activities will extend for many more years beyond that date. Table 3.2 summarises the financial resources required to implement the work plan within the given timeframe

(see section 3.5). The Marshall Islands Government will seek funds from international donors to support all or part of the activities shown in the detailed work plan.

3.3.3 Action Plan on measures to minimize and ultimately eliminate the Unintentional Production of POPs (Article 5 and Annex C, Part I, II and III).

3.3.3.1 Context and Analysis of Issue

Parties to the Stockholm Convention are required to take measures for continuous minimization of releases of unintentionally produced POPs (dioxins and furans, PCBs and HCBs) and where possible, eliminate their releases. The unintentionally produced POPs and their main sources are detailed in Article 5 and Annex C of the Convention, and Parties are required to fulfill the following specific requirements:

- Prepare an action plan within 2 years after entry into force (1st release inventory included)
- Require BAT as soon as possible but not later than four years after building a new source or substantial modification of a plant (for those sources listed in Annex C, Part II), and promote the application of BAT and BEP for all other sources
- Report on the success of identified strategies every five years.

Dioxins and furans are unintentionally produced Persistent Organic Pollutants (POPs) which are formed and released from thermal processes involving organic matter and chlorine and as a result of incomplete combustion or chemical reactions. In Phase II of the NIP project a preliminary inventory of dioxin and furan releases was conducted on the sources that were identified as being relevant to the Marshall Islands. This work was based on the methods given in the UNEP toolkit[4] for identification and quantification of dioxin and furan releases.

The estimated releases from the dioxin and furan inventory were given previously in Table 2.1. As indicated, the main sources of releases for the Marshall Islands are the incineration of medical and quarantine wastes, ferrous and non-ferrous metal production (specifically, the melting of lead from old batteries, and cable burning), uncontrolled combustion processes (landfill fires and backyard rubbish burning) and miscellaneous sources (burning of wood for fish smoking). The total dioxin and furan releases for the Marshall Islands are low by comparison with many other countries, although they are much more comparable on a per capita basis.

The Marshall Islands lacks the capacity to properly record, control or monitor the releases of dioxins and furans. The knowledge and application of best available techniques (BAT) and best environment practices (BEP) for new or existing sources is very limited or non existent. These measures need to be considered when any new facility is developed; for example the installation of a new incinerator for medical wastes, or possibly even municipal wastes.

Work is also needed for the development of emission control regulations under the National Environmental Protection Act 1984. These would allow the RMIEPA to take action in addressing other specific sources of dioxin releases, including cable burning, lead recovery, asphalt plants, and emissions from power stations and motor vehicles.

[4] UNEP, 2003. Standardized Toolkit for Identification and Quantification of Dioxin and Furan Releases.

There is no available data on releases from other unintentional POPs (ie HCB and PCBs) as no major sources of these chemicals were identified in the Republic. It is safe to assume that those processes identified as significant sources of dioxins and furans will also have significant releases of other unintentional POPs, and will therefore be effectively addressed through the same proposed action.

3.3.3.2 Goals and Objectives

Goal; To develop and implement actions for the minimization and ultimate elimination of unintentionally produced POPs.

Objective 1: To establish by the end of 2009, and maintain thereafter, capacity within the Marshall Islands for determining releases of unintentional POPs, and for promoting the application of BAT/BEP for new and existing sources.

Objective 2: To support and enhance the implementation of the National Waste Management Strategy, through the promotion of waste minimisation activities including composting and recycling, by 2010.

Objective 3: To carry out a review by the end of 2010 and implement the recommendations by the end of 2011, for upgrading the current facilities for the management and disposal of quarantine and medical wastes.

Objective 4: To further develop and then implement, by the end of 2011, the existing draft regulations on air emissions standards for stationary and mobile sources.

3.3.3.3 Implementation Strategy

The detailed work plan (Annex 2, Table A2) gives a detailed breakdown of the activities needed to achieve the above objectives in order to fulfill the specific requirements for unintentional POPs under the Stockholm Convention. The plan includes lists of key contributors, an indicative timeframe, performance indicators, and estimates of costs and resources needed to conduct the activities.

As indicated, the key steps in the plan include:

- Training of key staff in dioxin inventories and the application of BAT/BEP, and the development of systems for on-going data collection for the inventories,
- Promotional activities directed at waste minimisation, with the aim of reducing waste burning,
- Engagement of a consultant for review of the current systems for management and disposal of medical and quarantine wastes,
- Significant capital expenditure for upgrading or replacement of the current facilities for disposal of medical and quarantine wastes
- Engagement of a consultant for review of the existing draft air emission regulations.

3.3.3.4 Resources Needed

It is expected that this work plan will be implemented within three years, although the some of the activities are intended to be on-going. Table 3.2 summarises the financial resources required to implement the work plan within the given timeframe (see section 3.5). The Marshall Islands

Government will seek funds from international donors to support all or part of the activities shown in the detailed work plan.

3.3.4 Action Plan on measures to reduce or eliminate releases from stockpiles, wastes and contaminated sites (Article 6)

3.3.4.1 Context and Analysis of Issue

Article 6 of the Stockholm Convention addresses the obligations for stockpiles, wastes and contaminated sites. The primary requirements are as follows:

- Identification of stockpiles that consist of or contain intentionally produced POPs.
- Management of such stockpiles in a safe, efficient and environmentally sound manner.
- Identification of products and articles in use and wastes that consist of, contain or are contaminated, with intentionally or unintentionally produced POPs.
- Measures to ensure safe handling, collection, transport and storage of POPs wastes, and environmentally sound disposal.
- Identification of sites contaminated by Persistent Organic Pollutants (POPs).

There are no known stockpiles of POPs in the Marshall Islands. However, there are a significant number of potentially contaminated sites, although no formal exercise for identification and assessment has ever been undertaken. These include sites associated with power stations, boat and vehicle repair yards, and several 'legacy' sites from past activities, including the Pacific War. In addition, a pesticide burial site was recently identified on Majuro, and in the Arno research farm.

There is no expertise or capacity within the Marshall Islands for the identification, management and remediation of any of these sites.

3.3.4.2 Goals and Objectives

Goal: To build capacity within the Marshall Islands by December 2011, for the identification and management of contaminated sites.

Objective 1: To develop a pool of trained personnel by December 2010, with the skills and necessary equipment for undertaking contaminated site assessments and the preparation of site management plans.

Objective 2: To carry out preliminary site identification and site assessments for potentially contaminated sites throughout the Marshall Islands by December 2010.

Objective 3: To carry out detailed site investigations and develop site management plans for the 10 highest priority sites by December 2011.

3.3.4.3 Implementation Strategy

The detailed work plan (Annex 2, Table A4) gives a detailed breakdown of the activities needed to achieve the above objectives in order to fulfill the specific requirements for unintentional POPs under the Stockholm Convention. The plan includes lists of key contributors, an indicative timeframe, performance indicators, and estimates of costs and resources needed to conduct the activities. As indicated, the key steps in the plan include:

- Staff training and development

- Preliminary and detailed site investigations and assessments, and the development of site management plans,
- A longer-term programme for further site assessments and site remediation.

3.3.4.4 Resources Needed

It is expected that this work plan will be implemented within three years, although there will be a continuing need for work in this area over many more years. Table 3.2 summarises the financial resources required to implement the work plan over the first three years (see section 3.5). The Marshall Islands Government will seek funds from international donors to support all or part of the activities shown.

3.3.5 Action Plan to address public information, awareness and education (Article 10)

3.3.5.1 Context and Analysis of Issue

Article 10 of the Stockholm Convention requires Parties to promote and facilitate public information, awareness and education, within their capabilities. Particular emphasis is put on promoting awareness among policy makers and developing educational and public awareness programmes targeting women, children and the least educated, on the health and environmental effects of POPs. In addition, Parties are obligated to promote public participation "*in addressing persistent organic pollutants and their health and environmental effects and in developing adequate responses, including opportunities for providing input at the national level regarding implementation of this Convention"*. Parties are also required to ensure that the public has access to up-to-date awareness and education information regarding POPs and Convention activities whether in-country or from abroad.

Public awareness and education was an integral part of the enabling activities for the development of the NIP in the Marshall Islands, and it is intended that this work be continued over the following three or more years.

3.3.5.2 Goals and Objectives

Goal: To enhance public knowledge, participation and access to relevant information with regard to persistent organic pollutants, their effects on people and the environment, and the activities carried out under the Stockholm Convention.

Objective 1: To develop a system for on-going public information, awareness and education by December 2009.

Objective 2: To regularly monitor the effectiveness of all public information, awareness and education programmes implemented.

3.3.5.4 Implementation Strategy

It is envisaged that the lead agency responsible for carrying out this programme will be the RMIEPA, with assistance as appropriate from other members of the National Coordinating Committee (NCC).

A detailed list of activities required for this work and a list of proposed performance indicators is given in Annex 2 (Table A5). As indicated, the key steps include public consultations to obtain input on the most appropriate avenues for disseminating information to the general public. A system will also be established for the public to have access to information regarding the National Implementation Plan (NIP), Persistent Organic Pollutants (POPs) and the Stockholm Convention. Another important activity will be to work with the Department of Education in developing programmes on environmentally sound management of chemicals.

Monitoring of this programme will be in accordance with the performance indicators identified. It is important to continually monitor the effectiveness of these activities and make changes where necessary.

3.3.5.5 Resources Needed

The requirements for this programme include both human and technical resources. Designing appropriate awareness materials will depend on consultations with the public and these may include the provision of resources translated into Marshallese. Specialized technical input may be needed in developing awareness aids for television or other media. Both internal and external financial resources are needed to carry out the majority of these activities.

Table 3.2 (Section 3.5) presents a summary of the financial resources required to address public information, awareness and education on Persistent Organic Pollutants (POPs) and the Stockholm Convention. This programme is intended to be carried out over at least the next three years, but with annual reviews and monitoring to ensure programme effectiveness and the need for on-going work.

3.3.6 Action Plan to address research, development and monitoring (Article 11)

3.3.6.1 Context and Analysis of Issue

According to Article 11 of the Stockholm Convention, Parties are required to *"within their capabilities, at the national and international levels, encourage and/or undertake appropriate research, development, monitoring and cooperation pertaining to persistent organic pollutants and, where relevant, to their alternatives and to candidate persistent organic pollutants"*

The technical infrastructure for environmental monitoring and research in the Marshall Islands is extremely limited, and there is no capability for any such work in relation to POPs chemicals. The RMIEPA has a small water testing laboratory which is currently only equipped to perform the most basic of tests. There are no chemical research facilities.

The analysis of environmental samples for Persistent Organic Pollutants (POPs) and other hazardous chemicals is technically demanding and requires significant capital investment in laboratory facilities and on-going operation and support costs. On the other hand there are a variety of simple test kits that can be used to carry out screening level assessments in the field. Most likely, the most suitable approach for the Marshall Islands would be to develop the capacity for utilizing a combination of these two approaches, with local staff trained and equipped for screening level assessments, as well as having the systems in place for the collection of samples to be submitted for more exacting analyses overseas. Actions should also be taken to ensure that the

Marshal Islands is able to participate in relevant international studies, such as the regular WHO breast milk surveys.

3.3.6.2 Goals and Objectives

Goal: To build capacity in the Marshall Islands, by December 2010, for routine monitoring of Persistent Organic Pollutants (POPs) and other hazardous chemicals.

Objective 1: By December 2009, to carry out an assessment of POPs monitoring requirements for the Marshall Islands and recommend the most appropriate options for meeting these needs.

Objective 2: To implement the proposed monitoring programme by December 2010.

3.3.6.3 Implementation Strategy

It is envisaged that the lead agency responsible for carrying out this programme will be the RMIEPA, with assistance from the National Coordinating Committee and other agencies as appropriate. A detailed list of activities required for this work and a list of proposed performance indicators is given in Annex 2 (Table A6).

The first steps in this programme will involve work by an international consultant to assess the current infrastructure for sampling and analysis, consult with all relevant stakeholders on possible monitoring requirements, followed by development of a recommended monitoring programme and the most appropriate methods for implementation. There will also be a requirement for staff training in sample collection methods and the use of field test kits.

3.3.6.4 Resources Needed

Table 3.03 presents a summary of the financial resources required to implement the proposed programme. The key costs items include consultancy fees, equipment costs, and the operational costs for an on-going programme.

3.3.7 Strategy to address information exchange (Article 9) and reporting (Article 15)

3.3.7.1 Context and Analysis of Issue

Under Article 9 of the Convention, Parties are required to undertake measures to facilitate information exchange relevant to *"the reduction or elimination of the production, use and release of persistent organic pollutants and alternatives to persistent organic pollutants, including information relating to their risks as well as to their economic and social costs"*. Article 9 further states that Parties are to *"designate a national focal point for the exchange of such information"*.

In addition, each Party is required under Article 15 to *"report on the measures it has taken to implement the provisions of the Convention and the effectiveness of those measures"*. Information to be reported includes statistical data on total quantities of production, import and export of each of the chemicals listed in Annex A and B. The reporting intervals and format under Article 15 were decided by the first Conference of the Parties in May 2005.

It is proposed that the RMIEPA be designated as the National Operational Focal Point for information exchange under the Convention, which is in keeping with its activities over the last few

years in this regard. The RMIEPA will also be responsible for meeting the reporting requirements, although all formal reports will be submitted through the Official Focal Point for the Convention, which is the Ministry of Foreign Affairs.

3.3.7.2 Implementation Strategy

No specific goals, objectives or detailed action plans are required for meeting these obligations. It is intended that the work simply be undertaken as part of the normal duties of the Persistent Organic Pollutants POPs) Project Coordinator, as established under the project management structure shown previously in Figure 2. Additional input, oversight and advice will be provided through the RMIEPA management, and the National Coordinating Committee (NCC).

3.3.7.3 Resources Needed

There are no specific resource requirements for meeting these obligations, other than the normal personnel and operating costs associated with the POPs Project Team.

3.4 Development and Capacity-Building Proposals and Priorities

The action plans presented above were developed on the basis of agreed priorities for implementation of the Stockholm Convention in the Republic of the Marshall Islands. Much of the work is intended to be carried out by local personnel with assistance from international experts as and when required. This approach is intended to assist in developing local capacity for Persistent Organic Pollutants (POPs) management and implementation of the Convention. Table 3.1 presents a summary of the proposed capacity building activities.

Table 3.1: Summary of capacity building proposals.

POPs Issues	Capacity Building Proposals
POPs Pesticides	• **Training of government personnel, importers and users for better compliance with the pesticide regulations** • **Training on development of non – chemical alternatives to pesticides**
PCBs	• **Training on identification, removal and storage of PCBs in electrical equipment.**
Dioxins and Furans	• **Training on dioxin inventories and the application of BAT/BEP** • **Training for monitoring and enforcement of the air emission regulations**
Contaminated Sites	• **Training in identification, assessment and management of contaminated sites.**
Monitoring	• **Development of local facilities and improved access to overseas resources, as appropriate, for the monitoring of POPs and other pollutants** • **Staff training in sample collection techniques and the use of field test kits**

3.5 Timetable, resource requirements, and measures of success

The total estimated cost of all the activities planned to meet the Marshall Islands' obligations under the Stockholm Convention is US$731,000, with the breakdown between each of the different action plans as shown in Table 3.2 below. Details of each of the proposed action plans including the timeframes, performance indicators, and estimated cost requirements are presented in Table A1 to A6 of Annex 2.

Table 3.2:Summary of resource requirements for the implementation of the action plans.

Section	Action Plan	External	Internal	Total
3.3.1	Intentional Production and Use of POPs	$29,000	$3,000	$32,000
3.3.2	Specific Requirements for PCBs	$160,000	$15,000	$175,000
3.3.3	Unintentional Production of POPs	$344,000	$16,000	$360,000
3.3.4	Stockpiles, wastes and contaminated sites	$50,000	$9,000	$59,000
3.3.5	Information exchange	$39,000	$5,000	$44,000
3.3.7	Research, development and monitoring	$55,000	$6,000	$51,000
	TOTAL	**$677,000**	**$54,000**	**$731,000**

Annex 1: Technical Information on Persistent Organic Pollutants

Aldrin

Aldrin has been manufactured commercially since 1950 and used throughout the world up to the early 1970s to control soil pests such as corn rootworm, wireworms, rice water weevil and grasshoppers. It has also been used for protection of wood against termites. Aldrin is readily metabolised to dieldrin by both plants and animals. Biodegradation is slow and it binds strongly to soil particles and is resistant to leaching into groundwater.

Dieldrin

Dieldrin was mainly used as a soil insecticide. It is no longer manufactured in Canada and the USA, and its use is now restricted for termite control. Manufacture in Europe, especially for export to developing countries, continued until the late 1980s. It is a degradation product of aldrin. Dieldrin is extremely persistent in soil (half-life greater than seven years) and has a long half-life in biota (Howard 1991). It is the most potent carcinogen of the major organochlorine pesticides.

Endrin

Endrin was first used in the 1950s against a wide range of agricultural pests, mostly on cotton but also rice, sugar cane, maize and other crops. It has also been used as a Rodenticide. It is highly persistent in soils (half-life of up to 12 years) and has a high bioconcentration factor in fish. It is very toxic to fish, aquatic invertebrates and phytoplankton.

Chlordane and Heptachlor

Technical grade chlordane is a mixture of at least 120 compounds. In the past, chlordane was released into the environment primarily from its application as an insecticide and for seed dressings and coatings. In the USA, it was used extensively before 1983, and from 1983 to 1988, it was registered for termite control. It was cancelled for this use in 1988. Heptachlor has a similar use profile and is of particular interest since its oxidation product, heptachlor epoxide, is carcinogenic, and has been found in the Arctic abiotic and biotic environments.

DDT (Dichlorodiphenyltrichloroethane)

DDT was introduced in 1945 as an insecticide and is still in use today in many parts of the world where malaria is endemic. The technical product consists of 4,4'-DDT (or *p, p*'-substituted) and its *o,p*'-DDT isomer, as well as their dechlorinated analogs *(p,p*'- and *o,p*'-DDD). DDT is highly persistent in soil, with a half life of up to 15 years. It also exhibits high bioconcentration factors. In the environment it is metabolised to DDD and DDE, both of which have similar properties to DDT.

Toxaphene

Toxaphene is produced by the chlorination of technical camphene or γ-pinene and can consist of over 300 congeners, mainly bornanes and camphenes substituted with 6-10 chlorines, with an average composition of $C_{10}H_{10}C_{l8}$. Analysis has been difficult because of the mixture's complexity, and because of lack of standards for individual components. Analytical standards for some chlorinated bornanes have recently become available. Nevertheless, the levels and effects of toxaphene are not well studied even though it is a significant contaminant in some regions.

Mirex

Mirex was used as an insecticide and fire retardant, mainly in the USA and Canada. Its presence in the Lake Ontario food web has been well documented. Mirex is extremely persistent in soils and sediment with an estimated 'field half-life' of five to ten years. Although mirex has a very high molecular weight, it has the physical properties of a relatively volatile compound capable of undergoing long-range transport. Its presence in the Arctic at low levels is consistent with its volatility and persistence.

Hexachlorobenzene
HCB is formed as a by-product in the production of a large number of chlorinated compounds, particularly lower chlorinated benzenes, and in the production of several pesticides. It had limited use in the 1960s as a fungicide. HCB is emitted to the atmosphere in flue gases generated by waste incineration facilities and metallurgical industries. HCB has an estimated 'field half-life' of 2.7-5.7 years. HCB has a relatively high bioaccumulation potential because of high lipophilicity (log K_{ow} = 5.5) and long half-life in biota.

Polychlorinated biphenyls (PCBs)
PCBs were introduced in 1929 by the Monsanto Chemical Corporation and were manufactured in the USA, Japan, the former Soviet Union, and eastern and western Europe under various trade names (e.g., Aroclor, Clophen, Phenoclor). They are chemically stable and heat resistant, and were used worldwide as transformer and capacitor oils, hydraulic and heat exchange fluids, and lubricating and cutting oils.

There are 209 chlorinated biphenyl congeners, with different chlorine substitutions on the biphenyl ring. Most PCB congeners, particularly those lacking adjacent unsubstituted positions on the biphenyl rings (e.g., 2,4,5-, 2,3,5- or 2,3,6-substituted on both rings) are extremely persistent in the environment. They are estimated to have half-lives ranging from three weeks to two years in air and, with the exception of mono- and di-chlorobiphenyls, are essentially non-biodegradable in aerobic soils or sediments. Highly chlorinated PCBs have been shown to be dechlorinated in anaerobic sediments, but only where present at relatively high concentrations (>10 g/g dw). PCBs also have extremely long half-lives in adult fish.

Polychlorinated dibenzo-p-dioxins and furans (PCDD/Fs)
Polychlorinated dibenzo-p-dioxins and furans (PCDD/Fs) enter the environment as by-products of industrial processes. The most significant sources are low-temperature, incomplete incineration of wastes, and especially chlorine-containing materials such as plastics. Other major sources include thermal processes, such as motor vehicle fuel combustion in countries where leaded petrol is still used, and metallurgical industries. Pulp and paper mills using chlorine in the bleaching process have been important sources, although discharges have been significantly reduced in recent years because of the substitution of molecular chlorine by other bleaching agents. PCDD/Fs are also trace contaminants in chlorophenoxy herbicides, PCB formulations, and chlorophenol wood preservatives.

Most PCDD/F congeners, like PCBs, are extremely hydrophobic and resistant to biodegradation in soils and sediments. Historical profiles of PCDD/Fs in sediment cores from large lakes show no evidence of transformation of congeners (such as anaerobic dechlorination) over time. The tetra- to octa-chlorinated PCDD/Fs have lower vapor pressures and Henry's Law constants than PCBs and are therefore not expected to undergo long-range transport to the same extent. PCDD/Fs are rapidly photodegraded in air, water, and on surfaces. The 2,3,7,8-substituted PCDD/F congeners are known to bioaccumulate in fish and invertebrates, however non-2,3,7,8-substituted congeners (which predominate in combustion sources) are readily degraded by vertebrates.

Annex 2: Detailed Work Plans and Costings

Table A1: Detailed work plan to address the intentional production and use of POPs (Articles 3 and 4, Annexes A and B).

Detailed list of activities	Key Contributors	Timeline	Performance Indicators	Funding Sources	Estimated Cost (USD)	Resources Needed
Objective 1: To formally ban the importation, production, and use of POPs pesticides in the Marshall Islands, with the exception of DDT, by December 2009						
1. Draft a background paper for consideration by EPA Board	EPA, NCC	Months 1 & 2	Paper submitted to Board	Internal	$750 (in kind)	Staff time
2. Decision by Board followed by publication of an official Notice	EPA	Month 3	Decision notified	Internal	$500	Publication costs.
Objective 2: To take action, including amendments to the pesticide regulations if necessary, to ensure better provision of product information and user instructions, by December 2010.						
1. Set up an Officials group to consider necessary or desirable changes to the regulations, including stakeholder consultations	EPA, NCC AG's Office	Months 4 to 6	Agreement on proposed changes	External	$1000	Meeting costs
2. Draft changes to regulations in consultation with stakeholders	AG's Office, NCC, EPA	Months 7 to 9	Regulations drafted	Internal	$1000 (in kind)	Staff time
3. Submit changes to regulations for official promulgation	AG's Office, EPA	Months 10 to 12	Regulations promulgated	Internal	$750 (in kind)	Staff time
4. Promote changes to importers and user groups (including actions through official channels to promote compliance by donor countries)	EPA, NCC AG's Office	Months 13 to 15, then on-going	Number of groups consulted Feedback from these groups	External	$2000	Meeting costs
Objective 3: To build capacity amongst government agencies, importers and users for better compliance with, and monitoring and enforcement of, the pesticide regulations, by December 2010.						
1. Carry out training needs analysis for target groups (regulators, importers, users)	NCC, EPA	Months 10 to 12	Report on training needs	External	$5000	Local consultant
2. Prepare Terms of reference, identify and recruit consultant(s) to conduct training	NCC, EPA.	Months 15 to 17	Consultants recruited	External & internal	$250 (plus $750 in kind)	Advertising costs
3. Provide training	EPA (via consultants)	Months 18 to 24		External	$20,000	International consultant(s), travel and training costs

Table A2: Detailed work plan to address the specific requirements of PCBs on The Republic of the Marshall Islands Island.

Detailed list of activities	Key Contributors	Timeline	Performance Indicators	Funding Sources	Estimated Cost (USD)	Resources Needed
Objective 1: To finalise a PCB transformer inventory for the Marshall Islands, by November 2009.						
1. Purchase field test kits, other sampling equipment, protective clothing and other necessary supplies	EPA	Months 1 to 3	Adequate supplies received.	External	$5,000	Test kits and equipment
2. Field work throughout the country, including the outer islands, to identify and test all transformers not yet tested and labeled for PCB content	EPA, MEC	Months 4 to 9	Field work completed	External & internal	$12,000 + $2000 (in-kind)	Local travel costs, salaries, and support (in kind)
3. Send samples from field positive units overseas for lab analysis	EPA	Month 10 to 12	Lab results obtained	External	$3,000	Analysis costs and freight charges
4. Write up all field and lab test results into a formal PCB Transformer Inventory	EPA	Months 4 to 15	Inventory report	External & internal	$2,000 + $1,000 (in kind)	Staff costs and support (in kind)
Objective 2: To have systems in place for identifying and managing PCBs in small capacitors and other electrical equipment by June 2010.						
1. Draft TOR(s) for international consultant to conduct tasks below	EPA, NCC	Month 4 to 6	TOR approved by EPA and NCC	Internal	$1,000 (in kind)	staff time
2. Engage consultant to conduct training sessions for management and technical personnel in govt and private sector on identification, removal and storage of PCBs in electrical equipment, including provision of resource materials and guidance document.	EPA, NCC, MEC, Public Works, electrical contractors	Month 7 to 12	Training completed	External & internal	$20,000 + $3000 (in kind)	Consultant fees and travel cost, venue costs, training materials, plus staff time in-kind)
3. Purchase of storage containers and safety equipment for all personnel involved in handling of PCBs	EPA	Month 7 to 12	Equipment received	External	$3,500	Safety equipment, drums, plastic bags, emergency response kits
4. Set up a system to ensure that all PCBs are reported, documented, removed and safely stored including training on how to use this system. (also link to storage facility below)	EPA, MEC, Public Works	Month 7 to 12	System set up and operational	External	$4,500	Personnel, computer costs, plus information materials
Objective 3: To design and develop suitable facilities for the safe storage of PCB-containing equipment and other hazardous wastes, by June 2010.						
1. Draft TOR(s) for international consultant	EPA, NCC	Month 7-9	TOR approved by EPA and NCC	Internal	$1,000 (in kind)	staff time

Detailed list of activities	Key Contributors	Timeline	Performance Indicators	Funding Sources	Estimated Cost (USD)	Resources Needed
to conduct tasks below.						
2. Engage consultant to identify suitable sites, design the facility, and provide advice during construction and commissioning	EPA, NCC, MEC, Public Works	Month 10 to 15, plus on-going advice	Site recommendations and design accepted by government. Construction Completed	External	$25,000 + $1000 (in kind)	Consultant fees and travel costs, staff time (in kind)
3. Facility construction and commissioning	EPA, NCC, MEC, Public Works	Months 16 to 24	Facility completed	External	$35,000 + $4,000 (in kind)	Contractor and construction costs, staff time (in kind)
Objective 4: To set up on-going systems for the removal and disposal of PCBs in an environmentally sound manner by June 2011.						
1. Liaison with donor agencies, SPREP, UNEP and US EPA to identify options for export and disposal of PCBs.	NCC, EPA	Months 12 to 18	Reports to NCC on information received, including disposal options	Internal	$1,000 (in kind)	Staff time
2. Seek funding for export and disposal operations, as and when required	NCC, EPA.	On-going	Funding approved	Internal	$1,000 (in kind)	Staff time
3. Export and disposal of PCBs and other wastes, as required	NCC, EPA	On-going	Wastes exported and disposed	External	est$50,000	Estimated shipping and disposal costs over 3 to 5 years

Table A3: Detailed work plan for meeting obligations for reducing the production and release of unintentional POPs.

Detailed list of activities	Key Contributors	Timeline	Performance Indicators	Funding Sources	Estimated Cost (USD)	Resources Needed
Objective 1: To establish by the end of 2009, and maintain thereafter, capacity within the Marshall Islands for determining releases of unintentional POPs, and for promoting the application of BAT/BEP for new and existing sources.						
1. Identify training providers and training opportunities for developing local expertise in dioxin inventories and the application of BAT/BEP to new and existing processes	EPA,NCC	Months 1 to 3, then on-going	Options identified and proposed training programme endorsed by NCC	Internal	$500 (in kind)	Staff time
2. Send key staff overseas for training as and when opportunities arise	EPA	Months 4 to 18	Training completed and reported as appropriate	External & internal	$15,000 + $1,500 (in kind)	Travel costs, course fees, and staff time (in kind)
3. Engage consultant to conduct an in-country training course on the application of BAT/BEP, and further on-the-job training for key staff in dioxin inventories.	EPA, NCC	Months 19 to 24	Training completed and reported	External & internal	$15,000 + $2,000 (in kind)	Consultant fees and travel costs, workshop costs, staff time (in kind)
4. Set up and implement systems for on-going data collection and regular updating & reporting of the dioxin inventory	EPA, Health, MEC, Works, Industry	Months 18 to 36, and on-going	Systems in place and operational, with updated inventories reported locally every 2 years, and to the Convention when required	Internal	$1,000 (in kind)	Staff time and computer costs (in kind)
Objective 2:To support and enhance the implementation of the National Waste Management Strategy, through the promotion of waste minimisation activities including composting and recycling, by 2010.						
1. Organise consultation meetings between NCC and National Waste Committee to agree on a coordinated programme for promoting waste minimisation activities, demonstration projects, etc	EPA,NCC, and other key stakeholders	Months 1 to 6	Agreed programme	External & internal	$2,000 + $1,000 (in kind)	Meeting costs, staff time (in kind)
2. Design and implement programme as agreed	EPA	On-going	Regular reports to NCC on programme implementation	External	$10,000 + $1,000 (in kind)	Resource materials, and minor equipment costs, staff time (in kind)

Detailed list of activities	Key Contributors	Timeline	Performance Indicators	Funding Sources	Estimated Cost (USD)	Resources Needed
3. Periodic monitoring of programme effectiveness and review of programme activities		Months 24, 36, etc	Reports on effectiveness monitoring and endorsement of programme review by NCC	Internal	$1000 (in kind)	Staff time
Objective 3: To carry out a review by the end of 2010 and implement the recommendations by the end of 2011, for upgrading the current facilities for the management and disposal of quarantine and medical wastes.						
1. Draft TOR for a consultant to review current management and disposal systems for medical and quarantine wastes, including proposals for upgrading or replacing the equipment	EPA, NCC, Health, Agriculture	Months 7 to 9	TOR agreed	Internal	$1,000 (in kind)	Staff time
2. Engage consultant and carry out the review	EPA, Health, Agriculture	Months 10 to 15	Consultancy report accepted and endorsed by NCC and other key stakeholders	External & internal	$25,000 + $500 (in kind)	Consultancy fees and travel costs, staff time (in kind)
3. Implement any operational improvements arising from the review	Health, Agriculture	Months 16 to 24	Systems implemented as and when required (reports to NCC)	Internal	$1,000 + $1,500 (in kind)	Minor equipment costs, staff time (in kind)
4. Seek funding, prepare contract specifications, and undertake tendering process for supply, installation and commissioning of new disposal facilities	Health, Agriculture	Months 16 to 36	Funding secured, system purchased, installed and operating	External & internal	$250,000 + $1000 (in kind)	Equipment costs, staff time (in kind)
Objective 4: To further develop and then implement, by the end of 2011, the existing draft regulations on air emissions standards for stationary and mobile sources.						
1. Draft TOR for a consultant to carry out a review of the regulations, consult with key stakeholders on possible changes, and prepare a draft of the proposed changes	EPA, NCC, AG's Office, other key stakeholders	Months 10 to 12	TOR Agreed	Internal	$500 (in kind)	Staff time
2. Engage Consultant and carry out the review	EPA, NCC, AG's Office, other key stakeholders	Months 13 to 18	Consultancy report accepted and endorsed by NCC and other key stakeholders	External & internal	$25,000 + $500 (in kind)	Consultancy fees and travel costs, staff time (in kind)
3. Further consultations as required, then submit proposed regulations for promulgation by the Government	EPA, AG's Office	Months 18 to 24	Regulations submitted and then promulgated	Internal	$1,000 (in kind)	Staff time

Detailed list of activities	Key Contributors	Timeline	Performance Indicators	Funding Sources	Estimated Cost (USD)	Resources Needed
4. Undertake staff training (for enforcement) and public education and awareness programme on the new regulations,	EPA, NCC and key stakeholders	Months 25 to 36, then on-going	Training completed, and increasing levels of compliance with the regulations	Internal	$1,000 + $2,000 (in kind)	Materials costs, staff time

Table A4: Detailed work plan for achieving obligations for reducing or eliminating releases from stockpiles, wastes and contaminated sites.

Detailed list of activities	Key Contributors	Timeline	Performance Indicators	Funding Sources	Estimated Cost (USD)	Resources Needed
Objective 1: To develop a pool of trained personnel by December 2010, with the skills and necessary equipment for undertaking contaminated site assessments and the preparation of site management plans.						
1. Identify training providers for developing local expertise in contaminated site investigations and management, and draft a TOR for the train programme	EPA,NCC	Months 4 to 6	List of possible providers and draft TOR endorsed by NCC	Internal	$1,000 (in kind)	Staff time
2. Engage consultant to conduct an in-country training course on site investigations and management	EPA, NCC	Months 7 to 12	Training completed	External & internal	$15,000 + $1,500 (in kind)	Consultant fees and travel costs, workshop costs, staff time (in kind)
3. Purchase necessary sampling equipment and protective clothing and other supplies (on advice of the consultant)	EPA, NCC	Months 7 to 9	Equipment purchased	External & internal	$5,000 + $500 (in kind)	Equipment costs, staff time (in kind)
Objective 2: To carry out preliminary site identification and site assessments for potentially contaminated sites throughout the Marshall Islands by December 2010.						
1. Carry out initial identification and assessments on at least five sites during the above training activities	EPA, NCC, other stakeholders	Months 10 to 12	Site information included in training report.	External & internal	Included in above	As for training entry above
2. Continue site investigations and assessment work throughout the Marshall Islands	EPA, others	Months 13 to 24	Comprehensive report on all site assessments and risk rankings	External & internal	$10,000 + $2,000 (in kind)	Travel and operating costs, staff time (in kind)
Objective 3: To carry out detailed site investigations and develop site management plans for the 10 highest priority sites by December 2011.						
1. Carry out detailed site assessments on the five highest risk sites	EPA, others	Months 25 to 30	Investigation reports	External & internal	$20,000 + $2,000 (in kind)	Travel and operating costs, equipment hire, laboratory charges for sample analysis
2. Prepare site management plans, including remediation proposals	EPA, others	Months 31 to 36	Management plans endorsed by NCC	Internal	$2,000 (in kind)	Staff time
3. Implementation of management plans and site remediation, and further investigations at other sites	EPA, others	On-going	Management systems n place, sites remediated.	External & internal	unknown	Operating costs, clean-up costs, staff time

Table A5: Detailed work plan to address public information, awareness and education (Article 10).

Detailed list of activities	Key Contributors	Timeline	Performance Indicators	Funding Sources	Estimated Cost (USD)	Resources Needed
Objective 1: To develop a system for on-going public information, awareness and education within the first year of becoming a Party. ***Objective 2: To regularly monitor the effectiveness of all public information, awareness and education programmes implemented.***						
1. Public consultation on the Stockholm Convention and contents of the NIP, and to identify the most appropriate avenues for disseminating awareness and education materials	NCC, EPA, all key stakeholders	Months 1 to 3	Meeting reports, and endorsement of proposed programmes by the NCC	External & internal	$2,000 + $500 (in-kind)	Meeting costs, staff time (in kind)
2. Preparation of public awareness and education materials as per recommendations from consultations.	NCC, EPA, Education	Months 4 to 6	Materials produced and disseminated	External & Internal	$15,000 + $1,000 (in kind)	Resource production costs, staff time (in kind)
3. Programme implementation	NCC, EPA, NGOs, others	Ongoing	6-monthly programme reports (also see item 6 below)	External & Internal	$10,000 + $1,500 (in kind)	Operating costs, travel, staff time (in kind)
4. Provide on-going technical support to schools in educating students about environmentally sound chemical management.	EPA, Education	Ongoing	Provision of technical or other materials to support school curriculum activities relating to POPs.	External	$5,000	Technical materials
5. Establish a system to provide ready public access to information on POPs and the Stockholm Convention	EPA, NCC	Months 9 to 12.	System established and operational, with new materials added as they become available	External & Internal	$2,000 + $1,000 (in kind)	Office costs, staff time (in kind)
6. Monitor the effectiveness of the activities carried out, and revise programmes accordingly	NCC, EPA.	Months 1, 13, 25, 37.	Monitored changes in public awareness levels, and feedback on programme effectiveness.	External & Internal	$5,000 + $1,000 (in-kind)	Survey costs, staff time (in kind)

Table A6: Detailed work plan to address research, development and monitoring (Article 11).

Detailed list of activities	Key Contributors	Timeline	Performance Indicators	Funding Sources	Estimated Cost (USD)	Resources Needed
Objective 1: By December 2009, to carry out an assessment of POPs monitoring requirements for the Marshall Islands and recommend the most appropriate options for meeting these needs. ***Objective 2: To implement the proposed monitoring programme by December 2010.***						
1. Draft TOR for a Consultant to carry out a review of POPs monitoring requirements for the Marshall Islands, and the most appropriate options for meeting these needs (including service providers)	NCC, EPA	Months 1 to 3.	TOR endorsed by NCC	Internal	$500 (in kind)	Staff time
2. Engagement of a Consultant to carry out the above work	NCC, EPA	Months 4 to 9	Study completed and acceptance of the final report by the NCC	External & internal	$15,000 + $1,000 (in kind)	Consultant fees and travel costs, staff time (in kind)
3. Formal endorsement of proposed programme by the EPA Board	EPA	Months 10 to 12	Programme endorsed	Internal	$500 (in kind)	Staff time
4. Purchase of required equipment for sample collection, and field test kits	NCC, EPA	Months 13 to 15	Recommendations and input from Consultations.	External	$15,000	Equipment costs
5. Staff training in sample collection methods and use of field test kits	NCC, EPA	Months 16 to 18	Training completed	External & internal	$10,000 + $1,000 (in kind)	Consultant fees and travel costs, staff time (in kind)
6. Implementation of on-going programme	NCC, EPA	Month 18 onwards	Reports and reviews as per item 7 below	External & internal	$15,000 + $2,000 (in kind)	Laboratory costs, operating costs (consumables and freight), staff time (in kind)
7. Periodic reporting of results and programme reviews	NCC, EPA	Months 24, 36, etc	Endorsement of programme reports and any proposed changes by the EPA Board	Internal	$1,000 (in kind)	Staff time